12-2023

Status of the Western Australian pastoral rangelands 2023: total vegetative cover and cover risk

Department of Primary Industries and Regional Development

GOVERNMENT OF WESTERN AUSTRALIA
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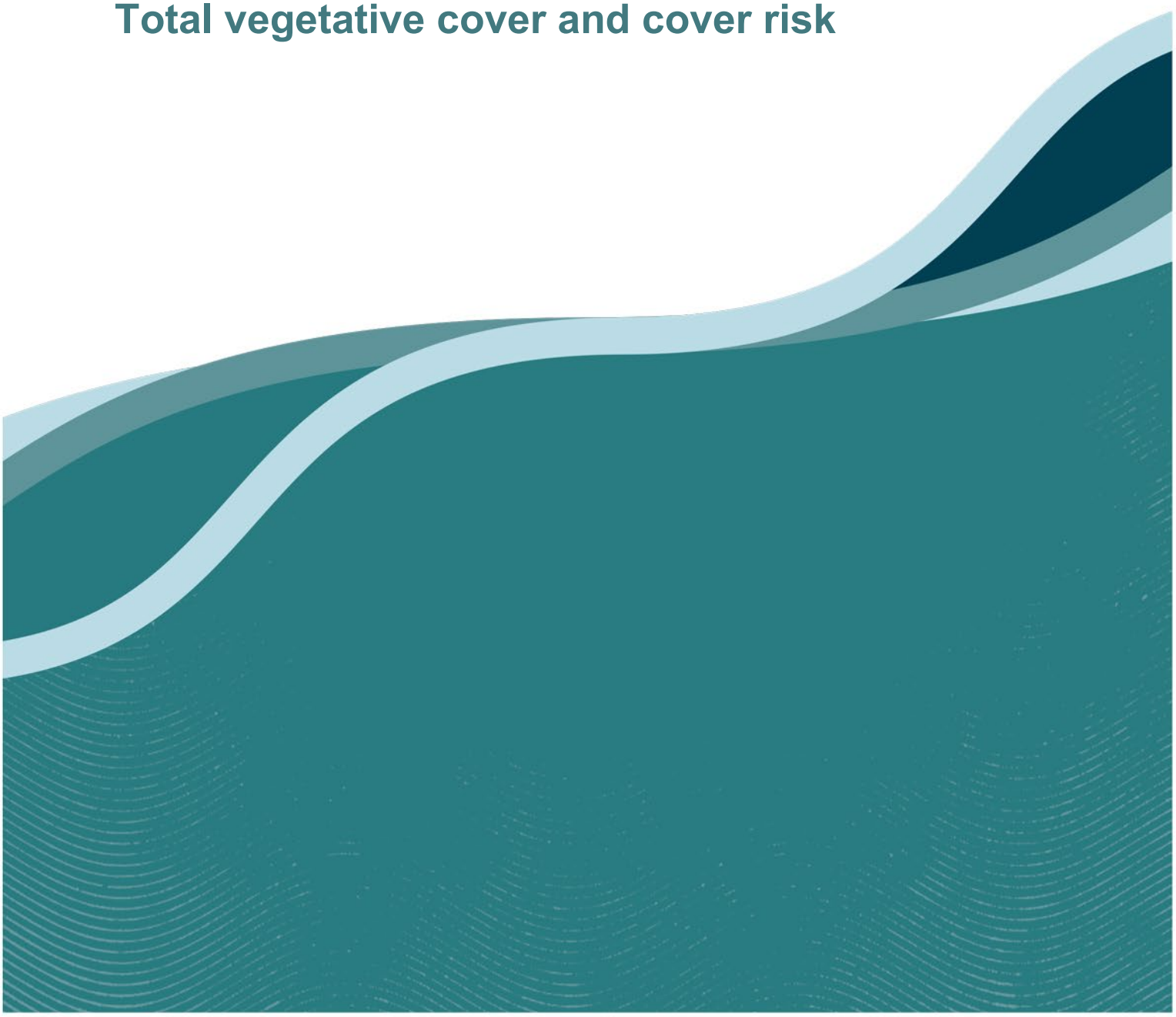
Status of the Western Australian pastoral rangelands 2023

Total vegetative cover and cover risk



Acknowledgement of Country

The Department of Primary Industries and Regional Development (DPIRD) acknowledges the Traditional Custodians of Country, the Aboriginal peoples of the many lands that we work on and their language groups throughout Western Australia and recognises their continuing connection to the land and waters. DPIRD respects the continuing culture of Aboriginal peoples and the contribution they make to the life of our regions, and we pay our respects to Elders past, present and emerging.

Status of the Western Australian pastoral rangelands 2023

Total vegetative cover and cover risk

Department of Primary Industries and Regional Development

Recommended reference

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Contents

Acknowledgements

This report was compiled by Rob Sudmeyer. Data analysis and image production was conducted by Phil Thomas, Sam van Wyngaarden, Pouria Ramzi and Karen Homes (Agriculture Resource Management and Assessment Branch, Department of Primary Industries and Regional Development).

Shortened forms

Short form	Meaning
CCC	current carrying capacity
DPIRD	Department of Primary Industries and Regional Development
LCD	land conservation district
MAU	monitoring and assessment unit
PCC	potential carrying capacity
PLB	Pastoral Lands Board

Summary

The Department of Primary Industries and Regional Development (DPIRD) monitors and reports on the vegetation condition of pastoral rangelands in Western Australia. This 2023 short report uses remotely sensed total cover data available to the end of October 2023, rainfall data to the end of November 2023 and Stock Return data reported in 2022 (the most recent available) to determine cover risk. Cover risk at the land conservation district (LCD) level is an indicator of the likelihood of total cover declining to, or remaining at, low or very low levels. Total cover and cover risk may not be indicative of vegetation condition and are best regarded as indicators of relative levels of groundcover and consequent susceptibility to erosion and the relative availability of stock forage. This report uses reported stock numbers relative to potential carrying capacity (PCC) as an indicator of grazing pressure and this may lead to underestimating cover risk because the current carrying capacity (CCC) is often significantly less than PCC.

Total cover in June–August 2023 was strongly influenced by rainfall in the preceding 2 years. The risk of the total cover of a key pasture or vegetation functional group falling to or remaining at below-average or very much below-average levels was high or very high in 17 LCDs; this is up from the estimate of 11 LCDs in the 2022 annual report (Table 3).

In the Kimberley, rainfall and flooding associated with ex-tropical cyclone Ellie in 2022–23 (Figure 51) resulted in generally above-average total cover. Summer rainfall across the Kimberley LCDs ranged from 130 to 173% of the long-term average. Pastures had average to very much above-average total cover, which combined with 2022 stocking rates at, or below, PCC (Figure 47) puts all LCDs at moderate or low risk of total cover declining to below-average or very much below-average levels (Table 3). This represents a reduction in risk compared to the estimate in the 2022 annual report.

In the Pilbara, rainfall was average or above average in eastern areas, but below average in western areas in 2022–23 (Figure 51). Rainfall was just above average (111 to 103%) for the East Pilbara, Ashburton and De Grey LCDs and below average (82%) for the Roebourne – Port Hedland LCD. All LCDs had vegetation functional groups considered to be at high risk of cover declining to, or remaining at, below-average or very much below-average levels. Alluvial plain tussock pastures in the De Grey LCD are at very high risk if stock numbers remain in excess of PCC (Figure 48), stock numbers in this LCD should be reduced to allow pasture recovery.

In the Upper Southern Rangelands, rainfall in the 12 months to November 2023 was below average, ranging from 37% of the long-term average in Gascoyne–Wooramel LCD to 94% in Gascoyne – Ashburton Headwaters LCD (Figure 51). Conditions were generally wetter in the northeast and drier in the southwest. Total cover of pastures was average to below average, and the risk of cover declining to, or remaining, below-average or very much below-average levels, ranged from moderate in the Gascoyne – Ashburton Headwaters LCD to very high in the Upper Gascoyne LCD. The very high risk in the Upper Gascoyne LCD reflects very much below-average total cover and 2022 stock numbers near PCC (Figure 49).

Stock numbers in the Upper Gascoyne LCD will require very conservative management to avoid animal welfare issues in 2024 and allow pasture recovery. Stock numbers in other LCDs are below PCC but will still require conservative management. The risk of cover decline increased in 2024 compared to the estimate in the 2022 annual report for all LCDs except the Gascoyne – Ashburton Headwaters LCD where it has decreased.

In the Lower Southern Rangelands, rainfall in the 12 months to November 2023 was below average, ranging from 34% of the long-term average in Shark Bay LCD to 95% in Cue LCD (Figure 51). Total cover of pastures ranged from average to very much below average, and the risk of cover declining to, or remaining at, below-average or very much below-average levels, ranged from moderate to high in the Shark Bay and Yalgoo LCDs to very high in all other LCDs. The risk of cover decline has increased compared to estimates in the 2022 report for all LCDs except the Kalgoorlie and North-eastern Goldfields LCDs where risk remained at very high levels. Stocking rates across the LCDs ranged from 14% of PCC for the Cue LCD to 57% for the North-eastern Goldfields LCD (Figure 50). The 2022 stocking rate in the North-eastern Goldfields and Nullarbor LCDs was 57% and 50% of PCC respectively and will need to be further reduced if significant rain does not fall early in 2024 to increase vegetation cover and fodder.

Seasonal values of total cover are highly correlated with rainfall and follow a cyclical pattern of maximum cover in the wetter months and minimum values in the drier months. Maximum cover values are reached in years with sustained above-average monthly rainfall. When these high rainfall years are followed by average or below-average rainfall years, there is a general trend for the cyclical annual maximum and minimum cover values to decline over time until there is another year(s) with sustained above-average rainfall. When an above-average rainfall year is followed by another above-average rainfall year, high cyclical cover levels are achieved.

For the monsoonal areas of the Kimberley, peak total cover is generally reached in March to May and forage availability at this time should be used to adjust stocking rates for the coming year.

For southern areas where rainfall is indeterminate or historically winter dominant, and summer rainfall is highly variable (i.e., dependent on cyclonic or north-west cloud band rainfall activity) stocking rates need to be predicated on current forage supplies with low confidence of rainfall over the summer months.

Unless rainfall is significantly above average over the coming months, low levels of vegetation cover and soil water (Figure 52) mean stocking rates in the Pilbara and Southern Rangelands will need to be decreased in line with fodder availability to manage degradation and animal welfare risks. DPIRD has established an agile response group to provide land managers with advice and assistance in managing these current dry conditions (agric.wa.gov.au/rangelands/dealing-dry-year-southern-rangelands-western-australia).

It is important the Pastoral Lands Board (PLB) and DPIRD continue to work together to encourage pastoralists to stock leases in line with forage availability, and to encourage greater development, understanding and use of seasonal weather forecasts and remote sensed products to manage grazing pressure. Continued implementation of the Framework for sustainable pastoral management and the rollout of regional condition standards underpins this work.

Introduction

DPIRD monitors the vegetation condition of pastoral rangelands in Western Australia and prepares annual reports on pastoral condition for the Commissioner of Soil and Land Conservation to meet legislative requirements set out in the *Land Administration Act 1997*.

Two levels of reporting are provided: every 5 years a full report details the state, trend and risk of decline of vegetation condition in the pastoral rangelands using information derived from both remotely sensed and on-ground data; in the intervening years, short reports are provided based on remotely sensed data.

This short report is based on remotely sensed vegetation cover data, rainfall data and livestock data available at the end of November 2023. Data is presented for 23 LCDs across the pastoral rangelands. Individual LCDs are grouped into Kimberley, Pilbara, Upper Southern Rangelands and Lower Southern Rangelands regions.

Total vegetation cover includes green and dead annual and perennial vegetation and litter cover. Total cover may not be indicative of vegetation condition which is based on on-ground assessment of the species composition, density and vigour of perennial vegetation. Total cover in this report is best regarded as an indicator of relative levels of soil cover and consequent susceptibility to erosion in the event of extreme weather events and the relative availability of stock forage.

This status report describes seasonal total cover and risk of decline for key MAUs or vegetation functional groups in each LCD, stocking rates for each LCD, rainfall over the last 12 months (December 2022 to November 2023), and comments on degradation risks given these factors.

Data sources and analyses

Remotely sensed vegetation cover data and rainfall data are publicly available and have been obtained from TERN (Terrestrial Ecosystem Research Network), and the Bureau of Meteorology (bom.gov.au) and aggregated livestock data are provided by the PLB. Total vegetation cover data are the median seasonal (winter – June, July, August; spring – September, October, November; summer – December, January, February; autumn – March, April, May) values derived from Landsat and Sentinel (after 2016). These data are presented in 2 ways:

- spatially as decile maps of 2023 winter season expressed relative (decile) to winter seasons from 1988 to 2012 for all vegetation associations in each LCD
- temporal charts of seasonal total cover from 1988 to 2023 for the most pastorally productive pasture associations in each LCD.

The more productive pasture associations have been selected because they generally experience the greatest grazing pressure. Consequently, these pastures should be considered as leading indicators of cover change and are most responsive to grazing management. All values reported here are averages across each LCD, and there will be areas with lower or higher total cover within each LCD. Contiguous areas identified as

having low cover will be considered during DPIRD's annual station inspection prioritisation process.

The pasture types in the Kimberley and Nullarbor have been mapped and the most productive (key pastures) identified. Where key pastures are similar in productivity and ecology and occur on similar lands units, they have been grouped into monitoring and assessment units (MAUs). Key pastures and MAUs for the West Kimberley are described in Pastoral land condition standards: Conceptual basis and West Kimberley region. In the Pilbara and the rest of the Southern Rangelands, key pastures and MAUs have yet to be defined and the most productive vegetation functional groups (aggregations of land systems with similar topography, soils and vegetation types) that each cover at least 1.5% of the pastoral area of the LCD are reported.

Cover risk at the LCD level is an indicator of the likelihood of total cover remaining at, or declining to, below-average or very much below-average levels with implications for erosion risk and forage availability (Table 1). Cover risk is based on median total cover between June and August 2023 (winter season) relative to total cover for the winter seasons from 1988 to 2023 (Table 2), assumed average rainfall over the next 12 months and reported 2022 stock numbers (most recent available numbers) relative to PCC (see Stocking rates section). Note that using stock numbers relative to PCC as an indicator of grazing pressure may lead to underestimating cover risk because the actual CCC is often significantly less than PCC.

Above-average rainfall will reduce risk and below-average rainfall will increase risk.

Table 1: Cover risk

Stock numbers relative to PCC	Relative cover				
	Very much below average	Below average	Average	Above average	Very much above average
Above PCC	Very high	Very high	High	Moderate	Low
Near PCC	Very high	High	Moderate	Moderate	Low
Below PCC	Very high	High	Moderate	Low	Low

Table 2: Median total cover in June–August 2023 compared to median total cover in June–August 1988–2023

Cover in 2023	Cover compared to 1988–2023
Decile 1	Very much below average
Deciles 2–3	Below average
Deciles 4–7	Average
Deciles 8–9	Above average
Decile10	Very much above average

Total cover and cover risk

In the Kimberley, rainfall and flooding associated with ex-tropical cyclone Ellie in 2022–23 resulted in generally above-average total cover and all LCDs were considered to have moderate or low risk (Table 3).

Generally dry conditions in the Pilbara and Southern Rangelands in 2023 have increased the number of LCDs at high or very high risk of the total cover of pastures falling to, or remaining at, below-average or very much below-average levels from 11 reported in 2022 to 17 in 2023 (Table 3). Except for the Gascoyne – Ashburton Headwaters and Wiluna LCDs, all of the LCDs in the Pilbara, Upper Southern Rangelands and Lower Southern Rangelands are considered to be at high risk or very high risk. Unless rainfall is significantly above average over the coming months, stocking rates in these LCDs will need to be decreased to manage this risk. DPIRD has established an agile response group to provide land managers with advice and assistance in managing these dry conditions (agric.wa.gov.au/rangelands/dealing-dry-year-southern-rangelands-western-australia).

Seasonal values of total cover are highly correlated with rainfall and follow a cyclical pattern of maximum cover in the wetter months and minimum values in the drier months. Maximum cover values are reached in years with sustained above-average monthly rainfall. When these high rainfall years are followed by average or below-average rainfall years, there is a general trend for the cyclical annual maximum and minimum cover values to decline over time until there is another year(s) with sustained above-average rainfall. When an above-average rainfall year is followed by another above-average rainfall year, high cyclical cover levels are maintained.

For the monsoonal areas of the Kimberley peak total cover is generally reached in March to May and forage availability at this time should be used to adjust stocking rates for the coming year.

For southern areas where rainfall is indeterminate or historically winter dominant and summer rainfall is highly variable (i.e. dependent on cyclonic or north-west cloud band rainfall activity), stocking rates need to be predicated on current forage supplies with low confidence of rainfall over the summer months.

Total cover and cover risk for individual LCDs are described below.

Table 3: LCDs and pastures that have High or Very high risk of total cover remaining at, or declining to, below-average or very much below-average levels

Region	LCD	Pastures with High cover risk	Pastures with Very high cover risk
Kimberley	Nil	Nil	Nil
Pilbara	Ashburton	Alluvial plain shrub Alluvial plain tussock River tussock	Nil
	De Grey	River tussock Soft spinifex	Alluvial plain tussock
	East Pilbara	Alluvial plain shrub Alluvial plain tussock	Nil
	Roebourne – Port Hedland	Alluvial plain shrub Alluvial plain tussock River tussock Soft spinifex	Nil
Upper Southern Rangelands	Gascoyne–Wooramel	Soft spinifex	Stony plain halophyte
	Lyndon	Alluvial plain Alluvial plain halophyte Stony plain halophyte	Nil
	Meekatharra	Low hills halophyte Mesas shrub	Nil
	Upper Gascoyne	Nil	Mesas shrub River tussock Stony plain halophyte
Lower southern rangelands	Cue	Alluvial plain Low hills halophyte Mesas shrub	Nil
	Kalgoorlie	Nil	Alluvial plain Alluvial plain halophyte Fringing salt lake Mesas shrub Stony plain halophyte
	Mount Magnet	Alluvial plain halophyte	Mesas shrub Stony plain halophyte
	Murchison	Mesas shrub Stony plain halophyte	Alluvial plain

(continued)

Table 3 (continued): LCDs and pastures that have High or Very high risk of total cover remaining at, or declining to, below-average or very much below-average levels

Region	LCD	Pastures with High cover risk	Pastures with Very high cover risk
Lower southern rangelands	North-eastern Goldfields	Nil	Alluvial plain halophyte Fringing salt lake Mesas shrub Stony plain halophyte
	Nullarbor – Eyre Highway*	Nil	Bluebush mixed chenopod MAU Eucalypt mixed chenopod MAU Myall mixed chenopod MAU Saltbush MAU
	Sandstone	Nil	Alluvial plain halophyte Mesas shrub Stony plain halophyte Fringing salt lake
	Shark Bay	Calcrete shrub	Nil
	Yalgoo	Stony plain halophyte	Nil

* No winter 2023 data was available for Nullarbor – Eyre Highway LCD so the risk assessment was based on April 2023 total cover.

Kimberley

Rainfall and flooding associated with ex-tropical cyclone Ellie in 2022–23 resulted in generally above-average total cover. Summer rainfall across the Kimberley LCDs ranged from 130 to 173% of the long-term average (Figure 51). Pastures had average to very much above-average total cover, which combined with 2022 stocking rates at, or below, PCC (Figure 47) puts all LCDs at moderate or low risk of total cover declining to below-average of very much below-average levels (Table 3). This represents a reduction in risk compared to estimates reported in 2022.

Broome LCD

The 2022–23 wet season rainfall was 169% of the long-term average and June–August 2023 total cover of MAUs was average or above average (Figure 1 and Figure 2). The risk of cover decline is considered moderate or low at the LCD level at reported stocking rates. This is similar to cover risk reported in 2022.

