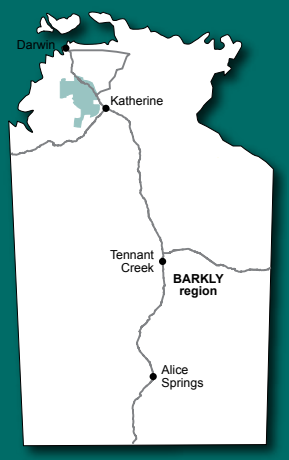
Northern Territory Government

Case Study:
Ruby Downs Station



- *Ruby Downs Station*
- *4 900ha*
- *~1260mm average rainfall*
- *Rotational grazing*
- *Soil carbon sequestration*

Understanding land-use effects on carbon stored in the soil

Ruby Downs Station trucks in around 2,500 young cattle just prior to the wet season and grows them out for shipment as live export feeders before the following dry season. Up to 500 head of overweight feeders and/or culled cows may be retained during the dry season for opportunity markets.

Grazing management is based on rotational grazing of both improved and native pastures. Over time, more improved pastures are being established in order to increase the carrying capacity of the enterprise.

The DPIF and Queensland DAFF are investigating how various cattle and land management practices perform in terms of their benefit to beef businesses and whether any of them also have potential for income via carbon farming. The DPIF is measuring soil carbon in different stages of land development on Ruby Downs and other properties in the Douglas Daly.

Australian Government

Queensland Government



Measuring soil carbon status

There are two main ways to generate “carbon credits”:

- By reducing emissions (e.g. methane), or
- By increasing sequestration (e.g. soil carbon)

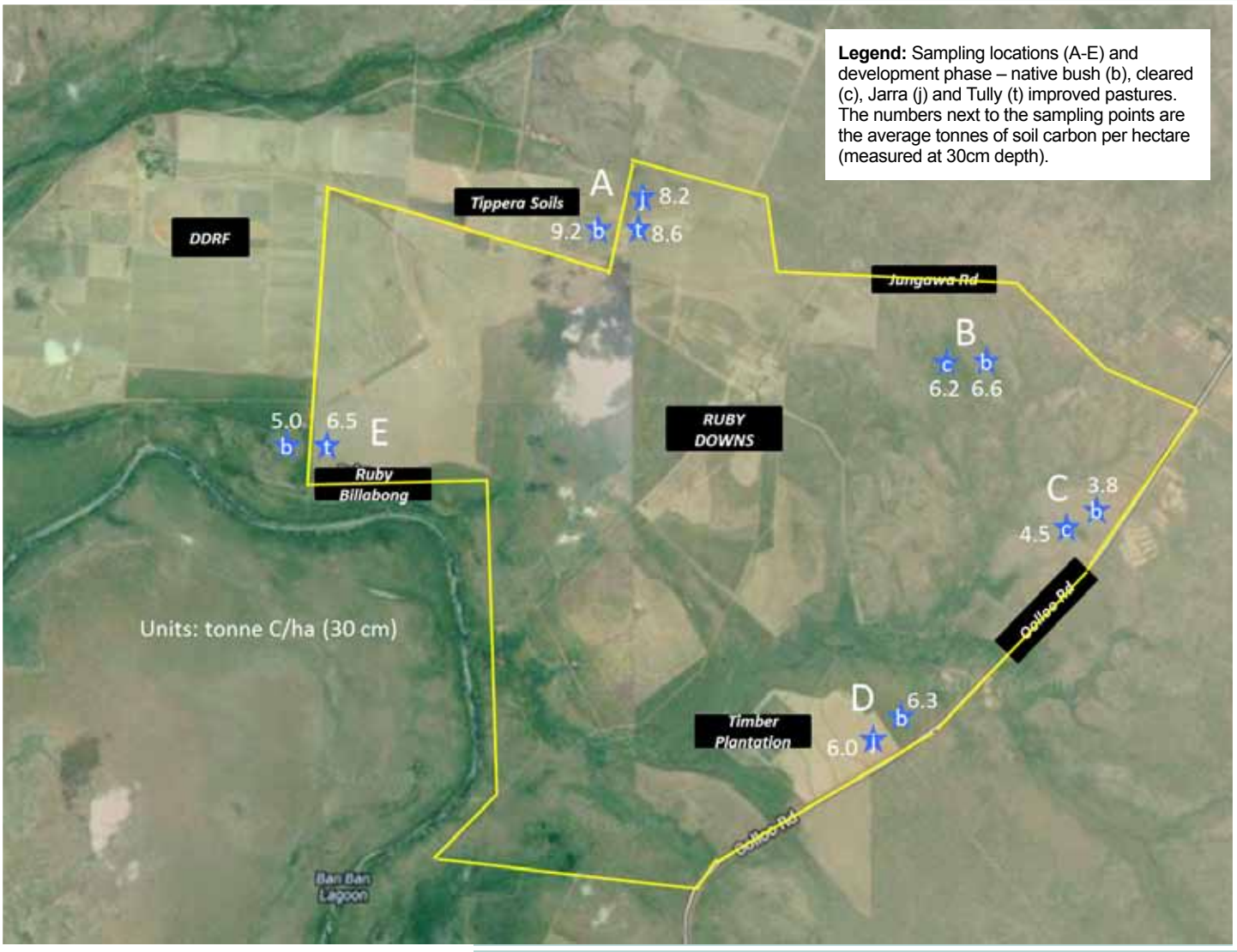
Soil organic carbon is being measured at paired sites representing different stages of pasture development:

