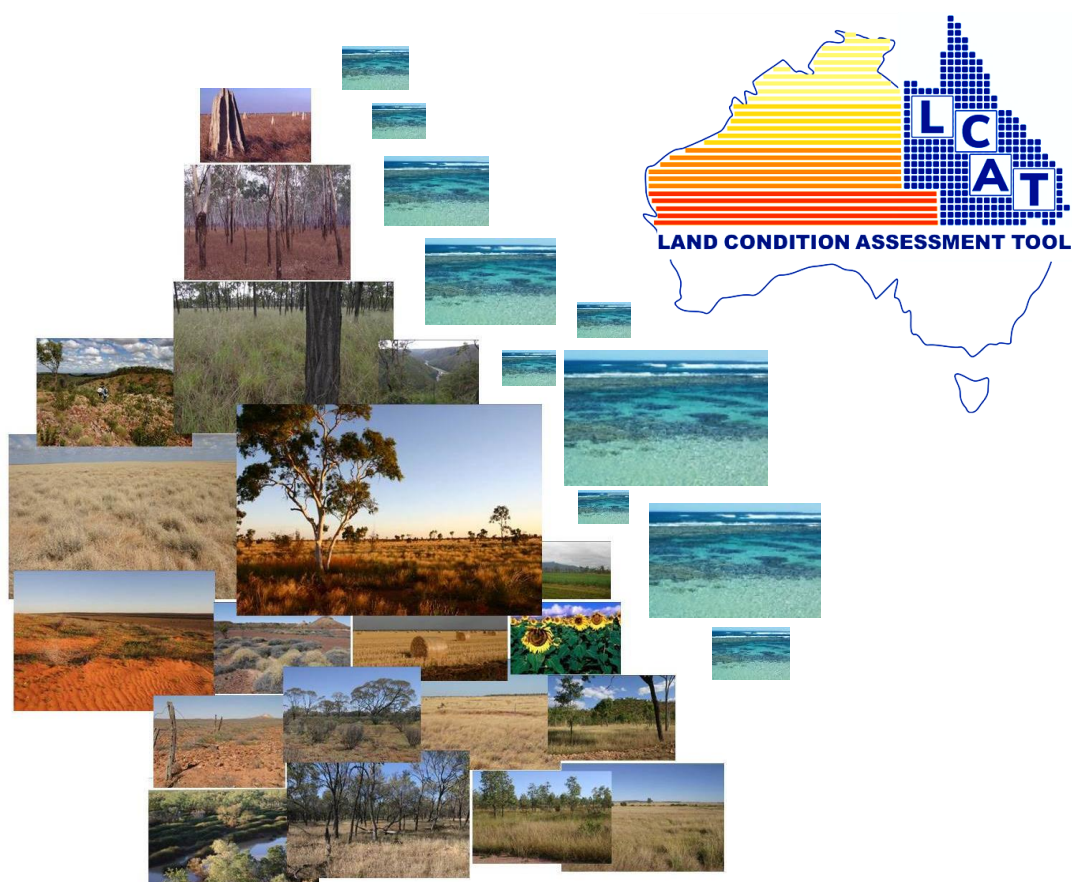


# Land Condition Assessment Tool

Data analysis—March 2020 to March 2022

September 2022



This publication has been compiled by Robert Hassett of Rural Economic Development, Queensland Department of Agriculture and Fisheries.

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# Preface

This report presents the Land Condition Assessment Tool (LCAT) data as collected—irrespective of the purpose or scale of collection, or whether representative sampling was undertaken.

It is important to note that at least 70 % of the data collected, intentionally targets land expected to be in C condition (poor), or D condition (degraded) i.e. data collected are not a randomised sample—they may not be representative of either the range of condition present, or the condition of an area or extent. Findings must not be used to infer and/or report at any scale other than the site scale. For example, where data are presented within land types, catchments or sub-catchments, these data are presented as site scale data within that spatial area for the purpose of indicating sampling frequency i.e. data cannot and must not be used to infer or otherwise report at the spatial area scale.

However, the LCAT can be used to collect data and determine condition at various scales, both directly (on-ground) and indirectly (modelled). For direct results, an area must be representatively sampled by assessing a minimum number of sites (based on the total area) using random, stratified or a combination of sampling methods. Indirect results can be achieved by utilising the collected LCAT data to train landscape models such as the collaborative DAF/DES land condition modelling and mapping program. Products derived from this model will be representative and un-biased across spatial (and possibly temporal) scales and extents.

## Summary

The Land Condition Assessment Tool (LCAT) has been developed by the Department of Agriculture and Fisheries (DAF), Management Practice Adoption team (MPA)—a component of the Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef or P2R)—within the Rural Economic Development (RED) business group.

The LCAT supports Queensland and Australian Government sustainable land management initiatives overseen by DAF, Resources and DES, as well as Natural Resource Management organisations, P2R delivery partners and others. The MPA has facilitated access to, and the state-wide implementation of the LCAT to a range of government and non-government organisations engaged in sustainable land management initiatives.

From implementation in March 2020 to March 2022, 3,666 land condition assessment sites have been collected by more than 200 users state-wide. This is the largest contemporary land condition dataset in Australia and is expected to grow at more than 1500 sites per year.

High level analysis of Site data indicates impacts on productivity and sustainability including species composition change, loss of perennial pasture density, soil erosion and presence of pest plants.

A high-level summary of findings is contained in Part 1. An explanation and key notes on land condition indicators and their values are available throughout the document.

## Acknowledgments

The Australian Department of Agriculture, Water and the Environment are gratefully acknowledged for funding the development and implementation of the LCAT.

The generous support provided by the DAF P2R team and the invaluable contributions of data by all LCAT users is gratefully appreciated and acknowledged.

Thank you kindly to Dr. F. Patrick Graz (Agri-Science Queensland, DAF) for reviewing this document and providing valuable feedback.

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# 1 Key findings

—Data collected are not a randomised sample—many projects target C and D condition land.

—Data may not be representative of either the range of condition or the condition of an area.

—Findings must not be used to infer and/or report at any scale other than the site scale.

- 3,666 land condition Site assessments completed between March 2020 and March 2022.
  - 2,722 within the GBR Catchments, and 944 outside the GBR.
- All Sites: 14 % A condition; 28 % B condition; 40 % C condition; and 18 % D condition.
- The Mean Site score (out of 100) was 50 (the C/B cut-off being 50) with a Median of 43.
- Buffel grass (3P) and Indian couch (2P/1P) were the most frequent dominant pasture species.
- 1,863 sites (51 %) are dominated by native species; 1,748 (48 %) introduced; 55 (1 %) pests.
- 2,322 (63 %) have a tussock species as the most dominant; 915 (25 %) stoloniferous; 279 (8 %) annual (within perennially dominated land types); 67 (2 %) legumes; 40 (1 %) none; 35 (1 %) forbs; 30 (1 %) hummock grasses.
- 3,340 (91 %) of all sites have a perennial pasture species as the most dominant.
- Of all sites, 34 % are dominated by less palatable and/or less productive species.
- 1,734 sites (47 %) had a pasture deficit—< 1000 kg/ha TSDM.
- Of 747 sites with a pasture utilisation record, 323 (43 %) were more than 30–50 % utilised.
- 47 % of all sites have a Dominant Pasture Density of *Sparse or Open* or less.
- 2,509 sites (68 %) had a Total Perennial Pasture Density of *Mid-dense or Closed or Dense*.
  - 32 % with *Sparse or Open* or less, have a crown cover of up to 50 %. Decline to *Sparse or Open* or less can indicate degradation and/or loss of productivity and sustainability.
- 29 % of all sites had an Average Pasture Tussock Height of 5-10 cm or less.
- 30 % of sites dominated by stoloniferous Indian couch were 1-5 cm and 57 % 10 cm or less.
- 4 % of sites dominated by 3P tussock species were 1–5 cm, 19 % <10 cm, and 54 % >20 cm.
- 52 % of all sites and 58 % of sites in GBR Catchments had organic ground cover > 70 %.
- 1,172 (43 %) of sites in GBR Catchments had *Minor, Moderate or Severe Soil Erosion*.
- 1,690 sites (46 %) have Pest Plants—Prickly pears, Lantana, and Rubber vine as dominant.
  - 126 (17 %) have a density of *Mid-dense*—significantly reducing productivity and requiring high on-going input costs to manage and recover.
- 15 % of sites had a record of Pest Animals—Feral pigs, wild dogs and rabbits as dominant.
- 550 sites in the GBR Catchments included an assessment of Riparian Zone impacts.
  - 123 (22 %) have riparian zones with *Severe Soil Erosion* or are *Heavily Disturbed*.
  - 84 (68 %) have *Unstable* or *Moderately Unstable* banks.
- 118 GBR sites were identified as Frontage Country—48 (41 %) D; and 46 (39 %) C condition.
- 2,363 (64 %) of all sites are within *High expected pasture density* (High EPD) land types (a surrogate for high productivity).
  - Declined condition in High EPD land types can significantly reduce productive potential.
  - 753 (32 %) of these High EPD's are alluvial land types.
    - 537 (23 %) are in D condition, and of these, 145 (6 %) are alluvial land types.
    - 1,281 (54 %) are in C condition, and of these, 290 (12 %) are alluvial land types.

**For further investigation**—‘Stability’ as a more accurate indicator of erosion and water quality risk.

Prototype Landscape Stability and Function results Vs Grazing ABCD results. Refer to page 100.

- Of C condition, 39 (22 %) may be ‘more stable’ and 56 (32 %) ‘less stable’ than C implies.
- Of B condition, 24 (12 %) may be ‘more stable’ and 77 (37 %) ‘less stable’ than B implies.
- Of A condition, 85 (or 91 %) may be ‘less stable’ than A condition implies.



## 2 Data March 2020—March 2022

### 2.1 Spatial Coverage

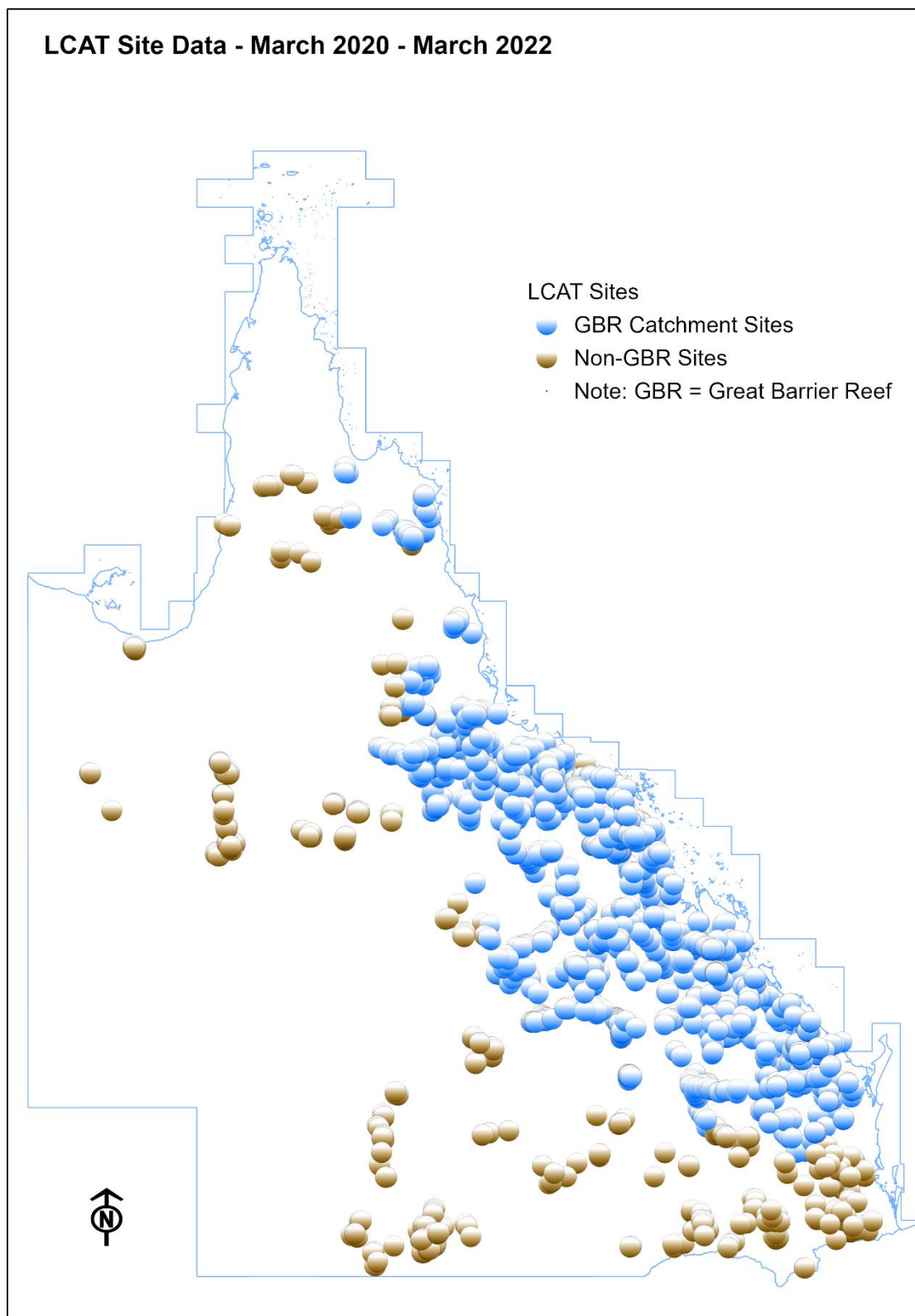


Image 1 LCAT Site Data—March 2020 – March 2022—All users.

## 2.2 Site Counts and Organisation

**Table 1** Organisational user group and LCAT Sites assessed.

Organisation	Total Sites
Queensland Government	1514
Natural Resource Management	1879
Other including P2R and GBRF delivery partners	273
Total	3666

There are major gaps in LCAT records primarily to the west of the State. In these areas, LCAT monitoring is undertaken largely by regional NRM organisations, unlike in the reef catchments where other organisations are contributing data (such as DAF, researchers and other reef-related delivery partners). Regional NRM Organisations undertake LCAT monitoring in areas where they are implementing projects aimed at improving land condition. Given the NRM funding available for the non-reef regions to the west of the State, and the need to strategically prioritise this investment, large areas of Queensland currently have no land condition projects, and consequently no current LCAT monitoring sites.

## 2.3 Site Counts and Region

**Table 2** Count and Percentage (%) of Count for Regions.

Region	Total Sites	% of Total Sites
GBR Catchments	2722	74
Non-GBR	944	26
Total Queensland	3666	100

**Table 3** LCAT sites by Great Barrier Reef Catchment and Sub-catchment.

Catchment	Cumulative Count of Sites		Sub-catchment	Cumulative Count of Sites	
	03/2021	03/2022		03/2021	03/2022
Burdekin	412	947	Black	0	3
Burdekin			Don	11	41
Burdekin			Haughton	7	37
Burdekin			Ross	12	12
Burdekin			Upper Burdekin	106	314
Burdekin			Bowen	71	107
Burdekin			Suttor	152	282
Burdekin			Lower Burdekin River	53	151
Burnett Mary	148	446	Burrum River	2	25
Burnett Mary			Burnett River	85	206
Burnett Mary			Upper Mary River	23	65
Burnett Mary			Baffle Creek	12	60
Burnett Mary			Kolan River	26	90
Cape York	2	81	Jeannie River	0	6
Cape York			Normanby River	2	54
Cape York			Endeavour River	0	21
Fitzroy	497	1000	Styx River	14	14
Fitzroy			Shoalwater	0	13

Catchment	Cumulative Count of Sites		Sub-catchment	Cumulative Count of Sites	
	03/2021	03/2022		03/2021	03/2022
Fitzroy			Waterpark Creek	4	4
Fitzroy			Comet River	1	62
Fitzroy			Mackenzie River	40	55
Fitzroy			Nogoa River	109	165
Fitzroy			Fitzroy River	108	265
Fitzroy			Calliope River	14	18
Fitzroy			Isaac River	87	145
Fitzroy			Boyne River	11	11
Fitzroy			Dawson River	109	248
Mackay Whitsunday			157	222	O'Connell River
Mackay Whitsunday	Pioneer River	30			48
Mackay Whitsunday	Plane Creek	26			36
Mackay Whitsunday	Proserpine River	33			42
Wet Tropics	6	26	Tully River	0	0
Wet Tropics			Mossman River	0	0
Wet Tropics			Johnstone River	6	24
Wet Tropics			Daintree River	0	0
Wet Tropics			Mulgrave-Russel River	0	0
Wet Tropics			Murray River	0	0
Wet Tropics			Herbert River	0	2
Wet Tropics			Barron River	0	0
<b>Total GBR</b>	<b>1,222</b>	<b>2,722</b>		<b>1,222</b>	<b>2,722</b>
<b>Total QLD</b>	<b>1,465</b>	<b>3,666</b>		<b>1,465</b>	<b>3,666</b>

## 3 Observed Land Condition Indicator Data

The **condition** of any thing is its particular mode of being; its situation with respect to circumstances; or its existing state or case (Macquarie Dictionary Online, 2021). The definition of 'land' condition may vary depending on the purpose or outcome sought from an assessment e.g. productivity, landscape function or vegetation as a surrogate for biodiversity. The LCAT determines the current state of the land—its condition—by evaluating key indicators of long-term land condition.

Land condition indicators (Table 80) and values framed within the LCAT, integrate a range of accepted science-based metrics, principles and concepts adapted from sources including Grazing land management (GLM) land condition framework (Chilcott et al. 2003); Stocktake (DPI&F 2004); Guidelines for determining land condition (DNR&M 2013); Landscape Function Analysis (Tongway and Hindley 1995); and the Australian soil and land survey field handbook (McDonald et al. 2009).

Indicators include pasture composition, density and 'quality'; groundcover and its components; detailed erosion processes; soil surface features; pest plant, understorey and overstorey composition density and management; native animals; total grazing pressure and site impacts such as from fire, flood and drought—a comprehensive land resource inventory.

Within the LCAT, indicators are presented as questions. Each indicator has an average of six associated values from which the assessor selects the value that is closest to describing what is observed. Indicator values are presented as pictograms (stylised images) that represent otherwise complex science-based land condition values and concepts. Pictograms are readily recognisable and have associated terms with foundations in published literature. The use of pictograms and minimal list-based questions and text, significantly simplifies and quickens the assessment for both experienced and inexperienced users alike.

This report presents indicator data collected through the LCAT Standard assessment. Indicators within the Standard version represent a minimum set of long-term land condition indicators from which data may be analysed and results calculated. In some instances, indicator data from the more data-rich Advanced version are also shown.

Pictogram values are shown for each indicator within the report.

### 3.1 Pasture / Ground Layer

The pasture (or ground layer) within the LCAT is defined as—*The layer usually dominated by grasses, forbs, sprawling vines, herbs and seedlings. Less than 2 m but usually less than 1 m in height. Includes grass or herbage, used or suitable for the grazing of domestic stock but may include non-woody pest plants.* The first part of this definition comes from the definition of *ground layer*.

The LCAT contains more than 580 pasture plant records. These may be represented as a species (e.g. Hoop Mitchell (*Astrebla elymoides*)); a Genus (e.g. *Astrebla spp.*); or a generic category (e.g. 3P). Each is categorised, weighted and calibrated to reflect their influence or impact on different results e.g. Buffel grass (*Cenchrus ciliaris*) is categorised as a 3P for the Grazing ABCD and other results where large, productive tussock species are beneficial, and as lesser categories where there is a negative impact (being a non-native species) such as Impact on Natural State.

### 3.1.1 Dominant Pasture Plant—Observed Data

Which established pasture plant or *Category* is the greater proportion of the pasture yield (TSDM kg/ha) or the greater proportion of the total ground layer bases?

**Note:**

- Of the more than 580 pasture species or generic categories, a total of 185 pasture genera, species, or generic categories were identified as the **most dominant** (from the 3666 LCAT sites assessed).
- The 185 most dominant have been reduced to the top 100 (Tables 5 and 6) by grouping genera where the *scoring* category (CAT) is alike e.g. all *Aristida* species (N) (wiregrasses) are grouped. Where the CAT differs between species of a genera, separation is retained e.g. *Panicum* species that are Preferred (P) or Intermediate (I).
- Tables 7 to 13 identify risks and benefits related to dominant pasture plant attributes. These tables include 105 sites (3 %) where the dominant pasture was *Unidentified*. To generate in-field results, *Unidentified* species are categorised (scored) as: Intermediate (I). Within these tables *Unidentified* is allocated as: a perennial native tussock, of intermediate productivity, providing less stability, and posing a moderate run-off risk.
- Queensland pasture communities are largely dominated by perennial pasture species.
- Of the approximately 250 GLM Land Types of Queensland, 4 are annually dominated and occur in the Channel Country of Southwest Queensland.
- Across the State, only perennially dominated land types were assessed.

**Summary— analysis of top 100 most dominant data:**

Data refer to the most dominant genera, species or generic category.

- 75.7 % of all sites are represented in the top 14 (of 100) most dominant pasture plant genus, species, or generic category.
  - These can be considered the ‘most dominant’ of the dominant pasture plants.
- Preferred (decreaser) pasture plants make up 57 % of the top 14 (76 % of all sites).
  - They make up 70 % of the top 10 (67 % of all sites).
- Non-preferred (21 %) and Annuals (7 %) make up a combined 28 % of the top 14.
- Perennial plants make up 93 % of the top 14 and 72 % of the top 100.
- Annual plants make up 7 % of the top 14 and 27 % of the top 100.
- Tussock plants make up 79 % of the top 14 and only 48 % of the top 100.
- Stoloniferous plants make up 14 % of the top 14 and 13 % of the top 100.
- The Origin of plants is consistent at approximately 60 % native and 40 % introduced across all breaks of the top 100 and the percentage of all sites.
- Pest plants contribute 3 % of the top 100.
- Productive plants (3P + 2P) make up 71 % of the top 14 and 50 % of the top 100.
- Plants with attributes contributing to greater soil stability make up 57 % of the top 14 and 42 % of the top 100.
- Plants with attributes contributing to a lower risk of run-off make up 43 % of the top 14 and 25 % of the top 100.
  - Plants with attributes contributing to a moderate to high risk of run-off make up 57 % of the top 14 and 75 % of the top 100.

