

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](http://www.longpaddock.qld.gov.au)



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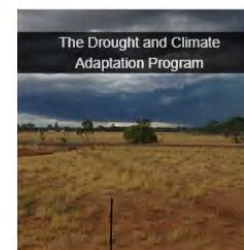
14 Nov, 2018

Average SOI value for the last 30 days

+2.43

## Climate risk information for rural Queensland

A Queensland Government initiative providing seasonal climate and pasture condition information to the grazing community



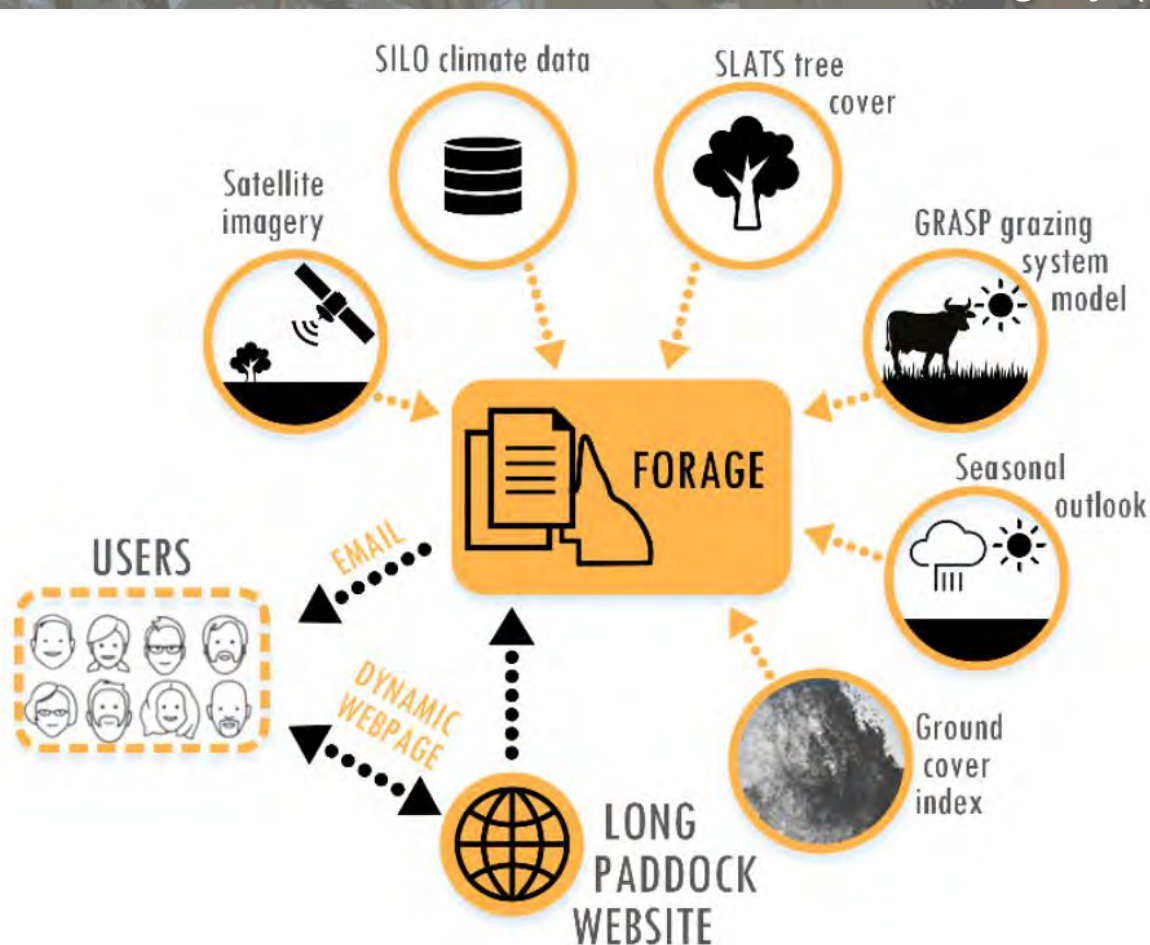
- The FORAGE system
- Crop Type & Frequency report (new info)
- Fire Scar report (new)
- Pasture Growth Alert report (prototype)
- Safe Carrying Capacity report (prototype)
- Accessing FORAGE reports
- Subscribing to FORAGE reports (free)
- FORAGE support
- Summary and wrap-up
- Funded by DCAP and REEF programs





## FORAGE:

- is an online information system accessed through the Long Paddock website: [www.longpaddock.qld.gov.au/forage](http://www.longpaddock.qld.gov.au/forage)
- generates and delivers 'property-scale' customised reports on climate, pasture, ground cover, land condition indicators and satellite imagery (Qld. only).
- currently has
- is used by
- can facilitate
- report information for monitoring &

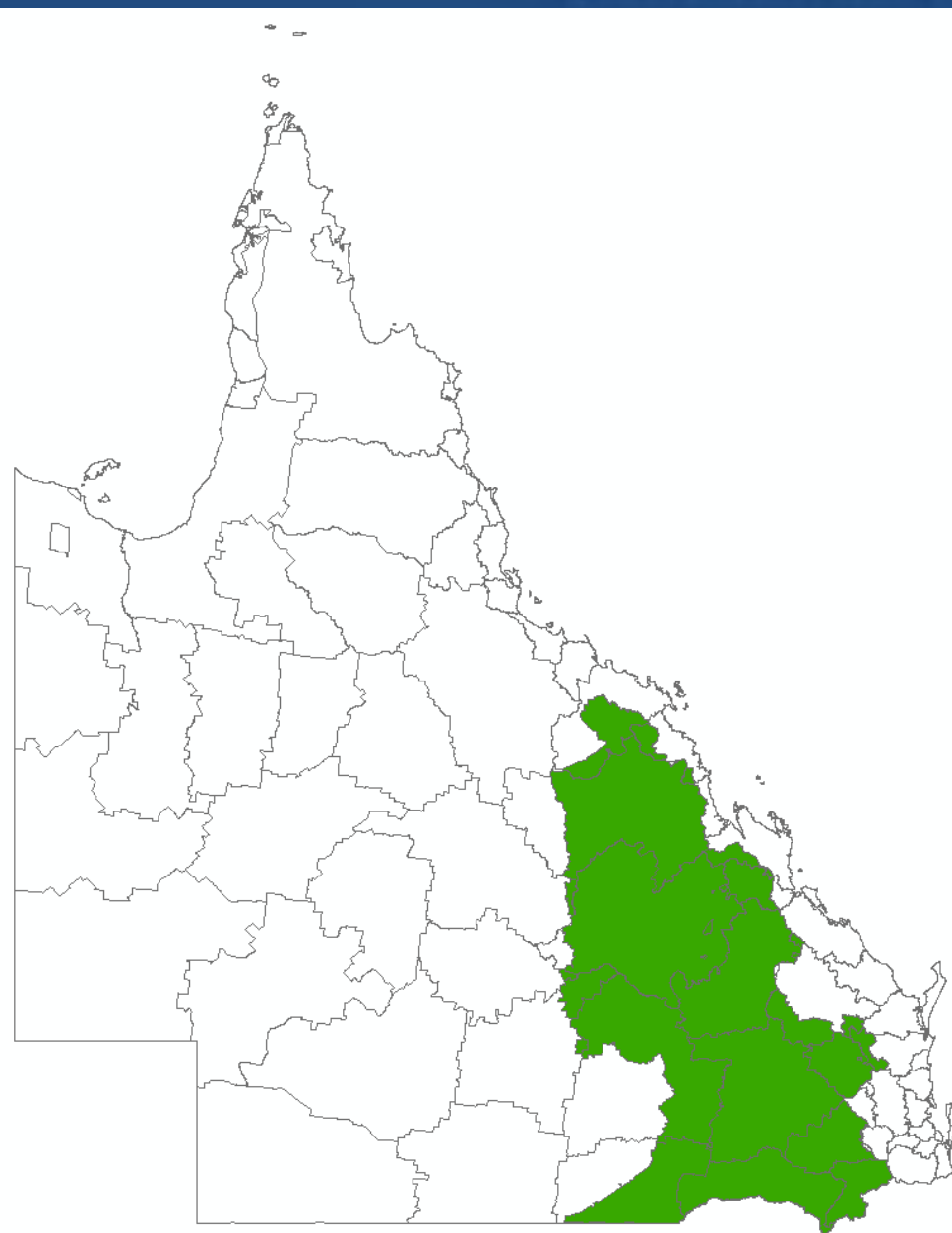


## Provides:

- 10 year crop frequency and broad crop type
- Summer (Feb) / winter (Sept) frequency
- **Seasonal frequency** is further separated into 2 groups
- **winter season:** cereal crop (e.g. wheat, chickpea)
- **summer season:** coarse-grain & pulse (e.g. mungbean); or cotton crop
- frequency maps – modis (250m)
- seasonal Images - Landsat satellite
- initially to identify high value cropping areas
- **Extent:**

