Benchmarking to improve long-term carrying capacity estimates for extensive grazing properties in Queensland

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Introduction

Safe carrying capacity information can assist producers in making stocking rate decisions to ensure minimal decline in land condition over the long-term. FORAGE, a modelling framework which uses the GRASP pasture growth model, spatial data, remote sensing and climate data, provides long-term carrying capacities for individual paddocks and land types for grazing properties in Queensland. Applying the framework across Queensland's diverse grazing lands and capturing the large range of land types and climates is challenging. To overcome this challenge, we will collate on-ground data and expert-knowledge for reference properties to help validate the modelling framework and ensure the best-available safe carrying capacity information is provided.

Methods

'Benchmarking' of practical information from experienced graziers who have been managing their livestock to ensure land condition is maintained or improved provides a reference to which modelled carrying capacity estimates can be compared. Properties that are well-managed and in good condition with a good density of perennial plants are being targeted. Property boundaries, land types, infrastructure, foliage projected cover and ground cover are mapped prior to the property visit. Land condition is assessed at a number of sites across the property. Through consultation with experienced graziers and use of long-term stock records and land condition assessments, a verified long-term safe carrying capacity estimate can be produced for the property.

Application

Newly established benchmark properties, historic grazing trials and carrying capacity projects will be collated in a verified GIS-based library of safe carrying capacities. This information will be used as a reference for current models, future developments to the models, and to increase knowledge of stocking rate strategies which achieve sustainable production. Knowledge of long-term carrying capacities and number of animals carried over a defined period, as learned from experienced graziers, enables us to review and refine sustainable levels of utilisation for land types. Improved property-based carrying capacity information will assist grazing land management decisions that promote both sustainable natural resource use and profitable beef and sheep industries.

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