**Table 4** Top 100 Most Dominant Detailed Statistics and attributes (Traffic light interpretive shading).

Dominant Pasture Plant Attribute		% of Top 10 (67% of all sites)	% of Top 14 (76 % of all sites)	% of Top 50 (97% of all sites)	% of All 100 (100% of all sites)
Category (scoring)	Preferred	70	57	34	23
	Intermediate	10	14	20	25
	Non-preferred	20	21	26	23
	Annual (scoring)	0	7	20	29
Lifecycle	Perennial	100	93	82	72
	Annual (lifecycle)	0	7	16	27
	None	0	0	2	1
Growth Habit	Tussock	80	79	58	48
	Hummock	0	0	2	3
	Stoloniferous	20	14	18	13
	Forb	0	0	2	5
	Legume	0	0	4	6
	Annual (habit)	0	7	14	24
	None	0	0	2	1
Origin	Native	60	64	60	60
	Introduced	40	36	36	37
	Pest plant	0	0	4	3
Productivity	More productive	70	57	36	25
	Intermediate	10	14	22	25
	Less productive	20	22	22	21
	Intermittent	0	7	14	25
	Not productive	0	0	6	4
Stability	More stable	60	57	46	42
	Less stable	40	36	38	33
	Least stable	0	7	16	25
Run-off Risk	Low run-off risk	50	43	32	25
	Moderate run-off risk	40	43	22	36
	High run-off risk	10	14	26	39

**Table 5** Top 50 Dominant Pasture Plant Species and attributes.

Order	Count	Dominant Pasture Plant Label	Cat	Lifecycle	Habit	Origin	Productivity	Stability	Run-off risk
1	514	buffel grass* (P) - Cenchrus ciliaris	P	Perennial	Tussock	Introduced	More	More	Moderate
2	461	Indian couch* gt 30 pc TSDM or bases (N) - Bot	N	Perennial	Stolon	Introduced	Less	Less	High
3	289	black speargrass (P) - Heteropogon contortus	P	Perennial	Tussock	Native	More	More	Low
4	256	Urochloa* (P) - Urochloa spp	P	Perennial	Stolon	Introduced	More	Less	Moderate
5	251	Mitchell grasses (P) - Astrebla spp	P	Perennial	Tussock	Native	More	More	Low
6	235	Preferred (Decreaser) (P) - 3P Dom and Unknov	P	Perennial	Tussock	Native	More	More	Low
7	120	wiregrasses (N) - Aristida spp	N	Perennial	Tussock	Native	Less	Less	Moderate
8	105	blue grasses (other 3P) (P) - Bothriochloa spp	P	Perennial	Tussock	Native	More	More	Low
9	105	chloris spp* (large perennials e.g. Rhodes) (P) -	P	Perennial	Tussock	Introduced	More	More	Low
10	105	Unidentified (I)	I	Perennial	Tussock	Native	Intermediate	Less	Moderate
11	102	Intermediate (I) - 2P Dom and Unknown; OR 3P	I	Perennial	Tussock	Native	Intermediate	More	Moderate
12	94	Annual (A) - Annual Dom and Unknown; OR 3P	A	Annual	Annual	Native	Intermittent	Least	High
13	91	Non-preferred (Increaser) (N) - 1P Dom and Unl	N	Perennial	Tussock	Native	Less	Less	Moderate
14	49	green Panic* (P) - Megathyrsus maximus	P	Perennial	Tussock	Introduced	More	More	Low
15	48	Flinders grass (A) - Iseilema spp	A	Annual	Annual	Native	Intermittent	Least	High
16	47	None observed	A	None	None	Native	None	Least	High
17	45	grader grass* (A) - Themeda quadrivalvis	A	Annual	Annual	Pest plant	None	Least	High
18	42	paspalum* (N) - Paspalum	N	Perennial	Stolon	Introduced	Less	More	Moderate
19	41	bluegrasses (I) - Bothriochloa spp	I	Perennial	Tussock	Native	Intermediate	More	Low
20	34	styro* lt 50 pc TSDM or bases (I) - Stylosanthes	I	Perennial	Legume	Introduced	Intermediate	Less	High
21	33	setaria* (P) - Setaria	P	Perennial	Tussock	Introduced	More	More	Moderate
22	31	kangaroo grass (P) - Themeda triandra	P	Perennial	Tussock	Native	More	More	Low
23	30	green couch* (I) - Cynodon dactylon	N	Perennial	Stolon	Introduced	Intermediate	Less	High
24	29	summer grass (I) - Paspalidium spp	I	Perennial	Tussock	Native	Intermediate	More	Moderate
25	27	wynn cassia (A) - Chamaecrista rotundifolia	A	Annual	Legume	Introduced	Intermittent	Least	High
26	26	pangola* (P) - Digitaria eriantha	P	Perennial	Stolon	Introduced	More	Less	Moderate
27	25	angleton grass* (P) - Dichanthium aristatum	P	Perennial	Stolon	Introduced	More	Less	Moderate
28	25	blue couch* (I) - Digitaria didactyla	N	Perennial	Stolon	Introduced	Intermediate	Less	High
29	23	burrs (perennial forbs) (N) - burrs (perennial forb	N	Perennial	Forb	Native	Less	Less	Moderate
30	23	spinifex (soft) (P) - Triodia and Plechtrachne spp	P	Perennial	Hummock	Native	More	More	Low
31	20	creeping bluegrass* (P) - Bothriochloa insculpta	P	Perennial	Stolon	Introduced	More	Less	Moderate
32	20	red Natal* (N) - Melinis repens	N	Perennial	Tussock	Introduced	Less	Less	Moderate
33	19	panic (large native perennials) (P) - Panicum spp	P	Perennial	Tussock	Native	More	More	Low
34	18	kikuyu grass* (P) - Pennisetum clandestinus	I	Perennial	Stolon	Introduced	More	Less	Moderate
35	17	wanderie (N) - Eriachne spp	N	Perennial	Tussock	Native	Less	Less	Low
36	16	love grasses (perennial) (I) - Eragrostis spp (per	I	Perennial	Tussock	Native	Intermediate	More	Moderate
37	13	African lovegrass* (N) - Eragrostis curvula	N	Perennial	Tussock	Introduced	Less	Less	Moderate
38	13	thatch grass* (N) - Hyparrhenia spp	N	Perennial	Tussock	Introduced	Less	More	Low
39	11	panic (small native perennials) (I) - Panicum spp	I	Perennial	Tussock	Native	Intermediate	More	Moderate
40	10	sedges (N) - Cyperus	N	Perennial	Tussock	Native	Less	Less	Moderate
41	10	wanderie grasses (I) - Eriachne	I	Perennial	Tussock	Native	Intermediate	More	Low
42	9	chloris (annuals) (A) - Chloris (small annuals e.g	A	Annual	Annual	Native	Intermittent	Least	High
43	9	golden beard grass (P) - Chrysopogon fallax	P	Perennial	Tussock	Native	More	More	Low
44	8	finger grasses (I) - Digitaria spp	I	Perennial	Tussock	Native	Intermediate	More	Moderate
45	7	blady grass (N) - Imperata cylindrica	N	Perennial	Tussock	Native	Less	Less	Moderate
46	6	button grass (A) - Dactyloctenium radulans	A	Annual	Annual	Native	Intermittent	Least	High
47	6	fire grass (A) - Schizachrium sp	A	Annual	Annual	Native	Intermittent	Least	High
48	6	giant rat's tail grass* (N) (Management) - Sporol	A	Perennial	Tussock	Pest plant	None	More	Low
49	6	native couch (A) - Brachyachne spp	A	Annual	Annual	Native	Intermittent	Least	High
50	6	Queensland bluegrass (P) - Dichanthium sericeu	P	Perennial	Tussock	Native	More	More	Low

**Table 6** Top 51-100 Dominant Pasture Plant Species and attributes.

51	6	reed grass (N) - <i>Arundinella nepalensis</i>	N	Perennial	Tussock	Native	Less	More	Moderate
52	6	scented top (I) - <i>Capillipedium spicigerum</i>	I	Perennial	Tussock	Native	Intermediate	More	Moderate
53	5	bracky* (I) - <i>Urochloa</i>	I	Perennial	Stolon	Introduced	Intermediate	Less	Moderate
54	5	chloris (small perennials e.g. windmill grass) (I)	I	Perennial	Tussock	Native	Intermediate	More	High
55	5	love grasses (annual) (A) - <i>Eragrostis</i> spp (annu	A	Annual	Annual	Native	Intermittent	Least	High
56	5	marine couch (P) - <i>Sporobolus virginicus</i>	P	Perennial	Stolon	Native	More	Less	Moderate
57	5	salt bushes (I) - <i>Atriplex</i> spp	I	Perennial	Forb	Native	Intermediate	Less	Moderate
58	5	silky browntop (P) - <i>Eulalia aurea</i>	P	Perennial	Tussock	Native	More	More	Low
59	5	Sorghum (I) - <i>Sorghum</i> spp	I	Perennial	Tussock	Introduced	Intermediate	More	Moderate
60	5	spinifex (hard) (I) - <i>Triodia</i> and <i>Plechtrachne</i> spp	I	Perennial	Hummock	Native	Intermediate	More	Low
61	5	spring grass (I) - <i>Eriochloa</i>	I	Perennial	Tussock	Native	Intermediate	More	Moderate
62	4	kerosene grass (A) - <i>Aristida contorta</i>	A	Annual	Annual	Native	Intermittent	Least	High
63	4	nut grass (N) - <i>Cyperus</i> spp	N	Perennial	Tussock	Native	Less	Less	Moderate
64	4	parthenium* (A) (Management) - <i>Parthenium hy</i>	A	Annual	Annual	Pest plant	None	Least	High
65	3	crowsfoot grass* (A) - <i>Eleusine indica</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
66	3	flannel weed* (N) - <i>Sida cordifolia</i>	A	Perennial	Forb	Introduced	Less	Less	High
67	3	gulf bluegrass (P) - <i>Dichanthium fecundum</i>	P	Perennial	Tussock	Native	More	More	Low
68	2	barnyard grass* (A) - <i>Echinochloa crus-galli</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
69	2	butterfly pea* (N) - <i>Clitoria ternatea</i>	A	Perennial	Legume	Introduced	Less	Less	High
70	2	channel millet in annual LTs (A) - <i>Echinochloa tu</i>	P	Annual	Annual	Native	Intermittent	Least	High
71	2	common oats* (A) - <i>Avena sativa</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
72	2	coolibah grass (N) - <i>Thellungia advena</i>	N	Perennial	Tussock	Native	Less	More	Moderate
73	2	fairy grass (annual) (A) - <i>Sporobolus</i> spp (annua	A	Annual	Annual	Native	Intermittent	Least	High
74	2	flannel weeds (N) - <i>Abutilon</i>	N	Perennial	Forb	Native	Less	Less	High
75	2	forage sorghum* (A) - <i>Sorghum bicolor</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
76	2	giant speargrass (P) - <i>Heteropogon triticeus</i>	P	Perennial	Tussock	Native	More	More	Low
77	2	hard spinifex (I) - <i>Triodia</i>	I	Perennial	Hummock	Native	Intermediate	More	Low
78	2	hyptis* (A) - <i>Hyptis suaveolens</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
79	2	native sorghum (I) - <i>Sarga leiocladum</i>	I	Perennial	Tussock	Native	Intermediate	More	Moderate
80	2	pigweed (A) - <i>Portulaca oleracea</i>	A	Annual	Annual	Native	Intermittent	Least	High
81	2	poverty grass (N) - <i>Eremochloa bimaculata</i>	N	Perennial	Tussock	Native	Less	Less	Moderate
82	2	rat's tail grasses (N) - <i>Sporobolus</i> spp	N	Perennial	Tussock	Native	Less	Less	Moderate
83	2	ruby saltbush (I) - <i>Enchylaena tomentosa</i>	I	Perennial	Forb	Native	Intermediate	Less	Moderate
84	2	white clover* (P) - <i>Trifolium repens</i>	I	Perennial	Legume	Introduced	More	Less	High
85	2	windmill grasses (I) - <i>Enteropogon</i> spp	I	Perennial	Tussock	Native	Intermediate	More	High
86	1	African star grass* (P) - <i>Cynodon nlemluensis</i>	I	Perennial	Tussock	Introduced	More	More	Low
87	1	annual digit grass* (A) - <i>Digitaria ciliaris</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
88	1	bottle washers (annual) (A) - <i>Enneapogon</i> spp (a	A	Annual	Annual	Native	Intermittent	Least	High
89	1	broad leaved carpet grass* (I) - <i>Axonopus comp</i>	I	Perennial	Stolon	Introduced	Intermediate	More	High
90	1	cowpea* (A) - <i>Vigna unguiculata</i>	N	Annual	Legume	Introduced	Intermittent	Less	High
91	1	finger rush (A) - <i>Fimbristylis</i> spp	A	Annual	Annual	Native	Intermittent	Least	High
92	1	hairy native couch (A) - <i>Brachyachne ciliaris</i>	A	Annual	Annual	Native	Intermittent	Least	High
93	1	hymenachne* (Management) - <i>Hymenachne am</i>	A	Perennial	Tussock	Introduced	Less	More	Low
94	1	jointvetch* (A) - <i>Aeschynomene</i>	N	Annual	Legume	Introduced	Intermittent	Less	High
95	1	liverseed grass* (A) - <i>Urochloa panicoides</i>	A	Annual	Annual	Introduced	Intermittent	Least	High
96	1	matrush (N) - <i>Lomandra</i>	N	Perennial	Tussock	Native	Less	More	Low
97	1	molasses grass* (I) - <i>Melinis minutiflora</i>	I	Perennial	Stolon	Introduced	Intermediate	Less	Moderate
98	1	mulga oats (P) - <i>Monochather paradoxa</i>	P	Perennial	Tussock	Native	More	More	Low
99	1	native oatgrass (I) - <i>Themeda avenacea</i>	N	Perennial	Tussock	Native	Intermediate	More	Moderate
100	1	noogoor burr* (A) - <i>Xanthium occidentale</i>	A	Annual	Annual	Introduced	Intermittent	Least	High

**Summary—analysis of site data:**

**Lifecycle and Origin** (Table 7).

- 91 % (3340) of all sites have a perennial pasture species as the most dominant.
  - 51 % of the sites dominated by a perennial pasture species are an introduced species, 49 % are a native species, and 0.2 % pest plants.
- 8 % (279) of all sites have an annual pasture species as the most dominant (within perennially dominated land types).
  - 67 % of the sites dominated by an annual species are a native species, 15 % are an introduced species, and 18 % are pest plants.
- 1 % (47) of all sites have no pasture present.
- 51 % (1863 (including 47 none)) of all sites have native species as the most dominant.
  - 87 % are perennial, 10 % annual, and 3 % none.



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- 48 % (1748) of all sites have an introduced species as the most dominant.
  - 98 % are perennial, and 2 % annual.
- 1 % (55) of all sites have pest plants species as the most dominant.
  - 89 % are annual, and 11 % are perennial.

**Table 7** Lifecycle and Origin of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Lifecycle	Perennial			Annual			None			Total all sites		
	Site	%	% O	Site	%	% O	Site	%	% O	Site	%	% O
Native	1629	49	87	187	67	10	47	100	3	1863	51	100
Introduced	1705	51	98	43	15	2	-	-	-	1748	48	100
Pest Plant	6	0.2	11	49	18	89	-	-	-	55	1	100
Total	3340	100	NA	279	100	NA	47	100	NA	3666	100	100
<b>Of All Sites</b>	<b>3340</b>	<b>91</b>	<b>NA</b>	<b>279</b>	<b>8</b>	<b>NA</b>	<b>47</b>	<b>1</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Origin—Growth Habit, Productivity, Stability, and Run-off Risk** (Tables 7, 8, 9, 10, and 11).

- Of the 51 % (1863 including 47 none) of all sites that have a native species as the most dominant,
  - 84 % (1562) are tussock species, 10 % annual, 3 % none, and 2 % each for forbs and hummock species.
  - 53 % (984) are more productive species, 19 % have intermediate productivity, 15 % are less productive, 10 % have intermittent productivity, and 3 % have none.
  - 66 % (1233) are more stable species, 21 % have less stability, and 13 % have the least stability.
  - 57 % (1056) have a low run-of risk, 30 % a moderate risk, and 13 % a high risk.
- Of the 48 % (1748) of all sites have an introduced species as the most dominant,
  - 52 % (910) are stoloniferous species, 43 % tussock, 4 % legume, and 1 % pest plants.
  - 60 % (1049) are more productive species, 6 % have intermediate productivity, 32 % are less productive, and 2 % have intermittent productivity.
  - 55 % (970) have less stability, 44 % are a more stable species, and 1 % have the least stable species.
  - 56 % (978) have a moderate run-off risk, 34 % a high risk, and 10 % a low risk.
- Of the 1 % (55) of all sites have pest plants species as the most dominant,
  - 20 % have an annual growth habit, and 1 % tussock.
  - 100 % have no productivity.
  - 89 % (49) have the least stable species, and 11 % have more stability.
  - 89 % (49) have a high run-off risk, and 11 % a low risk.

**Table 8** Origin and Growth Habit of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Origin	Native			Introduced			Pest plant			Total all sites		
Habit	Site	%	% H	Site	%	% H	Site	%	% H	Site	%	% H
Tussock	1562	84	67	754	43	32	6	11	1	2322	63	100
Hummock	30	2	100	-	-	-	-	-	-	30	1	100
Stolon.	5	0.3	1	910	52	99	-	-	-	915	25	100
Forb	32	2	91	3	-	9	-	-	-	35	1	100
Legume	-	-	-	67	4	100	-	-	-	67	2	100
Annual	187	10	75	14	1	5	49	89	20	250	7	100
None	47	2	100	-	-	-	-	-	-	47	1	100
Total	1863	100	NA	1748	100	NA	55	100	NA	3666	100	100
<b>Of All Sites</b>	<b>1863</b>	<b>51</b>	<b>NA</b>	<b>1748</b>	<b>48</b>	<b>NA</b>	<b>55</b>	<b>1</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Productivity and Origin** (Table 9).

- 55 % (2033) of all sites have a more productive species as the most dominant.
  - Of these, 52 % are introduced species, and 48 % are native species
- 23 % (843) of all sites have a less productive species as the most dominant.
  - 66 % are introduced species, and 34 % are native species.
- 13 % (458) of all sites have an intermediate productivity species as the most dominant.
  - 78 % are native species, and 22 % are introduced species.
- 6 % (230) of all sites have an intermittent species as the most dominant.
  - 81 % are native species, and 19 % introduced species.
- 3 % (102) of all sites have a most dominant pasture species with no productivity value.
  - 54 % are pest plants, and 46 % have no pastures.

**Table 9** Origin and Indicative Productivity Value of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Origin	Native			Introduced			Pest plant			Total all sites		
Productivity	Site	%	% P	Site	%	% P	Site	%	% P	Site	%	% P
More	984	53	48	1049	60	52	-	-	-	2033	55	100
Intermediate	357	19	78	101	6	22	-	-	-	458	13	100
Less	288	15	34	555	32	66	-	-	-	843	23	100
Intermittent	187	10	81	43	2	19	-	-	-	230	6	100
None	47	3	46	-	-	-	55	100	54	102	3	100
Total	1863	100	NA	1748	100	NA	55	100	NA	3666	100	100
<b>Of All Sites</b>	<b>1863</b>	<b>51</b>	<b>NA</b>	<b>1748</b>	<b>48</b>	<b>NA</b>	<b>55</b>	<b>1</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Stability—Growth Habit and Origin** (Tables 10 and 12).

- 55 % (2003) of all sites have a dominant pasture with a growth habit that is more stable than other pastures.
  - 96 % are tussock species, 2 % hummock species, and 2 % native stoloniferous species.
  - 62 % are native species, and 38 % are introduced species.
- 37 % (1366) of all sites have a dominant pasture with a growth habit that is less stable than other pastures.
  - 64 % are stoloniferous species, 29 % tussock species, 5 % legume, and 2 % forb.
  - 71 % are introduced species, and 29 % are native species.

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- 8 % (297) of all sites have a dominant pasture with a growth habit that is the least stable of all other pastures.
  - 84 % are annual species, and 16 % have no pastures.
  - 79 % are native species, 16 % are pest plants, and 5 % are introduced species.
- 42 % (1543) of all sites have a dominant species that poses a moderate run-off risk.
  - 72 % are tussock species, 26 % stoloniferous, and 2 % forb.
- 34 % (1230) of all sites have a dominant species that poses a low run-off risk.
  - 98 % are a tussock species, and 2 % a hummock species.
- 24 % (893) of all sites have a dominant species that poses a high run-off risk.
  - 58 % are stoloniferous species, 28 % annual, 7 % legume, 1 % tussock, 1 % forb, and 5 % none.

**Table 10** Origin and Stability of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Origin	Native			Introduced			Pest plant			Total all sites		
	Site	%	% <u>S</u>	Site	%	% <u>S</u>	Site	%	% <u>S</u>	Site	%	% <u>S</u>
More	1233	66	62	764	44	38	6	11	0	2003	55	100
Less	396	21	29	970	55	71	-	-	-	1366	37	100
Least	234	13	79	14	1	5	49	89	16	297	8	100
Total	1863	100	NA	1748	100	NA	55	100	NA	3666	100	100
<b>Of All Sites</b>	<b>1863</b>	<b>51</b>	<b>NA</b>	<b>1748</b>	<b>48</b>	<b>NA</b>	<b>55</b>	<b>1</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Table 11** Origin and Run-off Risk of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Origin	Native			Introduced			Pest plant			Total all sites		
	Site	%	% <u>R</u>	Site	%	% <u>R</u>	Site	%	% <u>R</u>	Site	%	% <u>R</u>
Low	1055	57	86	169	10	14	6	11	0	1230	34	100
Moderate	565	30	37	978	56	63	-	-	-	1543	42	100
High	243	13	27	601	34	67	49	89	6	893	24	100
Total	1863	100	NA	1748	100	NA	55	100	NA	3666	100	100
<b>Of All Sites</b>	<b>1863</b>	<b>51</b>	<b>NA</b>	<b>1748</b>	<b>48</b>	<b>NA</b>	<b>55</b>	<b>1</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Growth Habit—Origin, Stability and Run-off Risk** (Tables 8, 12 and 13).

- 63 % (2322) of all sites have a tussock species as the most dominant.
  - 67 % are native tussock species, 32 % introduced, and 1 % pest plants.
  - 83 % are more stable, and 17 % less stable.
  - 52 % have a low run-off risk, and 48 % a moderate risk.
- 25 % (915) of all sites have a stoloniferous species as the most dominant.
  - 99 % are an introduced stoloniferous species, and 1 % are a native stoloniferous species.
  - 95 % are less stable, and 5 % more stable.
  - 56 % have a high run-off risk, and 44 % a moderate risk.
- 7 % (250) of all sites have an annual species as the most dominant.
  - 75 % are native species, 20 % pest plant (and introduced), and 5 % introduced species.
  - 100 % are the least stable species.
  - 100 % have a high run-off risk.
- 2 % (67) of all sites have legume as the most dominant.
  - 100 % are introduced species.

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- 100 % are a less stable species.
- 100 % have a high run-off risk.
- 1 % (35) of all sites have forbs as the most dominant.
  - 91 % are native species, and 9 % are introduced.
- 1 % (30) of all sites have a hummock grass as the most dominant.
  - 100 % are native species.
  - 100 % are a more stable species.
  - 100 % have a low run-off risk.
- 1 % (47) of all sites have no pasture species.
  - 100 % were assumed to be native.
  - 100 % have the least stability.
  - 100 % have a high run-off risk.

**Table 12** Stability and Growth Habit of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Stability Habit	More			Less			Least			Total all sites		
	Site	%	% H	Site	%	% H	Site	%	% H	Site	%	% H
Tussock	1930	96	83	392	29	17	-	-	-	2322	63	100
Hummock	30	2	100	-	-	-	-	-	-	30	1	100
Stoloniferous	43	2	5	872	64	95	-	-	-	915	25	100
Forb	-	-	-	35	2	100	-	-	-	35	1	100
Legume	-	-	-	67	5	100	-	-	-	67	2	100
Annual	-	-	-	-	-	-	250	84	100	250	7	100
None	-	-	-	-	-	-	47	16	100	47	1	100
Total	2003	100	NA	1366	100	NA	297	100	NA	3666	100	100
<b>Of All Sites</b>	<b>2003</b>	<b>55</b>	<b>NA</b>	<b>1366</b>	<b>37</b>	<b>NA</b>	<b>297</b>	<b>8</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Table 13** Run-off Risk and Growth Habit of the Top 100 Most Dominant Pasture Plant Genus, Species, or Generic Category.

Run-off Habit	Low risk			Moderate risk			High risk			Total all sites		
	Site	%	% H	Site	%	% H	Site	%	% H	Site	%	% H
Tussock	1200	98	52	1115	72	48	7	1	-	2322	63	100
Hummock	30	2	100	-	-	-	-	-	-	30	1	100
Stoloniferous	-	-	-	398	26	44	517	58	56	915	25	100
Forb	-	-	-	30	2	86	5	1	14	35	1	100
Legume	-	-	-	-	-	-	67	7	100	67	2	100
Annual	-	-	-	-	-	-	250	28	100	250	7	100
None	-	-	-	-	-	-	47	5	100	47	1	100
Total	1230	100	NA	1543	100	NA	893	100	NA	3666	100	100
<b>Of All Sites</b>	<b>1230</b>	<b>34</b>	<b>NA</b>	<b>1543</b>	<b>42</b>	<b>NA</b>	<b>893</b>	<b>24</b>	<b>NA</b>	<b>3666</b>	<b>100</b>	<b>NA</b>

**Summary—top 100 First, Second, Third, Fourth, and Fifth most dominant pasture plant:**

Data refer to the most dominant genera, species or generic category.

- 754 (21 %) of sites were assessed using the Advanced version and contained up to 5 dominant pasture species.
  - Of all sites, 99 % had a dominant pasture species assessed, 23 % had a second, 14 % a third, 7 % a fourth and 5 % a fifth.

