Mapping Woody Vegetation

as an indicator of biodiversity at farm, regional and national scales
a methodology for all agricultural commodities

Mapping woody vegetation to benchmark areas for extent and connectivity at a national/industry scale – a new methodology

Southern Queensland Landscapes (SQL) in collaboration with Cotton Research Development Corporation (CRDC), Cotton Australia and Natural Resource Management Regions Australia have developed a methodology to map woody vegetation to benchmark areas, both for extent and connectivity to regional linkages, at a local, regional and national scale.

The new innovative methodology employs the Seasonal Persistent Green (SPG) dataset, a freely available national dataset to establish benchmark areas to measure the area of woody vegetation at a property and regional level which can be scaled up to an industry or national scale for reporting purposes. A benchmark for cover and connectivity can be established against which nature positive outcomes can be accounted for over time.

SQ Landscapes staff harnessed the statistical and analytic power of a geographic information system fueled by the SPG dataset to carry out tailored mathematical calculations and statistical analysis. This approach goes beyond the simple production of maps and into the realm of the innovative application of GIS for sophisticated landscape analysis.

The method has been designed to be adopted by other agricultural industry sustainability frameworks to support consistency and efficiency in national agricultural sustainability. While it measures extent and connectivity on farms that grow cotton, exactly the same indicators and measurement method can be used to measure regional or national extent and connectivity on farms that produce grains, livestock or other agricultural commodities.

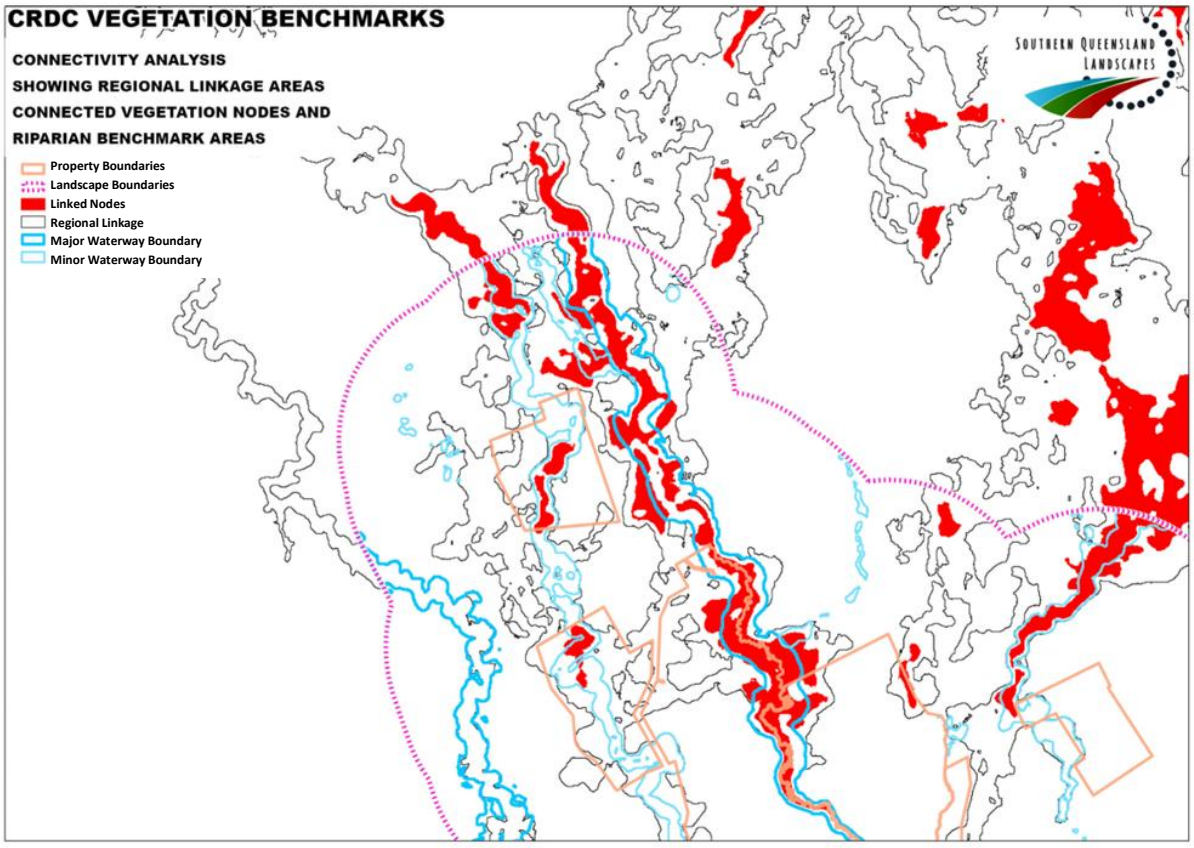

Figure 1: An example output from the mapping woody vegetation methodology displaying regional linkage areas (black line), connected riparian nodes (in red) and waterway boundaries (in blue).

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Key Points

The methodology employs the Seasonal Persistence Green (SPG) dataset which provides a measure of persistent green cover per season by "estimating the portion of vegetation that does not completely senesce within a year. This vegetation primarily consists of woody vegetation (trees and shrubs), although there are exceptions where non-woody cover remains green all year round".

- SPG is a readily available remotely sensed national scale dataset that assesses estimated woody vegetation nationally, year on year across the landscape.
- SPG provides a unique dataset to map vegetation uniformly across states boundaries.
- The methodology combines these products in a GIS environment to map connected vegetation using a "neighbourhood analysis" (an accepted GIS analysis approach).
- The methodology can map riparian vegetation where it actually exists for benchmarking rather than measuring vegetation within a predetermined stream buffer width. This enhances the reliability of mapping riparian vegetation across a range of river systems with diverse channel and fluvial characteristics.
- This process identifies regional vegetation linkages and connected nodes within these linkages.
- The identified regional vegetation linkages are important because they enhance ecosystem diversity and health, can buffer against weather extremes and are a logical area to target for improving the quality/area of existing woody vegetation.

Seasonal Persistence Green (SPG) source:
Department of Environment and Science, Queensland Government (2022): Seasonal persistent green - Landsat, JRSRP algorithm Version 3.0, Australia Coverage. Version 1.0. Terrestrial Ecosystem Research Network. (Dataset). Available at TERN Data Discovery Portal.

Mapping Woody Vegetation on Cotton Properties

Managing and reporting the impact of farming on native vegetation has many challenges. Despite these challenges, the Australian cotton industry is taking proactive action to address the increasing market access risks and opportunities around native vegetation on farms.

Recognising that biodiversity is best managed at a landscape scale, the industry has collaborated since 2021 with Natural Resource Management (NRM) Regions Australia and the seven NRM regions where cotton is traditionally grown to develop an ambitious model that involves:

- A better coordinated effort to support farmers wanting to take voluntary action to contribute to identified NRM regional priorities
- Cost-effective but robust data collection to measure area and connectivity of woody vegetation, using consistent indicators aligned to global sustainability reporting frameworks.

This project aims to bring farmers and independent evidence-based environmental groups closer together to collaborate on solutions that benefit the environment, agriculture and society. The project created the mapping woody vegetation methodology.

The Project's inception was driven by the cotton industry and NRM Regions Australia's common interest for integrating regional natural resource management plans into industry best management practice frameworks. NRMRA's industry partnerships project aimed to understand and improve partnerships with agricultural industries to identify links between sustainability and market access. The ultimate aim was to increase the effectiveness of partnerships between NRM regional organisations and agricultural industries.

Exactly the same indicators and method can be used to measure regional or national extent and connectivity on farms that produce grains, livestock or other agricultural commodities.

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