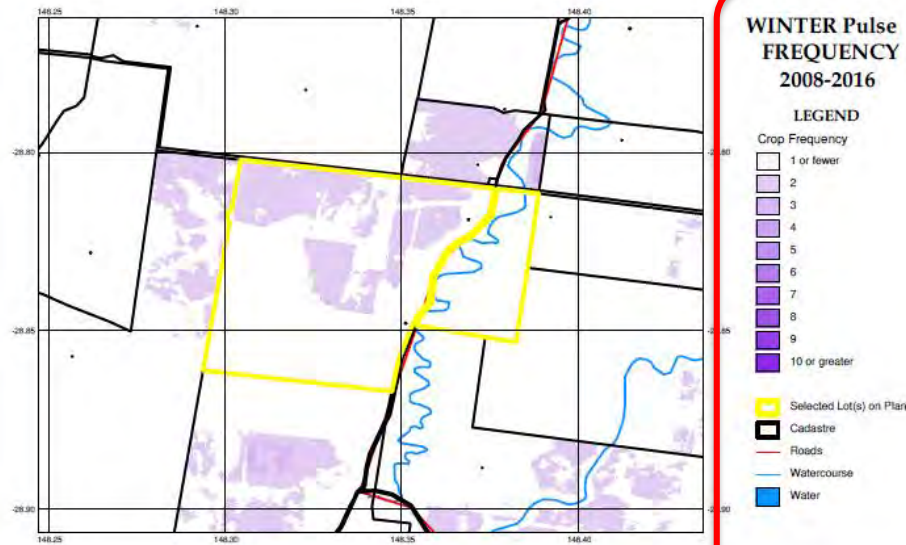
**Western Cropping Zone**

**= Darling Downs (S) to cent. Highlands (N.)**





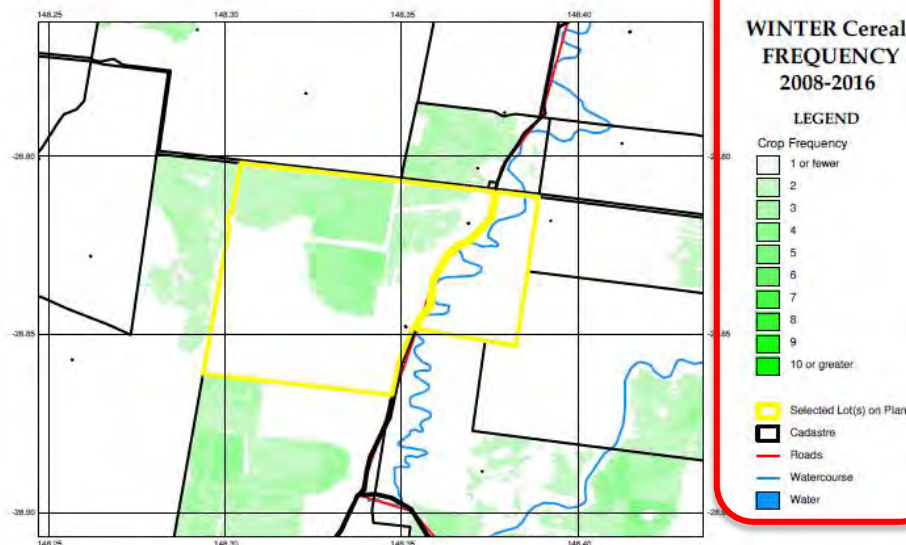
Estimated frequency map for winter (September) pulse crop (2008 - 2017)



**Page 1:** Report introduction  
Total crop frequency map  
map and image interpretation

**Page 2:** Summer/winter  
frequency map

Estimated frequency map for winter (September) cereal crop (2008 - 2017)



**Page 3:** Summer grain/cotton  
frequency map

**Page 4:** Winter pulse/cereal  
frequency map



# Summer (Feb) / winter (Sept.) images

Department of Environment and Science

February (left) and September (right) images for 2008

February (left) and September (right) images for 2009

February (left) and September (right) images for 2010

February (left) and September (right) images for 2011

February (left) and September (right) images for 2012

February (left) and September (right) images for 2013

**Summer**



**Winter**



.....continues to final year nominated

**Updated:** every 6 months (i.e. summer, winter)

**Access:** 6-monthly, property purchase/sale, identify high-value cropping







# Fire Scar report (Pages 2/3)

## FORAGE REPORT: FIRE SCAR

<http://www.longpaddock.qld.gov.au/forage>

November 17, 2018

Lot on Plan: 11WG840323, 48SP151928, 110USL4220 etc.

Label: firescar

### Fire scars in 2018

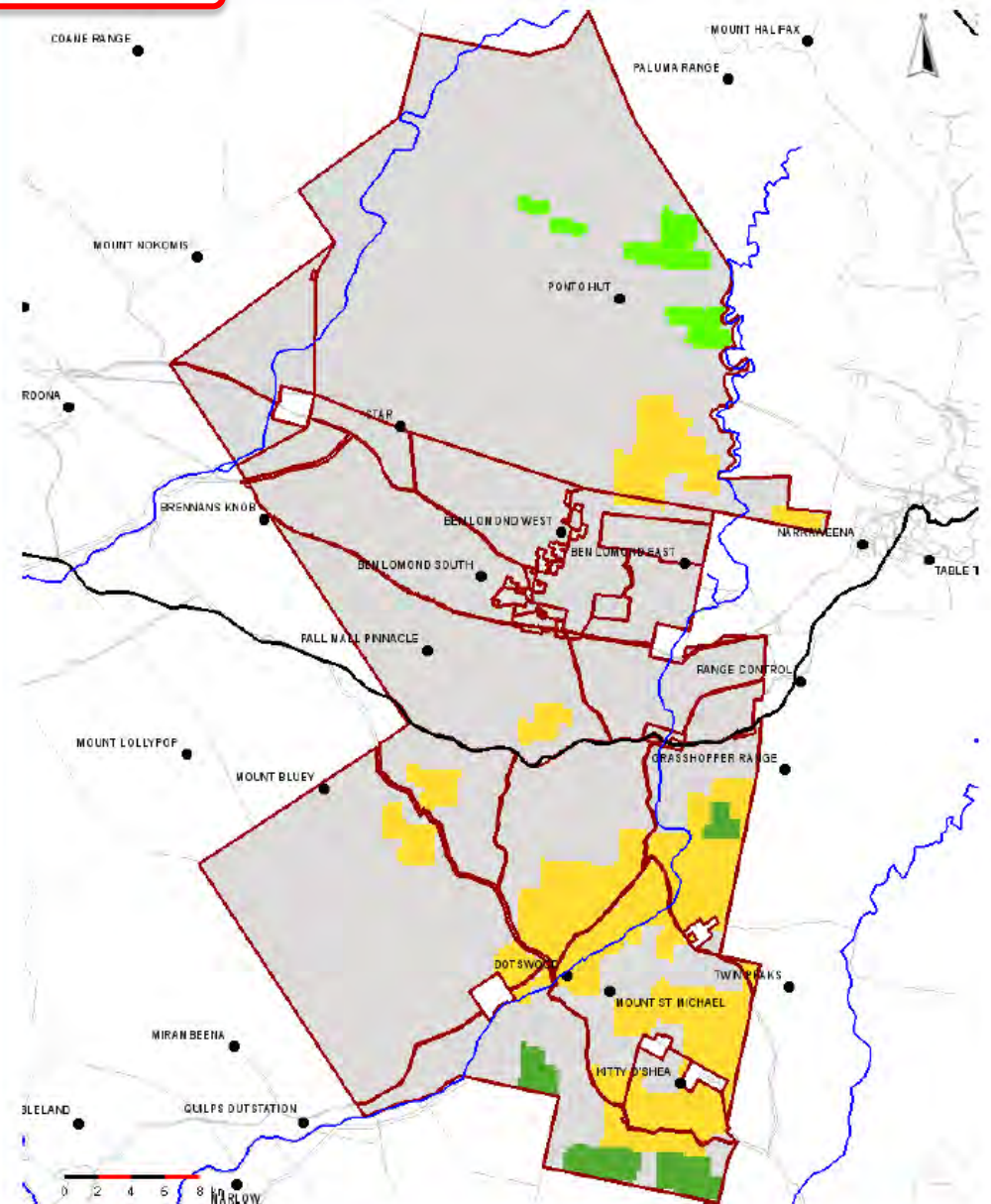
## Page 2:

