NRM STRATEGY 2030
NORTHERN TASMANIA

Attachments

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The 2030 NRM Strategy for northern Tasmania provides NRM North with a strategic direction for the management of natural resources in the region. The following attachments provide additional detail and information to supplement the 2030 NRM Strategy for northern Tasmania and to meet the requirements of the Australian Government's Regional Land Partnerships program.

The following 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

2030 NRM Strategy

Attachments

NORTHERN TASMANIA

Version 3.0

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» Lavendar rows at Bridestowe estate (Brian Dullaghan)

ATTACHMENT ONE

Tasmanian NRM policy context and drivers

1 Land, Water, Agriculture

In 2018-19, Tasmania produced 4.5 times more food than it consumed from 2,477 farm businesses, with processed food from agriculture valued at $3,535 million (Tasmanian Agri-Food Scorecard). In 2019-20, the total gross value of all agriculture was $2,150 million representing 5.8 percent of Gross State Product (Average) (ABS2). As set out in the *Tasmanian Government's Competitiveness of Tasmanian Agriculture for 2050* (White Paper 2020), the Tasmanian Government has a target of $10,000 million farm gate production by 2050. This target aims to enhance the broader economic, environmental, and social contributions of farming while also maintaining productive and sustainable terrestrial and marine farming systems, wise and fair use of water, and adaptation in the face of a changing climate.

Tasmania's *Draft Rural Water Use Strategy – October 2020* (DPIPWE, 2020) sets out a framework to guide Tasmania's water management arrangements to ensure integrated, fair and efficient regulation of water resources to deliver sustainable outcomes for rural water users, rural communities and the environment, while maintaining Tasmania's competitive advantages in a changing climate. This Strategy aligns with the NRM Strategies in ensuring wise and sustainable use of water resources.

Tasmanian Irrigation is a Government Business Entity with the aim to provide high surety irrigation water through 20 irrigation projects across the state. Tasmanian Irrigation's strategy expects that irrigation water is supplied and delivered with minimal impact on the environment. Farm Water Access Plans are a requirement for all farmers accessing water from an irrigation district. These plans provide a valuable link to the NRM Strategies.

Significant direct investment by the Tasmanian Government supports strategic partnerships with industry peak bodies and the three NRM organisations for prosperity and growth in sustainable food production, including fisheries and aquaculture. *Tasmania's Sustainable Agri- Food Plan 2019-23* recognises the role and importance of Landcare, and regional NRM organisations, in supporting the sustainability dimensions of the agri-food sector.

The *Strategic Growth Plan for the Tasmanian Forests, Fine Timber and Wood Fibre Industry* (Ministerial Advisory Council on Forestry, 2017) sets a clear agenda for increased sustainable timber production, both from native forests and plantations.

The Tasmanian Planning System provides for direct linkage to NRM Strategies by way of Regional Land Use Planning Strategies which set out the long-term planning goals for each Tasmanian region (aligned to NRM boundaries). The current Land Use Strategies specifically refer to the NRM Strategies as a source of guidance for land use planning. A review of the Tasmanian Planning System is underway including a review of regional land use strategies (Tasmanian Government, 2021).

At the national level, the Regional Land Partnerships Program (RLP) 5-year Outcomes 5 and 6 directly focus on sustainability of agriculture and soil, biodiversity and vegetation, and climate adaptation of agricultural systems. This is a fundamental aspect of the NRM planning process and aligns with the NRM organisations' existing roles as RLP service providers under the National Landcare Program.

The National Soil Strategy provides direction to state and national investors prioritising soil health, empowering soil innovation and strengthening knowledge and capability. The Soil Strategy has strong alignment with the NRM strategies' outcomes; a key to success is the forming of regional partnerships through a National Action Plan.

The Clean Energy Regulator is established by the Clean Energy Regulator Act 2011 and is a non-corporate Commonwealth entity for the purposes of the Public Governance, Performance and Accountability Act 2013. The Clean Energy Regulator administers schemes legislated by the Australian Government for measuring, managing, reducing or offsetting Australia's carbon emissions.

The Clean Energy Regulator's role is determined by climate change law. It has administrative responsibilities for the:

- National Greenhouse and Energy Reporting Scheme, under the National Greenhouse and Energy Reporting Act 2007
- Emissions Reduction Fund, under the Carbon Credits (Carbon Farming Initiative) Act 2011
- Renewable Energy Target, under the Renewable Energy (Electricity) Act 2000, and
- Australian National Registry of Emissions Units, under the Australian National Registry of Emissions Units Act 2011.

The NRM Strategies support the implementation of the Australian Government's Agricultural Stewardship Program's carbon farming initiative through the Emissions Reduction Fund.

The *Australian Dairy Plan* (Dairy Australia, 2020) is an industry-driven strategy providing a comprehensive and compelling framework for development of the dairy industry, underpinned by a robust Sustainability Framework with regular progress reporting. Partnerships with industries such as dairy are fundamental to successful natural resource management outcomes and are key to delivery of the NRM Strategies.

2 Coastal and marine

Tasmania's valuable coastal and marine resources are experiencing increasing development and competing pressures. The *State Coastal Policy Validation Act* (2003) sets out the principles and outcomes for sustainable use of Tasmania's coastal zone, and provides guidance on protection of natural and cultural values, sustainable urban and residential development, marine farming, tourism, public land and recreation.

Urban and residential development is considered within the Tasmanian Planning Scheme under the Coastal Hazards State Planning Provisions (2021). Marine reserves, commercial and recreational fishing, and marine farming are managed through the *Living Marine Resources Act* (1995).

The *Tasmanian Recreational Sea Fishing Strategy 2021-2030* sets out a vision to promote shared stewardship and sustainable and healthy fish stocks and habitats (DPIPWE, 2021). With potential for significant growth of Tasmania's salmon industry, a salmon industry plan is in development and due to be released in 2023.

Marine reserves are managed by the Tasmanian Parks and Wildlife Service, with seven marine reserves declared in state waters. Parks Australia manages the seven marine parks within Tasmanian waters through the *South-east Commonwealth Marine Reserves Network Management Plan 2013-23* (2013).

3 Renewables and circular economy

Electricity generation is a major use of Tasmania's water and wind resources. The *Draft Tasmanian Renewable Energy Action Plan* (Department of State Growth, 2020) is focussed on restoring energy as a competitive advantage for Tasmania by, among other things, maximising Tasmania' s renewable energy opportunities.

The Tasmanian Government has allocated funding specifically for projects to improve efficiency, reduce waste and drive productivity gains through circular economies (Department of Premier and Cabinet, 2020).

This initiative provides significant opportunity to build stronger understanding of the benefits of recycling, waste reduction and innovation for the natural resource management sector and as such provides valuable potential for strategic and project alignment.

4 Climate change

A focus on risk management is central to the Tasmanian Government's policy documents about climate change, agricultural competitiveness, biosecurity, rural water use and disaster management. The *Draft Rural Water Use Strategy* in particular, frames the prospective strategy squarely on a risk-based and adaptive approach to water management planning.

The observed and projected effects of climate change are comprehensively addressed in *Climate Action 21: Tasmania's Climate Change Action Plan* (DPAC, 2017). While Tasmania's *Climate Change Action Plan 2017–2021* has expired, Tasmania's next climate change action plan is under development. One of the six Priorities in the *Climate Change Action Plan* is "Building climate resilience", which "recognises the role of NRM organisations in working with all levels of government, business and the community to manage the associated risks and impacts from a changing climate." The Tasmanian Government has created a new advisory body, *Renewables, Climate and Future Industries Tasmania* (ReCFIT), who are working on a new Climate Action Plan (ReCFIT, 2021).

The *Tasmanian Disaster Resilience Strategy 2020-2025* (Tasmanian Government, 2020) explicitly notes that "The Tasmanian Government will work with others to... Include risk considerations in land use and natural resource management plans, policies, strategies, and use and development controls when developed or reviewed."

The Tasmania Fire Service has established a Fuel Reduction Program in response to the risk of catastrophic bushfires. This program deals with strategic and coordinated fuel reduction in high-risk areas. NRM organisations have the opportunity to link with this program through Fire Management Area Committees.

The Australian Government has identified its approach to improving climate resilience and adaptation in the natural, built, social and economic domains, including the agricultural sector, in its *National Climate Resilience and Adaptation Strategy 2021-2025*. In the natural domain, and agricultural sector specifically, this is realised through the Future Drought Fund, the Agricultural Biodiversity Stewardship Package, and National Agricultural Innovation Agenda.The *Drought Resilience Funding Plan 2020 – 2024* (DAWE, 2020) has a strong focus on natural resource management and has, as one of its three objectives, funding programs that will improve the natural capital of agricultural landscapes for better environmental outcomes. NRM partnerships with the Tasmanian Future Drought Fund Innovation Hub are already established and strategic alignment is ongoing.

5 Biodiversity

The Tasmanian Threatened Species Protection Act (1995) and the Nature Conservation Act (2002) are the primary state based regulatory framework for protecting and maintaining Tasmania's natural values and declaring reserved land.

The Tasmanian Wilderness World Heritage Area Management Plan (DPIPWE, 2016) and Tasmanian Wilderness World Heritage Area Biosecurity Strategy 2021-2031 (DPIPWE, 2021) provide strategic and operational linkage to natural resource management outcomes at the state and national levels, forming a fundamental part of landscape-scale conservation activities.

Australia's Strategy for Nature 2019-2030 (Australia's Nature Hub, 2019) is the overarching framework for all national, state and territory, and local legislation, policies and actions that target nature. It recognises that "Adaptive management includes assessing risk, measuring outcomes, reviewing and using approaches that maintain and restore the resilience of our terrestrial, aquatic and marine ecosystems."

This Strategy sets priorities, goals and objectives for the Australian Government, state/territory and local governments, non-government organisations, the private sector, research institutions, natural resource management organisations and the community. It prioritises action in the areas of climate change adaptation and resilience, including in the management of species and ecosystems that are vulnerable to climate change and understanding of the likely impacts of climate change on, and effective methods to promote adaptation and resilience of, terrestrial, aquatic and marine systems and species.

The Strategy for Nature 2019 -2030 (Australia's Nature Hub, 2019) links to the Regional Land Partnership's 5-year Outcomes for threatened species, threatened ecological communities, World Heritage Areas, and Ramsar Wetlands of International Significance. This Strategy provides overall guidance for NRM organisations in development and delivery of natural resource management outcomes.

The Regional Land Partnerships Program's five-year Outcomes 1 to 4 directly focus on biodiversity conservation. This is a fundamental aspect of the NRM planning process and aligns with the existing roles of NRM organisations as RLP service provider under the National Landcare Program.

The Environment Protection and Biodiversity Conservation Act (1999) is the primary federal legislation for protecting and maintaining Australia's natural values, and the new *Threatened Species Strategy 2021-2031* (DAWE, 2021) prioritises action and investment for EPBC protected matters. It broadens the number of priority threatened species from the previous strategy, which included birds, mammals and plants, to include reptiles, frogs, insects and fish. It also includes a focus on 'priority places', where threat mitigation and habitat protection efforts will benefit multiple species and ecological communities through landscape-scale actions, planning and coordination, and stronger partnerships. The *Threatened Species Strategy 2021 – 2031* will be underpinned by consecutive 5-year Action Plans, which will identify priority species and places, and detail actions and practical, measurable targets to assess progress. These documents are an important guide to future Australian Government investment in regional natural resource management.

6 Closing the gap

The Closing The Gap - Tasmanian Implementation Plan 2021- 2023 (Department of Communities Tasmania, 2021) provides a pathway to providing better outcomes for Tasmanian Aboriginal people and the framework for Aboriginal people to determine, drive and own the desired outcomes alongside all governments. The implementation plan provides local context to the National Agreement on Closing the Gap and seeks culturally-respectful engagement with Aboriginal people and community organisations and service providers. Outcome 15 and the associated 2030 targets refer specifically to natural resource management – Aboriginal people maintaining a distinctive physical, cultural and economic relationship to their land and waters – and it could be an area where the NRM Strategies align with the Closing The Gap plan.

7 Biosecurity

The *Tasmanian Biosecurity Strategy 2013-2017* (DPIPWE, 2013) remains current as the primary state policy reference for biosecurity in Tasmania. It notes "The role of the broader community, including landholders and Natural Resource Management organisations in surveillance activities through active and passive surveillance programs, citizen science initiatives, and general awareness campaigns is yet to be fully realised but will be built on in this Strategy."

The *Tasmanian Biosecurity Strategy 2013-2017* identifies the need for "Alignment of biosecurity communication activities amongst stakeholders such as government, industry, and Natural Resource Management groups." The *Biosecurity Act 2019* introduced the General Biosecurity Duty to Tasmania. The General Biosecurity Duty reinforces that everyone has a role to play in protecting Tasmania's unique environment and primary industries against biosecurity risks.

The Australian Government *Commonwealth Biosecurity 2030* (DAWE, 2021) highlights the importance of biosecurity at a national level, to lift our national preparedness, response and resilience to exotic pest and disease incursions. The stated intent is to develop a national biosecurity strategy that supports the emergence of effective control tools, and national and regional coordination, for on-ground management of exotic pests and diseases established in Australia.

8 Economic and Social Recovery

The COVID-19 pandemic has had a significant impact in Tasmania and on communities and economies across the world. In 2020, the Tasmanian Government developed a range of strategies to minimise the social and economic impacts. The Premier's Economic and Social Recovery Advisory Council (PESRAC) was established to provide advice to the Premier on strategies and initiatives to support the short to medium, and the longer-term recovery from COVID-19. The PESRAC Final Report (PESRAC, 2021) outlines 52 recommendations to support jobs and income; health and housing; community connectivity and engagement; environment and sustainability; and public sector capability.

9 Regional collaboration and governance

City Deals, administered by the Australian Department of Infrastructure, Transport, Regional Development and Communities, are a genuine partnership between the three levels of government and the community to work towards a shared vision for productive and liveable cities. City Deals work to align the planning, investment and governance necessary to accelerate growth and job creation, stimulate urban renewal and drive economic reforms. City Deals will help to secure the future prosperity and liveability of our cities. The uniqueness and diversity of cities across Australia means that we will get the best outcomes by tailoring our approach to designing and delivering City Deals.

The Launceston City Deal is one of eight in Australia. It is a partnership between the Australian and Tasmanian Governments, and the Launceston City Council. Project partners include Northern Midlands Council, Meander Valley Council, George Town Council, West Tamar Council, Hydro Tasmania, TasWater and NRM North. The Tamar Estuary Management Taskforce (TEMT) established under the City Deal is improving governance and planning for the estuary, reducing pollution flowing into the Tamar estuary, and upgrading Launceston's combined sewerage and stormwater system.

ATTACHMENT TWO

Tasmanian NRM linkages with UN SDGs

Make cities and human settlements inclusive, safe, resilient and sustainable

ID	Goal	Strategic linkage	Measure(s)
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage	NRM organisations will secure investment to preserve, protect and conserve priority cultural and natural heritage assets, as outlined in the Regional Strategies	$ Direct investment secured (total, and by source)

Ensure sustainable consumption and production patterns

ID	Goal	Strategic linkage	Measure(s)
12.2	By 2030, achieve the sustainable management and efficient use of natural resources	NRM organisations will work directly with production sectors (including agriculture, forestry, fisheries and renewable energy) to encourage the adoption of sustainability practices	$ Direct investment secured by NRM organisations to support sustainable production, by sector

Take urgent action to combat climate change and its impacts

ID	Goal	Strategic linkage	Measure(s)
13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	NRM organisations will seek investment to support local stakeholders to adopt and implement disaster risk reduction, resilience and adaptation strategies.	$ Direct investment secured by NRM organisations to support risk management, resilience, and adaptation measures
13.2	Integrate climate change measures into national policies, strategies and planning	NRM organisations have prioritised climate change actions in regional strategies, and will seek to encourage national, state, regional and local organisations and governments.	$ Direct investment secured by NRM organisations to support carbon sequestration # Direct submissions by NRM organisations in response to requests for comment on policy, strategy or planning to encourage or support measures to address climate change
13.3	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	NRM organisations will work with stakeholders to build awareness of climate change impacts and response options.	$ Direct investment secured by NRM organisations to improve awareness of climate change impacts and response options

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

ID	Goal	Strategic linkage	Measure(s)
14.1	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	NRM organisations will seek investment to prevent and reduce marine pollution (e.g. marine debris and nutrient pollution)	$ Direct investment secured by NRM organisations to prevent and reduce marine pollution
14.2	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	NRM organisations will seek investment to manage, protect and restore marine and coastal ecosystems	$ Direct investment secured by NRM organisations to manage, protect and restore marine and coastal ecosystems

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss

ID	Goal	Strategic linkage	Measure(s)
15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	NRM organisations will seek investment to conserve and restore terrestrial ecosystems and inland freshwater resources	$ Direct investment secured by NRM organisations to conserve and restore terrestrial and freshwater ecosystems
15.2	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	NRM organisations will seek investment to restore degraded forests and increase tree planting in agricultural areas	$ Direct investment secured by NRM organisations to improve condition of native vegetation and revegetation works
15.5	Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	NRM organisations will seek investment to improve outcomes for threatened species.	$ Direct investment secured by NRM organisations to manage threatened species
15.8	By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	NRM organisations will seek investment to manage (including prevention) key environmental and agricultural biosecurity issues (weeds, pests, diseases).	$ Direct investment secured by NRM organisations to manage environmental and agricultural biosecurity issues (weeds, pests, diseases)
15.a	Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	NRM organisations will work with key natural resource industry sectors to encourage improved practices and facilitate outcomes for biodiversity and ecosystems.	# Sectors directly engaged by NRM organisations

» Garden orb weaver spider, *Eriophora sp.* (Chris Grose)

ATTACHMENT THREE

Tasmanian NRM prioritisation process

1 Overview

In this strategy NRM North has created a framework to focus future investment on Outcomes and Actions that is strategically important, feasible to implement, creates value for money, and can be influenced by the efforts of NRM North.

Priorities and associated Actions have been identified by evaluating known natural resource assets and threats in the northern region. Assets were identified, and an assessment was undertaken to determine the relative importance of each asset in the region, and the potential to mitigate threats and improve or stabilise the health and trajectory of that asset.

This process recognises that some regional assets of high value or significance have not been prioritised in this plan as they may not be readily influenced by NRM investment, and that other strategies, policies, agencies, or interest groups may be active in the management or protection of these assets.

The prioritisation process is described in brief in Section 4.4 of the Strategy. This attachment provides a more detailed description of the processes used by NRM North in establishing regional Priorities and Actions within each Theme.

The prioritisation process has been iterative and has included detailed literature reviews, targeted expert elicitation, input from theme-based expert workshops and extensive stakeholder engagement.

A suite of methodologies have been used to identify the Priorities and Actions in the 2030 Strategies, largely framed around a Multi-Criteria Analysis (MCA), which utilised exiting literature and planning. This included a previous Project Prioritisation Protocol (PPP) report (*Prioritisation of Threatened Flora and Fauna Recovery Actions for the Tasmanian NRM Regions*, DPIPWE, 2010), national and state listing advice and recovery plans, water quality improvements plans and other documentation. This was followed by an expert elicitation process:

1. **Multi-Criteria Analysis (MCA):** Known natural resource assets and threats have been evaluated for the region, assessing available data and expert knowledge, and considering six key criteria within a fit-for-purpose "multi-criteria analysis" (MCA).
2. **Expert elicitation:** The Priorities, associated Outcome statements and Actions have been workshopped and further refined with state-wide experts and in consultation with existing and identified potential delivery partners and stakeholders, drawing on current research and published information.

2 Multi-Criteria Analysis (MCA) criteria

Each of the potential Priorities were scored and ranked according to how well they met six criteria (Table 1). This framework identified the types of enquiries that were considered through the MCA process – tailored to the type of asset being considered and the relevance of each consideration. Each criteria included a consideration of environmental, social, and economic implications, as relevant.

TABLE 1: Criteria and considerations for prioritisation in the 2030 NRM Strategy

Criterion	Potential considerations
1 Strategic importance	**Key line of enquiry:** Is the asset strategically significant at a regional, state, and/or national scale (considering environmental, social, and economic implications)? **Additional considerations:** • Investment will maintain, restore, or enhance the health and function of the asset and natural ecosystems more broadly. • The asset has a recognised economic value to the region and its communities. • Investment will provide positive flow-on benefits to the local and regional community (e.g. employment, improved amenity, resilience, health).
2 Influence	**Key line of enquiry:** Are the NRM organisations the right organisation to do this work? **Additional considerations:** • Action by NRM organisations will contribute to the health, condition and sustainable management of the asset. • NRM organisations can mitigate threats. • Action by NRM organisations will facilitate and contribute to sustainable economic growth in regional industries and enterprises (e.g. agriculture, tourism). • NRM organisations can attract investment for effective action. • Action by NRM organisations will positively influence community awareness and capacity to manage the asset. • NRM organisations can engage with stakeholders and community to deliver effective action.
3 Practicality	**Key line of enquiry:** Can the NRM organisations do something valuable? **Additional considerations:** • Sufficient information is available or could be developed (e.g. best practice delivery approaches, scientific evidence and community knowledge). • The financial cost of action is likely to be reasonable and acceptable. • Key stakeholders and community are interested in the Priority and are likely to be committed to the proposed Actions.
4 Value	**Key line of enquiry:** Is action worth it when considering the likely benefit? **Additional considerations:** • There are opportunities to undertake activities that contribute to multiple outcomes for the benefit of the environment. • There is a cost associated with inaction (in the immediate future or the longer term). • There are opportunities to add value through in-kind support, co-investment, and/or previous work. • Action will result in a public benefit.

Criterion	Potential considerations
5 Risk	**Key line of enquiry:** Can the NRM organisations reduce known or likely threats by acting locally (i.e. acknowledging factors outside the sphere of control e.g. climate)? **Additional considerations:** • The community and stakeholders support the approaches that will have the greatest impact.
6 Priorities and linkages	**Key line of enquiry:** Is this a priority of likely funders? Does it link with Government or stakeholder policy, priorities, or other drivers? **Additional considerations:** • The Priorities and Actions link with the environmental, social or economic priorities of likely funders (e.g. the 5-year RLP Outcomes, and/or other national, state or local government projects, programs, policies, guidelines and strategies). • Action will strengthen NRM partnerships.

3 Expert elicitation process

For each of the Priorities, information on location, condition, threats and potential Actions have been considered. The identification of Priorities and Actions was informed by published information (e.g. spatial analysis, listing statements, Recovery Plans or conservation advice) and expert elicitation.

Expert elicitation was sought at Theme based technical workshops and via written input. Face-to-face meetings were conducted with relevant stakeholders seeking management, industry, and conservation perspectives across each of the Priorities. Further detail on the stakeholder engagement process is provided in Attachment 4.

Technical experts provided specific advice regarding aspects such as species ecology, distribution, condition, threats and management requirements, geospatial specificity, and significance of the asset in Tasmania.

4 Specific considerations – Land Theme

Land Assets were identified (a) through spatial analysis using datasets available on TheLIST (including land use and vulnerable soils), (b) through the MCA process, and (c) in consultation with and guidance from a state-wide panel of experts and community leaders. Priorities were further informed by years of engagement with peak bodies, key stakeholders, land managers, and outcomes from previous projects.

4.1 Healthy Country

The MCA process was not applied to this Asset class. Priorities are self-determined by Tasmanian Aboriginal communities and groups and may develop further as partnerships strengthen and new projects emerge. The Priorities in this Asset Class focus on access, healing and protection of Country.

Priorities in the Healthy Country Asset class were identified through:

- feedback received over the past five years;
- feedback received during Strategy development; and
- on-going partnerships and projects (including through implementation of Regional Aboriginal Participation Plans or Healthy Country Plans).

4.2 Resilient Landscapes

Resilient Landscape Priorities were identified by considering:

- regional land management practices (existing practices and best practice opportunities); and
- the capacity of land managers to adopt practices that enhance resilience to biosecurity threats, climate variability in the near and long term, and market opportunities.

4.3 Soils and Vegetation

Intensification of land use has been a key driver in identifying Priorities and Actions associated with soil and vegetation. Unlike the Water and Biodiversity Themes, the assessment process considered the relative impact from a threatening process on the productivity of agricultural soils. Significant productive landscapes were assessed based on their geography, scale, importance to local community, and their relative productive value. The potential for further degradation of soils (through current or future land use practices) was also assessed. The analysis recognised the off-farm values of surrounding ecosystems.

Intensification of land use was considered a key driver in identifying Actions associated with each soil Priority, where changes to the condition of productive soils may occur. Considerations included:

- The relative impact from a threatening process on the productivity of agricultural soils
- Financial productivity and value of target soils
- Potential for degradation through current or future land use practices and
- Off-farm values of surrounding ecosystems.

Market and climate drivers have been considered in terms of future potential intensification and the six MCA criteria (outlined in Table 1).

The prioritisation process was informed by spatial data available on the State Government's Land Information System Tasmania (theLIST – https://www.thelist.tas.gov.au) (including land use and soil vulnerability). The spatial analysis was undertaken to determine the coverage, location and significance of land use types and native vegetation values. For the purposes of soil management, land use types such as production forestry (plantation and native) land were excluded, as these are managed through regulation and by other entities.

The following key land use types were identified:

1. Native vegetation on private land (excluding native vegetation associated with aquatic ecosystems such as riparian land, wetlands and saltmarsh as these are covered under the Water Theme);
2. Dryland grazing;
3. Irrigated grazing;
4. Cropping and seasonal horticulture;
5. Irrigated cropping and irrigated seasonal horticulture; and
6. Irrigated perennial horticulture and irrigated viticulture.

The following threatening processes were considered (informed by relevant datasets). Soil carbon loss was not included as meaningful data on soil carbon loss is unavailable for Tasmania. The most appropriate proxy for significant soil carbon loss is through wind and hillslope erosion, which are noted below:

- Soil acidity (AG Acidification Risk – CSIRO 2009)
- Soil salinity (NAPSWQ Municipal Salinity Hazard Mapping 2007)
- Soil structure decline (DPIPWE – Waterlogging Hazard)
- Soil nutrient excess or deficit (various)
- Soil erosion by water and wind (AG wind erosion 2017)

5 Specific considerations – Water Theme

5.1 Rivers, floodplains and estuaries

The 'Rivers, floodplains and estuaries' assets have been identified and prioritised across the recognised catchments in the region. Spatial analysis and data sources used to identify strategic importance include:

- Conservation of Freshwater Ecosystem Values (CFEV)
- Key Biodiversity Areas (KBAs)
- An assessment of size and proportion of estuary, estuarine conservation values, conservation areas, catchment area (size) and condition assessment (where available)
- The socio-economic importance of waterways has also been considered

A ranking system has been applied across the six MCA assessment criteria (Table 1) to identify Priorities for investment.

5.2 Wetlands and other waterbodies including Ramsar sites

Wetland and other water body assets have been considered based on the named water bodies in the region. Data sources used to identify strategic importance included:

- Conservation of Freshwater Ecosystem Values (CFEV)
- Key Biodiversity Area (size and proportion of estuary)
- Ramsar sites, nationally important wetlands and conservation areas.

A ranking system has been applied across the six MCA assessment criteria (Table 1) to identify Priorities for investment.

5.3 Coastal and marine

Coastal and marine assets have been identified, taking into account factors such as Key Biodiversity Areas and conservation areas. Habitat types have also been considered to identify the strategic importance and biodiversity values, socio-economic importance, and threatening processes. Feasibility and access have also been identified to inform the MCA.

Marine and coastal habitat types have been identified and scored against the six MCA criteria (Table 1). Specific considerations included:

- Identification of marine and coastal habitat types, and assessment against criteria including number and significance of threats, such as sea level rise, and social and economic values;
- Assessment of habitat types, including estuaries, inlets, wetlands, soft sediments, rocky reefs, seagrass beds, offshore islands, open ocean, beaches and dune systems, rocky coasts, and cliffs;
- Economic values, including wild catch fisheries, finfish and shellfish aquaculture, tourism, infrastructure, and marine traffic; and
- Social values, including recreational activities, attractions, and infrastructure.

6 Specific considerations – Biodiversity Theme

6.1 Important Biodiversity Areas

The Important Biodiversity Areas have been identified with consideration of:

- Publicly available information describing World Heritage Properties, Key Biodiversity Area's, important reserves or other recognised hotspots;
- Experience and knowledge of the region; and
- Stakeholder input.

The MCA (Table 1) was used to generate a shortlist of Priorities for investment.

6.2 Threatened and Important Ecological Communities

All Threatened Ecological Communities as identified by the Australian Government and State Government under relevant legislation and associated schedules have been considered. These include:

- Tasmanian *Nature Conservation Act 2002* and/or
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

In addition, the category "important ecological communities" has been included to allow for the consideration of locally important vegetation communities that are not formally listed under legislation.

The MCA (Table 1) has been used to generate a shortlist of Priorities for investment. Additional lines of enquiry and considerations (specific to this Asset) included:

- Level of threat (with those more threatened given a higher score*);
- Whether the trajectory of the ecological community can be improved;
- General Vegetation Reserve Report 2020; and
- Extent in reserved estate (including covenants), extent unreserved (on private land).

*While communities that are more threatened have been given a higher score, communities have also been prioritised where they are likely to:

- Support known (evidenced) habitat;
- Are intact (over areas with very low area/condition);
- Are feasible to manage (over areas that are less feasible);
- Have potential for long term viability (over areas with less long-term viability);
- Have secure tenure and commitment to post-treatment maintenance (over areas with less security);
- Are buffered against stochastic threats (e.g. natural disasters, climate change impacts);
- Have the opportunity for intervention based on previously demonstrated chance of success, impact and effectiveness (backed by strong supporting evidence), cost-benefit and value for money; and
- Benefit multiple species in a critical area (over management actions that complement single species/communities).

Threatening processes and potential actions have been identified from the relevant listing information.

6.3 Threatened and Important Species

The threatened species in each region have been identified using the Tasmanian Natural Values Atlas and the Commonwealth Protected Matters Search Tool. Species that are extinct, hybrids or parent species have been excluded. The 'long list' comprises species that are listed as:

- Endangered, Vulnerable or rare under Tasmanian *Threatened Species Protection Act 1995* and/or
- Critically endangered, endangered, vulnerable or conservation dependent under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (noting that listed marine species have not been included, but some are addressed under other Water, Land and Biodiversity priorities).

The levels of threat were used to score each species (the more threatened, the higher the score) to contribute to a ranking.

Other information that has been considered includes the *General Vegetation Reserve Report* (2020); *Prioritisation of Threatened Flora and Fauna Recovery Actions for the Tasmanian NRM Regions* (2010); and the Commonwealth *Threatened Species Strategy 2021-2031*.

In addition to this, the category "important species" has been included to allow the assessment of locally important species that are not formally listed under legislation.

The MCA (Table 1) has been used to generate a shortlist of Priorities. Specific to this Asset Class, the distribution of each species was also considered. Information from the Tasmanian Government's Threatened Species Link was used to determine whether our region was important (i.e. involved local endemism, a high percentage of habitat or distribution within the region, dependency on the region for breeding/life cycle, level of protection/amount in formal reserves). While species that are more threatened have been considered as 'strategically important', consideration has been given to species where they:

- Have viable populations (over species with very low numbers);
- Are feasible to manage (over species that are less feasible);
- Have potential for long term viability (over species with less long term viability);
- Have habitat with secure tenure and commitment to post treatment maintenance (over species with less security);
- Are buffered against stochastic threats (e.g. natural disasters, climate change impacts);
- Have the opportunity for intervention based on previously demonstrated likelihood of success, impact and effectiveness (backed by strong supporting evidence), cost-benefit and value for money; and
- Benefit multiple species or habitats in a critical area (over management actions that complement single species/habitats).

Within the MCA's 'Strategic Importance' criterion, the six prioritisation principles outlined in the Threatened Species Strategy 2021-2031 have been considered:

- Prioritising species and places under severe and imminent threat;
- Prioritising species and places where recovery action will benefit other species;
- Prioritising species and places where action can make a difference and is cost-effective;
- Prioritising species and places of cultural significance; and
- Prioritising species and places that are unlike any other.

7 Actions in the 2030 Strategies

Actions to address Priorities across all three Themes have been developed:

- By referring to current research and published information; and
- In consultation with the expert panels, existing and identified potential delivery partners and stakeholders.

These Actions have been identified to strategically direct Australian Government, Tasmanian Government, and stakeholder investment into management Actions that support cost-effective delivery (including of the RLP Outcomes).

Actions have been prioritised through a structured process, including consideration of the six MCA criteria (see Table 1);

- Input from experts and stakeholders (expert elicitation);
- Assessment of published information (e.g. context, condition, decision support tools);
- Values, benefits, costs and likelihood of successful, long-lasting and feasible outcomes (e.g. informed by the 2010 Project Prioritisation Protocol (PPP) report); and
- The potential to identify future projects (including targets, goals, and objectives).

» Up close with a kangaroo (Marcus Haywood)

ATTACHMENT FOUR

Stakeholders

1 NRM North's partnership approach

NRM North seeks to achieve the objectives under the 2030 NRM Strategy northern Tasmania (NRM Strategy) and delivery of programs by working with our partners and the community. Whilst the organisation is responsible for the development and monitoring of the NRM Strategy, we cannot complete programs and activities to support the strategy alone. By forming partnerships, we add value to the existing investments already being made by the Australian, Tasmanian, local governments, industries, and the wider communities in our region.

Government entities (local, state, and national) are critical partners in delivering NRM activities in the region. These entities provide much of the resourcing (funding, in-kind services, and/or project delivery technical expertise) to support best practice outcomes. In addition, NRM North engages with other delivery partners such as universities, research institutions, community groups (landcare and 'friends of' groups), industry, and landholders to blend the right mix of skills, funds, experience, and networks for effective and efficient delivery.

NRM North continues to strengthen existing partnerships, for example, with Hydro Tasmania, the Australian Maritime College, the Tasmanian Landcare Association, the Tasmanian Farmers and Graziers Association, Launceston Chamber of Commerce, the University of Tasmania, Launceston City Council, the Launceston Flood Authority, TasWater, West Tamar Council, Meander Valley Council, Break O'Day Council, Dorset Council, George Town Council, Flinders Council and Northern Midlands Council, Tamar NRM, the Tasmanian Farmers and Graziers Association, Dairy Tas, the Department of Justice, the Department of State Growth, the Environmental Protection Authority, the Tasmanian Chamber of Commerce and Industry, Natural Resources and Environment Tasmania (formerly the Department of Primary Industries, Parks, Water and Environment).

An excellent example of NRM North's capability in building strong, collaborative partnerships is demonstrated in the Tamar Estuary and Esk Rivers (TEER) Program.

The TEER Program was established in 2008 and involves more than 20 organisations directly engaged and working together. It provides a coordinated approach to management and guidance for solutions and investment to protect, maintain and enhance the kanamaluka / Tamar estuary and Esk rivers systems from 'catchment to coast'. The TEER program funds, and NRM North staff facilitate, collaborative research to develop best practice models of catchment pollutant exports and estuary water quality, decision support systems and primary research to address key knowledge gaps and underpin improved decision making.

Facilitated by NRM North, TEER adopts a partnership approach to all its projects. This creates trust, builds engagement between partners, promotes resource sharing opportunities, leverages funding and allows partners to develop strategic approaches to problems in conjunction with other major stakeholders in a non-threatening environment.

"NRM North is the primary partnership broker within northern Tasmania. The TEER Program, established and led by NRM North, represents a powerful regional partnership between statutory authorities, recreational user groups, community groups and industry that is primarily concerned with the management of the Tamar Estuary and Esk Rivers catchment."

—Michael Stretton
General Manager, City of Launceston Council
(Source: RLP Letter of Support, 1 February 2018)

2 Stakeholders

2.1 Partners

Across a suite of projects and initiatives, each NRM organisation maintains a strong portfolio of relationships with key organisations to deliver services ranging from communications and knowledge sharing through to on-the-ground actions.

Partners are organisations who have a formal relationship with NRM North through an existing mechanism such as a grant deed, contract or other agreement (e.g. Memorandum of Understanding). Partner aspirations vary from project to project, but these agreements formally recognise a commitment between parties to work together towards natural resource management outcomes in the region.

2.2 Collaborators

Delivering significant projects within regions is a complex activity and requires contributions from a number of organisations. While some contributions are formally partnered as above, NRM organisations also 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 (e.g. reference groups or steering committees).

2.3 Networks

As not-for-profits, and with a focus on raising awareness and engaging communities, NRM organisations rely heavily on regional networks. These regional networks are made up of organisations with aligned aspirations for the region and a shared interest in promoting natural resource management outcomes. These groups are often integral for communicating information and opportunities into relevant sectors, interest groups, or the general public; they also play an important role in facilitating knowledge sharing from project outcomes. The regional networks include working groups, and community and landcare groups.

2.4 Stakeholder Groups

Many varying stakeholder groups contribute to, access, develop and benefit from natural resources in the northern NRM region of Tasmania. Each has a role to play in effective natural resource management for the sustained benefit of the northern region and Tasmania more broadly. NRM North develops a northern regional strategy, with input sought from stakeholder groups, to help attract and focus investment and to coordinate efforts across relevant stakeholders.

Table 2 below identifies several stakeholder groups within the northern region. Each stakeholder group has an important role in collaboration and delivery of actions identified in the Strategy. These groups, and specific organisations identified in the "*Key Organisations*" column, shared their expertise and aspirations for natural resource management through numerous consultations, which have been integral to the robust development of the Priorities and Actions identified in 2030 NRM Strategy for northern Tasmania. The list of organisations is illustrative; the table does not include an exhaustive list of collaborators, partners, and stakeholders.

TABLE 2: NRM North's Stakeholder Groups

Category	Key Organisations	Aspirations & links to NRM organisations
Aboriginal Groups	Tasmanian Aboriginal Centre (TAC), Aboriginal Land Council of Tasmania (ALCT), melythina tiakana warrana Aboriginal Corporation (mtwAC), Riawunna Centre (UTas).	Tasmanian Aboriginal groups or communities aspire to heal, care for and manage their Country and people. Aspirations of the Aboriginal community are outlined in Healthy Country plans and/or shared with NRM North through ongoing engagement. This Strategy identifies Actions centred around self-determined participation and leadership in cultural and natural resource planning.
Australian Government	Department of Agriculture, Water and the Environment, National Recovery and Resilience Agency, Department of Infrastructure, Transport, Regional Development and Communities (DITRDC), Clean Energy Regulator, and other relevant/emerging agencies.	Through the National Landcare Program, and other associated environmental and agricultural grant schemes, the Australian Government is a key funding partner for project delivery. Tasmania is home to numerous threatened species, World Heritage sites and threatened ecological communities identified as national priorities and addressed through the Regional Land Partnerships Outcomes. City Deals, administered by DITRDC, are genuine partnerships between the three levels of government and the community to work towards a shared vision for productive and liveable cities. Improvement in water quality in the Tamar catchment is supported by the Launceston City Deal.
Tasmanian Government	Natural Resource and Environment Tasmania (NRE Tas) (including Biosecurity Tasmania, Marine Resources, AgriGrowth, Parks and Wildlife Service, Natural and Cultural Heritage, Aboriginal Heritage Tasmania, Inland Fisheries Service, Private Forests Tasmania, Forest Practices Authority) State Growth (including the Tamar Estuary Management Taskforce), Department of Premier and Cabinet (including Climate Change Office and Policy Office). Department of Justice (including State of Environment, Land use planning, and Local Government) Department of Health and Human Services (including Tasmanian Fire Service).	The State Government is a key funding and delivery partner. As well as developing and implementing State policy relevant to natural resource management, departments cover regulation, biodiversity conservation, climate change adaptation, water management, threatened species management, parks and wildlife management, and agricultural production. NRE Tas's new Strategic Plan (2022-2026) outlines aspirations for a sustainable Tasmania, and places significance on sustainable growth, protecting natural values, and addressing climate change. This new vision is well aligned with the three NRM organisations own new strategies. The Tamar Estuary Management Taskforce (State Growth) established under the Launceston City Deal aims to improve governance and planning for the estuary, reducing pollution flowing into the Tamar estuary, and upgrading Launceston's combined sewerage and stormwater system.
Local Government	City of Launceston Council, West Tamar Council, Northern Midlands Council, Meander Valley Council, George Town Council, Flinders Council, Break O'Day Council, Dorset Council, Local Government Association of Tasmania (LGAT).	Local Government councils provide a host of relevant natural resource management services, including weed, stormwater, and waste management, property management planning, managing public land, native vegetation planting and land use planning. They also administer the overarching planning schemes for development. Many councils include dedicated NRM units, which provide valuable collaboration opportunities as they seek to maximise natural values within their municipalities.

