Drought and climate adaptation program

FORAGE reports for assisting land management decision-making

and some "new stuff"

Grant Stone and colleagues

Outline

- How we use the latest technology assist in land management decision-making

- Long Paddock website – product and information portal

- Combining grazing systems models with Satellite imagery

- FORAGE Reports
  - Overview
  - Using reports for productivity
  - How to get reports
  - Who uses products

What's in the "pipeline"
  - New FORAGE Long Term Carrying report (LTCC)
  - My FORAGE all-property online tool
  - Pasture biomass est
  - Field sampling
  - Drone activity
  - Pasture quality est
  - Liveweight gain est

- Funded by Drought and Climate Adaptation (DCAP) and Reef programs

- Links to products and collaboration through E-Beef (NRMs & DAF)

So, how do our products assist?

- Obtain & provide costly & obscure data/information
- Turn complex concepts into, easily attainable, easy to use, automated products for property assessment – all free!
- Gives desktop analysis capability - for insight…
- Support for extension/consultant/researcher/grazier
  - Essential pre-visit information
  - Discussion/engagement tool
- Nudge for decision process
- Provides an independent umpire
- Limitations on scale, condition state, pasture spp., tree effects.
- Does not replace monitoring looking across paddocks!

Long Paddock website delivery portal
https://longpaddock.qld.gov.au/

FORAGE:

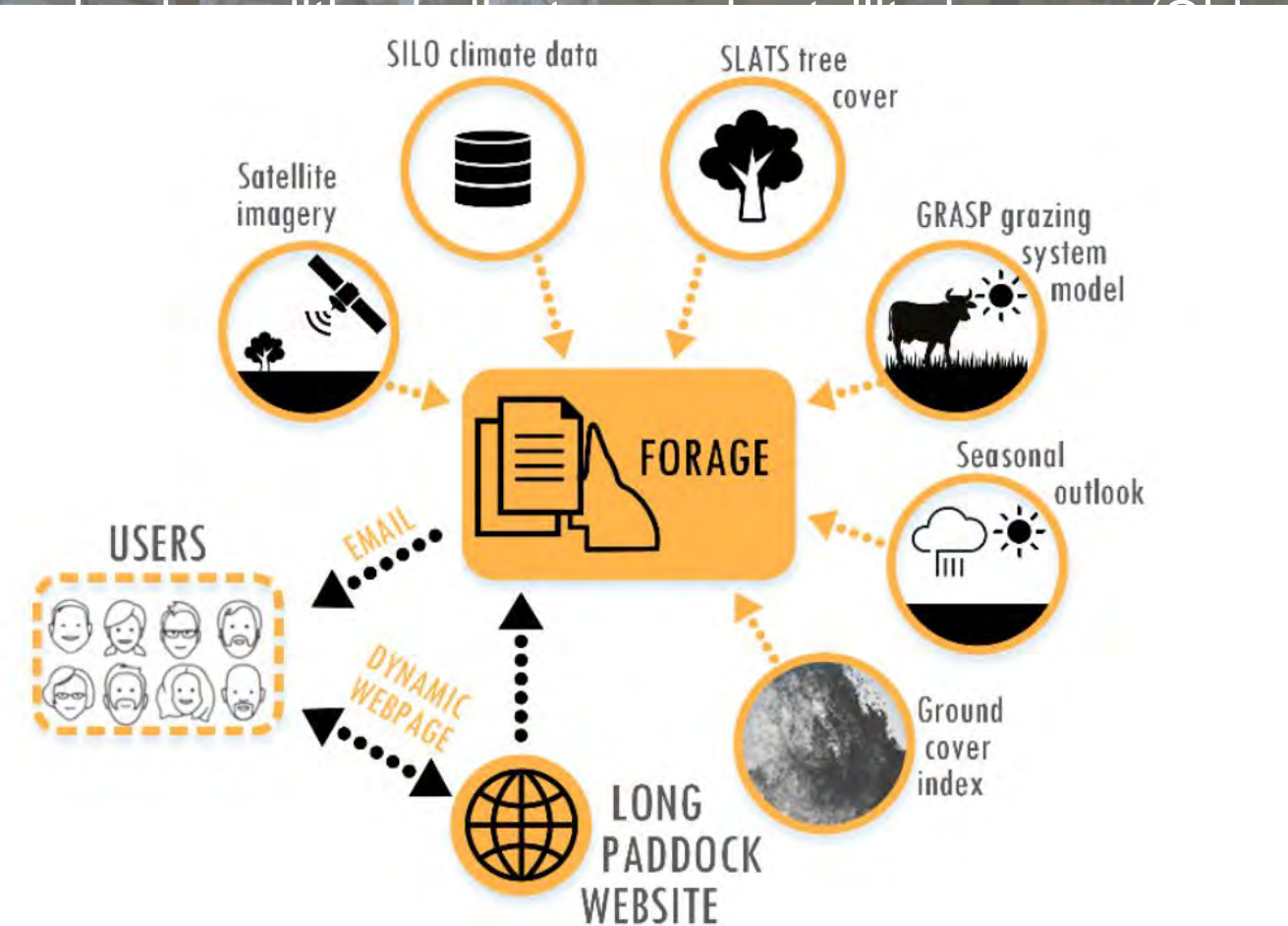•is an online information system accessed through the Long Paddock website: **www.longpaddock.qld.gov.au/forage**

•generates and delivers 'property-scale' customised reports on climate, pasture, ground cov...

•currently h...

•is used by...
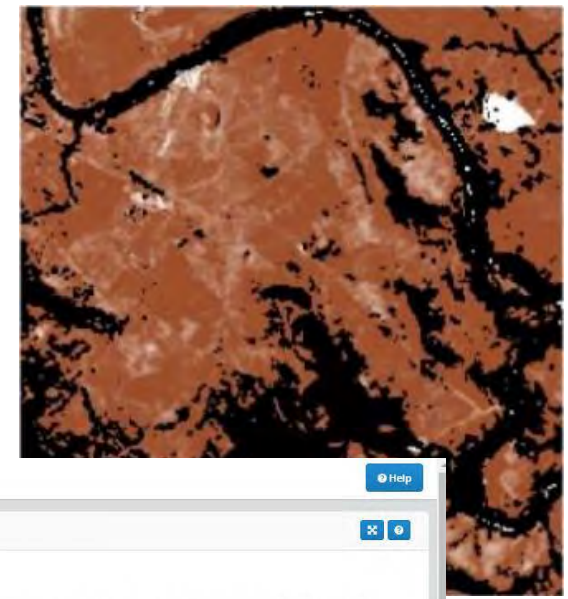
•can facilita...