"years since burnt" map

- how long ago the latest fire scar was detected
- check on woody weed control, pasture availability

## Page 3:

- "fire scars detected in each month" for current year map
- showing month of detection

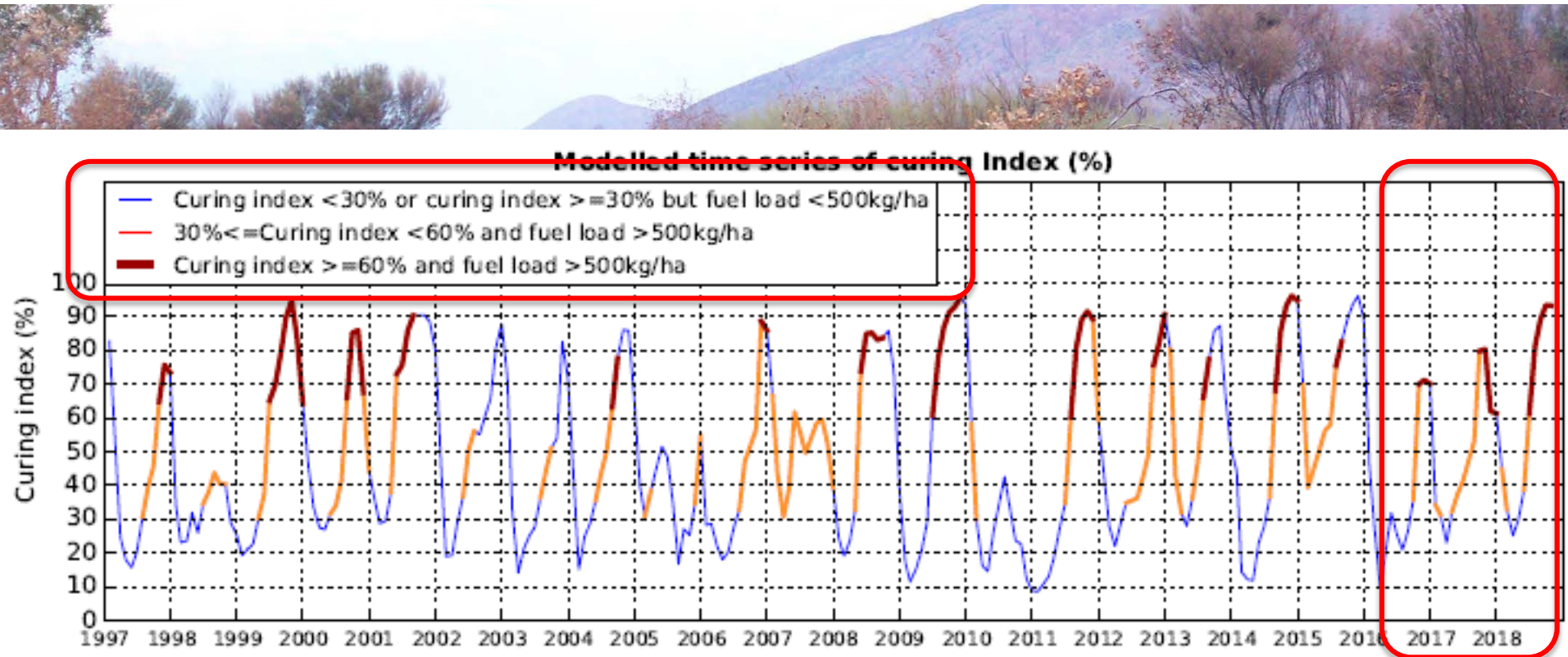


Fire scars detected in different months:

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
No mapping undertaken No fire scar detected DCDB Lot on Plan of Interest Road River Locality

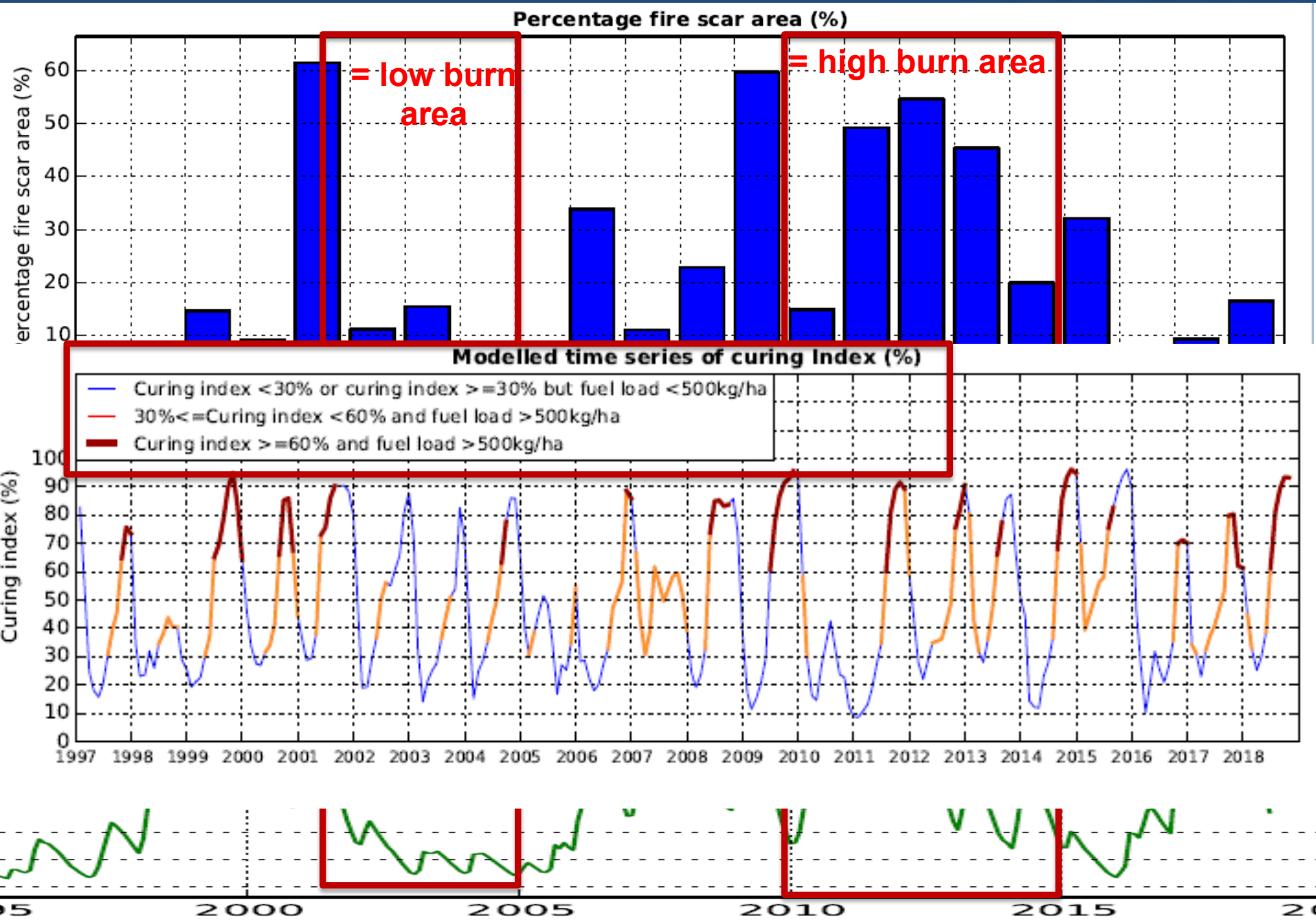


a historical time series of **curing index** and **fuel load** for the property  
– reveals what curing/fuel load zone fires may have been in (low, moderate, high fire potential)



**Updated:** ~weekly      **Access:** adhoc - annual, sale/purchase history, weed control, tree/grass balance, fuel hazard reduction







## FORAGE REPORT: PASTURE GROWTH ALERT (prototype)

<http://www.longpaddock.qld.gov.au/forage>

November 21, 2018

Lot on Plan: 1OC57

Label: after

### Introduction

This prototype report presents, for the selected Lot on Plan, the risk of seasonal 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 risk through assessing information of last 6 - 18 months pasture growth, current season total ground cover and pasture growth outlook for next 6 months. Pasture growth outlooks are produced using the GRASP pasture growth model in combination with the rainfall outlooks and the current pasture conditions with regard to soil moisture, nutrients and ground cover. The rainfall outlooks are developed from the El Niño - Southern Oscillation (ENSO) forecasts provided by the International Research Institute for Climate and Society, New York (IRI) (Barnston, *et al.* 2004). The information presented in this report can be used to facilitate stocking management.