Category	Key Organisations	Aspirations & links to NRM organisations
Non-Government Organisations	Industry peak bodies (e.g. Tasmanian Farmers and Graziers Association, Dairy Tasmania, Wine Tasmania, Tasmanian Agricultural Productivity Group, Tasmanian Women in Agriculture, TARFish, Rural Business Tasmania, Birdlife Tasmania, Tasmanian Land Conservancy, Birdlife Australia, Tasmanian Conservation Trust, Greening Australia, Soil First, OzFish, Oceanwatch, Derwent Estuary Program, Conservation Volunteers Australia, The Nature Conservancy.	Industry and conservation peak bodies provide the collective insights, aspirations, and priorities of their membership. Industry peak bodies are particularly important for the dispersed agricultural and seafood sectors. Non-government organisations are also valuable partners for effective extension, endorsement of sustainable practices, and knowledge and capacity building.
Govt. Business Enterprises, State-owned companies, corporations, and statutory authorities	Hydro Tasmania, Tasmanian Irrigation, TasWater, Private Forests Tasmania, Sustainable Timber Tasmania, Tasmanian Networks, Tasmanian Ports Corporation, Forest Practices Authority, Environment Protection Authority, Royal Tasmanian Botanical Gardens.	Statutory authorities, industry organisations and GBE's have close relationships with natural resources throughout Tasmania, and aspire to maintain a balance between sustainable use and production, and remaining commercially viable.
Industry, consultants, and businesses	Forico, Tassal, Huon Aquaculture, Petuna, Enviro-dynamics, RM Consulting Group, North Barker, Nutrien Ag Solutions, Elders, Southern Farming Systems, Fonterra, Soils First.	These groups are taking some action towards sustainable practices and have close relationships with natural resources throughout Tasmania. They aspire to maintain a balance between sustainable use and production, and remaining commercially viable
Community-based Organisations	Includes landcare groups and networks (e.g. Landcare Tasmania, Wildcare Tasmania, Landcare groups and other local 'friends of' groups), Conservation management networks (e.g. Conservation Landholders Tasmania, Threatened Plants Tasmania, Tasmanian Seed Conservation Centre), recreation groups (e.g. Anglers Alliance Tasmania), RSPCA, Just Cats, Australian Veterinary Association, local community groups and farming systems or productivity groups.	These groups play a critical role in connecting communities to natural resource management and provide a conduit both into these communities for information and capacity building, as well as representing the aspirations of their members and communities. These valuable insights assist in effective project planning and delivery to ensure regional relevance when delivering priority actions. Participants from many of these organisations sit as members of reference groups or advisory groups.
Education and research organisations	University of Tasmania (including Tasmanian Institute of Agriculture, Institute of Marine and Antarctic Studies and Australian Maritime College, Riawunna Centre, Tasmanian Drought Hub), Australian National University, CSIRO, Bookend Trust.	Deliver research, training, extension and education services to Tasmanian industry sectors, business, and the general public. They provide the foundational science underpinning extension and capacity building strategies across the region's stakeholders.

3 Strategy engagement

The NRM organisations have undertaken significant stakeholder engagement as part of the Strategy development. This process included a number of structured engagement points, but is built on long-term partnerships and engagement and has been steadily complemented over the last twelve months by formal and informal feedback and learning. The structured strategy consultation process is recognised below (Figure 1).

Infographic design available from Slidesgo and Freepik

FIGURE 1: **Structured engagement points for the development of the 2030 NRM Strategies for NRM North, NRM South and the Cradle Coast Authority**

3.1 Consultation Stage 1: Developing Draft Priorities and Actions

The first phase of consultation was at a high-level over a period of 3-4 months, with a focus on listening and learning, as well as seeking to ground truth our decisions regarding Priorities, Actions, and Outcomes. This included initial discussion with Australian and State Governments to review policy and priorities.

During this phase, the three NRM organisations hosted a series of thematic workshops (land, water, and biodiversity), bringing together state-wide experts from various stakeholder groups to workshop the draft Priorities and Actions. The independently facilitated workshops invited over 40 experts (including representation from State Government, industry, GBEs, private consultants, research institutes, NGOs, peak associations, and community groups), and elicited a wealth of valuable insight and contributions (both in person and in additional submissions). The workshop format, collaborative approach (across disparate stakeholders), and preliminary content all received strong positive endorsement.

Other key interactions during this consultation phase included:

1. Meetings (face-to-face and/or teleconference) with senior Australian and State Government officials to review the structure and discuss high-level alignment with government policy.
2. Each NRM organisation engaged with their respective local government bodies through presentations and feedback sessions. Feedback helped shape a holistic approach to Actions, and highlighted opportunities to partner with existing and planned efforts.
3. The NRM Regional Boards and Management Committees (comprising external membership) have been consulted throughout the regional Strategy development process, providing advice and input to ensure regional values are well considered.
4. Initial engagement with the Tasmanian Aboriginal Centre and regional Tasmanian Aboriginal community groups. This was undertaken with a listening-first approach, broadening our understanding of community priorities as well as opportunities for greater collaboration and participation in project design and delivery.
5. Various interactions with industry, community, and interest groups such as (not exhaustive) Birdlife Tasmania, Forico, Private Forests Tasmania, Sustainable Timber Tasmania, and North-East Bioregional Network. These interactions provided valuable perspective and improved understanding of specialist areas or community interests.

3.2 Draft Submission

The three draft regional NRM Strategies refined through the initial consultation period were submitted to Australian and State Government for review and feedback on 30 June 2021. Comprehensive feedback was received providing additional expert input as well as specific policy advice and considerations.

The process for Government review included:

- An internal (state) Departmental review of the draft strategies, led by DPIPWE, with the intent to provide consolidated written feedback and verbal feedback and advice.
- An internal (federal) Departmental review of the draft strategies, led by DAWE, with the intent to provide written (consolidated) feedback and advice.

3.3 Consultation Stage 2: Government and Regional consultation

Following draft submission, the NRM organisations conducted follow-up meetings with state-wide key stakeholders as well as increasing engagement with region-specific stakeholders. Additional meetings were held with stakeholders, noting their priorities and aspirations to further inform the Strategy development. Stakeholders involved included those named in the table above, as well as broader partners, collaborators, and networks.

The regions also hosted a State Government specific workshop attended by 13 senior officials representing numerous departments. The focus of this workshop was to build from the previous draft submission, and shift the focus to awareness, aspirations, partnerships and opportunities to strategically collaborate into the future. The workshop received extremely positive feedback and identified several partnership opportunities pursuing mutual goals.

Further engagement culminated in the preparation of a public comment drafts of the three regional strategies.

3.4 Public Comment

The three draft regional NRM Strategies were issued for public comment inviting feedback submissions until 14 November 2021. Invitations for comment were sent directly to key stakeholders, across all stakeholder groups. The opportunity was also promoted through social media and region mailing lists – with a combined recipient list of over 1,100+ subscribers.

Forty three feedback submissions were received state-wide, highlighting a broad, but well aligned range of aspirations for natural resource management in Tasmania, additional feedback on the draft Priorities and Actions, and identifying areas of potential collaboration to best deliver the strategy in line with our preferred partnership delivery model.

3.5 Final Submission

Incorporating extensive and robust consultation feedback over the preceding twelve months, including review by Australian and State Government, the final versions of the three regional NRM Strategies were endorsed by regional Boards and Management Committees for submission to Australian and State Government by 31 December 2021. Following acceptance of the strategies by the Australian and State Government, regional Boards and Management Committees formally adopt and publish the NRM Strategies.

3.6 Stakeholder feedback

With such extensive consultation, the NRM organisations received comprehensive and valuable feedback at each step through the process. All feedback received was collated internally, split into individual comments, categorised by theme or section, and reviewed in workshops across regions to determine how best to manage comments received. Responses ranged from triggering a review of our existing content, engaging in discussion to confirm the integrity of our prioritisation processes, modifying existing content, or even adding entirely new content.

The final regional NRM Strategies would not have been possible to deliver without the generous and comprehensive contributions of so many Tasmanian stakeholders. One clear aspiration that emerged through the process was a strong desire amongst so many to take action and contribute to plans and priorities to improve natural resource management outcomes in Tasmania.

» Lichen covered rocks on the north east coast of Tasmania (Sam Jack)

ATTACHMENT FIVE

NRM planning linkages with Regional Land Partnerships Outcomes

1 Introduction

The 2030 NRM Strategy for northern Tasmania serves as a planning document to meet the requirements of the Tasmanian Government under the Tasmanian *Natural Resource Management Act 2002* as well as the Australian Government's Regional Land Partnerships (RLP) Program. To achieve the requirements for both State and Australian Governments the Strategy document provides a summary of the Priorities, Outcomes and Actions relevant to the Management Unit (the northern region) within a shared state-wide Strategy framework. It does not attempt to describe prioritisation processes and decision making in detail. However, Australian Government requirements stated in the Services Agreement outline additional detail that must be provided to substantiate planning decisions and processes and demonstrate their alignment with the six RLP 5-Year Outcomes. This additional information is provided here in Attachment 5 – NRM planning linkages with Regional Land Partnerships Outcomes.

1.1 Regional Land Partnerships – Services Agreement

NRM North was accredited as a Service Provider for the Australian Government Regional Land Partnerships Program in July 2018. Service Providers are contracted to deliver Projects that contribute to achieving the six 5-year Outcomes for Regional Land Partnerships, as well as supporting services (Core Services) that aid the effective and efficient delivery of the Projects, such as Community engagement and natural resource management planning.

The requirements of the Services Agreement related to natural resource management planning are outlined in Schedule 2, Section 3.2 and state the following requirements:

3.2 Maintain the currency of natural resource management planning and the prioritisation of management actions

(a) The Service Provider must ensure appropriate and accurate information to underpin prioritisation of long term action on natural resource management for the Management Unit is available to the Australian Government and the Community.

(b) As part of its obligations under clause 4.2(a) of the Statement of Work, the Service Provider must:

  (i) maintain the currency of natural resource management planning and the prioritisation of management actions at the Management Unit scale to ensure:

    (A) Projects can be identified and appropriately scaled and scoped, are based on best available scientific, economic and social information, take into account the Investment Priorities relevant to the Management Unit and consider emerging science and innovations, climate change impacts, and the views of the Community;

    (B) Projects will effectively contribute to the 5-year Outcomes, including through identification and on-going prioritisation of management actions that support the delivery of the 5-year Outcomes;

  (ii) within 12 months of the Commencement Date (unless the Department agrees in writing to an alternative timeframe):

    (A) review any existing Natural Resource Management Plan(s) for the relevant Management Unit for their consistency with the requirements in clause 4.2(c) of the Statement of Work; and

    (B) provide a report on the review to the Department.

(iii) within 36 months of the Commencement Date (unless the Department agrees in writing to an alternative timeframe), to ensure that the Natural Resource Management Plan(s) meets the requirements of clause 4.2(c) of the Statement of Work, either:

(A) revise the relevant existing Natural Resource Management Plans or material; or

(B) develop a new Natural Resource Management Plan for the Management Unit; and

(C) submit the revised or new Natural Resource Management Plan to the Department.

(iv) where the Service Provider has determined that it is necessary to develop a new Natural Resource Management Plan for the Management Unit:

(A) ensure that the new Natural Resource Management Plan complements, rather than duplicates, any existing Natural Resource Management Plans for the Management Unit; and

(B) address, in the new Natural Resource Management Plan, only those requirements under clause 4.2(c) of the Statement of Work that are not adequately addressed in an existing Natural Resource Management Plan for the Management Unit.

(c) The Natural Resource Management Plan(s) must:

(i) identify and describe the 5-year Outcomes and Investment Priorities that are relevant to the Management Unit;

(ii) describe stakeholder aspirations for natural resource management in the Management Unit, and where possible, how these align with the 5-year Outcomes and other relevant Australian Government priorities;

(iii) identify and prioritise natural resource management actions based on knowledge of:

(A) location and condition of natural resources, including the Investment Priorities;

(B) threats to, or impacts on, natural resources;

(C) prioritisation methods for determining the most cost-effective management actions, including decision support and spatial mapping tools; and

(D) methodologies for assessing the effectiveness of management actions;

(iv) identify how the delivery of Projects will contribute to 5-year Outcomes and Investment Priorities for the Management Unit;

(v) identify how the Natural Resource Management Plan(s) will be implemented with comprehensive Community participation;

(vi) identify Indigenous peoples' land and sea management aspirations for the relevant Management Unit, including how they relate to 5-year Outcomes, and strategies to prioritise and implement them;

(vii) incorporate traditional ecological knowledge, where appropriate, in accordance with agreed protocols and with prior approval of the Indigenous custodians of the knowledge;

(viii) describe key collaborations, for example between the Service Provider, industry and/or Community groups, for delivery of 5-year Outcomes;

(ix) identify the monitoring and reporting processes in place and how they are utilised to measure the achievements and the effectiveness of the Natural Resource Management Plan(s); and

(x) include any other content relevant to the Service Provider's obligations under clause 4.2(a) of the Statement of Work.

(d) The Service Provider must involve the Community, including the Indigenous community, in the development of a new Natural Resource Management Plan or revision of an existing Natural Resource Management Plan.

(e) The Service Provider must make the new Natural Resource Management Plan, or revised Natural Resource Management Plan, publicly available at no cost to the Community, within 3 months of it being formally approved by the organisation's Board of Directors or equivalent.

2 Australian Government 5 year RLP Outcomes and Investment Priorities

2.1 RLP Outcome 1: The restoration of, and reduction in threats to, the ecological character of Ramsar sites, through the implementation of priority actions

The Convention on Wetlands of International Importance (the Ramsar Convention) was signed in Ramsar, Iran on 2 February 1971. The Ramsar Convention aims to halt the worldwide loss of wetlands and to conserve, through wise use and management, those that remain. There are five Ramsar listed wetlands in northern Tasmania (Table 3). The location of Ramsar wetlands is shown in Figure 2. In support of RLP Outcome 1, three wetlands have been prioritised through the Multi-Criteria Analysis (MCA) used for strategy development. The results of the MCA are shown in Table 3. Descriptions of Actions associated with these Priorities can be found in Section 6.3 of the Strategy document.

TABLE 3: **Results of the Multi-Criteria Analysis for Ramsar sites in northern Tasmania**

Ramsar sites	Further information	MCA Priority
East Coast Cape Barren Island Lagoons	Ecological Character Description 2010	High priority for investment
Flood Plain Lower Ringarooma River	Ecological Character Description 2012	High priority for investment
Logan Lagoon	Ecological Character Description 2012	High priority for investment
Jocks Lagoon	Ecological Character Description 2011	Not prioritised at this time
Little Waterhouse Lake	Ecological Character Description 2012	Not prioritised at this time

FIGURE 2: **Map showing locations of Ramsar wetlands in northern Tasmania**

East Coast Cape Barren Island Lagoon

This site is located south east of Cape Barren Island/truwana covering 4,473 hectares. It consists of over 100 wetlands in a natural or near-natural condition. It provides the most extensive example of a system representative of progradation of coasts in the Tasmanian Drainage Division, a process that is uncommon in southern Australia. It includes eight Ramsar wetland types. The site is important for maintaining the biological diversity of the biogeographic region. It contains a large range of Tasmanian wetland vegetation types, including 13 wetland communities. It also has a high diversity of habitats and species present including 13 species uncommon in Tasmania.

Title of the site is vested with Aboriginal Land Council of Tasmania. The local community, the Cape Barren Island Aboriginal Association, is the land manager.

Threats to the ecological character of the site include:

- Changes to the intensity and frequency of fire;
- Introduction and spread of invasive species such as rabbits, feral turkeys, thistle, marram grass and gorse;
- Pathogens particularly *Phytophthora cinnamomi* and Chytrid fungus;
- Vehicle access particularly four-wheel drives;
- Grazing through impacts on vegetation, erosion, nutrient enrichment from manure and spread of weeds and diseases into and within the site; and
- Climate change through changes in sea level, temperature and rainfall.

NRM North has existing relationships with the local rangers and has supported the truwana rangers to undertake weed management, cultural burns, and water quality monitoring. The extensive size, uniqueness and condition of these wetlands make it an important asset for continued investment.

Flood Plain Lower Ringarooma River

The Floodplain Lower Ringarooma River Ramsar is located in the north-east corner of Tasmania in the Ringarooma catchment covering 3,519 hectares. It contains a wetland type that is rare within the bioregion – that is, it is a regionally representative example of wetland systems within a flood plain that is in good condition. It supports six nationally or internationally listed threatened species and diverse invertebrate fauna. The site contains 40 species of wetland dependent plants and provides wetland habitat for two regionally threatened bird species and four regionally listed flora species. The site also supports five nesting bird species, three migratory fish and numerous migratory bird species at a critical stage in their life cycles and provides refuge to these species during adverse conditions.

This Ramsar site consists of three zones – coastal, estuarine and freshwater. It is altered from its natural condition with large scale sedimentation from historic mining having impacted on the site before its listing. Over 60 percent of the site is owned by a private landholder, with areas within the site and directly adjacent to the site used for grazing and dairy production. The rest of the site is Crown land reserved in two reserves - Cameron Regional Reserve in the freshwater zone and the coastal and estuarine zone at the northern end of the site which is reserved as part of the Boobyalla Conservation Area.

In the coastal zone the main threat is climate change, particularly sea level rise. There is relatively little recreational vehicle use in this zone and few human induced threats. Threats to the ecological character of the estuary and freshwater zones are: stock access, excess sedimentation, potential declines in water quality from grazing and dairying impacts, changes to hydrology through increased water extraction, and rising sea levels.

NRM North has an existing project, funded through the National Landcare Program, to address threats to the Floodplain Lower Ringarooma River Ramsar site and has developed a water quality improvement plan to prioritise investment in actions that improve water quality and reduce weed incursion (see case study).

Logan Lagoon

The Logan Lagoon Ramsar site is located on Flinders Island and covers 2,257 hectares. It supports eight near pristine representative wetland types and contains features that have geoconservation significance at a regional scale. The Ramsar site supports three wetland-dependant nationally listed fauna species and two threatened flora species as well as three regionally threatened vegetation communities and a regionally threatened species. There are 21 migratory bird species that have been recorded using the site and it regularly supports over one percent of the population of several species of waterbird.

The site is enclosed within the Logan Lagoon Conservation Area which is managed by the Tasmanian Parks and Wildlife Service and bounded by a mix of private property, Conservation area and sea. The catchment consists of Crown land, conservation reserve and some privately owned land.

The most immediate threats to the ecological character of the site are: changes in fire regime, impacts from recreational vehicles, introduction of pest plants and animals and diseases to the site, weeds already present at the site, feral pigs and cats, and chytrid and Phytopthora diseases. Other medium-term threats include: changes in drainage of the site, surrounding land use and agriculture, and climate change.

The natural values, size and condition of the Ramsar site, and the feasibility of reducing the threats to Logan Lagoon make it a high priority for investment.

Jocks Lagoon

Jocks Lagoon is a relatively small coastal freshwater lagoon located on the east coast of Tasmanian near St Helens. It is 18.6 hectares in size and is in near natural condition with minimal disturbance. It is a high-quality representative of four Ramsar wetland types and supports rare, poorly reserved and scientifically valuable species. It provides wetland habitat for five threatened flora species considered to be at risk in Tasmania. The site lies mostly on private land with a portion in the St Helens Conservation Area.

Threats to the site are: sand mining of secondary dunes occur close to the site, *Phytophthora* (root rot) is present at the site, introduction of weeds, pests and diseases, changes to fire frequency and intensity could impact on vegetation, areas surrounding the lagoon are thought to contain potential acid sulfate soils.

Climate change impacts are most likely to occur through impacts on hydrology with reduced inflows from lower rainfall and higher evaporation, and changes in vegetation.

NRM North has undertaken projects on this site in the past to restrict off-road vehicle access and other works. The site is on private land and there is little opportunity to undertake further works on this property.

Little Waterhouse Lake

Little Waterhouse Lake is a freshwater coastal lagoon near the Great Forester-Brid catchment. It is 10 hectares in size and a high-quality representative example of seven Ramsar wetland types within the Tasmania Drainage Division. It is highly productive with high floristic diversity containing over 40 species of aquatic and semi-aquatic plants. It contains a high macroinvertebrate abundance and diversity and supports substantial numbers of fish. It is in a near natural condition. It supports two threatened fauna species. It is one of only two lakes in the region to support a significant population of the freshwater planktonic dinoflagellate, *Prorocentrum foveolata*, which was considered marine until recently. The whole site is located within the Waterhouse Conservation Area. Runoff to the site occurs from a small watercourse which drains agricultural land.

Key threats to the site include: changes to the lakes water quality from upstream land use, changes to the site's hydrology through groundwater extractions, and breaching of an artificial dam wall, trout stocking, vegetation clearance for agriculture, vehicle and recreational use, weeds and disease, and climate change.

This Ramsar site is managed by the Tasmanian Parks and Wildlife Service with limited opportunity for NRM North to undertake works that will yield value for money.

CASE STUDY: **RLP OUTCOME 1 – The ecological character of Ramsar sites is maintained or improved**

FLOOD PLAIN LOWER RINGAROOMA RAMSAR SITE

NRM North's Ringarooma Ramsar Project aims to protect the ecological character of the Floodplain Lower Ringarooma River Ramsar site by improving and protecting the condition of the site's floodplain, wetlands and swamp forest (*Melaleuca ericifolia*).

The 3,500 hectare site in Tasmania's north east is one of five internationally important wetlands found in the NRM North region and one of only 10 Ramsar wetlands in Tasmania.

The Floodplain Lower Ringarooma River Ramsar site is a zone of high biodiversity that supports rare and valuable species, and provides habitat for threatened bird and plant species.

Significant progress has been made on identifying key actions that can be taken to reduce the impact of adjacent agricultural activity and runoff on the internationally listed site.

As part of the development of a Water Quality Improvement Plan, water sampling results were considered, together with land use data, to identify problem pollutants reaching the wetland system and the relative contribution from different parts of the catchment. The plan then sets out recommended actions that provide the greatest and most cost-effective improvements in water quality through changes in farm infrastructure and agricultural practices.

Early survey work has provided a basis for prioritising weed management actions and identified the locations of several threatened flora species.

Detailed investigations and planning are continuing, which will inform upcoming actions to improve water quality, and protect sensitive vegetation and wetland types.

This project is supported by NRM North through funding from the Australian Government's National Landcare Program.

2.2 RLP Outcome 2: The trajectory of species targeted under the Threatened Species Strategy, and other EPBC Act priority species, is stabilised or improved.

The Australian Government identify priority species through a number of mechanisms, including:

- The 100 Priority Species
- Threatened Species Strategies and associated Action Plans

Information on location, threats and actions can be found using:

- the Tasmanian Natural Values Atlas
- the Commonwealth Protected Matters Search Tool
- EPBC Recovery Plans and Listing Statements
- other published material such as Conservation Advice and scientific papers
- websites such as Tasmanian Threatened Species link

Across the two Threatened Species Strategies and 100 Priority Species list, there are 12 species of fauna and two species of flora that are listed as priority threatened species in the northern region (Table 4).

In addition to the Threatened Species Strategy and the 100 Priority Species list, there are a number of species that are listed under the EPBC Act that are regionally important and have been prioritised in the northern Tasmania strategy (Table 4).

TABLE 4: **Results of the Multi-Criteria Analysis for EPBC-listed Threatened Species in northern Tasmania**

100 Priority Species	Further information	MCA Priority
Australian Sea-lion	Recovery Plan 2013	Not prioritised at this time
Eastern Quoll	Recovery Plan 2016	Not prioritised at this time
New Holland Mouse	Conservation Advice 2010	High priority for investment
Australasian Bittern	Draft Recovery Plan 2020	High priority for investment
Eastern Curlew	Conservation Advice 2015 and Scorecard 2018	Not prioritised at this time
Hooded Plover (eastern)	Conservation Advice 2014 and Scorecard 2018	High priority for investment
Swift Parrot	Draft Recovery Plan 2019	Medium priority for investment
Forty-spotted Pardalotes	Recovery Plan 2006	High priority for investment
Growling Grass Frog (more widely known as the Green and Gold Frog in Tasmania)	Recovery Plan 2009	High priority for investment
Swan Galaxias	Recovery Plan 2006	Medium priority for investment
Red Handfish	Conservation Advice 2012	Not prioritised at this time
Tasmanian Giant Freshwater Crayfish	Recovery Plan 2017	High priority for investment
Davies Waxflower	Recovery Plan 2011	High priority for investment
Graveside Leek-orchid	Recovery Plan 2017	High priority for investment

Regionally important species	Further information	MCA Priority
Eastern Barred Bandicoot	Scorecard 2018	High priority for investment
Spotted-tailed Quoll	Recovery Plan 2016	High priority for investment
Wedge-tailed Eagles	Recovery Plan 2006	High priority for investment
White-bellied Sea-eagles	Recovery Plan 2006	High priority for investment
Masked Owl	Conservation Advice 2010	High priority for investment
Australian Grayling	Consultation document 2020	Medium priority for investment
Giant Freshwater Crayfish	Recovery Plan 2017	High priority for investment
Central Burrowing crayfish	Recovery Plan 2005	High priority for investment
Mt Arthur Burrowing Crayfish	Recovery Plan 2005	High priority for investment
Furneaux Burrowing Crayfish	Recovery Plan 2005	High priority for investment
Ptunarra Brown Butterfly	Recovery Plan 1998	High priority for investment

As described in Section 8.3 of the Strategy, it is noted that emerging priorities for threatened species (or changing issues or threats) will require some agility. For example, there may be new species, ecological communities or priority areas (habitats) that are under severe or imminent threat and require action. It is also noted that the Australian Government may seek to contract projects for Investment Priorities that are additional to those prioritised by the planning process.

EPBC listed threatened species in northern Tasmania

There are 127 threatened species and 63 migratory species listed under the EPBC Act in northern Tasmania. Those listed as Vulnerable, Endangered or Critically Endangered are provided in Table 5, 6 and 7 of this document.

TABLE 5: Threatened animals listed under the EPBC Act in northern Tasmania

Scientific Name	Common Name	Threatened Category
Antipodia chaostola leucophaea	Tasmanian Chaostola Skipper, Heath-sand Skipper	Endangered
Aquila audax fleayi	Tasmanian Wedge-tailed Eagle	Endangered
Astacopsis gouldi	Giant Freshwater Crayfish	Vulnerable
Botaurus poiciloptilus	Australasian Bittern	Endangered
Brachiopsilus ziebelli	Ziebell's Handfish, Waterfall Bay Handfish	Vulnerable
Ceyx azureus diemenensis	Tasmanian Azure Kingfisher	Endangered
Dasyurus maculatus maculatus (Tasmanian population)	Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population)	Vulnerable
Dasyurus viverrinus	Eastern Quoll, Luaner	Endangered
Diomedea antipodensis gibsoni	Gibson's Albatross	Vulnerable
Engaeus granulatus	Central North Burrowing Crayfish	Endangered
Engaeus martigener	Furneaux Burrowing Crayfish	Endangered
Engaeus orramakunna	Mount Arthur Burrowing Crayfish	Vulnerable
Engaeus spinicaudatus	Scottsdale Burrowing Crayfish	Endangered
Eubalaena australis	Southern Right Whale	Endangered
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	Vulnerable
Galaxias fontanus	Swan Galaxias	Endangered
Galaxias johnstoni	Clarence Galaxias	Endangered
Galaxias tanycephalus	Saddled Galaxias	Vulnerable
Galaxiella pusilla	Eastern Dwarf Galaxias, Dwarf Galaxias	Vulnerable
Halobaena caerulea	Blue Petrel	Vulnerable
Hoplogonus bornemisszai	Bornemissza's Stag Beetle	Critically Endangered
Hoplogonus simsoni	Simson's Stag Beetle	Vulnerable
Hoplogonus vanderschoori	Vanderschoor's Stag Beetle	Vulnerable

Scientific Name	Common Name	Threatened Category
Lathamus discolor	Swift Parrot	Critically Endangered
Leucopatus anophthalmus	Blind Velvet Worm	Endangered
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	Vulnerable
Litoria raniformis	Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog	Vulnerable
Oreixenica ptunarra	Ptunarra Brown, Ptunarra Brown Butterfly, Ptunarra Xenica	Endangered
Pachyptila turtur subantarctica	Fairy Prion (southern)	Vulnerable
Pardalotus quadragintus	Forty-spotted Pardalote	Endangered
Perameles gunnii gunnii	Eastern Barred Bandicoot (Tasmania)	Vulnerable
Potorous tridactylus tridactylus	Long-nosed Potoroo	Vulnerable
Prototroctes maraena	Australian Grayling	Vulnerable
Pseudomys novaehollandiae	New Holland Mouse, Pookila	Vulnerable
Pterodroma leucoptera leucoptera	Gould's Petrel, Australian Gould's Petrel	Endangered
Rostratula australis	Australian Painted Snipe	Endangered
Sarcophilus harrisii	Tasmanian Devil	Endangered
Sternula nereis nereis	Australian Fairy Tern	Vulnerable
Thinornis cucullatus cucullatus	Eastern Hooded Plover, Eastern Hooded Plover	Vulnerable
Thymichthys politus	Red Handfish	Critically Endangered
Tyto novaehollandiae castanops	Masked Owl (Tasmanian)	Vulnerable

TABLE 6: **Threatened plants listed under the EPBC Act in northern Tasmania**

Scientific Name	Common Name	Threatened Category
Acacia axillaris	Midlands Mimosa, Midlands Wattle	Vulnerable
Amphibromus fluitans	River Swamp Wallaby-grass, Floating Swamp Wallaby-grass	Vulnerable
Argyrotegium nitidulum	Shining Cudweed	Vulnerable
Asplenium hookerianum	Maidenhair Spleenwort	Vulnerable
Barbarea australis	Native Wintercress, Riverbed Wintercress	Endangered
Bertya tasmanica subsp. tasmanica	Tasmanian Bertya	Endangered
Boronia gunnii	Gunn's Boronia, Cataract Gorge Boronia	Vulnerable
Boronia hemichiton	Mt Arthur Boronia	Vulnerable
Boronia hippopala	Velvet Boronia	Vulnerable
Caladenia anthracina	Black-tipped Spider-orchid	Critically Endangered
Caladenia caudata	Tailed Spider-orchid	Vulnerable
Caladenia lindleyana	Lindley's Spider-orchid	Critically Endangered
Caladenia pallida	Rosy Spider Orchid, Pale Spider-orchid, Summer Spider-orchid	Critically Endangered
Caladenia tonellii	Robust Fingers	Critically Endangered
Callitris oblonga	Pygmy Cypress-pine, Pigmy Cypress-pine, Dwarf Cypress-pine	Vulnerable
Callitris oblonga subsp. oblonga	South Esk Pine	Endangered
Cassinia rugata	Wrinkled Cassinia, Wrinkled Dollybush	Vulnerable
Colobanthus curtisiae	Curtis' Colobanth	Vulnerable
Conospermum hookeri	Variable Smoke-bush	Vulnerable
Dianella amoena	Matted Flax-lily	Endangered
Epacris apsleyensis	Apsley Heath	Endangered
Epacris exserta	South Esk Heath	Endangered
Epacris grandis	Grand Heath, Tall Heath	Endangered
Epacris graniticola	Mt Cameron Heath, Granite Heath	Critically Endangered
Epacris limbata	Border Heath, Bordered Heath	Critically Endangered

Scientific Name	Common Name	Threatened Category
Epacris virgata	Pretty Heath, Dan Hill Heath	Endangered
Eucalyptus gunnii subsp. divaricata	Miena Cider Gum	Endangered
Glycine latrobeana	Clover Glycine, Purple Clover	Vulnerable
Lepidium hyssopifolium	Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed	Endangered
Leucochrysum albicans subsp. tricolor	Hoary Sunray, Grassland Paper-daisy	Endangered
Phebalium daviesii	Davies' Waxflower, St Helens Waxflower	Critically Endangered
Pomaderris pilifera subsp. talpicutica	Moleskin Dogwood	Vulnerable
Prasophyllum apoxychilum	Tapered Leek-orchid	Endangered
Prasophyllum incorrectum	Golfers Leek-orchid	Critically Endangered
Prasophyllum olidum	Pungent Leek-orchid	Critically Endangered
Prasophyllum robustum	Robust Leek-orchid	Critically Endangered
Prasophyllum secutum	Northern Leek-orchid	Endangered
Prasophyllum stellatum	Ben Lomond Leek-orchid	Critically Endangered
Prasophyllum taphanyx	Graveside Leek-orchid	Critically Endangered
Prasophyllum tunbridgense	Tunbridge Leek-orchid	Endangered
Pterostylis commutata	Midland Greenhood	Critically Endangered
Pterostylis cucullata	Leafy Greenhood	Vulnerable
Pterostylis pratensis	Liawenee Greenhood	Vulnerable
Pterostylis ziegeleri	Grassland Greenhood, Cape Portland Greenhood	Vulnerable
Ranunculus prasinus	Midlands Buttercup, Tunbridge Buttercup	Endangered
Senecio psilocarpus	Swamp Fireweed, Smooth-fruited Groundsel	Vulnerable
Spyridium lawrencei	Small-leaf Spyridium	Endangered
Spyridium obcordatum	Creeping Dusty Miller	Vulnerable
Stenanthemum pimeleoides	Spreading Stenanthemum, Propellor Plant	Vulnerable
Stonesiella selaginoides	Clubmoss Bush-pea	Endangered
Tetratheca gunnii	Shy Pinkbells, Shy Susan	Critically Endangered

Scientific Name	Common Name	Threatened Category
Thelymitra jonesii	Sky-blue Sun-orchid	Endangered
Veronica ciliolata	Ciliolate Hebe	Vulnerable
Xanthorrhoea arenaria	Sand Grasstree	Vulnerable
Xanthorrhoea bracteata	Shiny Grasstree	Endangered
Xerochrysum palustre	Swamp Everlasting, Swamp Paper Daisy	Vulnerable

TABLE 7: **Migratory species listed under the EPBC Act in northern Tasmania**

Scientific Name	Common Name	Threatened Category
Balaenoptera borealis	Sei Whale	Vulnerable
Balaenoptera musculus	Blue Whale	Endangered
Balaenoptera physalus	Fin Whale	Vulnerable
Calidris canutus	Red Knot, Knot	Endangered
Calidris ferruginea	Curlew Sandpiper	Critically Endangered
Carcharodon carcharias	White Shark, Great White Shark	Vulnerable
Caretta caretta	Loggerhead Turtle	Endangered
Charadrius mongolus	Lesser Sand Plover, Mongolian Plover	Endangered
Chelonia mydas	Green Turtle	Vulnerable
Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	Endangered
Diomedea antipodensis	Antipodean Albatross	Vulnerable
Diomedea epomophora	Southern Royal Albatross	Vulnerable
Diomedea exulans	Wandering Albatross	Vulnerable
Diomedea sanfordi	Northern Royal Albatross	Endangered
Eubalaena australis	Southern Right Whale	Endangered
Hirundapus caudacutus	White-throated Needletail	Vulnerable
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	Endangered
Macronectes halli	Northern Giant Petrel	Vulnerable
Megaptera novaeangliae	Humpback Whale	Vulnerable
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered

Scientific Name	Common Name	Threatened Category
Phoebetria fusca	Sooty Albatross	Vulnerable
Rhincodon typus	Whale Shark	Vulnerable
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	Vulnerable
Thalassarche cauta	Shy Albatross	Endangered
Thalassarche chrysostoma	Grey-headed Albatross	Endangered
Thalassarche eremita	Chatham Albatross	Endangered
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	Vulnerable
Thalassarche melanophris	Black-browed Albatross	Vulnerable
Thalassarche salvini	Salvin's Albatross	Vulnerable
Thalassarche steadi	White-capped Albatross	Vulnerable

2.2.1 Threatened Species Strategy – 100 Priority Species

Australian Sea-lion

The Australian Sea-lion is listed as Endangered under the EPBC Act. There are four recorded sightings (Figure 3) of the Australian Sea-lion in the northern region of Tasmania. Its range is predominantly in South and Western Australia and it breeds in the coastal and offshore waters in these areas.

While its range was thought to extend to Bass Strait, these breeding colonies are likely to have been eliminated during the seal harvesting from the 18th to the early 20th centuries.

Restoring Australian Sea-lions to the Bass Strait islands would require significant investment and specialist logistics.

Eastern Quoll

Eastern Quolls are listed as Endangered under the EPBC Act. The species disappeared from the Australian mainland last century due to disease, predation by foxes, feral cats and domestic dogs, poisoning and persecution. Conservation for wild Eastern Quolls depends on effective ongoing management for feral cats and biosecurity in Tasmania, with ongoing expansion and management of populations on islands and within fenced areas that are free of cats. Eastern Quolls have been reintroduced to three mainland sites since 2002.

In Tasmania the Eastern Quoll is mostly found in the dry-moderate rainfall areas of the eastern part of the island, in open grasslands, farmland, woodlands, dry forests, coastal scrub and alpine heathland (Figure 4). Eastern Quolls are usually absent from rainforest and wet sclerophyll forests. The population in Tasmania declined by over 50 percent over the ten years preceding 2009, coincident with a prolonged period of above average rainfall and warm winter temperatures during 2002-2003. This period of unsuitable weather reduced quoll populations to an unprecedented low abundance. The populations may now be too small to withstand threats to which they were robust when at higher densities, such

as feral cat predation and mortality from vehicle strike. Eastern Quoll numbers on the Tasmanian mainland have not recovered, however the high-density population on Bruny Island has subsequently recovered and has remained fairly stable ever since.

The main threats to the Eastern Quoll include climate change, predation by cats, disease, and habitat modification. Securing additional populations across Tasmania is vital. The most significant local threats include disease and feral cats. Replicating the successful stabilisation of the Bruny Island population is likely to be the most achievable action to secure additional populations. This species is prioritised through the Healthy Country Asset Class.