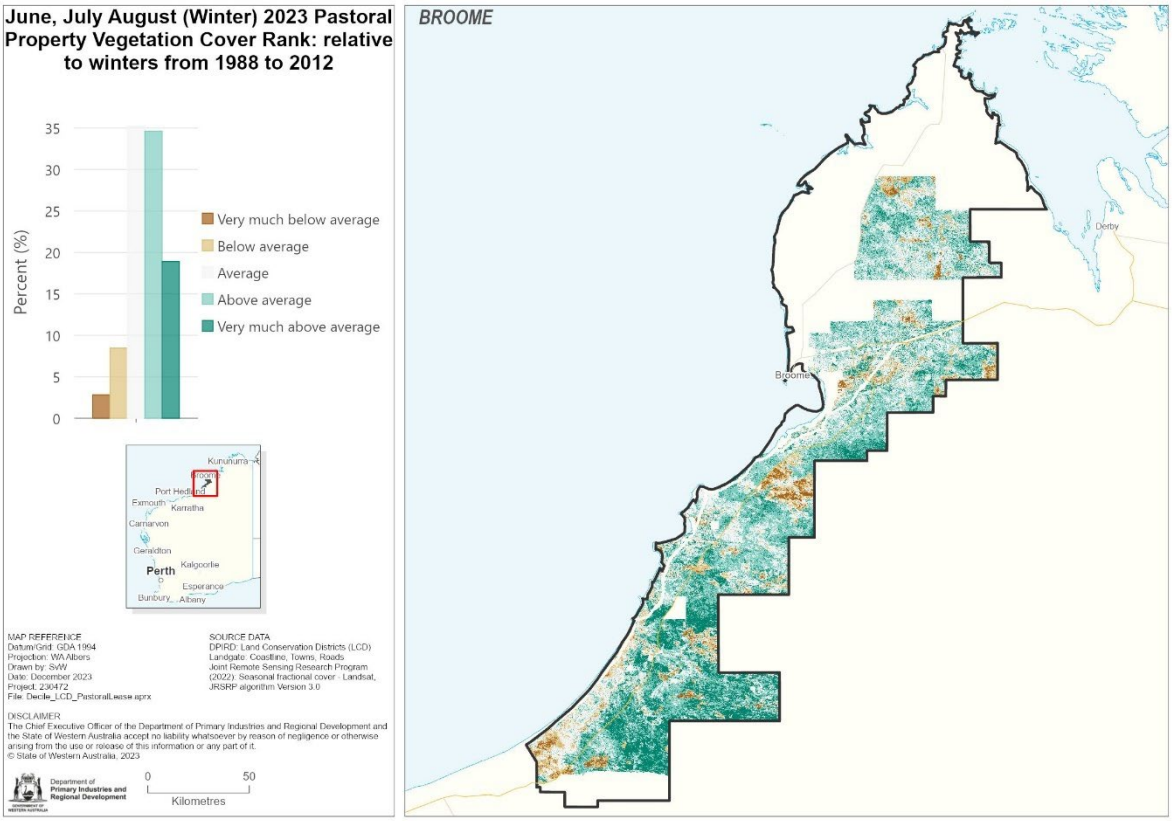


Figure 1: Relative total cover of all vegetation types in the pastoral areas of the Broome LCD

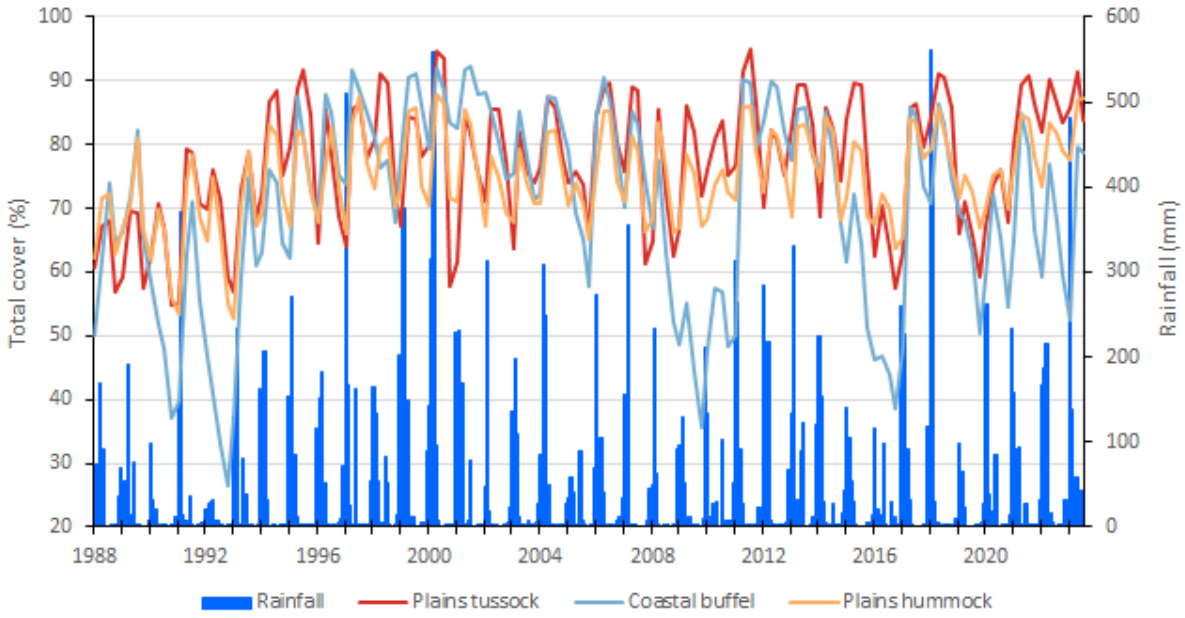


Figure 2: Total cover of MAUs in the Broome LCD

Derby – West Kimberley LCD

The 2022–23 wet season rainfall was 184% of the long-term average and June–August 2023 total cover of MAUs was above average (Figure 3 and Figure 4). The risk of cover decline is considered moderate at the LCD level at reported stocking rates. This is similar to cover risk reported in 2022.

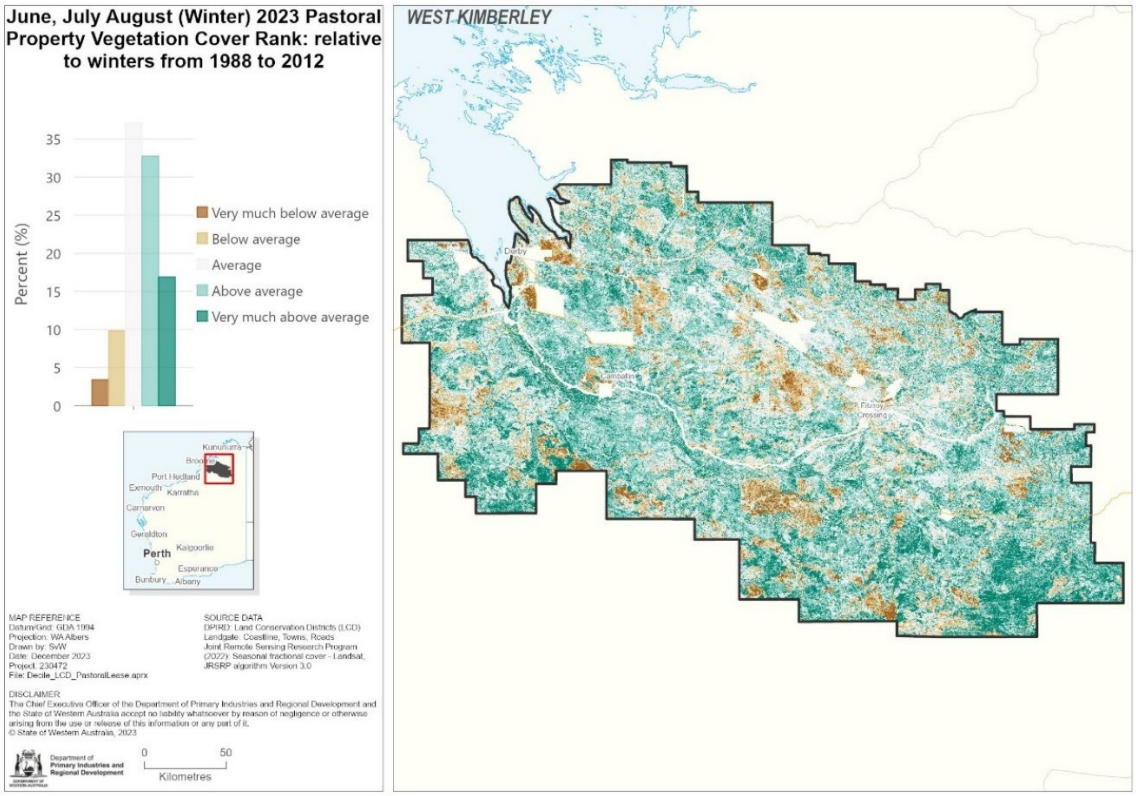


Figure 3: Relative total cover of all vegetation types in the pastoral areas of the Derby – West Kimberley LCD

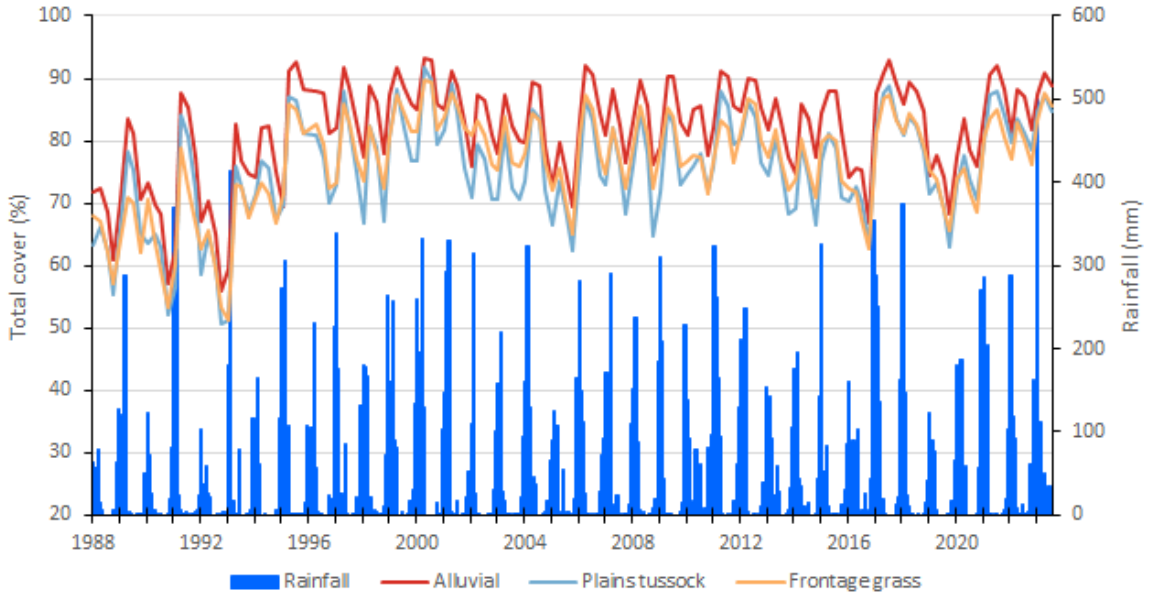


Figure 4: Total cover of MAUs in the Derby – West Kimberley LCD

Halls Creek – East Kimberley LCD

The 2022–23 wet season rainfall was 156% of the long-term average and June–August 2023 total cover of MAUs was above average or very much above average (Figure 5 and Figure 6). The risk of cover decline is considered low at the LCD level at reported stocking rates. This is a decline in cover risk compared to estimates reported in 2022.

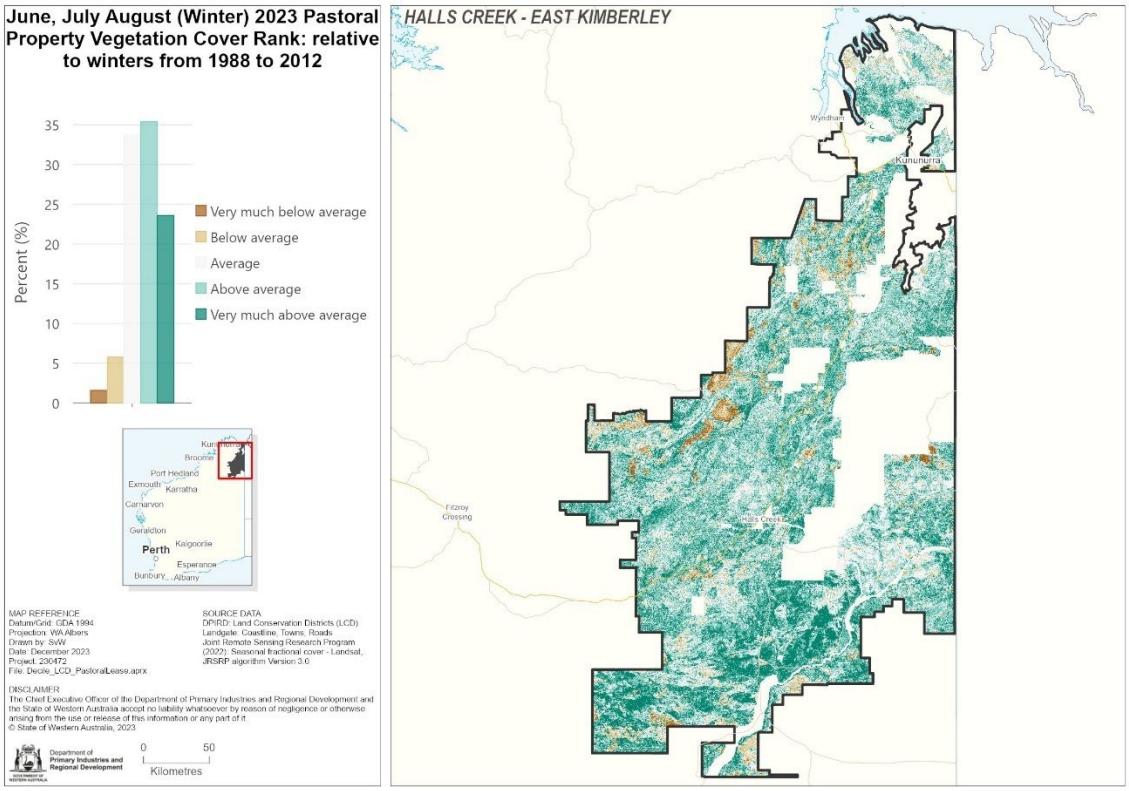


Figure 5: Relative total cover of all vegetation types in the pastoral areas of the Halls Creek – East Kimberley LCD

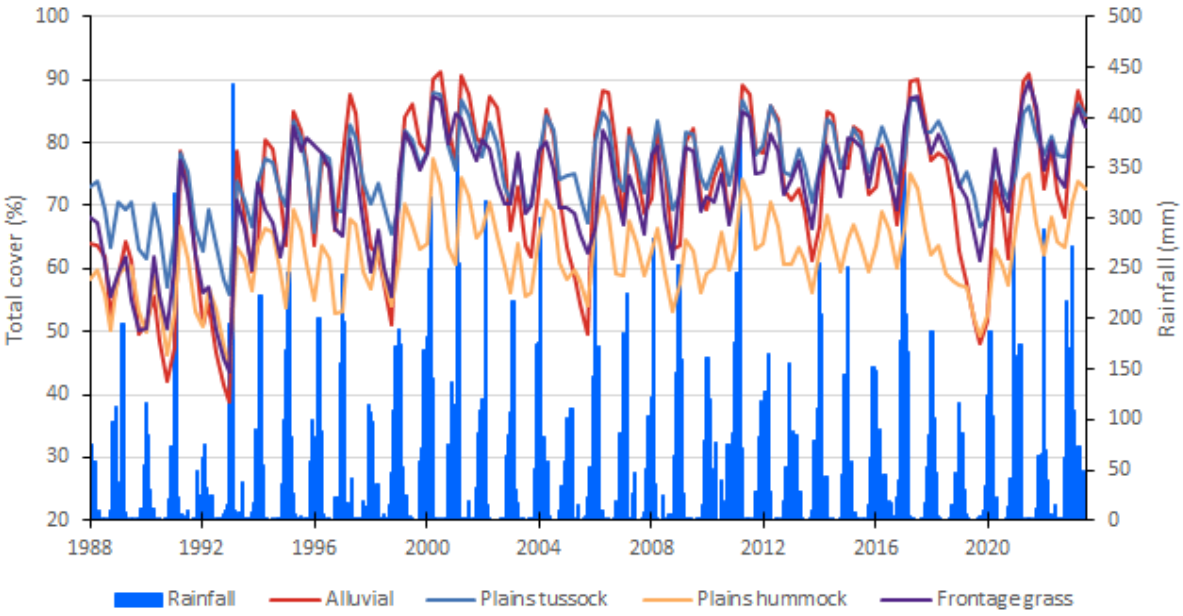


Figure 6: Total cover of MAUs in the Halls Creek – East Kimberley LCD

North Kimberley LCD

The 2022–23 wet season rainfall was 142% of the long-term average and June–August 2023 total cover of MAUs was very much above average (Figure 7 and Figure 8). The risk of cover decline is considered low at the LCD level at reported stocking rates. This is a decline in cover risk compared to estimates reported in 2022.

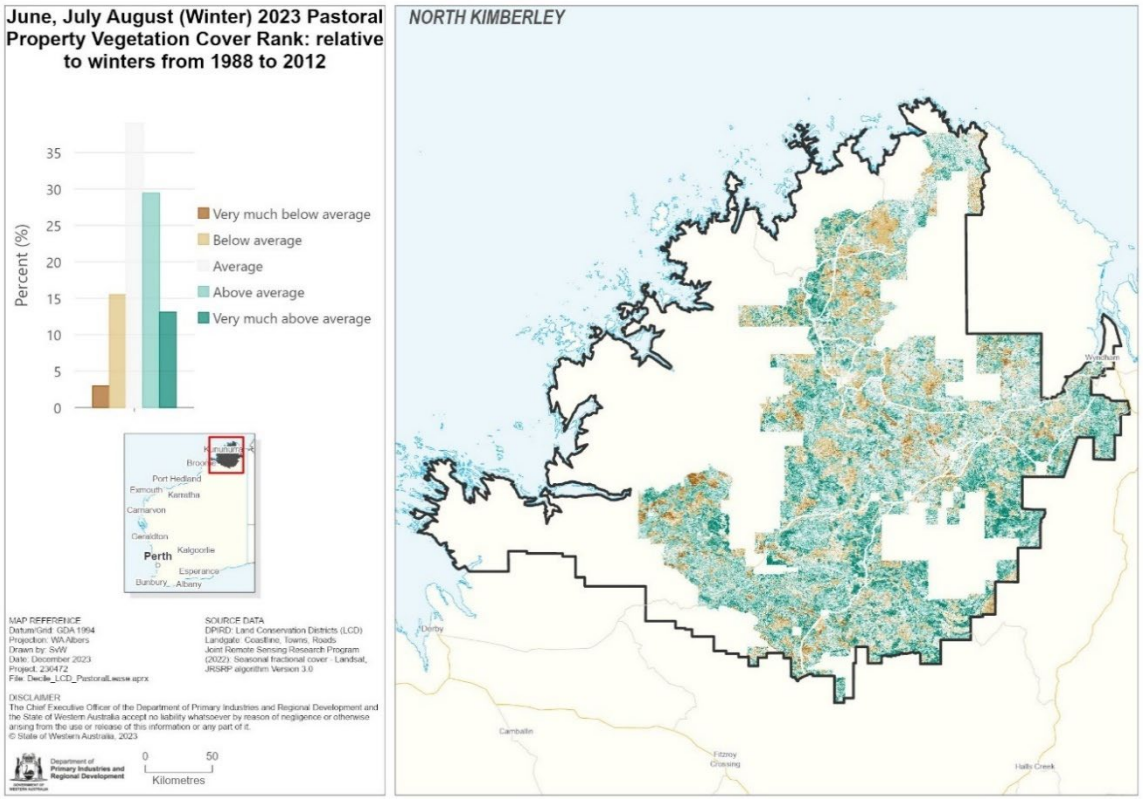


Figure 7: Relative total cover of all vegetation types in the pastoral areas of the North Kimberley LCD

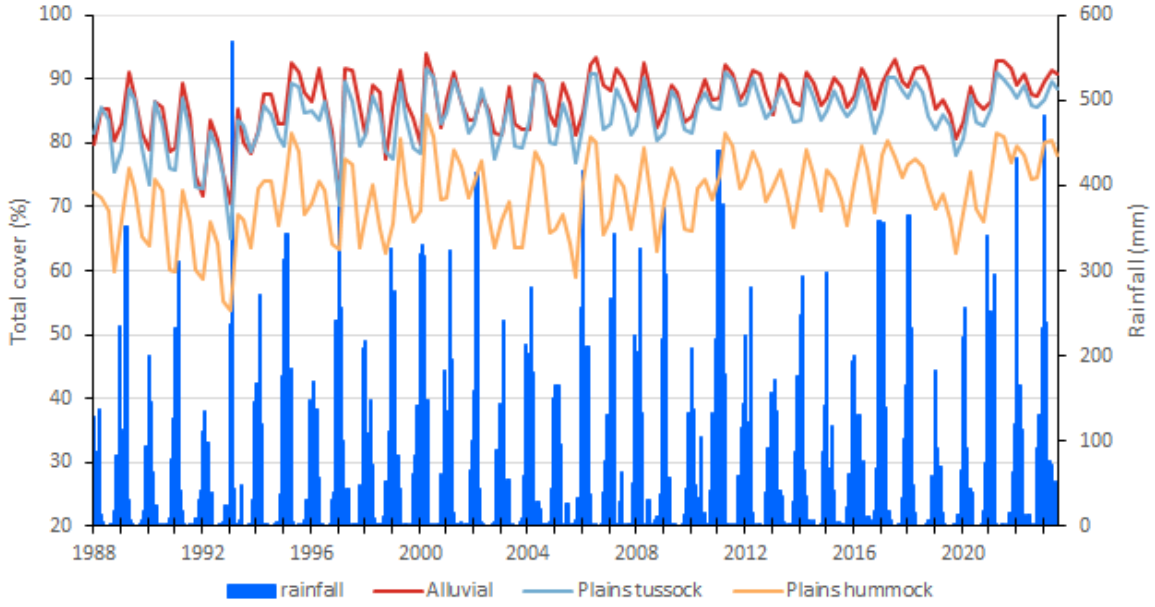


Figure 8: Total cover of MAUs in the North Kimberley LCD

Pilbara

In the Pilbara, rainfall in 2022–23 was average or above average in eastern areas, but below average in western areas (Figure 51). Rainfall across the LCDs was just above average (109 to 106%) for the East Pilbara, Ashburton and De Grey LCDs and below average (84%) for the Roebourne – Port Hedland LCD. All LCDs had vegetation functional groups considered to be at high risk of cover decline. The De Grey LCD had a functional group considered at very high risk at reported stocking rates (Figure 48), stock numbers in this LCD should be reduced to allow pasture recovery.