•report info...
monitoring...

FORAGE flow diagram

DES's Remote Sensing Centre (RSC) provides:

Satellite imagery – from 1986 to current inc:

- bare ground imagery
- foliage projective cover   (FPC)
- seasonal green/non-green cover imagery
- powers VegMachine online (https://vegmachine.net)
- RSC supplies imagery for external applications
  - (e.g. NDVI for E-Beef LW scale sites)

Aim: to combine major aspects of climate, pasture and grazing environment

SILO climate data + Grazing systems models + Satellite imagery ➡ data, maps & reports
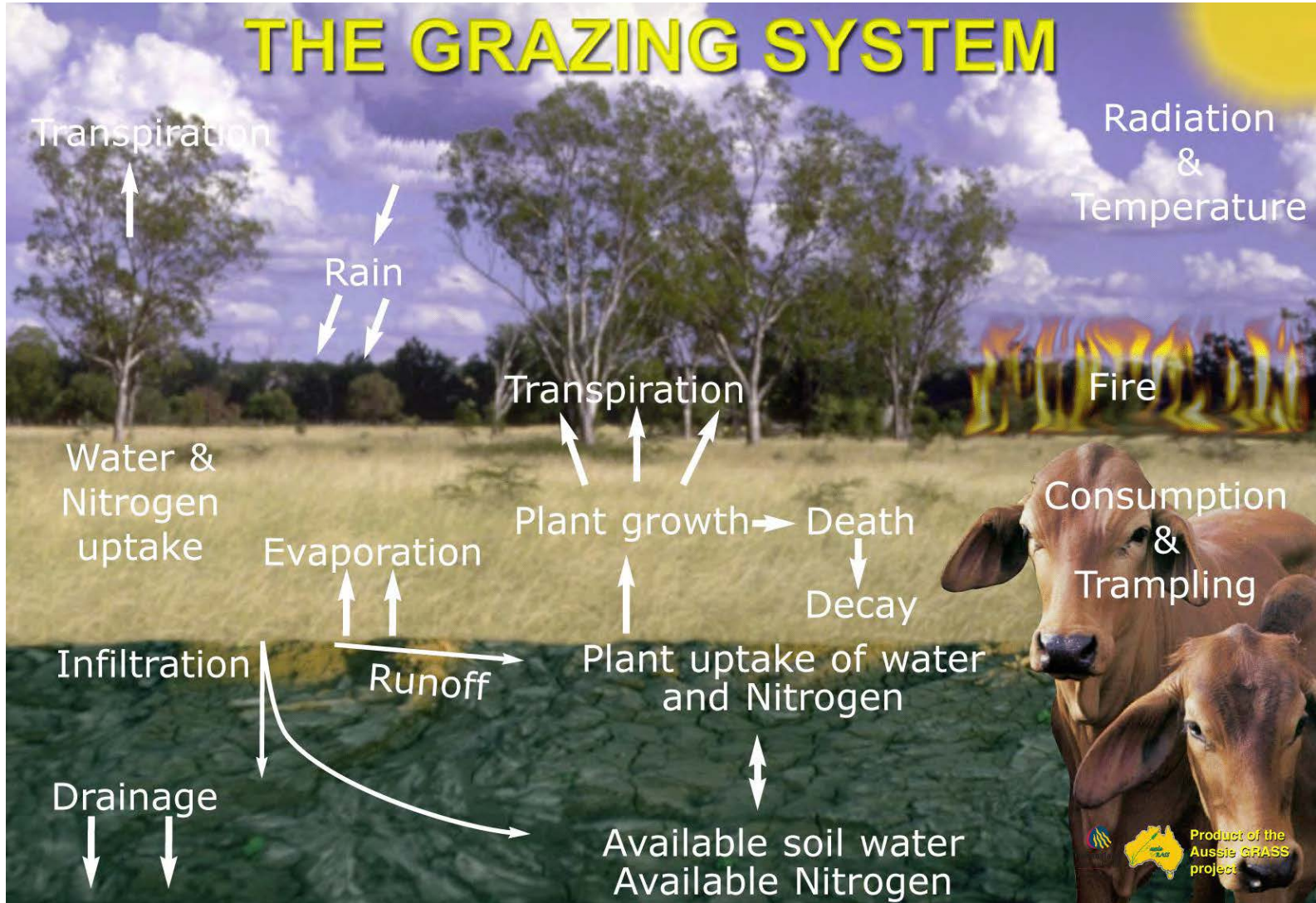
Queensland Government

http://www.longpaddock.qld.gov.au/forage   May 12, 2020   Lot on Plan: 1OC57,4835CP858256,3RP841848,4SP233424   Label: spyglass

Introduction

This report presents, for the selected Lot(s) on Plan, the risk of reduced pasture growth and pasture resilience for the next 6 months. The purpose of the report is to provide an assessment on pasture growth and resilience through assessing information of the last 12 months pasture growth, the pasture ground cover. The Institute for Climate to facilitate stocking

Webinar Videos

FORAGE – free property information: Part 1 – currently available information

FORAGE – free property information to assist with grazing land management decisions: Part 1 – currently available information

Webinar #3: 'Getting the Inside Edge in grazing land management' series

Grant Stone for The Grazing Land Systems team

www.longpaddock.qld.gov.au

▶ Watch the webinar

FORAGE – free property information to assist with GLM decisions: Part 2 – new and soon to be released reports

FORAGE – free property information to assist with grazing land management decisions: Part 2 – new and soon to be released information

Webinar #4: 'Getting the Inside Edge in grazing land management' series

Grant Stone for The Grazing Land Systems team

www.longpaddock.qld.gov.au

Climate risk information for rural Queensland

▶ Watch the webinar

based on the rainfall er percentile level.

e period.
record for the same
m (1990 to current)

l.
or the same period.
al 66%, La Niña 4%

*For information about percentiles, see https://longpaddock.qld.gov.au/forage/videos/understanding-percentiles-in-climate-data