New Holland Mouse

The New Holland Mouse (*Pseudomys novaehollandiae*) is listed as Vulnerable under the EPBC Act. It is a small, nocturnal native rodent found in a small number of disjunct populations on the north and north-east coast of Tasmania including Flinders Island (Figure 5). The species also occurs in Queensland, New South Wales and Victoria. The Tasmanian populations are a smaller and isolated population from mainland populations. New Holland Mouse is similar in appearance to the introduced and relatively common House Mouse (*Mus musculus*), but can be distinguished by its relatively large eyes and lack of a 'mousey' odour. In Tasmania, it has been found in open heathlands, heathy woodlands, and vegetated sand dunes. The species appears to have undergone a major decline since European settlement. Historical and ongoing threats to the species include loss of habitat and predation from introduced predators. Causes of habitat loss include inappropriate fire regimes (either burning too little or too often), root rot fungus (*Phytophthora cinnamomi*), and coastal development.

Recent surveys have observed the species on Flinders Island for the first time in 17 years. Previous surveys have resulted in hair samples, but no observations of individuals (Figure 5). There is no recovery plan for this species.

The Tasmanian populations represent important genetic contributions to the Australian population. Protection of habitat for the New Holland Mouse on the north-east coast will also improve habitat for the Spotted-tailed Quoll.

Australasian Bittern

The Australasian Bittern (*Botaurus poiciloptilus*) is a large heron-like bird, listed as Endangered under the EPBC Act and IUCN list. In Australia, a very small population remains in south-western Australia, while a slightly larger population remains in south-eastern Australia. The species is poorly studied in many of its habitats and as it is difficult to detect, therefore resulting in low confidence with current population estimates, however the population is believed to be less than 1,000 individuals. The species is believed to be still declining, at least on mainland Australia.

Habitat needs for Australasian Bittern include dense wetland vegetation such as reeds, rushes and sedges, associated with shallow wetlands and waterbodies. Threats to the species include destruction and modification of habitat, through draining or modifying wetlands and hydrological regimes, vegetation clearance, and stock impacts. Predation by cats is also a threat, as is reduced water quality.

Limited survey work has been undertaken in Tasmania (Figure 6). Bitterns are known to occur in north-eastern Tasmania, however the population size, movements, exact range and habitat usage are unknown. The first Action for this species will address some of these knowledge, gaps, with a focus on north-eastern Tasmania and the Furneaux Islands. Protection of wetland habitat is vital to securing populations of this species and will have multiple benefits for other species such as Green and Gold Frogs. Figure 6 shows the observations and potential range of the Australasian Bittern in northern Tasmania.

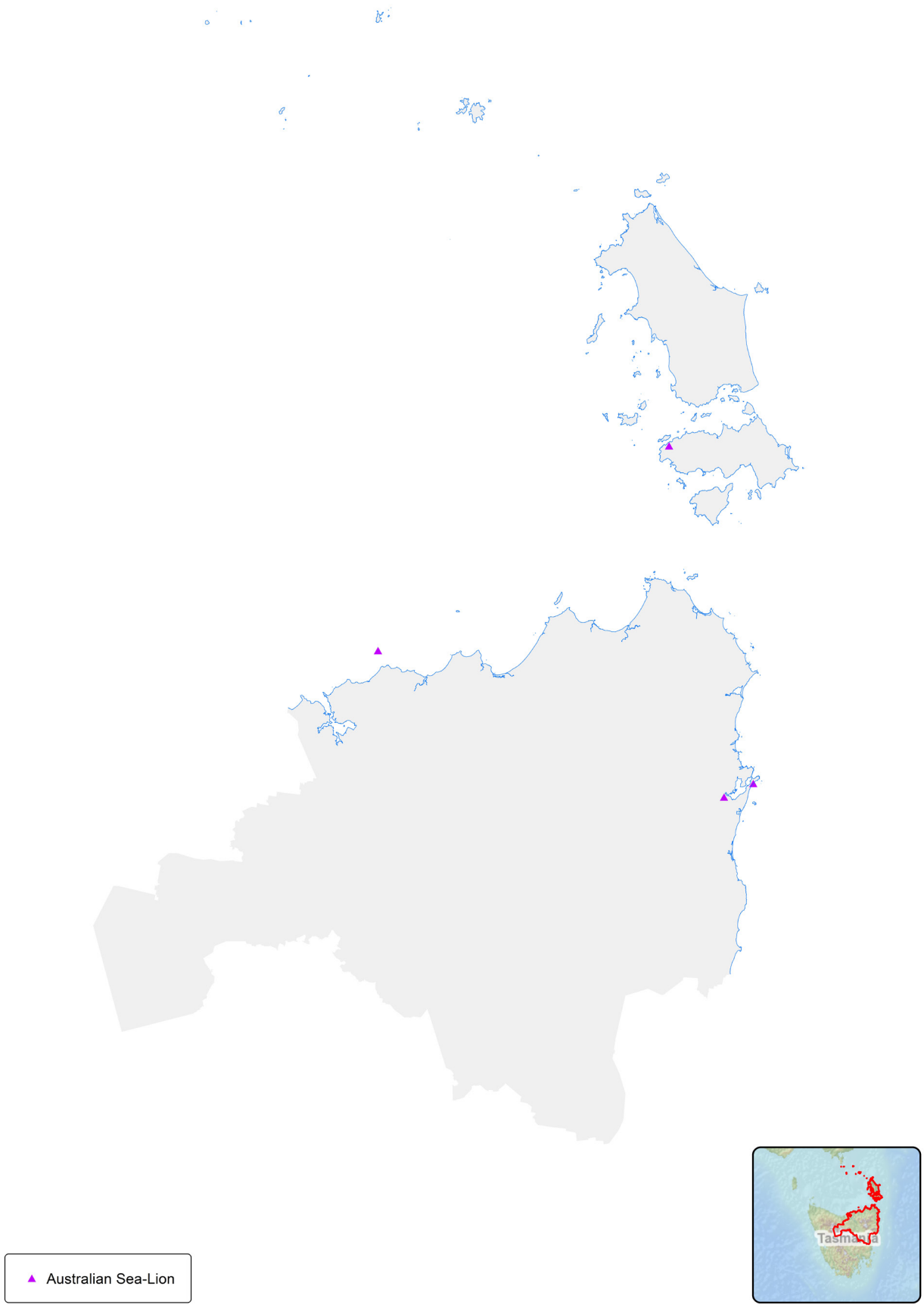

FIGURE 3: **Observations of the Australian Sea-lion in the northern region of Tasmania**

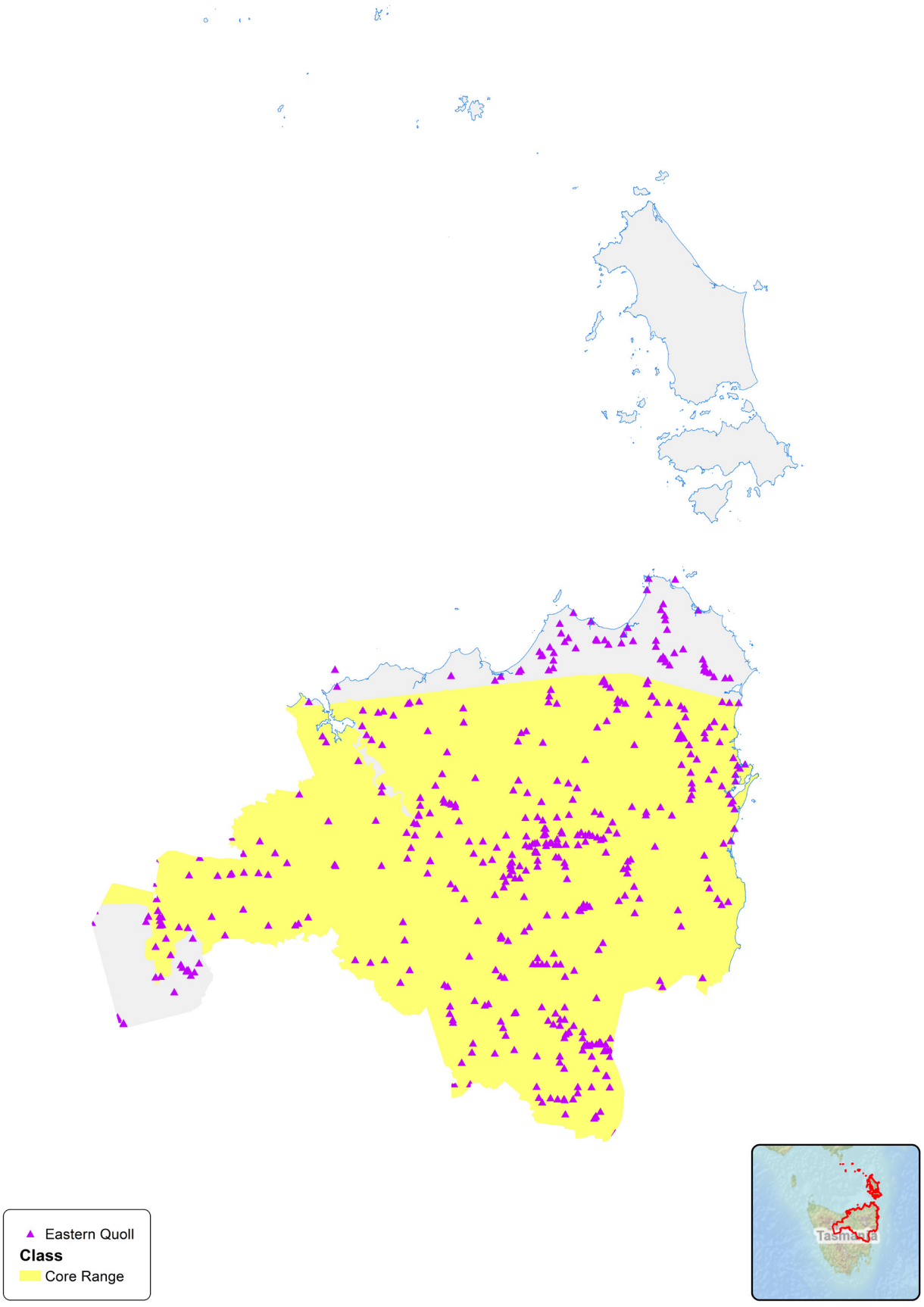

FIGURE 4: **Observations and core range of the Eastern Quoll in the northern region**

FIGURE 5: **Observations, core range and potential range of New Holland Mouse in northern Tasmania**

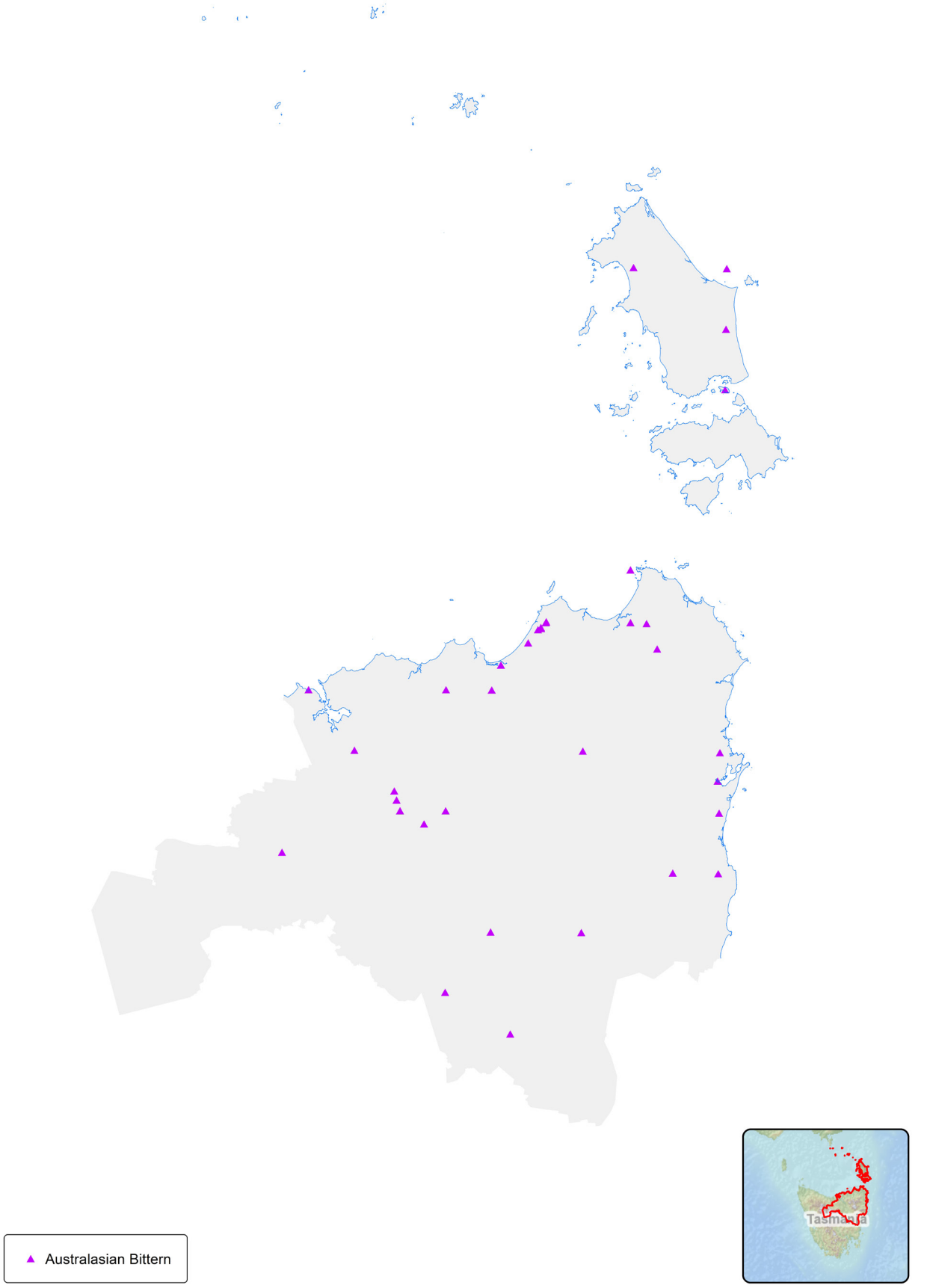

FIGURE 6: **Observations of Australasian Bittern in northern Tasmania**

Eastern Curlew

The Eastern Curlew is listed as Critically Endangered under the EPBC Act. It is a large, migratory wading bird. Global populations are declining steadily, primarily due to loss of intertidal mudflats around the Yellow Sea. Recovery efforts in Australia focus on coastal habitat restoration, raising community awareness and protecting important foraging sites. However, overall numbers are still decreasing and more work to protect the species is needed, particularly overseas.

Eastern Curlew, also known as Far Eastern Curlew, breed in China and Russia and migrate as far south as Australia and New Zealand, with the majority of the population spending the non-breeding season in Australia, and the remainder overwintering in southeast Asia and Papua New Guinea. During both northward and southward migration, they are highly reliant on staging and stopover sites in the Yellow Sea. While still reasonably common in northern Australia they have disappeared or become much rarer at many sites in the southern parts of Australia (Figure 7). Loss of intertidal mudflats around the Yellow Sea is believed to be primarily responsible for rapid declines observed in this species and others in the East Asian-Australasian Flyway (EAAF), a trend that is thought likely to continue at current rates of development.

Threats to the Eastern Curlew include coastal development, hunting, recreational, coastal mudflat degradation including incursion of rice grass, and sea level rise. Critical breeding areas for this species are in China and Russia, therefore Actions to secure this population are less likely to be effective in Tasmania.

Shorebirds

The Hooded Plover (Eastern) is listed as Vulnerable under the EPBC Act. It is an endemic resident shorebird of south-eastern Australia, listed as Vulnerable under the EPBC Act. Its range includes the coasts of NSW, Victoria, South Australia and Tasmania. A western subspecies occurs in Western Australia. Key feeding and nesting habitat consists mainly of ocean beaches backed by dunes, however Hooded Plover also feed in saltmarshes, estuaries, near-coastal lagoons and mudflats. Nesting occurs predominantly on flat sandy beaches above the high tide mark, or sparsely vegetated dunes (Figure 8).

Ongoing threats in Tasmania include disturbance or destruction of nests by people, dogs and vehicles on beaches; stock access to beaches and other coastal feeding grounds such as saltmarsh; entanglement or ingestion of marine debris, invasive beach weeds which make foredunes unsuitable for nesting; coastal development; extreme weather events and sea level rise. The extent and trajectory of these threats varies across the northern region. Although much has been achieved through past efforts, many threats require ongoing effort to address, and ongoing community education is crucial given that the species inhabits and relies upon spaces which are public and subject to a variety of pressures.

NRM North is actively reducing threats to and raising awareness of Hooded Plovers on east coast Tasmanian beaches. Continued action to reduce threats to Hooded Plover could be expanded in range. This would build on existing investments and partnerships and is likely to benefit other shorebirds such as the Lesser Sandpiper, White-fronted Tern and Little Tern.

Swift Parrots

The Swift Parrot (*Lathamus discolor*) is listed as Critically Endangered under the EPBC Act. It is a small, largely nectar-feeding fast flying parrot which spends its winter in south-eastern mainland Australian before migrating to Tasmania in late winter/early spring to breed (Figure 9). During the breeding season, nectar from Tasmanian blue gum (*Eucalyptus globulus*) and black gum (*Eucalyptus ovata*) flowers is the primary food source for the species. The distribution of these eucalypts is patchy and their flowering patterns are erratic and unpredictable, often leading to only a small proportion of Swift Parrot habitat being available for breeding in any one year. Swift Parrots breed in tree hollows in mature eucalypts within foraging range of a flower source. Birds can nest at low densities or sometimes in groups of >50 nests in <100 ha, depending on the availability of flowers and tree hollows. The main threats to the species are the loss of foraging and nesting habitat, predation by sugar gliders (*Petaurus breviceps*), and mortality of adults through collisions with man-made structures such as windows and chain-link fences.

Protection of the species requires the conservation and restoration of all remaining foraging and nesting habitat, which will benefit important Eucalyptus species such as *E. globulus* and *E. ovata*.

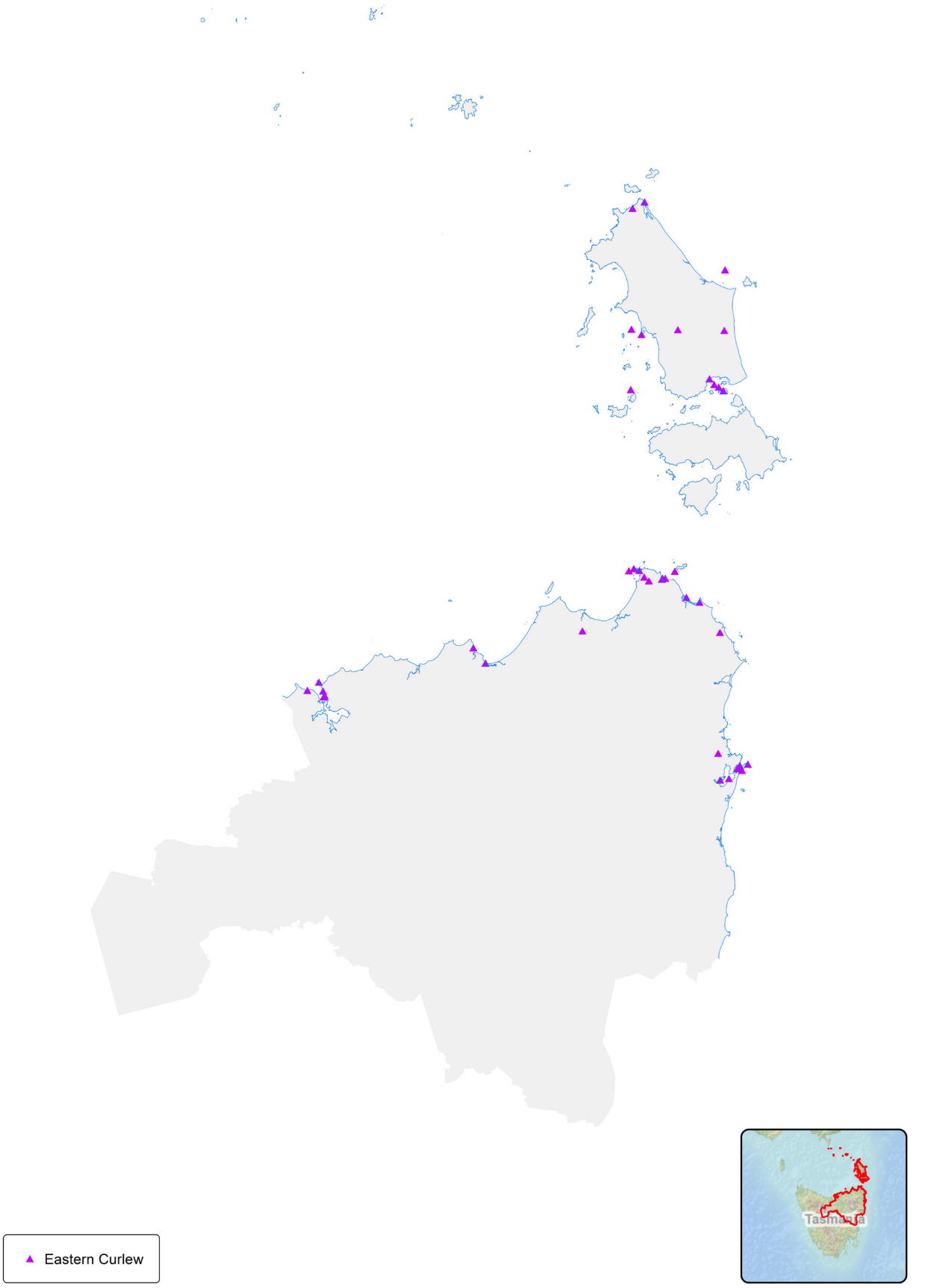

FIGURE 7: **Observations of Eastern Curlew in northern Tasmania**

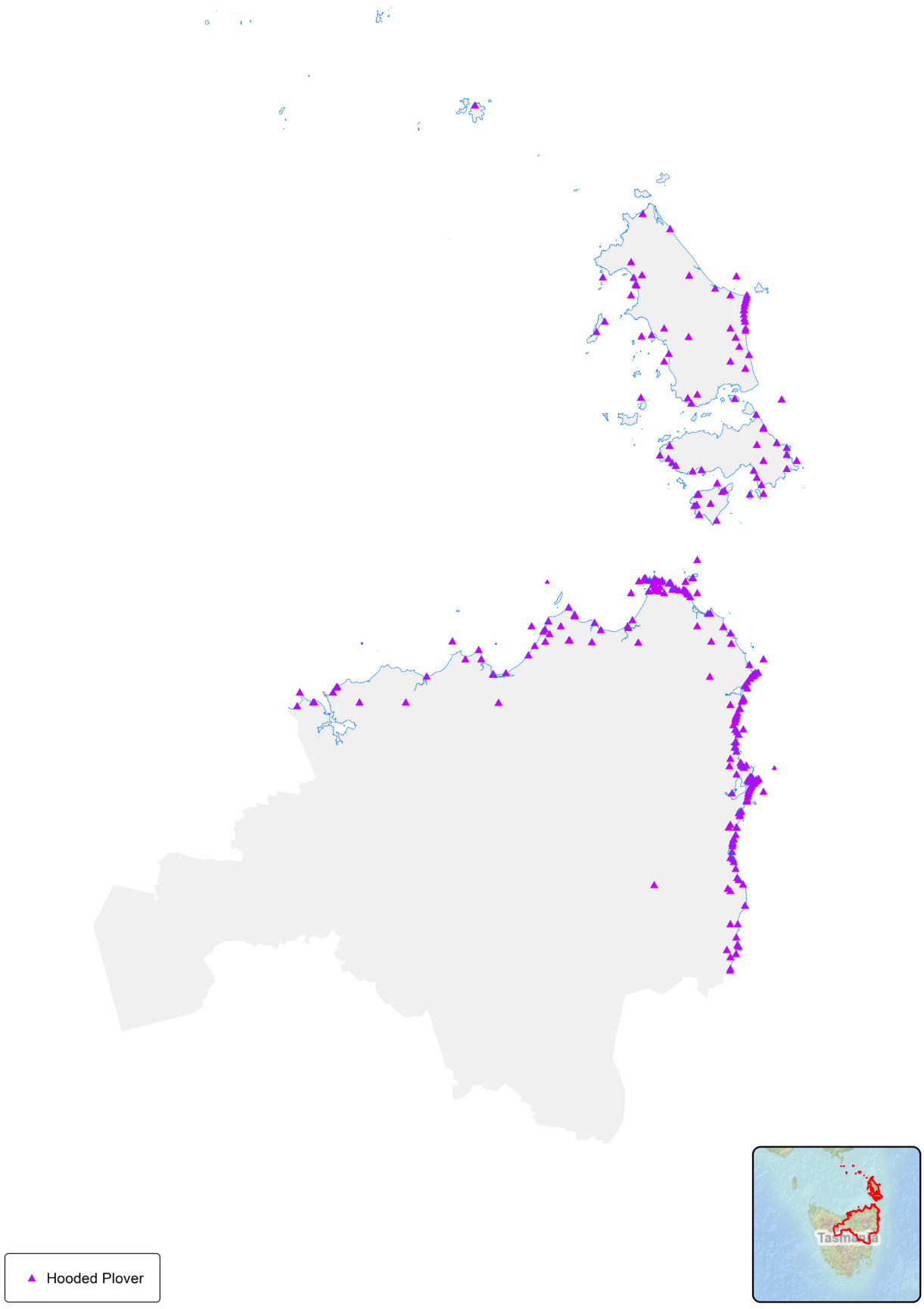

FIGURE 8: **Observations of Hooded Plover in northern Tasmania**

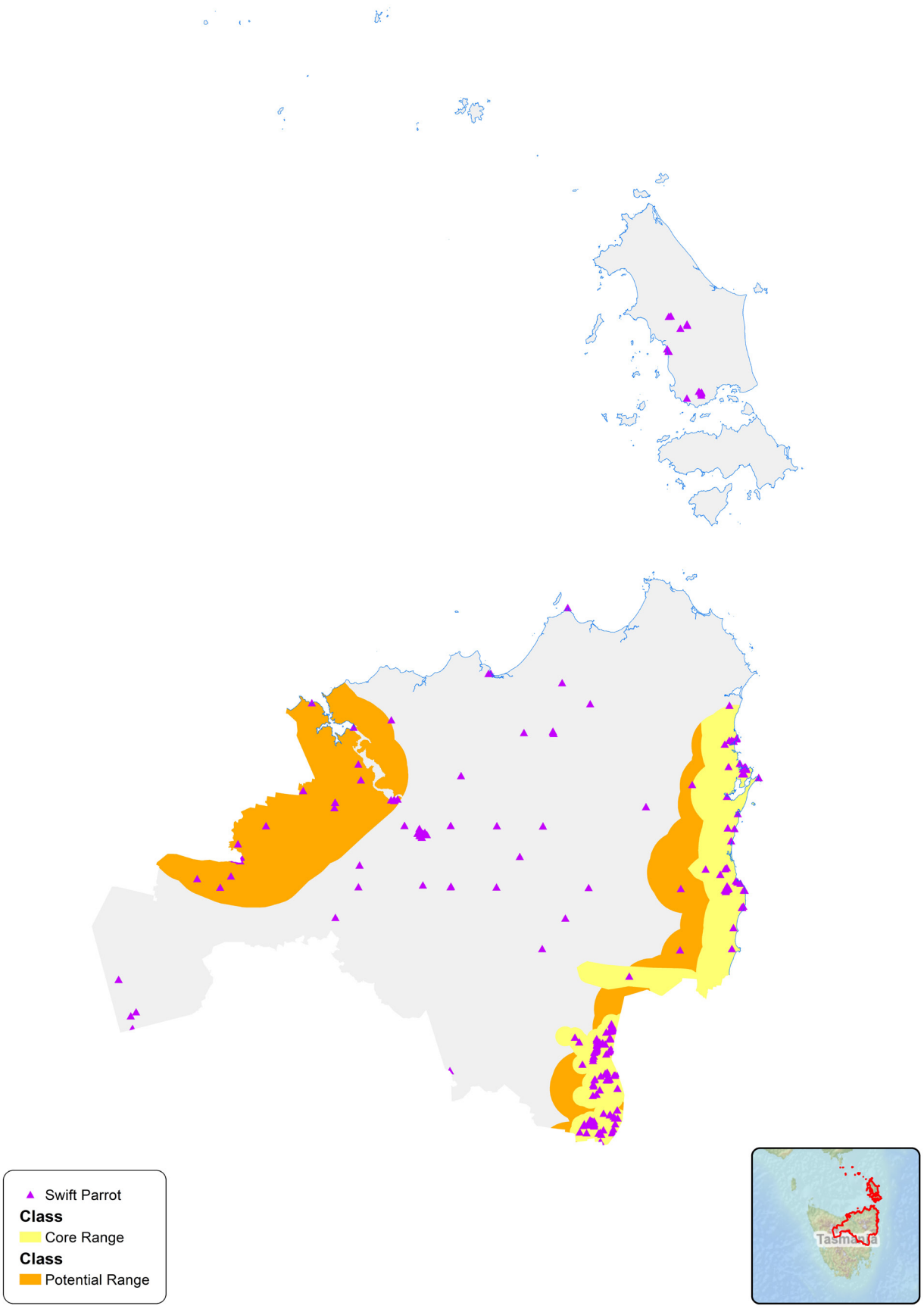

FIGURE 9: **Observations, core range and potential range of Swift Parrot in northern Tasmania**

Forty-spotted Pardalote

The Forty-spotted Pardalote (*Pardalotus quadragintus*) is listed as Endangered under the EPBC Act and is a tiny bird found only in Tasmania. It now occurs in only a few small areas of dry forest that contain *Eucalyptus viminalis* (white gum) trees, on which it is exclusively dependent (Figure 10). Core habitat includes any white gum forest 3-5 km from the east coast from St Helens to Southport and including the Furneaux group (Figure 10). Recent surveys found a 60 percent population decline in 17 years, to around 1500 individuals. The major threat to the species is loss and degradation of habitat through clearing, conversion, drought or dieback. Forty-spotted Pardalote colonies can also disappear with habitat fragmentation and human disturbance such as housing and roading. Substantial efforts are required to protect the species, including protection and covenanting of habitat, improved community awareness of the issues, as well as regeneration of white gum. Loss even of single white gum trees may significantly reduce a colony's survival prospects.

The Forty-spotted Pardalote exists in habitat that is a Tasmanian listed Threatened Vegetation Community so actions to secure and connect habitat will have multiple benefits.

Green and Gold Frogs

The Green and Gold Frog (*Litoria raniformis*) is listed as Vulnerable under the EPBC Act. It is a large frog (up to 80 mm long) which occurs in Tasmania and south-eastern mainland Australia. Despite the name, its coloration varies considerably, but all adults have a pale green stripe down the middle of the back and turquoise thighs. In Tasmania, the species occurs in lowland areas in the south-east and north (Figure 11), breeding in permanent freshwater lagoons, generally with emergent vegetation. The mating call is a very distinctive series of grunts and growls. This is the only Tasmanian frog which can be seen 'basking' out of water, amongst vegetation or on rocks and logs. It has declined significantly (over 20 percent) in range and abundance over the last 10 years, having disappeared from the Midlands, Derwent Valley, much of the Hobart region and parts of the north-west coast. The main threats to the Green and Gold Frog are clearing and draining of wetland and lagoon habitat for agriculture and housing, degradation of habitat through trampling by stock, chytrid fungus disease, and drought.

Green and Gold Frogs are comparatively abundant in the northern Tasmanian region, and opportunities exist to buffer and reconnect habitat in several locations. Actions to protect and secure these populations will contribute to the overall stablisation of the species.

Galaxiids

The Swan Galaxias (*Galaxias fontanus*) is listed as Endangered under the EPBC Act. It is a small native freshwater fish (up to 135 mm long). The species is restricted to a few very small populations in headwater streams in eastern Tasmania (Figure 12), which have in the past been protected from invasive introduced fish such as trout and Redfin Perch. These remaining populations include nine natural populations (all occurring in the Swan River and Macquarie River catchments and between upper St Pauls River in the north and Rocka Rivulet in the south) and a small number of translocated populations. Key threats to the species are from introduced fish and from changes to water flow and quality. Streams supporting healthy populations of the Swan Galaxias are all protected from trout invasion by some form of barrier (waterfall, marsh, small channel), and the maintenance of these barriers to fish movements (while avoiding alteration to water flow or quality) is vital for the long-term survival of the remaining Swan Galaxias populations.

The Dwarf Galaxias *Galaxiella pusilla* is listed as Vulnerable under the EPBC Act. It is a tiny freshwater fish endemic to south-eastern Australia, where it occurs in Tasmania, South Australia and Victoria. The Dwarf Galaxias is still widely distributed, but populations are fragmented and patchy across the landscape (Figure 13). It is likely that the species has suffered a significant decline in abundance due to habitat changes to shallow freshwater wetlands, especially wetland drainage. Major threats to the Dwarf Galaxias include wetland drainage, climate change, habitat damage through grazing and lack of regeneration, and feral fish competitors and predators.

Translocating populations of galaxiids to locations that have natural barriers to introduced freshwater fish species and good aquatic and riparian habitat are important Actions for securing the populations of these species. Improving riparian habitat and stream shading will have additional benefits for improving water quality.

