NRMPCC Modelling

Landscape Prioritisation

Statewide

Natural Resource Management Plan for Climate Change

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FOR MORE INFORMATION CONTACT

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Introduction

The NRMPCC aims, in part, to assess potential climate change mitigation activities in terms of their value by taking into account biodiversity, agriculture and carbon. This document outlines the methodology and models used to develop NRMPCC priority layers for such activities.

Biodiversity	Carbon	Agriculture
NRMPCC Priority		
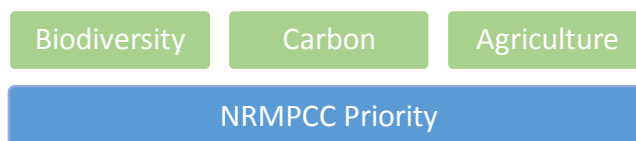
The priority layers are a management tool which aim to address three primary criteria for assessing the priority of potential activities; biodiversity, agriculture and carbon. In order to be a robust and informed plan, these three factors need to be balanced within the plan's modelling framework.

Criteria

The following outlines each of the criteria used in the NRMPCC priority layers.

Biodiversity

There is a good understanding of the value of biodiversity assets across Victoria through DELWP's Nature Print program. This dataset summarises a range of biodiversity related attributes including the presence and potential range of state and federal listed species, connectivity between vegetation, as well as vegetation extent and condition. This dataset is seen as fit for purpose for use with the modelling framework for the NRMPCC. The biodiversity component of the priority layers is key and is included in all layers for all regions.

Carbon

The carbon component of the priority layers is key and is included in all layers for all regions. Carbon sequestration potential datasets have been provided by DELWP and assess the potential of terrestrial ecosystems to sequester carbon.

Agriculture

The protection of agricultural land has been flagged by Glenelg Hopkins and Wimmera CMA as being important to contribute to the priority layers. The agriculture component of the priority layers is included to ensure that activities conducted through the NRMPCC factor in the importance of agricultural land.

NOTE: For all CMA's not referenced above, the agriculture criteria is not assessed.

Methodology

The NRMPCC priority layers are build using a multi-criteria decision analysis which assesses the three criteria discussed above. The factors used as input for criteria will depend upon the target ecosystem and action.

Actions

An overview dataset is provided outlining the appropriateness of actions. This dataset summarises if the particular ecosystem is best suited for protection, enhancement or revegetation. This dataset is classified with three distinct values representing the three above mentioned actions:

Remnant Protection (1)

Remnant vegetation protection and management can ensure functioning ecosystems retain their ability to maintain an active carbon cycle.

Remnant Enhancement (2)

Remnant vegetation enhancement facilitates degraded ecosystems to increase their ability to maintain an active carbon cycle.

Native Revegetation (3)

Degraded ecosystems have potential for restoration and an enhanced carbon carrying capacity. Revegetation actions aim to restart natural carbon cycles.

Priorities

Priority datasets are typically derived using the following model:

$$priority = \left(\frac{carbon + biodiversity + agriculture}{\max(carbon + biodiversity + agriculture)} \right)$$

Each input criteria included in the model is a rated factor between 0 and 100, which when combined creates an overall priority between 0 and 100. 100 represents the highest priority where 0 represents the lowest.

The NRMPCC priority layers focus on two ecosystem groups (waterway and terrestrial) and target appropriate actions.

Terrestrial Ecosystems

In this modelling framework, terrestrial ecosystem outputs are identified as *green carbon*. Activities appropriate to this ecosystem are discussed below:

Protection

Targets **high value terrestrial ecosystems** deemed to be in **good condition**. Typically this applies to areas of native vegetation where most ecosystem functions exist.

Enhancement

Targets **high value terrestrial ecosystems** deemed to be in **poor condition**. Typically this applies to areas of native vegetation where many ecosystem functions are absent.

Revegetation

Targets **all terrestrial ecosystems** where **native vegetation is absent**.

Waterway Ecosystems

In this modelling framework, waterway ecosystem outputs will be identified as *wet carbon*.

Protection

Targets **high value waterway ecosystems** deemed to be in **good condition**. Typically this applies to areas of native vegetation where most ecosystem functions exist.

Enhancement

Targets **high value waterway ecosystems** deemed to be in **poor condition**. Typically this applies to areas of native vegetation where many ecosystem functions are absent.

Modelling Environment

The modelling is completed using a mix of Python and Windows Batch Scripting making calls to the Geographic Data Abstraction Library (GDAL). Data and scripts used to generate outputs are available upon request.

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Input Datasets

The following datasets have been used in the process of generating action and priority datasets:

NaturePrint 2013

http://services.land.vic.gov.au/catalogue/metadata?anzlicId=ANZVI0803005186

Extent

The extent dataset has been classified as per the source vegetation's origion, being either native or non-native.

Condition

Areas within the condition layer without a score or one that is lower than 10 are reclassified as 10.

Strategic Biodiversity Score

The strategic biodiversity score (SBS) dataset has been used without modification throughout the modelling framework.

Waterway Carbon Sequestration Potential

Refer to accompanying document *NRMPCC Modelling - Waterways*

Carbon Potential

The carbon potential dataset has been used without modification throughout the modelling framework.

Restoration Potential

The restoration potential dataset has been used without modification throughout the modelling framework.

Terrestrial Carbon Sequestration Potential

Refer to accompanying document *NRMPCC - BioSim Carbon Sequestration Layers*

Current Carbon Sequestration

The current carbon sequestration layer (*EVCST_CarbSeq_VIC*) has had its values scaled from its native unit to an arbitrary unit between 0 and 100, with 100 representing a high current carbon sequestration rate and 0 representing a low rate.

Potential Biodiversity Carbon Sequestration

The current carbon sequestration layer (*Biodiversity_CarbSeq_VIC*) has had its values scaled from its native unit to an arbitrary unit between 0 and 100, with 100 representing a high potential carbon sequestration rate and 0 representing a low rate.

Agricultural Land Protection

See accompanying document *NRMPCC Modelling – Ag Land Protection*. Applicable to GHCMA and WCMA Only.

Priority for Agricultural Land Protection

The priority for agricultural land protection dataset has been used without modification throughout the modelling framework.

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Deliverables

Green Carbon – Actions

Defines appropriate activities/actions across a region.

Dataset name: {CMAName}_GreenCarbon_Action.tif

Green Carbon – Protection Priority

Defines priority for protection activities across a region.

Dataset name: {CMAName}_GreenCarbon_ProtectionPriority.tif

Green Carbon – Enhancement Priority

Defines priority for enhancement activities across a region.

Dataset name: {CMAName}_GreenCarbon_EnhancementPriority.tif

Green Carbon – Revegetation Priority

Defines priority for revegetation activities across a region.

Dataset name: {CMAName}_GreenCarbon_RevegetationPriority.tif

Wet Carbon – Actions

Defines appropriate activities/actions across a region.

Dataset name: {CMAName}_GreenCarbon_Action.tif

Wet Carbon – Protection Priority

Defines priority for protection activities across a region.

Dataset name: {CMAName}_WetCarbon_ProtectionPriority.tif

Wet Carbon – Enhancement Priority

Defines priority for enhancement activities across a region.

Dataset name: {CMAName}_WetCarbon_EnhancementPriority.tif

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