Appendix 2. Carbon Planting Spatial Prioritisation

In support of this Strategy’s development and implementation, work was undertaken to spatially identify locations in the region that could be available and realise multiple benefits for carbon-based vegetation planting programs.

Three distinct projects were completed:

- Cradle Coast NRM—Carbon Planting Priorities: Results of statewide analysis;
- CSIRO AdaptNRM Module 4—Helping Biodiversity Adapt: Revegetation for multiple benefits in Tasmania; and
- SCARP—A Means to an End: A process guide for participatory spatial prioritisation in Australian natural resource management.

Southern Tasmania still has very high vegetation cover across much of its area with the exception of specific sections that have been cleared for agricultural development. Apart from this, areas available for carbon-based vegetation planting programs are limited and will require significant consultation in order to proceed. The three projects are outlined in greater detail below.

1. Cradle Coast NRM—Carbon Planting Priorities — Results of a statewide analysis

Tasmania’s three NRM regions jointly funded this project to spatially prioritise and assess potential priority areas that could form a focus for implementation of future vegetation-based carbon planting programs. This assessment investigated:

- Existing carbon values;
- Potential biodiversity values;
- Soil protection and amelioration priorities; and
- Probability of landholder uptake in low-use agricultural areas.

The assessment indicated that Tasmania has significant carbon sequestration reserves in the south-west, but also has important areas for soil amelioration and biodiversity hotspots within and adjacent to over-cleared areas, particularly in the Midlands. Focus areas were identified as riparian areas and also cleared production landscapes for the multiple benefit of soil improvement and protection (Figure A1).
Figure A1: Carbon planting focus areas
Revegetation is usually conducted with multiple aims in mind, so our revegetation benefit measure will almost always need to be combined with other information to guide priorities for placement of revegetation in the landscape. At the moment, most prioritisations incorporate some measure of current biodiversity benefits. Our measure of revegetation benefit estimates benefits for biodiversity of the baseline climate (1990) under future climate scenarios. This could substitute for current benefit layers to explore how priority areas might shift. Because revegetated areas will take decades to mature and begin to provide the full biodiversity benefits intended, prioritising areas that will continue to benefit biodiversity into the future is particularly critical.

For example, the NRM regions in Tasmania (NRM North, NRM South and Cradle Coast NRM) have collaborated to produce a multi-criteria analysis of where revegetation might best serve multiple purposes within the State. They considered carbon sequestration, soil protection and amelioration, and current biodiversity benefits in their analysis, as well as areas where the greatest opportunities may exist due to minimal agricultural use. To include biodiversity benefits, they used an analysis of biodiversity hotspots produced by the Tasmanian Resource Management Council (TRMC). Specifically, the spatial layer was a single metric that summed ratings according to eight criteria:

- Biogeographic distinctiveness
- Distinctiveness of areas of threatened and uncommon plants
- Conservation and reservation status of vegetation communities
- Native vegetation in bioregions with <10% in the reserve system
- Fire and disease refugia
- Glacial refugia
- Important bird habitat
- Freshwater ecosystems.

Note that the first two of these criteria place importance on areas that are currently distinctive, particularly in terms of plants, as these areas may disproportionately contribute to state or national scale biodiversity. Our revegetation benefit measure is based on the same principle but under a changing climate. It places importance on revegetating areas that will be rare and distinctive in the future to best support the full range of national diversity in the long term. To adjust the existing Tasmanian analysis to plan for future biodiversity benefits, the TRMC biodiversity metric could be disaggregated and revegetation benefit for vascular plants substituted for the first two criteria. Further, revegetation benefit for mammals, reptiles, and amphibians could be incorporated as measures of future importance for faunal habitat.

Figure A2, panel (c), and the existing Tasmanian analysis suggest there are also localised opportunities for change due to patches of minimal agricultural use and potential for carbon benefits and soil improvement as well.

The NRM groups plan to use the analysis to identify focal areas for more detailed regional analysis, including evaluation of potential landholder uptake of revegetation opportunities. The addition of our future revegetation benefit layer in a revised version of the analysis could help identify additional focal areas worthy of further exploration, like the north coast east of Bridport.
Finally, as these multi-criteria analyses are often constructed using means-ends diagrams, it is worth considering new principles for biodiversity conservation (Section 2 of Module 4) in the context of defining the ‘ends’ and then working backwards to define the means to map/model them. The Tasmanian approach in general and the specific use of revegetation benefit aligns primarily with the potential new principle of minimising species loss nationally, through prioritising ‘distinctiveness’. If additional new principles are adopted, they should be considered as ‘ends’ and might result in different approaches to a revegetation analysis. For example, if new principles adopted include optimising ecological processes and maintaining key services, additional layers representing landscape connectivity to support species’ movements and ecosystem services beyond soil protection could be incorporated. Explicitly recognising the principles underlying the ‘ends’ can lead to greater clarity about the means needed to perform such analyses to actually benefit biodiversity into the future.

3. Southern Slopes Climate Change Adaptation Research Partnership: A means to an end: a process guide for participatory spatial prioritisation in Australian natural resource management

This project was funded through the Australian Government’s Stream 2 NRM Planning for Climate Change Fund to support NRM planning and implementation. Spatial prioritisation for NRM in Australia aims to support decisions about where scarce resources should be invested to create the best possible outcomes. Many NRM objectives or goals require identification of regions and then localities for such investment. This guide was developed through action research with Tasmanian NRM organisations to help address these types of ‘where’ questions. The report is intended to be a working document for ongoing adaptation and refinement, as the process of spatial prioritisation is an evolving part of NRM planning and implementation. This report is not the final answer, but a waypoint that lays out progress thus far in a key task in adaptive management: knowing where to invest to achieve the best outcomes towards goals.

This guide outlines a process to enable potential use of the Multi Criteria Analysis Shell (MCAS-S) software developed by the Australian Bureau of Agricultural and Resource Economics and Sciences in prioritising the ‘Where in the landscape’ questions related to natural resource management.

This project identified that it is essential to recognise that spatial analyses are only the start of a much larger process to enable on-ground action in areas of NRM including land management decision-making and environmental projects. Spatial analysis is the starting point from which to start a much larger discussion around priorities, possibility for action and the crucial step of engaging with relevant stakeholders to realise an opportunity for action.

It was recognised that the spatial prioritisation process may be implemented for various needs and outcomes that will vary for each assessment and project. People’s willingness to act, however, ultimately relies on engagement through consultation and negotiation (Figure A3).

Figure A3: The linkages between key components in spatial assessment