**Table 14** First, Second, Third, Fourth, and Fifth Most Dominant Pasture Plant Where Observed.

Order	Dominant Pasture	Ct	Second Dominant	Ct	Third Dominant	Ct	Fourth Dominant	Ct	Fifth Dominant	Ct
1	buffel grass* (P) - Cenchrus	514	black speargrass (P) - Hypochaeris	73	stylos* (I) - Stylosanthes	40	wiregrasses (N) - Aristida	24	stylos* (I) - Stylosanthes	17
2	Indian couch* (I) - Bothriochloa	461	Urochloa* (P) - Urochloa	50	forbs (perennial e.g. bur	38	stylos* (I) - Stylosanthes	20	Non-preferred (1P grass	13
3	black speargrass (P) - Hypochaeris	289	Indian couch* (I) - Bothriochloa	49	black speargrass (P) - Hypochaeris	34	Non-preferred (1P grass	14	Unidentified (I)	10
4	Urochloa* (P) - Urochloa	256	buffel grass* (P) - Cenchrus	48	Non-preferred (Increase	27	black speargrass (P) - Hypochaeris	13	Urochloa* (P) - Urochloa	9
5	Mitchell grasses (P) - Aristida	251	Mitchell grasses (P) - Aristida	44	wiregrasses (N) - Aristida	25	Rhodes grass* (P) - Chloris	12	wynn cassia (A) - Chamaecrista	8
6	Preferred (Decreaser) (P)	235	Flinders grass (A) - Isolepis	41	Urochloa* (P) - Urochloa	20	Sida (N) - Sida	10	wiregrasses (N) - Aristida	7
7	wiregrasses (N) - Aristida	121	wiregrasses (N) - Aristida	41	Sida (N) - Sida	19	Unidentified (I)	10	Sida (N) - Sida	7
8	blue grasses (other 3P)	105	Non-preferred (1P grass	39	Indian couch* (I) - Bothriochloa	17	kangaroo grass (P) - Themeda	7	sedges (N) - Cyperus	7
9	chloris spp* (large perenn	105	stylos* (I) - Stylosanthes	35	blue grasses (other 3P)	15	sedges (N) - Cyperus	7	forbs (perennial e.g. bur	7
10	Unidentified (I)	105	forbs (N) - forbs	32	Unidentified (I)	13	buffel grass* (P) - Cenchrus	6	sensitive plant (I) - Neptunia	4
11	Intermediate (I) - 2P Dor	102	Unidentified (I)	30	Intermediate (I) - 2P Dor	13	burrs (perennial forbs) (P)	6	grader grass* (A) - Themeda	4
12	Annual (A) - Annual Dor	94	chloris spp* (large perenn	21	Flinders grass (A) - Isolepis	13	Indian couch* (I) - Bothriochloa	6	golden beard grass (P) -	4
13	Non-preferred (Increase	91	Preferred (3P grasses C	21	Mitchell grasses (P) - Aristida	12	Annual (short-lived gras	5	spinifex (soft) (P) - Triodia	3
14	green Panic* (P) - Megalopanax	49	blue grasses (other 3P)	20	kangaroo grass (P) - Themeda	11	golden beard grass (P) -	5	red Natal* (N) - Melinis	3
15	Flinders grass (A) - Isolepis	48	Intermediate (2P grassee	20	golden beard grass (P) -	11	grader grass* (A) - Themeda	5	Indian couch* (I) - Bothriochloa	3
16	None observed	47	Annual (A) - Annual Dor	16	buffel grass* (P) - Cenchrus	11	native legumes (I) - Tetraodon	5	chloris spp* (large perenn	3
17	grader grass* (A) - Themeda	45	kangaroo grass (and nat	15	Preferred (Decreaser) (P)	9	rattlepods (N) - Crotalaria	5	buffel grass* (P) - Cenchrus	3
18	paspalum* (N) - Paspalum	42	panic (large native perenn	14	grader grass* (A) - Themeda	9	Urochloa* (P) - Urochloa	5	bluegrasses (I) - Bothriochloa	3
19	bluegrasses (I) - Bothriochloa	41	desert bluegrass (P) - B	11	giant speargrass (P) - Hypochaeris	9	fairy grass (annual) (A) -	4	yabila grass (P) - Panicum	2
20	stylo* lt 50 pc TSDM or	34	angleton grass* (P) - Dic	10	sedges (N) - Cyperus	8	Flinders grass (A) - Isolepis	4	siratro* (N) - Macroptiliu	2
21	setaria* (P) - Setaria	33	Sida (N) - Sida	9	sensitive plant (I) - Neptunia	7	Intermediate (2P grassee	4	rattlepods (N) - Crotalaria	2
22	kangaroo grass (P) - Themeda	31	button grass (A) - Dactyloctenium	8	panic (large native perenn	7	Preferred (3P grasses C	4	Queensland bluegrass (P)	2
23	green couch* (I) - Cynodon	30	setaria* (P) - Setaria	8	love grasses (annual) (A)	7	giant speargrass (P) - Hypochaeris	3	paspalum* (N) - Paspalum	2
24	summer grass (I) - Paspalum	29	giant speargrass (P) - Hypochaeris	7	chloris spp* (large perenn	7	jointvetch* (A) - Aeschynomene	3	panic (large native perenn	2
25	wynn cassia (A) - Chamaecrista	27	pigweed (A) - Portulaca	7	button grass (A) - Dactyloctenium	7	kerosene grass (A) - Aristida	3	panic (annual) (A) - Panicum	2
26	pangola* (P) - Digitaria	26	roly-poly* (A) - Salsola k	7	silky browntop (P) - Eulalia	6	pigweed (A) - Portulaca	3	malvastrum* (A) - Malva	2
27	angleton grass* (P) - Dic	25	grader grass* (A) - Themeda	6	red Natal* (N) - Melinis	6	sensitive plant (I) - Neptunia	3	love grasses (annual) (A)	2
28	blue couch* (I) - Digitaria	25	rattlepods (N) - Crotalaria	6	Annual (short-lived gras	6	summer grasses (I) - Digitaria	3	kangaroo grass (P) - Themeda	2
29	burrs (perennial forbs) (P)	23	sensitive plant (I) - Neptunia	6	rattlepods (N) - Crotalaria	5	angleton grass* (P) - Dic	2	Intermediate (2P grassee	2
30	spinifex (soft) (P) - Triodia	23	wynn cassia (A) - Chamaecrista	6	bluegrasses (I) - Bothriochloa	5	bluegrasses (I) - Bothriochloa	2	forest bluegrass (P) - B	2
31	creeping bluegrass* (P)	20	cupgrasses (I) - Eriochloa	6	wynn cassia (A) - Chamaecrista	4	desert bluegrass (P) - B	2	fire grass (A) - Schizachy	2
32	red Natal* (N) - Melinis	20	bluegrasses (I) - Bothriochloa	5	siratro* (N) - Macroptiliu	4	green couch* (I) - Cynodon	2	fairy grass (perennial) (I)	2
33	panic (large native perenn	19	forest bluegrass (P) - B	5	malvastrum* (A) - Malva	4	green Panic* (P) - Megalopanax	2	blady grass (N) - Imperata	2
34	kikuyu grass* (P) - Pennisetum	18	native millet (P) - Panicum	5	fairy grass (annual) (A) -	4	love grasses (perennial)	2	black speargrass (P) - Hypochaeris	2
35	wanderrie (N) - Eriachne	17	reed grass (N) - Arundin	5	bluebush (I) - Maireana	4	Mitchell grasses (P) - Aristida	2	weir vine (N) - Ipomoea	1
36	love grasses (perennial)	16	sedges (N) - Cyperus	5	summer grasses (I) - Digitaria	3	native couch (A) - Brachiaria	2	thatch grass* (N) - Hypochaeris	1
37	African lovegrass* (N) -	13	summer grass (I) - Paspalum	5	roly-poly* (A) - Salsola k	3	native panic (P) - Panicum	2	summer grasses (I) - Digitaria	1
38	thatch grass* (N) - Hypochaeris	13	wanderrie (N) - Eriachne	5	pitted bluegrass (I) - Bot	3	red Natal* (N) - Melinis	2	purpletop chloris* (A) - C	1
39	panic (small native perenn	11	golden beard grass (I) -	4	panic (annual) (A) - Pan	3	setaria* (P) - Setaria	2	Preferred (3P grasses C	1
40	sedges (N) - Cyperus	10	Queensland bluegrass (P)	4	finger rush (A) - Fimbristylis	3	silky browntop (P) - Eulalia	2	poverty grass (N) - Eren	1
41	wanderrie grasses (I) - B	10	scented top (I) - Capillipedium	4	cupgrasses (I) - Eriochloa	3	siratro* (N) - Macroptiliu	2	pitted bluegrass (I) - Bot	1
42	chloris (annuals) (A) - C	9	bluebush (I) - Maireana	3	chloris (annuals) (A) - C	3	wanderrie (N) - Eriachne	2	pepper grass (A) - Panicum	1
43	golden beard grass (P) -	9	chloris (small perennials	3	angleton grass* (P) - Dic	3	barnyard grass* (A) - Ectocarpus	1	native legumes (I) - Tetraodon	1
44	finger grasses (I) - Digitaria	8	curly bluegrass (P) - Dic	3	indigofera spp (N) - Indigofera	3	blue grasses (other 3P)	1	native couch (A) - Brachiaria	1
45	blady grass (N) - Imperata	7	green couch* (I) - Cynodon	3	wanderrie (N) - Eriachne	2	bluebush (I) - Maireana	1	love grasses (perennial)	1
46	button grass (A) - Dactyloctenium	6	herbs (A) - herbs	3	setaria* (P) - Setaria	2	budda pea (A) - Aeschynomene	1	kerosene grass (A) - Aristida	1
47	fire grass (A) - Schizachy	6	pangola* (P) - Digitaria	3	rhynchosia (N) - Rhynchosia	2	chloris (annuals) (A) - C	1	joyweed (A) - Alternanthera	1
48	giant rat's tail grass* (N)	6	pepper grass (A) - Panicum	3	pigweed (A) - Portulaca	2	chloris spp* (large perenn	1	green Panic* (P) - Megalopanax	1
49	native couch (A) - Brachiaria	6	pitted bluegrass (I) - Bot	3	pangola* (P) - Digitaria	2	cobbler's pegs* (A) - Bidens	1	green couch* (I) - Cynodon	1
50	Queensland bluegrass (P)	6	woollybutt (I) - Eragrostis	3	native legumes (I) - Tetraodon	2	comet grass (A) - Perotis	1	giant speargrass (P) - Hypochaeris	1
51	reed grass (N) - Arundin	6	barnyard grass* (A) - Ectocarpus	2	love grasses (perennial)	2	cow vine (N) - Ipomoea	1	giant rat's tail grass* (N)	1
52	scented top (I) - Capillipedium	6	blue couch* (I) - Digitaria	2	green couch* (I) - Cynodon	2	finger grasses (I) - Digitaria	1	fairy grass (annual) (A) -	1
53	bracky* (I) - Urochloa	5	channel millet in annual	2	curly bluegrass (P) - Dic	2	five minute grass (I) - Triodia	1	downs couch (A) - Brachiaria	1
54	chloris (small perennials	5	chloris (annuals) (A) - C	2	chloris (small perennials	2	forage sorghum* (A) - Sorghum	1	desmanthes* (managed	1
55	love grasses (annual) (A)	5	daisy burrs (A) - Calotis	2	rat's tail grasses (N) - S	2	fringe rush (A) - Fimbristylis	1	desert bluegrass (P) - B	1
56	marine couch (P) - Sporobolus	5	kerosene grass (A) - Aristida	2	windmill grasses (I) - Eriachne	1	giant rat's tail grass* (N)	1	cobbler's pegs* (A) - Bidens	1
57	salt bushes (I) - Atriplex	5	love grasses (annual) (A)	2	three-awned wanderrie	1	herbs (A) - herbs	1	chloris (small perennials	1
58	silky browntop (P) - Eulalia	5	malvastrum* (A) - Malva	2	tambookie grass (I) - Hypochaeris	1	hymenachne* (Manager	1	Centro* (P) - Centrosema	1
59	Sorghum (I) - Sorghum	5	purpletop chloris* (A) - C	2	spinifex (soft) (P) - Triodia	1	joyweed (A) - Alternanthera	1	bottle washers (annual)	1
60	spinifex (hard) (I) - Triodia	5	silky browntop (P) - Eulalia	2	Rhodes grass* (P) - Chloris	1	love grasses (annual) (A)	1	barnyard grass* (A) - Ectocarpus	1

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60	spinifex (hard) (I) - Triodia	5	silky browntop (P) - Eulalia	2	Rhodes grass* (P) - Chloris	1	love grasses (annual) (A)	1	barnyard grass* (A) - Echinochloa	1
61	spring grass (I) - Eriochloa	5	spinifex (soft) (P) - Triodia	2	reed grass (N) - Arundo	1	malvastrum* (A) - Malva	1		
62	kerosene grass (A) - Aristida	4	thatch grass* (N) - Hypochaeris	2	Queensland bluegrass (I)	1	mint bush (N) - Prostanthera	1		
63	nut grass (N) - Cyperus	4	tick weed (A) - Cleome	2	plume sorghum (I) - Sorghum	1	mountain wanderie grass (I)	1		
64	parthenium* (A) - Managradum	4	rat's tail grasses (N) - Sorghum	2	paspalum* (N) - Paspalum	1	native oatgrass (I) - Thecophora	1		
65	crowsfoot grass* (A) - Eriochloa	3	bahia grass* (N) - Paspalum	1	native couch (A) - Brachiaria	1	native rats tail grass (N)	1		
66	flannel weed* (N) - Sida	3	barbwire grass (I) - Cymbopogon	1	limestone bottlewashers (I)	1	panic (annual) (A) - Panicum	1		
67	gulf bluegrass (P) - Dichanthium	3	blady grass (N) - Imperata	1	lemon-scented grass (I)	1	panic (small native perennial)	1		
68	barnyard grass* (A) - Echinochloa	2	bottle washers (annual)	1	kerosene grass (A) - Aristida	1	paspalum* (N) - Paspalum	1		
69	butterfly pea* (N) - Clitoria	2	box grass (I) - Paspalidium	1	joyweed (A) - Alternanthera	1	pepper grass (A) - Panicum	1		
70	channel millet in annual	2	browntop (P) - Eulalia sp.	1	herbs (A) - herbs	1	purpletop chloris* (A) - Chloris	1		
71	common oats* (A) - Avena	2	couch grass* (I) - Cynodon	1	glycine (I) - Glycine falcataria	1	Queensland bluegrass (I)	1		
72	coolibah grass (N) - Thecophora	2	desmanthes* (I) - Desmanthes	1	fire grass (A) - Schizachyria	1	rhynchosia (N) - Rhynchosia	1		
73	fairy grass (annual) (A) - Sorghum	2	downs sorghum (A) - Sorghum	1	crowsfoot grass* (A) - Eriochloa	1	scented top - Capillipedium	1		
74	flannel weeds (N) - Abutilon	2	fairy grass (annual) (A) - Sorghum	1	channel nut grass (N) - Cymbopogon	1	silky oil grass (I) - Cymbopogon	1		
75	forage sorghum* (A) - Sorghum	2	fairy grass (perennial) (I) - Sorghum	1	channel millet in annual	1	thatch grass* (N) - Hypochaeris	1		
76	giant speargrass (P) - Heteropogon	2	feathertop Rhodes grass (I)	1	butterfly pea* (managed)	1	tick weed (A) - Cleome	1		
77	hard spinifex (I) - Triodia	2	fire grass (A) - Schizachyria	1	burgundy bean* (P) - Macrotyloma	1	white grass (N) - Sehima	1		
78	hyptis* (A) - Hyptis suaveolens	2	five minute grass (I) - Triodia	1	barnyard grass* (A) - Echinochloa	1	winged windmill grass (A)	1		
79	native sorghum (I) - Sorghum	2	hairy armgrass (A) - Urochloa	1	barbwire grass (I) - Cymbopogon	1	wynn cassia (A) - Chamaecrista	1		
80	pigweed (A) - Portulaca	2	jointvetch* (A) - Aeschynomene	1						
81	poverty grass (N) - Eriochloa	2	kikuyu grass* (P) - Pennisetum	1						
82	rat's tail grasses (N) - Sorghum	2	liverseed grass* (A) - Urochloa	1						
83	ruby saltbush (I) - Enchytaria	2	native couch (A) - Brachiaria	1						
84	white clover* (P) - Trifolium	2	native legumes (I) - Tephrosia	1						
85	windmill grasses (I) - Eriochloa	2	paspalum* (N) - Paspalum	1						
86	African star grass* (P) - Melinis	1	red Natal* (N) - Melinis	1						
87	annual digit grass* (A) - Digitaria	1	salt bushes (I) - Atriplex	1						
88	bottle washers (annual)	1	silk sorghum (I) - Sorghum	1						
89	broad leaved carpet grass (I)	1	silky oil grass (I) - Cymbopogon	1						
90	cowpea* (A) - Vigna unguiculata	1	windmill grasses (I) - Eriochloa	1						
91	finger rush (A) - Fimbristylis	1								
92	hairy native couch (A) - Brachiaria	1								
93	hymenachne* (Manager)	1								
94	jointvetch* (A) - Aeschynomene	1								
95	liverseed grass* (A) - Urochloa	1								
96	matrush (N) - Lomandra	1								
97	molasses grass* (I) - Melinis	1								
98	mulga oats (P) - Monochloa	1								
99	native oatgrass (I) - Thecophora	1								
100	noogoora burr* (A) - Xanthoxylum	1								

### Dominant Pasture Plant Category—Observed and/or Weighted Data

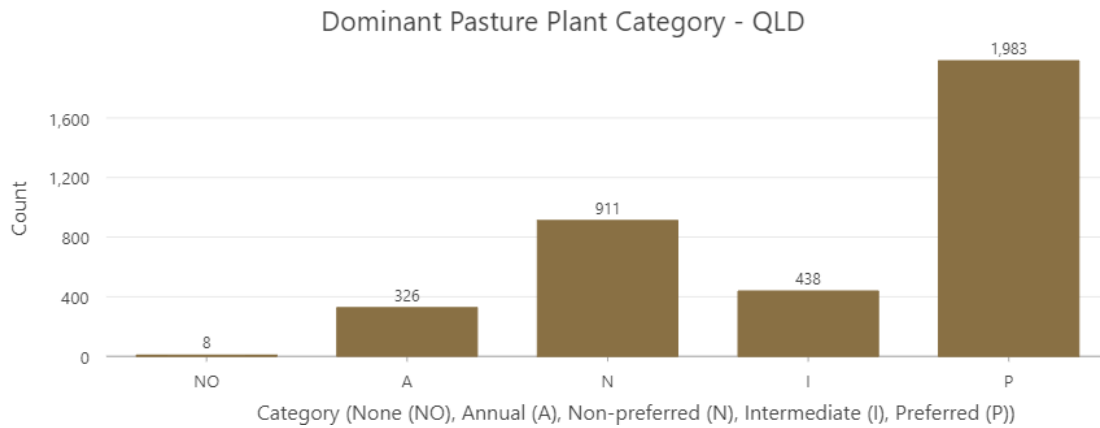
Over 580 pasture plants are included in the LCAT. Each pasture plant name displays a label of the category according to grazing land management (GLM) principles i.e. P = Preferred, I = Intermediate, N = Non-preferred, A = Annual, and NO = None. Within the framework, each species is one of these categories for each of the 6 results that consider pasture species. The category *P* is weighted highest and *NO* weighted lowest. This approach allows a single pasture species to be categorised and weighted for its positive or negative contribution or impact to multiple results. For example a non-native species may have a high value for productivity but a low value for environmental outcomes.

**Table 15** Example of Dominant Pasture Plant Categories assigned to Multiple Results.

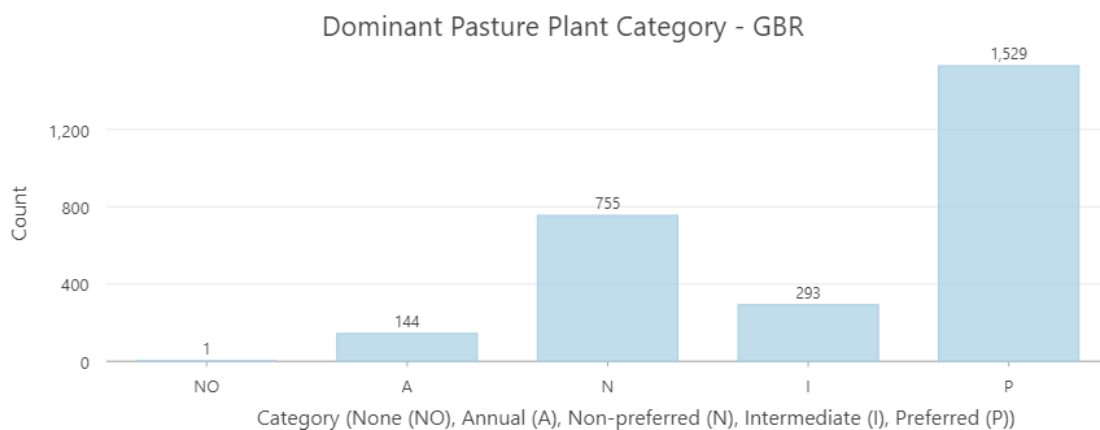
Pasture Plant Name and Label (* = Non-native; # = Prototype)	GLM ABCD	Impact on Natural State	Landscape Stability and Function#	Riparian Zone Stability#	Natural Capital#	Carbon Store#
black speargrass (P) - Heteropogon contortus	P	P	P	P	P	P
pitted bluegrass (I) - Bothriochloa decipiens	I	I	I	I	I	I
wiregrasses (N) - Aristida spp	N	N	P	I	N	N
Flinders grass (A) - Iseilema spp	A	N	A	NO	N	A
buffel grass* (P) - Cenchrus ciliaris	P	A	P	P	NO	P
Indian couch* >30 % TSDM (N) – B. pertusa	N	A	NO	N	NO	A

## Labelled category Vs Scoring value category

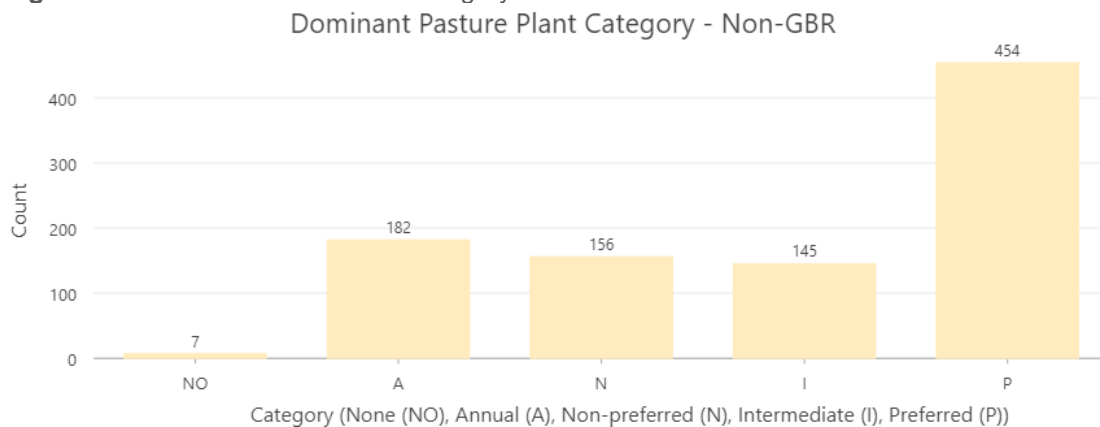
Figures and Tables that include the *pasture plant category* as a metric, use the Grazing ABCD Result category for summary and analysis. For example, whilst the introduced Indian couch (*Bothriochloa pertusa*) is labelled *I*, it is categorised (scored) as *N* (where its dominance is determined as greater than 30 % total standing dry matter (TSDM) kg/ha). Therefore a Count of Non-preferred (*N*) species will include some species such as Indian couch that have a different label e.g. *I*.