Ashburton LCD

The 2022–23 wet season rainfall was 109% of the long-term average and June–August 2023 total cover of vegetation functional groups was below average (Figure 9 and Figure 10). The risk of cover decline is considered high at the LCD level at reported stocking rates (Table 3). This an increase in risk compared to what was reported in 2022.

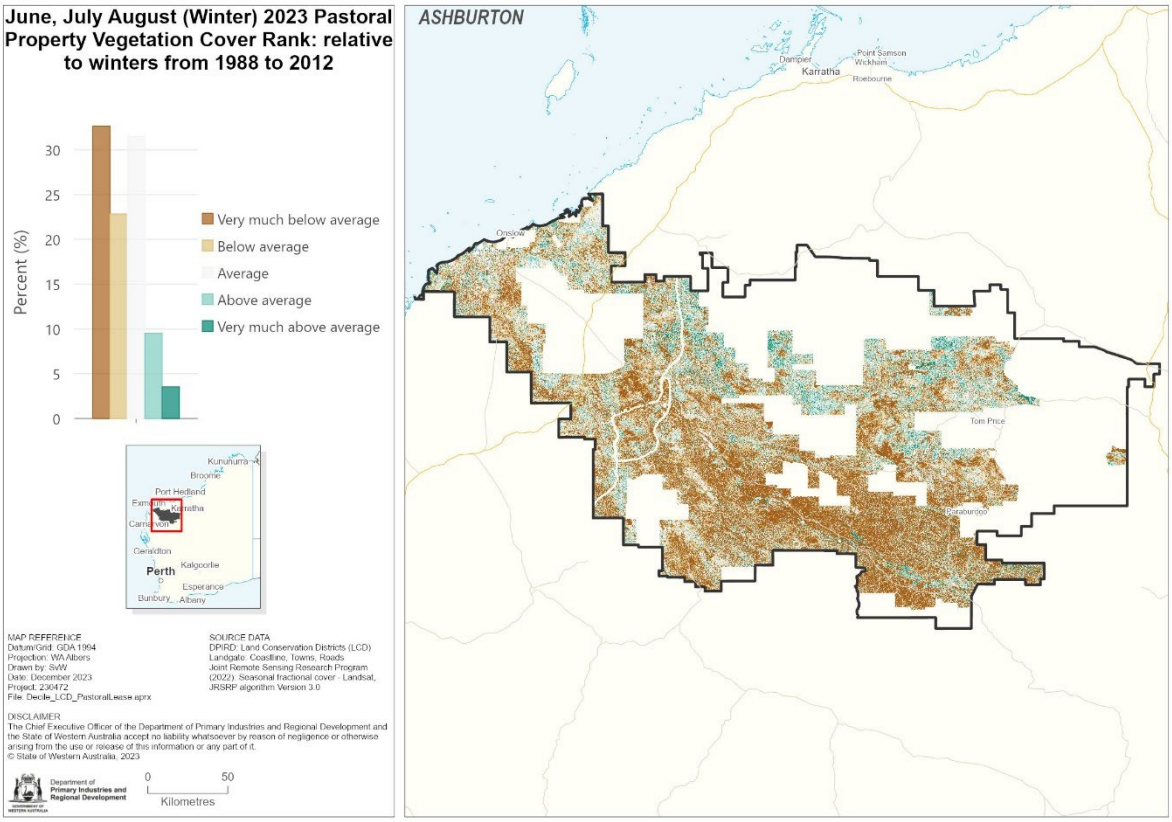


Figure 9: Relative total cover of all vegetation types in the pastoral areas of the Ashburton LCD

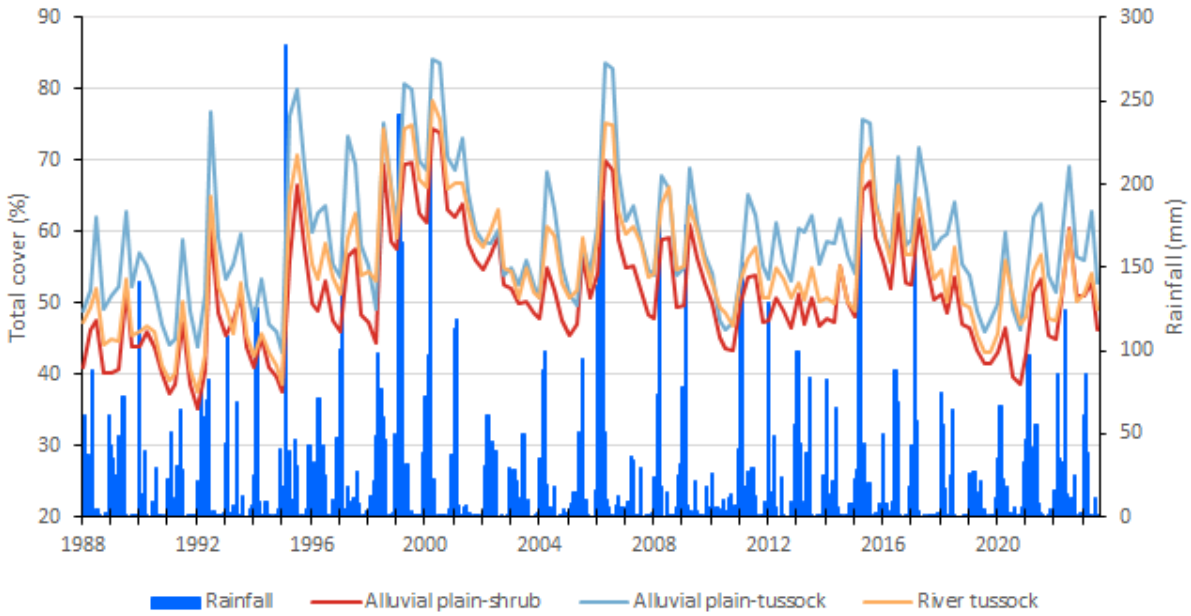


Figure 10: Total cover of vegetation functional groups in the Ashburton LCD

De Grey LCD

The 2022–23 wet season rainfall was 106% of the long-term average and June–August 2023 total cover of vegetation functional groups was average or below average (Figure 11 and Figure 12). The risk of cover decline is considered high to very high at the LCD level at reported stocking rates (Table 3). This is a similar risk to estimates reported in 2022.

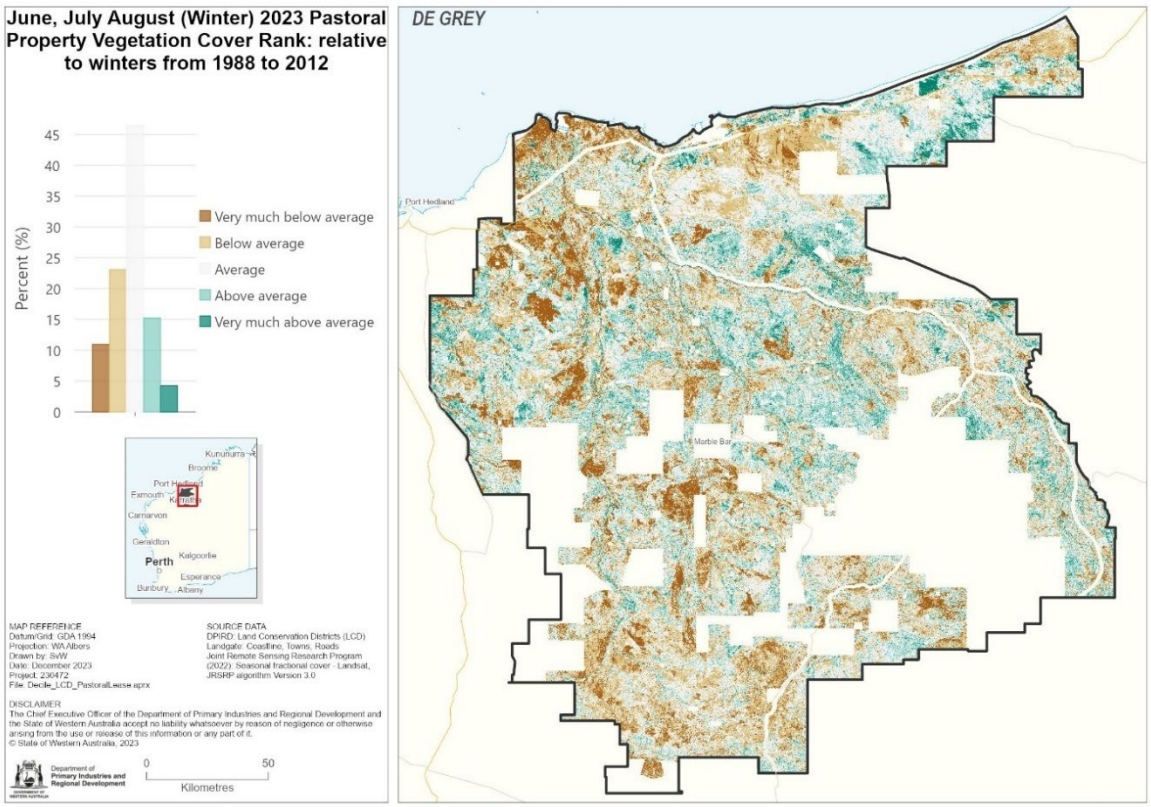


Figure 11: Relative total cover of all vegetation types in the pastoral areas of the De Grey LCD

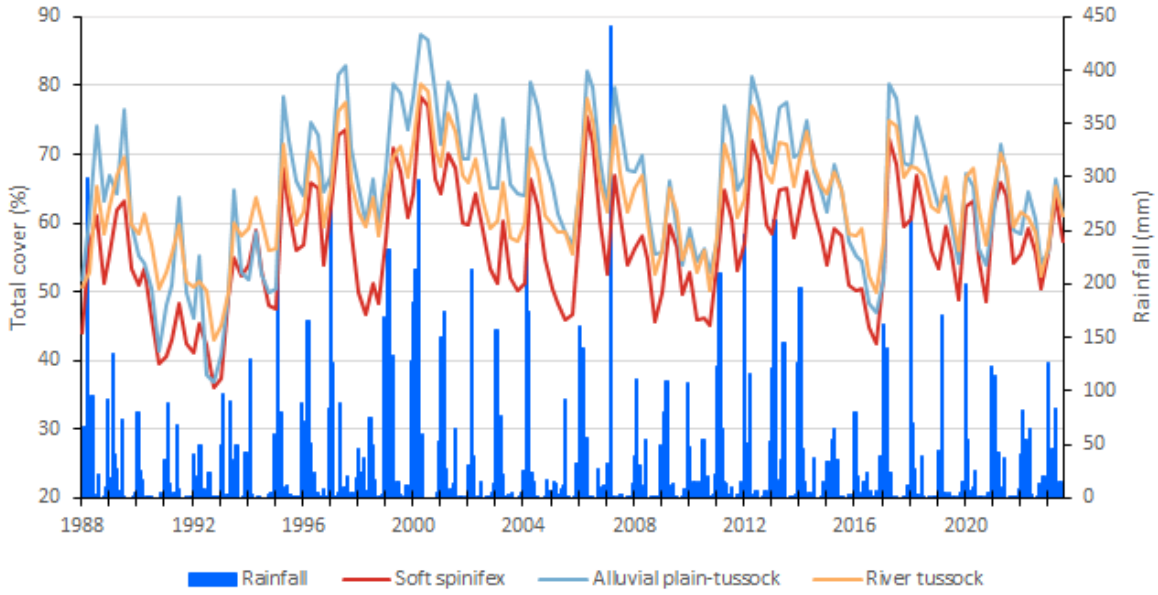


Figure 12: Total cover of vegetation functional groups in the De Grey LCD

East Pilbara LCD

The 2022–23 wet season rainfall was 109% of the long-term average and June–August total cover of vegetation functional groups was average or below average (Figure 13 and Figure 14). The risk of cover decline is considered moderate to high at the LCD level at reported stocking rates (Table 3). This is a decline in risk from estimates reported in 2022.

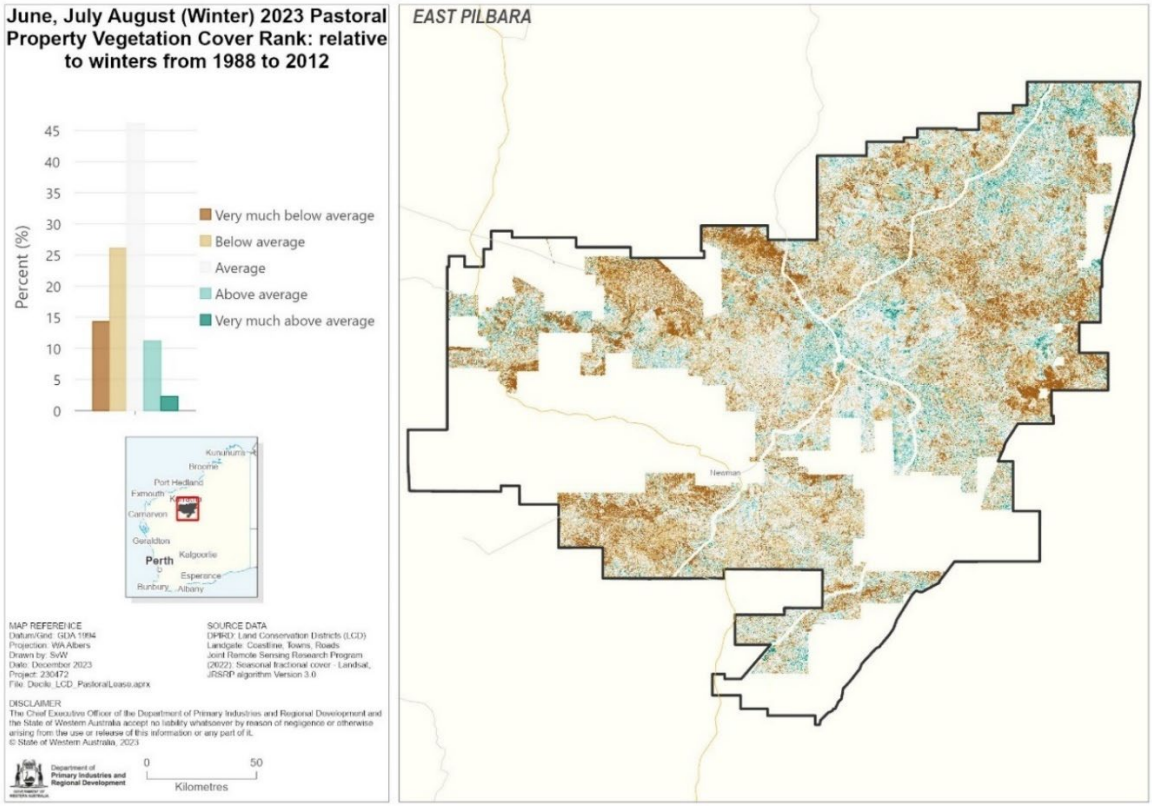


Figure 13: Relative total cover of all vegetation types in the pastoral areas of the East Pilbara LCD

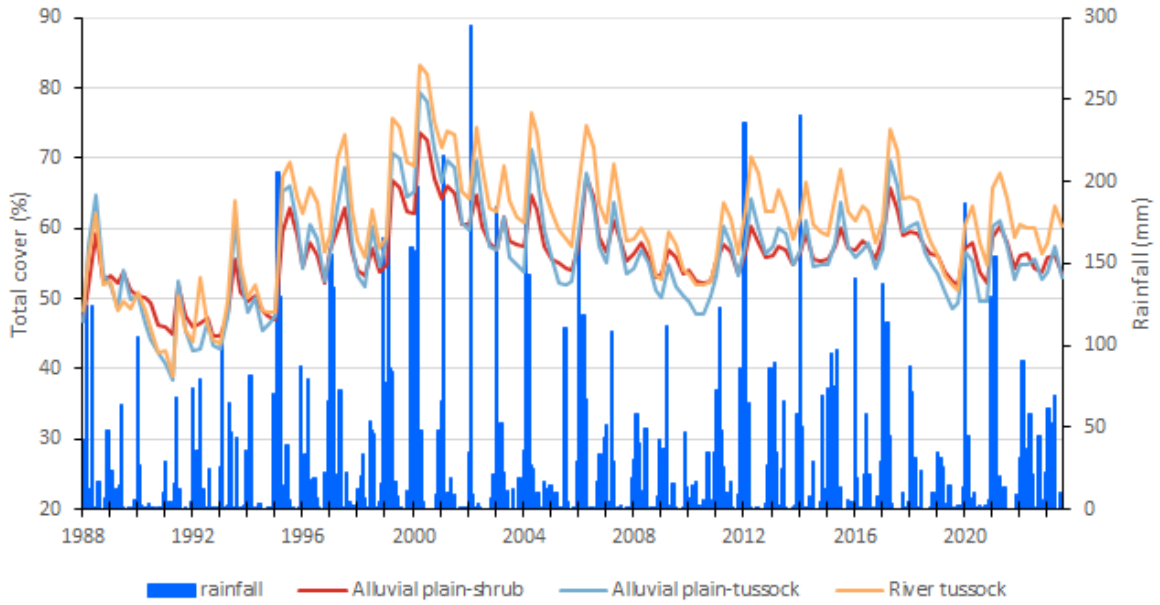


Figure 14: Total cover of vegetation functional groups in the East Pilbara LCD

Roebourne – Port Hedland LCD

The 2022–23 wet season rainfall was 84% of the long-term average and June–August 2023 total cover of vegetation functional groups was below average (Figure 15 and Figure 16). The risk of cover decline is considered high at reported stocking rates (Table 3). This is similar to risk estimates reported in 2022.