Management considerations due to the above conditions

Maintaining too many stock may significantly constrain livestock condition and seriously impact on the pasture base with increased erosion risk. Considering agisting/selling livestock to match available feed. Monitor seasonal outlooks on a regular basis. Have a plan to reduce stock numbers

FORAGE REPORT: GROUND COVER

http://www.longpaddock.qld.gov.au/forage   May 12, 2020   Lot on Plan: 1OC57,4835CP858256,3RP941848,4SP233424   Label: spyglass

Queensland Government

Introduction

This report presents three ground cover information products: (i) a ground cover map for the chosen month; (ii) a minimum ground cover map for the period 1990 to 2016; and, (iii) a graph showing the historical time series of seasonal ground cover. The maps and historical time series graph are generated from the ground cover products which are produced by the Queensland Government's Remote Sensing Centre using Landsat satellite image data from the United States Geological Survey.
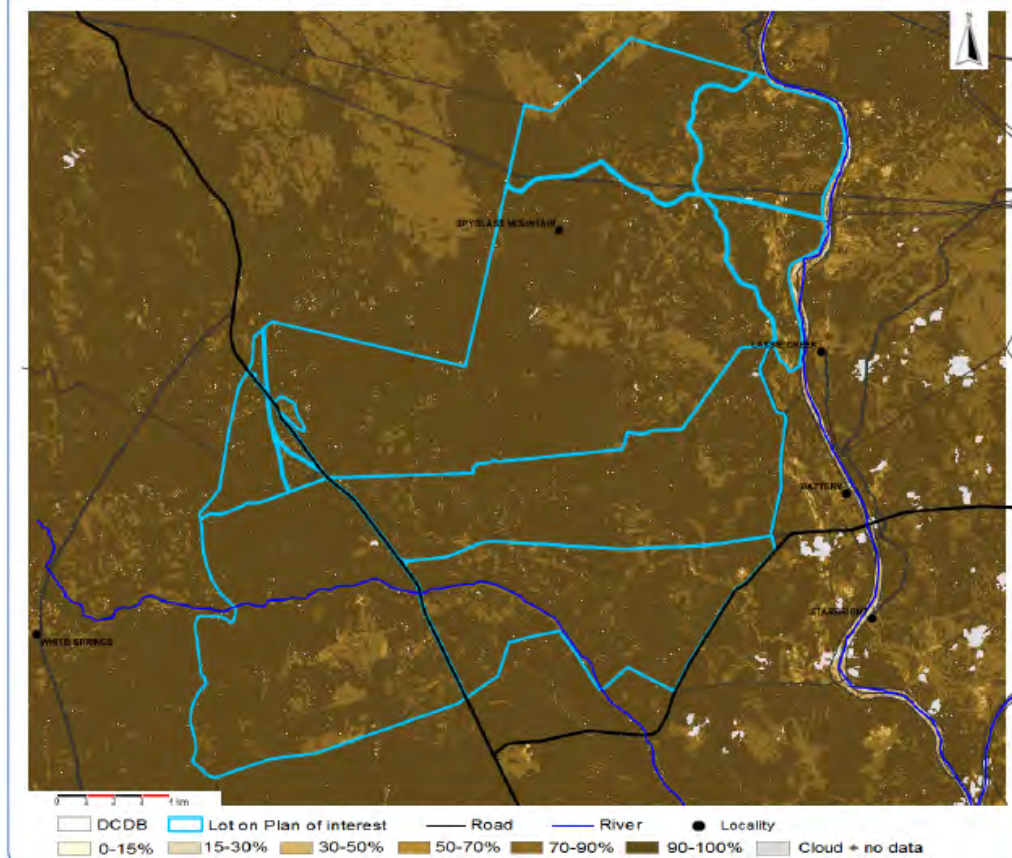
Background information of the Lot on Plan

Latitude/longitude: -19.42/145.73	Local government: Charters Towers Regional
Total land area : 35336 ha	Average woody vegetation cover: 14.9%
Long-term annual mean temperature : 23.2 °C	Long-term annual mean rainfall : 591.3 mm
Last 12-month rainfall : 430.5 mm	Last month rainfall: 20.8 mm

Location map

Ground cover map (The image is for April 2020)

Legend: DCDB | Lot on Plan of interest | Road | River | Locality
0-15% | 15-30% | 30-50% | 50-70% | 70-90% | 90-100% | Cloud + no data

Ground cover map summary

The monthly ground cover map shows the level of ground cover for areas on the Lot on Plan with less than 60% tree cover. The image is for April 2020. The percentage of the total area of the Lot on Plan for 6 ranges of ground cover levels are summarised below:

Cover levels	<15%	15-30%	30-50%	50-70%	70-90%	>90%
Percentage out of the total area	0.0	0.0	0.1	0.7	13.7	85.6

GE REPORT: PASTURE GROWTH ALERT

gpaddock.qld.gov.au/forage   May 12, 2020   Lot on Plan: 1OC57,4835CP858256,3RP841848,4SP233424   Label: spyglass