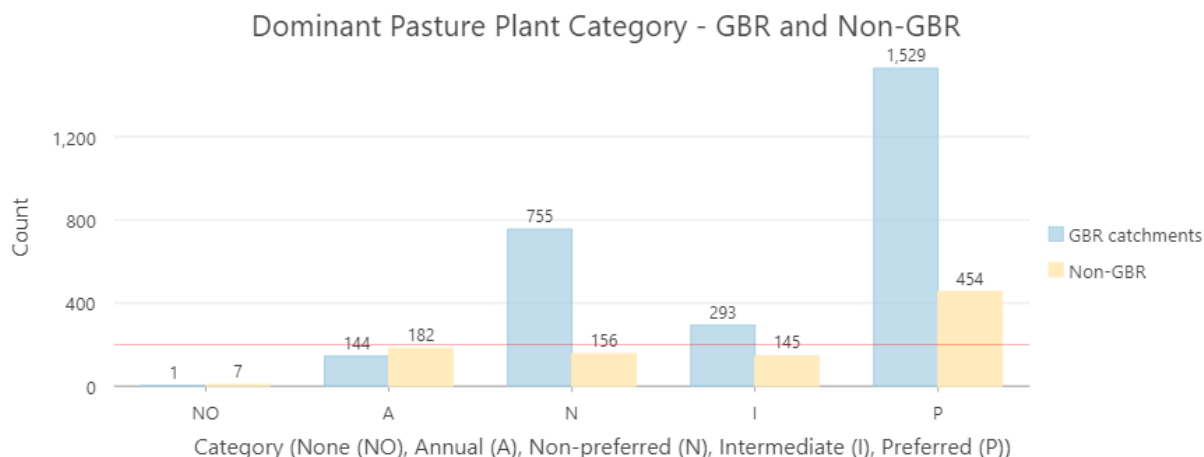
**Figure 1** Dominant Pasture Plant Category—Queensland.



**Figure 2** Dominant Pasture Plant Category—GBR Catchments.



**Figure 3** Dominant Pasture Plant Category—Non-GBR Catchments.



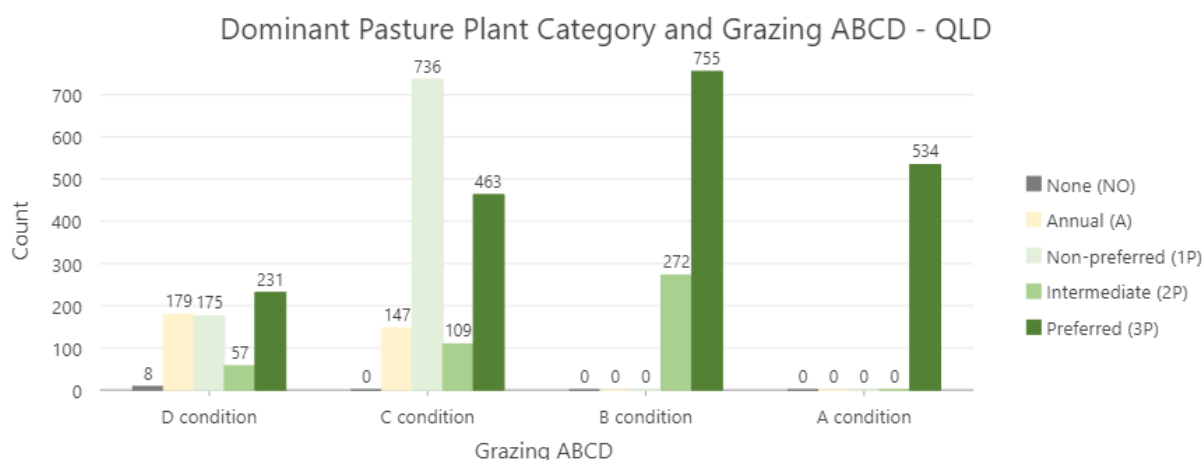
**Figure 4** Dominant Pasture Plant Category—GBR Catchments and Non-GBR. (Red line = 200)

**Table 16** Regional and State Dominant Pasture Plant Category (scoring) Proportion.

Region	Dominant Pasture Plant Category (scoring)					Grand Total
	NO	A	N	I	P	
GBR Catchments	0%	5%	28%	11%	56%	100%
Non-GBR	1%	19%	17%	15%	48%	100%
Queensland	0%	9%	25%	12%	54%	100%

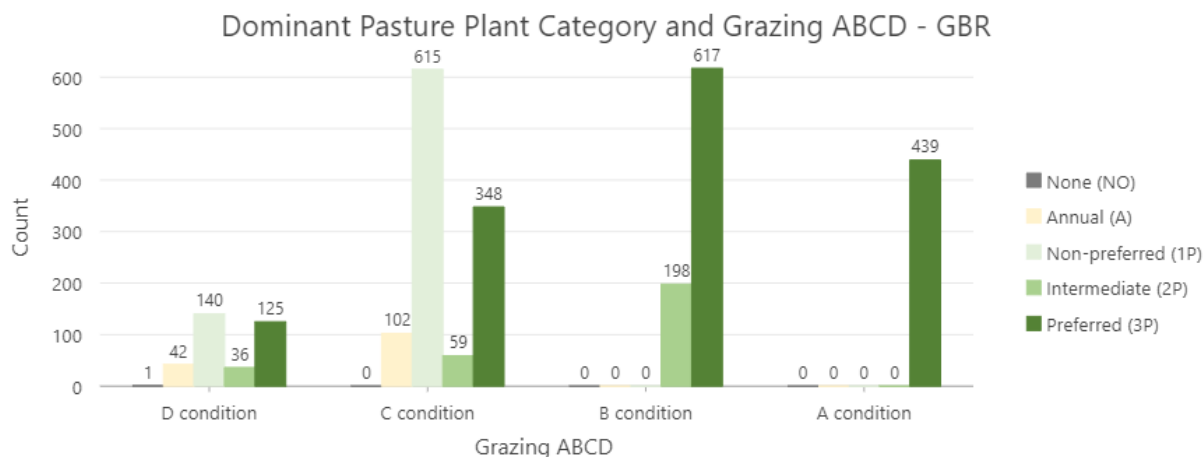
**Note:**

- The 28 % of sites dominated by a Non-preferred (N) species in the GBR Catchments includes Indian couch (*Bothriochloa pertusa*) dominated sites—an Intermediate species categorised as N where dominant or greater than 30 % of the TSDM.
- Of all sites, 34 % are dominated by less palatable and/or less productive (A or N) species.
- The low proportion of sites dominated by Intermediate (I) species (12 % for Queensland) would benefit from monitoring to determine trend (up or down) over time.
  - Intermediate species are generally sub-dominant; however, their low proportion may indicate composition shifts due to management and/or climate.
  - Includes 105 sites (or 3 %) where the dominant pasture species was *Unidentified*.

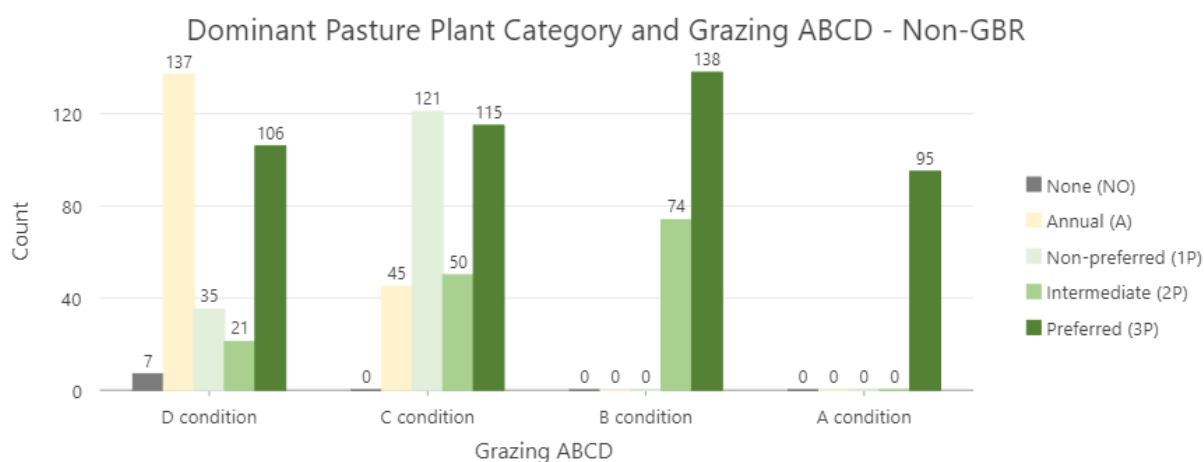


**Figure 5** Dominant Pasture Plant Category and Grazing ABCD—Queensland.





**Figure 6** Dominant Pasture Plant Category and Grazing ABCD—GBR Catchments.



**Figure 7** Dominant Pasture Plant Category and Grazing ABCD—Non-GBR.

**Table 17** Frequency % of Dominant Pasture Plant Category (scoring) and Grazing ABCD of All Sites.

Region	Grazing ABCD															TTL
	D condition					C condition					B			A		
	A	N	I	P	TTL	A	N	I	P	TTL	I	P	TTL	P	TTL	
GBR Catchments	1	4	1	3	9	3	17	2	9	31	5	17	22	12	12	74
Non-GBR	4	1	1	3	8	1	3	1	3	9	2	4	6	3	3	26
<b>All Sites Qld</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>6</b>	<b>18</b>	<b>4</b>	<b>20</b>	<b>3</b>	<b>13</b>	<b>40</b>	<b>7</b>	<b>21</b>	<b>28</b>	<b>15</b>	<b>15</b>	<b>100</b>

A = Annual, N = Non-Preferred, I = Intermediate, P = Preferred, TTL = Total. All values %.

**Table 18** Frequency % of Dominant Pasture Plant Category (scoring) and Grazing ABCD of Each Category.

Region	Grazing ABCD															
	D condition						C condition					B			A	
	NO	A	N	I	P	TTL	A	N	I	P	TTL	I	P	TTL	P	TTL
GBR Catchments	0	12	41	10	36	13	9	55	5	31	41	24	76	30	100	16
Non-GBR	2	45	11	7	35	32	14	37	15	35	35	35	65	22	100	10
<b>Category Qld</b>	<b>1</b>	<b>28</b>	<b>27</b>	<b>9</b>	<b>36</b>	<b>18</b>	<b>10</b>	<b>51</b>	<b>7</b>	<b>32</b>	<b>40</b>	<b>26</b>	<b>74</b>	<b>28</b>	<b>100</b>	<b>15</b>

NO = None, A = Annual, N = Non-Preferred, I = Intermediate, P = Preferred, TTL=Total. All values %.

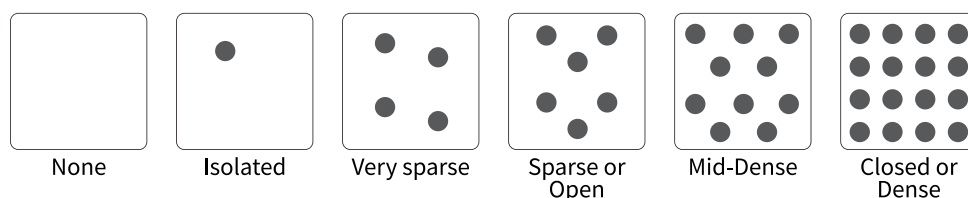
**Table 19** Frequency % of Dominant Pasture Plant Category (scoring) and Grazing ABCD of Each Region.

Region	Grazing ABCD															
	D condition						C condition					B			A	
	NO	A	N	I	P	TTL	A	N	I	P	TTL	I	P	TTL	P	TTL
GBR Catchments	0	2	5	1	5	13	4	23	2	13	41	7	23	30	16	16
Non-GBR	1	15	4	2	11	32	5	13	5	12	35	8	15	22	10	10
Category Qld	0	5	5	2	6	18	4	20	3	13	40	7	21	28	15	15

NO = None, A = Annual, N = Non-Preferred, I = Intermediate, P = Preferred, TTL=Total. All values %.

### 3.1.2 Dominant Pasture Plant Density—Observed Data

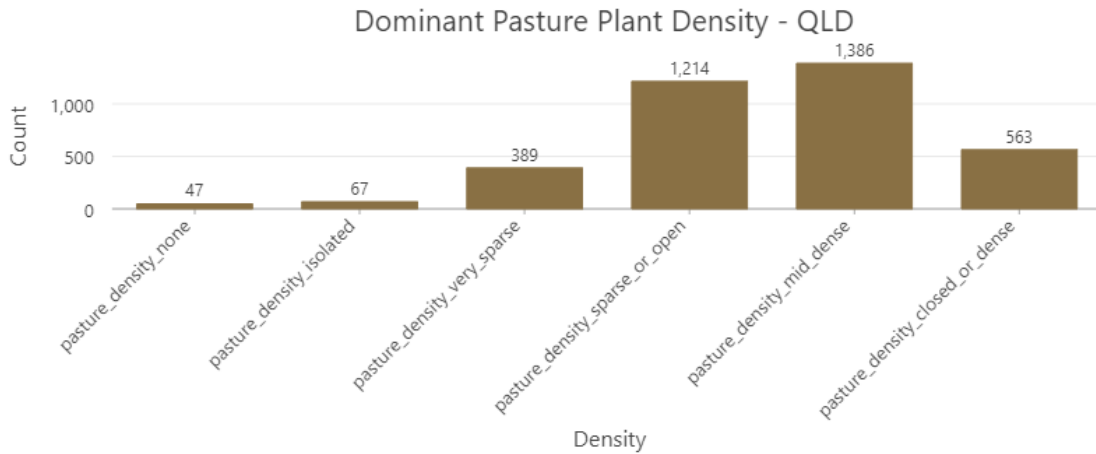
What is the density of the pasture plant or category chosen as the most dominant?



**Image 2** Dominant Pasture Plant Density Values.

**Note:**

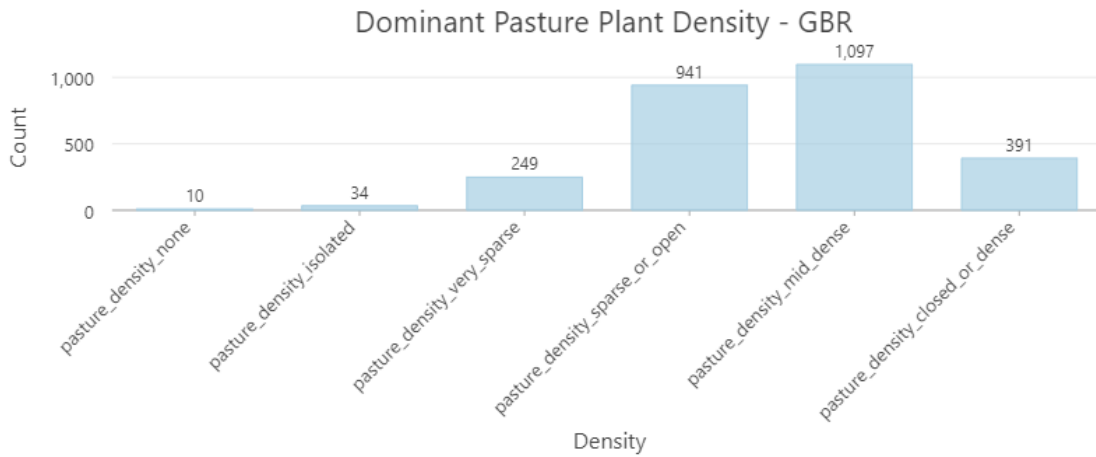
- Whilst the *Sparse or Open*, *Very sparse* and *Isolated* densities may occur naturally in some pasture communities or land types—mostly semi-arid and arid zones—these landscapes may be less productive and/or more prone to erosion processes, due to the inherent ‘openness’ of the ground layer.
- In the *Cover classes and characteristics* table of Hnatiuk et al. 2009., the *Sparse or Open* density value has an equivalent Crown Cover of 20 – 50 % and a Foliage Cover of 10 – 30 %. To picture these values, the *Braun-Blanquet cover–abundance scale for estimating species quantities* (after Mueller-Dombois and Ellenberg, 1974) defines 25 – 50 % Crown Cover as—*Any number of plants covering ¼ to ½ of the sample site.*
- The *Sparse or Open* density value—particularly in the Total Perennial Pasture Density—may be considered a ‘tipping-point’ from which further decline may be difficult to arrest without management practice change.



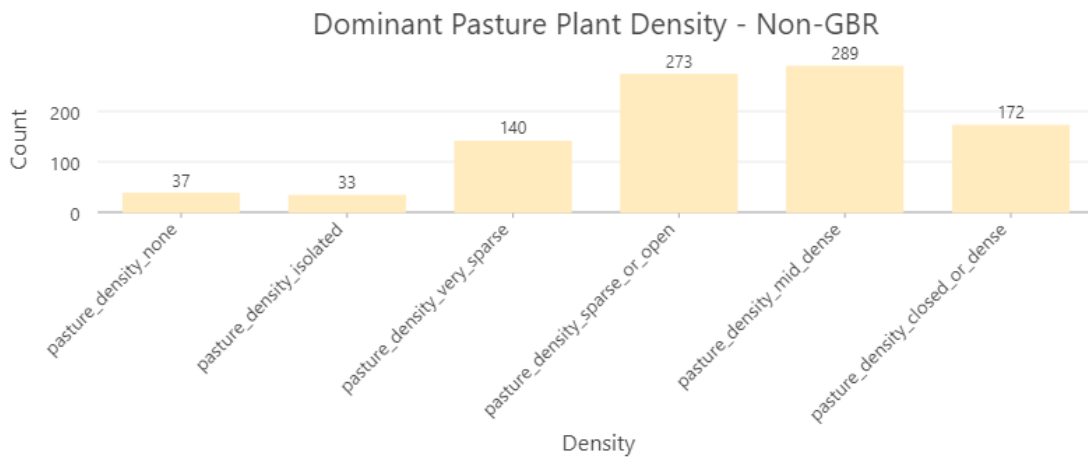
**Figure 8** Dominant Pasture Plant Density—Queensland.

**Note:**

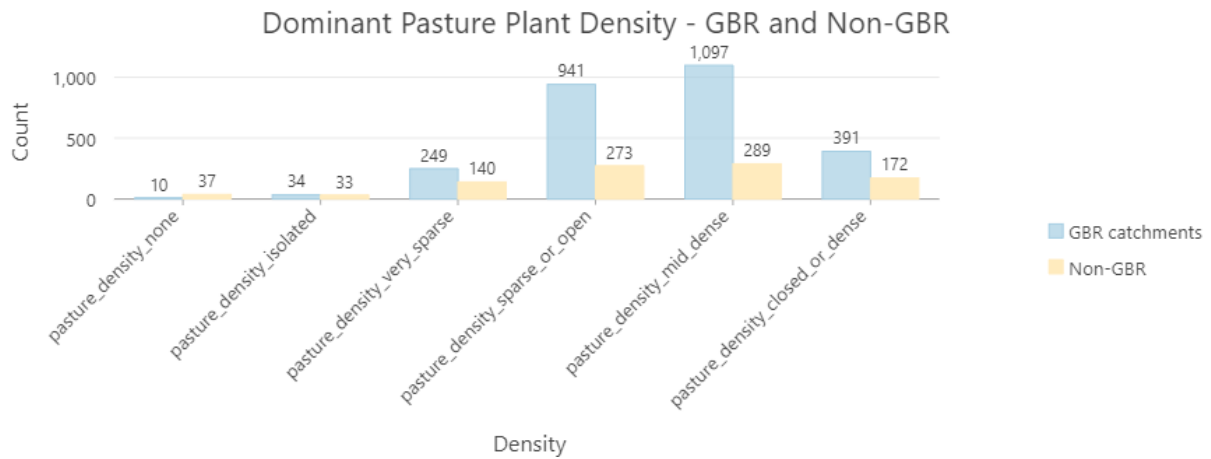
- 33 % of sites across Queensland, have a Dominant Pasture Density of *Sparse or Open*.
- 47 % of all sites have a Dominant Pasture Density of *Sparse or Open* or less.



**Figure 9** Dominant Pasture Plant Density—GBR Catchments.



**Figure 10** Dominant Pasture Plant Density—Non-GBR.



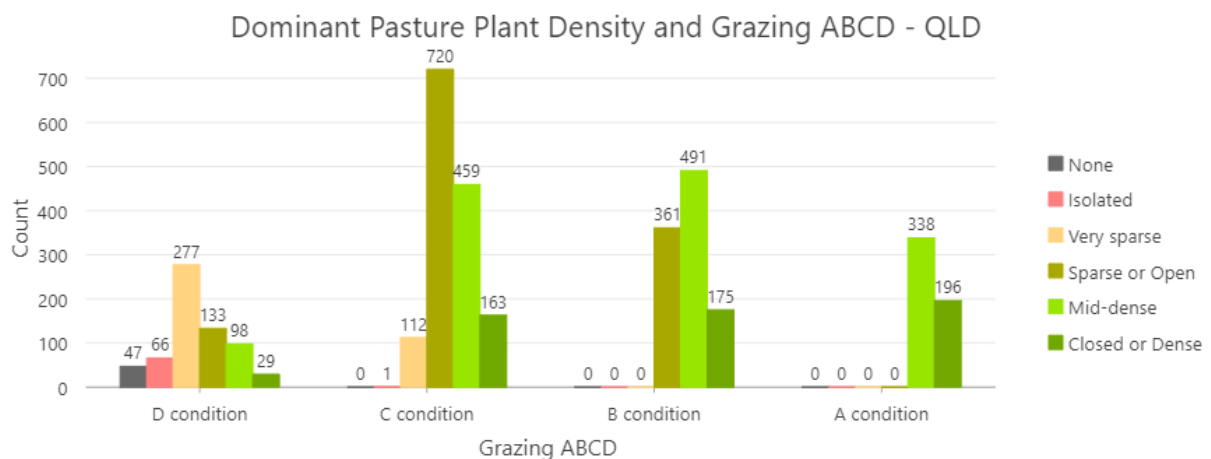
**Figure 11** Dominant Pasture Plant Density—Comparison of GBR Catchments and Non-GBR.

**Table 20** Frequency % of Dominant Pasture Plant Density for Regions and Queensland.

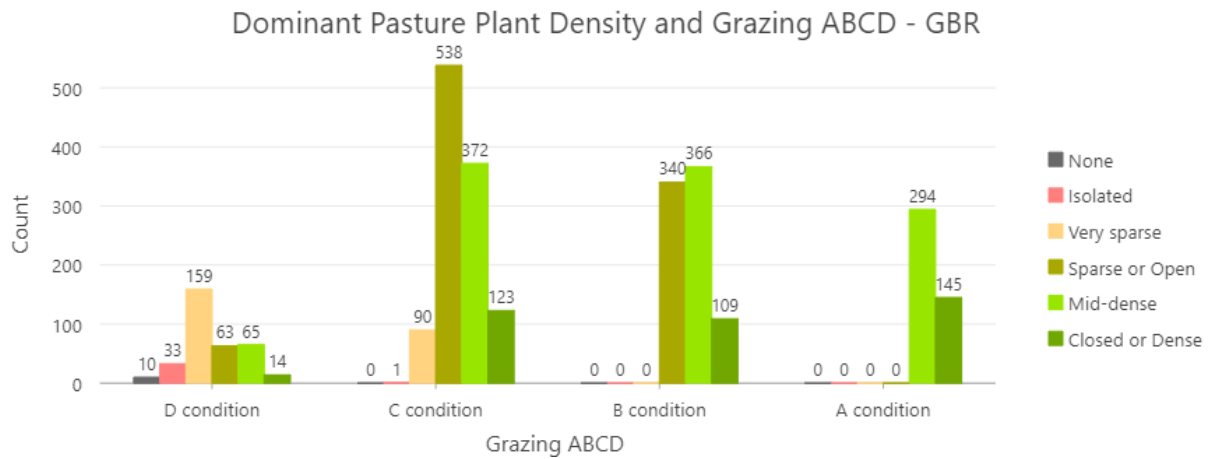
Region	Dominant Pasture Plant Density						Grand Total
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense	
GBR Catchments	0	1	9	35	40	14	100
Non-GBR	4	3	15	29	31	18	100
<b>Queensland</b>	<b>1</b>	<b>2</b>	<b>11</b>	<b>33</b>	<b>38</b>	<b>15</b>	<b>100</b>

**Note:**

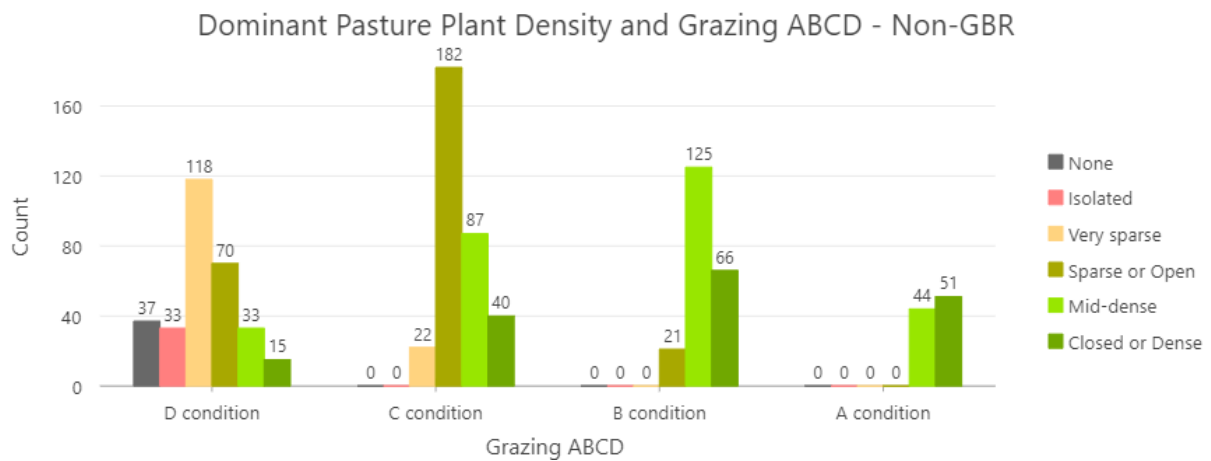
- The high frequency of lower density values within the higher rainfall and ‘more productive’ eastern area of Queensland—the GBR Catchments—would benefit from monitoring.
  - Across the two regions and Queensland as a whole, the proportion of sites with Dominant Pasture Density values of *Mid-dense* or *Closed or Dense* is little more than 50 %.