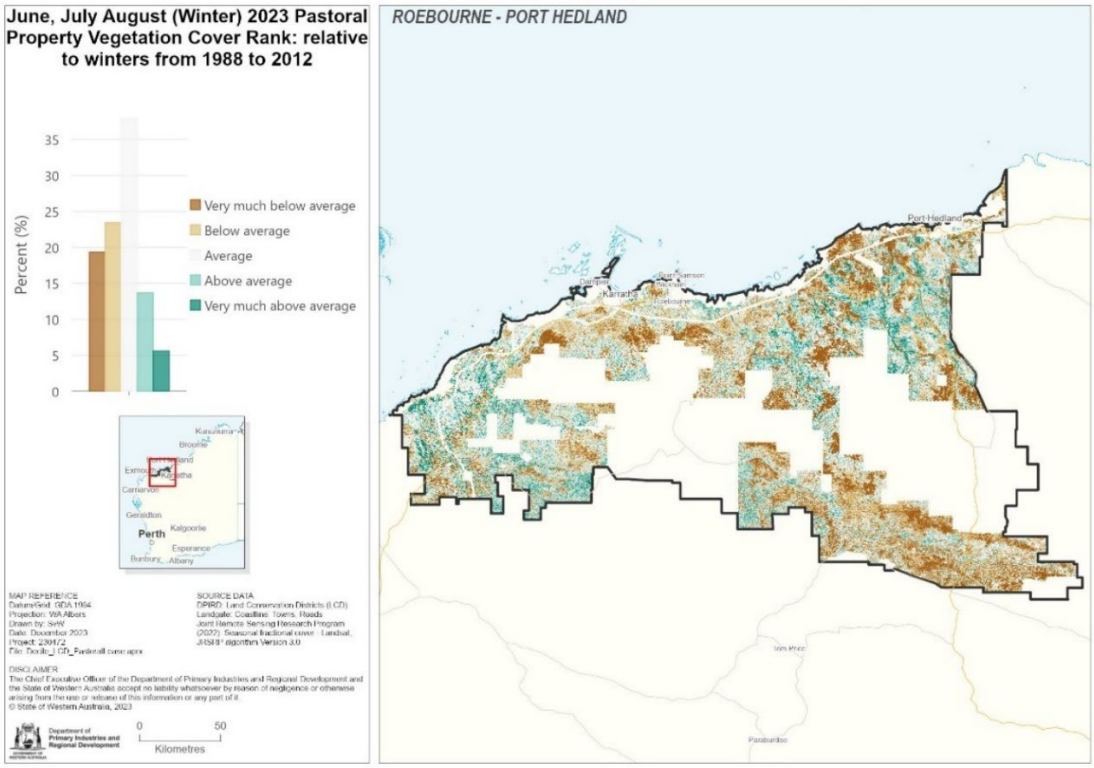


Figure 15: Relative total cover of all vegetation types in the pastoral areas of the Roebourne – Port Hedland LCD

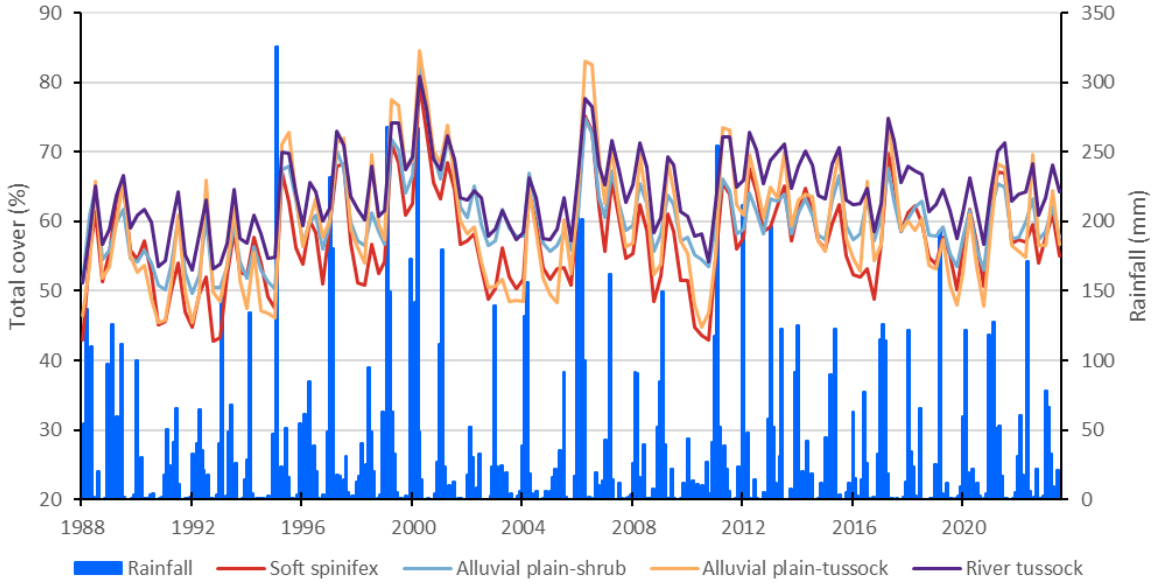


Figure 16: Total cover of monitoring and assessment units in the Roebourne – Port Hedland LCD

Upper Southern Rangelands

Seasonal conditions were generally wetter in the northeast and drier in the southwest, with rainfall in the 12 months to November 2023 ranging from 37% of the long-term average in the Gascoyne–Wooramel LCD to 97% in the Gascoyne – Ashburton Headwaters LCD (Figure 51). Total cover of vegetation functional groups ranged from average to very much below average, and the risk of cover decline ranged from moderate in the Gascoyne – Ashburton Headwaters and Wiluna LCDs to very high in the Upper Gascoyne LCD. The very high risk in the Upper Gascoyne LCD reflects very much below-average total cover and 2022 stock numbers near PCC (Figure 49). Stock numbers in the Upper Gascoyne LCD will require very conservative management to avoid animal welfare issues in 2024 and allow pasture recovery. The risk of cover decline increased compared estimates reported in 2022 for all LCDs except Gascoyne – Ashburton Headwaters LCD where it has decreased.

Gascoyne – Ashburton Headwaters LCD

Rainfall over the 12 months to November 2023 was 94% of average and June–August 2023 total cover was average for all vegetation functional groups (Figure 17 and Figure 18). The risk of cover decline is considered moderate at the LCD level at reported stocking rates (Table 3). This is a decline in risk compared to estimates reported in 2022.

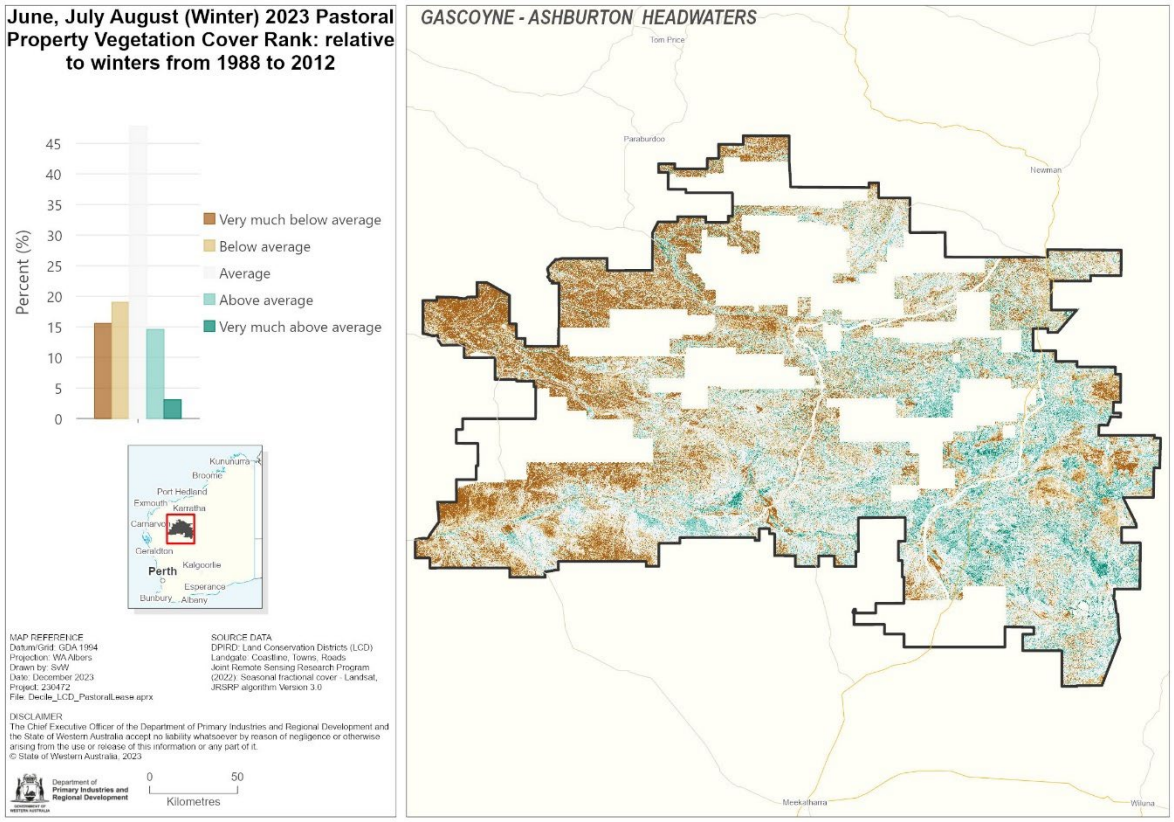


Figure 17: Relative total cover of all vegetation types in the pastoral areas of the Gascoyne – Ashburton Headwaters LCD

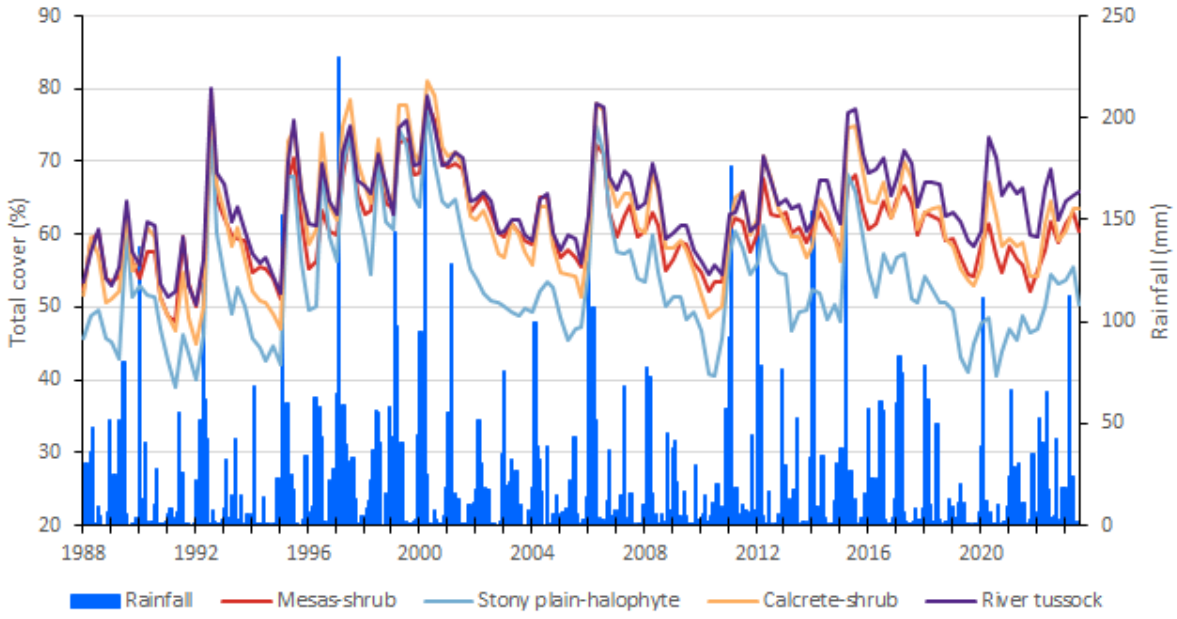


Figure 18: Total cover of vegetation functional groups in the Gascoyne – Ashburton Headwaters LCD

Gascoyne–Wooramel LCD

Rainfall over the 12 months to November 2023 was 37% of average and June–August 2023 total cover of vegetation functional groups was average or below average (Figure 19 and Figure 20). The risk of cover decline is considered moderate to high at the LCD level at reported stocking rates (Table 3). This an increase in risk compared to estimates reported in 2022.

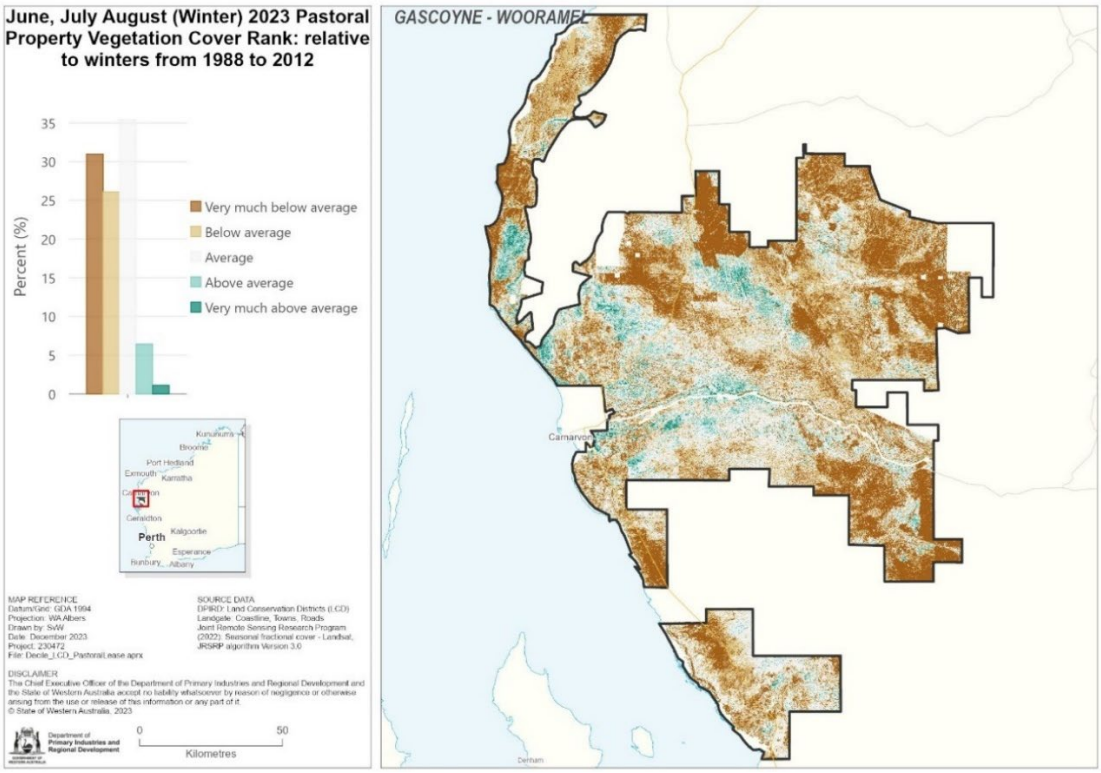


Figure 19: Relative total cover of all vegetation types in the pastoral areas of the Gascoyne–Wooramel LCD

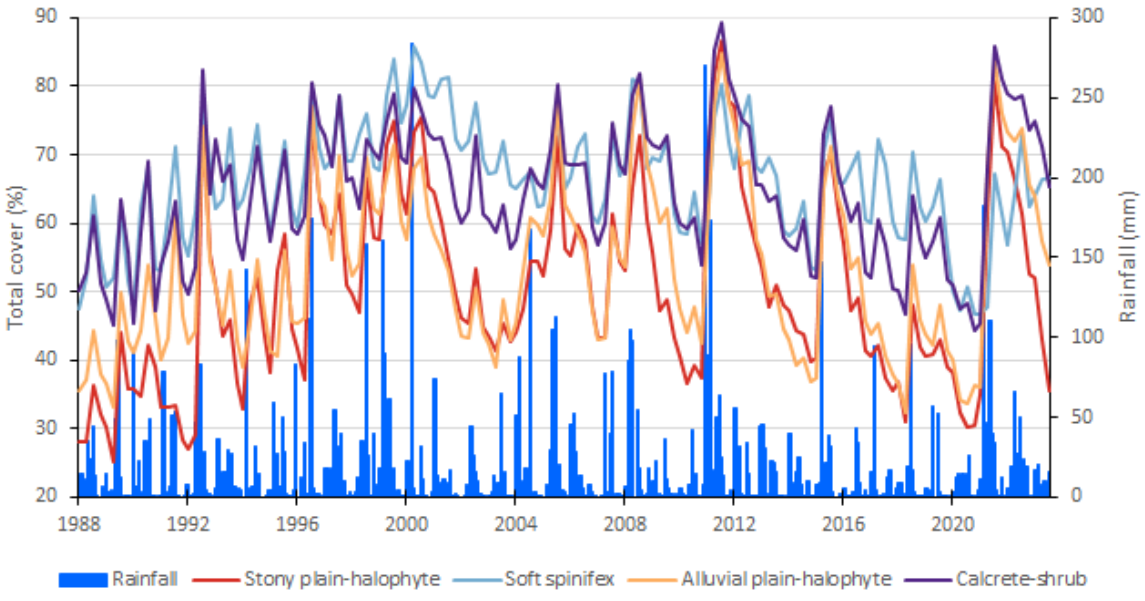


Figure 20: Total cover of vegetation functional groups in the Gascoyne–Wooramel LCD

Lyndon LCD

Rainfall over the 12 months to November 2023 was 59% of average and June–August 2023 total cover of vegetation functional groups was average or below average (Figure 21 and Figure 22). The risk of cover decline is considered moderate to high at the LCD level at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

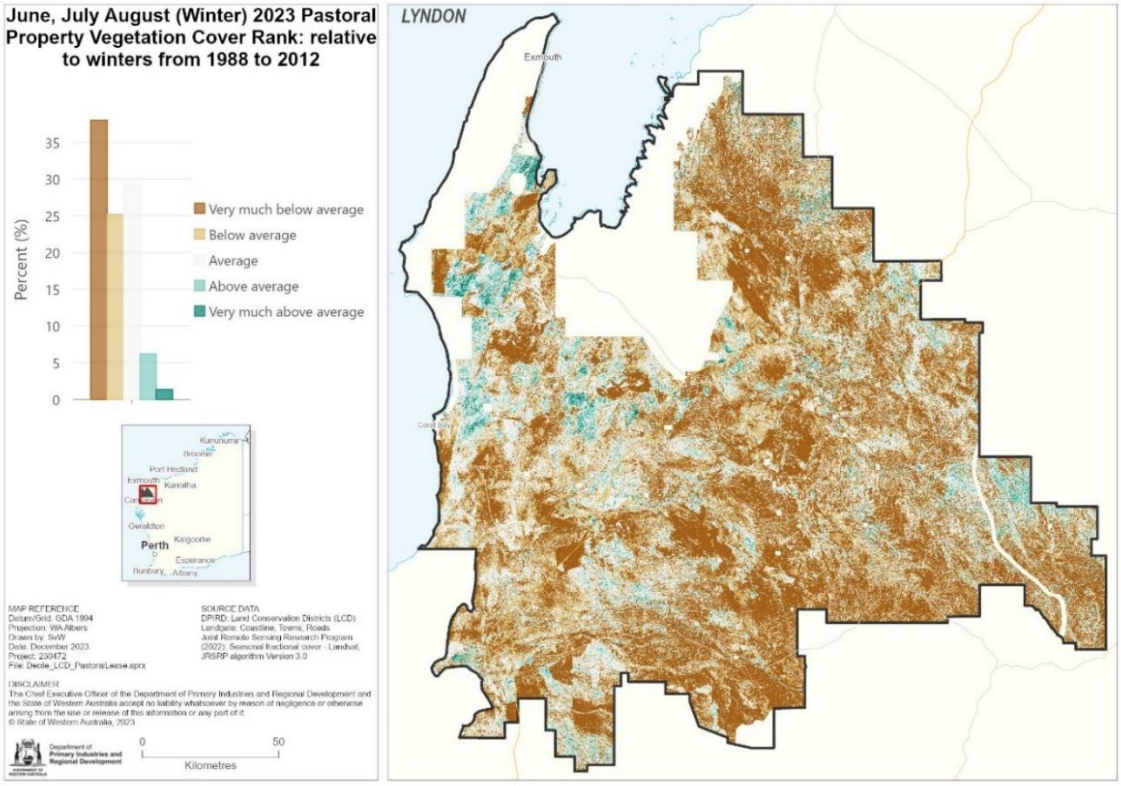


Figure 21: Relative total cover of all vegetation types in the pastoral areas of the Lyndon LCD

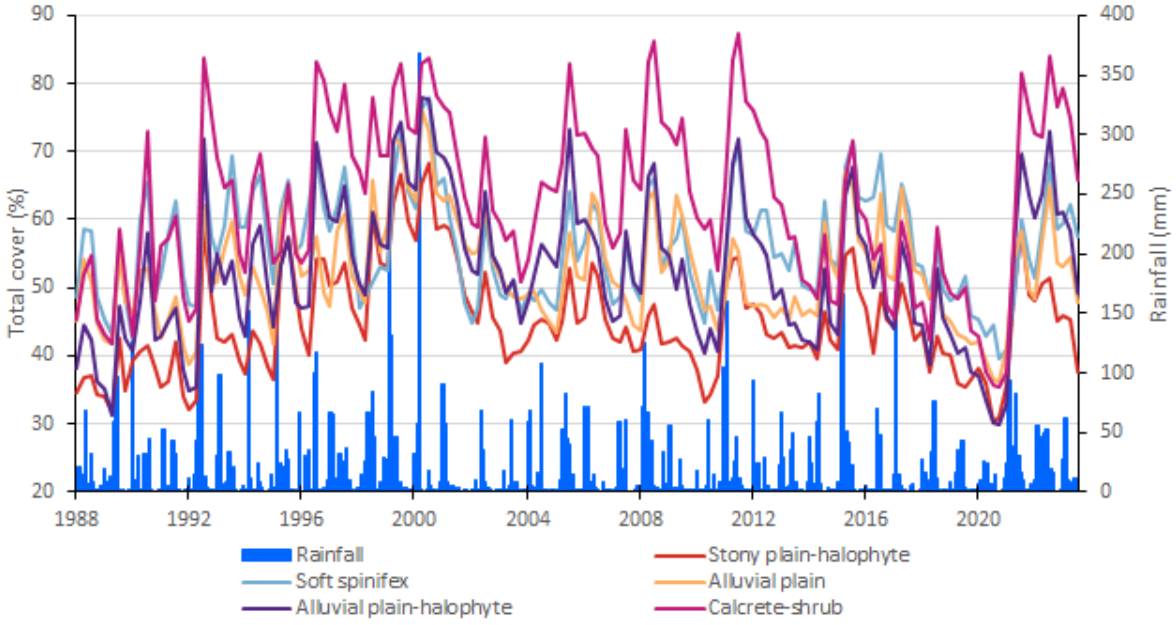


Figure 22: Total cover of vegetation functional groups in the Lyndon LCD

Meekatharra LCD

Rainfall over the 12 months to November 2023 was 97% of average and June–August 2023 total cover of vegetation functional groups was average or below average (Figure 23 and Figure 24). The risk of cover decline is considered moderate to high at the LCD level at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