### Background information

Latitude/longitude: -19.49, 145.68

Total land area: 6920 ha

Last 6-month pasture growth: 1590 kg/ha

Last 12-month pasture growth: 1590 kg/ha

Long-term\* annual pasture growth: 1890 kg/ha

\* 1900-2018

Mean foliage projective cover (FPC): 17.5%

Current month to date rainfall: 9 mm

Last 6-month rainfall: 103 mm

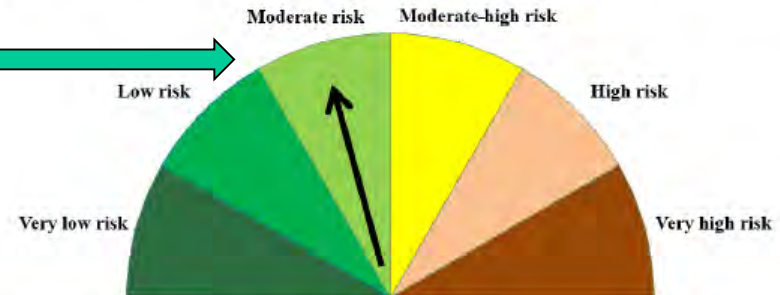
Last 12-month rainfall: 103 mm

Long-term\* annual mean rainfall: 582 mm

### Location map



### Pasture growth and resilience risk for the next 6 months (Nov 2018 to Apr 2019)



### Summary for the selected area (Lot on Plan)

The reduced pasture growth and resilience risk level for the Lot on Plan of interest in the next 6 months is **moderate**. This is based on the historical rainfall and pasture growth in the last 12 months, the current total cover percentile level and the forecasted rainfall and pasture growth for the next 6 months. The key indicators are as follows:

- Pasture growth in the last 12 months was **between 33th and 66th percentile** of the long-term record for the same period.
- The current mean seasonal total cover across the Lot on Plan is **between 33th and 66th percentile** of the long-term (1990 to current) record for the same season.

### Other relevant indicators are:

- Rainfall in the last 12 months was **higher than 66th percentile** 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 70% (likely dry), Neutral 30%, La Niña 0%** (likely wet).
- The forecasted rainfall for the next six months is **between 33th and 66th percentile** of the long-term record for the same period.

### Management considerations due to the above conditions

Monitor stocking numbers and adjust to ensure end of season dry reserve and adequate ground cover is conserved. Keep monitoring seasonal outlooks for adverse forecasts.

Page 1:

Introduction

Background information

Location map

6 mth Pasture Growth resilience risk indicator (v.low - v.high risk)

derived by 3-point decision analysis – see in “Summary” below

Summary - tercile position for: last 12-mth growth; ground cover, growth outlook (see also page 2)

additional 3-points for context

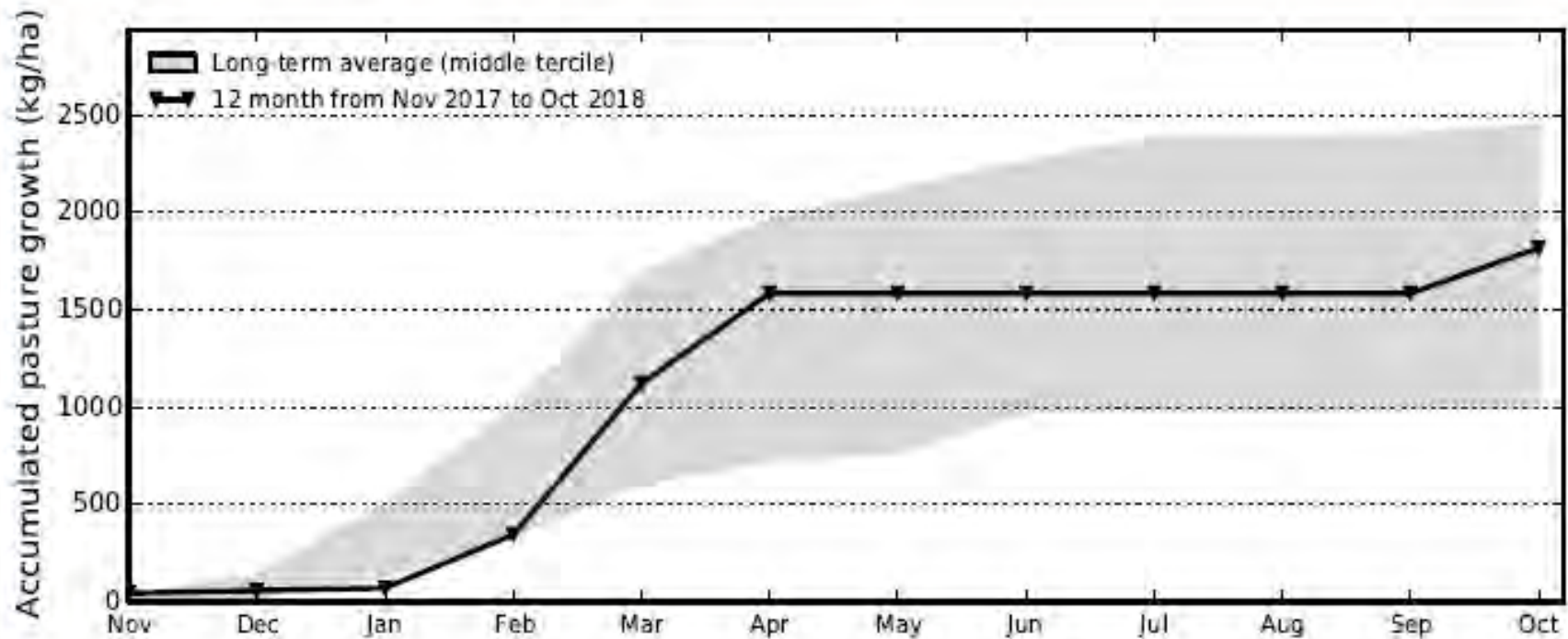
management considerations – sensitive to “level of risk”



### Pasture growth history - accumulative

- moving 12-month period
- shaded area is middle tercile = average long term growth
- 12 months accumulated growth (black line)
- matches 12 months in page 1 summary
- Question: where does last point sit? (upper/middle/lower tercile)