**Figure 12** Dominant Pasture Plant Density and Grazing ABCD—Queensland.



**Figure 13** Dominant Pasture Plant Density and Grazing ABCD —GBR Catchments.



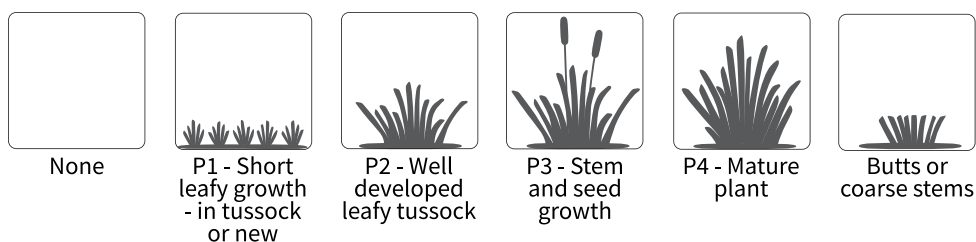
**Figure 14** Dominant Pasture Plant Density and Grazing ABCD—Non-GBR.

**Note:**

- Sites with low Dominant Pasture Density values may nonetheless have a high Total Perennial Pasture Density Value.
- Conversely, sites with a high Dominant Pasture Density value (and therefore at least an equal Total Perennial Pasture Density), are being impacted by other land condition drivers such as Dominant Pasture Category, erosion processes etc.
- Higher Dominant Pasture Densities would be expected in the higher rainfall GBR Catchments.
  - Grazing within the GBR Catchments is generally more intensive.
  - Both the GBR and Non-Non-GBR Catchment areas experienced prolonged drought conditions prior the collection of these 2020 – 2022 data.

### 3.1.3 Dominant Pasture Growth Phase—Observed Data

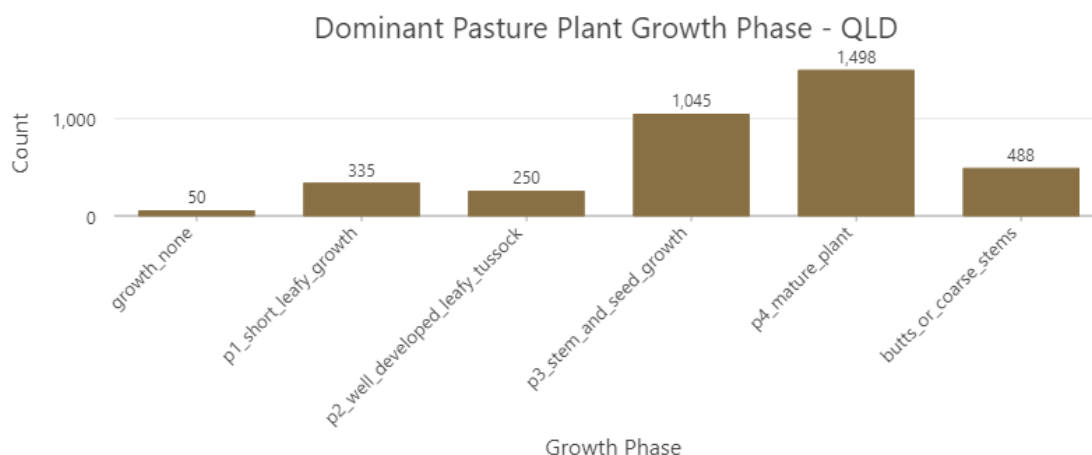
What is the development stage of the pasture plant or category chosen as the most dominant?



**Image 3** Dominant Pasture Growth Phase Values.

**Note:**

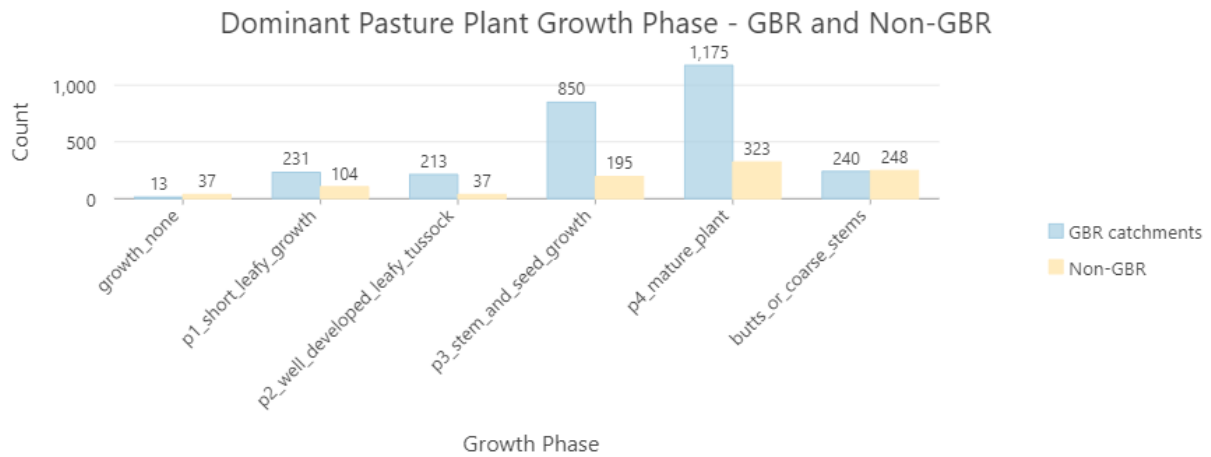
- Healthy and productive pastures are maintained between *Phases 2 and 4*.
  - Phases 2, 3 and 4 do not impact the Grazing ABCD or any other LCAT result.
- High counts of *Phase 1* may indicate overgrazing and/or recovery after prolonged drought, fire, or flood. *Phase 1* is more prevalent in C and D condition Sites.
  - Phase 1—a critical and vulnerable stage in pasture establishment and recovery—has not yet become established, and therefore (where the dominant growth phase) has a reduction applied across most results.
- *Butts or Coarse Stems* reflect heavy or prolonged grazing and/or climatic impacts. Pastures dominated by plants at this stage are very susceptible to significant pasture loss/death and land degradation. Prevalence of *Butts or Coarse Stems* are significant in C and D condition Sites.
  - *Butts or Coarse Stems*—grazed or impacted by climatic conditions to the point of having little to no forage value—may or may not recover depending on management and climate impacts, and therefore (where the dominant growth phase) has a reduction applied across most results.
- *Phase 1* and *Butts or Coarse Stems* are the least productive and prone to decline if not carefully managed.
- Timing of assessment influences findings of pasture growth phase.



**Figure 15** Dominant Pasture Plant Growth Phase—Queensland.

**Note:**

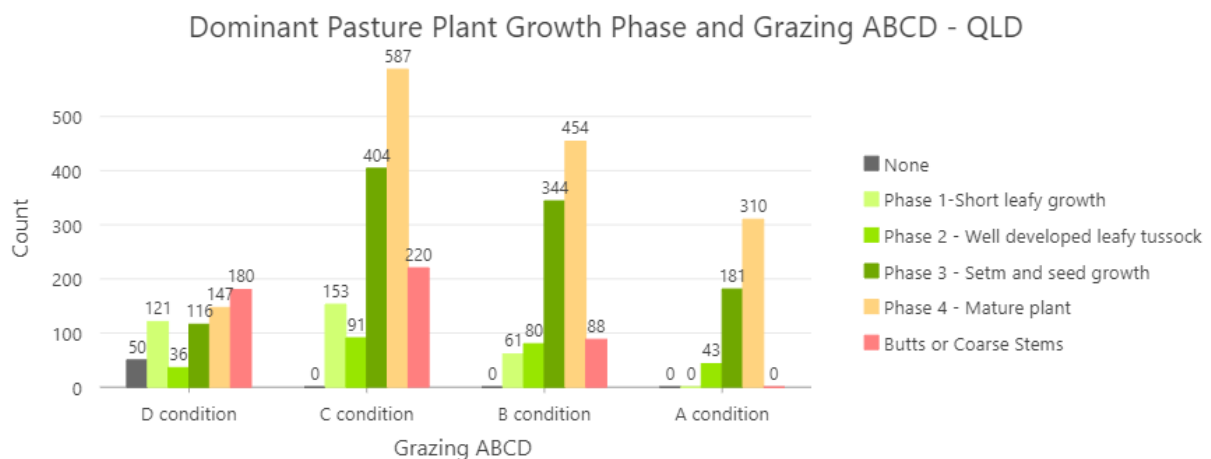
- 2793 (or 76 %) of sites had a Dominant Pasture Plant Growth Phase between *Phase 2* and *4*.
- 335 (or 9 %) of sites had a Dominant Pasture Plant Growth Phase of *Phase 1*.
- 488 (or 13 %) of sites had a Dominant Pasture Plant Growth Phase of *Butts or Coarse Stems*.
- 50 (or 1 %) of sites had no pasture.



**Figure 16** Dominant Pasture Plant Growth Phase—Comparison of GBR Catchments and Non-GBR.

**Table 21** Frequency (%) of Dominant Pasture Plant Growth Phase for Regions.

Dominant Pasture Plant Growth Phase	Region		
	GBR Catchments	Non-GBR	Queensland
None	0.5	3.9	1.4
Phase 1—Short leafy growth	8.5	11.0	9.1
Phase 2—Well developed leafy tussock	7.8	3.9	6.8
Phase 3—Stem and seed growth	31.2	20.7	28.5
Phase 4—Mature plant	43.2	34.2	40.9
Butts or Coarse stems	8.8	26.3	13.3
<b>Grand Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>



**Figure 17** Dominant Pasture Plant Growth Phase and Grazing ABCD—Queensland.

**Table 22** Percentage (%) of Sites with any Dominant Pasture Plant Growth Phase in Grazing ABCD classes—Queensland.

Dominant Pasture Plant Growth Phase (read rows across)	Grazing ABCD				Row Total
	D condition	C condition	B condition	A condition	
None	100	0	0	0	100
Phase 1—Short leafy growth	36	46	18	0	100
Phase 2—Well developed leafy tussock	14	36	32	17	100
Phase 3—Stem and seed growth	11	39	33	17	100
Phase 4—Mature plant	10	39	30	21	100
Butts or Coarse stems	37	45	18	0	100
<b>% Grazing ABCD Queensland</b>	<b>18</b>	<b>40</b>	<b>28</b>	<b>15</b>	<b>100</b>

**Note:**

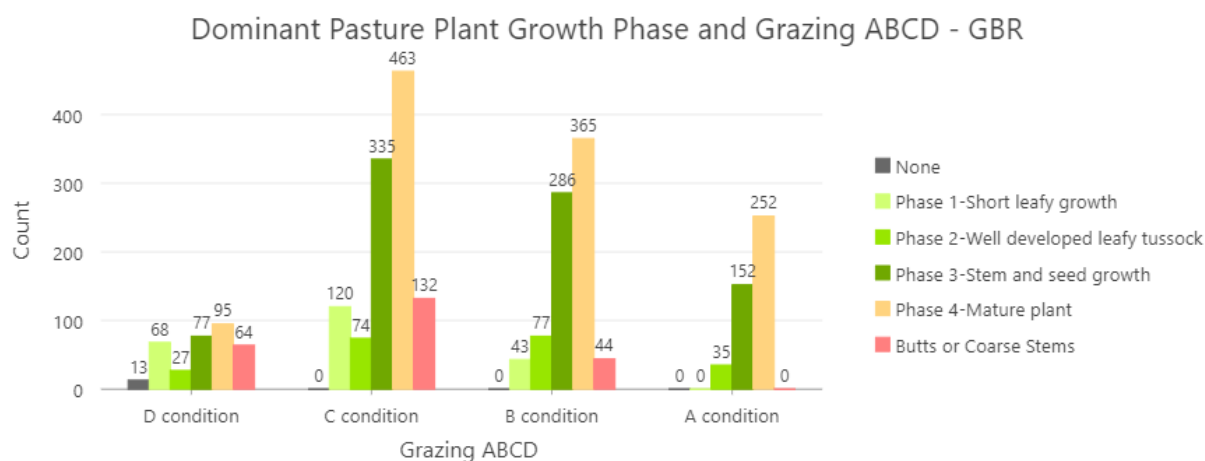
- Phase 1 or Butts or Coarse Stems cannot be the dominant phase in A condition sites.
- A wide range of condition states were sampled shown by similar proportions of C condition.
- C and D condition classes have higher proportions of Phase 1 or Butts or Coarse Stems.

**Table 23** Percentage (%) of Dominant Pasture Plant Growth Phase by Grazing ABCD—Queensland.

Dominant Pasture Plant Growth Phase (read columns down)	Grazing ABCD			
	% D condition	C condition	B condition	A condition
None	8	0	0	0
Phase 1—Short leafy growth	19	11	6	0
Phase 2—Well developed leafy tussock	6	6	8	8
Phase 3—Stem and seed growth	18	28	33	34
Phase 4—Mature plant	23	40	44	58
Butts or Coarse stems	28	15	9	0
<b>Column Total Queensland</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- Phase 1 or Butts or Coarse Stems cannot be the dominant phase in A condition sites.
- Phases 3 and 4 are the most frequently assessed in A, B and C condition classes.
- High proportions of Phase 1, Butts or Coarse Stems, or None (i.e. no pasture plants present), exist in D condition sites.
- A/B and D condition values appear as the inverse of each other whilst C appears transitional.
- Proportions of growth phases are similarly represented in C and B condition.



**Figure 18** Dominant Pasture Plant Growth Phase and Grazing ABCD—GBR Catchments.



**Table 24** Percentage (%) of Sites with any Dominant Pasture Plant Growth Phase in Grazing ABCD classes—GBR Catchments.

Dominant Pasture Plant Growth Phase (read rows across)	Grazing ABCD				Row Total
	D condition	C condition	B condition	A condition	
None	100	0	0	0	100
Phase 1—Short leafy growth	29	52	19	0	100
Phase 2—Well developed leafy tussock	13	35	36	16	100
Phase 3—Stem and seed growth	9	39	34	18	100
Phase 4—Mature plant	8	39	31	21	100
Butts or Coarse stems	27	55	18	0	100
<b>% Grazing ABCD GBR Catchments</b>	<b>13</b>	<b>41</b>	<b>30</b>	<b>16</b>	<b>100</b>

**Note:**

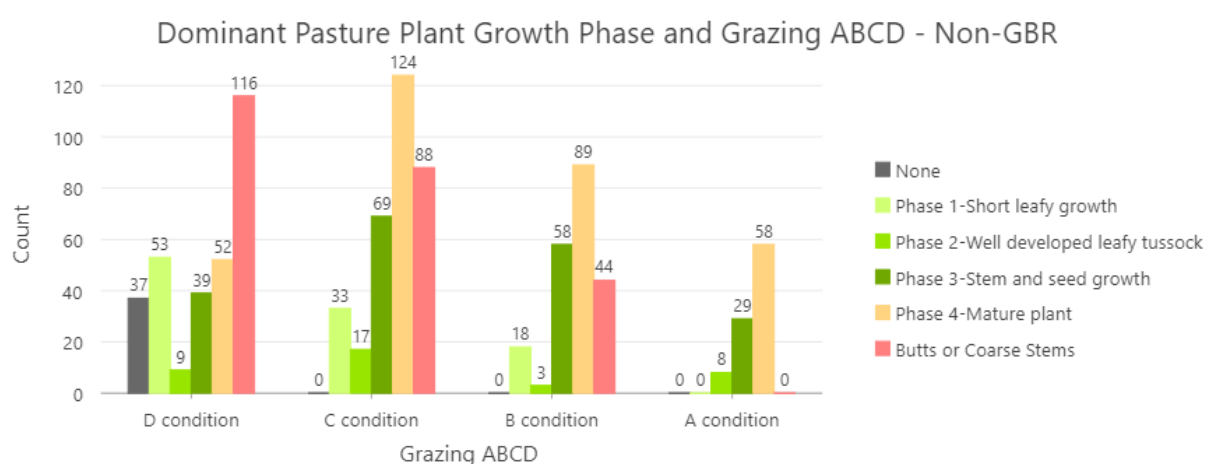
- Phase 1 or Butts or Coarse Stems cannot be the dominant phase in A condition sites.
- Phase 1 or Butts or Coarse Stems are in their highest proportions in C and D classes.
- B and C condition classes have high and similar proportions of Phase 2, 3 and 4.

**Table 25** Percentage (%) of Dominant Pasture Plant Growth Phase by Grazing ABCD—GBR Catchments.

Dominant Pasture Plant Growth Phase (read columns down)	Grazing ABCD			
	D condition	C condition	B condition	A condition
None	4	0	0	0
Phase 1—Short leafy growth	20	11	5	0
Phase 2—Well developed leafy tussock	8	7	9	8
Phase 3—Stem and seed growth	22	30	35	35
Phase 4—Mature plant	28	41	45	57
Butts or Coarse stems	19	12	5	0
<b>Column Total Queensland</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- Phase 1 or Butts or Coarse Stems cannot be the dominant phase in A condition sites.
- Growth phase proportions within C and B condition classes are very similar.



**Figure 19** Dominant Pasture Plant Growth Phase and Grazing ABCD—Non-GBR.

**Table 26** Percentage (%) of Sites with any Dominant Pasture Plant Growth Phase in Grazing ABCD classes—Non-GBR.

Dominant Pasture Plant Growth Phase (read rows across)	Grazing ABCD				Row Total
	D condition	C condition	B condition	A condition	
None	100	0	0	0	100
Phase 1—Short leafy growth	51	32	17	0	100
Phase 2—Well developed leafy tussock	24	46	8	22	100
Phase 3—Stem and seed growth	20	35	30	15	100
Phase 4—Mature plant	16	38	28	18	100
Butts or Coarse stems	47	35	18	0	100
<b>% Grazing ABCD Non-GBR</b>	<b>32</b>	<b>35</b>	<b>22</b>	<b>10</b>	<b>100</b>

**Note:**

- Phase 1 or Butts or Coarse Stems cannot be the dominant phase in A condition sites.
- Proportions of each growth phase are similar within C condition (columns) indicating a wide range of condition states were sampled.
- C and D condition classes have higher proportions of Phase 1 or Butts or Coarse Stems.

**Table 27** Percentage (%) of Dominant Pasture Plant Growth Phase by Grazing ABCD—Non-GBR.

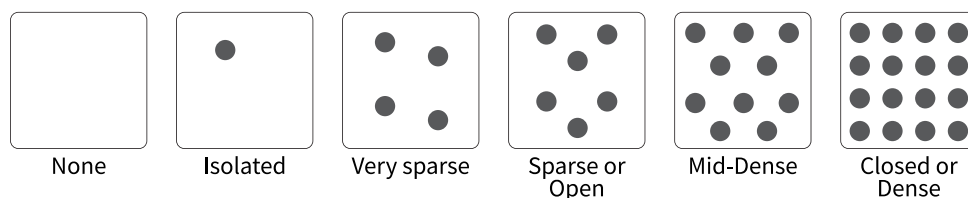
Dominant Pasture Plant Growth Phase (read columns down)	Grazing ABCD			
	D condition	C condition	B condition	A condition
None	12	0	0	0
Phase 1—Short leafy growth	17	10	8	0
Phase 2—Well developed leafy tussock	3	5	1	8
Phase 3—Stem and seed growth	13	21	27	31
Phase 4—Mature plant	17	37	42	61
Butts or Coarse stems	38	27	21	0
<b>Column Total Queensland</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- 38 % of sites in D condition had *Butts or Coarse Stems* as the dominant growth phase.

### 3.1.4 Total Perennial Pasture Density—Observed Data

What is the density of ALL established perennial pasture plants combined? Exclude annual pasture plants.



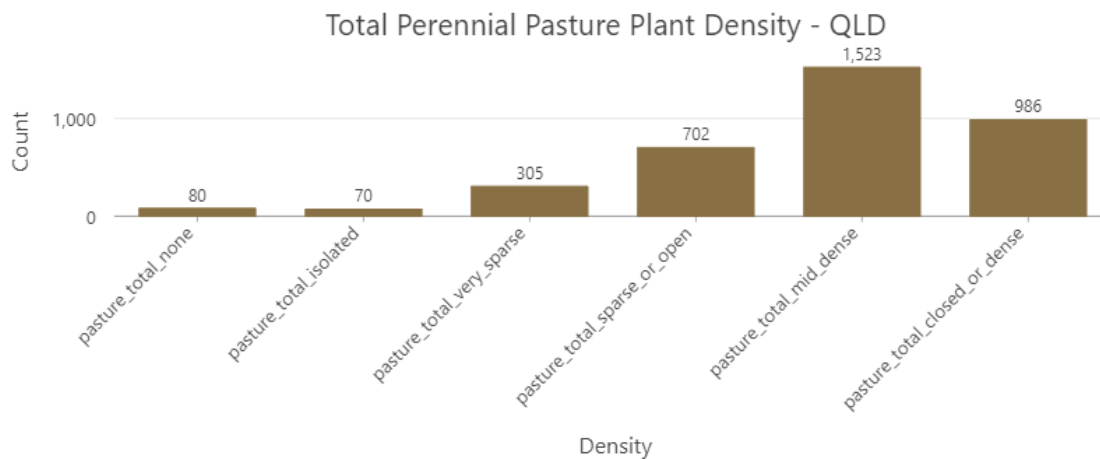
**Image 4** Total Perennial Pasture Density Values.

**Note:**

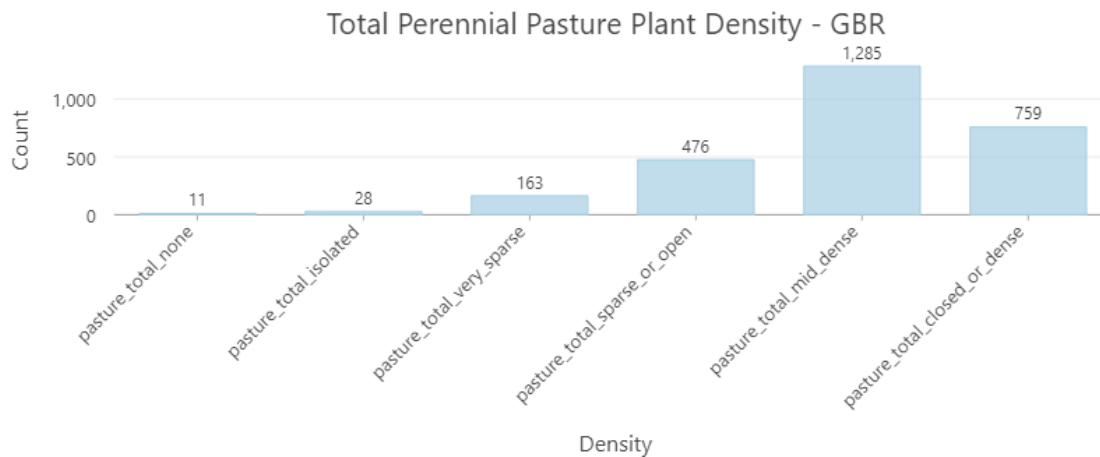
- Whilst the *Sparse or Open*, *Very sparse* and *Isolated* densities may occur naturally in some pasture communities or land types—mostly semi-arid and arid zones—these landscapes may

be less productive and/or more prone to erosion processes due to the inherent ‘openness’ of the ground layer.