Queensland Government

over percentile map for Apr 2020 (median total cover percentile: 90th)
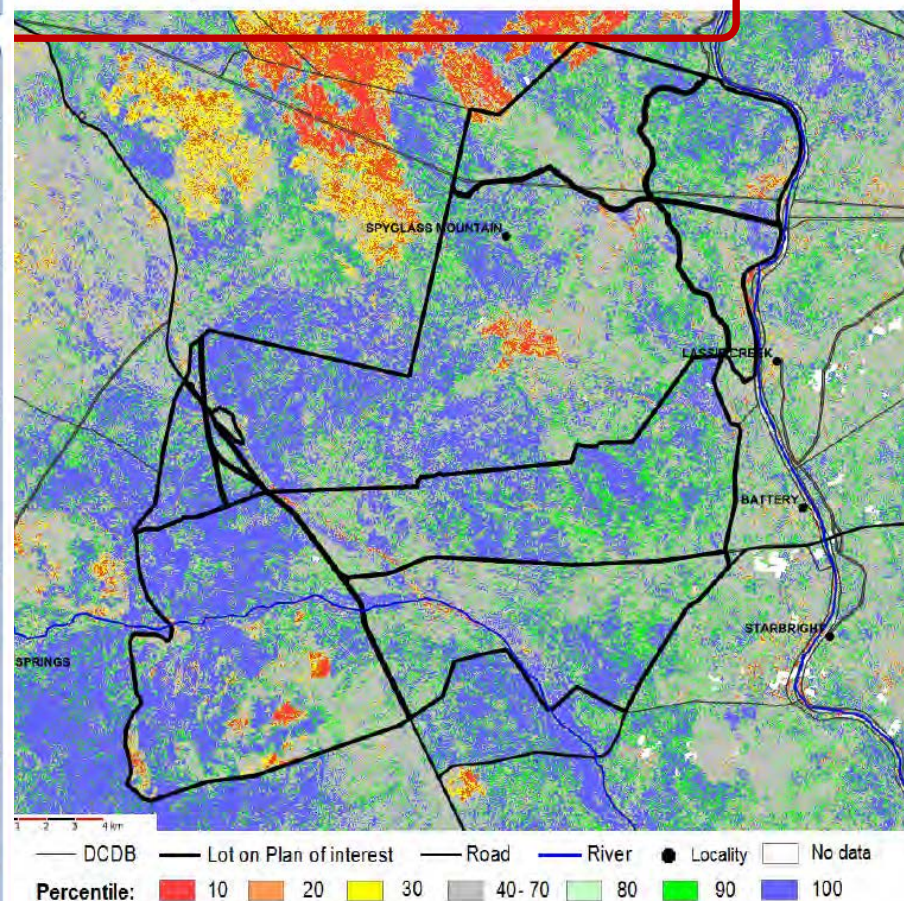
DCDB — Lot on Plan of interest — Road — River • Locality | No data

Percentile: 10 | 20 | 30 | 40-70 | 80 | 90 | 100

FORAGE REPORT: PASTURE GROWTH ALERT

http://www.longpaddock.qld.gov.au/forage   May 12, 2020   Lot on Plan: 1OC57,4835CP958256,3RP841848,4SP233424   Label: spyglass

Queensland Government

Introduction

This report presents, for the selected Lot(s) on Plan, the risk of reduced pasture growth and pasture resilience for the next 6 months. The purpose of the report is to provide an assessment on pasture growth and resilience through assessing information of the last 12 months pasture growth, the pasture growth forecast for the next 6 months and the most recent monthly total cover. Pasture growth forecasts are produced using the GRASP pasture growth model in combination with the rainfall forecasts and the current pasture conditions with regard to soil moisture, nutrients and ground cover. The rainfall forecasts are developed from the El Niño – Southern Oscillation (ENSO) forecasts provided by the International Research Institute for Climate and Society (IRI), Columbia University, New York (Barnston, et al. 2004). The information presented in this report can be used to facilitate stocking management.

Background information

Total land area: 35336 ha
Median total cover percentile: 90th
Last 6-month pasture growth: 1210 kg/ha
Last 12-month pasture growth: 1330 kg/ha
Long-term* annual pasture growth: 2120 kg/ha
*1890-2020

Mean foliage projective cover (FPC): 14.9%
Current month to date rainfall: 5 mm
Last 6-month rainfall: 377 mm
Last 12-month rainfall: 426 mm
Long-term* annual mean rainfall: 617 mm

Location map

Pasture growth and resilience risk for the next 6 months (May 2020 to Oct 2020)

Moderate risk   Moderate high risk

Low risk   High risk

Very low risk   Very high risk
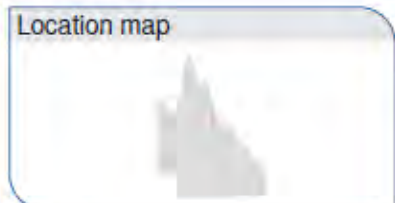
Summary for the selected area (Lot(s) on Plan)

The reduced pasture growth and resilience risk level for the Lot(s) on Plan of interest in the next 6 months is **moderate high**. This is based on the rainfall and pasture growth in the last 12 months, the rainfall and pasture growth forecast for the next 6 months and the last month total cover percentile level.

The key factors are as follows:

- Pasture growth in the last 12 months was **lower than the 33rd percentile (bottom tercile)** of the long-term record for the same period.
- The pasture growth forecast for the next six months is **between the 33rd and 66th percentile (middle tercile)** of the long-term record for the same period.
- The median total cover for Apr 2020 across the Lot(s) on Plan is **higher than the 66th percentile (top tercile)** of the long-term (1990 to current) record for the same month.

Other relevant factors are:

- Rainfall in the last 12 months was **lower than the 33rd percentile (bottom tercile)** of the long-term record for the same period.
- The rainfall forecast for the next six months is **between the 33rd and 66th percentile (middle tercile)** of the long-term record for the same period.
- The forecast of ENSO probability for the next three months (starting from current month) are: **El Niño** 30% (likely dry), **Neutral** 66%, **La Niña** 4% (likely wet).

*For information about percentiles, see https://longpaddock.qld.gov.au/forage/videos/understanding-percentiles-in-climate-data

Management considerations due to the above conditions

Maintaining too many stock may significantly constrain livestock condition and seriously impact on the pasture base with increased erosion risk. Considering agisting /selling livestock to match available feed. Monitor seasonal outlooks on a regular basis. Have a plan to reduce stock numbers further and pre-determined decision dates for this action. It is easy to drift into a bad situation given the current conditions and outlook.

Pasture

Pasture

Accumulated pasture growth (kg/ha)
3000
2500
2000
1500
1000
500
0

Accumulated pasture growth (kg/ha)
3000
2500
2000
1500
1000
500
0

FORAGE

Request FORAGE Property Reports

About FORAGE

Report Examples

Indicative Land Type Report

Rainfall and Pasture Reports

Ground Cover Report

Drought Assessment Information

Rainfall and Pasture Growth Outlook Report

Foliage Projective Cover Report

Fire Scar Report

Regional Climate Projections Report

Erodible Soils Report

Crop Frequency and Type Report

Satellite Imagery

Awareness Videos

Home   Request FORAGE Property Reports

Request FORAGE Property Reports

Select FORAGE report(s)

Indicative Land Type ✕   Rainfall and Pasture ✕   Rainfall and Pasture by Land Type ✕

Specify location using lot on plan

Enter lot(s) on plan (e.g. 3MZ594) and select from list. A maximum of 30 lots on plan are allowed

Enter lot(s) on plan

3MZ594 ✕

Quick guide for map control :

Click on + or - to zoom into the area of your property

Use the search bar to search for a property name, address, place, road intersection, coordinate, etc.