FIGURE 10: **Observations and range of Forty-spotted Pardalote in northern Tasmania**

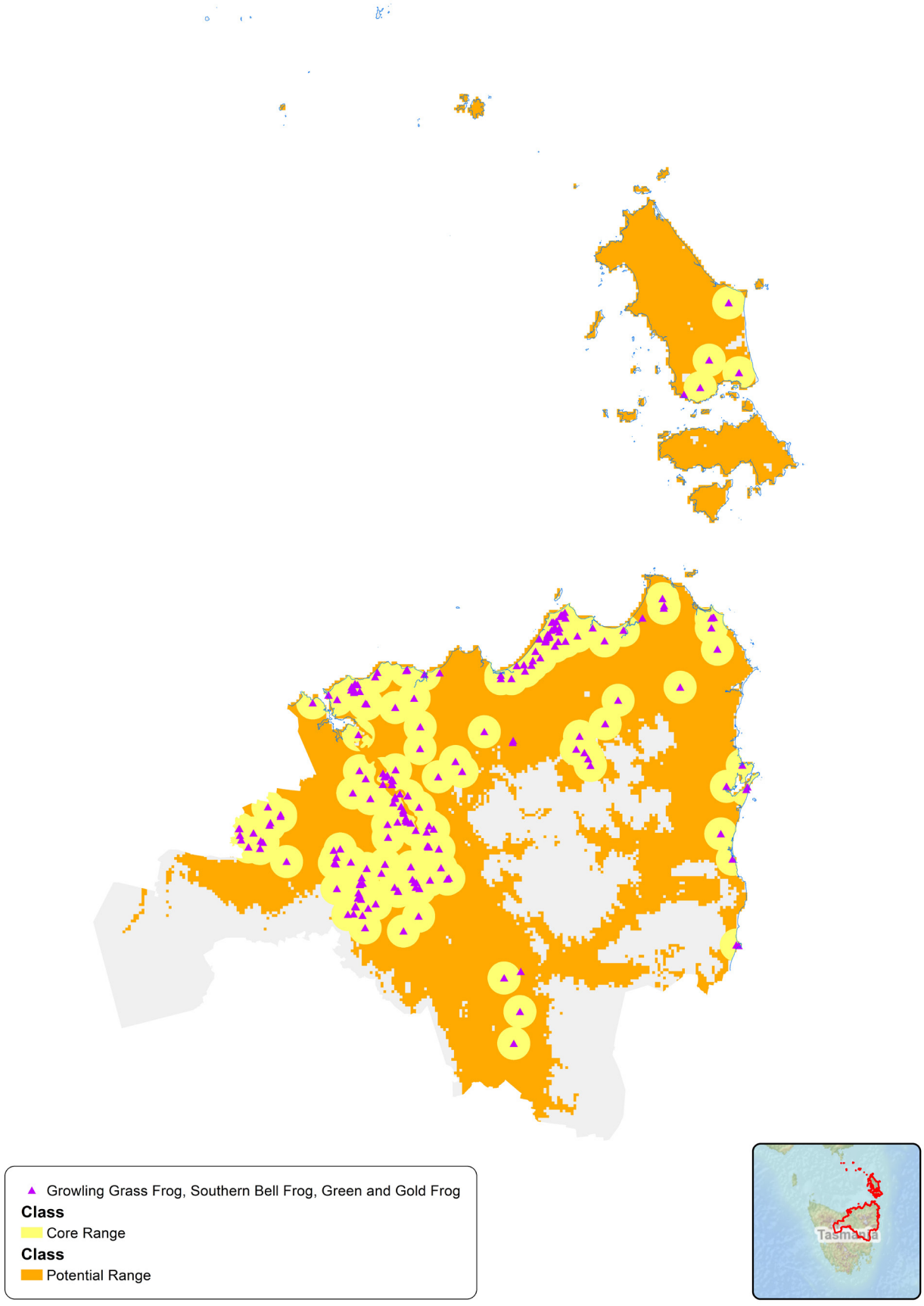

FIGURE 11: **Observations, core range and potential range of Green and Gold Frogs in northern Tasmania**

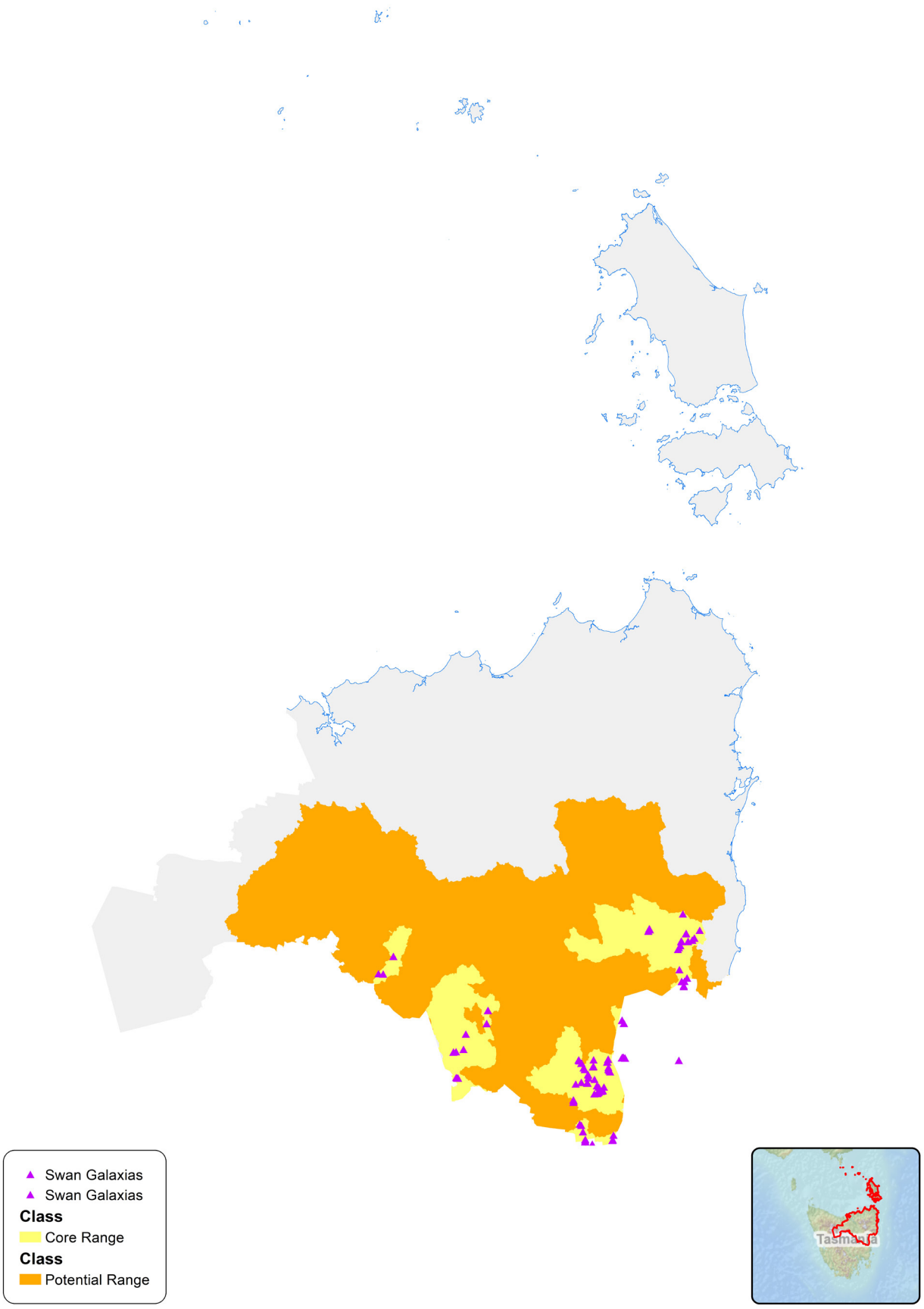

FIGURE 12: **Observations, core range and potential range of Swan Galaxias in northern Tasmania**

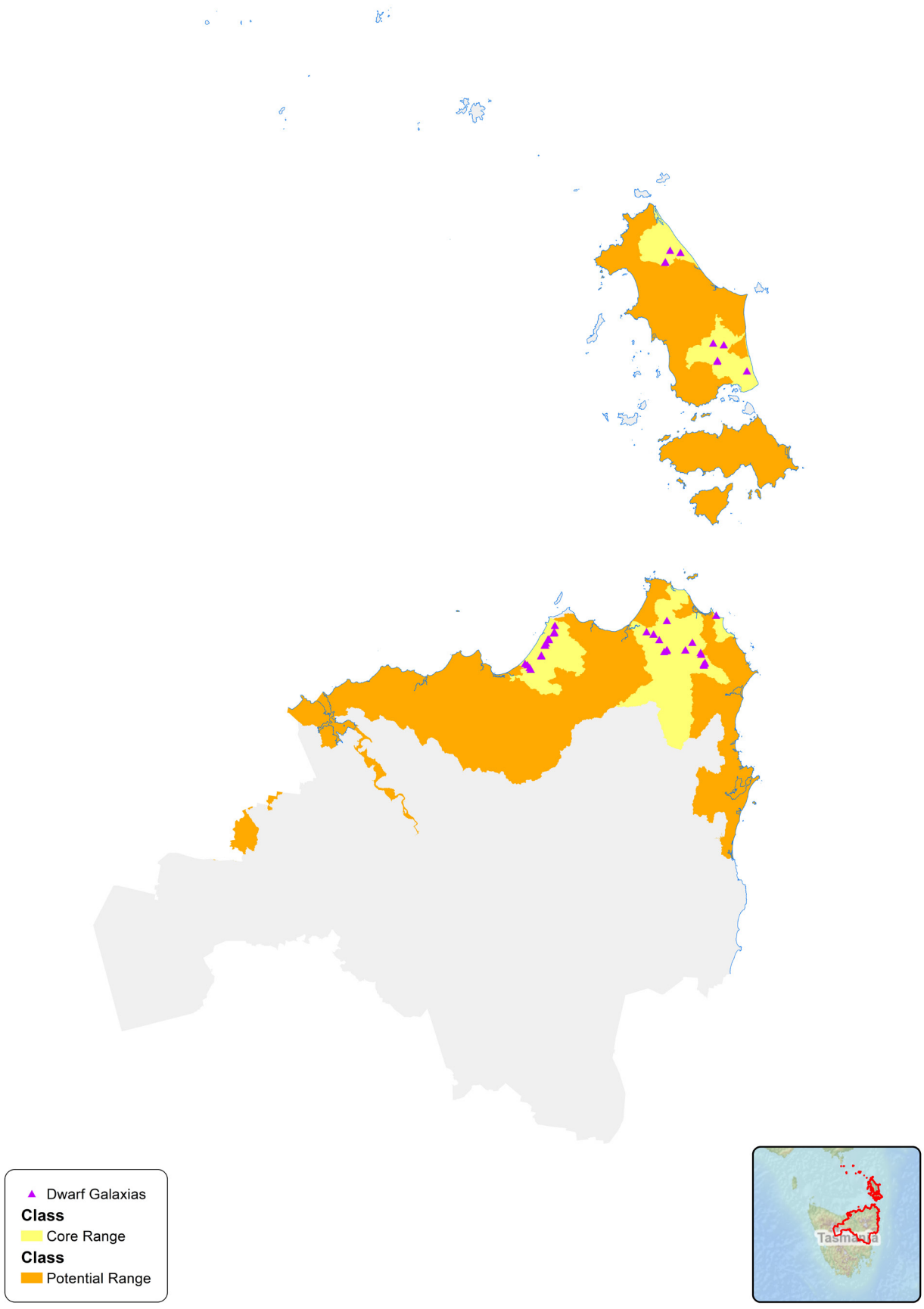

FIGURE 13: **Observations, core range and potential range of Dwarf Galaxias in northern Tasmania**

Red Handfish

Red Handfish is listed as Critically Endangered under the EPBC Act. It is a small, slow moving benthic fish with a relatively elongate and moderately compressed body that tapers towards the tail. The species grows to at least 136 mm total length and their skin is covered in small, close-set, flattened warts. There are two primary colour morphs, both dominated by reddish tones. One morph is a uniform vivid red over the body and fin bases with the outer parts of the fins bluish and white; the second morph is a less strikingly mottled pink with extensive reddish patches and spots. Red Handfish are endemic to south-east Tasmania. They are currently known only from Primrose Sands in Frederick Henry Bay. However, historically the species range extended along the eastern coast of Tasmania. There are two recorded observations of Red Handfish in the northern region, recorded in 1950 near Bridport

Restoration of Red Handfish in the northern region would require significant investment and specialist expertise, based on little evidence of historic populations or baselines, and is therefore not considered a priority for investment.

Giant Freshwater Crayfish

The Giant Freshwater Crayfish (GFC), *Astacopsis gouldi* (also referred to as 'Giant Freshwater Lobster') is listed as Vulnerable under the EPBC Act. It is the world's largest freshwater crustacean, growing to up to 6kg and living for up to 60 years. The species is endemic to rivers of northern Tasmania (Figure 14). GFC is classified as "Vulnerable" under both the Environment Protection and Conservation Act 1999 and the Threatened Species Protection Act 1995 (Tasmania).

Critical habitat requirements of this species are well-shaded streams that have good water quality, low sediment levels, snags, pools and undercut banks. Populations of GFC have declined due to degraded water quality, raised temperature and sedimentation of waterways from historic land management activities such as vegetation clearing, forestry and mining. Sediment in waterways covers rocks and cobbles and fills crevices crucial for cover and food for juvenile Lobsters, causing loss of food sources and exposure to predation.

Prior to 1998, fishing for the species was legal, resulting in a high proportion of large reproductive adults being removed from the ecosystem. Because the species is long-lived and takes many years to breed, recovery rates are slow. Illegal fishing remains an issue and further community education is needed.

In north-eastern Tasmania, populations have declined more significantly than in the north-west, and while there has been a lack of survey effort in this region until recently, populations in some north-east catchments are believed to be critically low. The species is considered iconic by the local community, and is culturally significant to Tasmanian Aboriginal people.

With funding from the National Landcare Program, NRM North is actively improving the habitat quality and connectivity for Giant Freshwater Crayfish, and continued investment would build on existing partnerships and Actions.

Davies Waxflower

The Davies Waxflower is listed as Critically Endangered under the EPBC Act. It is a medium shrub that grows to around 3m tall, found on the north east coast of Tasmania (Figure 15). Leaves are dark green on top, and silvery underneath, around 2-3cm long and thin. Pale yellow flowers occur in groups of five to eight at the end of branchlets with stamens that protrude from the flowers about twice the length of the petals. Recruitment is from seed with flows adapted to pollination by non-specialised insects and birds. Dispersal appears to be though water and ants. Large amounts of seed are produced but few seeds have been found in the soil-bank. Long term viability of seeds in the soil-bank is not known. Germination appears to be triggered by events such as flood and fire though low numbers of seedlings are seen without the stimulus of fire.

Securing in-situ populations and establishing ex-situ populations is critical to stabilising the trajectory of this rare and endemic plant.

» Giant Freshwater Crayfish, *Astacopsis gouldi*, carrying newly hatched juveniles (Todd Walsh)

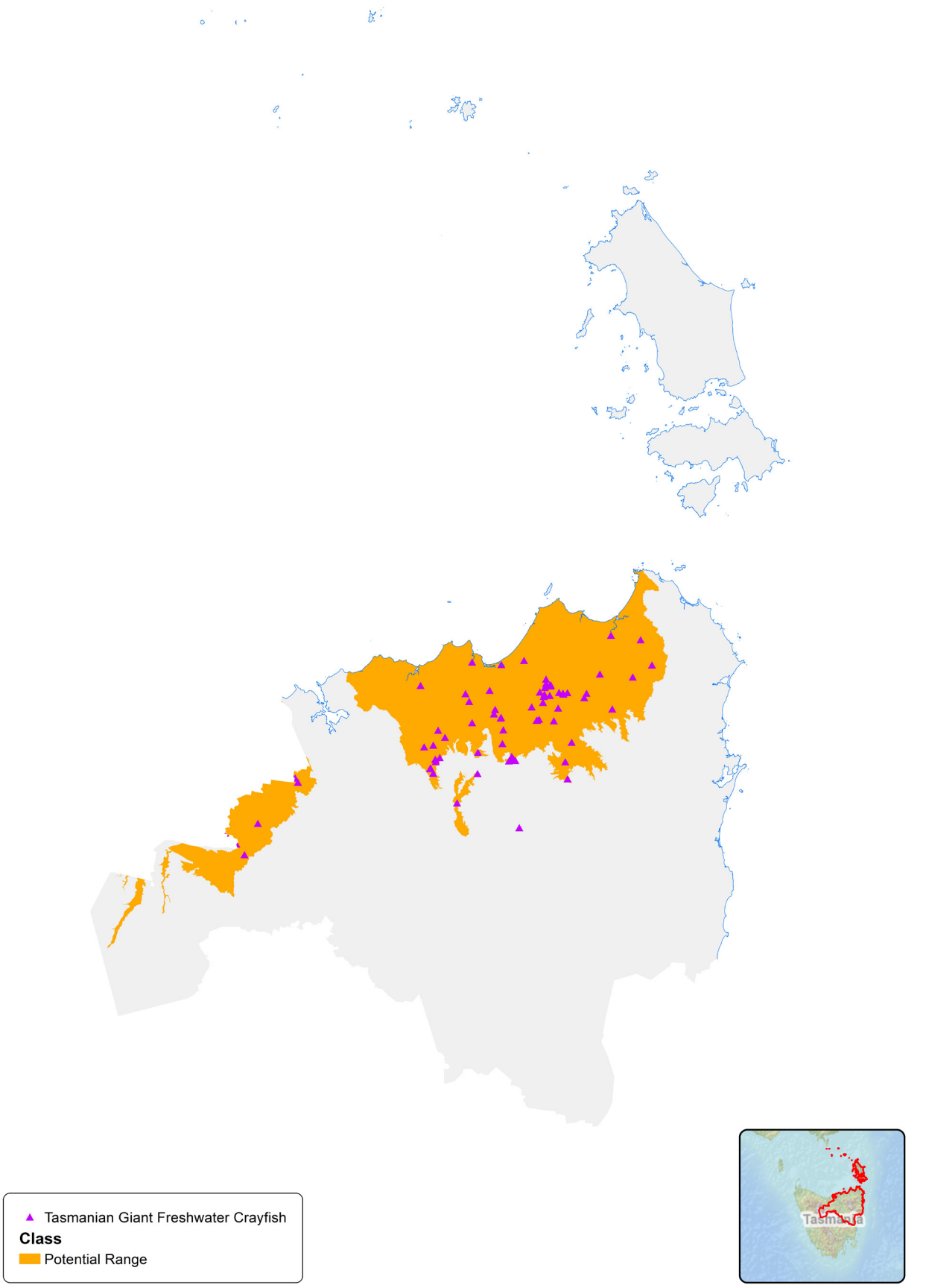

FIGURE 14: **Observations and range of Giant Freshwater Crayfish in northern Tasmania**

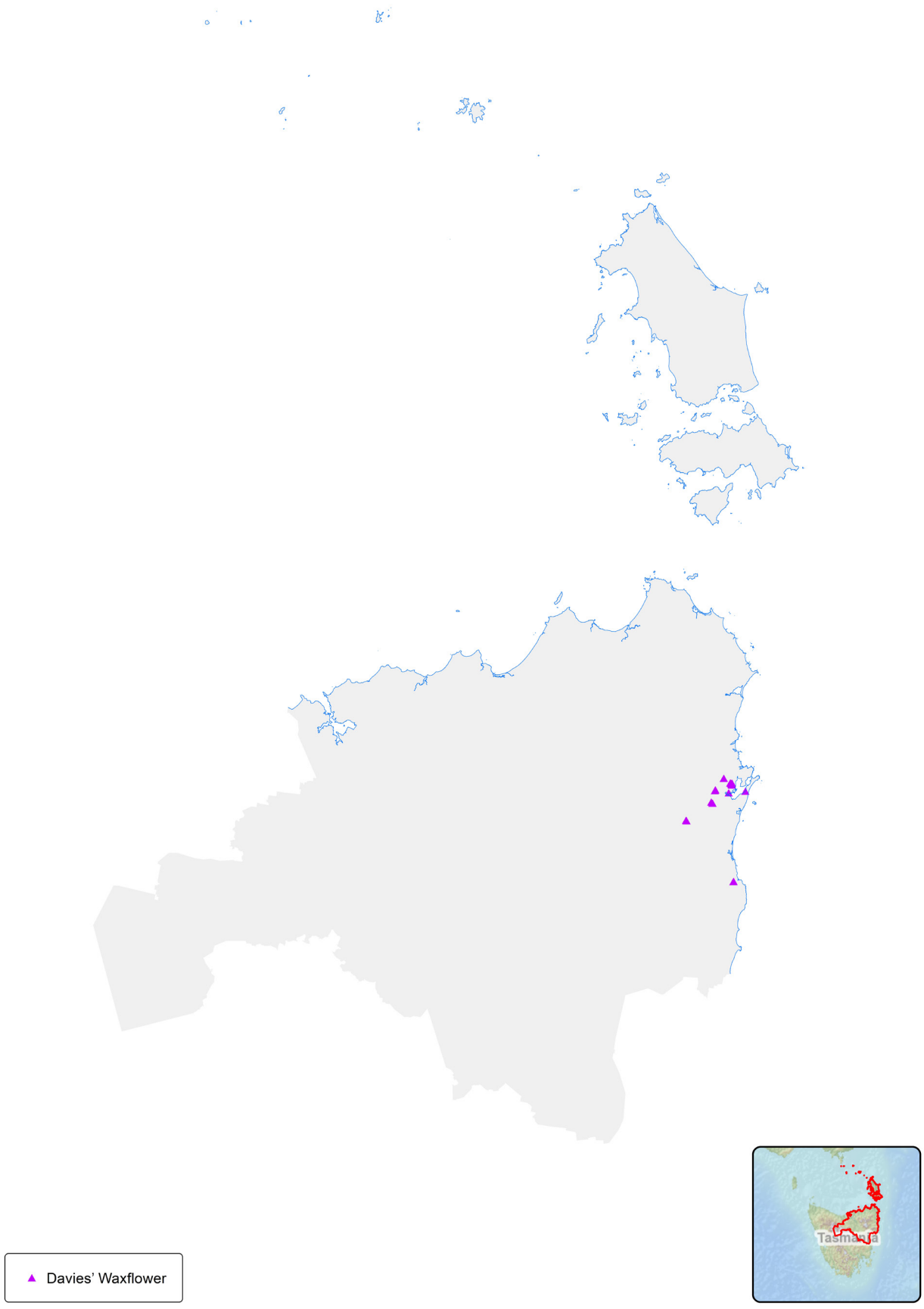

FIGURE 15: **Distribution of Davies Waxflower in the northern region**

Graveside-leek orchids

The Graveside Leek-orchid is listed as Critically Endangered under the EPBC Act. It is a small fleshy terrestrial orchid. It has a single green onion like leaf and tiny light-green flowers with pinkish-purple markings. The orchid is known from a survey in 2001 which identified three flowering plants occupying a 20m x 5m area, though additional plants without flowers that may or may not be the Graveside Leek-orchid were also seen (Figure 16). Intensive surveys over the last 20 years have not uncovered any additional sites and the orchid has not been seen again since its discovery. It is considered likely that the orchid was once more widespread but its late discovery means there is no historical data on which to confirm any trends in population. The site where plants have been observed does not occur within a conservation reserve.

Potential threats to the Graveside Leek-orchid are: changes to fire frequency, application of fertilisers, weed invasion, off-target herbicide impact, changes to slashing or mowing regime, damage by machinery. The lack of historical survey data means that the risk posed by these threats is not well understood.

Understanding this orchid's current status and securing in-situ populations and establishing ex-situ populations is critical to stabilising the trajectory of this rare and endemic plant.

2.2.2 Regionally important species

Eastern Barred Bandicoot

The Eastern Barred Bandicoot is listed as Vulnerable under the EPBC Act. It is a small mammal which occurs only in south-eastern Australia. According to the Recovery Plan for Eastern Barred Bandicoot (mainland), the "Tasmanian and mainland populations are recognised as distinct subspecies, although these have not been formally named". The mainland subspecies is believed to be extinct in the wild and now only occurs in captive and reintroduced populations.

Eastern Barred Bandicoots occur in open habitats including grasslands and grassy woodlands and forests, requiring understorey for shelter and food (Figure 17). The species occurs in largely agricultural and peri-urban landscapes, with few reserves on public land known to contain Eastern Barred Bandicoot (Approved Conservation Advice). The distribution of the species overlaps with *Eucalyptus ovata – Callitris oblonga* (Black Gum) forest, and areas of Tasmanian Lowland Native Grasslands, both threatened ecological communities under the EPBC Act.

In Tasmania, Eastern Barred Bandicoots are relatively widespread (Figure 17), but numbers are believed to be still declining, and are at threat from habitat clearance, fragmentation and degradation, predation by cats and dogs and disease transmission by cats. The Tasmanian subspecies is listed under the EPBC Act as 'Vulnerable'.

NRM North has an existing project funded through the National Landcare Program working on improving habitat values and connectivity for Eastern Barred Bandicoot in northern Tasmania. In addition to securing the Tasmanian population of Eastern Barred Bandicoot, this provides an opportunity for multiple benefits across two Threatened Ecological Communities.

Spotted-tailed Quoll

The Spotted-tailed Quoll (*Dasyurus maculatus maculatus*) is listed as Vulnerable under the EPBC Act. It is a large carnivorous marsupial that is found in a range of habitats throughout mainland Tasmania and Australia. The Tasmanian species is distinct from the mainland populations, enough to warrant a subspecies although a subspecies has not yet been classified. Male Spotted-tailed Quolls can weigh up to 7.2 kg and females up to 4 kg. Spotted-tailed Quolls have long bodies and short legs, and a brown coat with a lighter underside. Numerous bold white spots are found on the body, legs and tail. They can be distinguished from the superficially similar Eastern Quoll (*Dasyurus viverrinus*) by their larger size and long spotted tail. Eastern Quolls do not have spots on their tail.

Habitat important to the Spotted-tailed Quoll includes large patches of forest containing adequate denning sites and high densities of mammalian prey such as rats, possums and small wallabies (Figure 18). Habitat loss, fragmentation, and modification are the major threats to the species in Tasmania. Competition and predation from introduced predators such as cats, road mortality and wildfires are also threats. Causes of habitat loss and modification include urban and agricultural development, conversion of forest to pasture or plantation, road construction, and vegetation clearance in general.

Securing habitat is a priority action for this species in the northern region, as well as investigating options to reduce road mortality, and is likely to have benefits for multiple species such as the New Holland Mouse and Eastern Quoll.

Figure 18 shows the observations and range of Spotted-tailed Quoll in northern Tasmania.

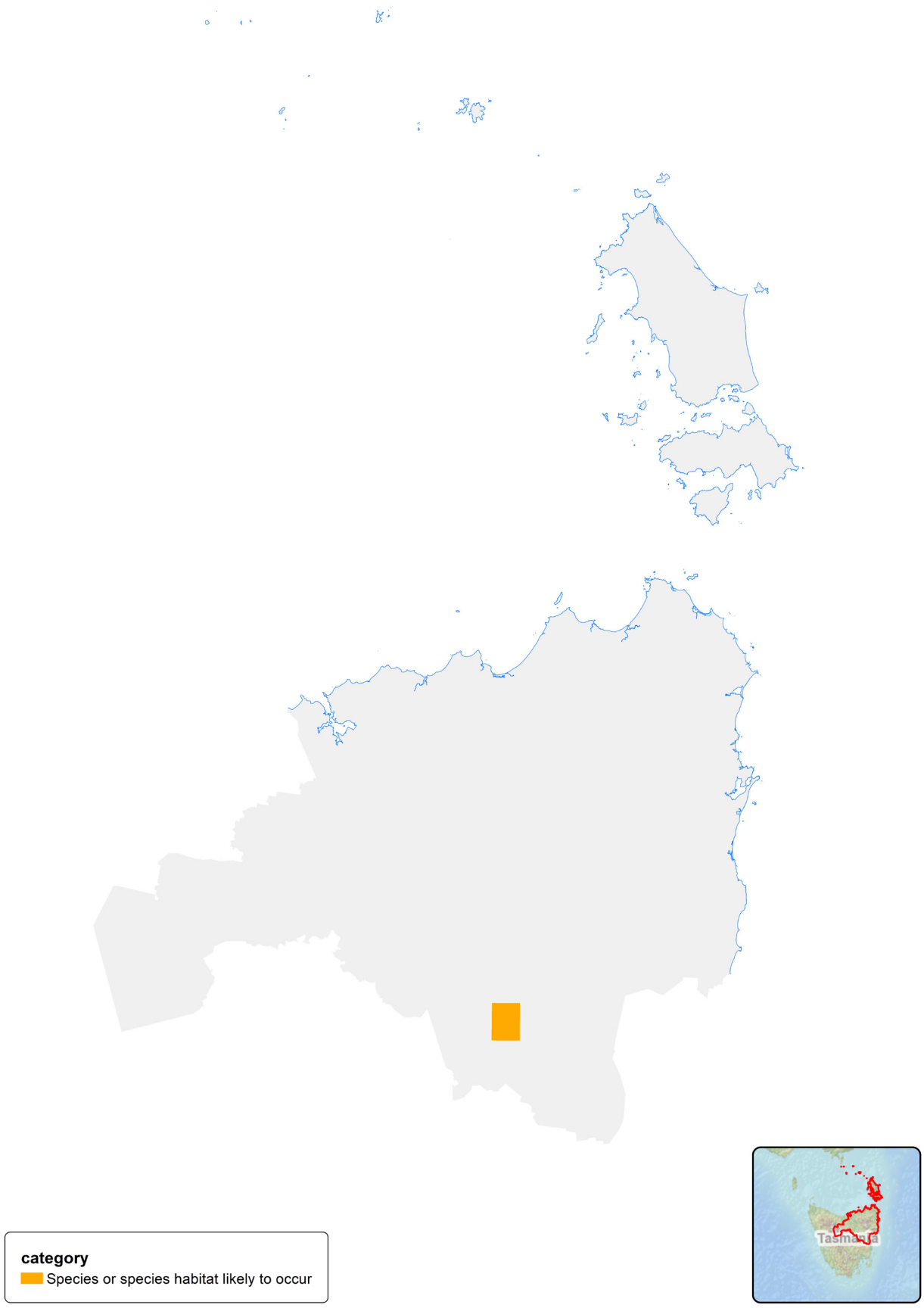

FIGURE 16: **Distribution of Graveside leek orchid in northern Tasmania**

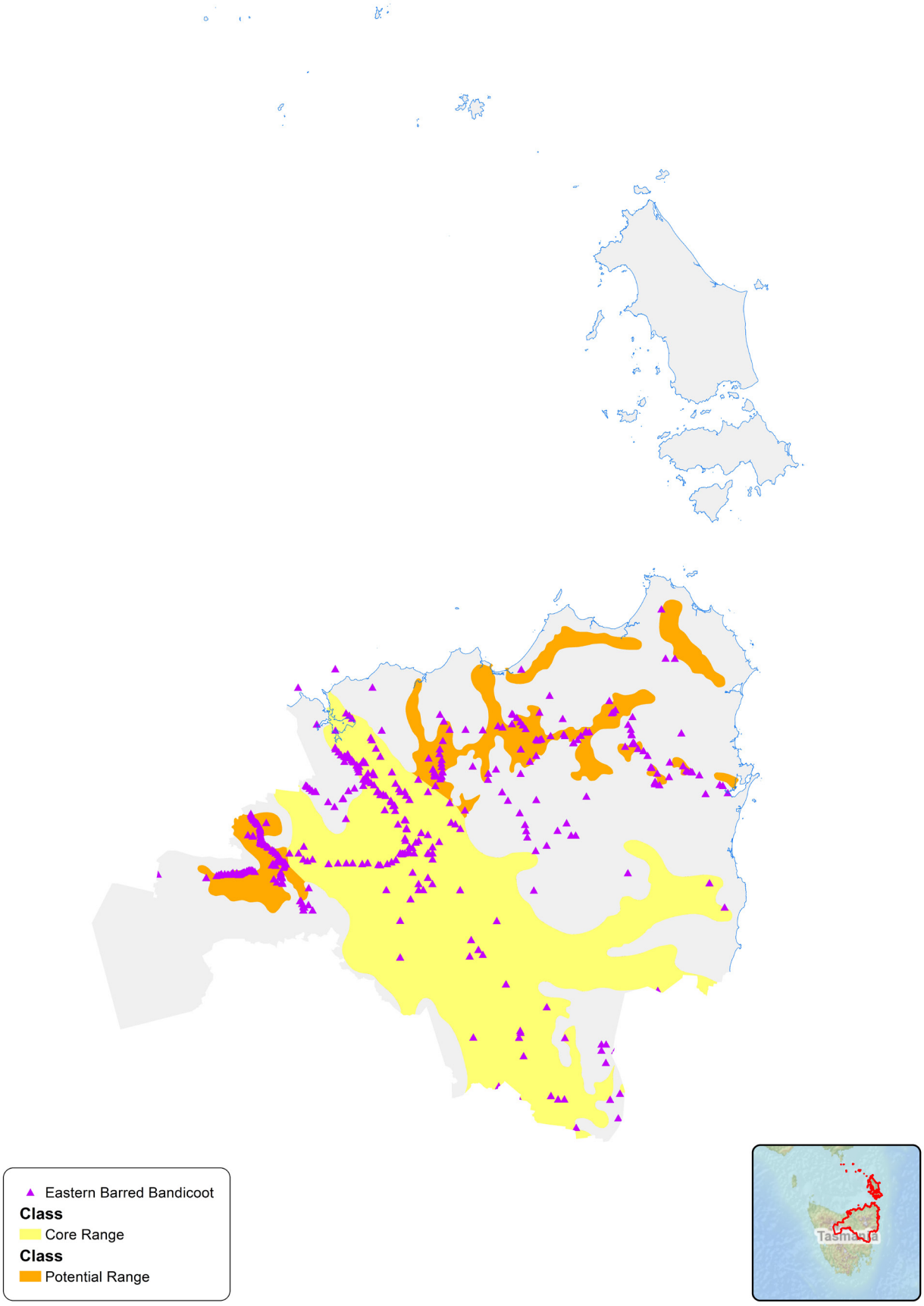

FIGURE 17: **Observations and range of Eastern Barred Bandicoot in northern Tasmania**

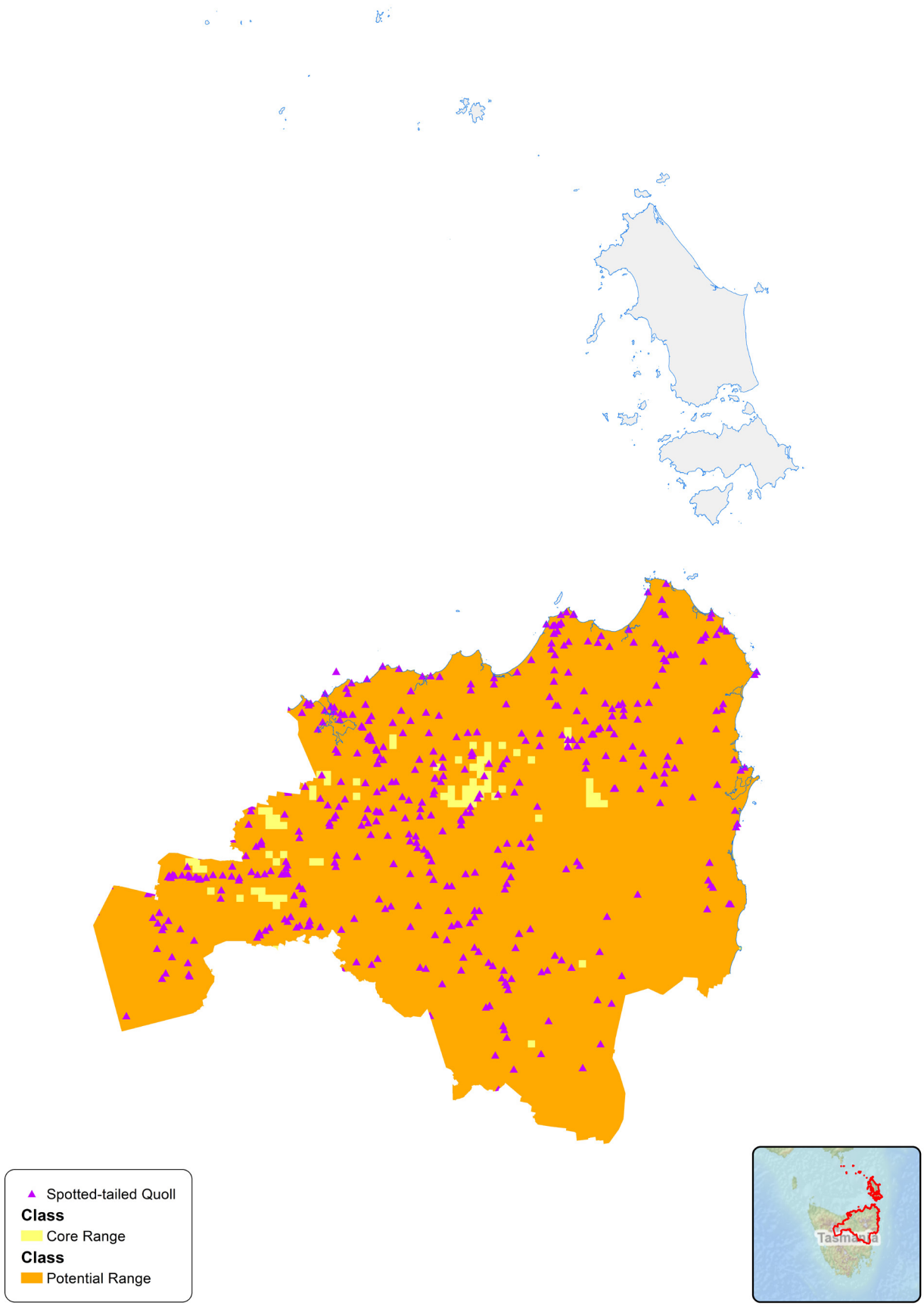

FIGURE 18: **Observations and range of Spotted-tailed Quoll in northern Tasmania**

Shearwaters

The Short-tailed Shearwater is protected under international treaty and the EPBC Act as a migratory species. It is a dark brown coloured seabird and the most numerous seabird in Australia. The bird breeds over summer, migrating to breeding grounds on islands along the south-east and south coast of Australia. In particular, large breeding areas are found on the Furneaux Island group in the northern Tasmania region (Figure 19). Adults remain with chicks until they are large enough to fend for themselves, before migrating north-east through the central Pacific Ocean, spending the summer winter at sea in the northern Pacific off Japan, Siberia and Alaska. Over 18 million birds make the migration with flocks of up to 60,000 birds per hour being sighted.

Birds nest in long burrows (1-2m long) on sandy headlands amongst low lying vegetation and feed on krill, fish and squid, diving as deep as 50 m for prey. They have a crop of nutrient rich oil in their neck that can sustain them on long trips and which fuels chicks when left behind in the colony.

Short-tailed shearwaters are protected under international treaty as migratory species. Habitat loss and degradation has also led to many colonies disappearing. Shearwaters are culturally important to Tasmanian Aboriginal people. Historically unsustainable harvesting of eggs and birds by European settlers threatened the survival of many colonies.

Monitoring of breeding populations, protection of priority habitat and control of invasive pests and nesting disturbance are important to maintain the trajectory of shearwater populations.

Raptors

The Wedge-tailed Eagle subspecies *Aquila audax fleayi* is listed as Endangered under the EPBC Act. It occurs only in Tasmania and is distinguished by its size (being Australia's largest bird of prey) and wedge-shaped tail. It kills and scavenges on animals including reptiles, birds and mammals, across a wide range of habitats, from the coast to highland areas. It defends a large territory, nesting in patches of mature forests with sheltered aspects throughout Tasmania (including large offshore islands) (Figure 20). The total adult population has been estimated as less than 1,000 birds. Principal threats include loss of nesting habitat, nest disturbance, collisions (with artificial structures, vehicles and aircraft), electrocution and persecution. While individual responses vary, disturbance occurring even many hundreds of metres away can cause breeding birds to temporarily leave eggs or chicks at risk, or even to desert their nest site for years. Disturbances involving visible people or helicopters can be particularly serious. Population numbers may increase if nest protection is more effective and unnatural mortality rates reduced.

The White-bellied Sea-eagle is listed as a protected marine species under the EPBC Act, and listed as vulnerable under the Threatened Species Protection Act. It has white on the head and underparts and dark grey on the back and wings, and is the second largest bird of prey in Australia. It can be found on the coast and some way inland (Figure 21), and birds form permanent pairs that inhabit territories throughout the year. It feeds off aquatic species and builds nests in trees up to 30 m off the ground. Threats to the White-bellied Sea-eagle are similar to those of the Wedge-tailed Eagle.

Habitat and nest protection, and education and awareness, are critical to stabilising the trajectory of these species. Critical to this is research and monitoring, that informs policy and guidance to support development decision making, regarding the limits to acceptable nest disturbance.

Masked Owls

The Tasmanian Masked Owl (*Tyto novaehollandiae castanops*) is listed as Vulnerable under the EPBC Act. It's a subspecies of Masked Owl which occurs only in Tasmania. Its population has been estimated to comprise approximately 500 breeding pairs. It is a large bird with a mask-like facial disc and distinctive husky, screeching call. The Tasmanian Masked Owl hunts at night for small mammals and birds in a range of habitats which contain some mature forest, usually below 600 m altitude - these include native forests and woodlands as well as agricultural areas with a mosaic of native vegetation and pasture (Figure 22). Birds pair for life, occupying a permanent territory and relying on hollows in old-growth trees for nesting and roosting. The main threats to the Tasmanian Masked Owl are clearing of nesting/roosting and foraging habitat (particularly tree hollows), secondary poisoning, and competition with other bird and mammal species for the limited number of suitable nesting hollows.

As with raptors, knowledge of the nesting habitat required by the species is limited and necessary for informing the recovery of the species. Education and awareness of the habitat preferences near agricultural areas, and the risk of secondary poisoning, are important for improving outcomes for the species.