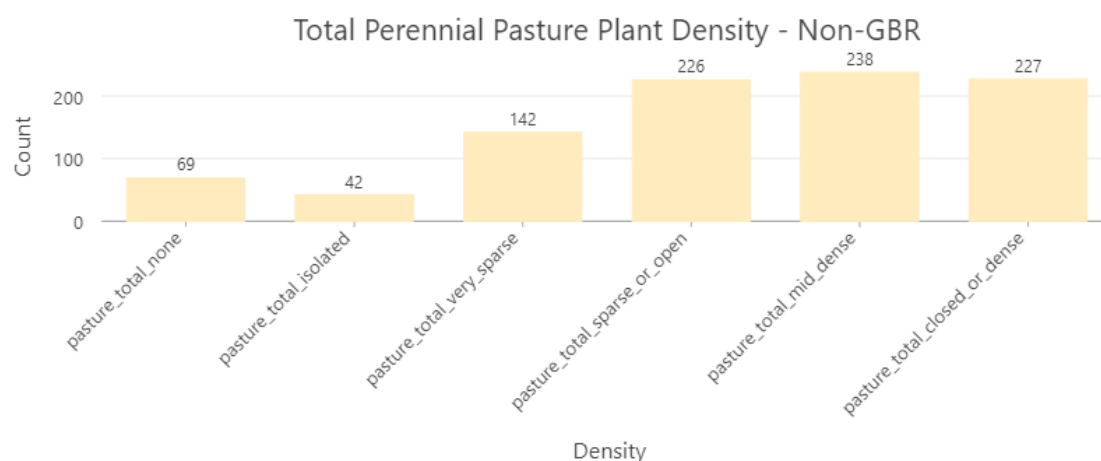
- In the *Cover classes and characteristics* table of Hnatiuk et al. 2009., the *Sparse or Open* density value has an equivalent Crown Cover of 20 – 50 % and a Foliage Cover of 10 – 30 %. To picture these values, the *Braun-Blanquet cover–abundance scale for estimating species quantities* (after Mueller-Dombois and Ellenberg, 1974) defines 25 – 50 % Crown Cover as—*Any number of plants covering ¼ to ½ of the sample site.*
- The *Sparse or Open* density value—particularly in the Total Perennial Pasture Density—may be considered a ‘tipping-point’ from which further decline may be difficult to arrest without management practice change.



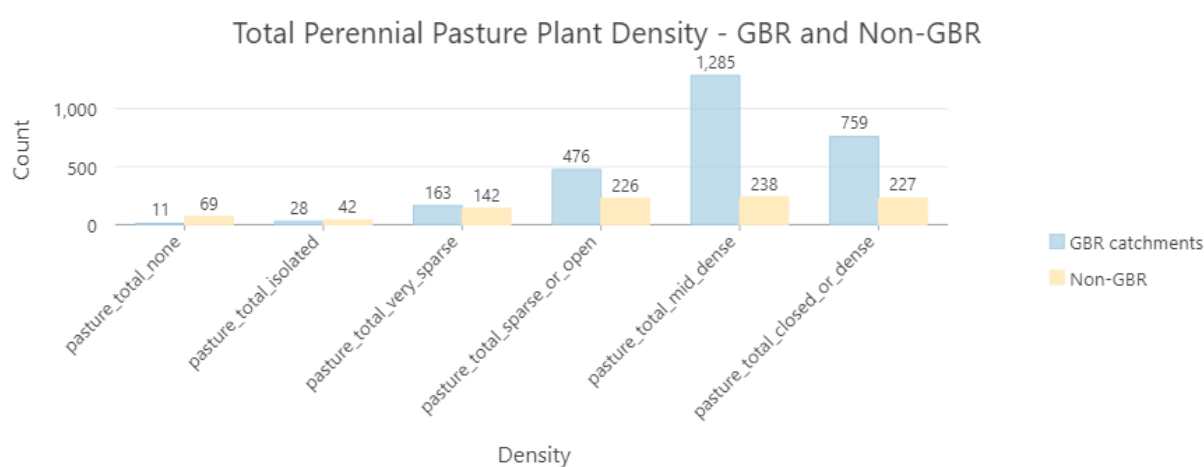
**Figure 20** Total Perennial Pasture Plant Density—Queensland.



**Figure 21** Total Perennial Pasture Plant Density—GBR Catchments.



**Figure 22** Total Perennial Pasture Plant Density—Non-GBR.



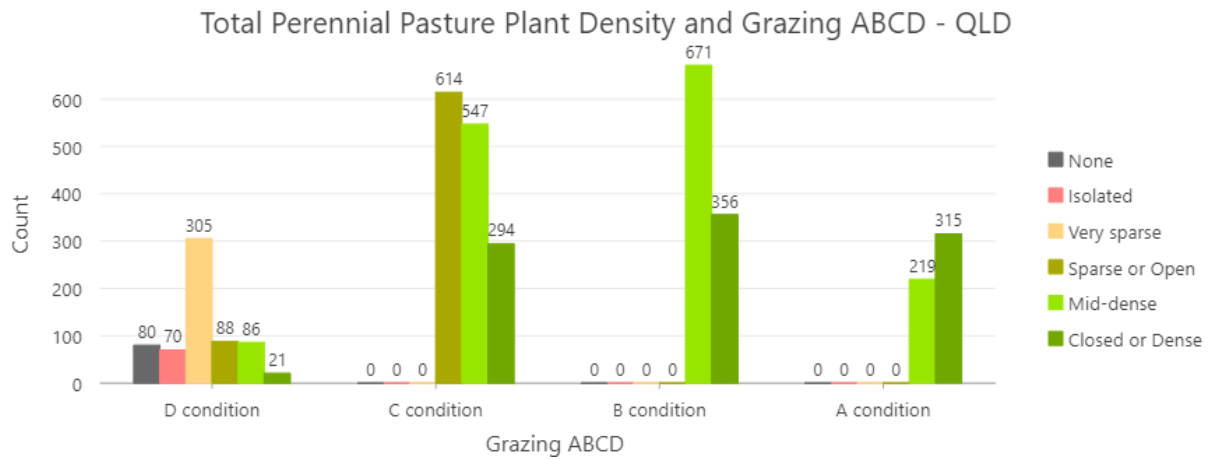
**Figure 23** Total Perennial Pasture Plant Density—Comparison of GBR Catchments and Non-GBR.

**Table 28** Frequency (%) of Total Perennial Pasture Plant Density for Regions and Queensland.

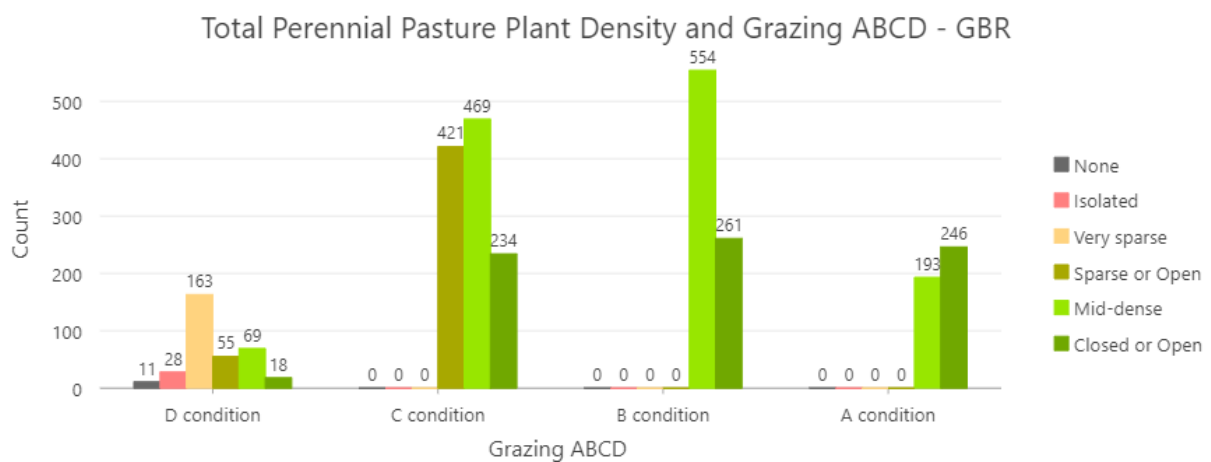
Region	Total Perennial Pasture Plant Density						Grand Total
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense	
GBR Catchments	0	1	6	17	47	28	100
Non-GBR	7	4	15	24	25	24	100
<b>Queensland</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>19</b>	<b>42</b>	<b>27</b>	<b>100</b>

**Note:**

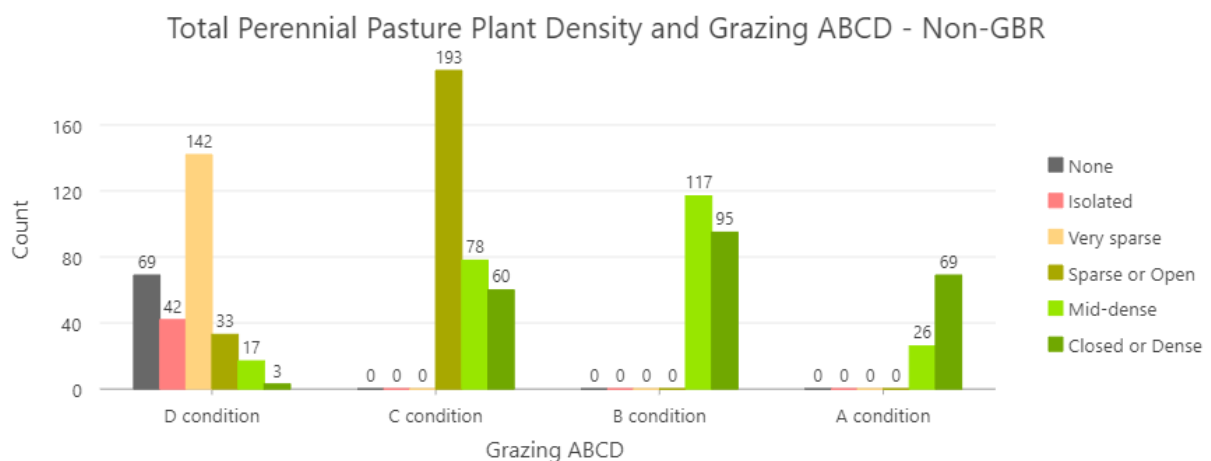
- Total Perennial Pasture Density is a key indicator of long-term land condition.
- 2509 sites (or 68 %) had a Total Perennial Pasture Density of *Mid-dense* or *Closed or Dense*.
- The remaining 32 % with a Total Perennial Pasture Density of *Sparse or Open* or less—crown cover up to 50 % only—would benefit from monitoring.
  - Decline to *Sparse or Open* or less may indicate degradation and/or loss of productivity and sustainability.



**Figure 24** Total Perennial Pasture Plant Density and Grazing ABCD—Queensland.



**Figure 25** Total Perennial Pasture Plant Density and Grazing ABCD—GBR Catchments.



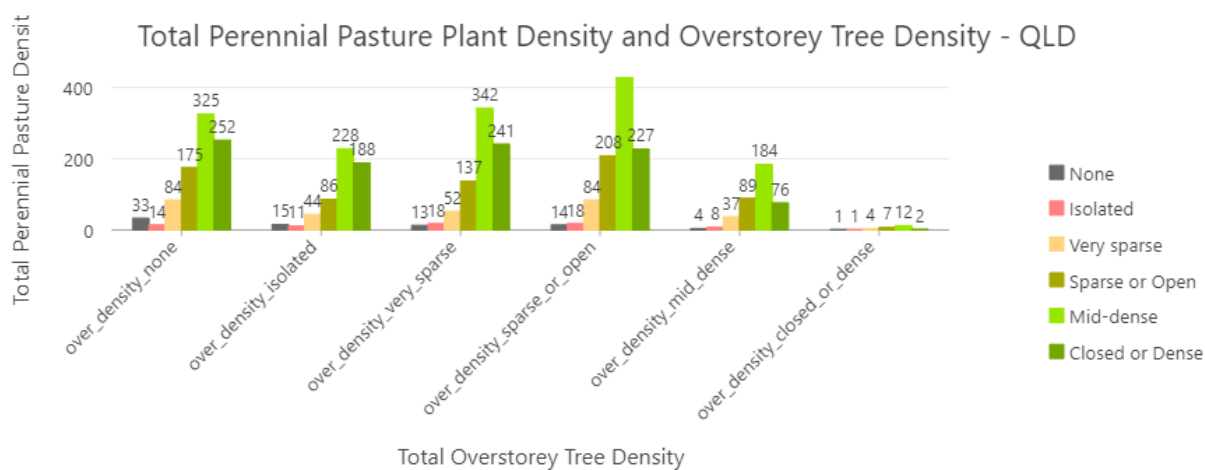
**Figure 26** Total Perennial Pasture Plant Density and Grazing ABCD—Non-GBR.

**Table 29** Frequency (%) of Total Perennial Pasture Plant Density and Grazing ABCD for Regions and Queensland.

Grazing ABCD	Region		
	GBR Catchments	Non-GBR	Queensland
<b>Total Perennial Pasture Density</b>			
<b>D condition</b>	<b>13</b>	<b>32</b>	<b>18</b>
None	3	23	12
Isolated	8	14	11
Very sparse	47	46	47
Sparse or Open	16	11	14
Mid-dense	20	6	13
Closed or Dense	5	1	3
<b>C condition</b>	<b>41</b>	<b>35</b>	<b>40</b>
Sparse or Open	37	58	42
Mid-dense	42	24	38
Closed or Dense	21	18	20
<b>B condition</b>	<b>30</b>	<b>22</b>	<b>28</b>
Mid-dense	68	55	65
Closed or Dense	32	45	35
<b>A condition</b>	<b>16</b>	<b>10</b>	<b>15</b>
Mid-dense	44	27	41
Closed or Dense	56	73	59
<b>Grand Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- The *Closed or Dense* and *Mid-Dense* values within C and D condition indicates a different 'driver' of condition e.g. the C condition may have been driven by the dominant pasture category being a 1P; erosion processes; pest plants etc.



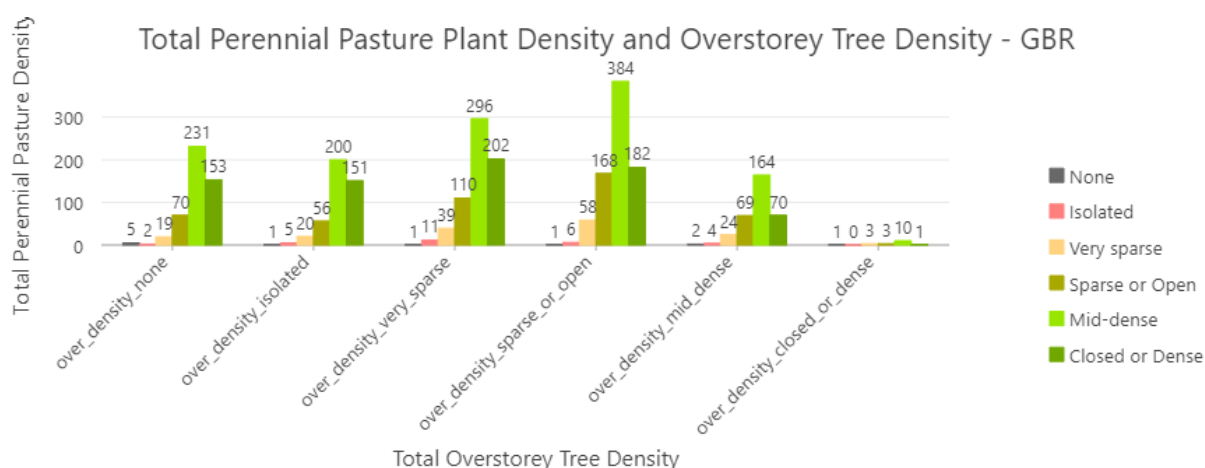
**Figure 27** Total Perennial Pasture Plant Density and Total Overstorey Tree Density—Queensland.

**Table 30** Frequency (%) of Total Perennial Pasture Plant Density and Total Overstorey (Tree layer) Density for all Sites.

Total Overstorey Tree Density	Total Perennial Pasture Density						Grand Total
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense	
None	0.9	0.4	2.3	4.8	8.9	6.9	24.1
Isolated	0.4	0.3	1.2	2.3	6.2	5.1	15.6
Very sparse	0.4	0.5	1.4	3.7	9.3	6.6	21.9
Sparse or Open	0.4	0.5	2.3	5.7	11.8	6.2	26.8
Mid-dense	0.1	0.2	1.0	2.4	5.0	2.1	10.9
Closed or Dense	0.0	0.0	0.1	0.2	0.3	0.1	0.7
<b>Queensland</b>	<b>2.2</b>	<b>1.9</b>	<b>8.3</b>	<b>19.1</b>	<b>41.5</b>	<b>26.9</b>	<b>100.0</b>

**Note:**

- *Mid-dense* was the most frequently assessed (41.5 %) Total Perennial Pasture Plant Density at all sites.
- *Sparse or Open* was the most frequently assessed (26.8 %) Total Overstorey (Tee layer) Density at all sites.
  - *Sparse or Open* is equivalent to approximately 10 – 30 % foliar cover or a tree basal area (TBA) of approximately 4 – 12 m<sup>2</sup>/ha.
  - Depending on soil type and available water, in general, tree/grass competition for water and nutrients increases beyond approximately TBA 6 m<sup>2</sup>/ha.
- The most frequent combination of Total Perennial Pasture and Total Overstorey Density was *Mid-dense* with *Sparse or Open* at 11.8 %.
- Total Perennial Pasture Densities of *Very Sparse*, *Isolated* and *None* represented a combined 12.4 %.



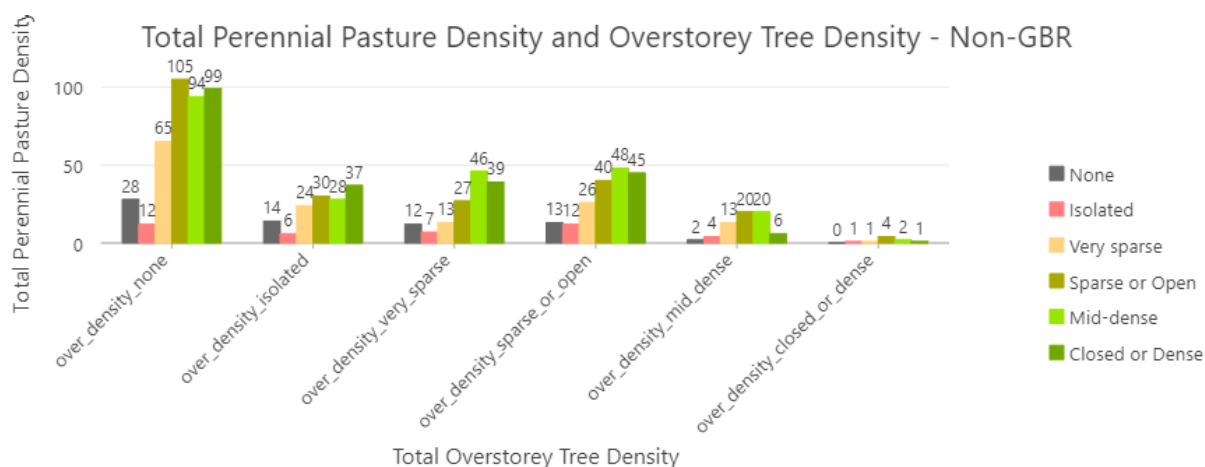
**Figure 28** Total Perennial Pasture Plant Density and Total Overstorey Tree Density—GBR Catchments.

**Table 31** Frequency (%) of Total Perennial Pasture Plant Density and Total Overstorey (Tree layer) Density for Sites—GBR Catchments.

Total Overstorey Tree Density	Total Perennial Pasture Density						Grand Total
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense	
None	0.2	0.1	0.7	2.6	8.5	5.6	17.6
Isolated	0.0	0.2	0.7	2.1	7.3	5.5	15.9
Very sparse	0.0	0.4	1.4	4.0	10.9	7.4	24.2
Sparse or Open	0.0	0.2	2.1	6.2	14.1	6.7	29.4
Mid-dense	0.1	0.1	0.9	2.5	6.0	2.6	12.2
Closed or Dense	0.0	0.0	0.1	0.1	0.4	0.0	0.7
<b>GBR Catchments</b>	<b>0.4</b>	<b>1.0</b>	<b>6.0</b>	<b>17.5</b>	<b>47.2</b>	<b>27.9</b>	<b>100.0</b>

**Note:**

- *Mid-dense* was the most frequently assessed (47.2 %) Total Perennial Pasture Plant Density at GBR sites.
- *Sparse or Open* was the most frequently assessed (29.4 %) Total Overstorey (Tee layer) Density at GBR sites.
- The most frequent combination of Total Perennial Pasture and Total Overstorey Density was *Mid-dense* with *Sparse or Open* at 14.1 %.
- Total Perennial Pasture Densities of *Very sparse*, *Isolated* and *None* represented a combined 7.4 %.



**Figure 29** Total Perennial Pasture Plant Density and Total Overstorey Tree Density—Non-GBR.

**Table 32** Frequency (%) of Total Perennial Pasture Plant Density and Total Overstorey (Tree layer) Density for Sites in the Non-GBR.

Total Overstorey Tree Density	Total Perennial Pasture Density						Grand Total
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense	
None	3.0	1.3	6.9	11.1	10.0	10.5	42.7
Isolated	1.5	0.6	2.5	3.2	3.0	3.9	14.7
Very sparse	1.3	0.7	1.4	2.9	4.9	4.1	15.3
Sparse or Open	1.4	1.3	2.8	4.2	5.1	4.8	19.5
Mid-dense	0.2	0.4	1.4	2.1	2.1	0.6	6.9
Closed or Dense	0.0	0.1	0.1	0.4	0.2	0.1	1.0
<b>Non-GBR</b>	<b>7.3</b>	<b>4.4</b>	<b>15.0</b>	<b>23.9</b>	<b>25.2</b>	<b>24.0</b>	<b>100.0</b>

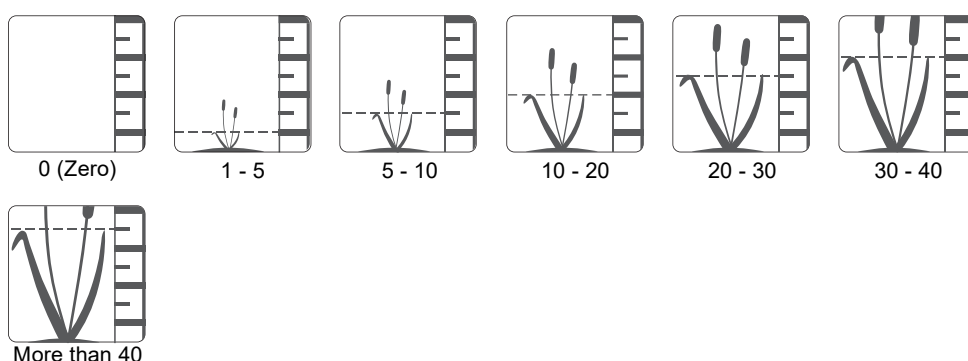


**Note:**

- *Mid-dense* is the most frequently assessed (25.2 %) Total Perennial Pasture Plant Density at Non-GBR sites. However, *Closed or Dense* and *Sparse or Open* were equivalent frequencies.
- *None* is the most frequently assessed (42.7 %) Total Overstorey (Tee layer) Density at non-GBR sites. *Sparse or Open* was the next most frequent at 19.5 %.
- The most frequent Total Perennial Pasture and Total Overstorey Density combination is *Sparse or Open* to *Closed or Dense* with an overstorey of *None*, ranging from 10 to 11.1 %.
- Total Perennial Pasture Densities of *Very sparse, Isolated* and *None* represent 26.7 %.