To search for a coordinate, separate latitude and longitude with a comma (e.g. -24, 1234, 146, 1234)

To search for a road intersection, type in 'xxxx road and xxx road' format.

Click on the ⊕ to locate your current position (note: limited by device hardware and/or GPS signal strength. Computers without GPS receiver will not get accurate location.)

Click on the lot to select or remove.

Brian Pastures R

PLACES AND ADDRESSES

Brian Pastures Rd, Ban Ban, Queensland...

Brian Pastures Rd, Campbell Creek, Que...

Brian Pastures Rsch Stn, 819 Brian Past...

3MZ594

Local Government Area: North Burnett Regional

Locality: Ban Ban

Area: 1659.585 ha

Parcel Type: Lot Type Parcel

Tenure: Freehold

Surveyed: Y

Remove

Subscription Service (Free)

Set the subscription interval to receive report regularly. (e.g. select '3 months' and you will receive a report every 3 months) Set it to 'One-off' to receive a report for this time only. This is a free service.

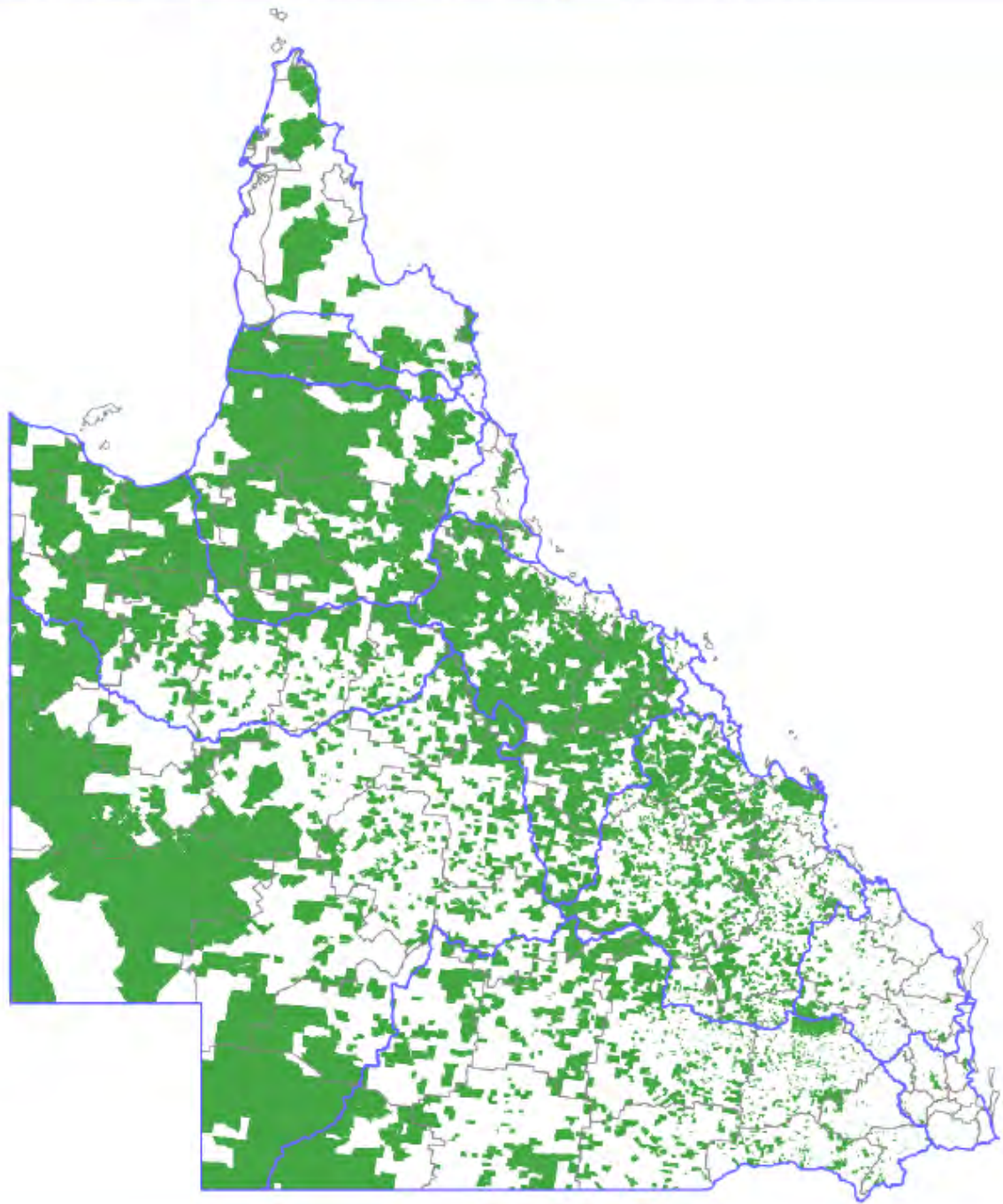**Pasture Growth Alert Report**

| One-off | 1 month | 2 months | 3 months |

Delivery information

*Email   grant.stone@qld.gov.au   Label   Brian_Pastures

Submit

*Required information

- >70
- fro
- cur
- >40

Requests

2011

60000

40000

20000

0

Aim:

• to automate calculation of estimated Long-Term carrying capacity – lot/plan and property

Uses:

• general discussion/information for graziers, consultants on LTCC

• check of stock numbers vs LTCC - BMP

Progress:

• Prototype complete

• Testing continues (generally good agreement)

• Release late June 2020

• Guides, webinar, video

Queensland Government

ptation program

Summary of estimated LTCC (fully watered)

Land condition	LTCC (AE)	LTCC (Ha/AE)
A	3709 (3385 to 4033)	9.6 (8.7 to 10.5)
B	2782	12.8
C	1669	24.0
D	742	48.0

Estimated long-term average feral animal and kangaroo density for selected property or areas: 318 AE