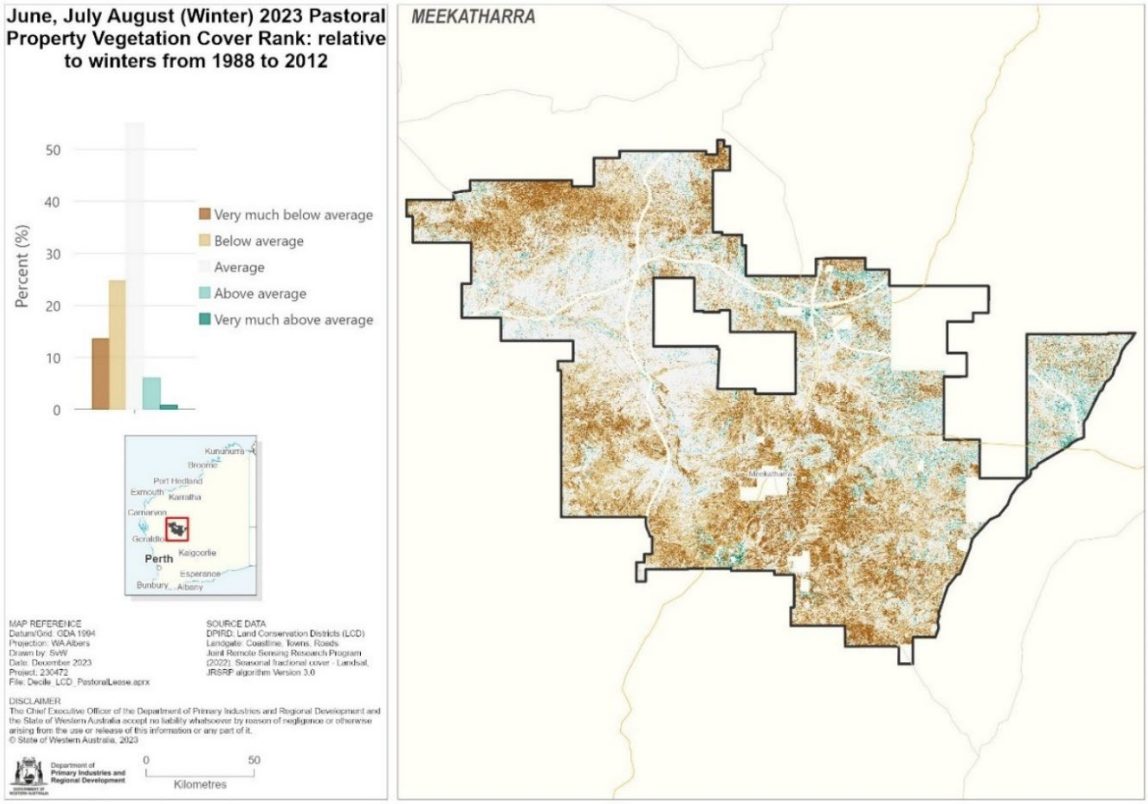


Figure 23: Relative total cover of all vegetation types in the pastoral areas of the Meekatharra LCD

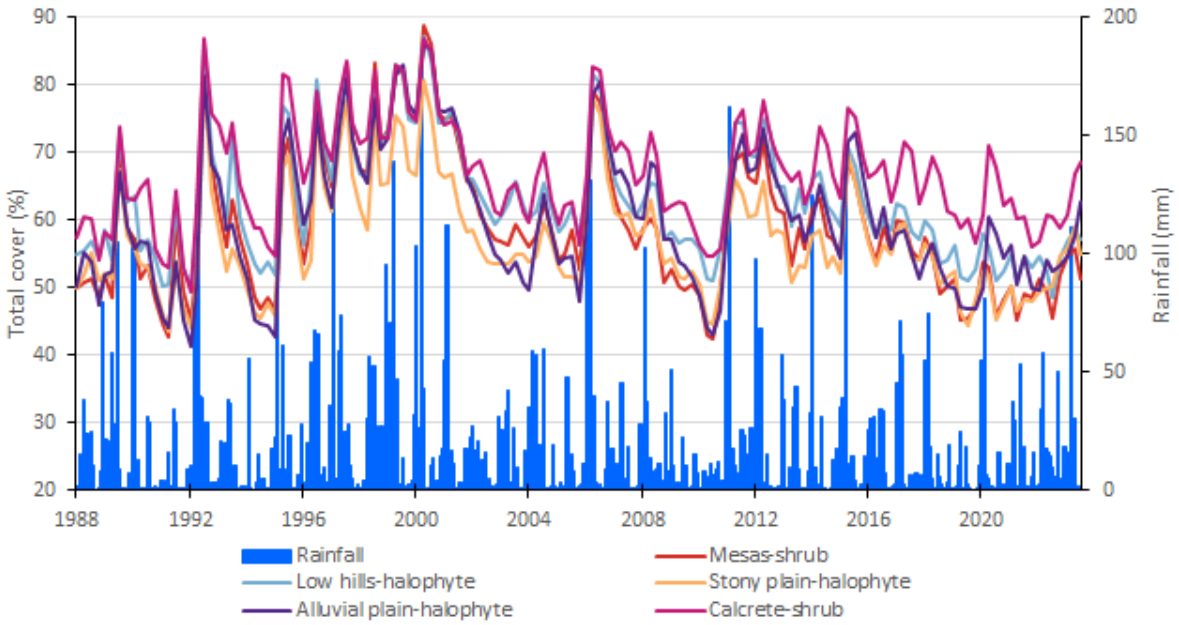


Figure 24: Total cover of vegetation functional groups in the Meekatharra LCD

Upper Gascoyne LCD

Rainfall over the 12 months to November 2023 was 51% of average and June–August 2023 total cover of vegetation functional groups was very much below average (Figure 25 and Figure 26). The risk of cover decline is considered very high at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

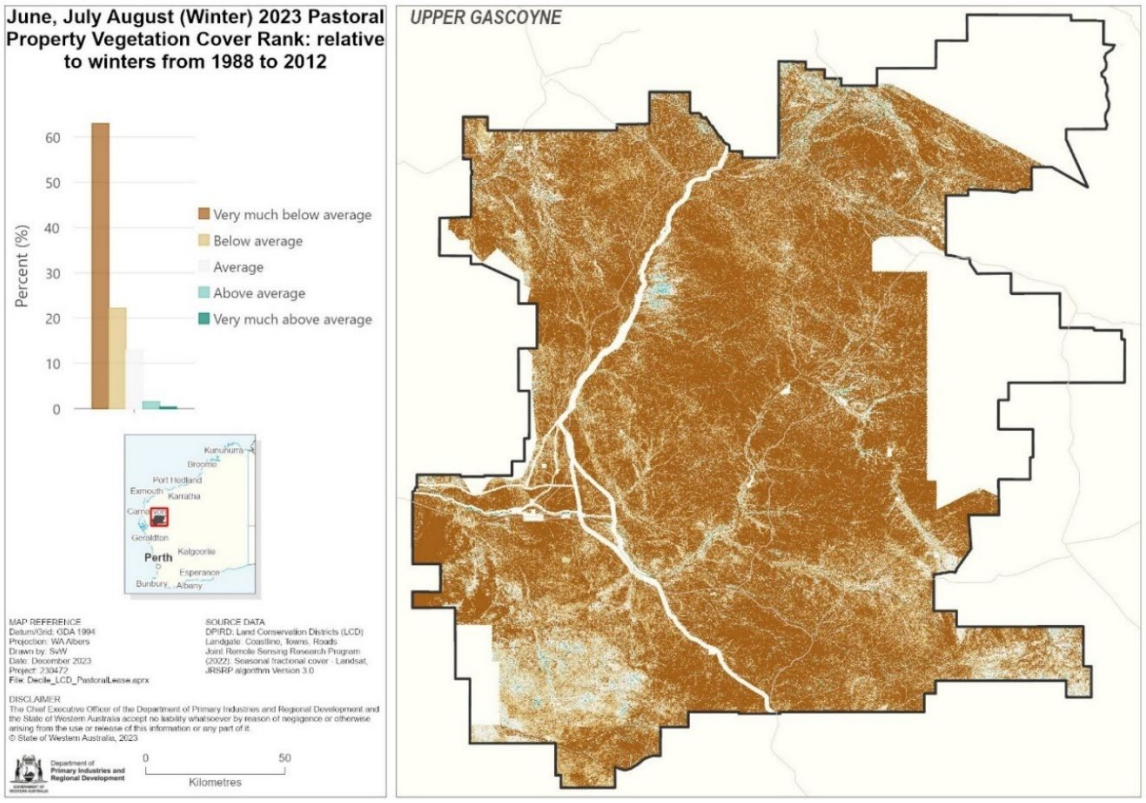


Figure 25: Relative total cover of all vegetation types in the pastoral areas of the Upper Gascoyne LCD

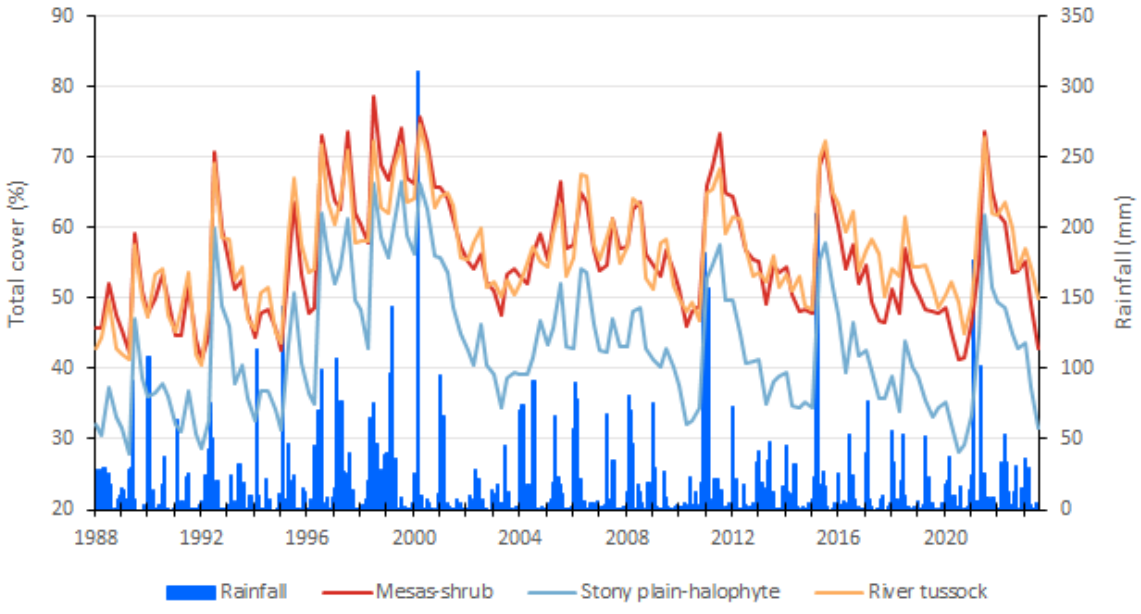


Figure 26: Total cover of vegetation functional groups in the Upper Gascoyne LCD

Wiluna LCD

Rainfall over the 12 months to November 2023 was 85% of average and June–August 2023 total cover of vegetation functional groups was average (Figure 27 and Figure 28). The risk of cover decline is considered moderate at the LCD level at reported stocking rates (Table 3). This is decline in risk compared to estimates reported in 2022.

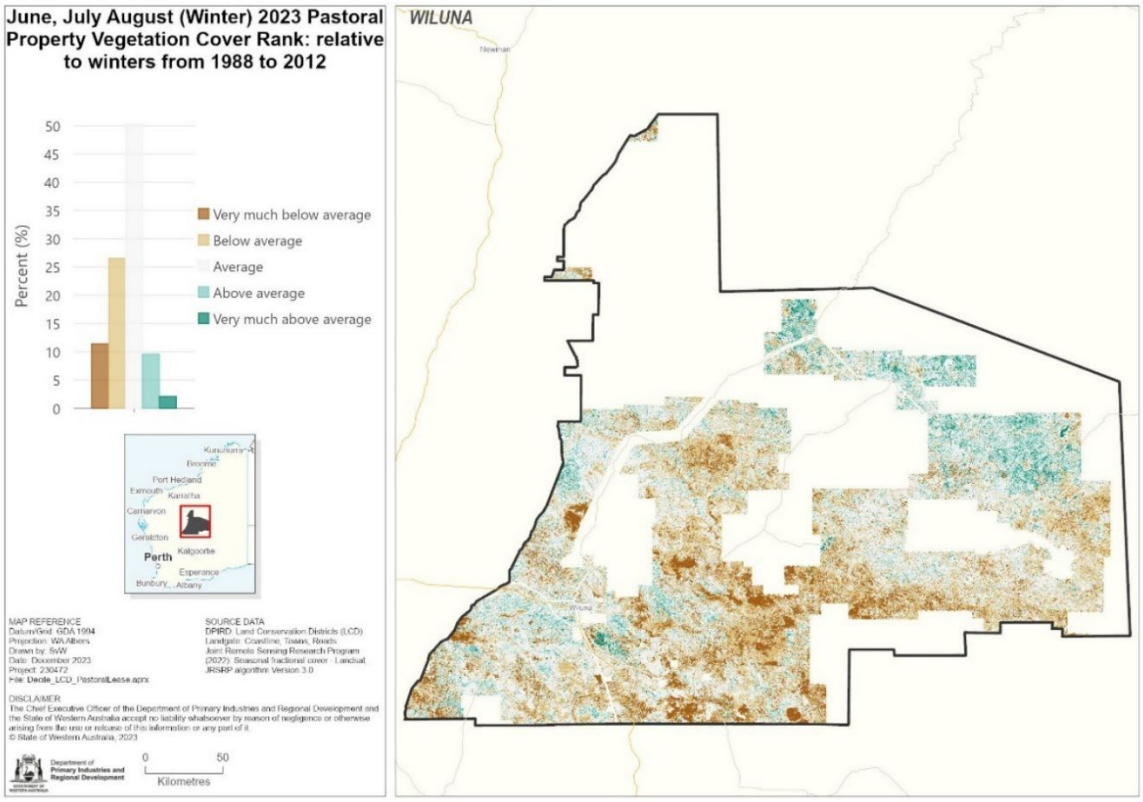


Figure 27: Relative total cover of all vegetation types in the pastoral areas of the Wiluna LCD

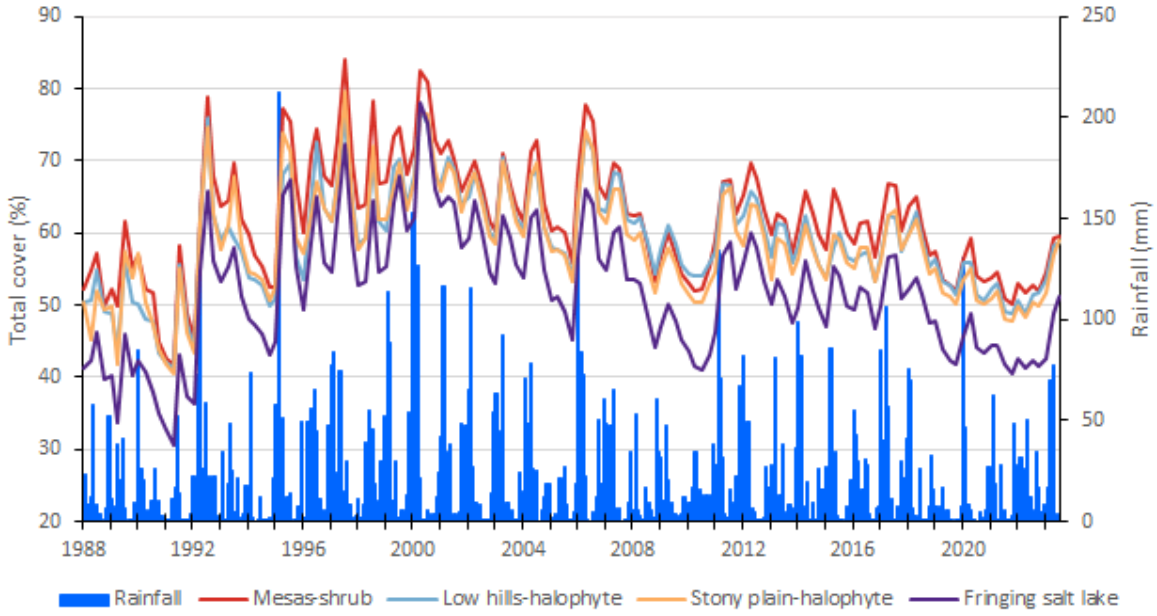


Figure 28: Total cover of vegetation functional groups in the Wiluna LCD

Lower Southern Rangelands

Seasonal conditions were generally dry, with rainfall in the 12 months to November 2023 ranging from 34% of the long-term average in Shark Bay LCD to 95% in Cue LCD (Figure 51). Total cover of vegetation functional groups was average to very much below average, and the risk of cover decline ranged from moderate to high in the Shark Bay and Yalgoo LCDs to very high in all other LCDs. The risk of cover decline increased compared to estimates reported in 2022 for all LCDs except Kalgoorlie and North-eastern Goldfields LCDs where risk remained at very high levels.

The 2022 stocking rate in the North-eastern Goldfields and Nullarbor LCDs was 57 and 50% of PCC respectively (Figure 50) and will need to be further reduced if significant rain does not fall early in 2024 to increase vegetation cover and fodder.

Cue LCD

Rainfall over the 12 months to November 2023 was 95% of average and June–August 2023 total cover of was very much below average (Figure 29 and Figure 30). The risk of cover decline is considered very high even though the 2022 stocking rate was just 14% of PCC (Table 3). This is an increase in risk compared to estimates reported in 2022.

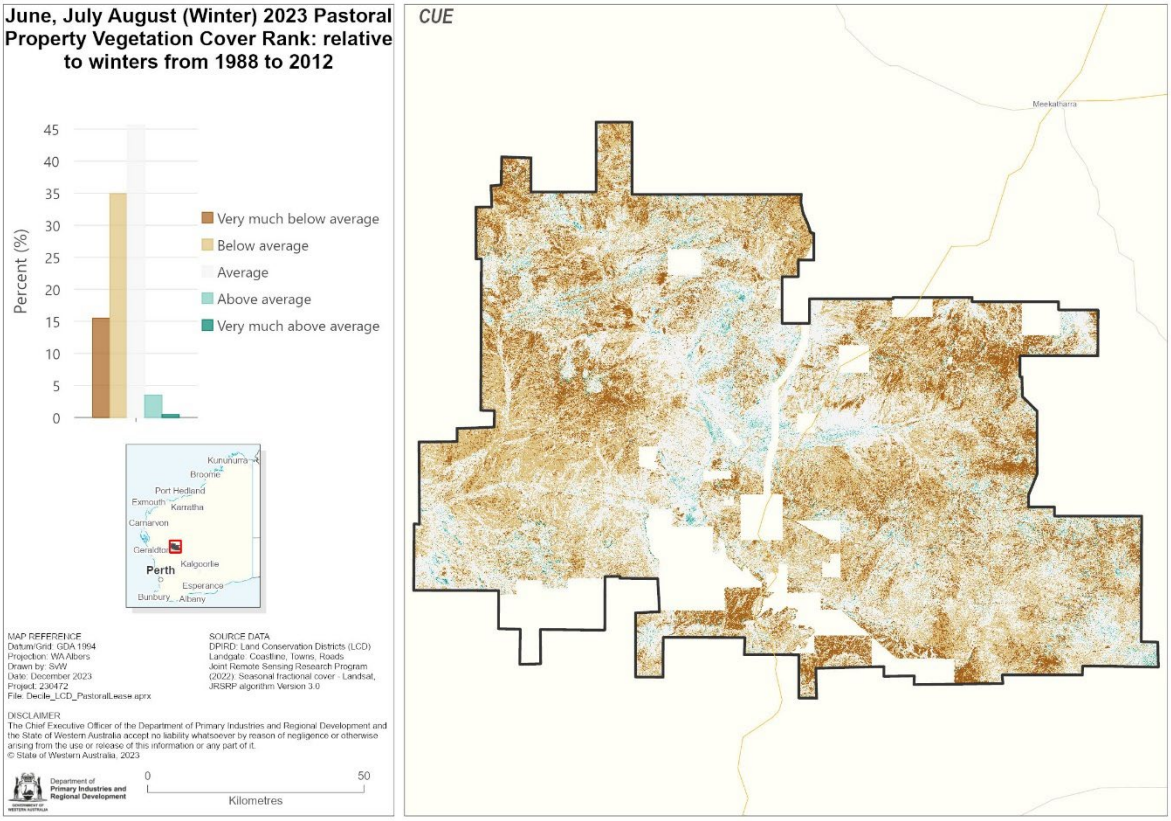


Figure 29: Relative total cover of all vegetation types in the pastoral areas of the Cue LCD

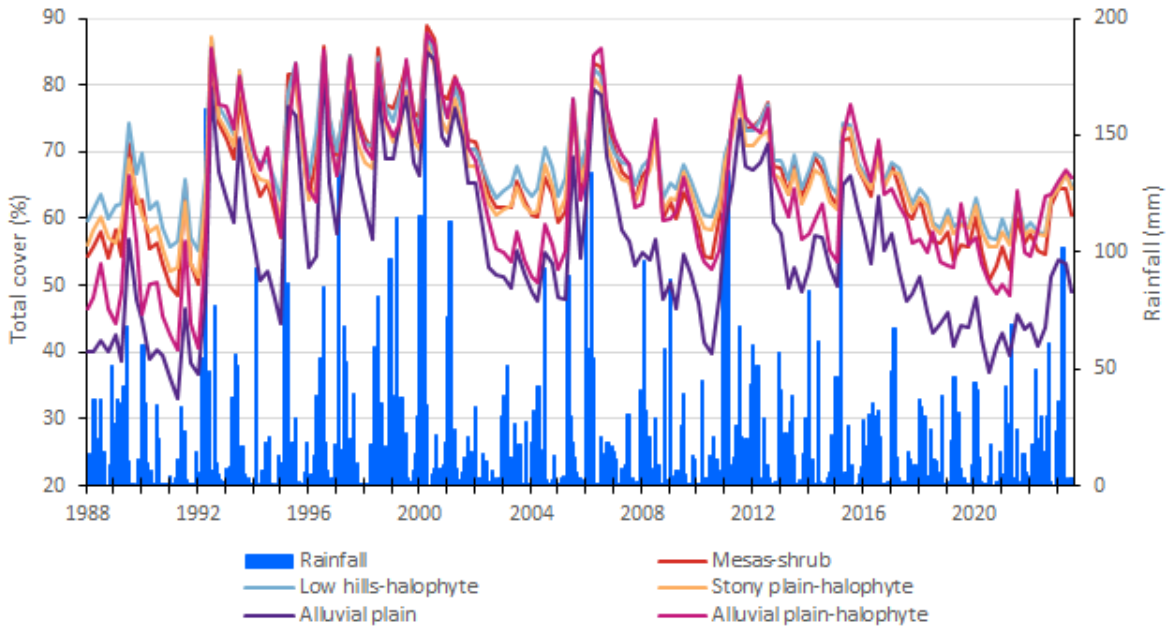


Figure 30: Total cover of vegetation functional groups in the Cue LCD

Kalgoorlie LCD

Rainfall over the 12 months to November 2023 was 64% of average and June–August 2023 total cover of was very much below average (Figure 31 and Figure 32). The risk of cover decline is considered very high at reported stocking rates (Table 3). This is a similar risk compared to estimates reported in 2022.