### 3.1.5 Pasture Tussock Height—Observed Data

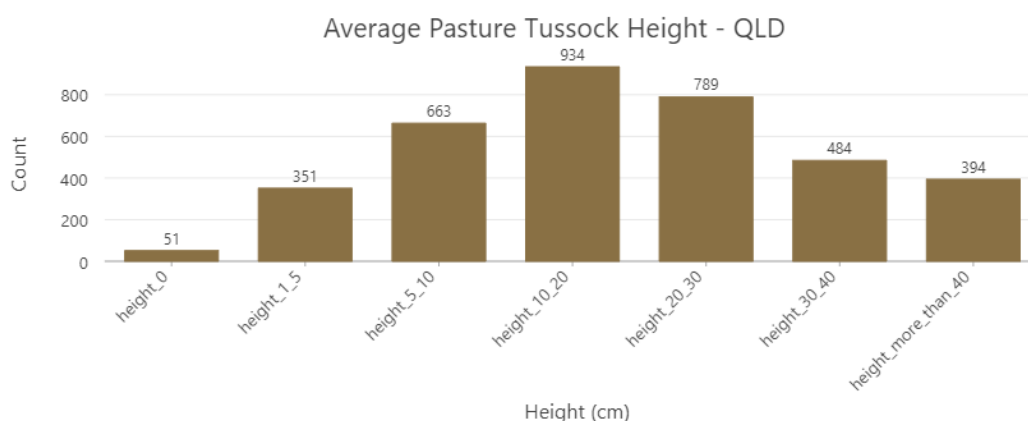
What is the average height of ALL pasture plants (cm)? To the top of the leafy tussock only. Exclude seed heads and their stems.



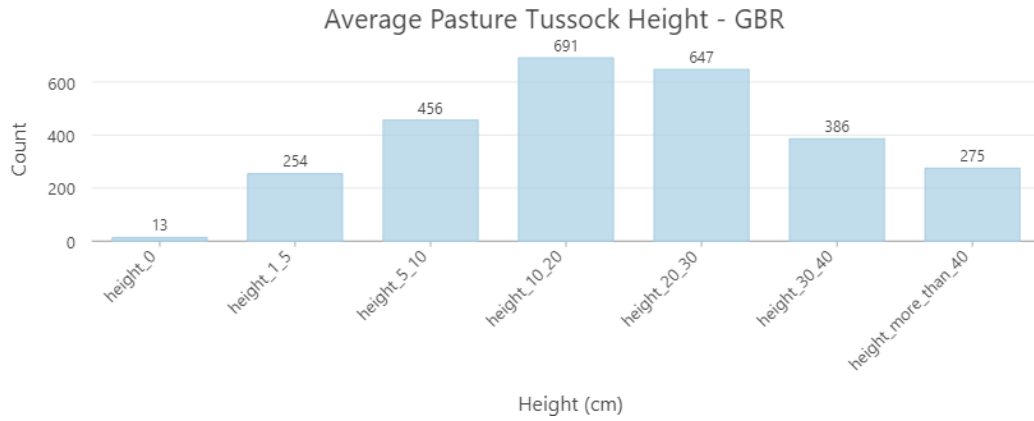
**Image 5** Pasture Tussock Height Values.

**Note:**

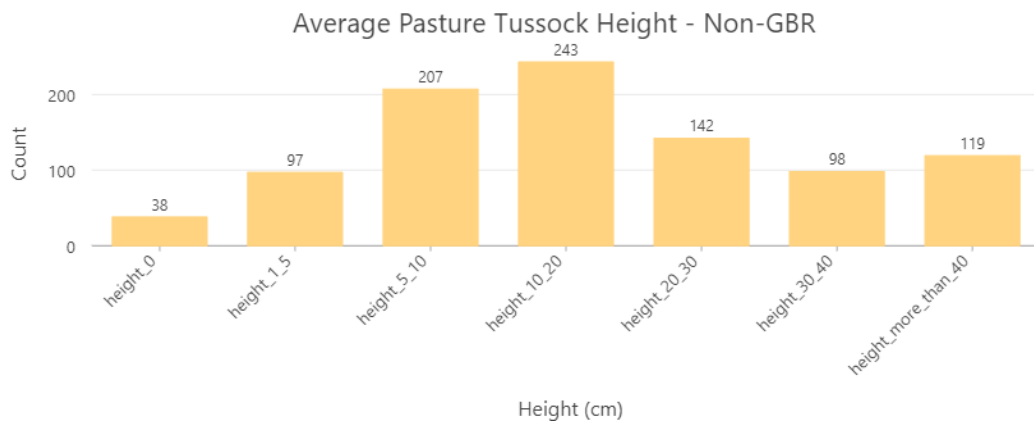
- The Average Pasture Tussock Height (cm) does not contribute to the Grazing ABCD result.
  - It is used in calculation of the indicative pasture biomass and most contextual results.
- Healthy, productive, and sustainable pastures are maintained at levels greater than 10-15 cm.
- Retaining a pasture residual (ungrazed) at 10-15 cm (approximately 800-1200 total standing dry matter (TSDM) kg/ha) ensures the plant is not stressed, has sufficient reserves to cope with poor conditions and can respond rapidly to rainfall. A residual of 1000 kg/ha is considered the Industry standard.



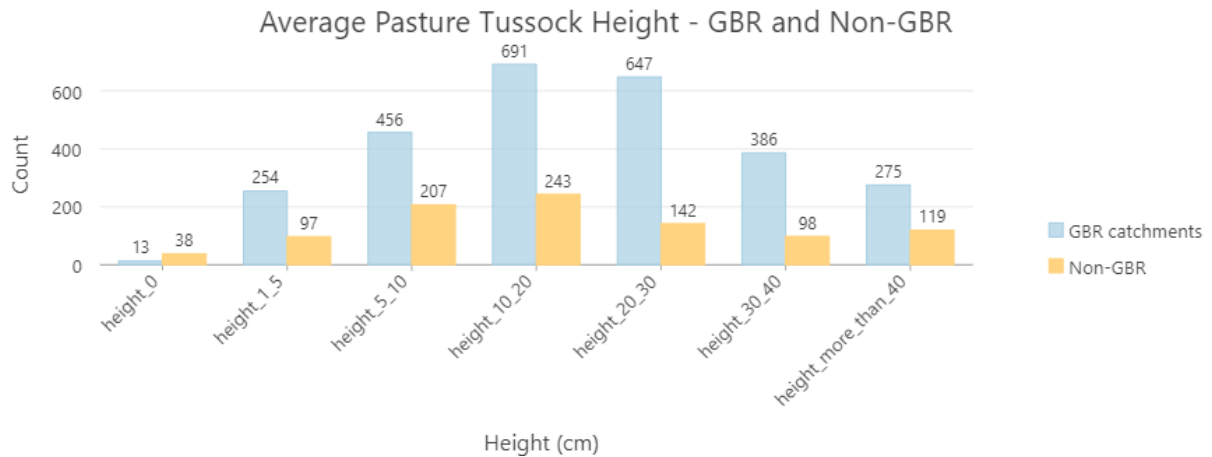
**Figure 30** Average Pasture Tussock Height (cm)—Queensland.



**Figure 31** Average Pasture Tussock Height (cm)—GBR Catchments.



**Figure 32** Average Pasture Tussock Height (cm)—Non-GBR.



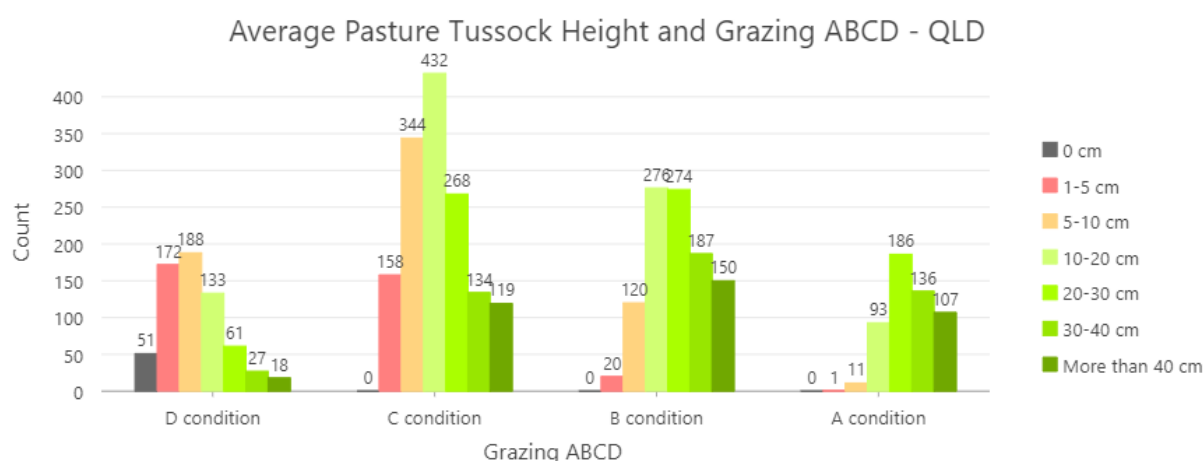
**Figure 33** Average Pasture Tussock Height (cm)—Comparison GBR Catchments and Non-GBR.

**Table 33** Percentage (%) of Sites with any Average Pasture Tussock Height (cm)—Regional Comparison.

Average Pasture Tussock Height (cm)	Region		
	GBR Catchments	Non-GBR	Queensland
0 cm	0	4	1
1 - 5 cm	9	10	10
5 - 10 cm	17	22	18
10 - 20 cm	25	26	25
20 - 30 cm	24	15	22
30 - 40 cm	14	10	13
> 40 cm	10	13	11
<b>Grand Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- 29 % of all sites had an Average Pasture Tussock Height of 5 - 10 cm or less.
- Proportions of Average Pasture Tussock Height are very similar across the two regions.



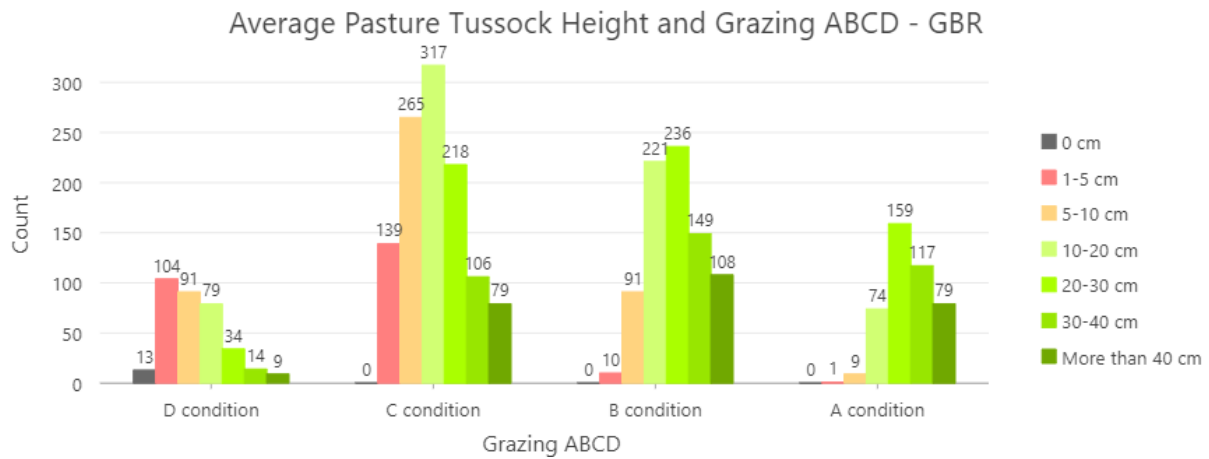
**Figure 34** Average Pasture Tussock Height (cm) and Grazing ABCD—Queensland.

**Table 34** Percentage (%) of Sites with any Average Pasture Tussock Height (cm) and Grazing ABCD—Queensland.

Average Pasture Tussock Height (cm)	Grazing ABCD Queensland			
	D condition	C condition	B condition	A condition
0 cm	8	0	0	0
1 - 5 cm	26	11	2	0
5 - 10 cm	29	24	12	2
10 - 20 cm	20	30	27	17
20 - 30 cm	9	18	27	35
30 - 40 cm	4	9	18	25
> 40 cm	3	8	15	20
<b>Grand Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- For each Grazing ABCD class, the two most frequently assessed height values are shaded pale red (below 10 cm) and pale green (above 10 cm). Figures are % of Queensland sites.
- Sites in A and B condition have comparatively equivalent heights.



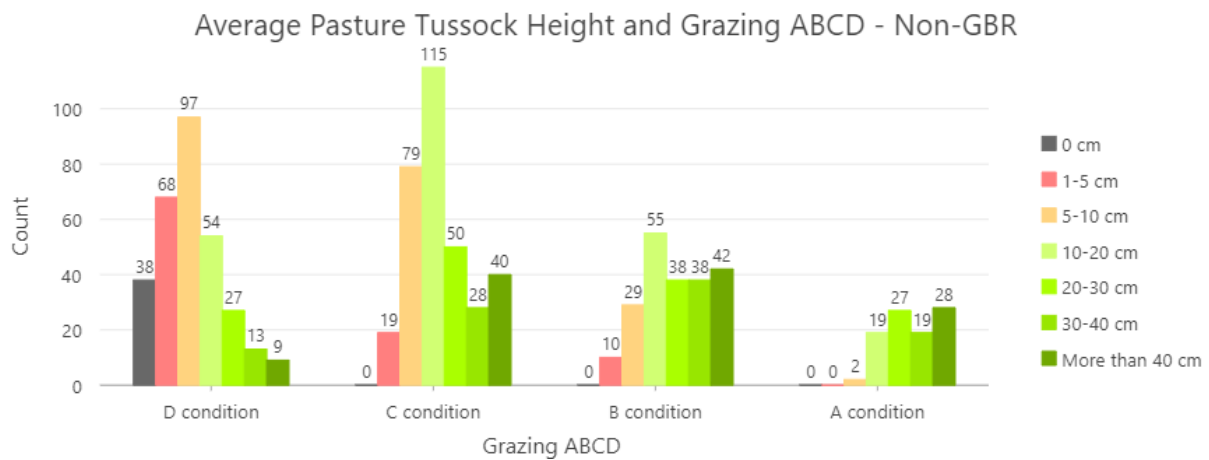
**Figure 35** Average Pasture Tussock Height (cm) and Grazing ABCD—GBR Catchments.

**Table 35** Percentage (%) of Sites with any Average Pasture Tussock Height (cm) and Grazing ABCD—GBR Catchments.

Average Pasture Tussock Height (cm)	Grazing ABCD GBR Catchments			
	D condition	C condition	B condition	A condition
0 cm	4	0	0	0
1 - 5 cm	30	12	1	0
5 - 10 cm	26	24	11	2
10 - 20 cm	23	28	27	17
20 - 30 cm	10	19	29	36
30 - 40 cm	4	9	18	27
> 40 cm	3	7	13	18
<b>Grand Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- For each Grazing ABCD class, the two most frequently assessed height values are shaded pale red (below 10 cm) and pale green (above 10 cm). Figures are % of GBR Catchment Sites.



**Figure 36** Average Pasture Tussock Height (cm) and Grazing ABCD—Non-GBR.

**Table 36** Percentage (%) of Sites with any Average Pasture Tussock Height (cm) and Grazing ABCD—Non-GBR.

Average Pasture Tussock Height (cm)	Grazing ABCD Non-GBR			
	D condition	C condition	B condition	A condition
0 cm	12	0	0	0
1 - 5 cm	22	6	5	0
5 - 10 cm	32	24	14	2
10 - 20 cm	18	35	26	20
20 - 30 cm	9	15	18	28
30 - 40 cm	4	8	18	20
> 40 cm	3	12	20	29
<b>Grand Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

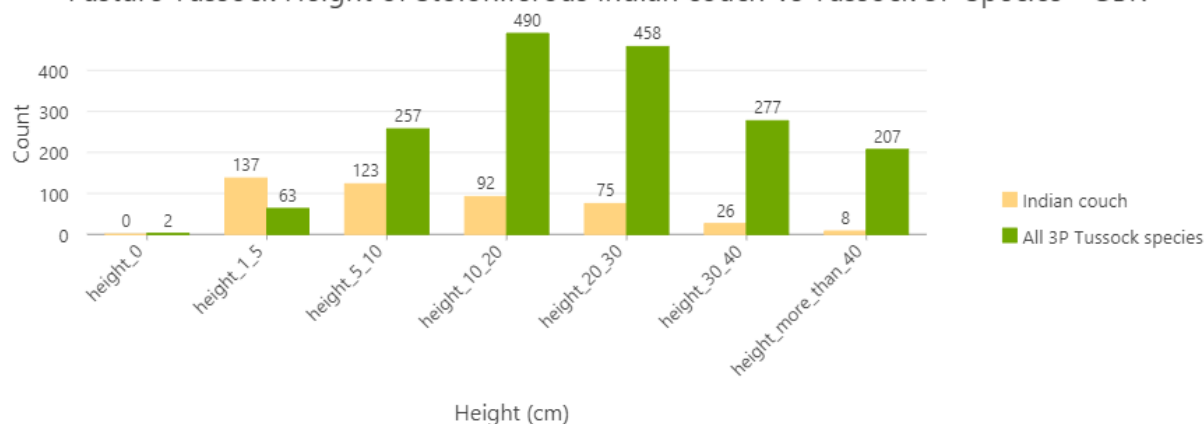
- For each Grazing ABCD class, the two most frequently assessed height values are shaded pale red (below 10 cm) and pale green (above 10 cm). Figures are % of Non-GBR Sites.

## Stoloniferous Vs Tussock Pasture Grasses

**Note:**

- The stoloniferous species, Indian couch (*Bothriochloa pertusa*) is widespread and increasing in range throughout the GBR catchments and Queensland.
- Stoloniferous species typically form low 'mats' of plant bases. Stem and leaf growth may be significant and productive at times, however, under grazing pressure or poor conditions, plants contract to the parent plant and take on a lawn-like appearance.
- Indian couch at high density and ground cover, under grazing pressure or poor conditions is often < 5 cm tall.
- At this height and with this growth form, water may move across a landscape at a higher velocity than where larger tussock species occur, increasing the risk of hillslope erosion.
- Native and introduced tussock pasture grasses are typically larger in basal (crown) area, are more robust and erect in form, and are deep-rooted.

Pasture Tussock Height of Stoloniferous Indian couch Vs Tussock 3P Species - GBR



**Figure 37** Average Pasture Tussock Height (cm) of Stoloniferous Indian couch Vs Tussock 3P Species—GBR Catchments.

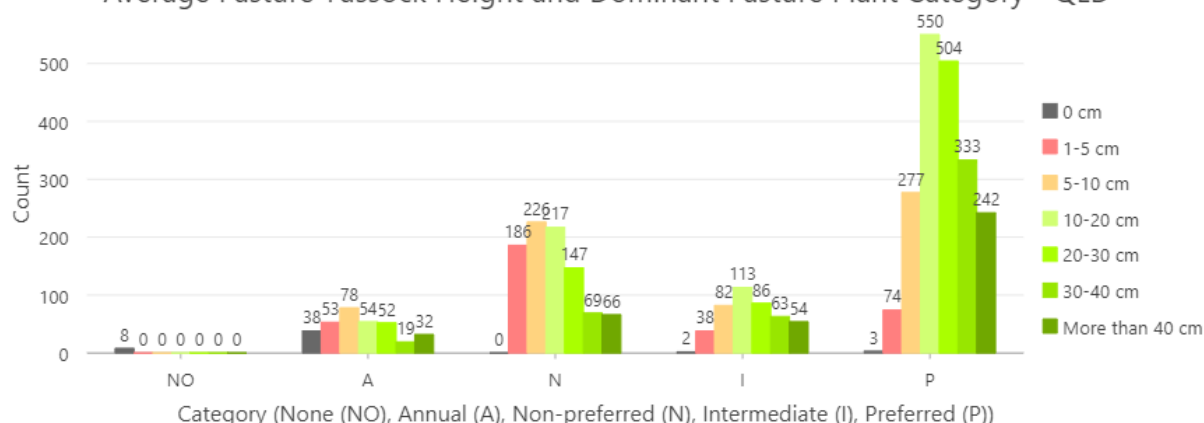
**Table 37** Percentage (%) of Height Ranges for selected Tussock and Stoloniferous Pasture Plant Species—GBR Catchments.

Average Pasture Tussock Height (cm)	% of Height Ranges for Sites Dominated by Tussock Vs Stoloniferous Species		
	All 3P Tussock spp (including Black Speargrass)	Indian couch 2P/1P (stoloniferous)	Black Speargrass (3P) (tussock)
1 - 5 cm	4	30	2
5 - 10 cm	15	27	4
10 - 20 cm	28	20	20
20 - 30 cm	26	16	32
30 - 40 cm	16	6	27
> 40 cm	12	2	16
<b>Grand Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Sites in GBR</b>	<b>1754</b>	<b>461</b>	<b>263</b>

**Note for GBR Catchment Sites:**

- Of the 461 sites dominated by Indian couch (*Bothriochloa pertusa*) in the GBR Catchments, 30 % of sites had an average Indian couch pasture tussock height of 1 – 5 cm; and 57 %, 5 – 10 cm or less.
- Of the 1754 sites dominated by a tussock pasture plant in the GBR Catchments:
  - 28 % of sites had an 3P average pasture tussock height of 10 – 20 cm, 26 % 20 – 30 cm and 28 % a combined height of 30 – 40 cm or more.
  - 4 % of sites had an 3P average pasture tussock height of 1 – 5 cm and 19 %, 5 – 10 cm or less.
- Comparatively, of the 263 sites dominated by Black Speargrass (*Heteropogon contortus*)—a 3P that has been displaced by Indian couch:
  - 32 % of sites had an 3P average pasture tussock height of 20 – 30 cm, 27 % 30 – 40 cm and 16 % greater than 40 cm.
  - 2 % of sites had an average Black Speargrass pasture tussock height of 1 – 5 cm and 6 %, 5 – 10 cm or less.

Average Pasture Tussock Height and Dominant Pasture Plant Category - QLD



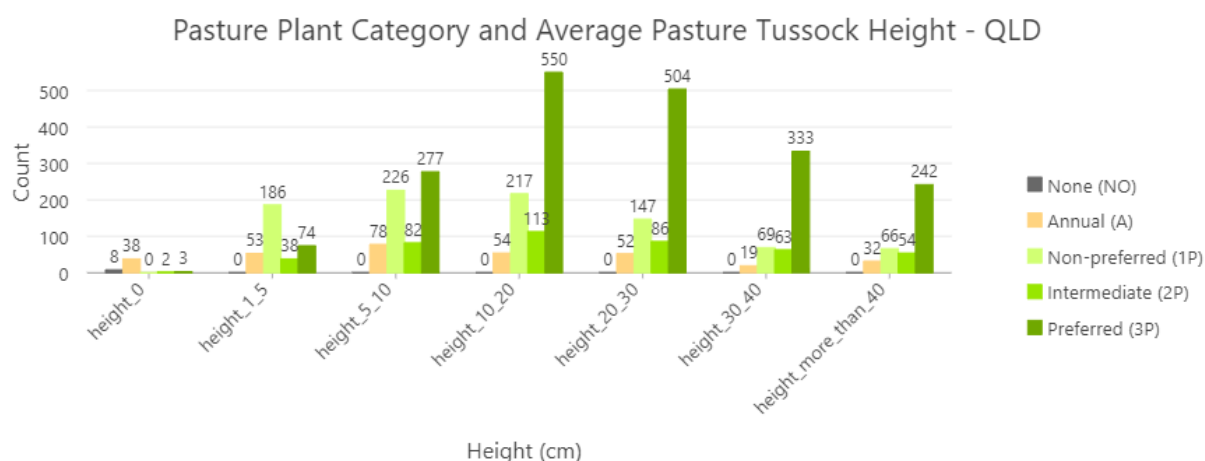
**Figure 38** Average Pasture Tussock Height (cm) and Dominant Pasture Plant Category—Queensland.