Location map

Estimated LTCC (AE) for selected areas under best (A) land condition

dcdb
rivers
roads
Property/Paddocks
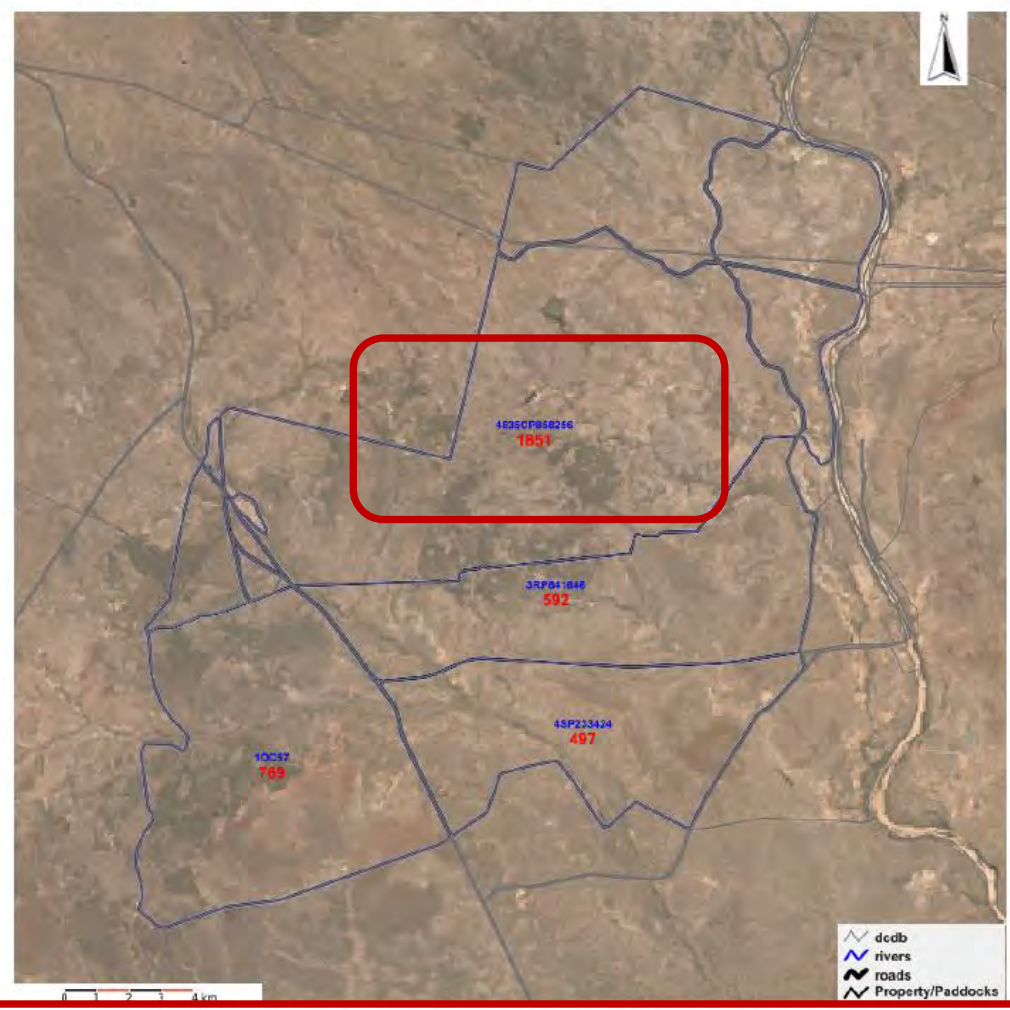
About the report

This report presents the estimated **"long-term carrying capacity"** (LTCC), for the property of interest. LTCC in this report refers to "number of livestock

"My FORAGE" online property mapper (in-dev)

LongPaddock - My FORAGE Map Project: Default Scenario: Default Back

My FORAGE will:

- import property/paddock shapefile/kml
- draw property boundary plus establish/split paddocks
- split lot/plans
- add waters, gates, exclusion zones
- change land types, pasture spp. and fertility
- analyses for "what if" scenarios
- save a project
- export files (shp, kml, GeoJSON)
- order all FORAGE reports direct from program
- due 2021

Pasture Biomass estimates from satellite imagery (in-dev.)

lection

Drone - in action

Four seasons of Fractional Cover - by VegMachine

Spring 2019

High SR

Summer 2019

High SR

Non-Green (NG)

NG
NG Mix
NG & Bare   NG & Green
Bare Mix   Green Mix
Bare   Green & Green   Green