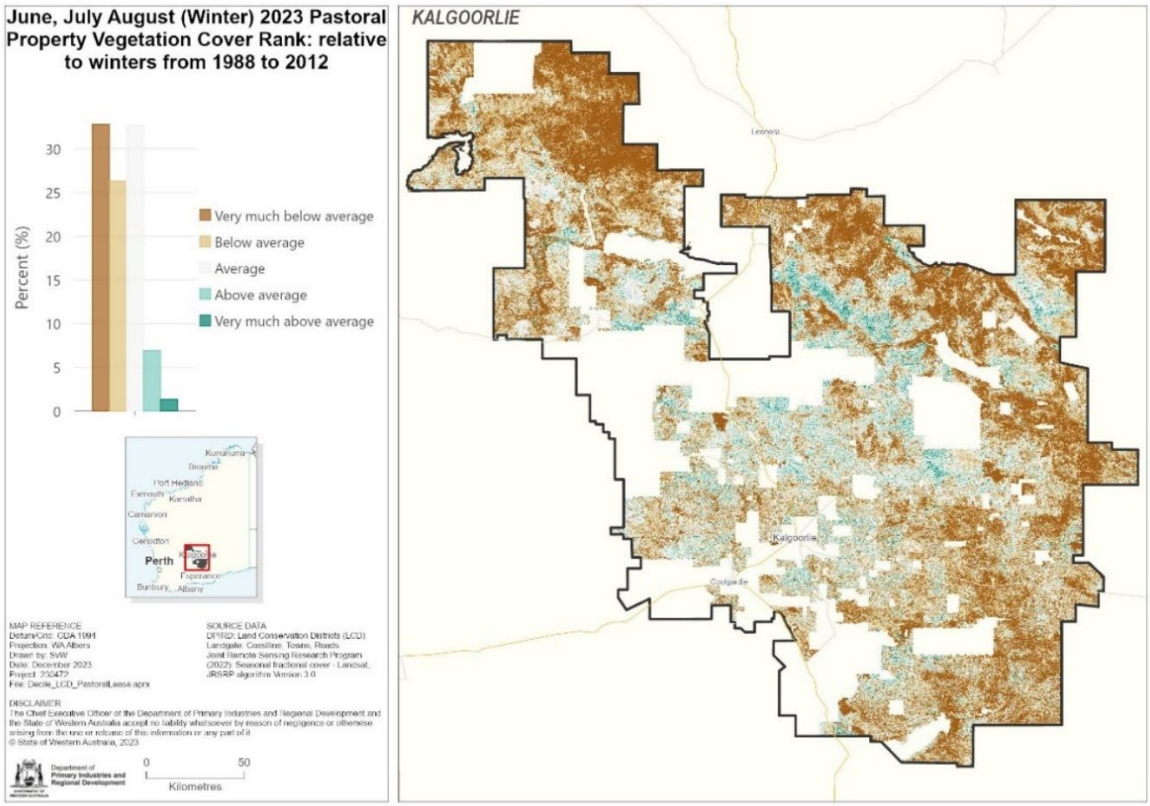


Figure 31: Relative total cover of all vegetation types in the pastoral areas of the Kalgoorlie LCD

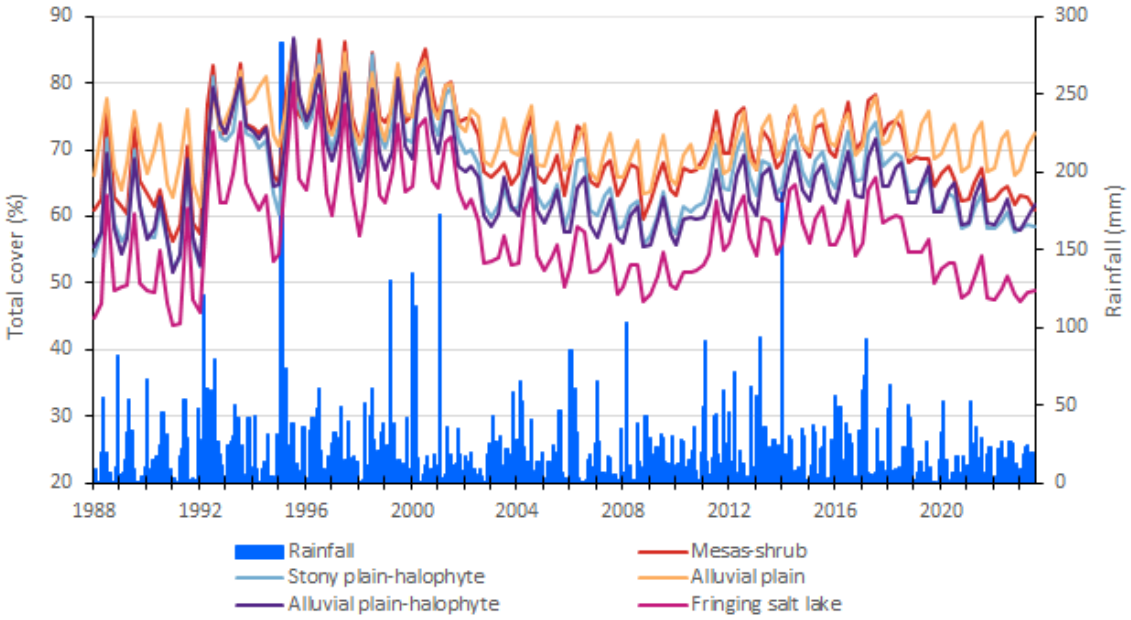


Figure 32: Total cover of vegetation functional groups in the Kalgoorlie LCD

Mount Magnet LCD

Rainfall over the 12 months to November 2023 was 59% of average and June–August 2023 total cover ranged from average to very much below average (Figure 33 and Figure 34). The risk of cover decline ranges from moderate to very high, even though the 2022 stocking rate was 19% of PCC (Table 3). This is an increase in risk compared to estimates reported in 2022.

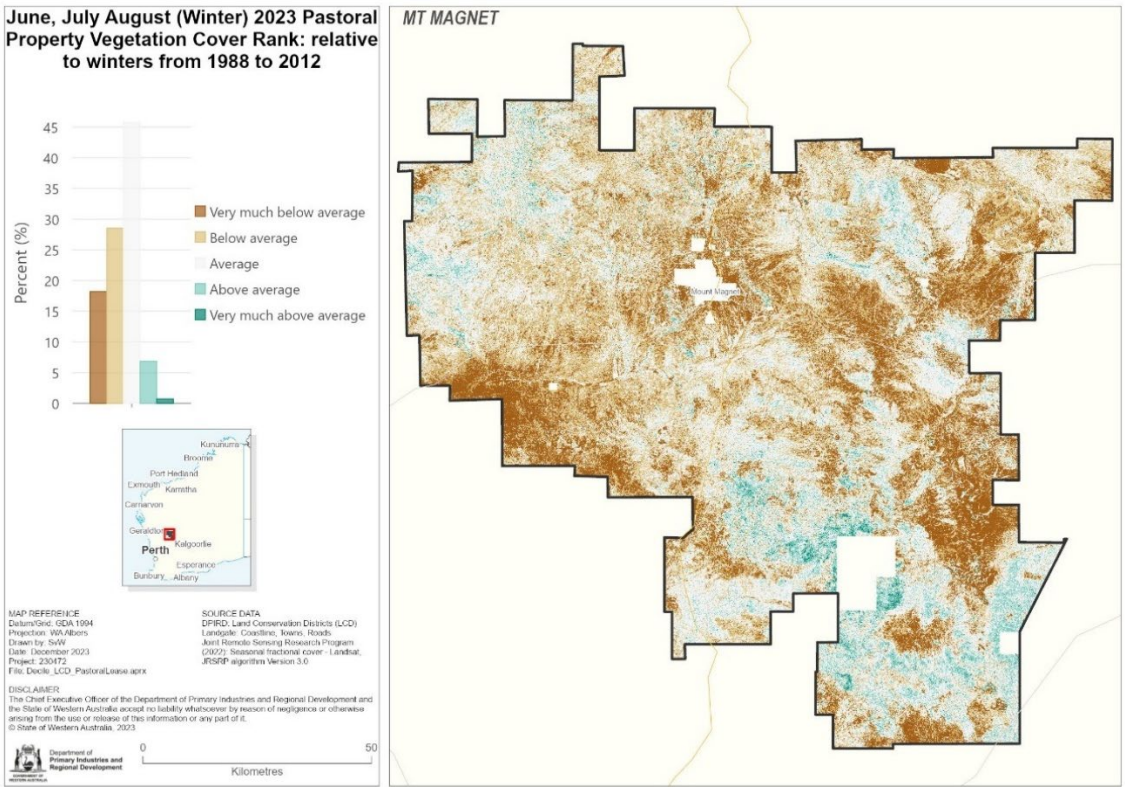


Figure 33: Relative total cover of all vegetation types in the pastoral areas of the Mt Magnet LCD

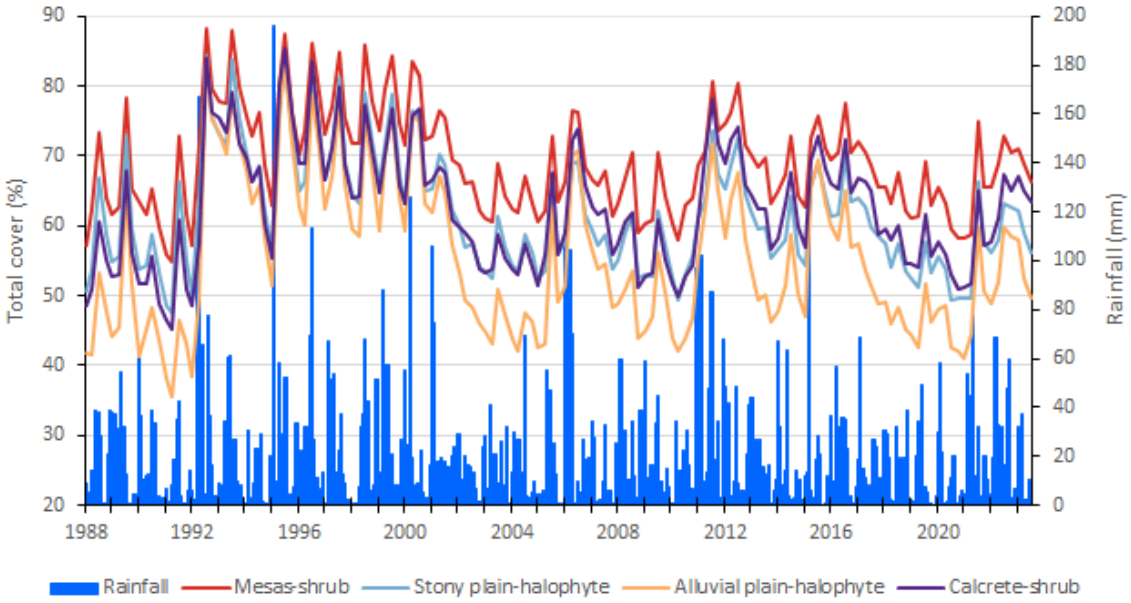


Figure 34: Total cover of vegetation functional groups in the Mount Magnet LCD

Murchison LCD

Rainfall over the 12 months to November 2023 was 72% of average and June–August 2023 total cover ranged from average to very much below average (Figure 35 and Figure 36). The risk of cover decline ranges from moderate to very high at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

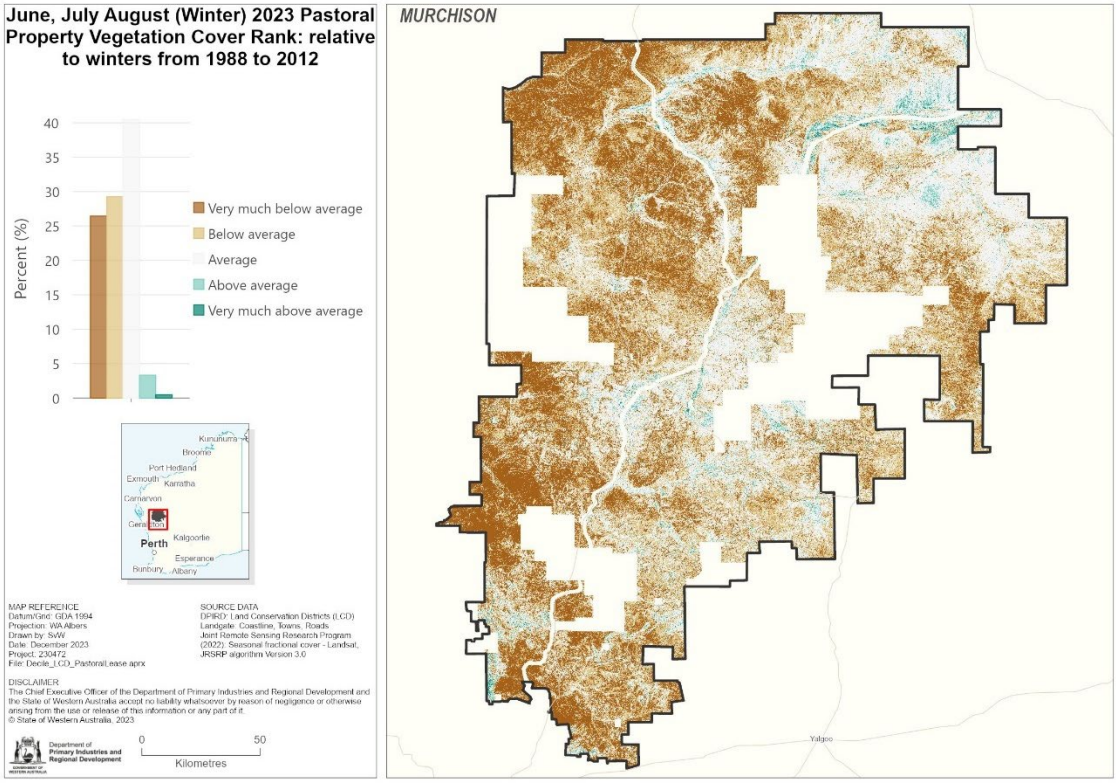


Figure 35: Relative total cover of all vegetation types in the pastoral areas of the Murchison LCD

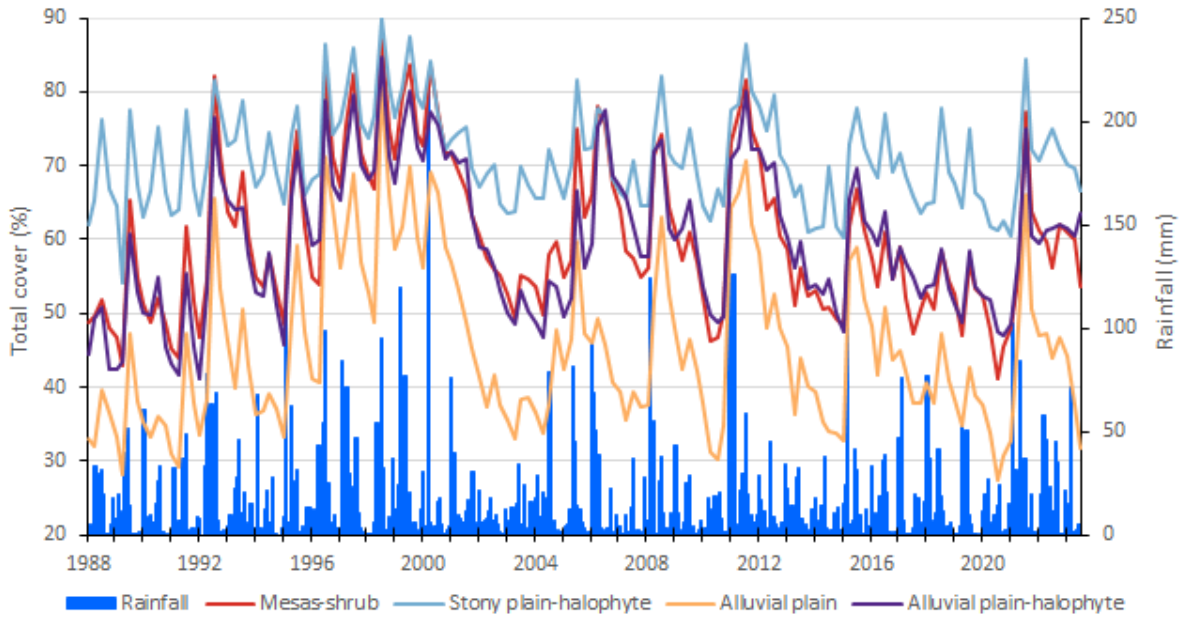


Figure 36: Total cover of vegetation functional groups in the Murchison LCD

North-eastern Goldfields LCD

Rainfall over the 12 months to November 2023 was 51% of average and June–August 2023 total cover was very much below average (Figure 37 and Figure 38). The risk of cover decline is considered very high at reported stocking rates (Table 3). This is a similar to risk estimates reported in 2022. The 2022 the stocking rate was 57% of PCC and will need to be further reduced unless significant rain falls in 2024 to increase cover levels.