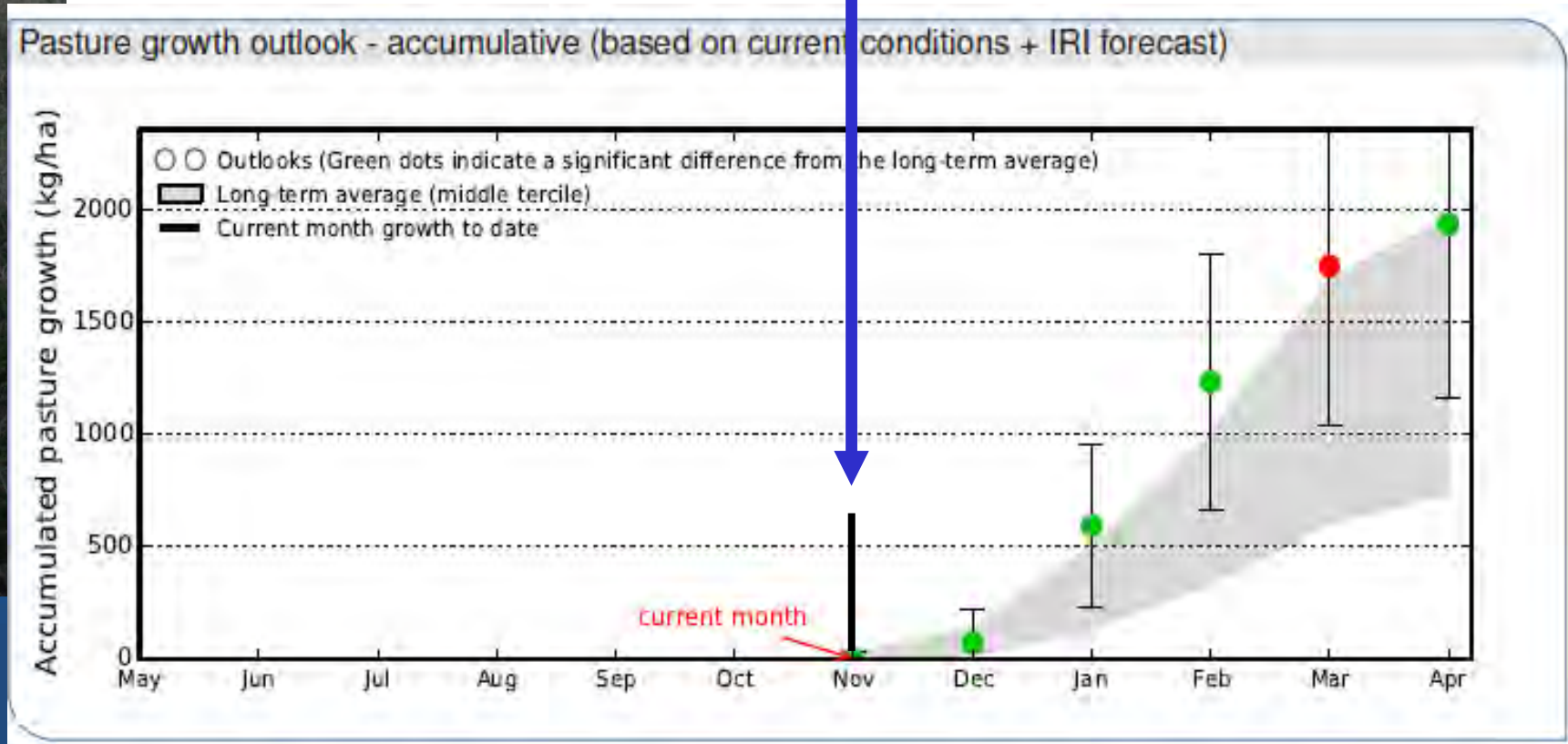
Pasture growth history - accumulative





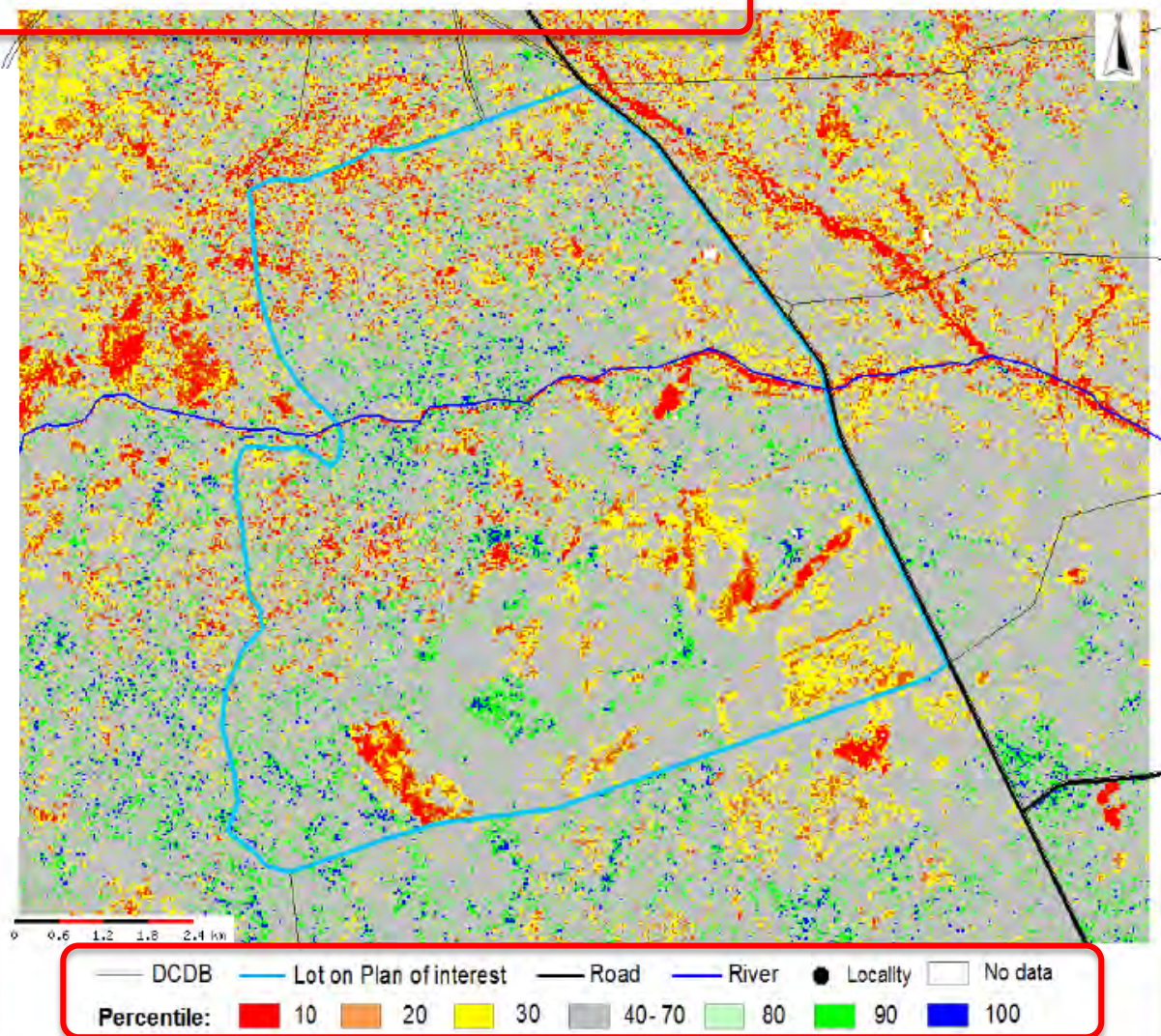
### 6 month Pasture Growth outlook moving 6-month period

- shaded area is middle tercile = 6 mth long term ave growth
- dots are forecast of 6-months accumulated growth (and est. range)
- green/red indicates if different from long term average
- current month growth (vertical black line)
- Question: where does last dot sit? (upper/middle/lower tercile)