Green

Autumn 2020

High SR

//vegmachine.net/

44.20654
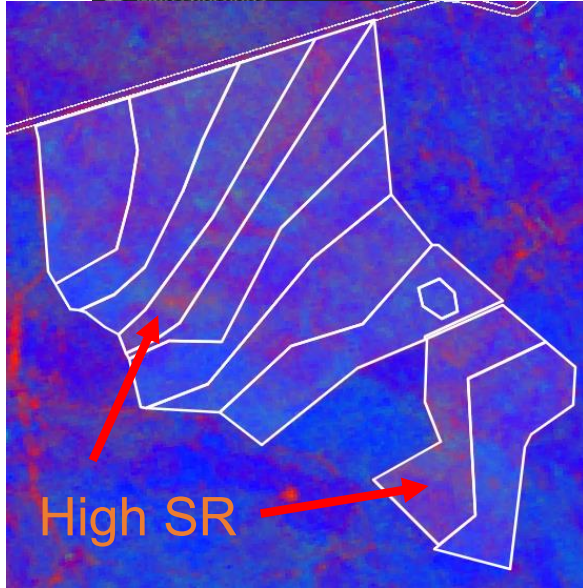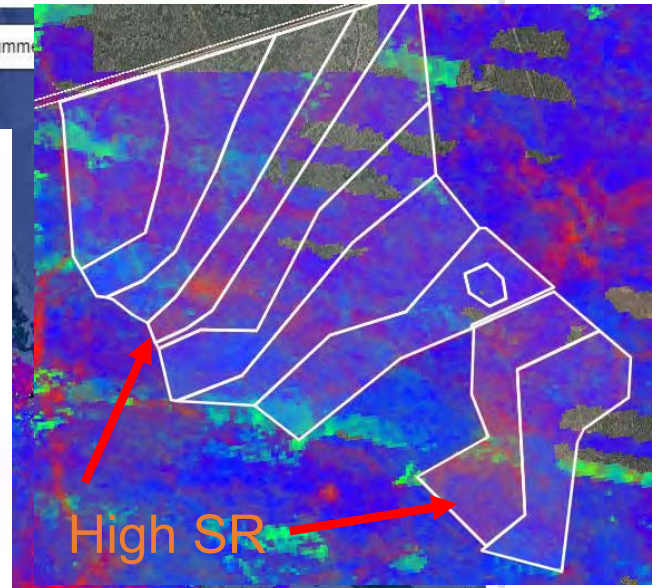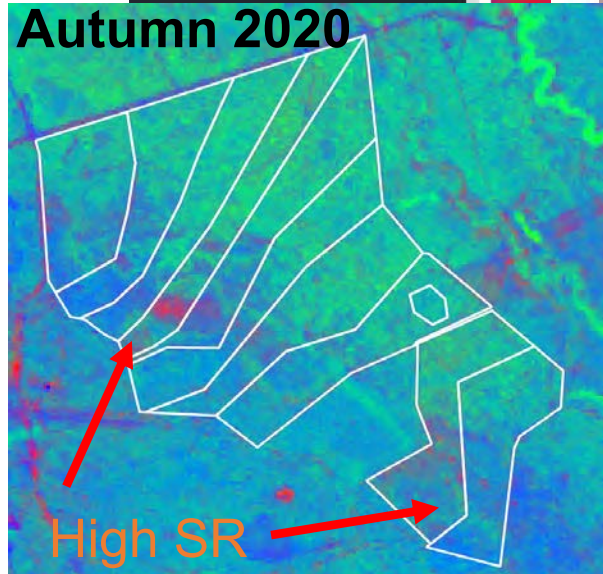
Dry season

WINTER IS COMING

Pasture digestibility (DMD) impact on animal LWG (in dev)

Wambiana Pdk 1 ALW and DMD
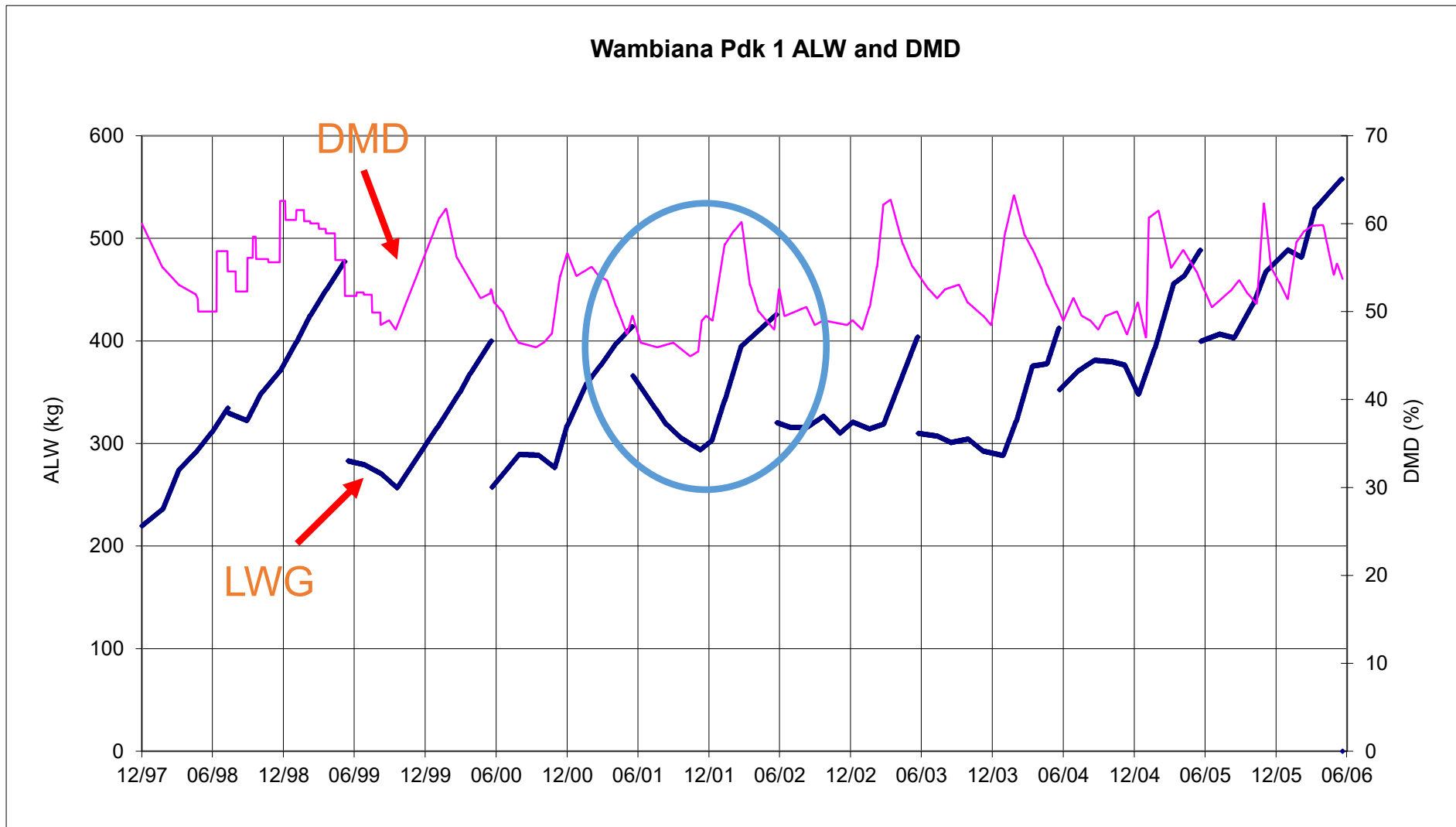
Common industry question:

Will (and when) cattle require N-supplementation after the wet season ends?