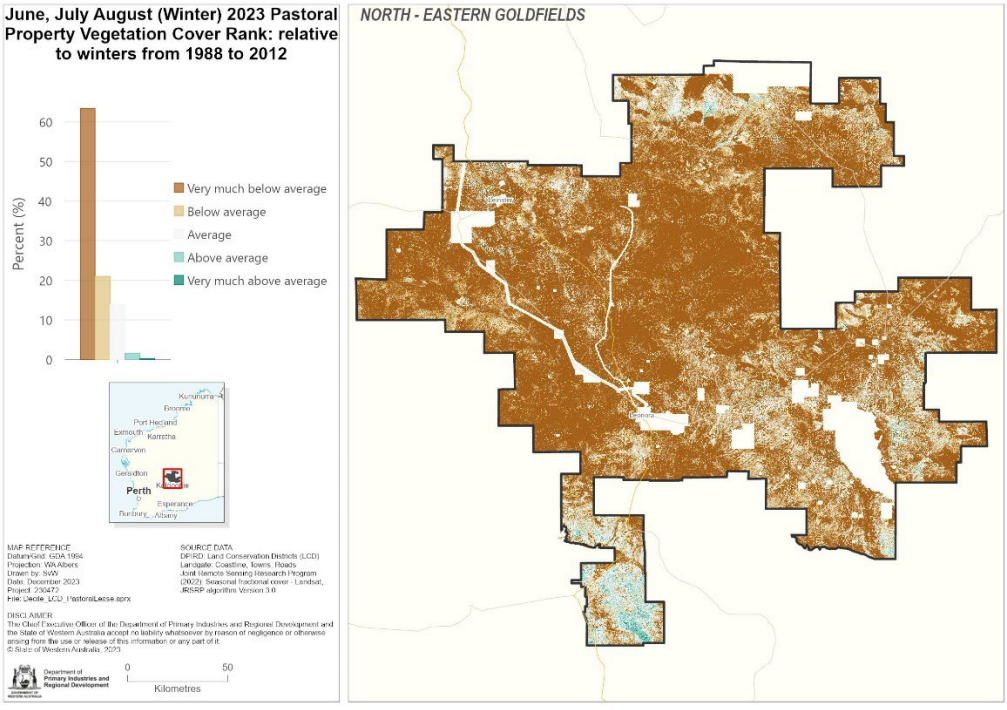


Figure 37: Relative total cover of all vegetation types in the pastoral areas of the North-eastern Goldfields LCD

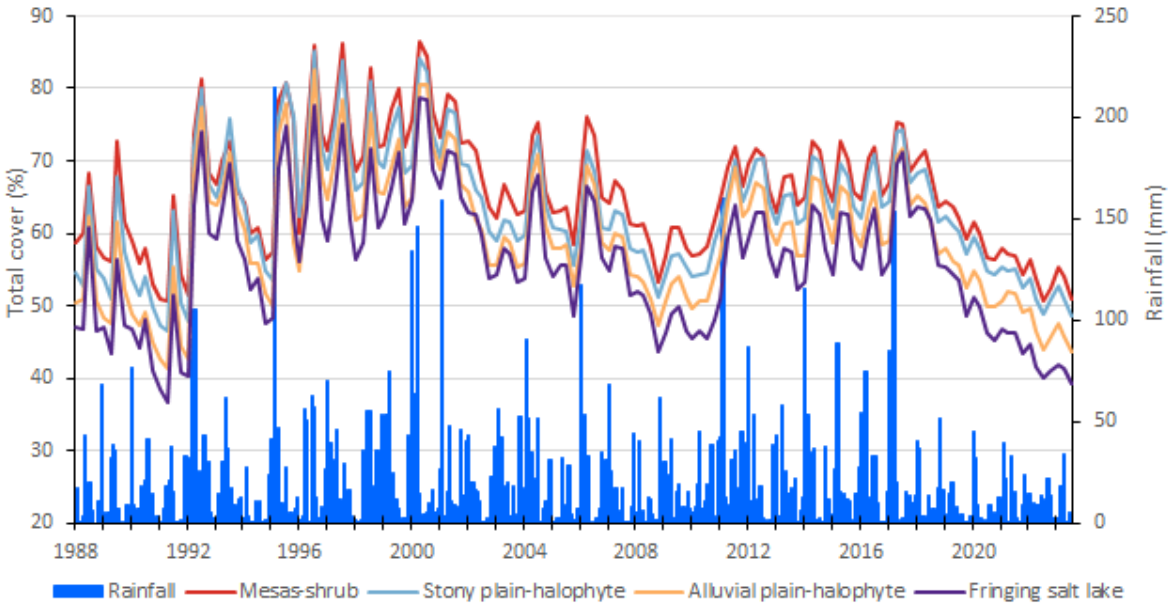


Figure 38: Total cover of vegetation functional groups in the North-eastern Goldfields LCD

Nullarbor – Eyre Highway LCD

Rainfall over the 12 months to November 2023 was 60% of average and June–August 2023 total cover of key MAUs was very much below average (Figure 39 and Figure 40). The risk of cover decline is considered very high at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022. The 2022 stocking rate was 50% of PCC and will need to be further reduced unless significant rain falls in 2024 to increase cover levels.

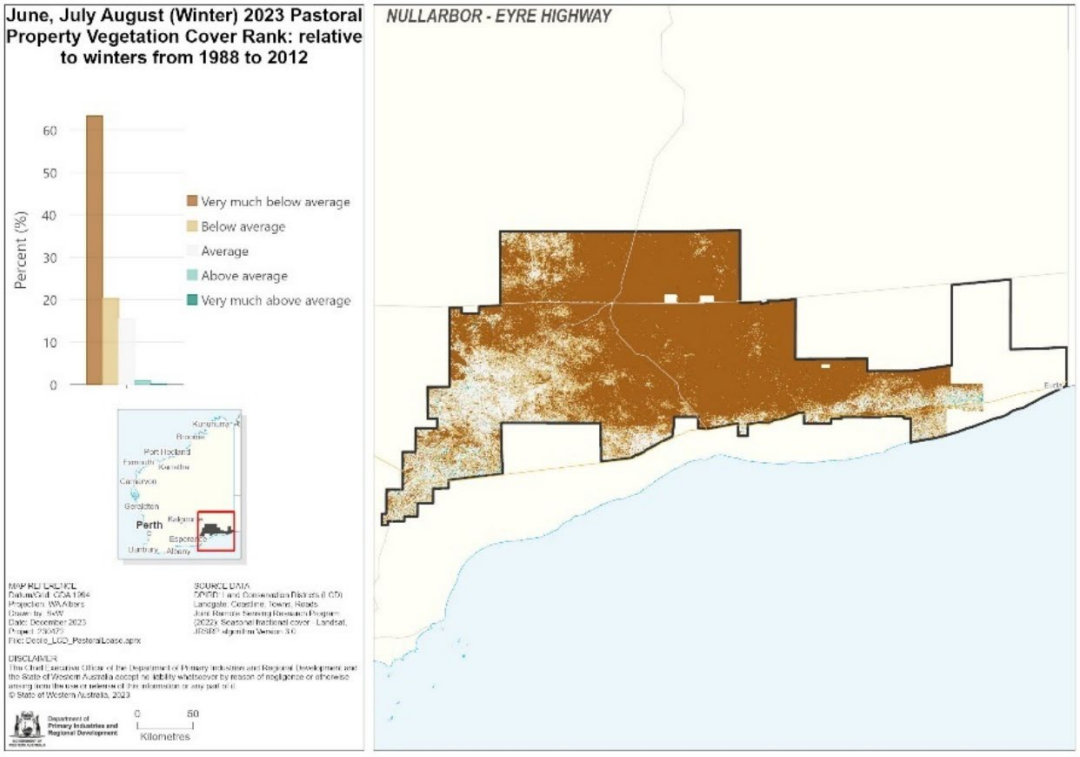


Figure 39: Relative total cover of all vegetation types in the pastoral areas of the Nullarbor – Eyre Highway LCD

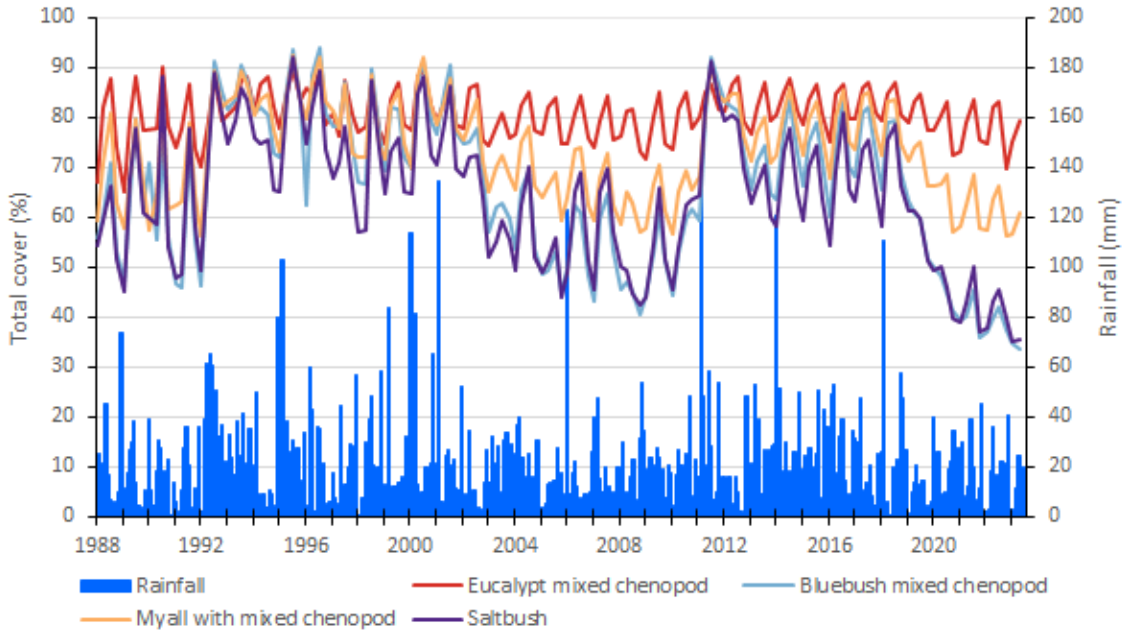


Figure 40: Total cover of key MAUs in the Nullarbor – Eyre Highway LCD

Sandstone LCD

Rainfall over the 12 months to November 2023 was 45% of average and June–August 2023 total cover of vegetation functional groups was very much below average (Figure 41 and Figure 42). The risk of cover decline is considered very high at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

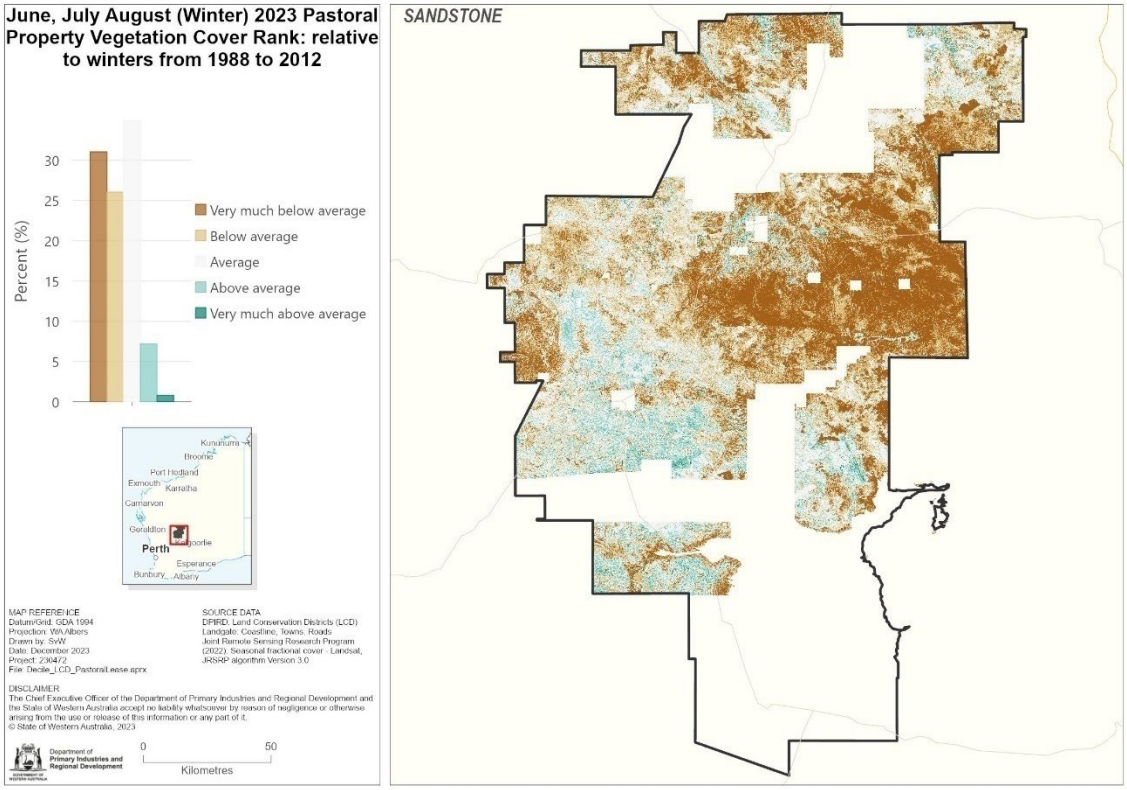


Figure 41: Relative total cover of all vegetation types in the pastoral areas of the Sandstone LCD

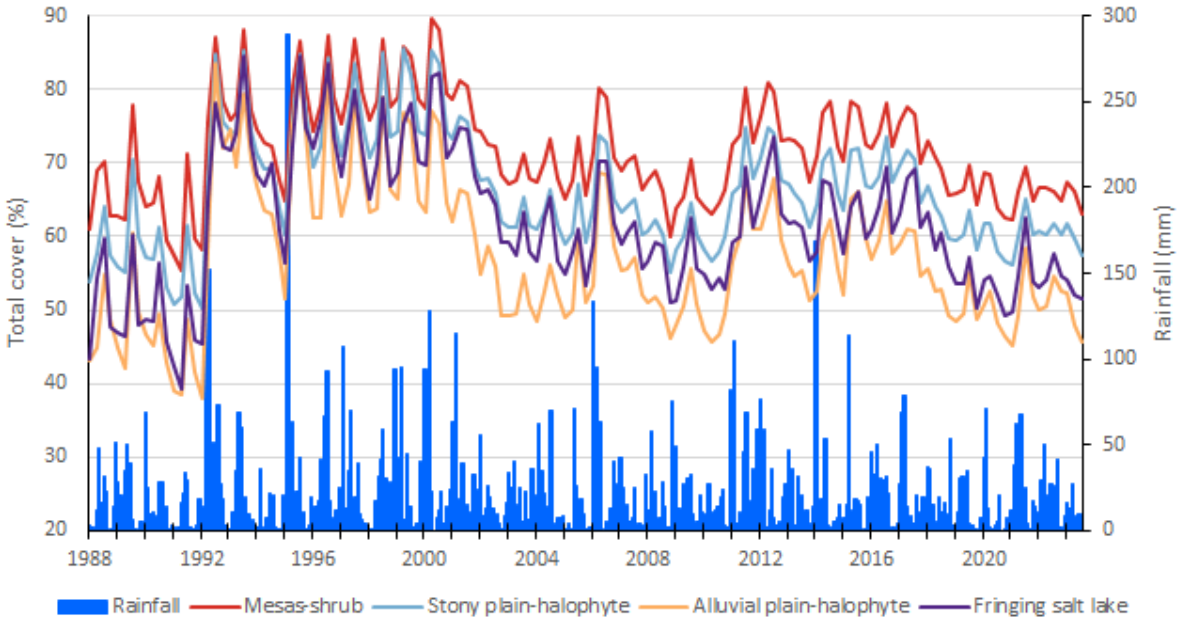


Figure 42: Total cover of vegetation functional groups in the Sandstone LCD

Shark Bay LCD

Rainfall over the 12 months to November 2023 was 34% of average and June–August 2023 total cover of vegetation functional groups ranged from average to below average (Figure 43 and Figure 44). The risk of cover decline is considered moderate to high at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

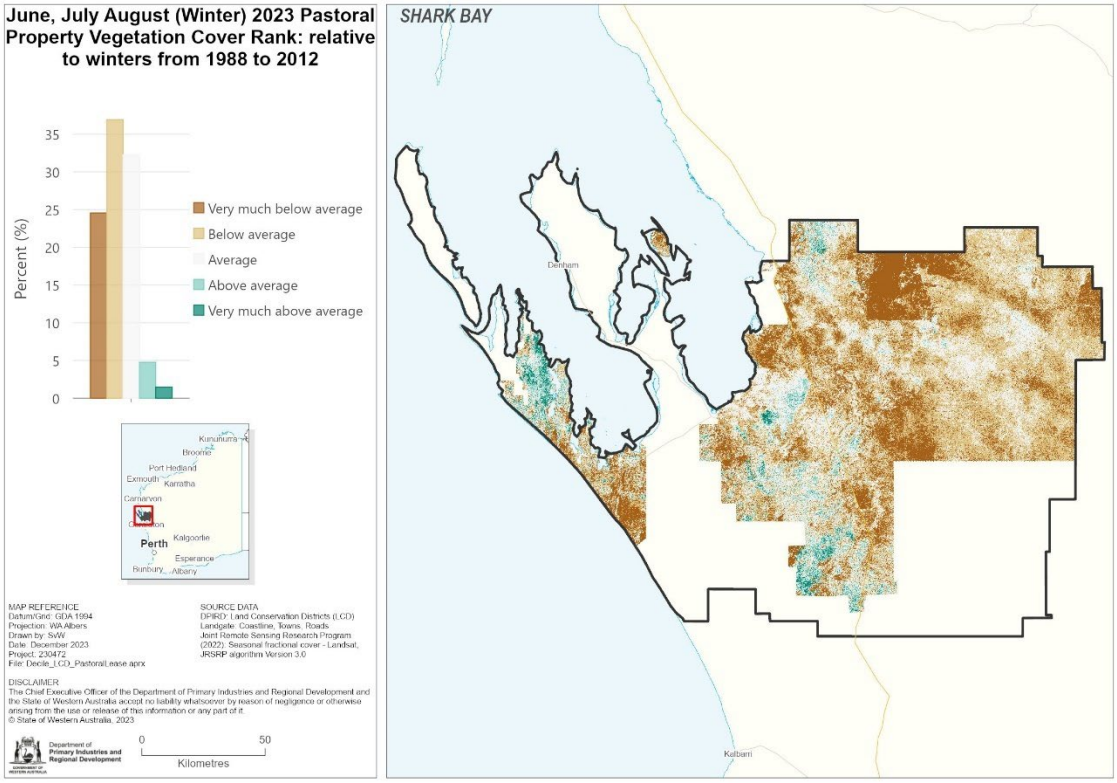


Figure 43: Relative total cover of all vegetation types in the pastoral areas of the Shark Bay LCD

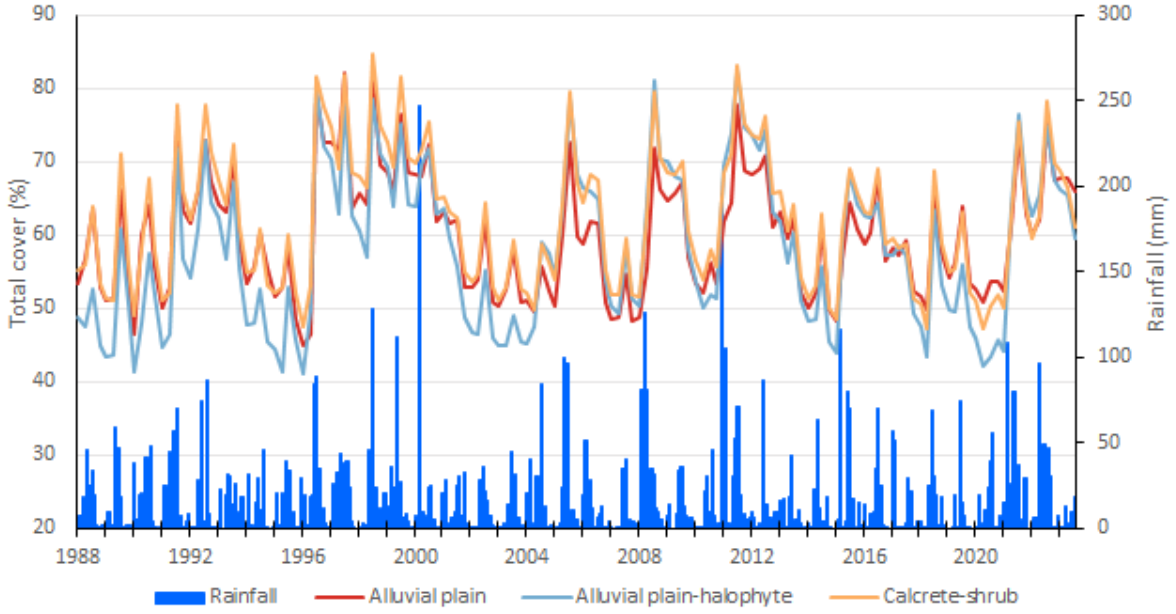


Figure 44: Total cover of vegetation functional groups in the Shark Bay LCD

Yalgoo LCD

Rainfall over the 12 months to November 2023 was 60% of average and June–August 2023 total cover of vegetation functional groups ranged from average to below average (Figure 45 and Figure 46). The risk of cover decline is considered moderate to high at reported stocking rates (Table 3). This is an increase in risk compared to estimates reported in 2022.

