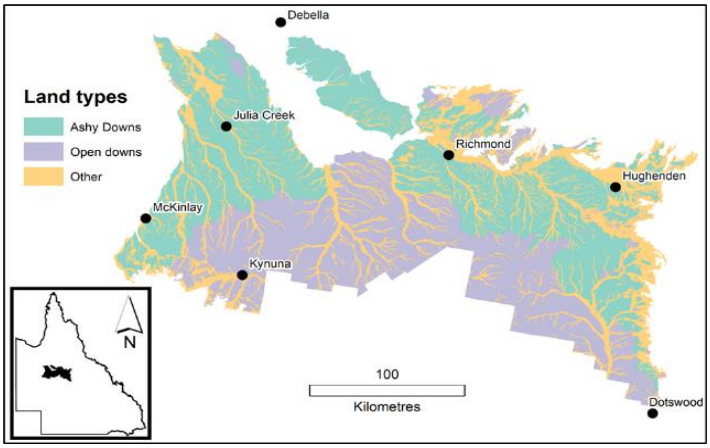
Northern Downs – Factsheet 1: Evaluating grazing management strategies to improve drought resilience – Representative property

Key finding
Implementing strategies such as optimising the age of steer turnoff and controlling prickly acacia were found to improve profitability (*see Factsheets 2 and 3)*.

Annual rainfall variability in the Northern Downs is classed as moderate to high. In Richmond, annual rainfall ranged from 108 to 1,160 mm between 1890 and 2018 and there have been 33 droughts since 1900 (using the drought percentile method). The Queensland Department of Primary Industries evaluated the economic implications from implementing a range of management strategies that build drought resilience.

The Northern Downs falls within the Flinders River catchment and Mitchell Grass Downs bioregion and encompasses 4.4 million ha of grazing land. It has a semi-arid to arid environment with long dry seasons, extreme temperatures, high evaporation rates, and high rainfall variability. The Mitchell grasslands consist of largely treeless, undulating clay-soil downs.



Typical beef herd characteristics of the Northern Downs include low female mortalities, sound reproductive performance and moderate liveweight gains.

Modelled Northern Downs property and herd

A representative property and herd were constructed from research, industry surveys and consultation with local beef producers. The property had 16,000 ha of Mitchell grass and other native pastures with long-term carrying capacity of 2,000 adult equivalents (8 ha/AE).

The evaluation examined a self-replacing, controlled mated, 50% Bos Indicus breeding herd that grazed open downs and ashy downs land types considered adequate in phosphorus. Nitrogen supplements were fed during the dry season to reduce breeder liveweight loss.

Replacement heifers were first mated at two years of age. Conception rates of breeders and calf loss were modelled to reflect the region. The tables on the right show productivity, sales and gross margin information.

Long-term average cattle prices (2008 - 2019) were used in the analysis. Steers mostly grazed similar land types to the breeders until they were sold to the 'feed-on' market at 474 kg liveweight (31 months) for $1.82/kg net price (minus freight, fees, etc). Cull heifers (2-3 yr) were sold at 472 kg for $1.39/kg net, while cull cows (3+ yrs at 500 kg) and bulls were sold to slaughter markets for $1.45/kg net.

Productivity traits	
Weaning rate	65%
Steer liveweight gain/yr	140 kg
Heifer liveweight gain/yr	133 kg
Herd mortality rate	2%
% of PTE heifers/cows sold	90-100%
Female sales/total sales	48%

Production, sales & gross margin	
Total cattle carried	2,116
Total females mated	1,035
Total calves weaned	673
Cows and heifers sold	300
Steers & bullocks sold	326
Average female price	$701
Average steer price	$863
Net cattle sales	$491,992
Variable costs	$55,813
Herd gross margin	$436,179

Australian Government | Future Drought Fund | Drought and Climate Adaptation Program | Queensland Government

Strategies to improve profitability and drought resilience

To help inform decision-making, an economic analysis was undertaken evaluating the changes in cash flow and effect on business profit over 30 years from implementing alternative management strategies.

The table below outlines the annualised net present value (NPV), internal rate of return, payback period and peak deficit for strategies that were found to improve or have negligible effect on the profitability of the representative property. For example, the results identified that increasing the age of steer turnoff from weaners to 31-months increased profitability each year by $71,100 (annualised NPV). A maximum peak deficit of -$122,100 occurred in year 2 due to retaining stock. Increasing the age of steer turnoff also improves drought resilience by reducing the proportion of breeders. Please note, these results are specific to the assumptions used for the analysis. More detail on these, and other strategies resulting in negative changes in profit, are available in supplementary factsheets and the full report (QR code link below).

Management strategy	NPV ($/year)	Rate of return	Payback period	Peak deficit (year of)
Increasing age of steer turnoff from weaners to 31 months*	$71,100	n/c	2 years	-$122,100 (yr 2)
Controlling prickly acacia: whole property**	$92,000	11%	17 years	-$1,328,300 (yr 4)
Controlling prickly acacia: invest $10,000 + maintenance costs in high, moderate, low or minimal infestations**	$1,900 to $103,700	6% to 16%	13 to 25 years	-$13,100 to -$39,400 (yr 3-8)
Converting from breeding to steer turnover	$62,500	18%	9 years	-$576,700 (yr 2)
Home-bred bulls	$10,000	53%	3 years	-$17,300 (yr 2)
Genetics to improve weaning rate: gradual changeover of bulls	$1,800	28%	7 years	$0
Reducing foetal/calf loss by 50% by spending $5 to $7.50 per breeder or capital of $50,000 to $100,000	$1,300 to $8,700	12% to 102%	1 to 13 years	-$7,100 to -$100,000 (yr 1)
Hormonal growth promotants for steers (if no price penalty)	$9,500	67%	3 years	-$12,700 (yr 2)
Reducing final cow culling age from 13 to 11 years	$200 annual gross margin impact			

** See Factsheet 2.* *** See Factsheet 3 (assuming 10 years until consecutive wet years occur).*

Find your local DPI Officer ← here

All factsheets and full reports are found ← here.

This project is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government's Drought and Climate Adaptation Program.

Australian Government | Future Drought Fund | Drought and Climate Adaptation Program | Queensland Government