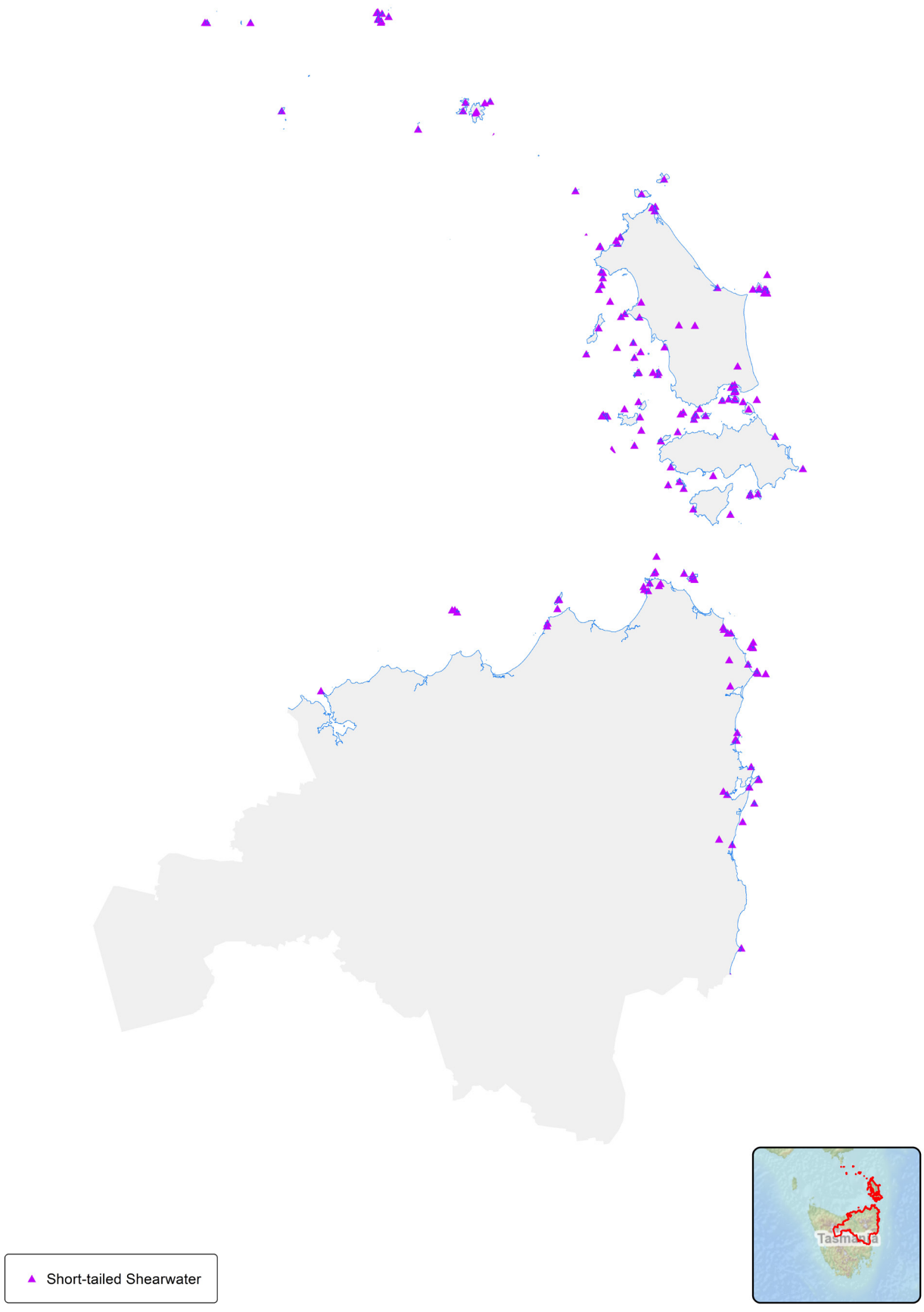

FIGURE 19: **Observations and known range of the Short-tailed Shearwater in northern Tasmania**

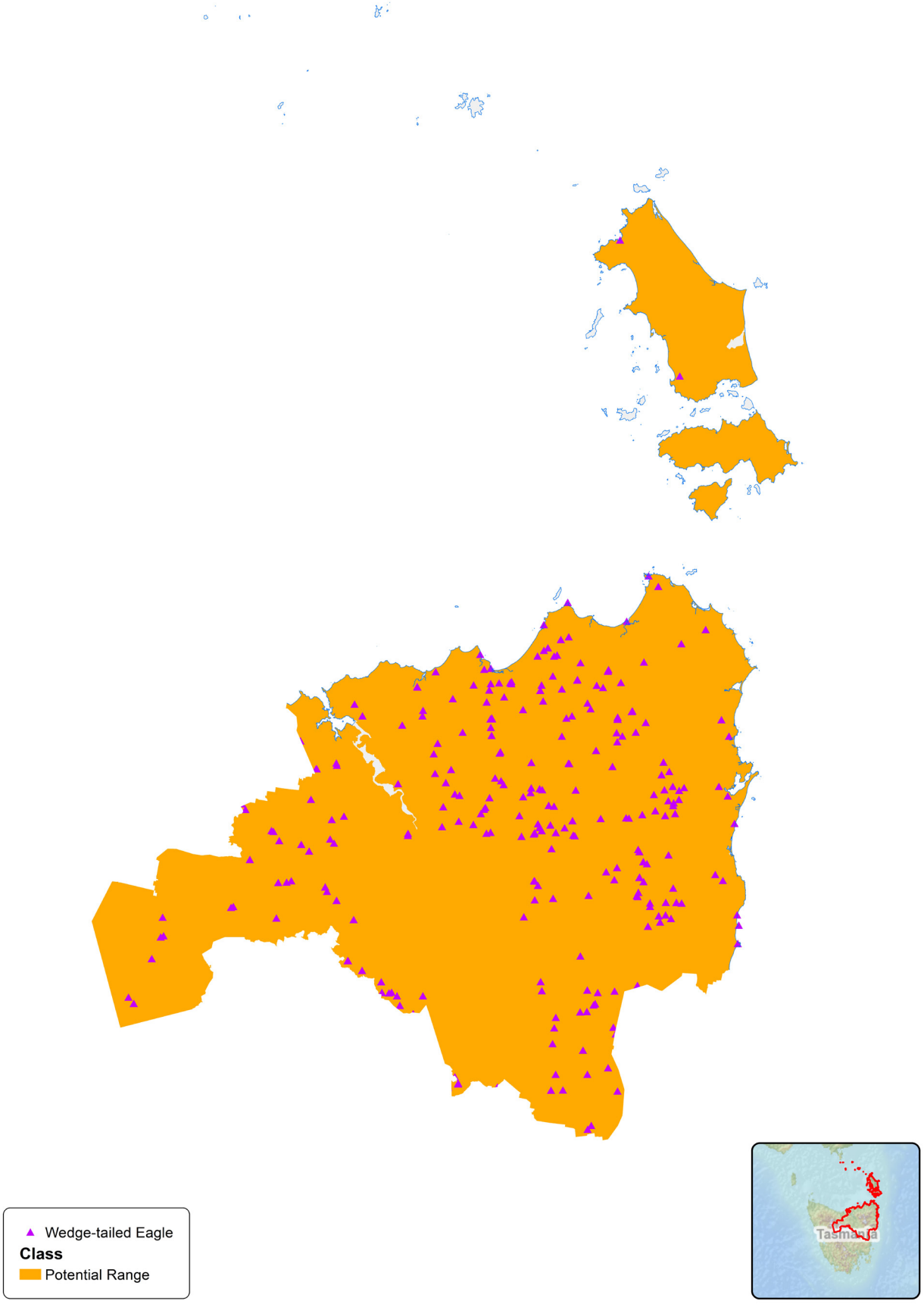

FIGURE 20: **Observations and range of the Wedge-tailed Eagle in northern Tasmania**

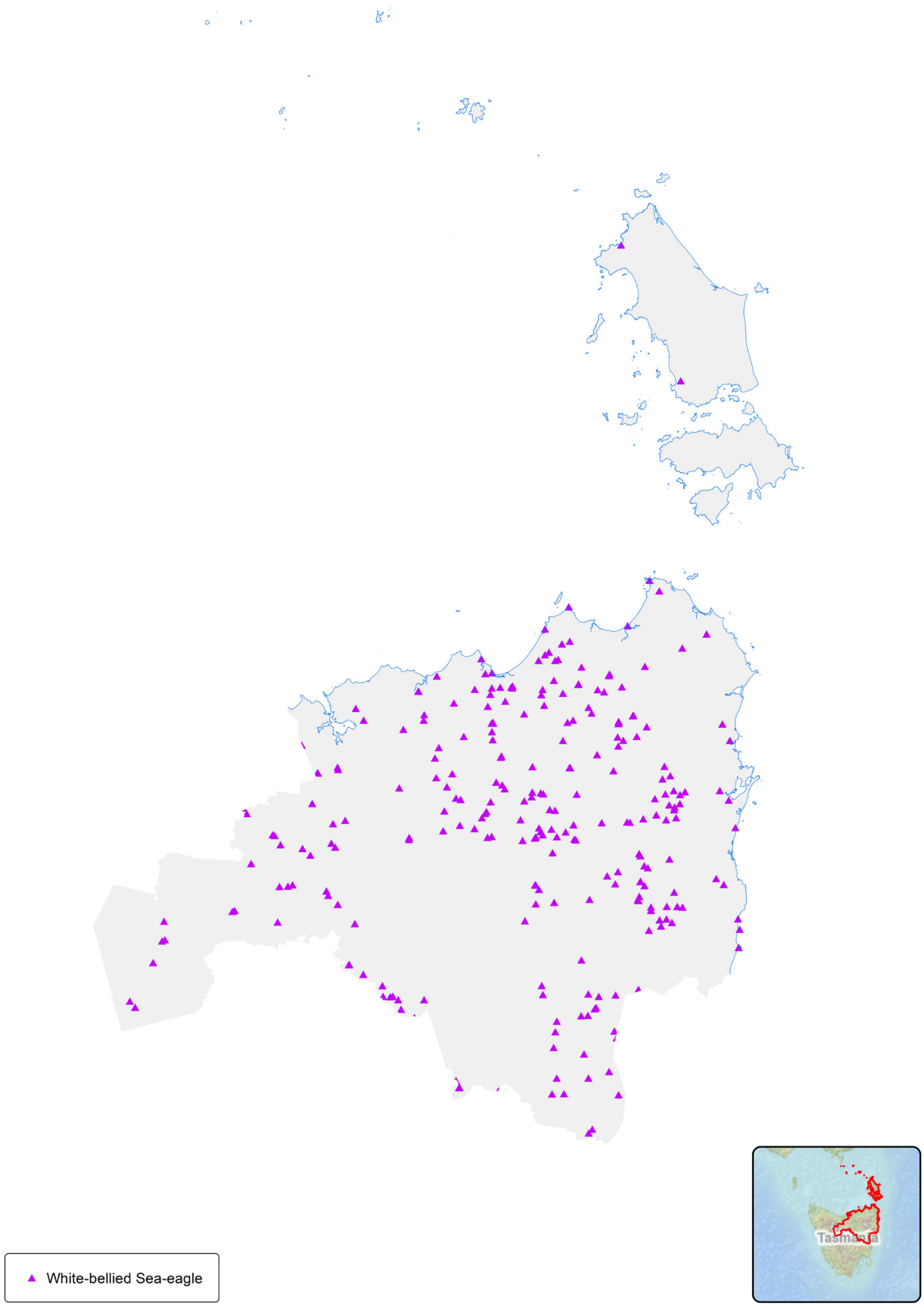

FIGURE 21: **Observations and range of the White-bellied Sea-eagle in northern Tasmania**

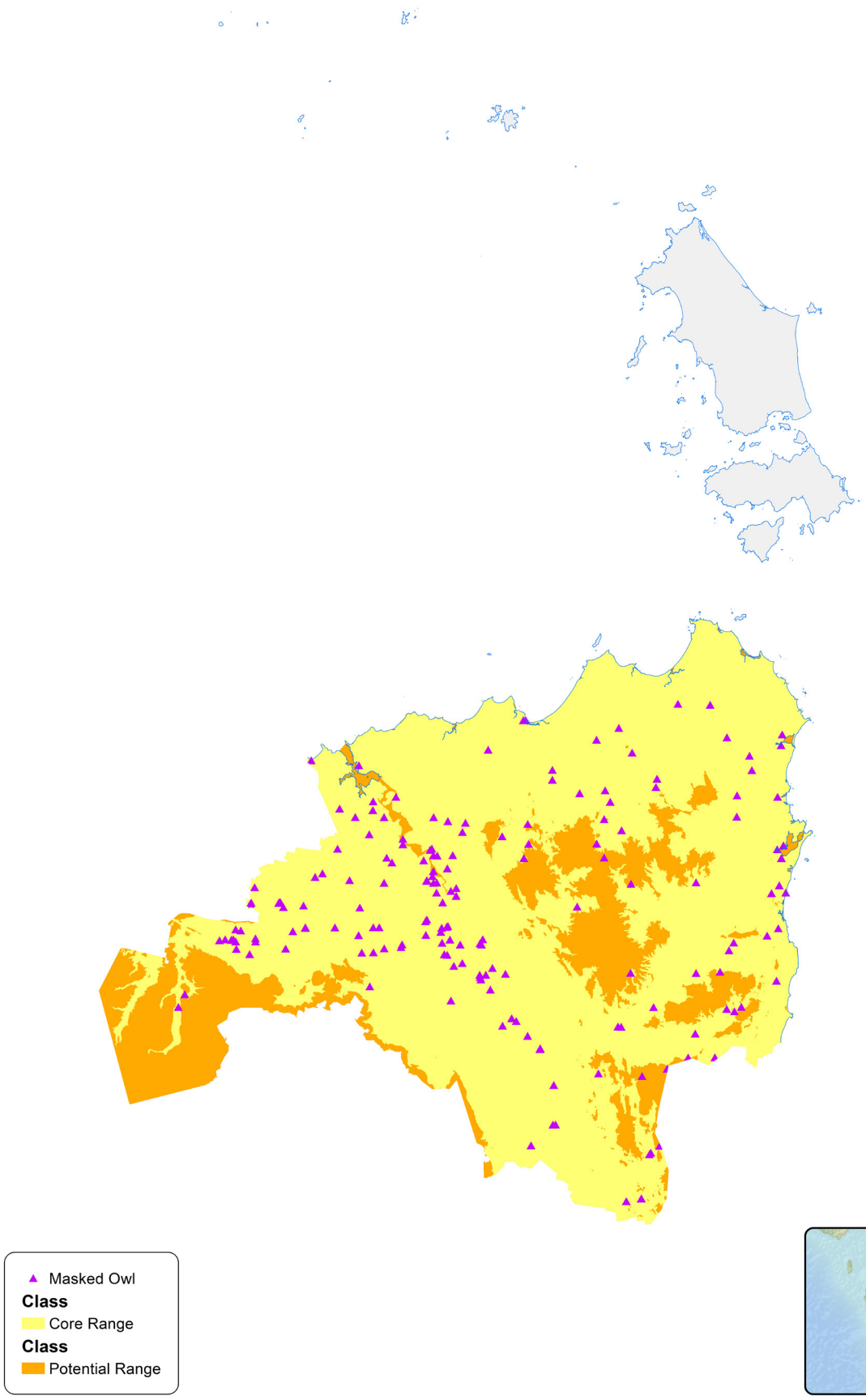

FIGURE 22: **Observations, core range and potential range of Masked Owls in northern Tasmania**

Australian Grayling

The Australian Grayling (*Prototroctes maraena*) is listed as Vulnerable under the EPBC Act. It is a native fish which migrates between fresh and marine waters. The species occurs in coastal rivers and streams in New South Wales, Victoria and Tasmania. In Tasmania, the Australian Grayling has been found in northern, eastern and western rivers, but has so far not been recorded from the south-west (Figure 23). Adults live and breed in freshwater rivers, and the larvae are swept downstream into coastal waters. Juveniles then remain in marine waters for about six months before returning to the freshwater adult habitat. Little is known of the population size of the species in Tasmania, but it is believed that the species' range has contracted substantially in recent years. The major threat to this species is the construction of barriers to fish movement which prevent adults migrating upstream and larvae moving downstream.

Burrowing Crayfish

The Mt Arthur Burrowing Crayfish (*Engaeus orramakunna*) is listed as Vulnerable under the EPBC Act. It is a medium-sized burrowing crayfish growing to a length of about 8 cm. The species is among the most terrestrial of the burrowing crayfish in Tasmania. Animals are usually a striking orange in colour but can also be brown. The Mt Arthur Burrowing Crayfish is known from a range of approximately 300 square km centred on Mt. Arthur in north-east Tasmania (Figure 24). The species extends to near Lilydale, Nabowla and South Springfield, and is also found in the vicinity of Launceston. The Mt Arthur Burrowing Crayfish prefers moist seeps and flat swampy or marshy land feeding into or next to streams and rivers, but can also be found in stream banks, wet pasture, culverts and roadside drains. The principal threats to the species are forestry activities and conversion of habitat to pasture.

The Furneaux Burrowing Crayfish (*Engaeus martigener*) is listed as Endangered under the EPBC Act. It is a medium-sized burrowing crayfish; its carapace grows to a length of about 25 mm. The species is distinctively coloured with predominantly purple hues. The Furneaux Burrowing Crayfish is found only on Flinders Island and Cape Barren Island in Bass Strait (Figure 25). The species is found in fern-rich gullies on the mountains of Flinders Island (Mt Strzelecki and the Darling Range) and at Mt Munro on Cape Barren Island. The principal threat to the Furneaux Burrowing Crayfish is wildfire which has the potential to decimate the species' fire-sensitive habitat. The species is also vulnerable to extended periods of drought which also increases fire risk.

The Central North Burrowing Crayfish (*Engaeus granulatus*) is listed as Endangered under the EPBC Act. It is a medium-sized, burrowing crayfish, typically brownish and normally reaching a length of less than 10 cm. It is endemic to Tasmania, occurring only within a roughly rectangular area between the Mersey River and Port Sorell (Figure 26), northern Tasmania, in seepages, wetlands and stream banks. Usually all that can be seen of a burrowing crayfish is a burrow entrance, often with a raised 'chimney' of pelleted mud surrounding it. Much of its original habitat has been cleared, and the species now occurs in small isolated and fragmented populations within its original range amounting to less than 100 ha. The main threats to the Central North Burrowing Crayfish include activities which destroy or dry out its habitat, including residential development and inappropriate agricultural and forestry activities.

While inappropriate fire regimes are the main threat to the Furneaux Burrowing Crayfish, threats to all three species are similar, but in different geographies. Actions to protect habitat in all three geographies could result in benefits to all three species.

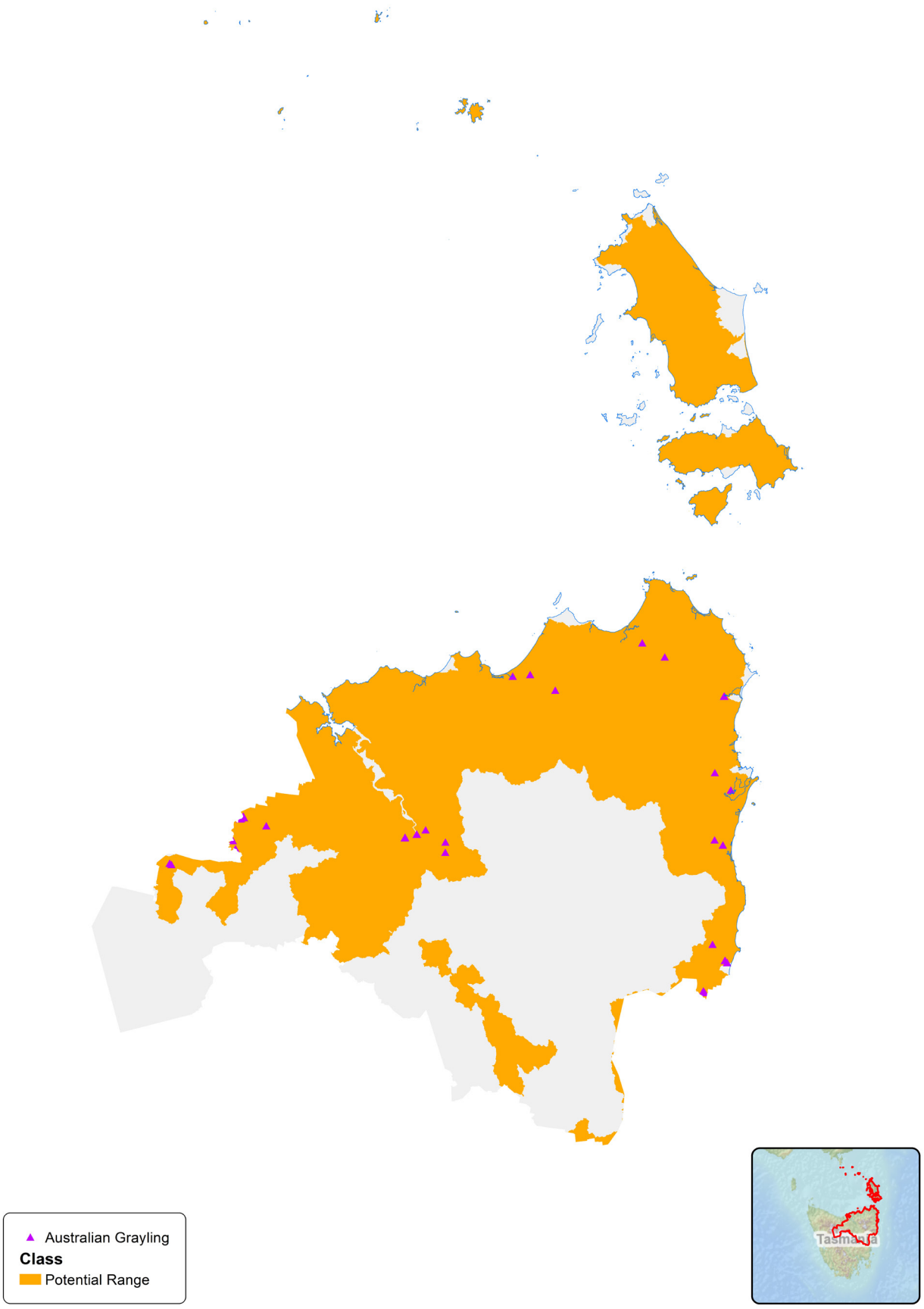

FIGURE 23: **Observations and range of Australian Grayling in northern Tasmania**

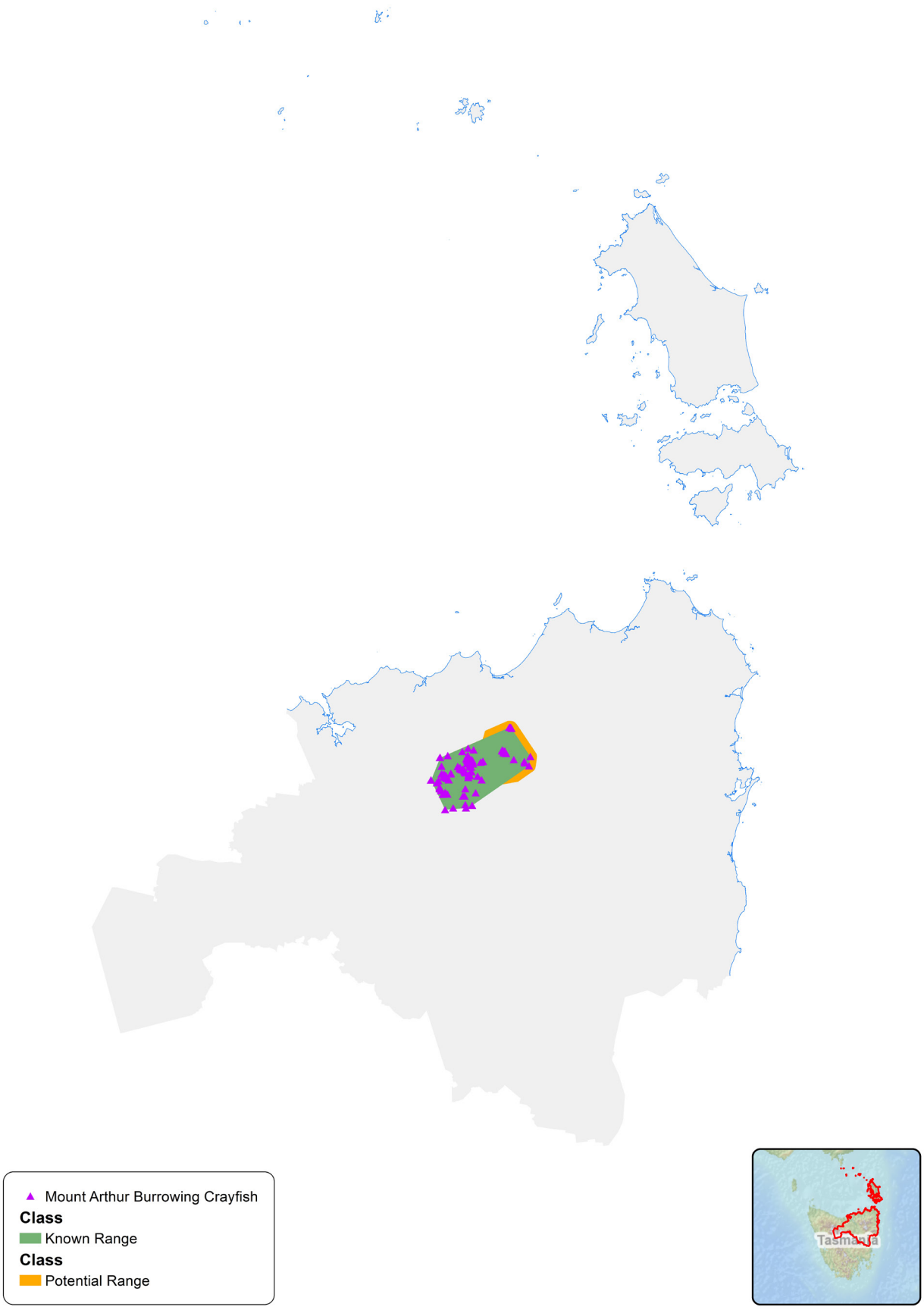

FIGURE 24: **Observations, known range and potential range of the Mt Arthur Burrowing Crayfish in northern Tasmania**

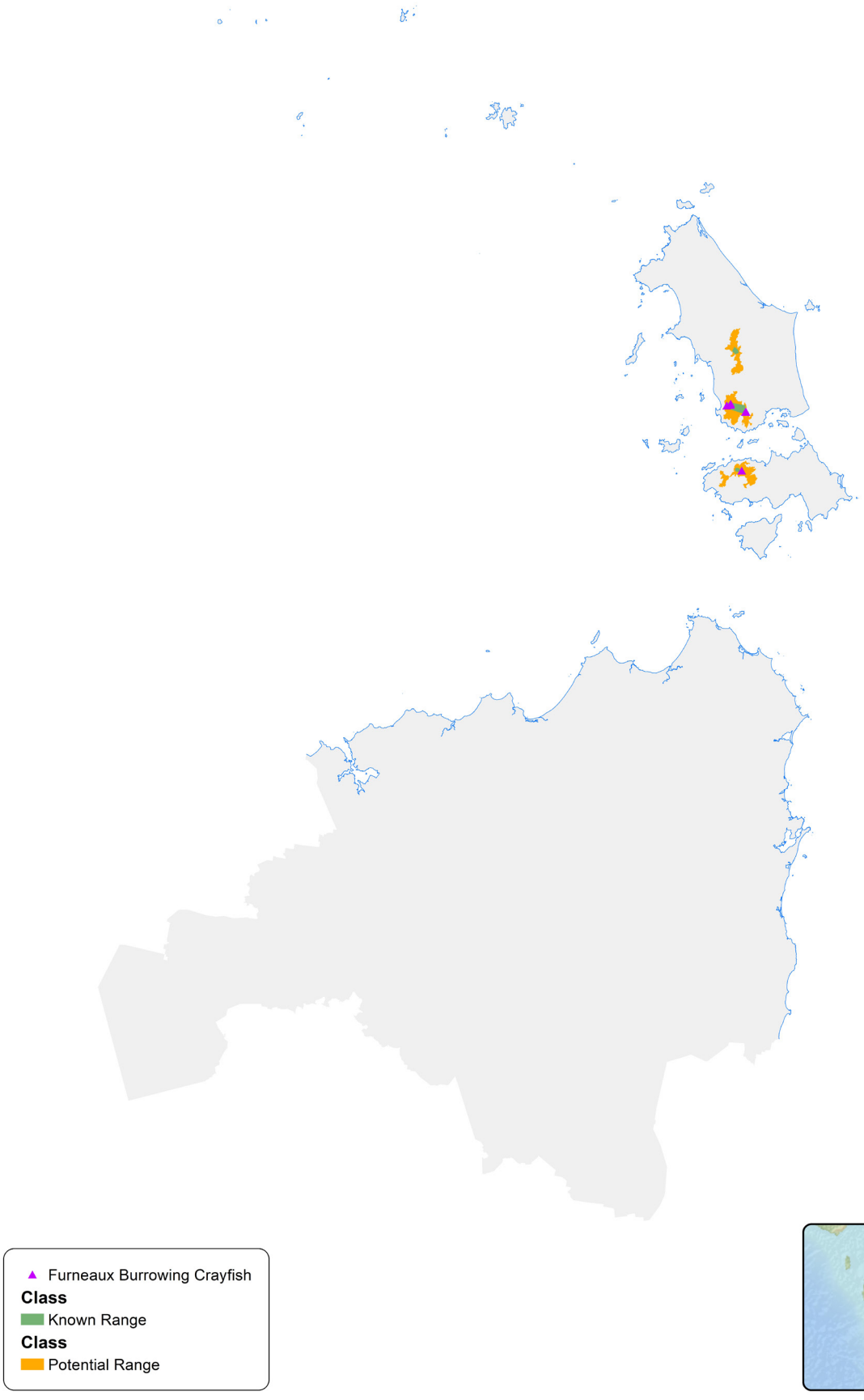

FIGURE 25: **Observations, known range and potential range of the Furneaux Burrowing Crayfish in northern Tasmania**

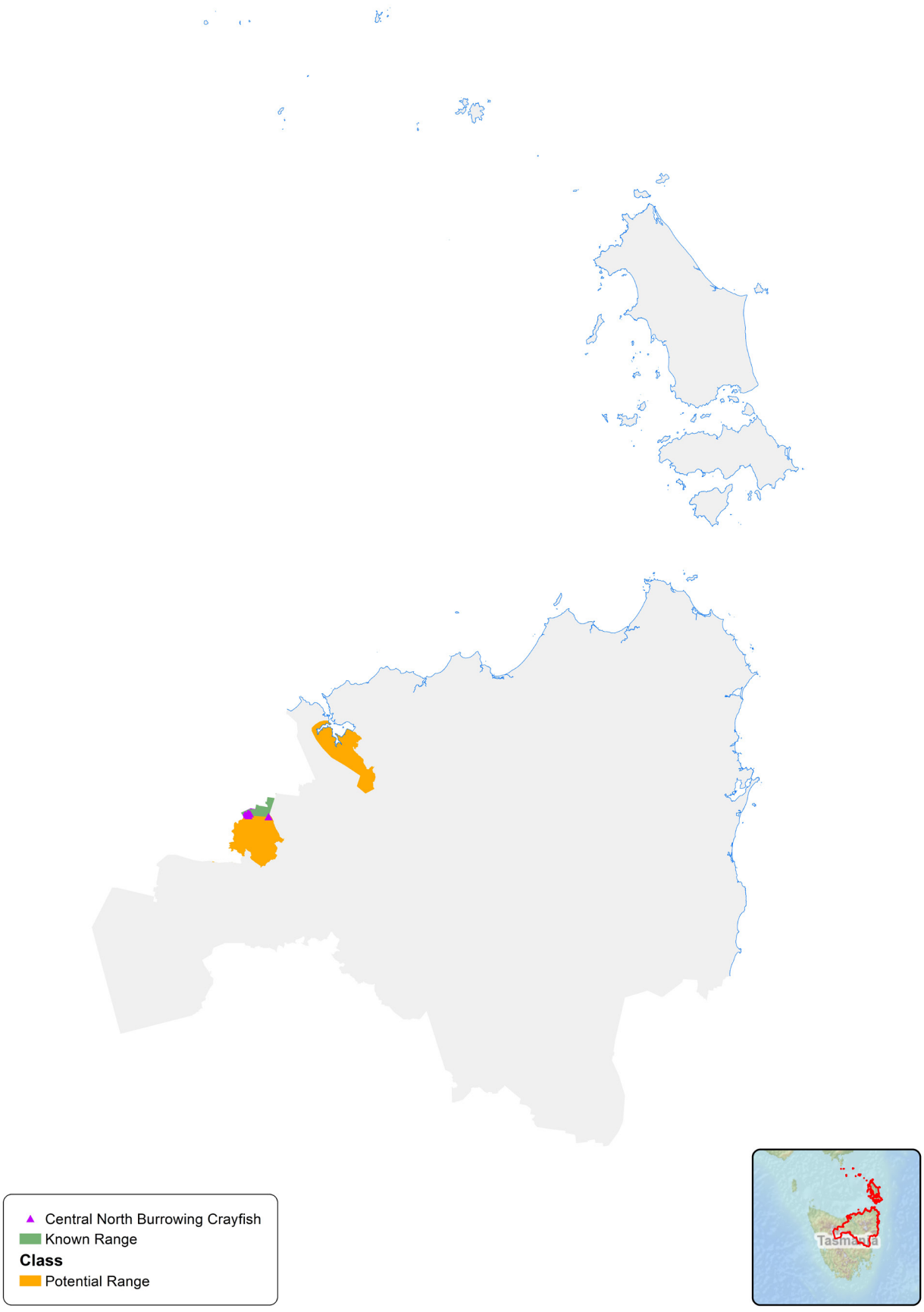

FIGURE 26: **Observations, known range and potential range of the Central North Burrowing Crayfish in northern Tasmania**

Ptunarra Brown Butterfly

The Ptunarra Brown Butterfly (*Oreixenica ptunarra*) is listed as Endangered under the EPBC Act. It is a small brown and orange butterfly found only in Tasmania. The species occurs in *Poa* tussock grassland and grassy shrubland and woodland above 400 m in the north-west plains, Central Plateau, southern Midlands, the Steppes, and the eastern highlands (Figure 27). The female is similar in size to the male, but is a brighter orange. The caterpillars feed exclusively on the leaves of *Poa* grass. The adult flying season lasts only a few weeks in early autumn, during which time the butterflies mate and lay eggs on the tussocks. 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.

Control of European wasp populations is a simple and cost effective action to improve the trajectory of Ptunarra Brown Butterfly within its known range. Protection of native grassland will also secure habitat for this species.

Shy Susan

Shy Susan (*Tetratheca gunnii*) is listed as Critically Endangered under the EPBC Act. It is known from only a handful of locations in a very limited distribution on serpentinite substrates in the foothills of the Dazzler Range near Beaconsfield, northern Tasmania. Their general location is shown in Figure 28. The most recent surveys for the species identified less than 50 flowering individual plants in the wild, all occurring on reserved land managed by the Tasmanian Parks and Wildlife Service. The entire wild distribution of the species is believed to be in one meta-population, consisting of several subpopulations. An insurance population exists at the Royal Tasmanian Botanical Gardens (Hobart).

The wild population is declining, and is at risk from inappropriate fire regimes, browsing by native animals (particularly after fire), disturbance and introduction of disease due to illegal firewood harvesting and illegal off-road vehicle use.

NRM North is actively protecting habitat for this species, which is often associated with two other range-restricted, Tasmanian endemic plants associated with serpentine geology, Pretty Heath and Creeping Dustymiller. Continued investment to secure habitat could have multiple benefits for other unique and rare species.

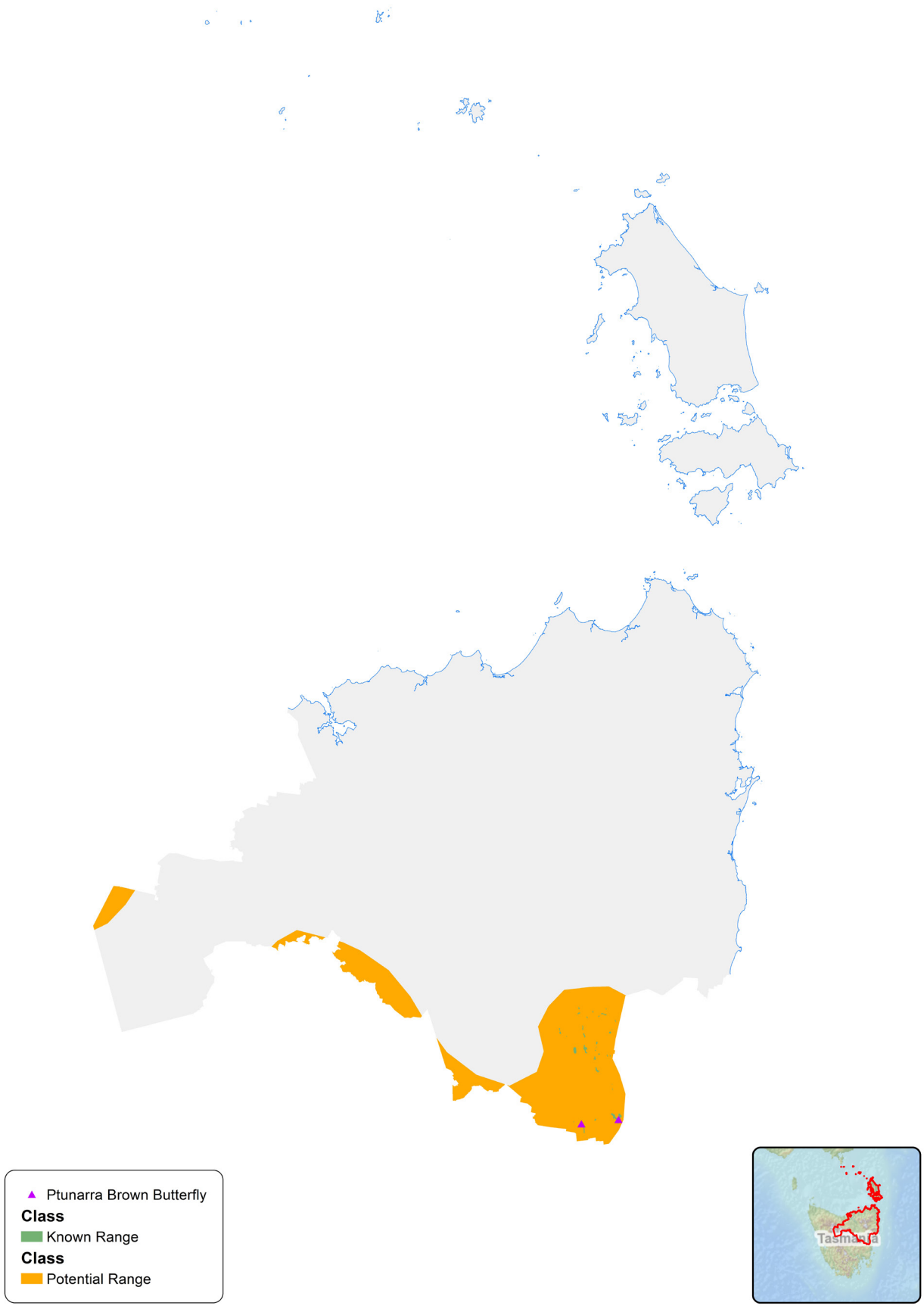

FIGURE 27: **Observations, known range and potential range of Ptunarra Brown Butterfly in northern Tasmania**

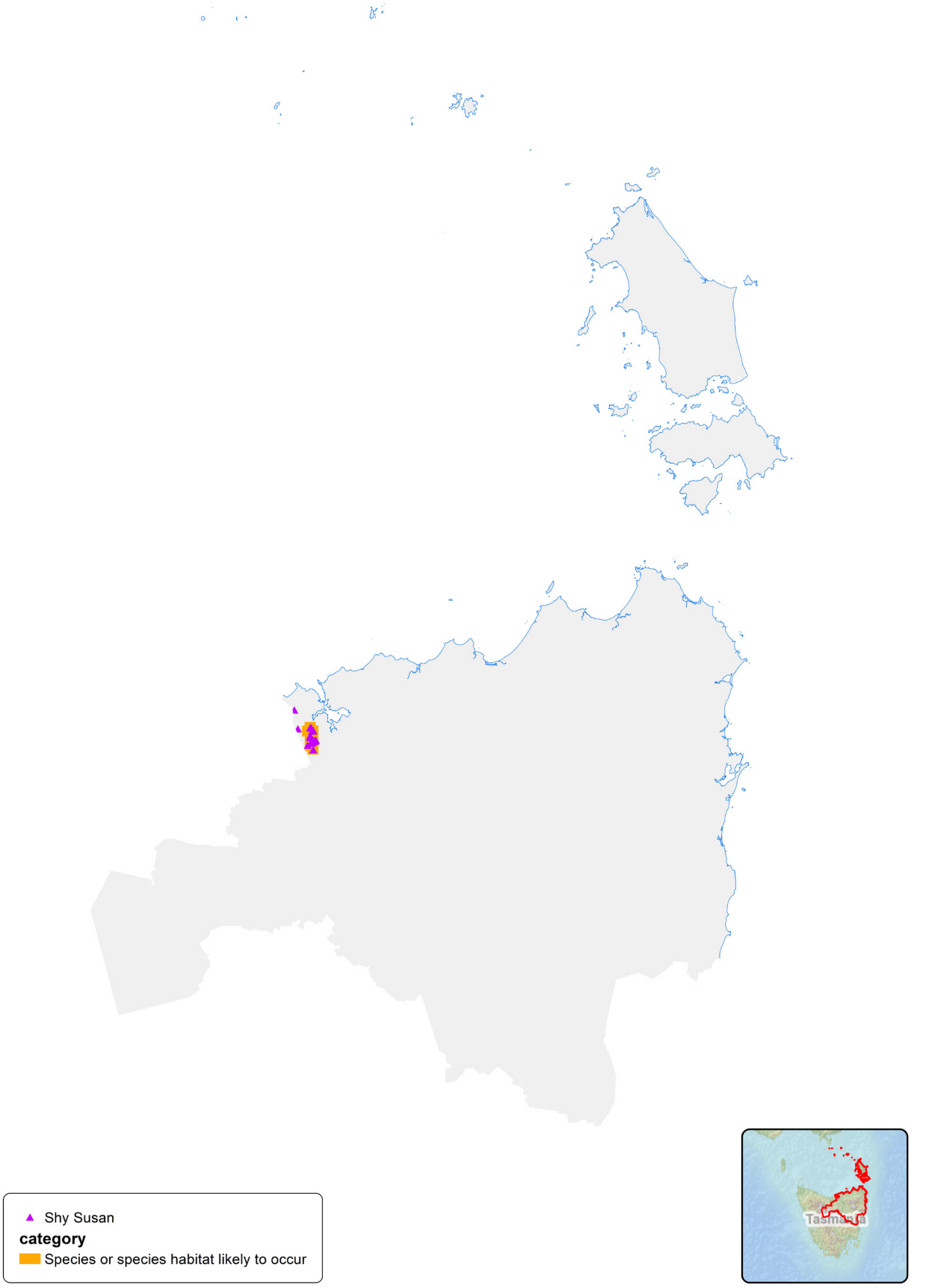

FIGURE 28: **Distribution of Shy Susan in northern Tasmania**

CASE STUDY: RLP OUTCOME 2 – The trajectory of species targeted under the Threatened Species Strategy, and other EPBC Act priority species, is improved.