- Native bush (uncleared) pastures
- Recently cleared areas
- Established improved pastures

Preliminary results are shown on the following map for each of the five sampling locations (A-E) on Ruby Downs.

Sampling locations and preliminary results at Ruby Downs.

Photo: David Ffoulkes





Early results

At this stage of the project there is no suggestion of differences in soil carbon densities between different stages of pasture development. Carbon stocks decreased with depth in every location from an average of 9.3 t C/ha in the 0-10 cm profile to around 3.6 t C/ha at 20-30 cm and 2.4 t C/ha at 60-100 cm depth.

Note that these early results are from only three soil samples per treatment per site. Sampling is continuing and is expected to improve our understanding of soil carbon stocks in the Douglas Daly.

"Current farming practices do not appear to have resulted in significant losses of soil carbon"

Table 1: Soil carbon densities (tonnes C/ha) for paired "native bush" versus "recently cleared" sites


Depth	Native bush	Recently cleared	Depth mean
0-10 cm	8.55	8.23	8.39
10-20 cm	3.98	4.65	4.32
20-30 cm	2.98	3.08	3.03
Development stage mean	5.20	5.32	
Statistical significance		P=0.89 (Development stage) Not significantly different	P=0.014 (Soil depth) Significantly different

Table 2: Soil carbon densities (tonnes C/ha) for paired "native bush" versus "established improved pastures" sites


Depth	Native bush	Established improved pastures	Depth mean
0-10 cm	10.64	9.83	10.24
10-20 cm	5.61	6.93	6.27
20-30 cm	3.97	4.41	4.19
Development stage mean	6.74	7.05	
Statistical significance		P=0.74 (Development stage) Not significantly different	P=0.001 (Soil depth) Significantly different



Project Partners

The Climate Clever Beef project is supported by funding from DPIF and the Australian Government until May 2015.

Key messages

- Soil surveys done in the mid-1970s found organic carbon content averaged 7.7 t C/ha (0-30 cm) in the sandy Kandosol soils and native pasture landscapes of the Douglas Daly Region.
- Current farming practices do not appear to have resulted in significant losses of soil carbon.
- Early results from the region suggest there could be an increase in carbon stocks over time with development of improved pastures under rotational grazing.

For more information

Contact the Pastoral Production team
at Berrimah Farm on 8999 2011.

Left: Tully Paddock.

Right: Chained landscape.

Photos: David Ffoulkes

Banner photos courtesy of
Dionne Walsh and Department of Primary Industry and Fisheries