Total cover percentile map for period from Jun 2018 to Aug 2018

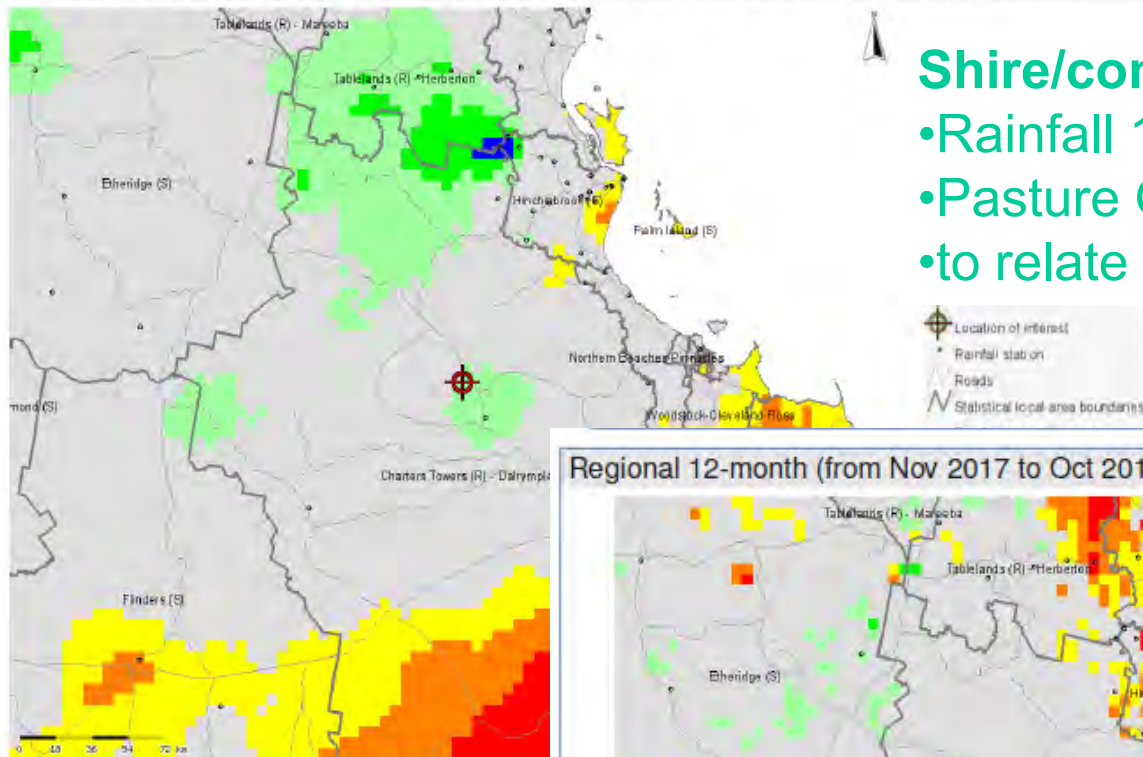


## Provides:

- seasonal (3-mth) total cover percentiles - relative to history
- average of visible pixels (not cloud) used in page 1 decision analysis
- Landsat 30m pixel size
- can identify hotspots for addressing management



Regional 12-month (from Nov 2017 to Oct 2018) rainfall relative to historical records

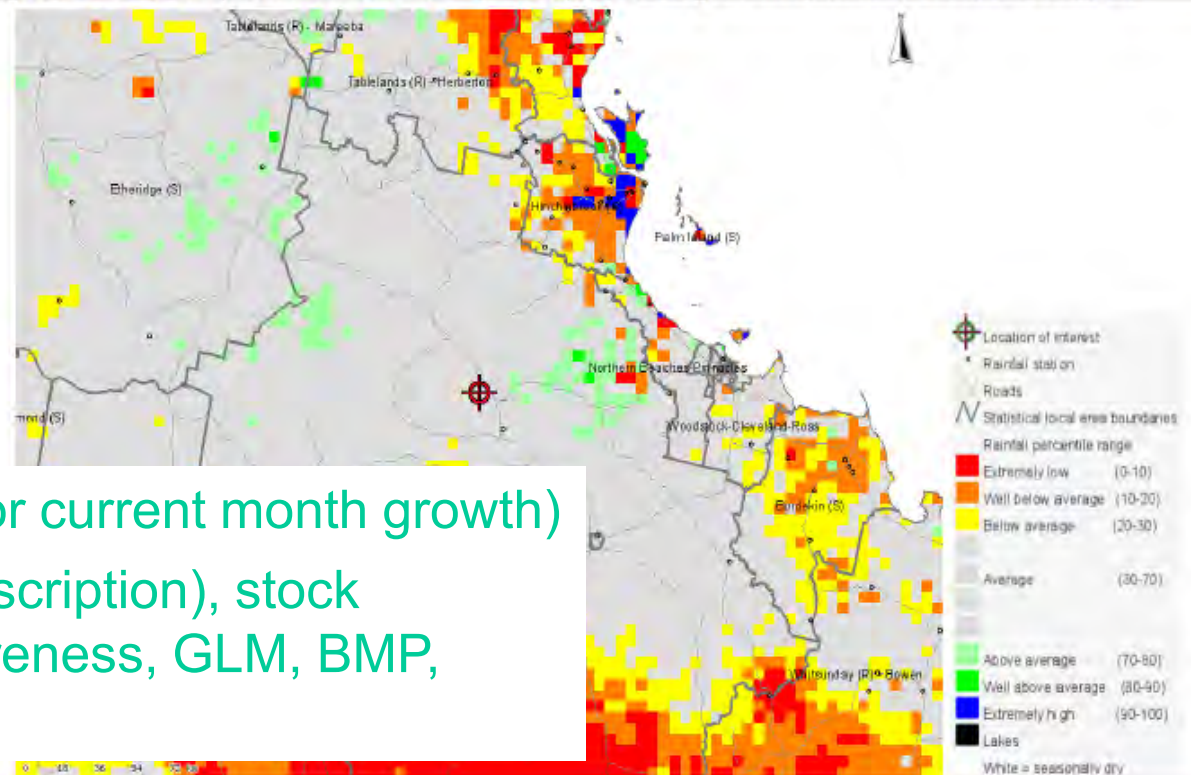


## Shire/contextual view:

- Rainfall 12-mth percentile
- Pasture Growth 12-mth percentile
- to relate this 12-mths relative to history



Regional 12-month (from Nov 2017 to Oct 2018) pasture growth relative to historical records



**Updated:** monthly (daily for current month growth)

**Access:** 1-3 monthly (subscription), stock adjustments, drought awareness, GLM, BMP, purchases/sales

## Aim:

- to automate calculation of safe carrying capacity at paddock/property scale
- maintain some user control over issues such as land condition state
- use best science available (e.g. optimisation against Landsat green cover).

## Uses:

- general discussion/information for graziers, consultants on SCC
- check of stock numbers vs SCC - BMP
- benefit of area watered with supplementary waters, fencing etc.