EASTERN BARRED BANDICOOT

NRM North's Eastern Barred Bandicoot Project seeks to create, enhance, and protect habitat for the threatened species in northern Tasmania. A key focus is to improve the population trajectory and to reduce threats to the species through community education and engagement.

The preferred habitat for the eastern barred bandicoot is grassy woodland and native perennial grasslands - areas that are largely used for agricultural activity, which results in habitat being heavily degraded or destroyed. Eastern barred bandicoot populations have declined across much of Tasmania, with most remnant habitat occurring on private land, rather than in protected areas such as national parks.

NRM North Biodiversity Coordinator Stephen Izzard said engaging with landholders is an encouraging boost to conservation efforts.

"Eastern barred bandicoots are a species that can happily co-exist alongside humans … Well watered lawns and paddocks provide excellent feeding grounds for bandicoots, and they can reproduce quickly when conditions are good."

The response from the community has been overwhelming, with 46 rural landholders engaged in on-ground works such as revegetation and fencing stock out of remnant habitat. Many more have committed to changing land management practices. On the ground, a mix of revegetation remnant protection will see a target of 110 hectares managed for bandicoot habitat.

Since inception, the project has been working with rural property owners in the West Tamar region and parts of the Meander Valley and Northern Midlands to protect and create vital habitat for the species. Recently, the focus has turned to improving habitat and creating a safe refuge in the urban and peri-urban areas of Riverside, Legana, Perth, Longford, Hadspen, Carrick and Exeter.

West Tamar Council Reserves Supervisor Jamie Smith is facilitating the creation of a display garden and habitat corridor on the high-profile Windsor Park Precinct site at Riverside. He said it is a great way to educate the community about creating a safe habitat for the eastern barred bandicoot and other native animals in urban and peri-urban areas.

> "We are in a unique position at the Windsor Precinct to have the eastern barred bandicoot living in the vicinity, and with the natural surroundings of the parkland, we can educate the public and work with NRM North to promote the project."
>
> —*Jamie Smith*

In June 2021, NRM North released a booklet containing five professionally designed "Urban Refuge" gardens for eastern barred bandicoots and other wildlife to guide residents who want to create their own backyard habitat.

The increased focus on urban areas, ongoing engagement in rural areas, and the commencement of two PhD research projects on the threatened species (supported by NRM North), has put the Eastern Barred Bandicoot Project in a strong position to achieve targets, despite many challenges including those posed by the Covid-19 pandemic.

This project is supported through funding by the Australian Government's National Landcare Program.

2.3 RLP Outcome 3: Invasive species management has reduced threats to the natural heritage Outstanding Universal Value of the World Heritage properties through the implementation of priority actions

The northern region has three World Heritage sites recognised on the UNESCO World Heritage List (Table 8). The Tasmanian Wilderness World Heritage Area (TWWHA) is the only site of relevance to the Regional Land Partnerships 5 Year Outcomes. The location of the TWWHA is shown in Figure 29.

TABLE 8: **MCA priority results for UNESCO World Heritage sites in northern Tasmania**

UNESCO World Heritage Sites	Further information	MCA Priority
Tasmanian Wilderness World Heritage Area (TWWHA)	Detailed descriptions of the TWWHA can be found in the TWWHA Management Plan 2016, the TWWHA Biosecurity Strategy 2021 and the UNESCO listing	High priority for investment
Brickendon Estate	DAWE listing information	Not prioritised at this time
Woolmers Estate	Conservation Plan 2008	Not prioritised at this time

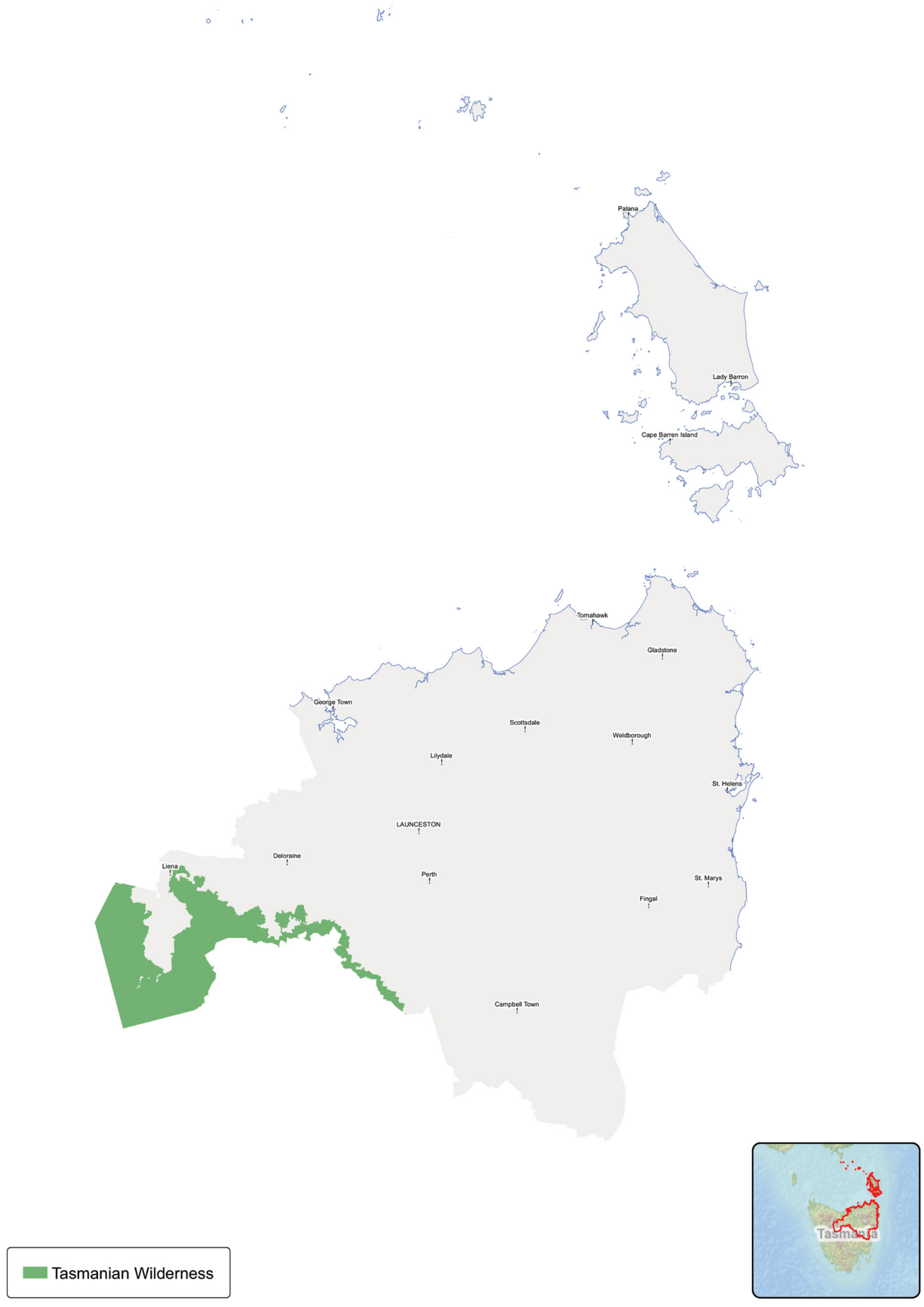

FIGURE 29: **Map showing locations of the Tasmanian Wilderness World Heritage Area in northern Tasmania**

2.4 RLP Outcome 4: The implementation of priority actions is leading to an improvement in the condition of EPBC listed Threatened Ecological Communities

Threatened ecological communities are protected at a National level under the EPBC Act. Many threatened ecological communities in the northern Tasmania region also have some protection under the Tasmanian *Nature Conservation Act 2002*, as well as, in some cases, non-statutory listing through the IUCN. There are seven Threatened ecological communities listed under the EPBC Act in northern Tasmania. A brief summary of the status of threatened ecological community investment priorities within the northern Tasmania region, current condition and threats to these is described below, along with a description of the location of these investment priorities. Any relevant Conservation advice, Recovery plans or Threat abatement plans is given in Table 9.

As described in Section 8.3 of the Strategy, it is noted that emerging priorities for threatened ecological communities (or changing issues or threats) will require some agility. For example, there may be new species, ecological communities or priority areas (habitats) that are under severe or imminent threat and require action. It is also noted that the Australian Government may seek to contract projects for Investment Priorities that are additional to those prioritised by the planning process.

TABLE 9: MCA priority results for EPBC listed Threatened Ecological Communities in northern Tasmania

Threatened Ecological Communities	Further information	MCA Priorities
Alpine sphagnum bogs and associated fens	Recovery Plan 2015	Not prioritised at this time
Eucalyptus ovata – Callitris oblonga forest	Recovery Plan 2011	Medium priority for investment
Giant Kelp Marine forests of South East Australia	Conservation Advice 2012 and Fact Sheet 2012	Medium priority for investment
Lowland Native Grasslands of Tasmania	Conservation Advice 2009 and Fact Sheet 2010	High priority for investment
Subtropical and Temperate Coastal Saltmarsh	Conservation Advice 2018	High priority for investment
Tasmanian Forest and Woodlands dominated by black gum or Brookers gum (*E. ovata/E. brookeriana*)	Conservation Advice 2019 and Fact Sheet 2020	High priority for investment
Tasmanian white gum (*E. viminalis*) wet forest	Conservation Advice 2021	Medium priority for investment

» Saltmarsh monitoring in the kamalauka / Tamar estuary (Sam Jack)

CASE STUDY: RLP OUTCOME 4 – The condition of EPBC Act listed Threatened Ecological Communities is improved.

SUPPORTING SALTMARSH RECOVERY IN THE KANAMALUKA/TAMAR ESTUARY

The low-lying tidal floodplains of the lower, more saline reaches of the kanamaluka / Tamar estuary are home to tidal Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Communities that play important roles in mitigating storm surge and flooding, acting as fish nurseries and providing important carbon storage services. Saltmarshes enhance the health and productivity of the kanamaluka / Tamar estuary and provide important habitat for specialised plants and animals.

The Tamar Estuary and Esk Rivers (TEER) Program commenced citizen science monitoring of saltmarshes in 2016, with data collected from seven sites along the kanamaluka / Tamar estuary foreshore. Participating community members undertake low tide surveys which record the abundance and diversity of birds and vegetation.

Volunteers successfully collected data across four survey sites last monitoring period, observing over 1,100 birds and 35 plant species. These data sources provide information on how saltmarshes, and associated fauna, may be changing over time, and the risks of rice grass incursion.

Monitoring allows the detection of changes in the health and abundance of saltmarsh, including emergent patches of introduced rice grass, *Spartina anglica*, and human impacts such as recreational vehicle access. These assessments inform options for improved management practices and interventions. Saltmarsh surveys continue to be a valuable community engagement tool and provide opportunities to educate the public on the importance of monitoring and protecting tidal saltmarshes.

Alpine Sphagnum Bogs and associated fens

Alpine Sphagnum Bogs and associated fens occur in alpine and subalpine areas, around Ben Lomond and in the Central Highlands. It is listed as 'Endangered' Threatened Ecological Community under the EPBC Act. The ecological community is listed as threatened because: its geographic distribution is restricted (Figure 30); the decline of functionally important species is severe; and the change in community integrity is severe.

Bogs and fens are found in permanently wet areas such as along stream, valley edges and floors and on slopes where soils are waterlogged. Species of Sphagnum moss are integral to the Alpine Sphagnum bogs and associated fens ecological community, with three species being present in this ecological community in Tasmania: *Sphagnum austral*, *Sphagnum cristatum* and *Sphagnum falcatulum*.

These plants contribute to peat creation, have a high water holding capacity which allows gradual release of spring snow melt, critical to the survival of many other ecological communities. The ecological community is also associated with at least 28 other species of shrubs, herbs, grasses, sedges, rushes and ferns.

A recovery plan was released in 2015. Actions in the recovery plan focus on managing the impacts of fire, invasive species, livestock, infrastructure and recreation and resource use.

Alpine Sphagnum Bogs and associated fens are predominantly found in state reserves within the northern region and are managed by public land managers.

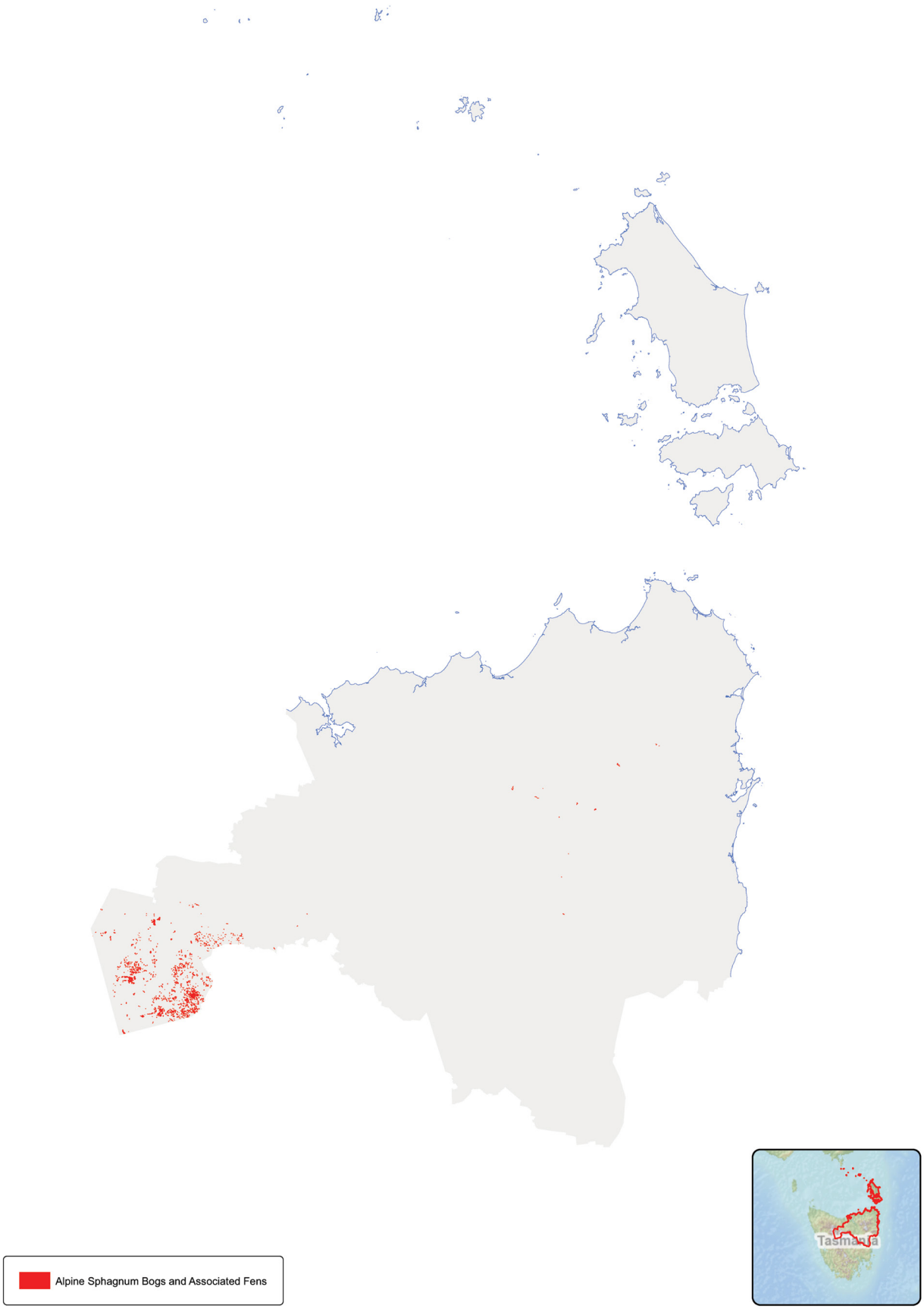

FIGURE 30: **Alpine bogs and fens in the northern region**

Eucalyptus ovata – Callitris oblonga Forest

Eucalyptus ovata – Callitris oblonga Forest is listed as a Vulnerable Threatened Ecological Community under the EPBC Act. It generally occurs in and around the riparian zone and on alluvial flats in Tasmania's Midlands and East (Figure 31). The most extensive stands in the Northern NRM region occur along the St Pauls River with isolated patches occurring on the South Esk, in Cataract Gorge near Launceston and on the East Coast.

The community is characterised by:

- an overstorey of eucalypts, typically black gum (*Eucalyptus ovata*), but also with white gum (*E. viminalis*) or black peppermint (*E. amygdalina*) in some patches;
- a midstorey of south esk pine (*Callitris oblonga* subsp. *oblonga*); and
- a shrubby understorey, where prickly box (*Bursaria spinosa*), slender honeymyrtle (*Melaleuca gibbosa*) and silver wattle (*Acacia dealbata*) are common.

Regeneration of *Callitris oblonga* subsp. *oblonga* generally requires disturbance such as flood or fire that kills the parent plant, but which causes the release of seed stored in cones in the canopy. Flood events can disperse seeds and seed cones considerable distances. The community requires moist conditions, periodic flooding, infrequent fire and low light intensities at ground level.

A Recovery Plan for the community was released in 2011. On-ground management recovery actions in this plan are: management agreements with key stakeholders; manage weeds in *Eucalyptus ovata – Callitris oblonga* Forest and adjacent areas; and manage stock, fire regimes and hydrological processes.

Several private properties already have Conservation Covenants and the site in Cataract Gorge is managed by City of Launceston Council. Other recovery actions in the Recovery Plan include protecting other remnants using conservation covenant and management agreements, surveys and monitoring, extension and education and long-term management and coordination.

Giant Kelp Marine Forests of South East Australia

Giant Kelp Forest of South East Australia has reduced in size by 95 percent in Tasmania (Figure 32), and is listed as an 'Endangered' Threatened Ecological Community under the EPBC Act. It occurs on rocky substrates in cold, nutrient rich waters requires water temperatures between 5°C and 20°C, and its growth is limited by the availability of nitrate. Giant Kelp forests stretch from the ocean floor to the sea surface, with the ecological community generally limited to areas greater than 8 m below sea level. The cornerstone species of the ecological community is *Macrocystis pyrifera*, also known as giant kelp or string kelp and the ecological community is defined by its forest-like structure.

The vertical structure provided by *Macrocystis pyrifera* provides habitat for a wide range of aquatic flora and fauna including commercially important species such as fish, rock lobster, and abalone as well as sea snails, corals, worms, sea horses, crabs, sea urchins, sea stars and sponges.

The main threat to Giant Kelp Marine Forests of South East Australia is climate change. Increasing temperatures also reduce nutrient levels, making plants more vulnerable to other threats. Other threats include: Long-spined Sea-urchins, *Centrostephanus rodgersii,* are an introduced species of sea urchin which graze on kelp; sedimentation which can smother areas of rocky reef; declining water quality; catastrophic storms; and invasion by Japanese seaweed *Undaria pinnatifida*.

Monitoring and reduction of Long-spined Sea-urchin populations around remnant patches of Giant Kelp Forests is vital to maintain existing habitat. Emerging research on thermally tolerant strains of *Macrocystis pyrifera* is promising, which may be used to restore the ecological community in priority areas.

FIGURE 31: Map of *Eucalyptus ovata – Callitris oblonga* Forest in northern Tasmania

FIGURE 32: **Remnant patches of Giant Marine Kelp Forests of South East Australia**

Lowland Native Grasslands of Tasmania

Lowland Native Grasslands of Tasmania ecological community is listed as 'Critically endangered' under the EPBC Act. It is typically found in valley bottoms and on gentle slopes below 600 m (Figure 33). The community generally occur in the Tasmanian Midlands, Derwent Valley, east coast and southeast Tasmania, with localised areas of the community in the northwest and on Flinders and Cape Barren Islands in Bass Strait. The grasslands are usually concentrated in areas with low rainfall and soils are deep and fertile.

Lowland Native Grasslands of Tasmania support a wide array of fauna species, with the structure and species composition of the community providing shelter, food and nesting materials for animals which play important roles in the ongoing function of the grassland ecosystem. There are 23 species listed as nationally threatened under the EPBC Act which occur in the Lowland Native Grasslands of Tasmania, and approximately 60 species of flora and fauna listed as threatened under State legislation. There is no recovery plan for this ecological community.

Threats to the Lowland Native Grassland of Tasmania community are: Clearing and conversion of land and fragmentation of remnants, pasture improvement and fertilisation, invasion of weeds and feral animals, inappropriate grazing and fire regimes, urban expansion, off-road vehicle disturbance, soil salinity, and climate change.

Protecting and connecting remnant grassland areas is vital to improving the condition of this community and will benefit multiple species and contribute to maintaining biodiversity values in the Midlands Biodiversity Hotspot.

Subtropical and Temperate Coastal Saltmarsh

Subtropical and Temperate Coastal Saltmarsh is listed as a Vulnerable Threatened Ecological Community under the EPBC Act. Saltmarsh are habitats which are defined by the presence of plants that are salt tolerant and subject to waterlogging. The ecological community is present in Queensland, NSW, WA, SA, Victoria and Tasmania and occurs in the intertidal zone in coastal areas under regular or intermittent tidal influence, often restricted to the upper intertidal environment.

In the northern Tasmania region saltmarshes are mostly found in low energy environments of estuaries and embayments (Figure 34) and often dominated by glasswort species, native grasses and rushes and in some areas the threatened sea lavender. Saltmarsh offer important habitat to small fish, including juveniles of marine species. Saltmarsh provides important habitat for resident and migratory shorebird species, many of which are protected under national legislation and international agreements. There is no recovery plan for this ecological community.

Threats to Subtropical and Temperate Coastal Saltmarsh in Northern Tasmania include: clearing and fragmentation, infilling of wetland areas and changes in tidal regime, invasive species including rice grass, off-road vehicle access and recreational use, water quality and other pollutants, acid sulfate soils, grazing pressure, inappropriate fire regimes, and climate change.

Containing the spread of invasive species such as rice grass, particularly in the kanamaluka / Tamar estuary, and creating refuges for retreat from sea level rise are important actions to improve the condition of saltmarshes, and will link to existing projects and build on work done in the past.

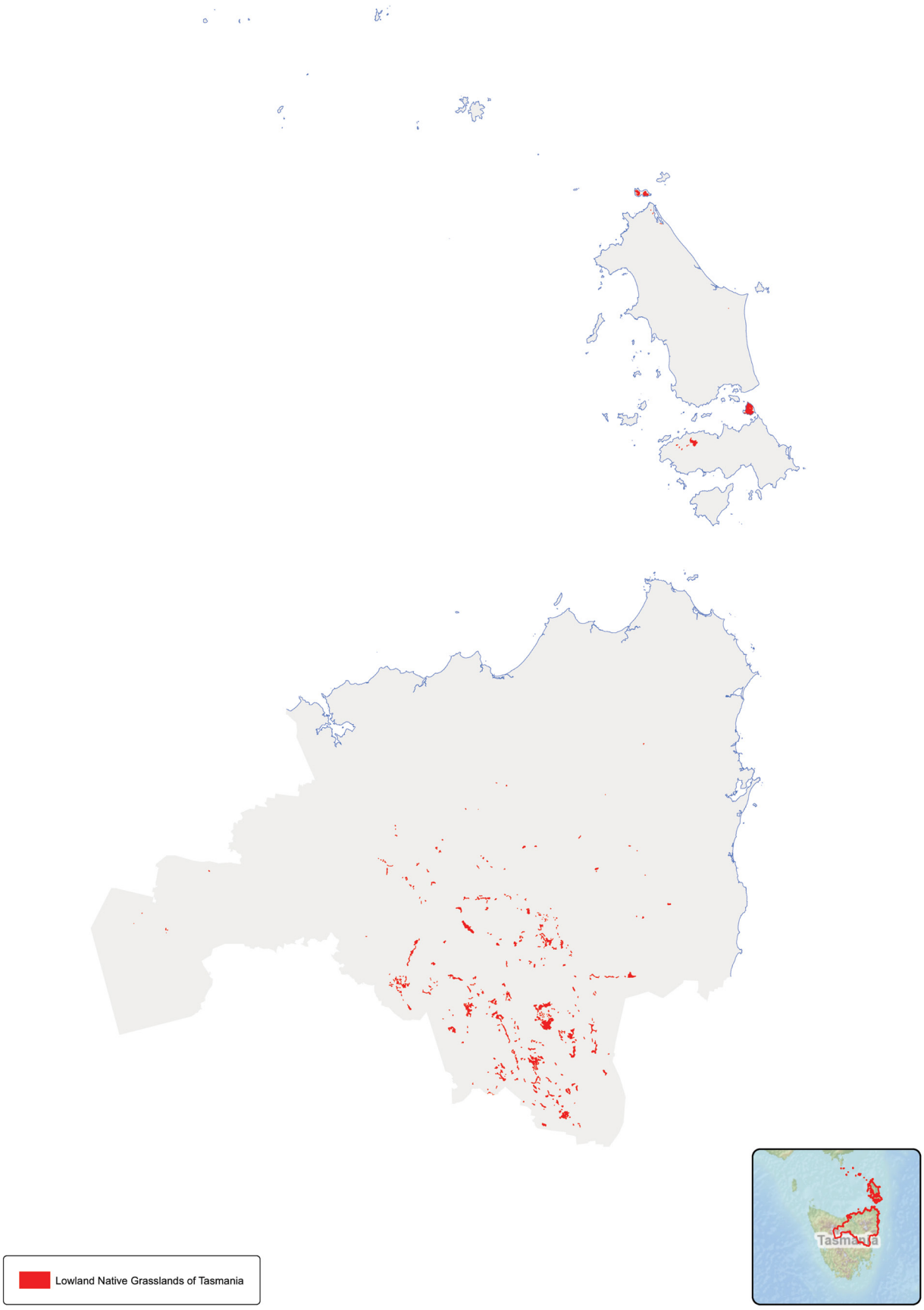

FIGURE 33: **Distribution of Lowland Native Grassland Threatened Ecological Community in northern Tasmania**

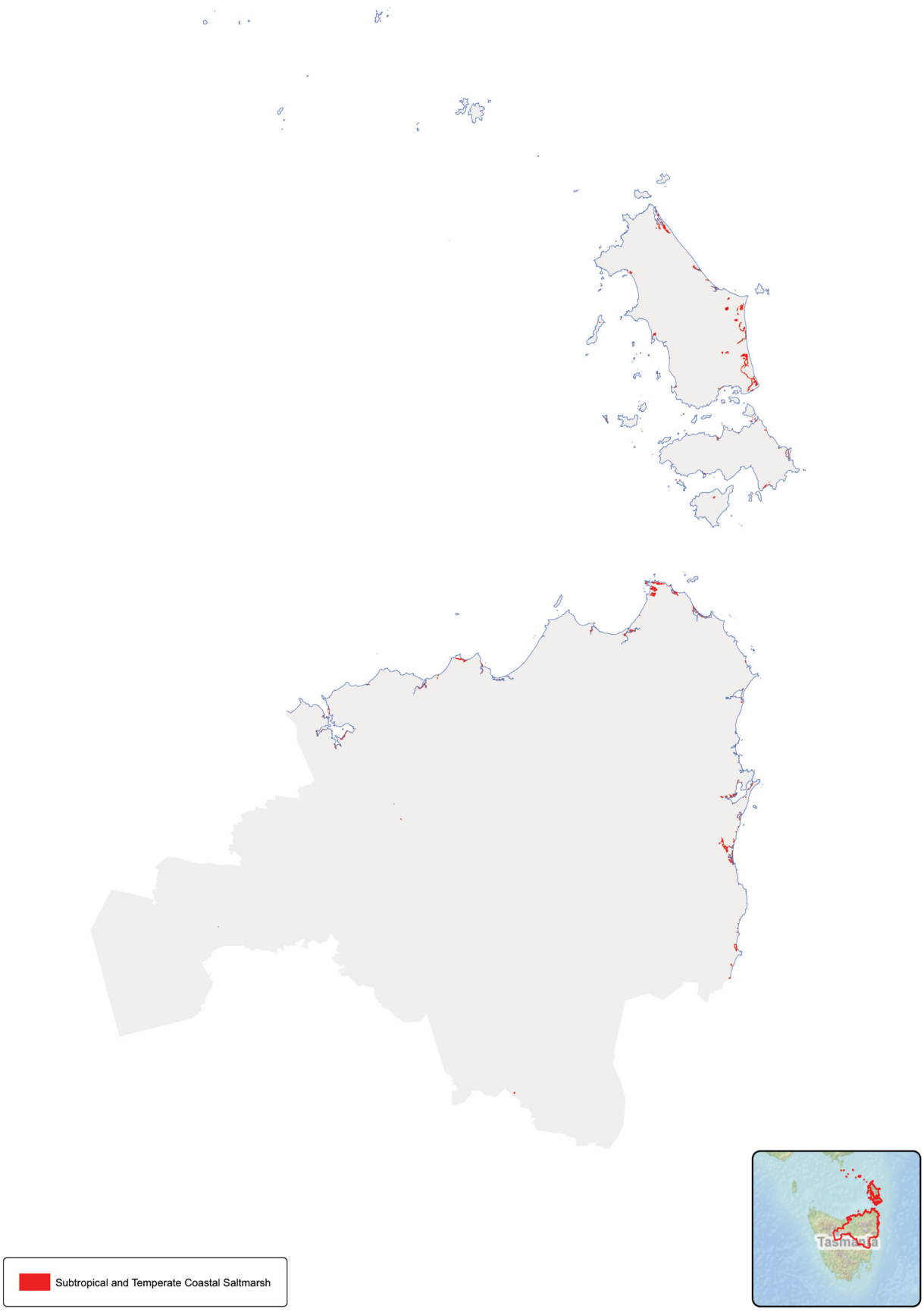

FIGURE 34: **Distribution of Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community in northern Tasmania**

Tasmanian Forest and Woodlands dominated by Black gum or Brookers gum (*Eucalyptus ovata / Eucalyptus brookeriana*)

Tasmanian forests and woodlands dominated by Black Gum or Brookers Gum (*Eucalyptus ovata* and *Eucalyptus brookeriana*) is listed as a 'Critically endangered' Threatened Ecological Community under the EPBC Act, there is no recovery plan for this ecological community. This community consists of woodlands and forests dominated by either *Eucalyptus ovata* or *Eucalyptus brookeriana* and only occurs in Tasmania. Both these species are associated with moist sites, occurring on the margins of swampy flats and in well-drained gullies (Figure 35).

The ecological community provides habitat for a wide range of fauna species including: herbivores such as kangaroos and wallabies; quolls and devils; soil engineers such as Eastern Bettongs and Eastern Barred Bandicoots; arboreal mammals such as sugar gliders and ringtail possums; insectivorous bats; birds including the critically endangered Swift Parrot; snakes and lizards; frogs; and invertebrates such as burrowing crayfish, giant velvet worms and stag beetles.

The key threats to the Black gum – Brookers gum forest/ woodland ecological community include: clearance of native vegetation, invasive species including weeds, cats and deer, altered hydrology and water quality, grazing pressure, altered fire regimes, chemical drift of pesticides and herbicides, hybridisation with non-Tasmanian plantation eucalypts, disease and dieback from plant diseases such as *Phytophthora*, and climate change.

Protecting and connecting remnant forest and woodland areas is vital to improving the condition of this critically endangered community and will benefit multiple species including the critically endangered Swift Parrot.

Tasmanian white gum (*E. viminalis*) wet forest

Tasmanian white gum (Eucalyptus viminalis) wet forest was nominated for listing as a Critically Endangered Threatened Ecological Community in 2016. Following public consultation the threatened ecological community was listed in October 2021. Within the northern region, the extent of the proposed threatened ecological community consists of isolated patches the Meander catchment and the north-east of Tasmania, stretching from north-east of Launceston towards the Bay of Fires (Figure 36).

The ecological community consists of wet sclerophyll forest with an open, tall canopy dominated by *Eucalyptus viminalis*, secondary tree layer and understorey generally consisting of broad-leaved shrubs and ferns. It provides habitat for a wide-range of fauna including hollow dependant and threatened species. Most fauna are not solely dependent on the ecological community but these fauna components play a critical role in the functioning of the community through factors such as nutrient cycling and seed dispersal. Management actions for this community are addressed in the Conservation Advice.

Key threats to Tasmanian white gum wet forests include: clearing and fragmentation, invasion by exotic species, inappropriate grazing regimes by domestic stock, hybridisation of *Eucalyptus viminalis* with plantation species, changes in fire regime, climate change induced heat stress.

The northern region has the most hectares of white gum in the state, and actions to protect and connect remnant wet forest areas are vital to improving the condition of this critically endangered community.

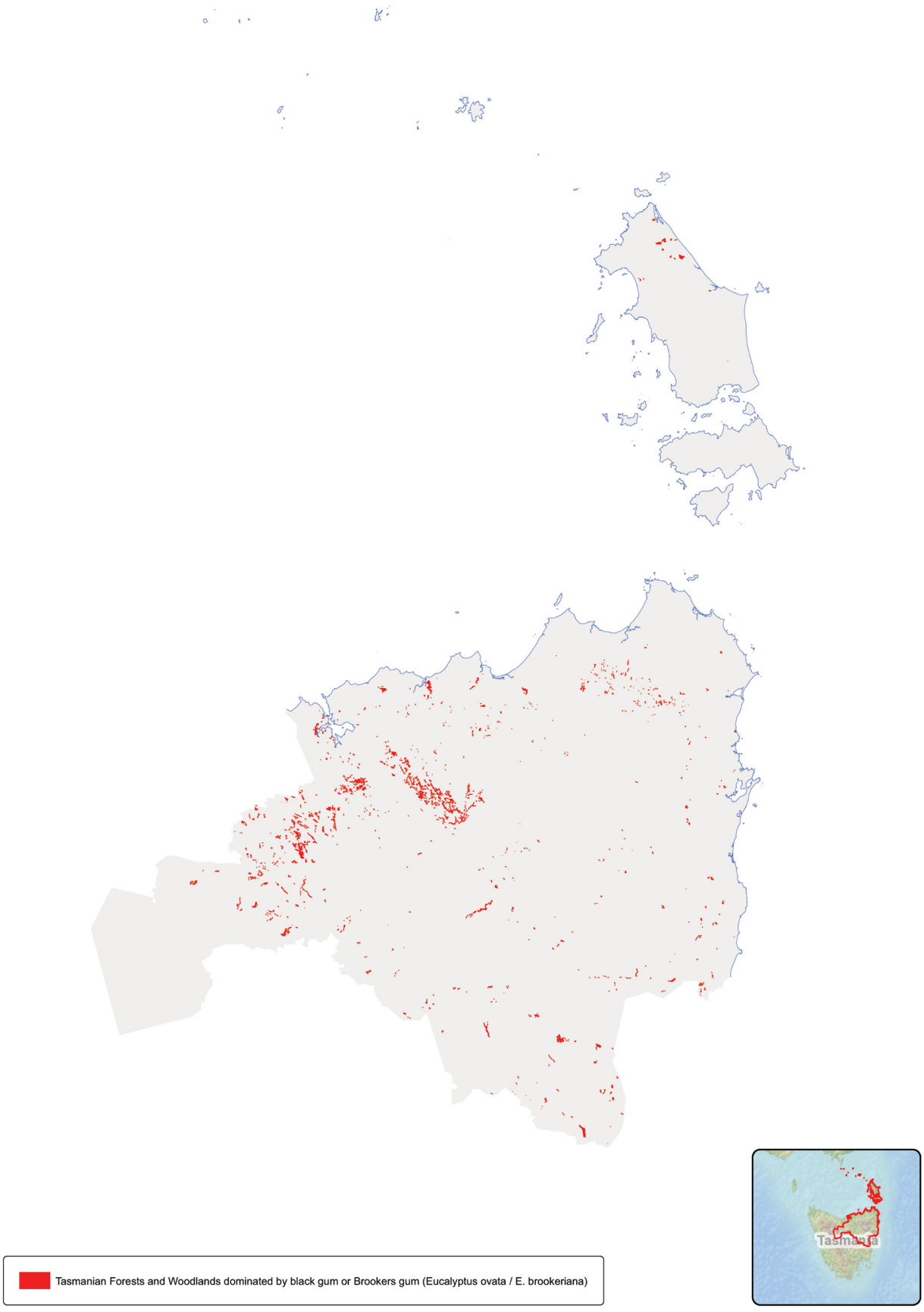

FIGURE 35: **Distribution of Tasmanian forests dominated by black Gum or Brookers Gum (*Eucalyptus ovata / Eucalyptus brookeriana*) Threatened Ecological Community in northern Tasmania**

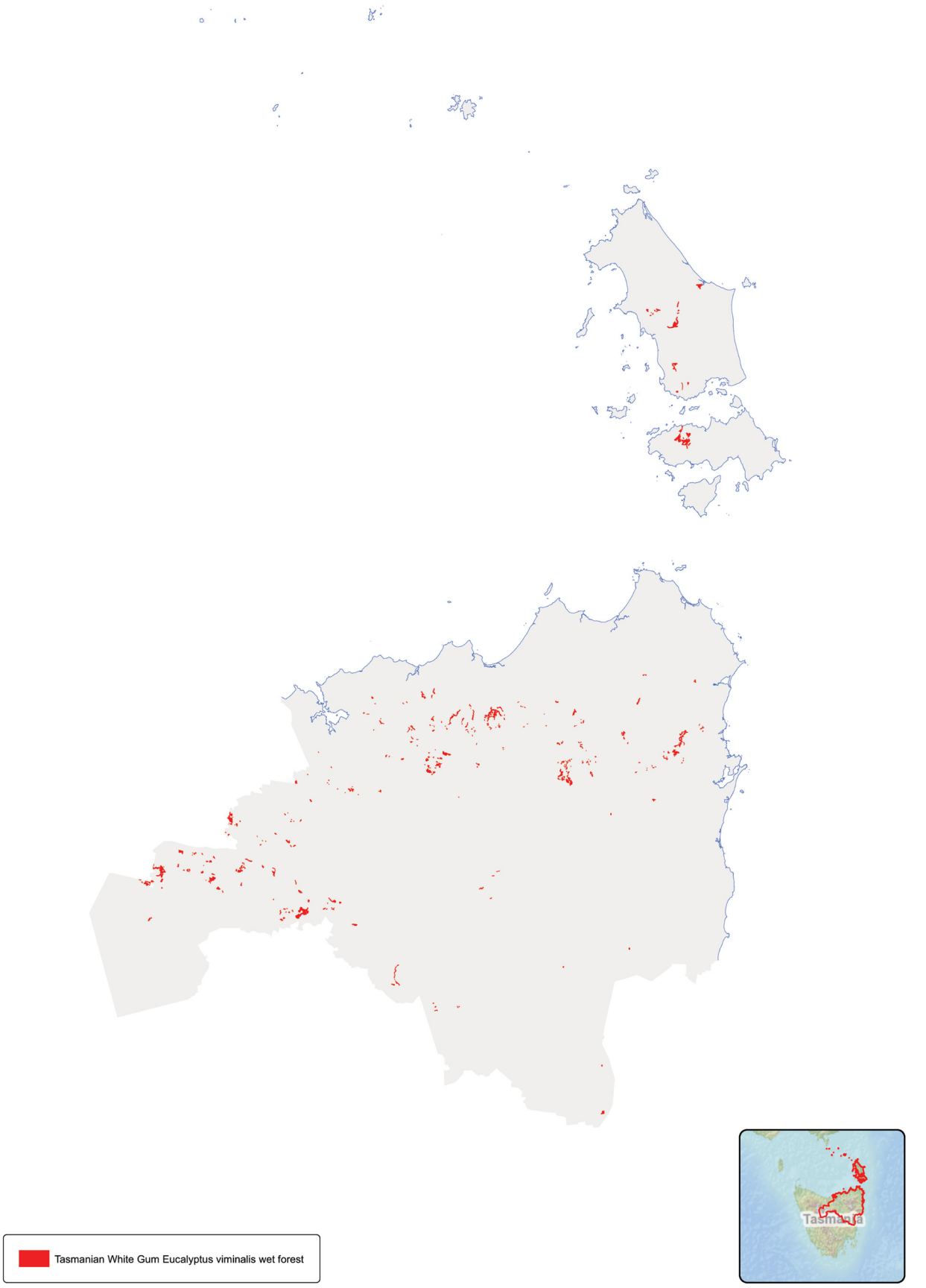

FIGURE 36: **Distribution of Tasmanian White Gum, *Eucalyptus viminalis*, wet forest Threatened Ecological Community in northern Tasmania**

2.5 RLP Outcome 5: There is an increase in the awareness and adoption of land management practices that improve and protect the condition of soil, biodiversity and vegetation.