Can we build a monthly model to report from the end of May with forecasts of pasture quality (Crude Protein and Digestibility) transitioning into the dry season?
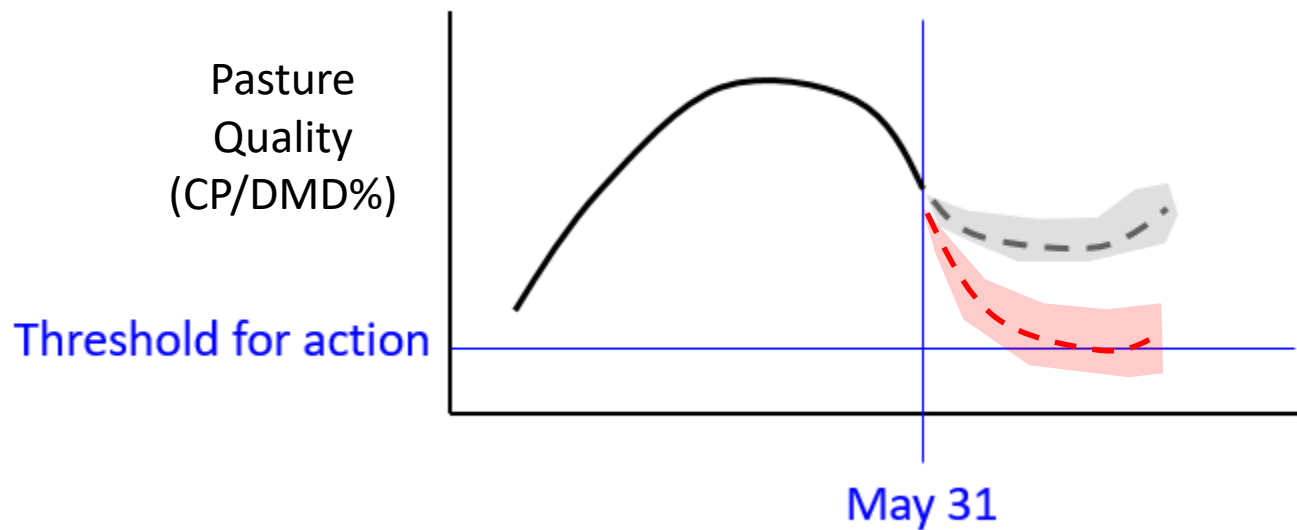
Forecasting liveweight gain (ADG) - (In Dev.)
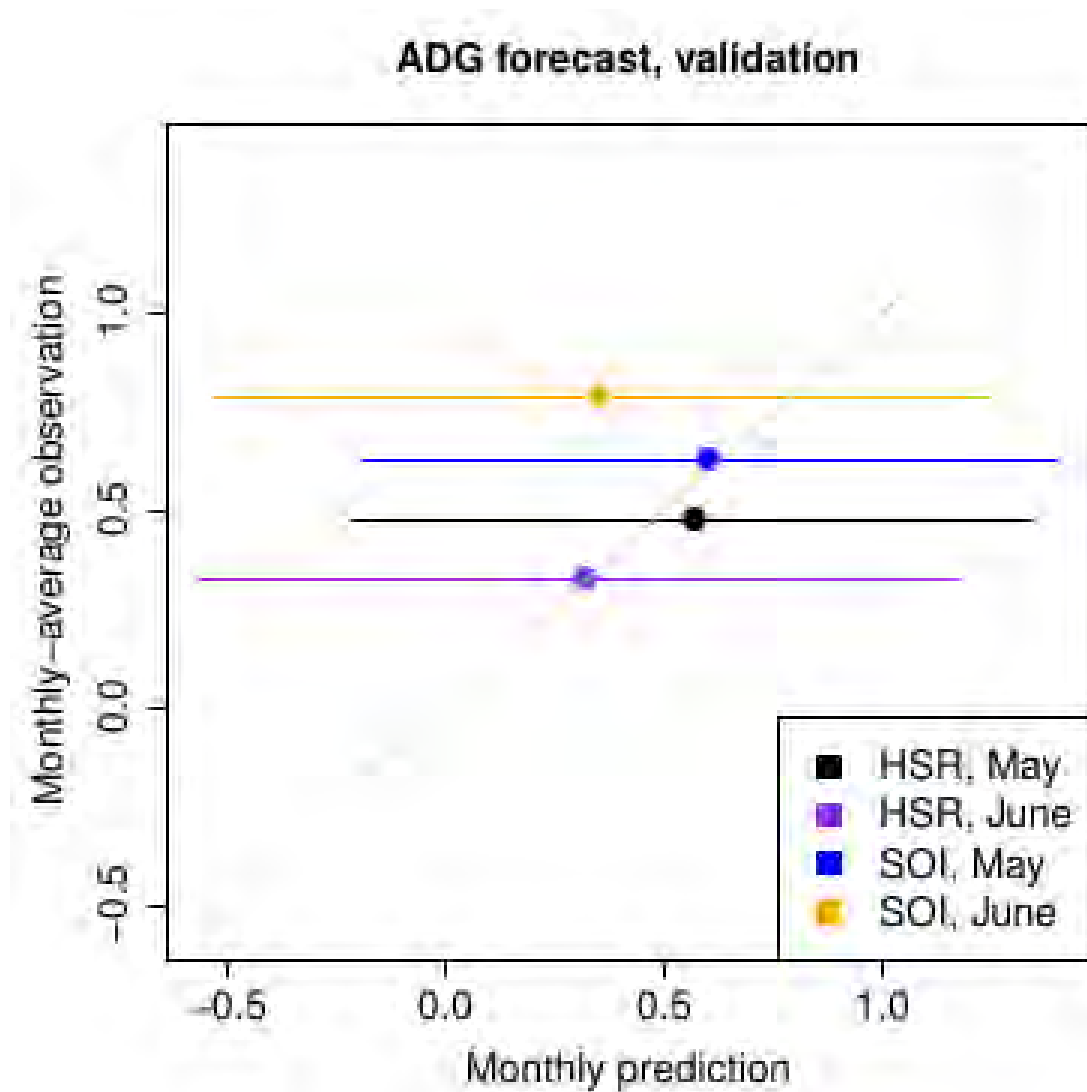
Last word(s)

- we turn complex concepts into useful products for land management decisions
- more products in development for Long Paddock
- more communication videos and visualisations planned
- contact eBeef officers (NRMs & DAF) for product info & usage
- other products with similar technology available
  - but, ours are free and in for the long haul!....
- to stay informed - **go to Long Paddock products!**