# What's used to calculate SCC

Department of Environment and Science

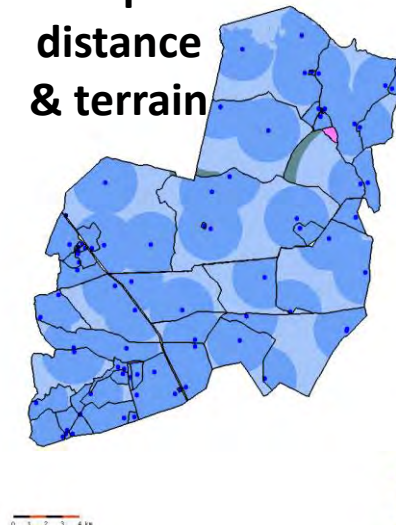
## Paddocks



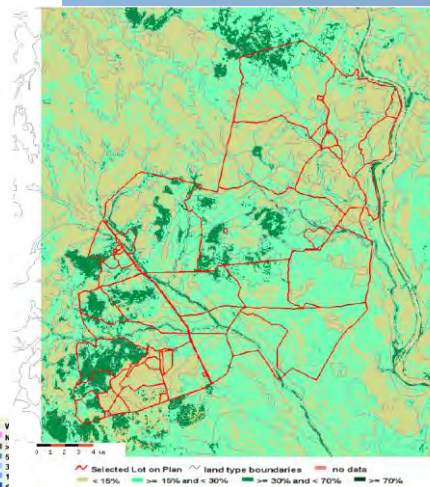
## Land Types



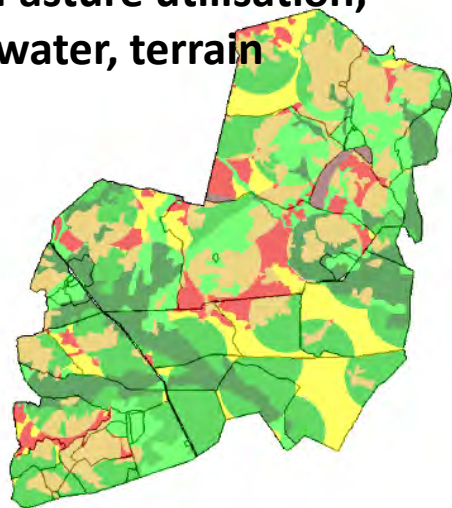
## Water points distance & terrain



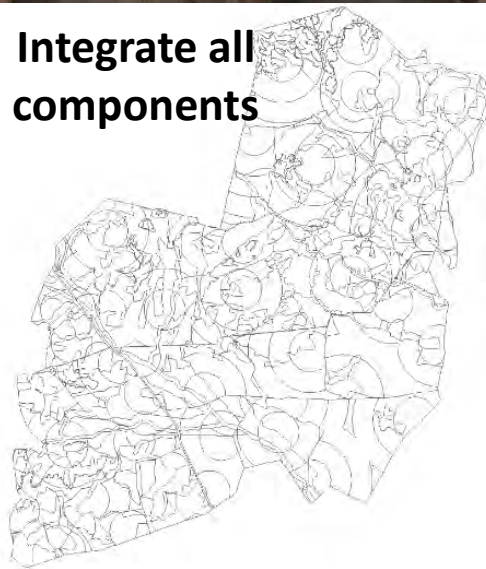
## Tree & woody cover



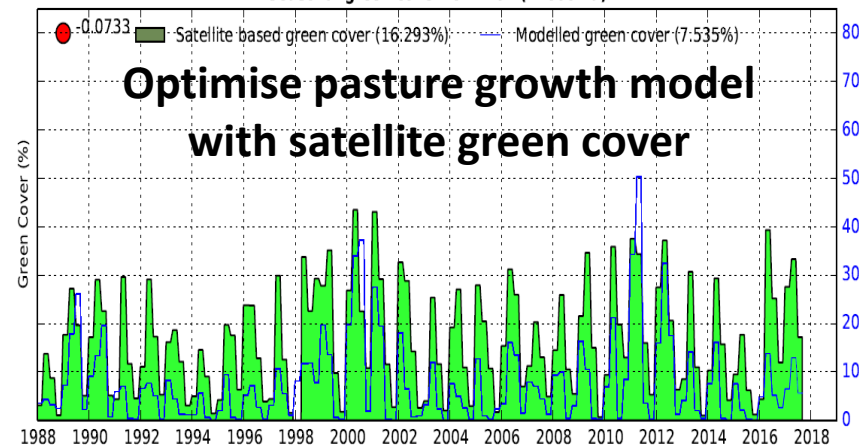
## Pasture utilisation, water, terrain



## Integrate all components



## Seasonal green cover for BD04 (14606 ha)



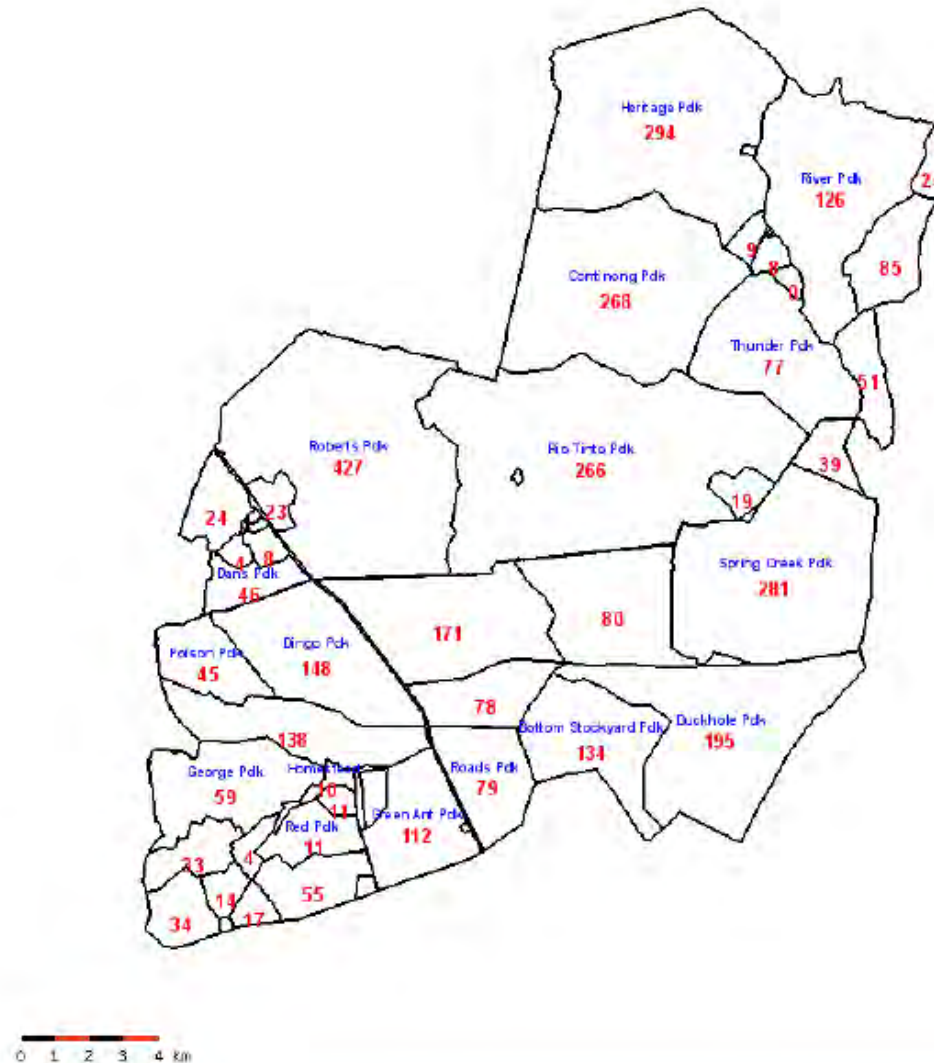
## Optimise pasture growth model with satellite green cover

## Paddock name

Air Strip Pdk  
Arsenic Dam  
Arsenic North P  
Arsenic Pdk  
Arsenic South P  
Bluewater Sprin  
Bottom Stockyar  
Cockatoo Dam  
Cockatoo Pdk  
Continong Pdk  
Continong Yard  
Dans Pdk  
Derricks Pdk  
Dingo Pdk  
Duckhole Pdk  
George Pdk

## Land type name

Brigalow / gidgee	
Goldfields country	
Goldfields country	
Loamy alluvials	
Yellowjacket with	
Narrow-leaved iron	
Box country (BD)	
Narrow-leaved iron	
Box and napunya	
Wetland	
Ranges (BD)	
Lancewood - bend	
Total/mean	



## Summary

The estimated total safe carrying capacity for this property under A land condition is  $3539 \pm 315$  AE, corresponding to  $10.6 \pm 0.9$  ha/AE. The long-term average feral animal and kangaroo density on this property is estimated to be equivalent to 190 AE. The safe carrying capacity under B, C, and D condition is considered to be 75%, 45% and 20% of that under A condition. The annual feed intake for an AE is set as 3285 kg/year.

D

33.3  
74.6  
51.9  
49.6  
34.3  
31.7  
39.7  
25.9  
40.5  
51.0  
53.6  
33.4  
31.1  
46.1  
58.0  
87.0

e growth  
(/year)

24  
03  
13  
90  
67  
12  
99  
06  
06  
77  
07  
77  
24



- you provide lot/plan, assume fully watered → total AE result; or
- current FORAGE interface (prototype) allows import file of paddock & water points; or
- premium “My FORAGE” interface (next slide) allows digitisation of water points and fences
- output Includes diagnostic testing to compare results
- modification of pasture condition state/land type preference etc. (in dev)
- upgrade of land types and pasture parameters
- tested against w.Qld properties + other locations (+ve result)
- current testing by DAF and consultants -> validation and improved design