Australian Government priorities and guidance for management of soils, biodiversity and vegetation on agricultural land is summarised in Table 10.

The Australian Government has identified its approach to the management of soils on agricultural land in the National Soil Strategy 2021. Management of biodiversity and vegetation on agricultural land is informed by assessment of land use change and agricultural development evident in the Australian Bureau of Statistics land use data.

National Soil Strategy goals and objectives are:

- Prioritise soil health
- Empower soil innovation and stewards
- Strengthen soil knowledge and capability

On farm vegetation management practices are monitored through the Australian Bureau of Statistics' Agricultural Resource Management Survey.

The major focus of the Australian Government in respect to on farm vegetation is to:

- increase stakeholder knowledge and understanding of the scope for NRM improvements through improved management of vegetation on farms
- identify (and where possible address) impediments to improved vegetation management on farms.

TABLE 10: **Australian Government guidance for management of soils, biodiversity and vegetation in northern Tasmania**

Priority	Further information
Soils	National Soil Strategy 2021
Soil threats	Priorities for improving soil condition
Land use data	Agricultural sector reporting data (ABS 2017)

CASE STUDY: **RLP OUTCOME 5 – The condition of soil, biodiversity and vegetation are maintained or improved**

HILLSLOPE EROSION ECONOMIC CALCULATOR – ESTIMATES A FARM'S FINANCIAL LOSSES THAT MAY BE CAUSED BY EROSION.

The loss of fertile topsoil, its nutrients, and a reduction in depth to subsoil can incur significant costs to farm productivity that haven't traditionally been accounted for and don't appear on balance sheets.

With project funding from the National Landcare Program, NRM North's first hillslope erosion trial at Weetah in 2019 included a simple financial analysis of erosion costs by environmental and agricultural consultancy, RMCG. Five 250m2 plots were prepared for the hillslope erosion demonstration site at Jetsonville in June 2021. Treatments were: Bare fallow (smooth bed); Cover crop (smooth bed); Contour-ripped bare fallow; Contour-ripped with cover crop; and Contour-ripped with cover crop (early terminated).

The results indicated that on a moderate slope on Scottsdale ferrosols in a wet year and late sowing of cover crop, erosion will occur despite treatments. However, sowing a basic ryegrass cover crop reduces the costs of erosion by $900/ha including the cost of cover crop.

This financial analysis generated interest from the local farming community and NRM North saw benefit in creating a detailed, adaptable all-purpose calculator to understand the potential costs of erosion. The erosion economic calculator was developed with input from technical experts. It is widely promoted and available to land managers to evaluate erosion management impacts and options and adopt improved practices to reduce erosion both in Tasmania and nationally.

Soils at risk of carbon decline

Tasmanian agricultural systems have relatively high organic carbon content due to climatic and soil influences. However, the cropping systems (including root vegetables and crops that require fine seedbeds) often lead to high levels of tillage. As Tasmania was settled by Europeans for agriculture before most of the rest of Australia, it has fields that have been tilled and cultivated for 200 years, causing significant declines in soil organic carbon and the associated problems of compaction, erosion, poor water infiltration and nutrient cycling etc. A more recent development which may be reducing soil carbon is irrigation expansion and the carbon losses which could potentially result from moisture and nitrogen being available year-round.

Soil organic carbon is one of the fundamental building blocks of soil fertility. Factors resulting in soil carbon reduction can lead to a loss of soil fertility over time.

In pasture systems, soil carbon levels are lower than they could be due to a range of issues, but particularly a historic reliance on just one or two short-rooted pasture species, lacking the depth, density and diversity of root structures which increase soil carbon flows under natural grassland systems. The high potential areas for increasing soil carbon in the northern Tasmania region are shown in Figure 37.

Prioritisation considered landuse and management practices across the municipalities of the northern region. Supporting adoption of best management cultivation practices, diverse-species pasture selection and grazing management practices were identified as priority actions to continue across the agricultural dryland grazing, dryland cropping and irrigated cropping land uses.

Soils at risk of structural decline

Soil structure is defined as the way in whichorganic matter, and the pore spaces between them, are arranged. Soil with good structure allows for aeration, infiltration and drainage and increased activity of beneficial soil organisms, which supports plant productivity and root growth to access water and nutrients.

Degraded soil structure is caused by compaction and results in blocks of soil that restrict root growth and plant productivity. Excessive cultivation, combined with prolonged saturation and traffic and tillage practices, can result in rapid decline in soil structure. Cropping and irrigation management practices that promote good soil structure are essential for avoiding soil structural decline and optimising productivity. Figure 38 shows areas at risk of structural decline.

With funding from the Australian Government, NRM North has delivered a range of trials demonstrating impacts on soil structure and courses and field days across different farming systems. More recently, NRM North's soil carbon trials have shown that poor soil structure inhibits soil carbon sequestration. Increasing landholder awareness of structural decline and equipping them with tools to improve management practices is vital across all soil types most notably for dairy, irrigated cropping and annual horticulture enterprises in high hazard areas.

Soil at risk from erosion

Hillslope erosion occurs when soil particles detach and are transported through the action of water or wind. While erosion is a natural process, the conversion of areas of native vegetation to agriculture or other land uses where there is a loss of groundcover can exacerbate and accelerate erosive processes. The rate of erosion depends on factors such as slope and rainfall intensity and frequency as well as human actions and activities which affect groundcover or which disturb the soil. Land management practices such as tillage or overgrazing can lead to very high rates of hillslope erosion. Erosion removes topsoil, the most productive layer of soil with the highest organic matter content, potentially impacting on agricultural productivity over time. Soil transported from hillslopes frequently ends up in waterways including streams, estuaries and marine environments. In these environments it has the potential to increase turbidity, decrease light, smother native aquatic species and reduce waterway health.

High and medium risk areas generally correspond to agricultural areas, particularly grazing, where drier summers and grazing pressure can lead to poorer groundcover and greater susceptibility to erosion. There are also significant areas where cropping occurs and paddocks are left with no cover for part of the production cycle, with a consequent high risk of soil erosion. High rainfall, high slope areas tend to be forested and so are not as susceptible to hillslope erosion even through rainfall and slope are both factors that can increase erosion risk. Hillslope erosion hazard areas are shown in Figure 39.

NRM North has a long history of promoting good groundcover management to minimise hillslope erosion through extension projects. Projects have focused on enabling graziers to understand appropriate grazing pressure and fertiliser rates to maximise groundcover and minimise soil erosion. In cropping systems extension work has involved promoting practices to minimise periods of bare soil in these landscapes using management practices such as cover crops, zero and minimum tillage techniques.

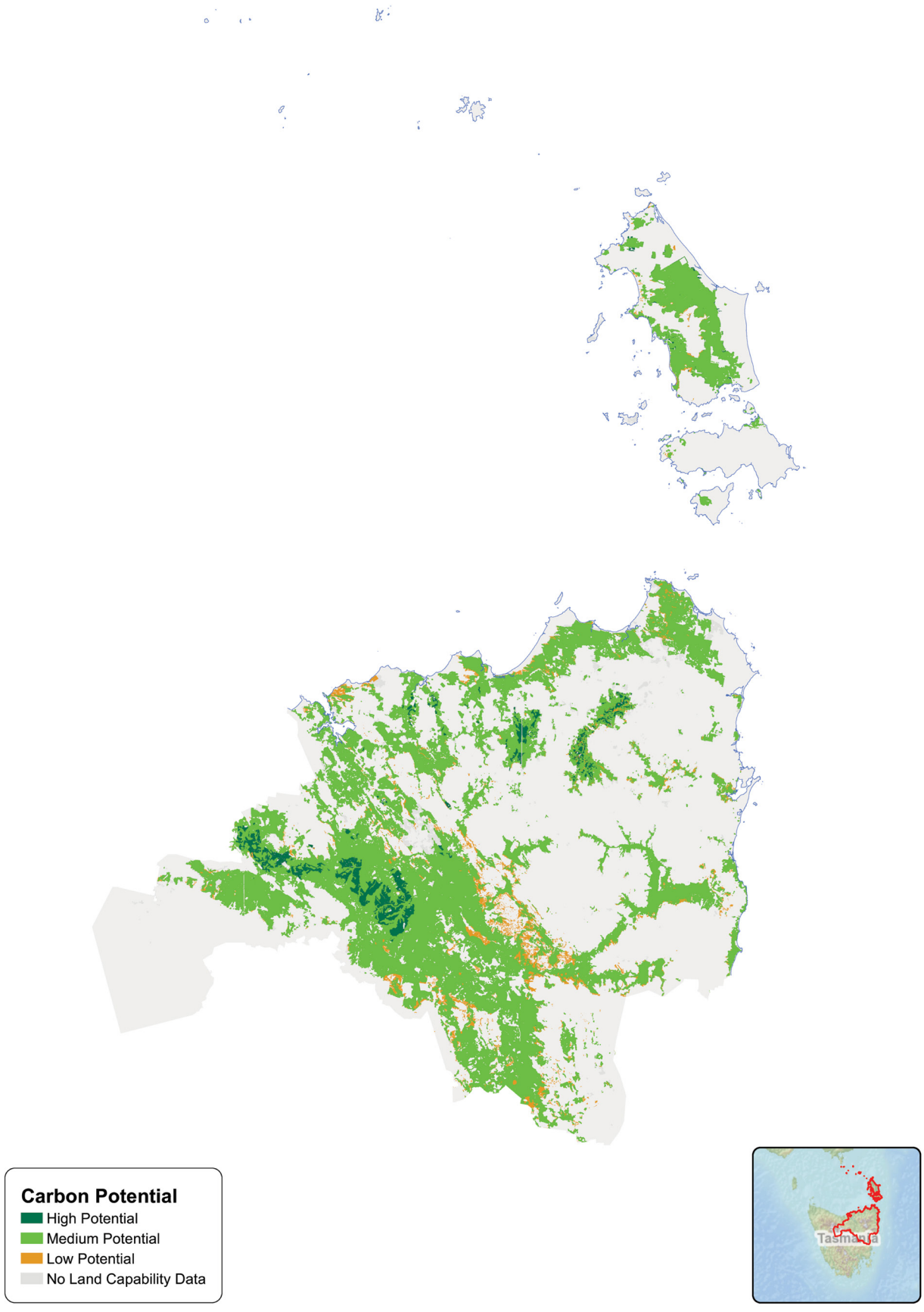

FIGURE 37: **Carbon potential mapping in northern Tasmania**

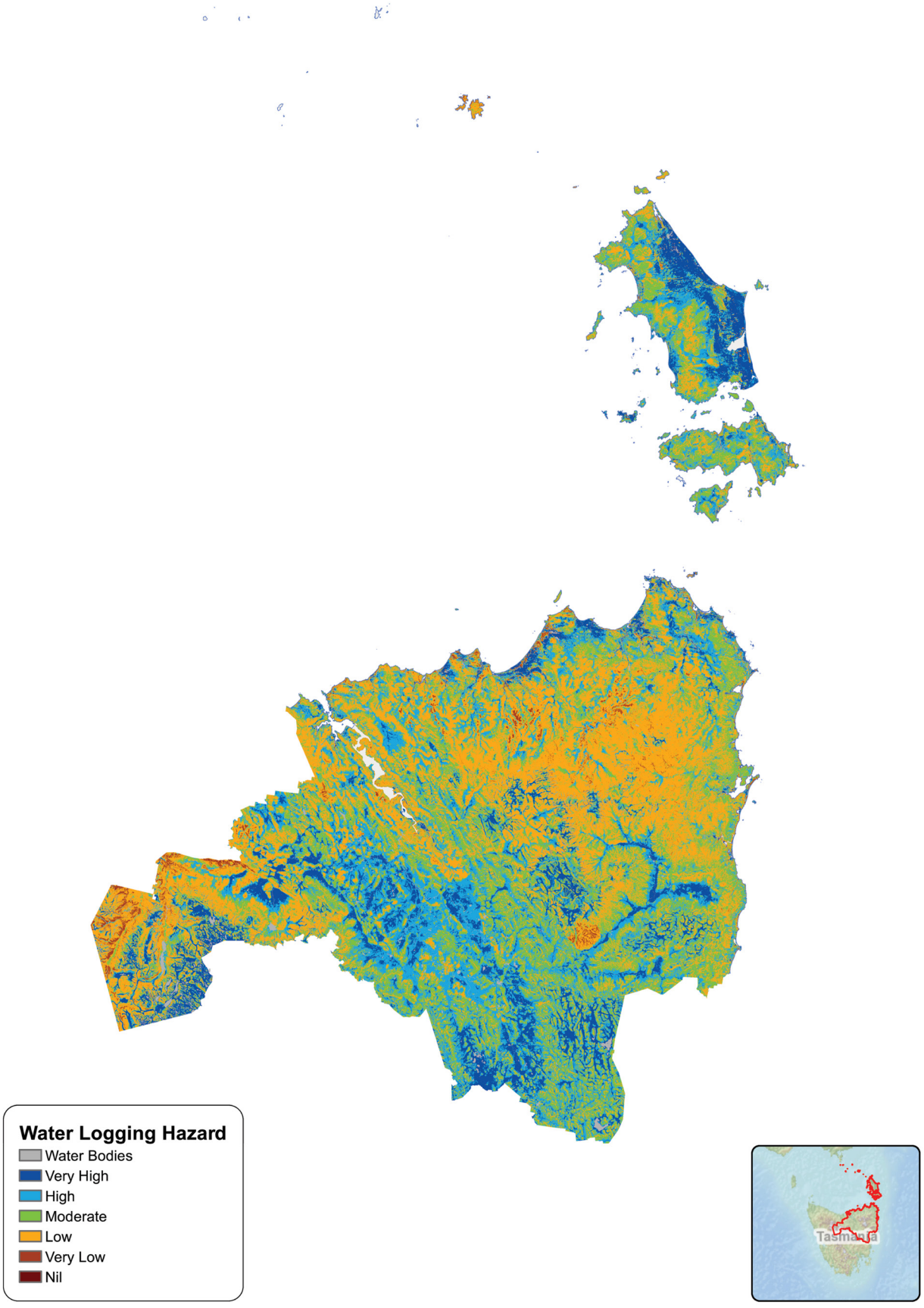

FIGURE 38: **Soil water logging hazard in northern Tasmania**

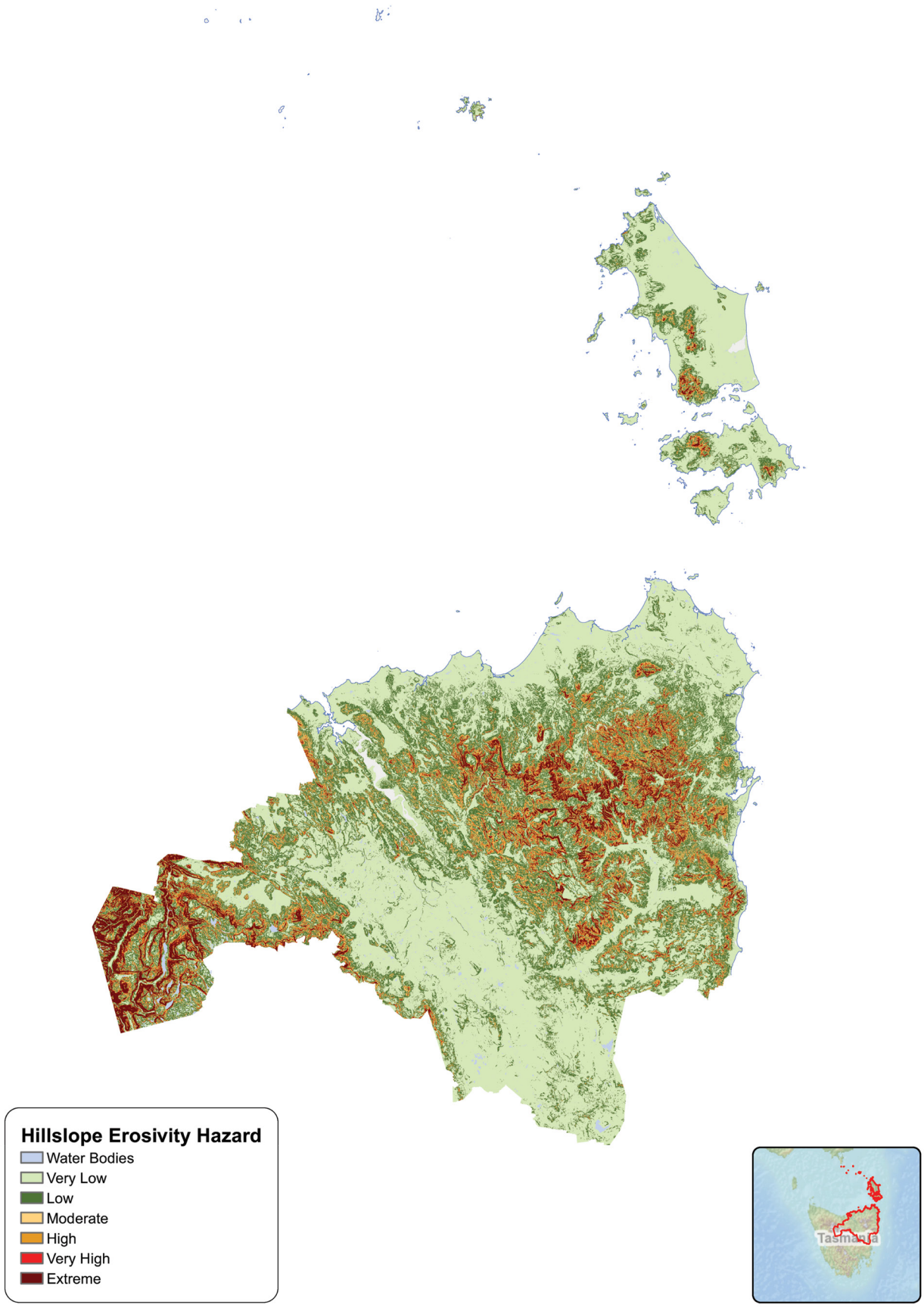

FIGURE 39: **Erosion hazards in northern Tasmania**

» Hillslope erosion trial site (Adrian James)

Soils at risk from salinisation

Land management practices and climatic change are the two primary factors which, acting alone or together, impact on salinity. Salt stores are a natural feature of the Tasmanian landscape, in areas with low average annual rainfall evaporation exceeds rainfall in most months which results in salt accumulation in the soil, groundwater or bedrock below. Increased availability of water in soils can mobilise salt stores in the soil and increase salinity in soils, groundwater or surface waters. If poorly managed, land management and use changes can increase the amount of water passing through the root zone and increase salinity.

The area of salt-affected private land (rural and urban) in Tasmania is estimated to be about 74,000 ha or about 4 percent of Tasmania's private land (based on visible symptoms). No estimates have been made of salinity on public land. Salinisation processes occurring on the surface can impact on groundwater quality and quantity. Groundwater is an important resource in Tasmania particularly for domestic, irrigation, stock and industrial uses. Groundwater also provides the basal flow to our rivers and if impacted by salinity may cause increases in salinity of rivers. Salinity could pose a significant threat to some threatened or endangered vegetation communities, fauna and habitats with those considered most threatened found on valley floors and lower slopes, including native grasslands, wetlands and woodlands. In 2000 the Tasmanian Salinity Audit reported that a number of threatened or endangered species were found in land systems containing salinity.

Salinity hazard spatial analysis (Figure 40), and its intersection with land uses most susceptible to salinity risk and the current rate of adoption of appropriate management practices identified priority areas for action. This builds on previous work including the state-wide, three-year salinity project including groundwater flow system mapping, trialling salt-tolerant pastures and shrubs, creating property salinity management plans, and publication of the Tasmanian Salinity Glovebox Guide.

Soils at risk from acidification

Many of Tasmania's agricultural areas are relatively high-rainfall and nitrogen rich, which lead to rapid soil acidification. This results in many farm paddocks having a pH (water) below 5.5 in the topsoil. Subsurface soil acidity is more variable, as some Tasmanian soil types (particularly those with potential salinity and sodicity issues) are strongly alkaline at depth. Low soil pH in agricultural systems leads to a range of issues including aluminium toxicity and impaired performance of soil biological function, such as legumes that fail to form relationships with rhizobia. Over time if soil acidity is not addressed it will decrease productivity and become increasingly expensive to ameliorate.

The low level of testing and lime or dolomite application in Tasmanian grazing systems mean that effective management relies on extension programs raising the knowledge of farmers on issues relating to soil acidification, encouraging soil pH testing and effective management through appropriate application of lime or dolomite. The high priority areas for addressing soil acidification issues in the northern Tasmania region are shown in Figure 41.

Assessment of soil acidification risks and related land uses and management practices identified permanent pasture systems as a priority focus area to improve the adoption of practices that effectively manage soil pH. This builds on NRM North's successful history of projects aimed at improving soil acidification such as the Fert$mart program with the dairy industry, and working with graziers focused on permanent pastures which are systems where addressing soil acidification is very slow.

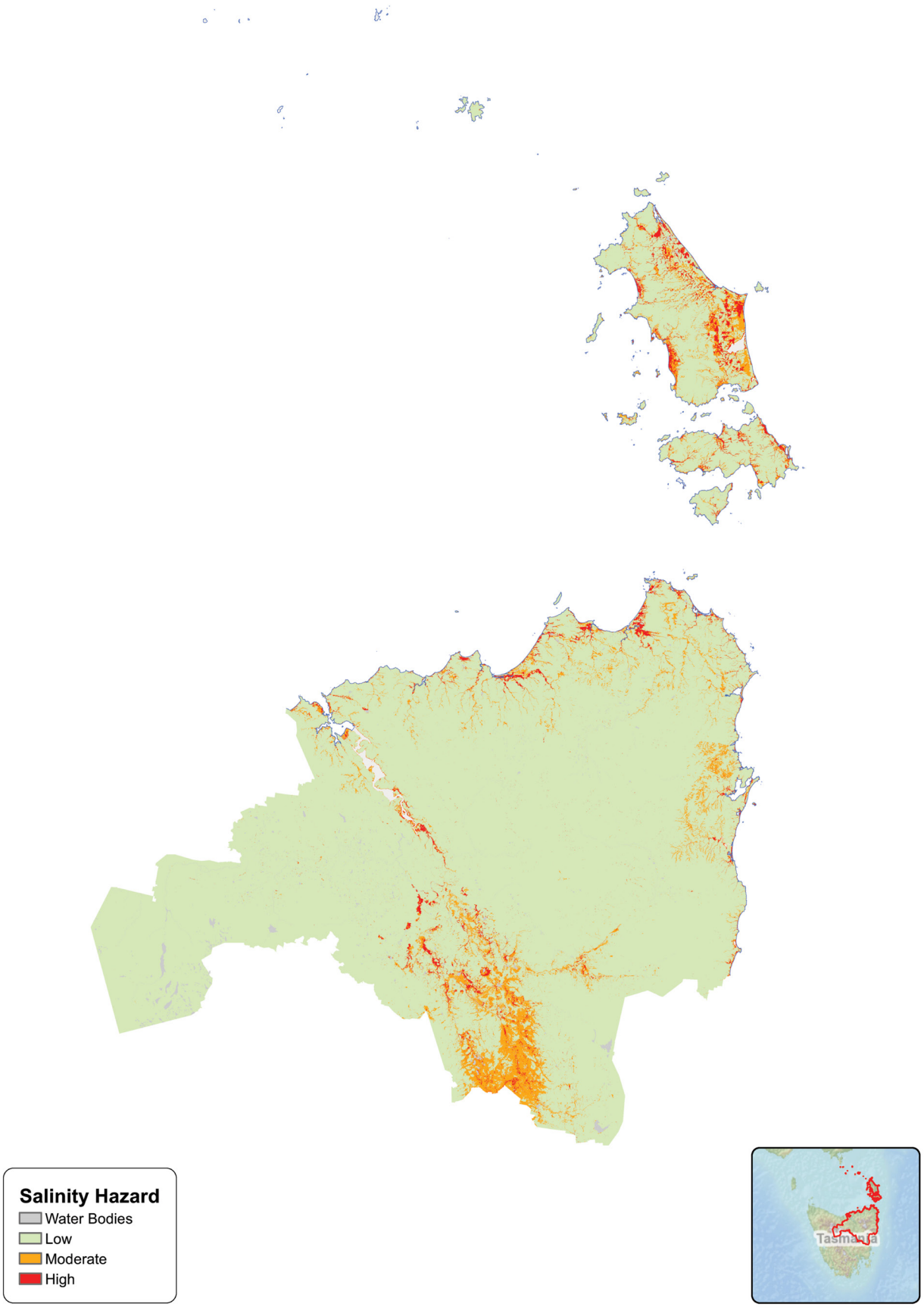

FIGURE 40: **Salinity Hazard in northern Tasmania**

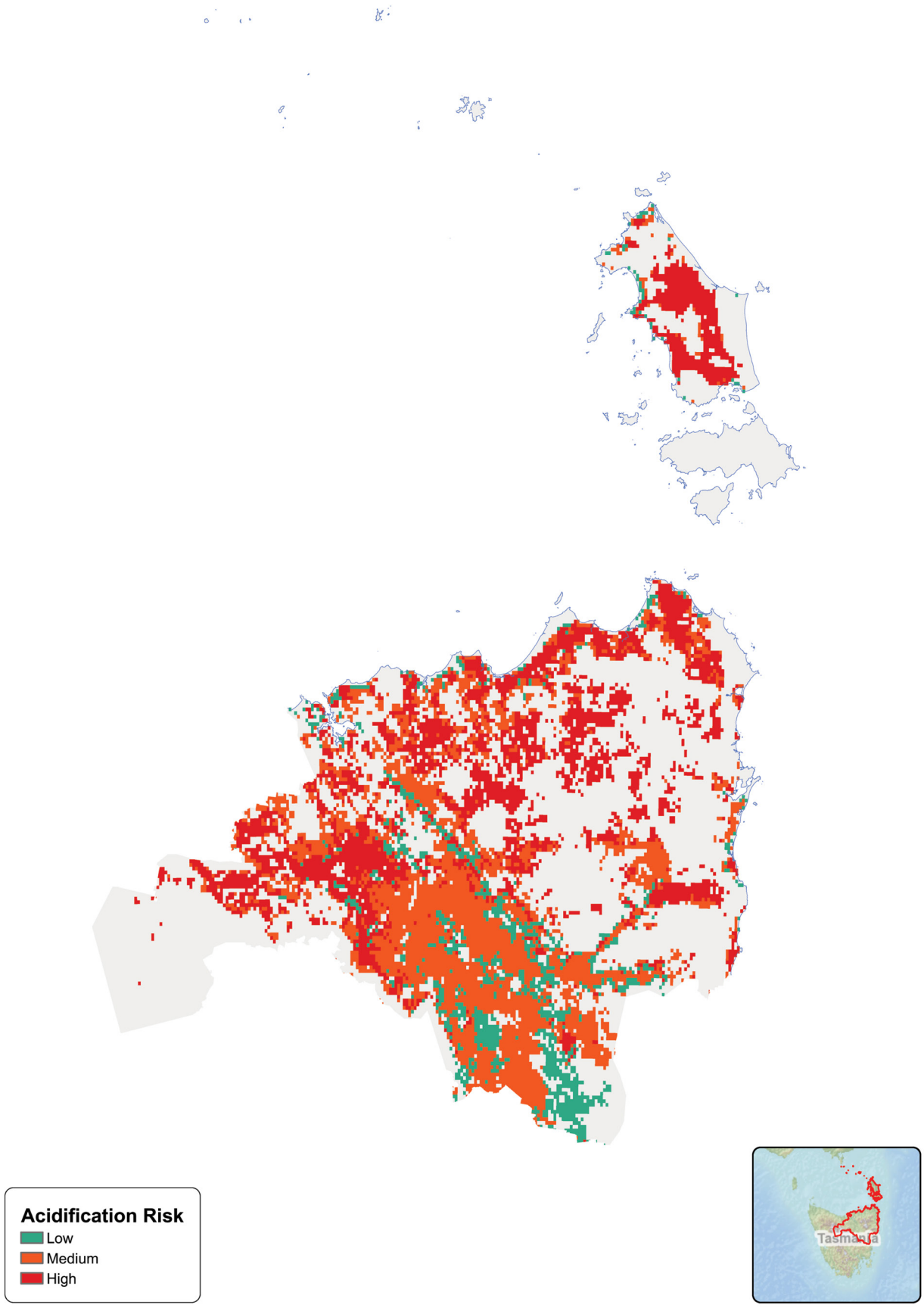

FIGURE 41: **Soil acidification in the northern region**

On farm native vegetation

On-farm native vegetation management is identified as a high priority for regional investment in the northern Tasmania region. In particular vegetation is important in preventing soil erosion and land degradation, catchment-scale impact on hydrology and water quality, maintaining soil health and productive capacity, and managing and restoring areas subject to past damage. Overall the landscape of the northern Tasmania region has a high degree of vegetation retention, with approximately 60 percent native vegetation cover across the region. However, closer analysis shows that on a localised scale vegetation retention is highly variegated, with many areas in the agricultural landscape falling below 30 percent (see Figures 42 and 43).

Vegetation cover is also important in helping manage extreme events such as drought or rainfall events.

Native vegetation on farms in northern Tasmania is under a combination of threats including rural tree decline, climatic changes, weed infestation, and removal for development such as centre-pivot irrigation. Expansion of irrigation and the adoption of new technologies is seeing an intensification of land use and increasing pressures on remnant areas. Added to this are increasing market demands to demonstrate sustainable land management practices to secure market access and a social licence to operate, and opportunities to access carbon and biodiversity markets.

Variegated landscapes within the region, and areas of land use intensification associated with irrigation, represent the greatest opportunity for improving landscape function efficiently, including the northern midlands south of Campbell Town, Fingal Valley and the northern coastal plains (including Flinders Island).

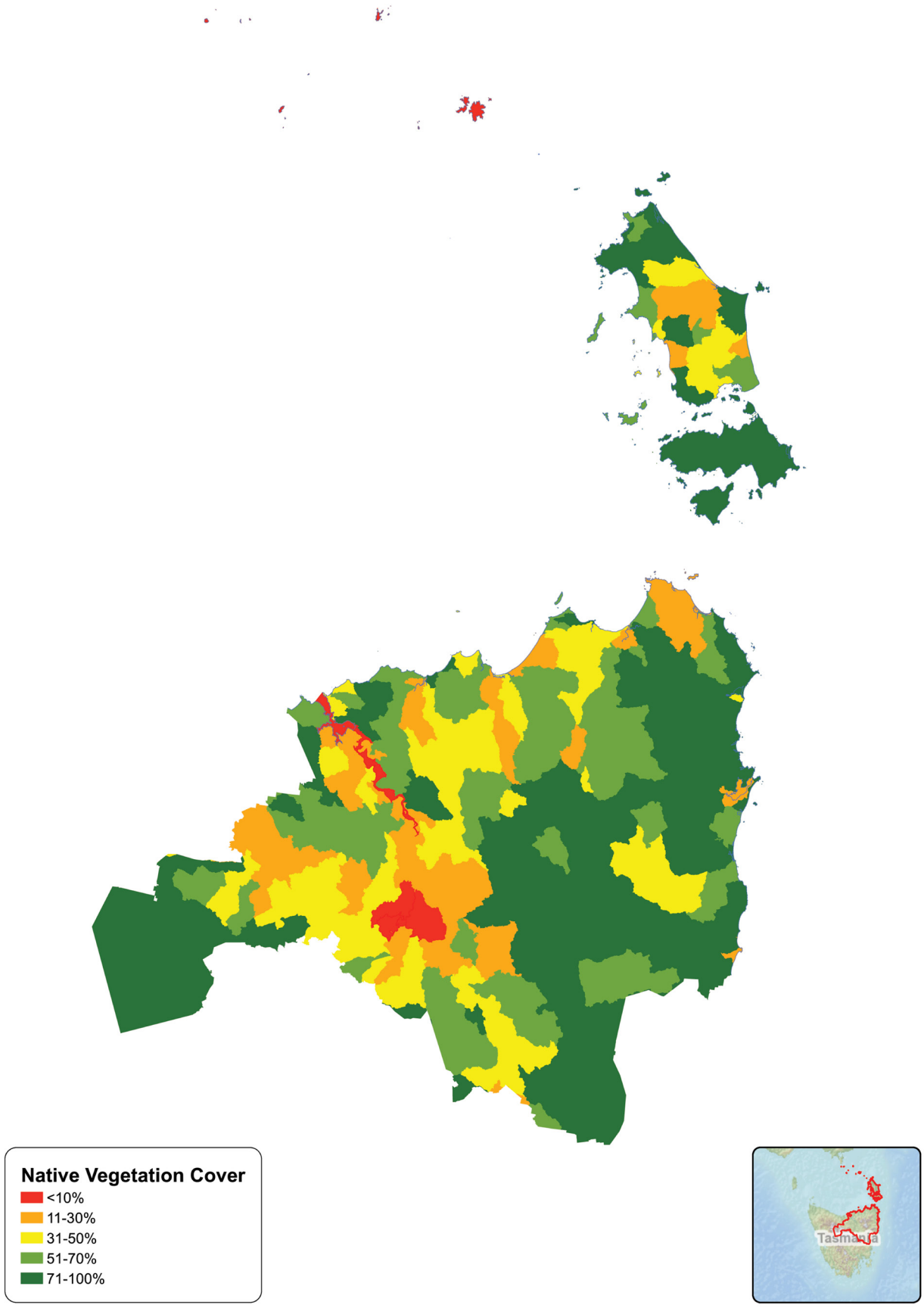

FIGURE 42: **Vegetation cover across sub-catchments in northern Tasmania**

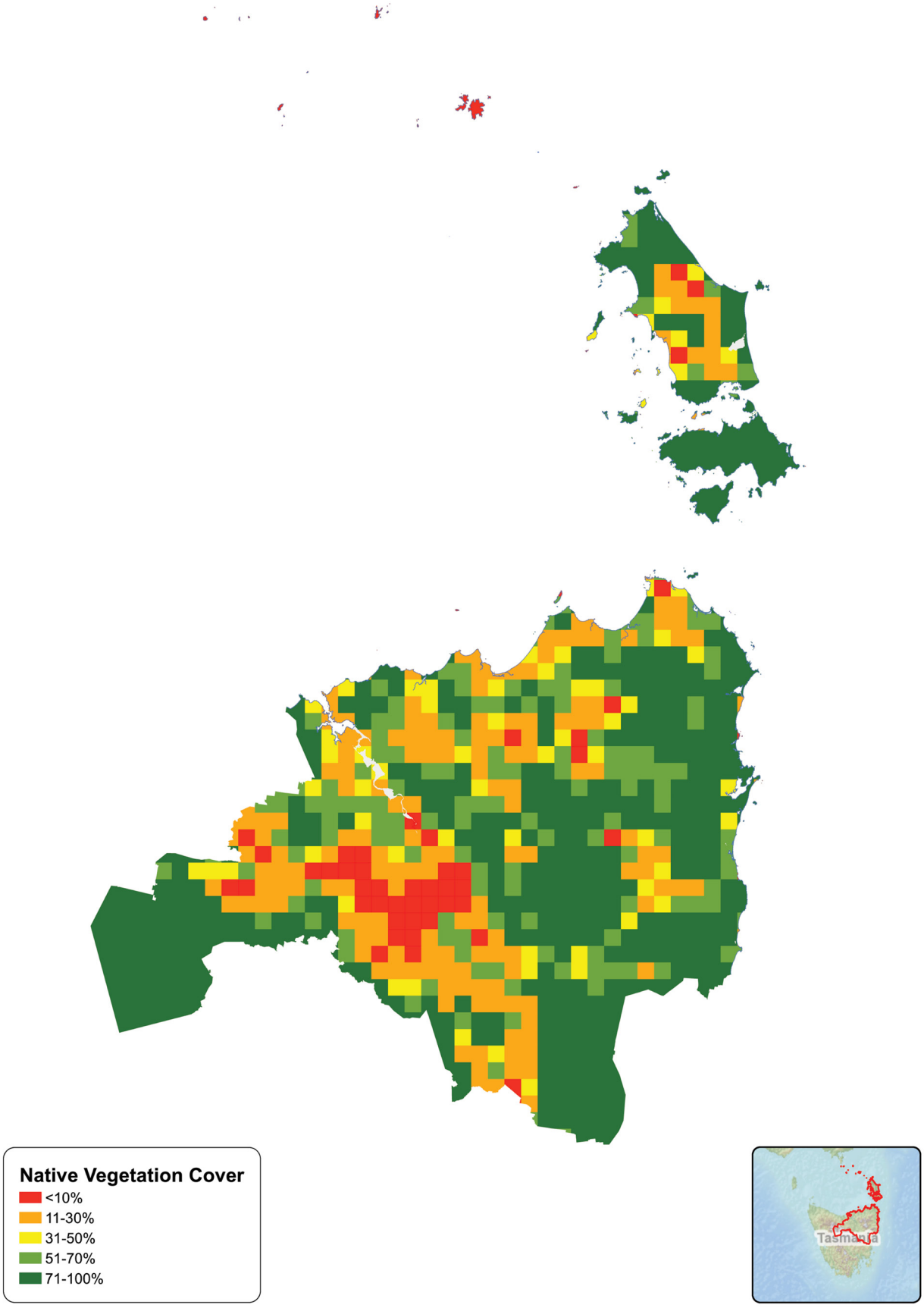

FIGURE 43: **Vegetation cover over 5 km grid in northern Tasmania**

Prioritisation by Multi-Criteria Analysis

In support of RLP Outcome 5, risks to soils have been assessed across local areas within the region, as well as the extent of vegetation cover, which form the basis of the multi-criteria analysis (See section 4 in Attachment 3). Areas of soil and vegetation Actions have been prioritised using a Multi-Criteria Analysis (MCA), and the results of the MCA are shown in Table 11. Descriptions of Actions associated with these Priorities can be found in Section 5.4 of the Strategy document.