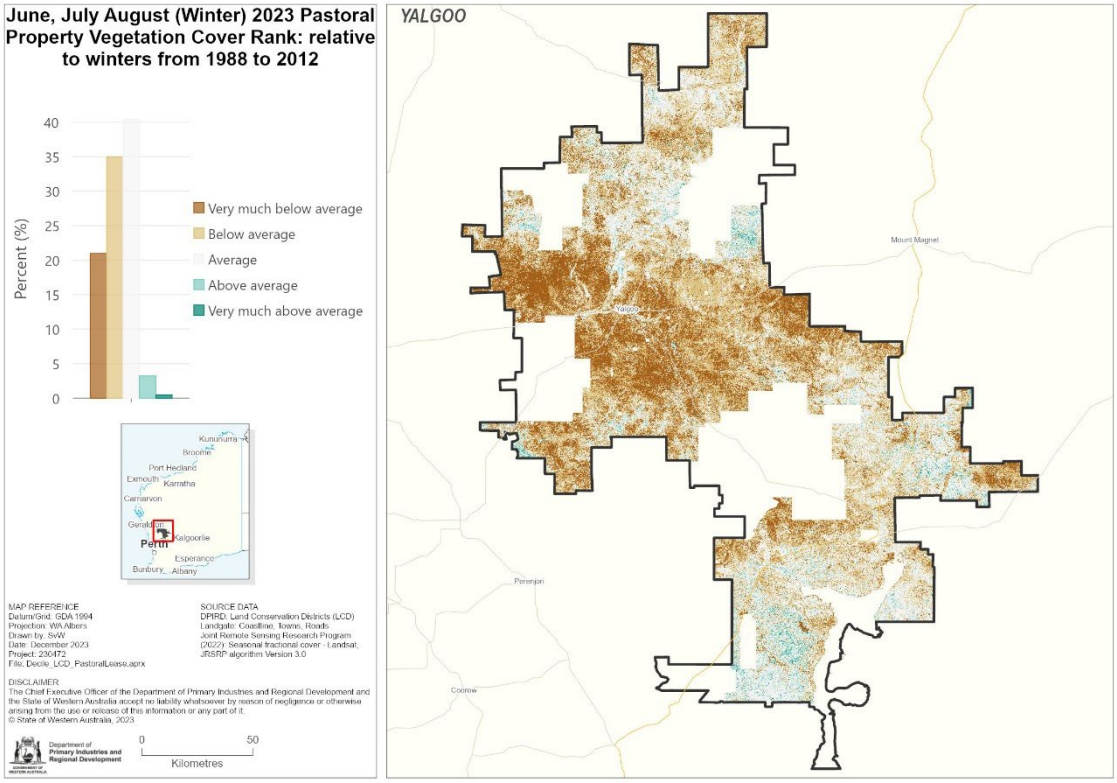


Figure 45: Relative total cover of all vegetation types in the pastoral areas of the Yalgoo LCD

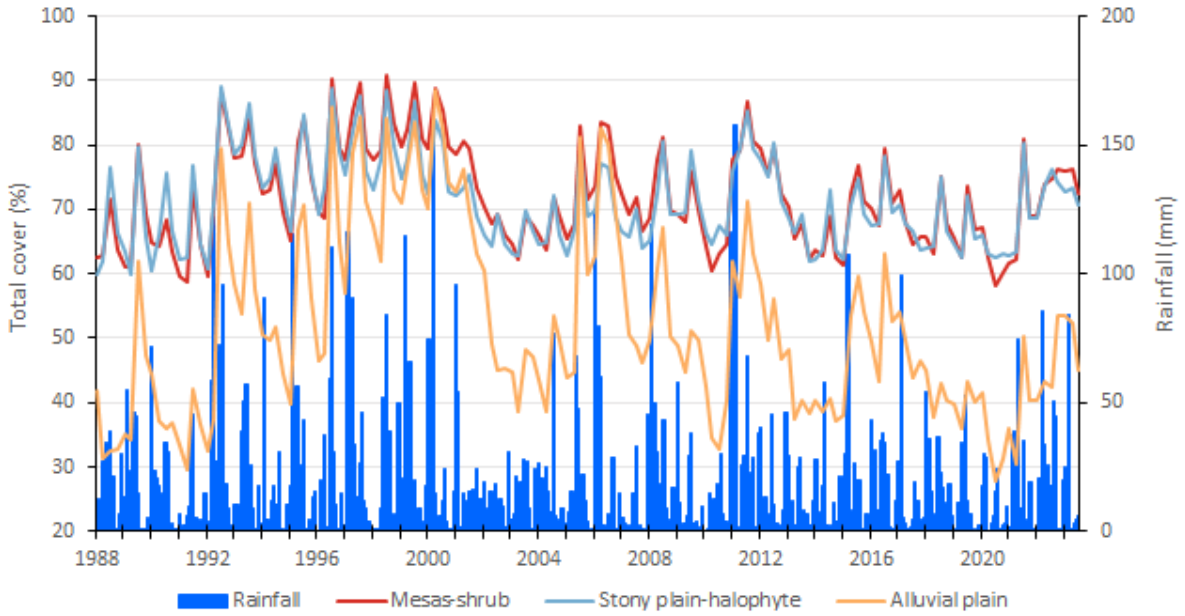


Figure 46: Total cover of vegetation functional groups in the Yalgoo LCD

Stocking rates

Reported stocking rates are expressed as a percentage of the PCC for each LCD. The most recent year for which stock data are available is 2022.

In the Kimberley, the five-year (2018–2022) average stocking rate was above the LCD PCC in the Derby – West Kimberley LCD (104%) and below the PCC in the Broome (64%), Halls Creek – East Kimberley (73%) and North Kimberley (74%) LCDs (Figure 47).

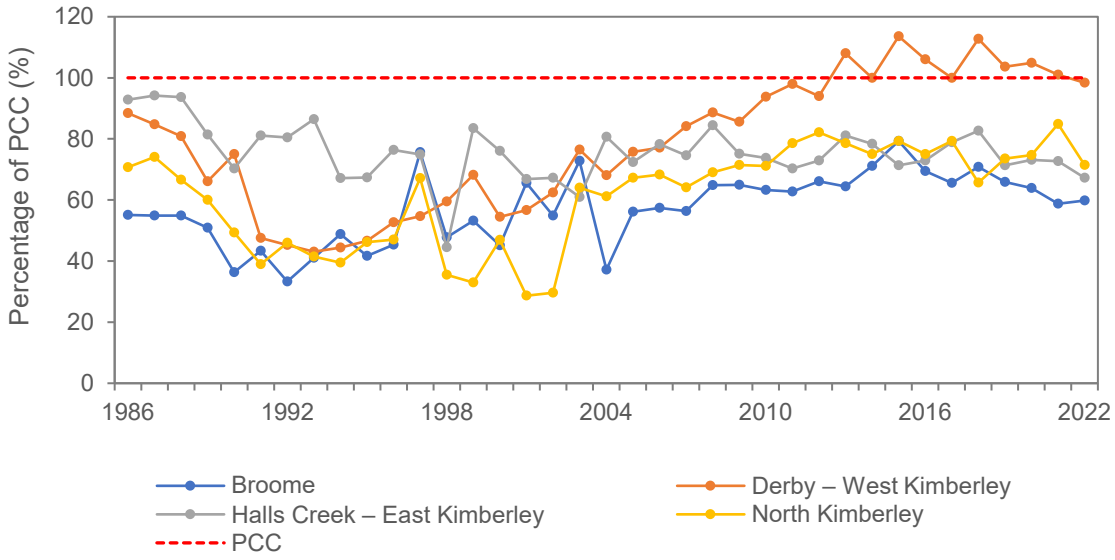


Figure 47: Stocking rates relative to PCC for the Kimberley LCDs, 1986–2022

In the Pilbara, the five-year (2018–2022) average stocking rate was above PCC in the De Grey (123%) and East Pilbara (108%) LCDs and below PCC in the Ashburton (74%) and Roebourne – Port Hedland (95%) LCDs (Figure 48).

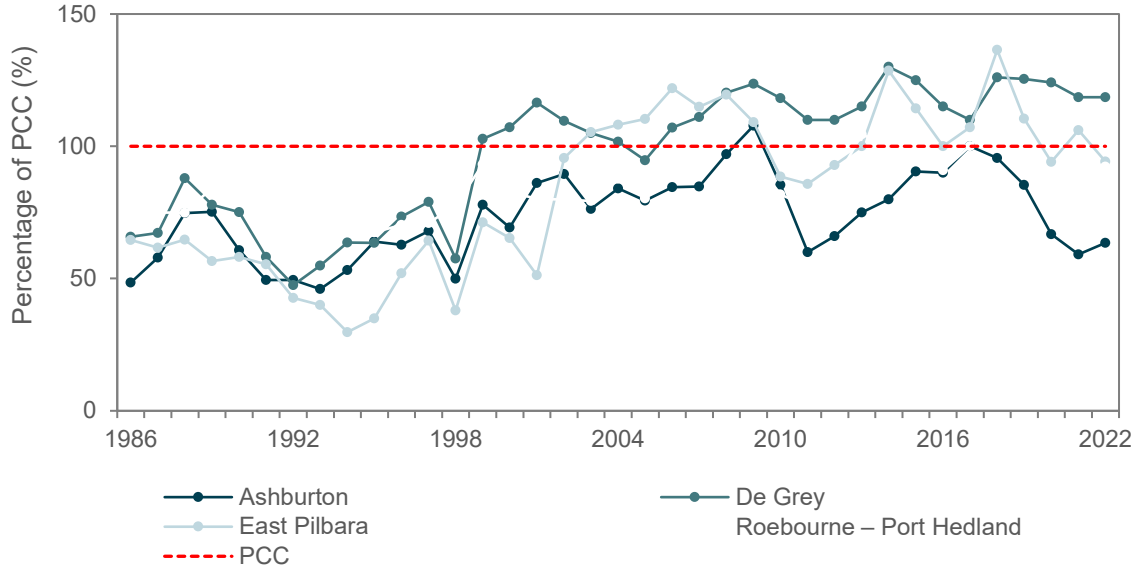


Figure 48: Stocking rates relative to PCC in the Pilbara LCDs, 1986–2022

In the Upper Southern Rangelands, the five-year (2018–2022) average stocking rate was 100% of PCC in the Upper Gascoyne LCD and below PCC in the Lyndon (62%), Meekatharra (66%) Gascoyne–Wooramel (71%), Wiluna (71%) and Gascoyne – Ashburton Headwaters (77%) LCDs (Figure 49).

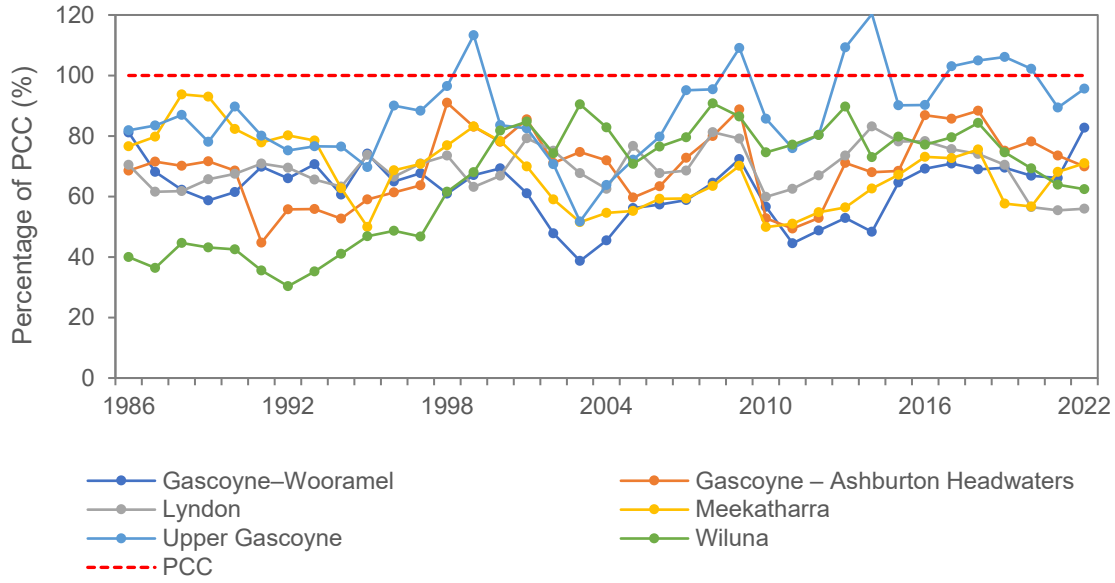


Figure 49: Stocking rates relative to PCC in the Upper Southern Rangelands LCDs, 1986–2022

In the Lower Southern Rangelands, the five-year (2018–2022) average stocking rate was below PCC in all LCDs, ranging from 17% in the Cue LCD to 67% in the Nullarbor – Eyre Highway LCD (Figure 50).

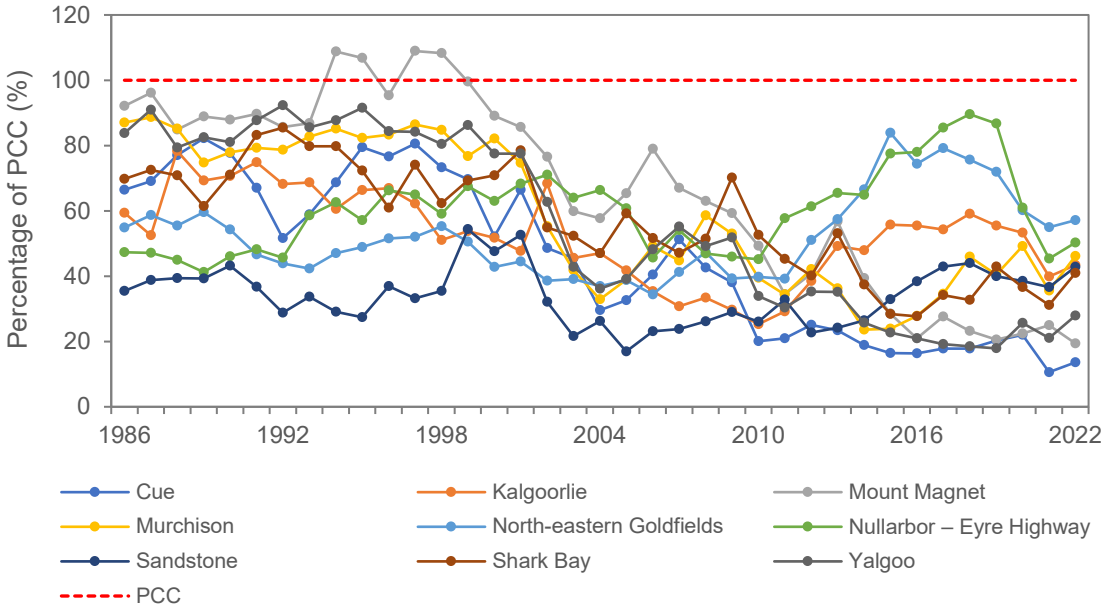
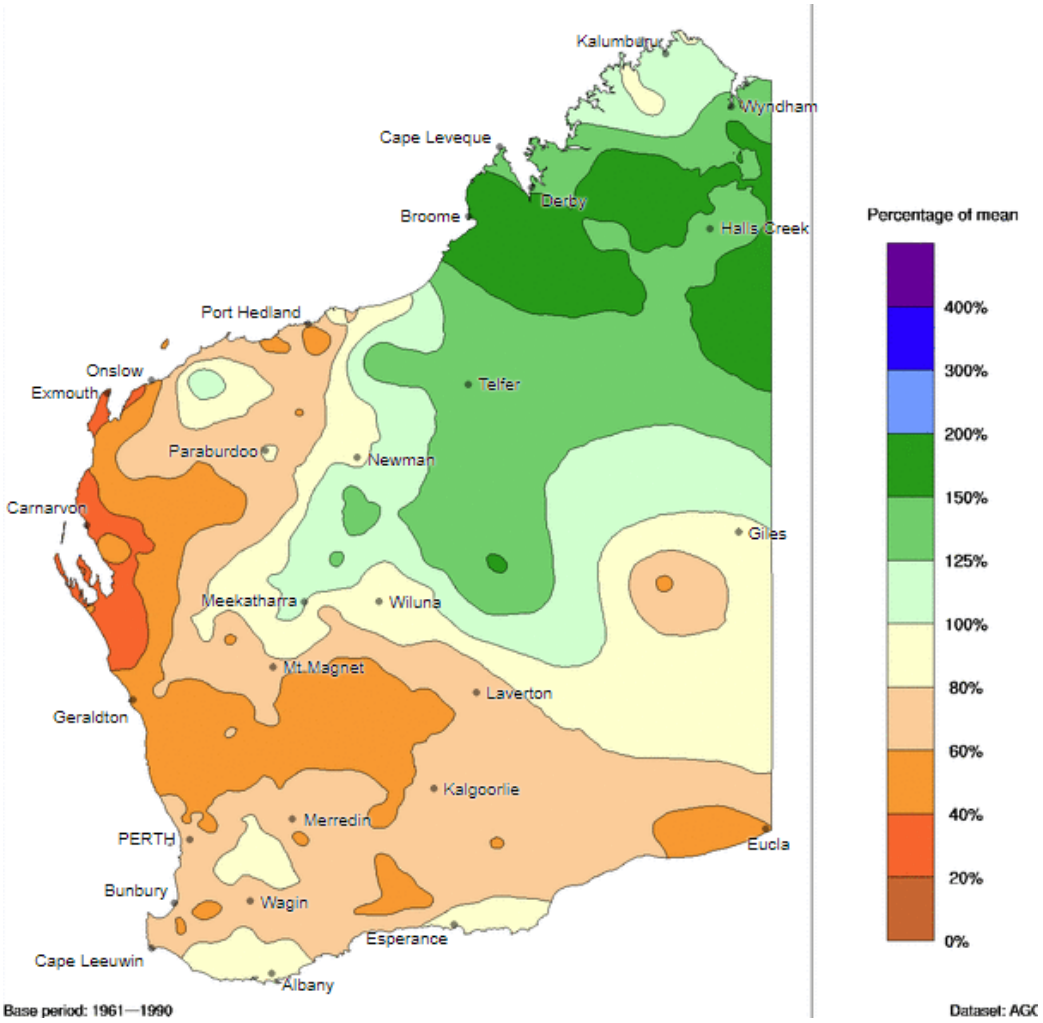


Figure 50: Stocking rates relative to PCC in the Lower Southern Rangelands LCDs, 1986–2022

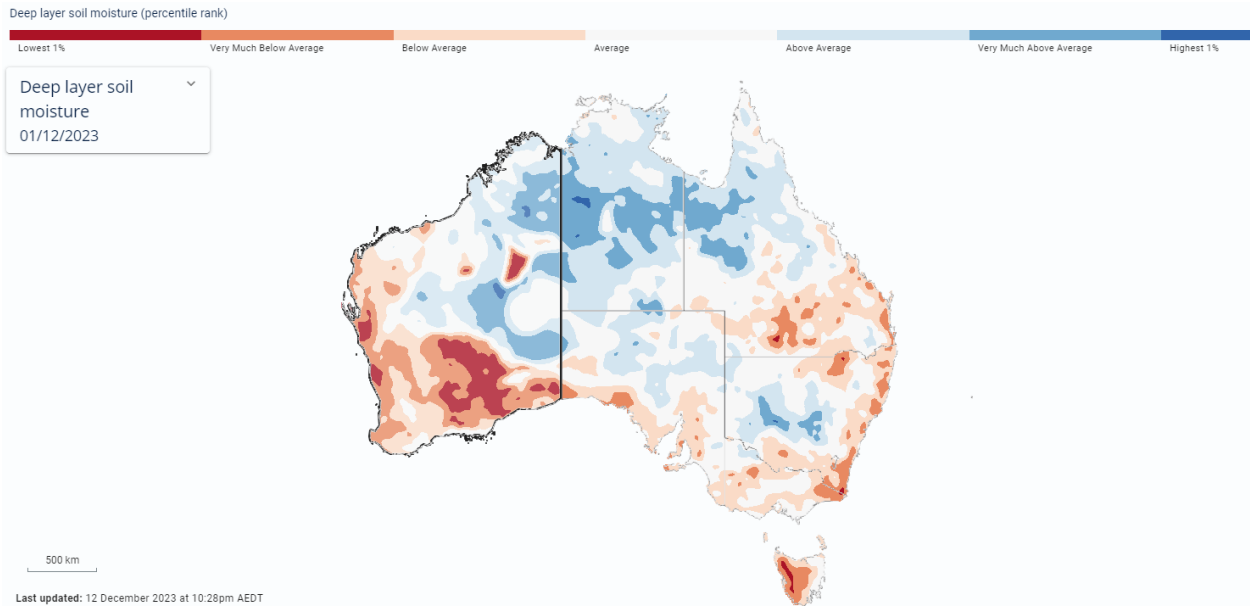
Rainfall

Total rainfall over the 12 months from 1 December 2022 to 30 November 2023 was average or above average over the Kimberley and eastern Pilbara and Upper Gascoyne (Figure 51). Rainfall was below average in the western Pilbara and most of the Southern Rangelands. Below-average rainfall is more strongly expressed in modelled deep soil water (1–6 m) which is very much below average or in the lowest 1% of records over large areas of the Lower Southern Rangelands and western districts (Figure 52). Reduced soil water in these areas will put deeper rooted shrubs and trees under stress.



Source: Bureau of Meteorology, bom.gov.au/climate/maps/

Figure 51: Total rainfall from 1 December 2022 to 30 November 2023 expressed as the percentage of the long-term average



Source: Bureau of Meteorology, bom.gov.au/climate/maps/

Figure 52: Modelled deep (1–6 m) soil water storage as of 1 December 2023 expressed as the percentile of the long-term average