LongPaddock - My FORAGE Map

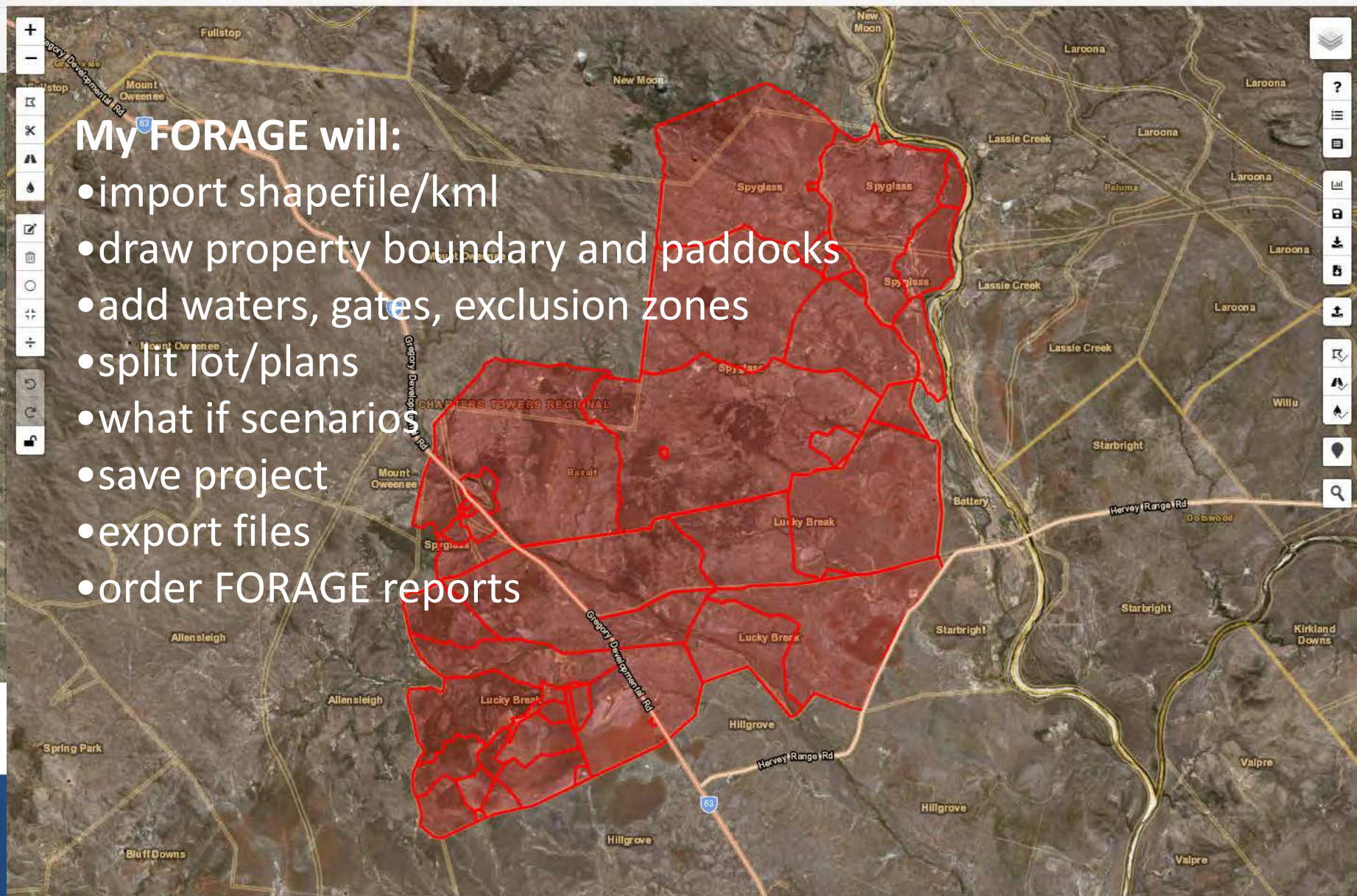
Project: Default

Scenario: Default

Back

## My FORAGE will:

- import shapefile/kml
- draw property boundary and paddocks
- add waters, gates, exclusion zones
- split lot/plans
- what if scenarios
- save project
- export files
- order FORAGE reports







## 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 x Rainfall and Pasture x Rainfall and Pasture by Land Type x

### Specify location using lot on plan

For help on plan (e.g. 3MZ594) and search from BM. A maximum of 30 lots on plan are allowed.

Enter lot(s) on plan

3MZ594 x

Quick guide for map control:

Click (L) or (R) to zoom into the area of your property.

Use this search bar to search by a property name, address, place, road intersection, coordinates, etc.

To search for a coordinate, separate latitude and longitude with a comma (e.g. -24, 123.456, 123.456).

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

Click on the P 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 X to report a problem.



### Delivery information

\*Email

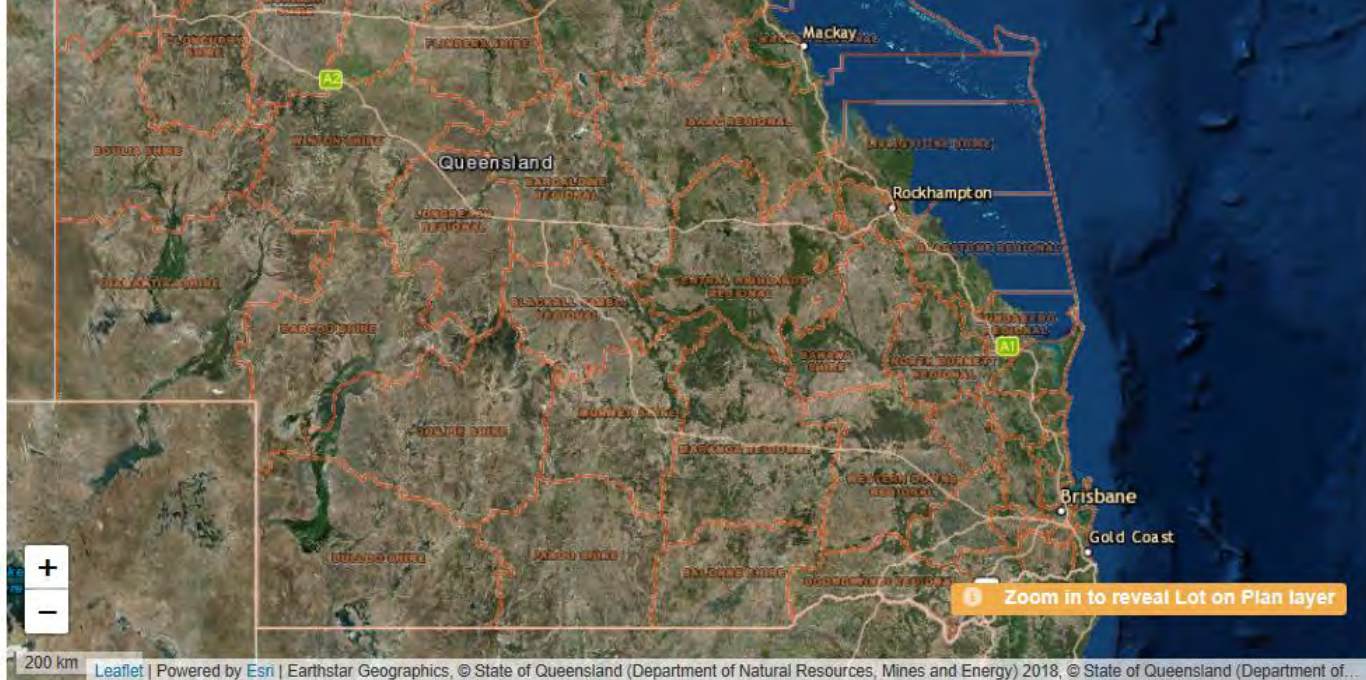
grant.stone@qld.gov.au

Label

Brian\_Pastures

Submit

\*Required information



### Subscription Service

Drought Assessment - receive report every :

Off

1 month

2 months

3 months

### Delivery information

\*Email

Label

Optional

Submit

- Subscribe to receive report every 1, 2 or 3 months (no cost)
- To un-subscribe email us - [longpaddock@qld.gov.au](mailto:longpaddock@qld.gov.au)



# FORAGE support



- within-report information
- web page information plus Q&As
- 2-page quick guides
- detailed FORAGE guide
- awareness videos
- instructive videos – ytd
- [longpaddock@qld.gov.au](mailto:longpaddock@qld.gov.au)



About

How FORAGE can help land management?

How FORAGE can help land management

How FORAGE can help with livestock body condition

How FORAGE can help with livestock body condition

How FORAGE can help with agistment

How FORAGE can help manage stock and pasture

How FORAGE can help manage stock and pasture

Guide

GE

Delivery

rsion 1.9



# Summary of new FORAGE reports

Department of Environment and Science

- latest technology products assist with awareness and land management decision-making
- online, free and easy to access – now with free subscription option
- track record over time (despite no real marketing)
- niche market (graziers, extension staff, BMP, consultants, education, policy)
- reports support analyses with other FORAGE products (fire scar, rainfall / ground cover)
- FORAGE can be linked with other products (e.g. shapefiles with GIS, Google Earth, VegMachine)
- report information for use in conjunction (not a substitute) with “hands-on” monitoring & managing
- support across BMP, DAF and NRM groups
- Improvements to reports will continue
- current prototypes in development will be announced – e.g. FutureBeef media, webinars



Photos: Grant Stone



Concludes the “Getting the *Inside Edge* in grazing land management” series

Webinars now available: <https://longpaddock.qld.gov.au/about/webinars/> - see below

**Questions and suggestions** - email The Long Paddock team at [longpaddock@qld.gov.au](mailto:longpaddock@qld.gov.au)

Watch future webinars for new releases and to demonstrate products

[www.longpaddock.qld.gov.au](http://www.longpaddock.qld.gov.au)



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**Climate risk information for rural Queensland**  
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