TABLE 11: **MCA prioritisation of soils and vegetation Actions**

● Priority for investment ● Not prioritised at this time

	MCA Prioritisation					
Soils and vegetation	Carbon	Structure	Erosion	Salinisation	Acidification	Vegetation
Meander	●	●	●	●	●	●
Tamar municipalities	●	●	●	●	●	●
Northern Midlands	●	●	●	●	●	●
Dorset	●	●	●	●	●	●
Break O'Day	●	●	●	●	●	●
Furneaux	●	●	●	●	●	●

» Farming landscape in northern Tasmania

2.6 RLP Outcome 6: There is an increase in the capacity of agriculture systems to adapt to significant changes in climate and market demands for information on provenance and sustainable production.

The Australian Government has identified its approach to improving climate resilience and adaptation in the agriculture sector in its National Climate Resilience and Adaptation Strategy 2021-2025, with three main objectives:

- Drive investment and action through collaboration
- Improve climate information and services
- Assess progress and improve over time

The Australian Governments *Commonwealth Biosecurity 2030* is a roadmap to protecting Australia's environment, economy and way of life. Globalisation has brought more exotic pests and diseases, and response, management and recovery costs are much greater than prevention. Biosecurity systems offer defence against these threats, on a national, state and local scale.

TABLE 12: **Climate resilience and biosecurity**

Priority	Further information
Resilient industries and communities	National Climate Resilience and Adaptation Strategy 2021-2025
	National Agricultural Innovation Agenda
	Landcare's role in building adaptive capacity and resilience 2016
Biosecurity	Commonwealth Biosecurity 2030

Resilient communities and industries

This Australian Government investment priority is the resilience and adaptive capacity of agricultural systems, including soil and water, productive capacity, farmers and their families and workers and rural communities, in the face of climatic and market information changes.

In the last 15 years Tasmania has experienced 1 in 100-year floods and droughts, including increasing frequency of dry seasons and changes in seasonal rainfall patterns. During that time Tasmanian agriculture has also been through a dramatic and rapid increase in irrigation infrastructure and use, demonstrating the urgency of adapting to these changes and unpredictability.

However, irrigation is expensive and still limited in reach and capacity, and many farmers and their surrounding rural communities continue to experience hardships from locally-experienced climatic changes, due in part to the relative novelty of these impacts and cultural inertia holding back significant increases in adaptive capacity. This paucity of adaptive capacity can cause wider social problems in the longer term, as many Tasmanian farming practices are high visible to locals and tourists – land degradation and livestock welfare problems related to climatic changes and poor adaptive capacity may create significant social licence issues for rural industries. Therefore, increasing agriculture's capacity to adapt to climatic changes and variability will also increase capacity to adapt to significant changes in market demand for information on sustainable production.

Key issues include:

- Risks to some aspects of soil function are increased by climate change, particularly erosion and soil carbon reduction under extreme conditions.
- The threat of extreme climatic events has the potential to greatly influence production. Flooding from intense rainfall events at a local and regional level is a recognised risk that may increase under changing climate and rising sea levels.
- There may be increased potential for agricultural production in some areas as temperatures change, with opportunities for new crops that prefer a warmer climate, resulting in land-use change or intensification in those areas.
- Impacts from increased extreme weather events and projected drought, flooding and fire risk increases will certainly affect the health of our rural communities through associated loss of income, mental health issues and physical stress.

The Tasmanian Government's Research, Development and Extension for 2050 White Paper has identified:

- Productivity improvements in agriculture depend on the effective uptake and adoption of research and development by farmers on their farm or in business improvements generally. Extension is about working with people in industries and communities to achieve change. Accordingly, the State Government will encourage a principles-based approach to enhancing delivery of extension services in the State, including:
  - supporting extension delivered using different approaches that optimise the benefits for industry;
  - ensuring a partnership approach is adopted with private sector providers to facilitate and broker information and extension services;
  - supporting the private sector's expansion of extension delivery into areas where there are market opportunities, while continuing to invest directly in extension where market failure is evident;
  - extending the provision of extension beyond the farm-gate, along the supply chain; and
  - establishing metrics to guide and assess extension efforts.

Biosecurity

Effective biosecurity is critically important to Tasmania's natural environment and production landscapes. As biosecurity pressures and threats increase, due to increased movement of goods and people, so does the potential for weed, pest and disease incursions.

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

Both the Commonwealth Biosecurity roadmap and the Tasmanian Biosecurity Strategy focus on aligning communications among stakeholders, and enhancing the preparedness to achieve a consistent biosecurity response across jurisdictions to improve biosecurity outcomes.

To increase the number of land managers that understand and adopt new information and technology that enhances resilience and biosecurity management, effective education, awareness and extension programs must be used. This includes demonstrations, trials and field days in partnership with other organisations and businesses.

NRM North successfully delivers effective programs to build resilience and capacity in land managers, including a carbon and biodiversity pilot aimed at increasing access to carbon and biodiversity markets.

CASE STUDY: RLP OUTCOME 6 – Agriculture systems have adapted to significant changes in climate and market demands.

SOIL CARBON + BIODIVERSITY PILOT PROJECT

The Natural Resource Management region in northern Tasmania was one of only six NRM regions in Australia nominated to improve on-farm biodiversity under the Australian Government's Carbon + Biodiversity Pilot.

Announced in April 2021, the pilot is part of the Australian Government's $34 million Agriculture Stewardship Package which aims to develop a market mechanism that rewards farmers for improving biodiversity on their land.

Working with the Australian National University, the Department of Agriculture, Water and the Environment created the pilot as a first test in whether biodiversity payments would encourage farmers to participate in carbon offset plantings of mixed, native vegetation, designed to provide additional benefits for biodiversity conservation.

The plantings would also benefit farmers by providing shelter for livestock, improving soil moisture and reducing erosion.

With the pilot active in the region and only two months for applications to be submitted, NRM North's Land Program quickly adapted to the opportunity, providing information to farmers through various methods including the NRM North website and social media platforms, radio, webinars, workshops, field days, AgFest, farm visits and one-on-one advice. Farmers in the region have responded with some excellent project proposals, including large-scale farm revegetation works that link nearby bush with riparian areas and remnant old paddock trees.

Additional work under the Agricultural Stewardship Package has included incentivised protection and enhancement of existing native vegetation on farms.

3 Identification of future management actions (Projects)

The processes and methods for developing Projects (including management actions) are summarised in Section 8 of the Strategy (Implementation).

Within the Strategy, strategic actions are identified as 'Actions' that fall beneath the identified Priorities and Outcome statements.

These are different to 'management actions', which are to be developed as a part of the project implementation process, within specific projects, as project-related activities. Projects, consisting of management actions that are both foundational activities that support project planning and immediate activities in project delivery, will contribute to the immediate and long-term RLP Outcomes (Table 13).

3.1 Program and Project Logics

Project services must be relevant to 'priority actions' identified in formal plans, strategies, reports and advice. The Regional Land Partnerships Program Logic notes specific assumptions that will influence the selection of appropriate management actions in the project development phase.

The RLP Program Logic assumes that management actions meet the following requirements to form part of an RLP project:

- Projects will be
  - Fit for purpose (tailored to the design, purpose and objectives of the National Landcare Program);
  - Credible (guided by best available science);
  - Transparent (clearly demonstrate how public money has been spent and the resulting outputs and outcomes); and
  - Cost-effective (provides value for money and where possible, builds on achievements of previous natural resource management programs).
- Projects will deliver services that will contribute to delivering Regional Land Partnerships 5-Year Outcomes and Long-term Outcomes
- The community, including Indigenous people and farmers, are able to participate in the planning and delivery of projects
- Regional Land Partnerships will deliver on the Australian Government's commitment to Closing the Gap on Indigenous Disadvantage (Closing the Gap) by providing opportunities for stronger Indigenous participation in the planning and delivery of investment and outcomes
- There is an increase in the amount of investment leveraged from other funding sources as a part of the delivery of projects
- Projects will be delivered using collaborative partnerships where this makes sense to do so
- Investments that are on private owned/managed land are expected to generate public benefits

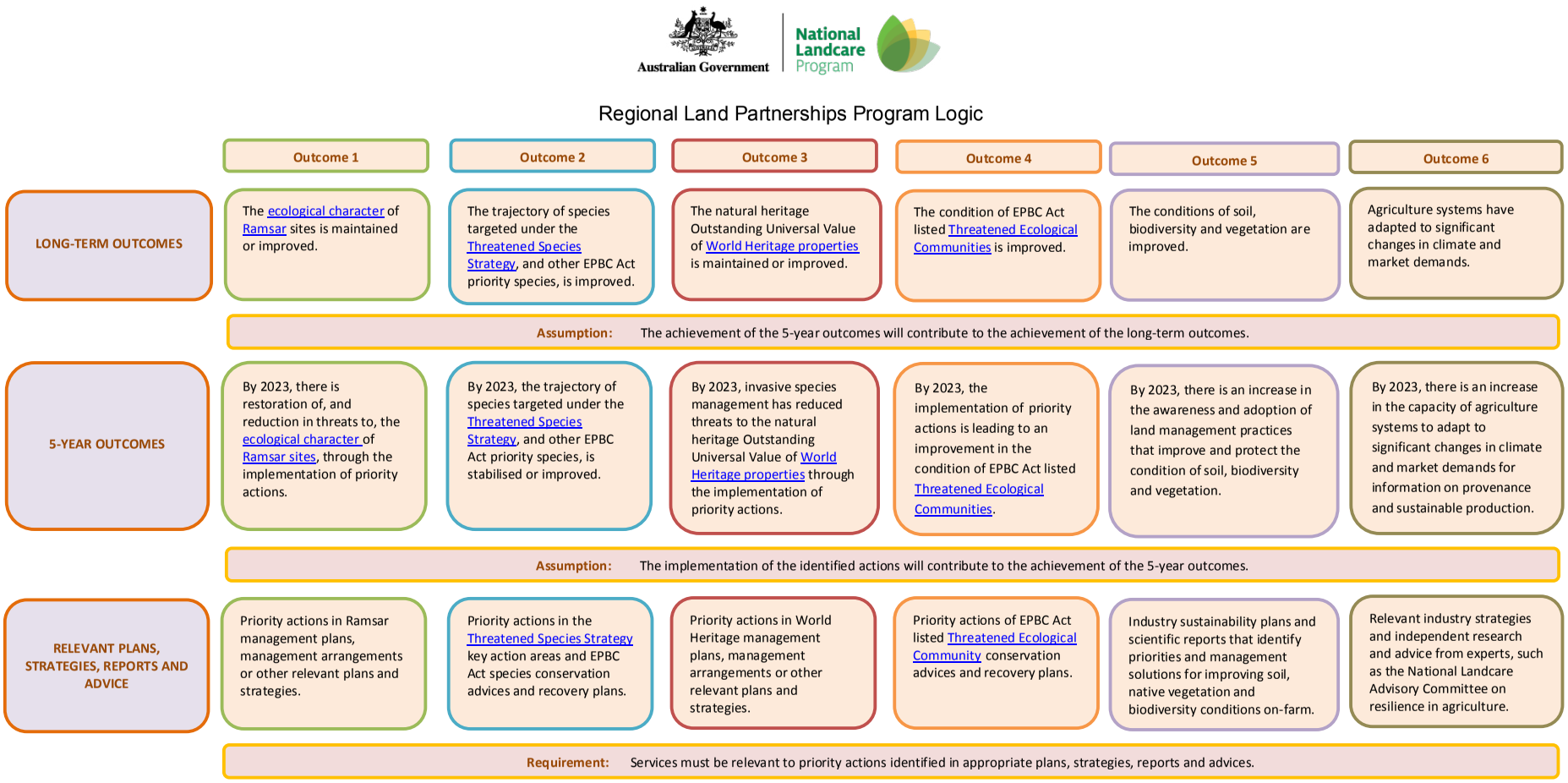

FIGURE 44: **Regional Land Partnerships Program Logic and 5-year Outcomes**

RLP project design will start with the establishment of a Project Logic as part of the MERI planning process (see Strategy section 8.5). Project Logics will link to the RLP Program Logic (Figure 44) by demonstrating the rationale of the selection of appropriate management actions (that constitute project planning and delivery), that will be expected to contribute to the RLP 5-year outcomes as described in Table 13. They will describe the expected consequences of management actions, in the immediate to long-term, underpinned by associated assumptions.

TABLE 13: **RLP Outcome hierarchy (adapted from NRM MERI Framework)**

Outcome hierarchy		Outcome description	Associated target (and indicators)
Aspirational program goal	Vision for the asset	Statement of the overall vision for the state of the asset in 50 years. This statement helps guide program planning and provides a context for setting other targets	No targets at this level
Longer term outcome	Improvements in the state of the asset	Expected outcomes relating to the condition of the biophysical, institutional and social assets as a result of intervention	Usually longer-term targets at a broad geographic level
Immediate outcome (5-year)	Aggregate changes in how the asset is managed and affected	Changes in management practices resulting in impact on asset condition across a region	Immediate targets (e.g. percentage of land protected or managed in a certain way over five years)
		A reduction in pressures on and threats to the asset	
		Adoption of best practice or sustainable management practices	
	Practice and attitude change	Enhanced knowledge, aspirations, skills, attitudes and/or confidence	Immediate and intermediate targets (e.g. percentage of land/resource managers or communities that adopt sustainable management practices)
		Institutional and organizational change, as reflected in corporate policy, business practices, laws and infrastructure	
Management actions (Immediate activities)	Biophysical outputs	Deliverables that are related immediate on-ground results as set out in investment plans and funding agreements	Output targets (e.g. number of hectares and land re-vegetated or enhanced)
	Non-biophysical outputs	Deliverables that are related to immediate social, institutional, cultural or economic results as set out in investment plans and funding agreements	Output targets (e.g. number of community plans number or participants in training workshops, or number of incentives projects funded)
Management actions (Foundational activities)	Project activities	Activities that largely concern the development of NRM strategies and investment plans. These include: • Conducting baseline assessment and analysing program evaluation results • Building skills and developing knowledge base • Developing institutional frameworks, plans and strategies • Undertaking community consultation • Consulting and /or commissioning scientific research	Output targets (e.g. number of community workshops conducted or number of educational resources developed)

Project Logics will also provide the basis for assessment and evaluation of project impact, effectiveness and efficiency, both by assessing the extent of achievement of stated target outputs towards outcomes and by testing stated assumptions. This will be achieved through analysis of monitoring indicator data, established in the project design phase and where gaps in data exists or cannot be obtained, through independent expert review.

3.2 Prioritisation approaches

To select the most effective and efficient actions at the highest priority sites across the region, appropriate prioritisation processes will be utilised based upon the nature and extent of Priorities (assets), the threatening processes affecting those Priorities, types of management actions that can be taken to improve their trajectories, availability of relevant data and/or expert stakeholder and community knowledge and scale of funds available.

3.2.1 Prioritisation of areas for conservation intervention

Conservation of native habitat is critical to the ongoing provision of many ecosystem services and the future survival of Tasmania's native plant and animal species. Habitat conservation will be a central pillar to achieving the proposed outcomes for many prioritised environmental assets identified in the Strategy. Habitat can be conserved by:

(f) protecting and managing the most ecologically intact areas;

(g) assisting natural regeneration in degraded areas; and by

(h) attempting restoration where habitat has been lost or replaced, including by the establishment of corridor linkages.

Protecting intact habitat, and ensuring that it is well-managed, safeguards more biodiversity and generates greater ecosystem services per unit area than regenerating or restoring habitat. For this reason, projects that protect and manage ecologically intact areas will generally be prioritised over restoration activities based on cost, the expected benefits, and a shorter time-frame to achieve them. While habitat restoration can improve a site's ecological condition, it can take decades for vegetation to mature and establish genuine biodiversity and ecosystem benefits.

However, well-planned habitat restoration is important in areas where widespread habitat loss and fragmentation threatens the survival of fragmented or isolated populations of native species, and where habitat linkages between ecologically intact remnant areas need to be created to support species movement. It will also be important where translocation or establishment of habitat will be required to support species impacted by climate change. In practice, a combination of habitat protection, assisted regeneration, and restoration interventions may be required simultaneously in a focal landscape to achieve the Strategy's outcomes for priority ecological assets. Focusing intervention to specific areas within a priority landscape and balancing this combination will require prioritisation at the project scale. It will also be influenced by the available level of resourcing and investment.

Identifying and prioritising areas for conservation intervention in the landscape

Prioritising focal areas within the landscape relevant to priority ecological assets in the Strategy will be evidence-based. It will consider an area's level of potential contribution to species or ecological community persistence, and the outcome or level of estimated return from the interventions proposed.

At a project scale, as needed, expert elicitation processes will engage technical specialists to identify and rank focal areas for intervention e.g. localised areas, river reaches, wetland sites. Each project will consider the entire landscape supporting a priority species or ecological community, drawing on spatial data e.g., TasVeg, satellite imagery, remote sensing, ground truthing and research datasets. Overlaying species and landscape spatial data will allow project planners to identify and prioritise significant land areas for NRM intervention.

Ranking and prioritisation will be based on an area's:

(a) Significance to known/identified populations of a species and/or multiple species (i.e. areas known to be critical to existing populations over areas with very low population numbers, or areas with no known recent sightings);

(b) Landscape context, including:
- relative proximity to existing protected areas/ reserves
- ability to enhance structural connectivity by extending from existing protected areas/reserves or intact habitat or remnant patches
- location relative to other areas or sites (e.g. clusters or aggregations of remnant habitat);

(c) Existing habitat condition (e.g. more ecologically intact areas where damage is relatively low and

pre-existing biota should be able to recover with managed cessation of degrading practices over less ecologically intact areas where damage is high or the biota no longer exists and the causes of degradation still need to be removed);

(d) Size of area (i.e. larger and/or wider areas will generally be prioritised over smaller or narrower areas); and

(e) Ongoing (long-term) viability (e.g. areas with better security of tenure, degree of buffering against threats such as inappropriate fire frequency, hydrological change etc, would be ranked higher).

This structured ranking of areas will provide a relative priority value of each portion of the landscape, identify preliminary areas of focus, and help inform investment options.

Once priority areas are identified, the required actions and interventions for land parcels and sites will be determined (e.g. fencing, weed and pest eradication, incentives for grazing reduction, ecological burning, considering aspects including their demonstrated chance of success, impact and effectiveness (backed by supporting scientific evidence), cost-benefit and value for money). Where required, further expert elicitation processes may be used to inform this.

Protecting or restoring on-farm/property-scale vegetation

Based on experience of on-farm vegetation management and incorporating the works of Lindenmayer et al (Restoring Farm Woodlands for Wildlife), the following principles will be used to prioritise on-farm vegetation management projects:

- Protection of remnant vegetation is preferred
- If plantings are required:
  - Supplement existing stands of healthy remnant vegetation to enhance biodiversity and ecosystem function
  - Species mix and local provenance must be considered
  - Larger plantings are preferred to smaller, narrower plantings
  - Block plantings are preferred to strip plantings
  - Plantings in proximity to existing remnants or near other rehabilitated or new plantings is preferred to isolated patches of plantings
  - Plantings that create corridors or connections to remnant stands or rehabilitated or new plantings is preferred to isolated patches of plantings.

Planting projects must consider site selection, preparation including weed management, timing of planting, and protection from browsing or other threats including fencing stock or plant cages/guards to address native and feral species damage. Adequate preplanning is required to ensure appropriate and adequate plant species, guards, and stakes are available through local nursery suppliers.

Standards for landscape restoration

Where habitat restoration is determined as a priority within a landscape, the National Restoration Standards will be applied. The Standards offer a tool (five-levels or 'stars') for progressively assessing and ranking the degree of recovery over time, which are summarised in Table 14 and Figure 45.

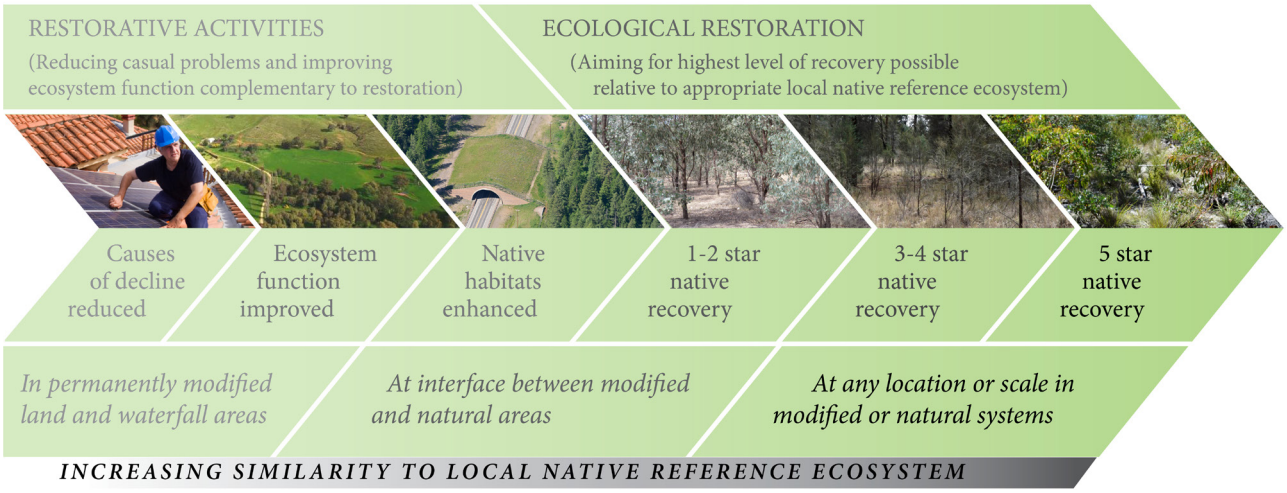

Photo credits: (from left): 1. Used under license from Shutterstock.com; 2: ©S. Triggs: Inglis Rural; 3: ©Marcel Huijser; 4 and 6: ©T. McDonald; 5: ©J. Jonson

FIGURE 45: **Restorative continuum (McDonald et al. 2016)**

TABLE 14: **Summary of generic standards for one to five star recovery levels (2018, Society for Ecological Restoration)**

Stars	Recovery outcome
1 star	Ongoing deterioration prevented. Substrates remediated (physically and chemically). Some level of indigenous biota present; future recruitment niches not negated by biotic or abiotic characteristics. Future improvements for all attributes planned and future site management secured.
2 stars	Threats from adjacent areas starting to be managed or mitigated. Site has a small subset of characteristic indigenous species and there is low threat from undesirable species on site. Improved connectivity arranged with adjacent property holders.
3 stars	Adjacent threats being managed or mitigated and very low threat from undesirable species on site. A moderate subset of characteristic indigenous species are established and evidence of ecosystem functionality commencing. Improved connectivity in evidence.
4 stars	A substantial subset of characteristic biota present (representing all species groupings), providing evidence of a developing community structure and commencement of ecosystem processes. Improved connectivity established and surrounding threats being managed or mitigated.
5 stars	Establishment of a characteristic assemblage of biota to a point where structural and trophic complexity is likely to develop without further intervention other than maintenance. Appropriate ecosystem exchanges are enabled and commencing and high levels of resilience is likely with return of appropriate disturbance regimes. Long term management arrangements in place.

3.2.2 Prioritising the management of invasive species to Priorities (assets) in the landscape

For projects addressing invasive species, the invasion curve and management principles can be used to prioritise investment. Prevention is the most effective and low-cost solution for managing invasive species. Waiting until an invasive species is established to start management is costly and can harm valuable infrastructure and the natural biodiversity needed for healthy ecosystems.

The invasion curve shows the stages of invasive species management from pre-arrival (prevention) to long-term control. After a species is introduced, management costs increase, and likelihood of eradication decreases as time passes.

- **Prevention:** The most cost-effective solution for managing invasive species. Public awareness is essential for this stage.
- **Eradication:** Removing a species population in its entirety. If populations are localised, eradication is possible.
- **Containment:** Reducing further spread of an introduced species. As populations increase, eradication becomes increasingly unlikely and priorities shift to preventing further spread.
- **Long-term control:** The most costly stage of invasive species management. Eradication is unlikely to impossible and we instead focus on limiting populations and protecting remaining resources.

Investing in prevention provides **economic returns up to 100x higher** than trying to manage a species after it arrives.

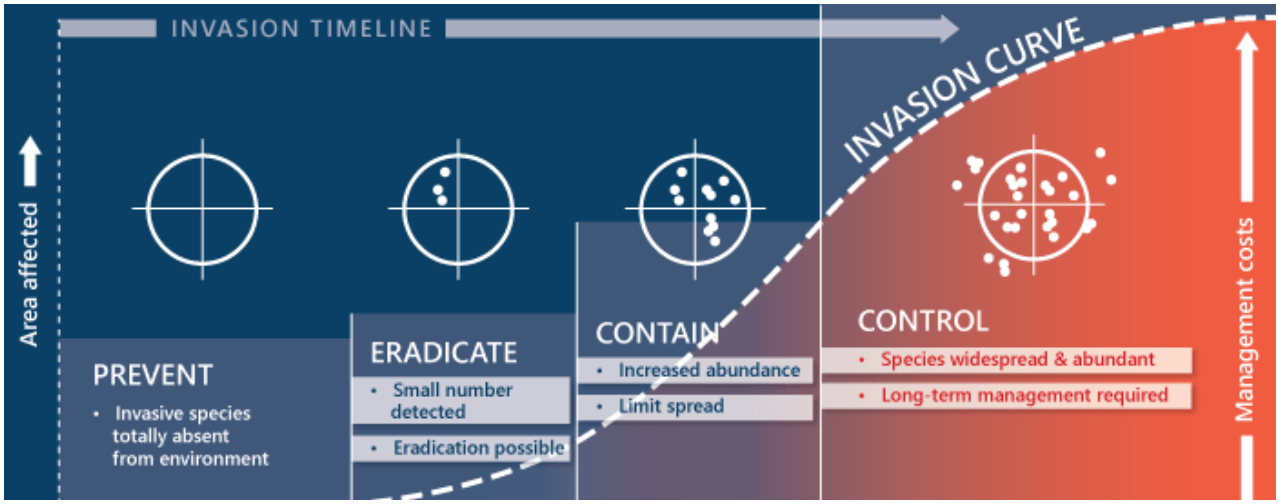

FIGURE 46: **Invasive species curve**

3.2.3 Tools to support prioritisation during project design

A range of decision support tools are available to help guide the various steps of project development and management intervention, which sometimes includes a prioritisation step. The use of such tools, including the following, will be considered for projects as required.

Investment Framework for Environmental Resources (INFFER)

A structured, participatory process to guide and prioritise projects, and actions within projects, to maximise the value from investment. It helps identify potential projects, calculate their benefit:cost ratio and, using a Public: Private Benefits Framework, provide guidance on the most appropriate type of policy mechanism to use within a project (e.g. incentives, extension/information etc.).

Conservation Action Planning (CAP)

An open standard project development and management tool. It is used to guide the development of projects, work plans and measures of success, structured within an adaptive framework. It relies on the participation of experts and informed community practitioners. CAP recognises that the identification and ranking of key values, priority locations, and candidate actions is required (although it doesn't provide specific guidance on how to do this).

AdaptNRM – Biodiversity Adaptation Toolkit

A toolkit designed by CSIRO to help guide and incorporate climate adaptation planning into biodiversity management, to support practical choices about which management options to employ now and which to consider for the future. The toolkit links optional actions to the strategic goals they are designed to achieve. The actions reflect a gradient from low risk or preventative approaches to options involving more risk and investment (which may be necessary under greater degrees of change).

» Fungi at Punchbowl reserve (Peter Wilkes)

ATTACHMENT SIX

References and relevant resources

1 Strategy references and relevant resources

Priority	References
Strategy	Grose, M et al., 2015, Southern Slopes Cluster Report, Climate Change in Australia's Natural Resource Management Regions: Cluster Reports, eds. Ekström, M. et al., CSIRO and Bureau of Meteorology, Australia. Meyer, A and Holbrook, N and Strutton, P and Eccleston, R, The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report: What does it mean for Tasmania? A special briefing by the Australian Research Council Centre of Excellence for Climate Extremes and the University of Tasmania, University of Tasmania, Hobart, Tasmania (2021) Poloczanska, ES, Hobday, AJ and Richardson, AJ (Eds), 2012, Marine Climate Change in Australia, Impacts and Adaptation Responses, 2012 Report Card. Please note footnote 4 relates to the information provided for ocean temperature and ocean acidification.
Healthy Country	truwana Weed Management Plan http://tacinc.com.au/wp-content/uploads/2015/07/truwana_17.4.15.pdf larapuna Healthy Country Plan 2015 http://tacinc.com.au/wp-content/uploads/2015/07/larapuna_17.4.15.pdf Wybalena Healthy Country Plan 2015 http://tacinc.com.au/wp-content/uploads/2015/07/Wybalena_17.4.15.pdf tayaritja Healthy Country Plan http://tacinc.com.au/wp-content/uploads/2020/07/tayaritja-Healthy-Country-Plan-Final-Updated-June-2020.pdf
Great Forester-Brid catchment	DPIPWE (2020). Great Forester River Catchment Water Management Plan. DRAFT. Water and Marine Resources Division, Department of Primary Industries, Parks, Water and Environment, Hobart. Kelly, R. and White, M. (2015) Water Quality Improvement Plan for the Brid River Catchment, Rivers and Waters for Life Program, NRM North, Launceston.
Georges catchment	George Catchment Waterways Monitoring Report (2006) Department of Primary Industries and Water. Kelly, R. and White, M. (2015) Water Quality Improvement Plan for the Georges Bay Catchment, Rivers and Waters for Life Program, NRM North, Launceston.
kanamaluka / Tamar estuary and Esk rivers catchment	Tamar Estuary and Esk Rivers Program (2015). Tamar Estuary and Esk Rivers Catchments Water Quality Improvement Plan. NRM North, Tasmania.
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McKerrows Marsh	DPIPWE. (2018). McKerrows Marsh. An Assessment of Vegetation Condition. Department of Primary Industries, Parks, Water and Environment, Hobart.
Diana's Basin	North and Barker (2009) Break O'Day Coastal Lagoon Assessment. Report to NRM North and Break O'Day Council.

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Seagrass habitat	Orth, EJ. Carruthers, TJB. Dennision, WC. Duarte, CM. Fourqurean, JW. Heck, KL. Hughes, AR. Kendrick, GA. Olyarnik, KJ. Short, SFT. Waycott, M. Wiliams, AL. (2006) A Global Crisis for Seagrass Ecosystems, *BioScience*l, Volume 56, Issue 12, Pages 987-996 Jänes, H. Carnell, P. Young, M. Ierodiaconou, D. Jenkins, GP. Hamer, Zu Ermgassen, P. Gair, JR. Macreadie, PI. 2021. Seagrass valuation from fish abundance, biomass and recreational catch. Ecological Indicators. Volume 130
Temperate coastal oyster beds and reefs	Gillies, CL., Castine, SA., Alleway, HK., Crawford, C., Fitzsimons, JA., Hancock, B., Koch, P., McAfee, D., McLeod, IM., zu Ermgassen, PSE. (2020) Conservation status of the Oyster Reef Ecosystem of Southern and Eastern Australia. Global Ecology and Conservation. 22 Martin, J. and Cheetham, M. (2018) Final Report Lower George River Investigation. Lower George Riverworks Trust.
Coastlines vulnerable to erosion, inundation and human impact	Macreadie, P.I. Anton, A. Raven, JA. *et al*. The future of Blue Carbon science. Nature Communications 10, 3998 (2019).
North east corner of Tasmania	Environment Australia 2000. Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report. Department of Environment and Heritage, Canberra. IBRA 7 maps https://www.keybiodiversityareas.org/
Midlands Biodiversity Hotspot	Case Studies on Biodiversity Conservation: Volume 1. Iftekhar, S. Tisdell, J. and Sprod, D. (2013) A review of conservation project selection criteria in the Midlands Biodiversity Hotspot tender, Tasmania. Sensitivity to project duration and auction budget.
Furneaux Islands	Environment Australia 2000. Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report. Department of Environment and Heritage, Canberra. https://www.awe.gov.au/sites/default/files/documents/revision-ibra-development-5-1-summary-report.pdf IBRA 7 maps https://www.keybiodiversityareas.org/
Riparian Vegetation	DPIPWE (2018) Tasmanian Threatened Native Vegetation Communities, Riparian Scrub.
Eucalyptus viminalis – Eucalyptus globulus coastal forests and woodlands	DPIPWE (2018) Tasmanian Threatened Native Vegetation Communities, Eucalyptus globulus coastal forest and woodland.

2 References in Attachments 1–5

Attachment 1: Policy

Section		References
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4	**Climate Change**	Climate Action 21, Tasmania's Climate Change Action Plan 2017 – 2021. Department of Premier and Cabinet. Tasmanian Disaster Resilience Strategy 2020 – 2025. Department of Premier and Cabinet.
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9	**Regional Collaboration and Governance**	Commonwealth of Australia, Department of the Prime Minister and Cabinet, Launceston City Deal Tamar Estuary Management Taskforce (2017) Tamar Estuary River Health Action Plan.

Attachment 2: UN SDGs

Section	References
1	United Nations Sustainable Development Goals

Attachment 3: Prioritisation

Section	References
1	Standards Reference Group SERA (2017) National Standards for the Practice of Ecological Restoration in Australia. Second Edition. Society for Ecological Restoration Australasia

Attachment 5: Regional Land Partnerships

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2.4	**Black Gum or Brookers Gum**	Approved conservation advice (incorporating listing advice) – Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)

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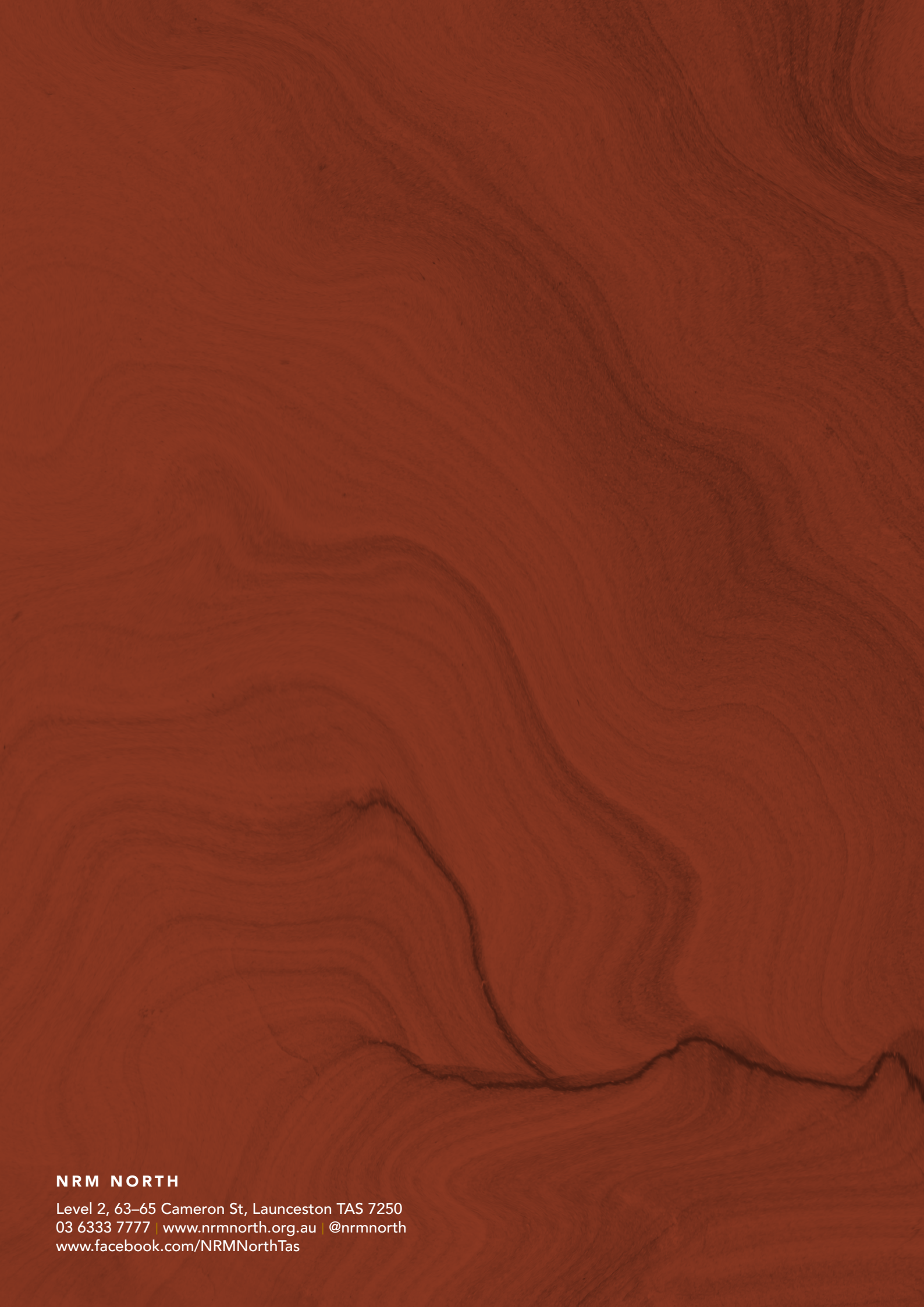

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Level 2, 63–65 Cameron St, Launceston TAS 7250
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