**Table 38** Count and Percentage (%) of Average Pasture Tussock Height (cm) by Dominant Pasture Plant Category—Queensland.

Average Pasture Tussock Height (cm)	Dominant Pasture Plant Category Queensland										Totals	
	NO		A		N		I		P		Total Count	Total %
	Count	%	Count	%	Count	%	Count	%	Count	%		
0 cm	8	100	38	12	-	0	2	0	3	0	51	1
1 - 5 cm	-	0	53	16	186	20	38	9	74	4	351	10
5 - 10 cm	-	0	78	24	226	25	82	19	277	14	663	18
10 - 20 cm	-	0	54	17	217	24	113	26	550	28	934	25
20 - 30 cm	-	0	52	16	147	16	86	20	504	25	789	22
30 - 40 cm	-	0	19	6	69	8	63	14	333	17	484	13
> 40 cm	-	0	32	10	66	7	54	12	242	12	394	11
<b>Grand Total</b>	<b>8</b>	<b>100</b>	<b>326</b>	<b>100</b>	<b>911</b>	<b>100</b>	<b>438</b>	<b>100</b>	<b>1983</b>	<b>100</b>	<b>3666</b>	<b>100</b>

**Note for all Sites:**

- The highest frequency for each Dominant Pasture Category is shaded.
- 10 – 20 cm (25 %) and 20 – 30 cm (22 %) were the most frequently assessed height ranges.
  - Preferred and Intermediate species 10 – 20 cm; Non-preferred and Annual 5 – 10 cm.
- 69 % of Non-preferred species are more frequently less than 20 cm tall.
- 54 % of Preferred species are more frequently more than 20 cm tall.



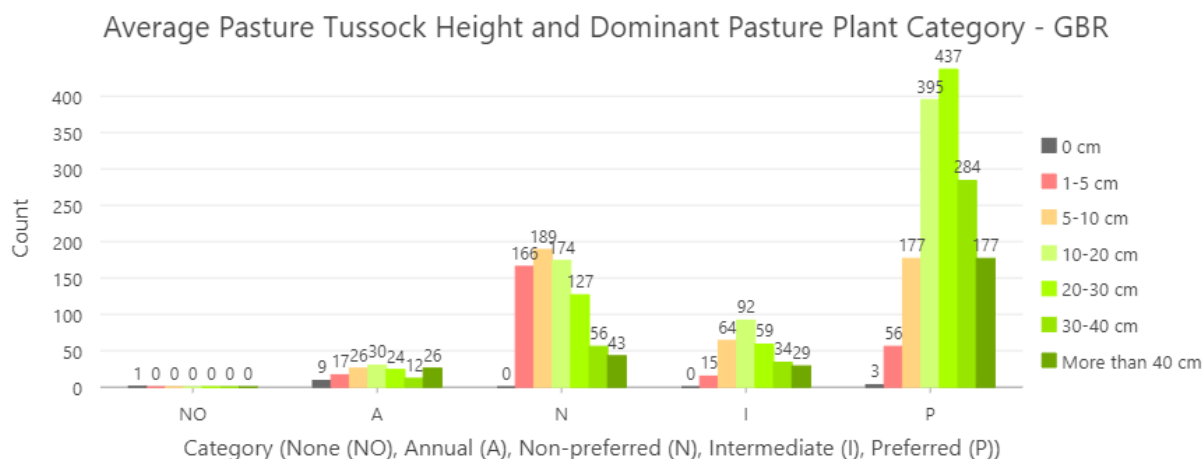
**Figure 39** Dominant Pasture Plant Category and Average Pasture Tussock Height (cm)—Queensland.

**Table 39** Percentage (%) of Dominant Pasture Plant Category by Average Pasture Tussock Height (cm)—Queensland.

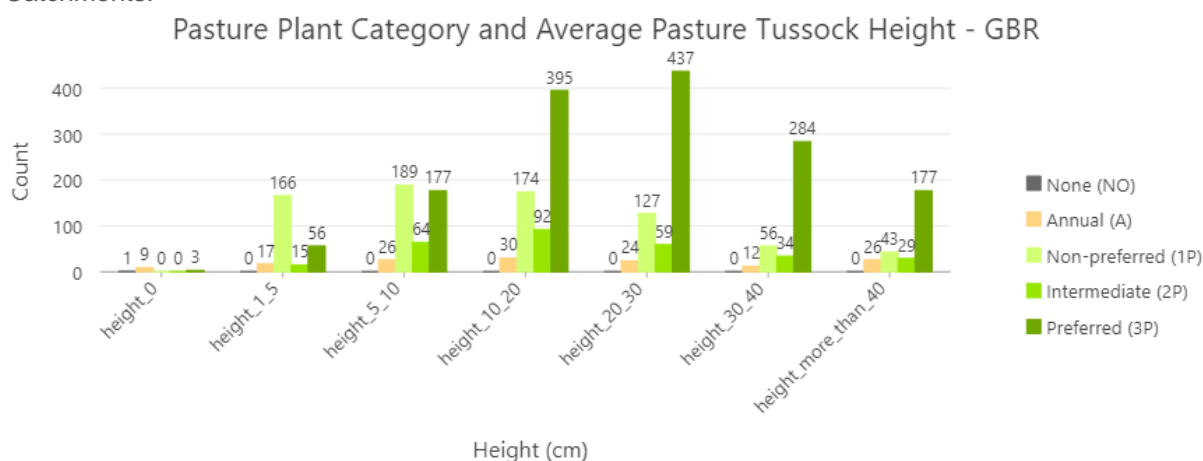
Dominant Pasture Plant Category	Average Pasture Tussock Height (cm) Queensland							Totals	
	0 cm	1 - 5 cm	5 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	> 40 cm	Total Count	Total %
NO	16	0	0	0	0	0	0	8	0
A	75	15	12	6	7	4	8	326	9
N	0	53	34	23	19	14	17	911	25
I	4	11	12	12	11	13	14	438	12
P	6	21	42	59	64	69	61	1983	54
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>NA</b>	<b>100</b>
<b>Qld Count</b>	<b>51</b>	<b>351</b>	<b>663</b>	<b>934</b>	<b>789</b>	<b>484</b>	<b>394</b>	<b>3666</b>	<b>NA</b>

**Note for all Sites:**

- 53 % of Non-preferred species and 21 % of Preferred species are 1 – 5 cm.
- Preferred species are the most frequently assessed in all height ranges from 5 – 10 cm to greater than 40 cm.
- Intermediate species are represented almost equally across all height ranges.
- Annual species are more frequently 5 – 10 cm or less.



**Figure 40** Average Pasture Tussock Height (cm) and Dominant Pasture Plant Category—GBR Catchments.



**Figure 41** Percentage (%) of Dominant Pasture Plant Category by Average Pasture Tussock Height (cm)—GBR Catchments.

**Table 40** Percentage (%) of Dominant Pasture Plant Category by Average Pasture Tussock Height (cm)—GBR Catchments.

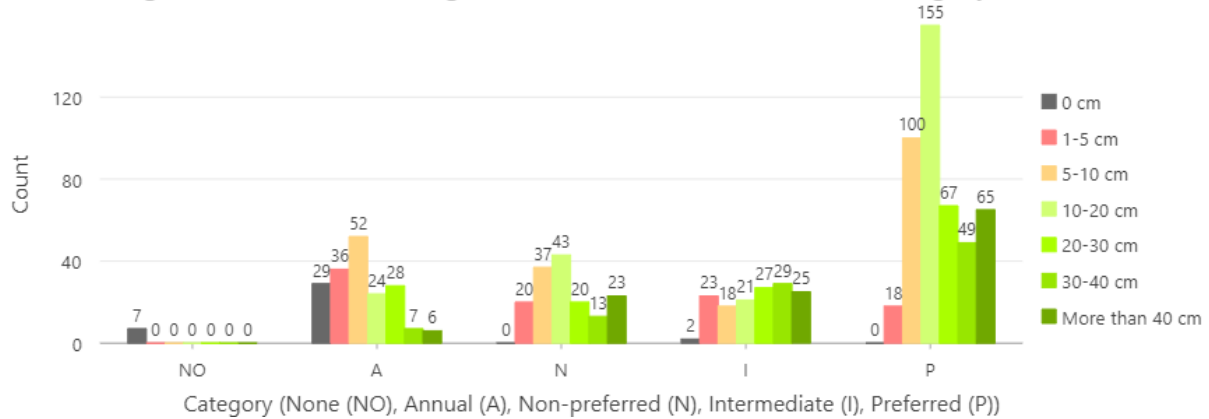
Dominant Pasture Plant Category	Average Pasture Tussock Height (cm) GBR Catchments							Totals	
	0 cm	1 - 5 cm	5 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	> 40 cm	Total Count	Total %
NO	8	0	0	0	0	0	0	1	0
A	69	7	6	4	4	3	9	144	5
N	0	65	41	25	20	15	16	755	28
I	0	6	14	13	9	9	11	293	11
P	23	22	39	57	68	74	64	1529	56
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>NA</b>	<b>100</b>
<b>GBR Count</b>	<b>13</b>	<b>254</b>	<b>456</b>	<b>691</b>	<b>647</b>	<b>386</b>	<b>275</b>	<b>2722</b>	<b>NA</b>



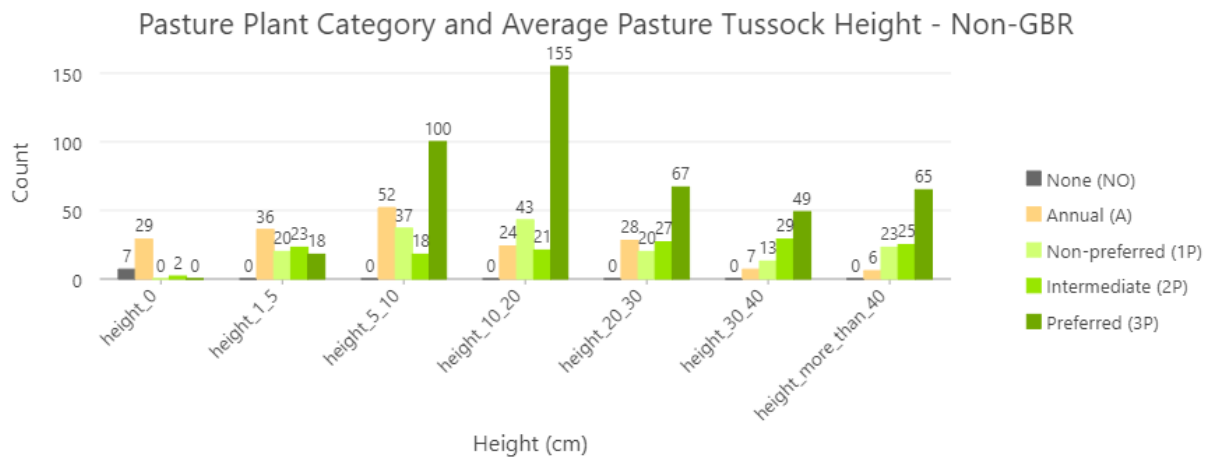
**Note for GBR Catchment Sites:**

- 65 % of Non-preferred species and 22 % of Preferred species are 1 – 5 cm.
- 41 % of Non-preferred species are 5 – 10 cm.
- Preferred species are the most frequently assessed in all height ranges from 10 - 20 cm to greater than 40 cm.
- 10 – 20 cm (25 %) and 20 – 30 cm (24 %) were the most frequently assessed height ranges.

**Average Pasture Tussock Height and Dominant Pasture Plant Category - Non-GBR**



**Figure 42** Average Pasture Tussock Height (cm) and Dominant Pasture Plant Category—Non-GBR.



**Figure 43** Dominant Pasture Plant Category and Average Pasture Tussock Height (cm)—Non-GBR.

**Table 41** Percentage (%) of Dominant Pasture Plant Category by Average Pasture Tussock Height (cm)—Non-GBR.

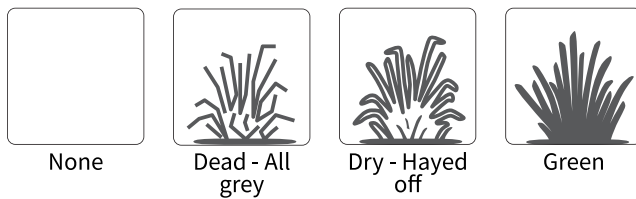
Dominant Pasture Plant Category	Average Pasture Tussock Height (cm) Non-GBR							Totals	
	0 cm	1 - 5 cm	5 - 10 cm	10 -20 cm	20 -30 cm	30 -40 cm	> 40 cm	Total Count	Total %
NO	18	0	0	0	0	0	0	7	1
A	76	37	25	10	20	7	5	182	19
N	0	21	18	18	14	13	19	156	17
I	5	24	9	9	19	30	21	145	15
P	0	19	48	64	47	50	55	454	48
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>NA</b>	<b>100</b>
<b>Non-GBR Ct</b>	<b>38</b>	<b>97</b>	<b>207</b>	<b>243</b>	<b>142</b>	<b>98</b>	<b>119</b>	<b>944</b>	<b>NA</b>

**Note for Non-GBR Sites:**

- 37 % of Non-preferred species and 19 % of Preferred species are 1 – 5 cm.
- 41 % of Non-preferred species are 5 – 10 cm.
- Preferred species are the most frequently assessed in all height ranges from 5 - 10 cm to greater than 40 cm.
- 5 - 10 cm (22 %) and 10 - 20 cm (26 %) were the most frequently assessed height ranges.

### 3.1.6 Pasture Quality—Observed Data

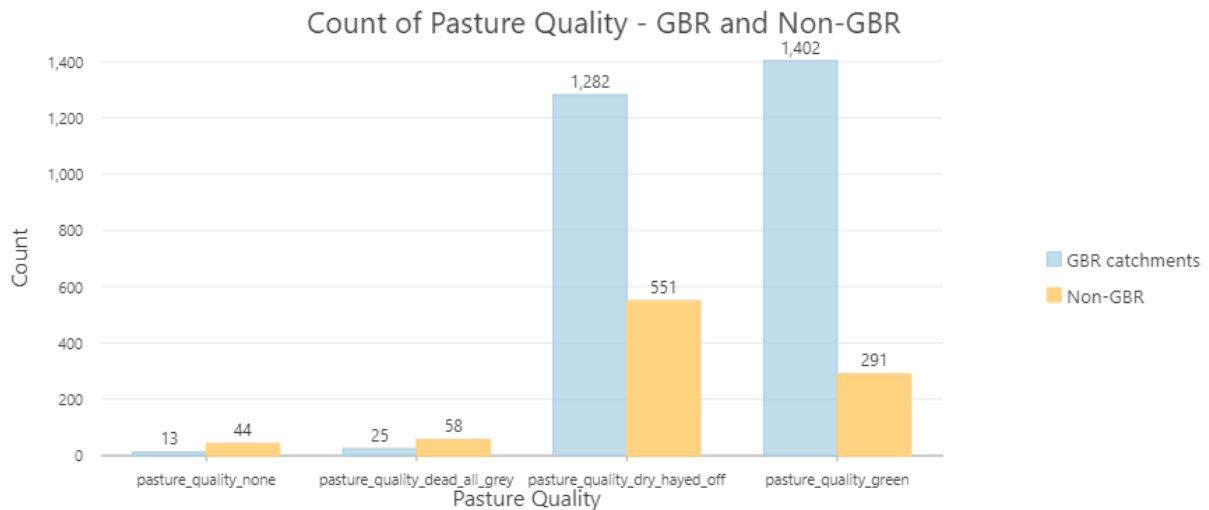
What quality value comprises more than 70% (or the next highest %) of the pasture?



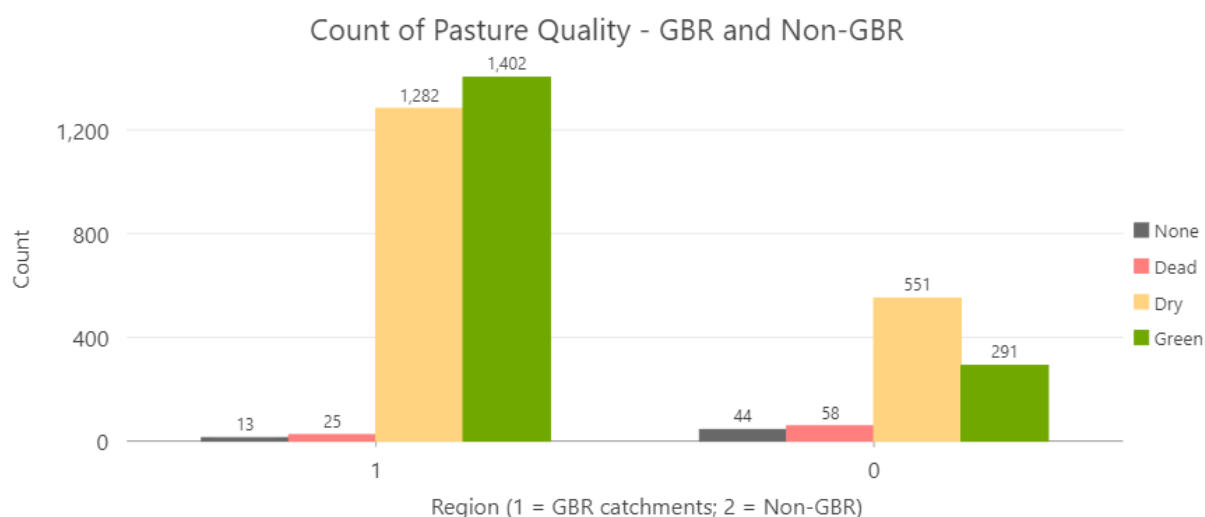
**Image 6** Pasture Quality Values.

**Note:**

- Pasture Quality values of *Dry* and *Green* do not contribute to the Grazing ABCD Result.
  - They are used in the calculation of some contextual results.
- The *None* and *Dead* values are used in the calculation of all results.
  - Both values effectively represent no pasture.
- This indicator is contained in the report for completeness.



**Figure 44** Pasture Quality and Regions—GBR catchments and Non-GBR.

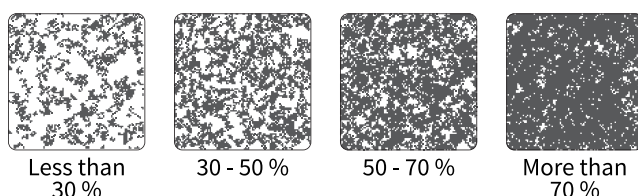


**Figure 45** Regions and Pasture Quality—GBR catchments and Non-GBR.

## 3.2 Land Surface

### 3.2.1 Ground cover—Observed Data

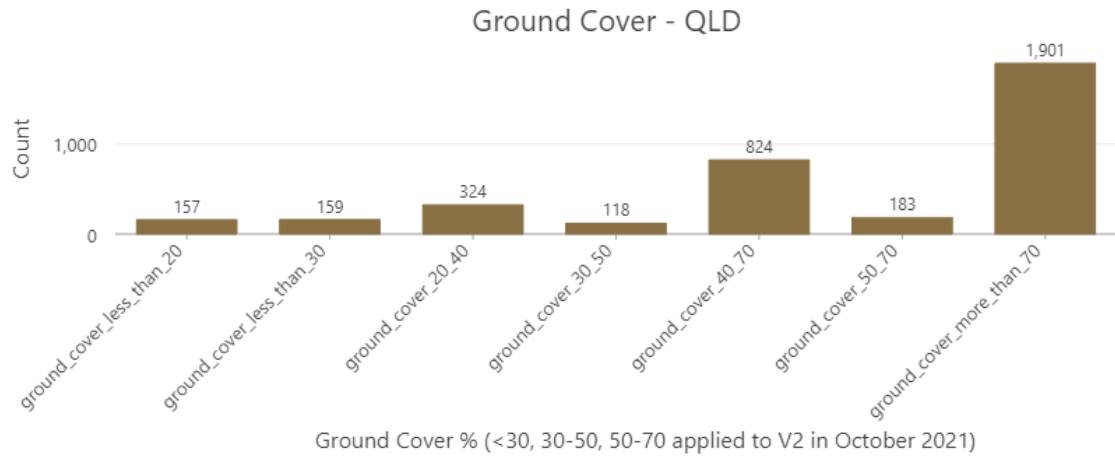
What is the percentage of the ground covered with organic cover? Organic cover includes pasture plants; grass, shrub and tree leaf litter; woody litter and organic crusts.



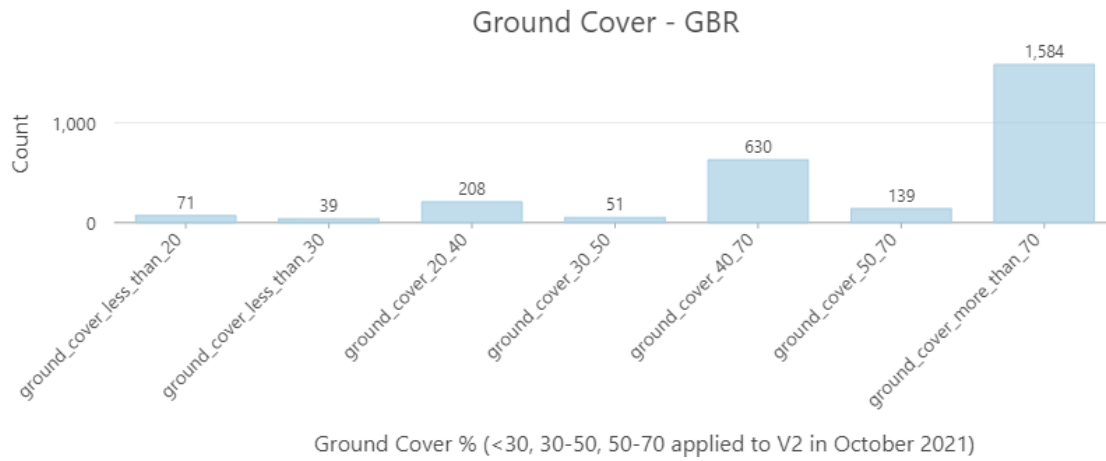
**Image 7** Ground Cover Values.

**Note:**

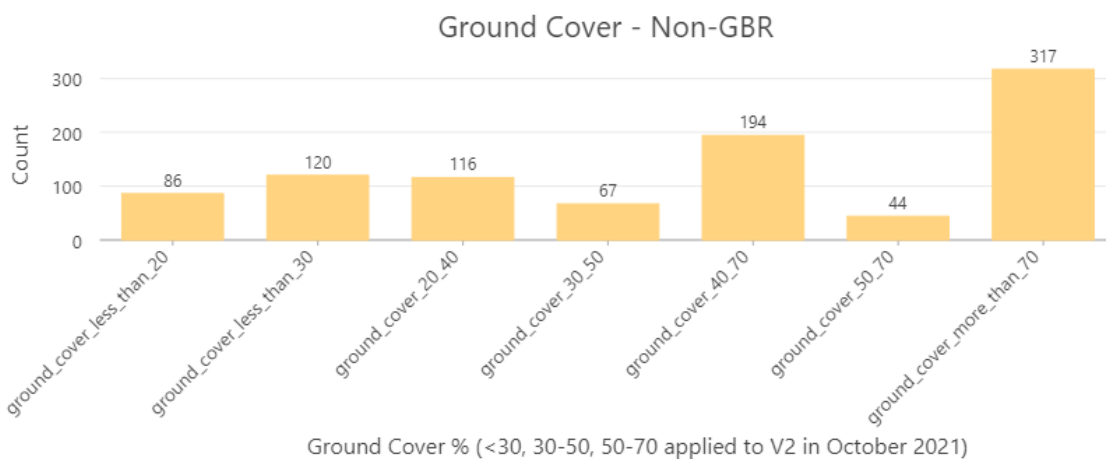
- Organic ground cover (%)—particularly that of attached perennial pasture tussocks—is an important indicator of long-term land condition.
- However, ground cover is not an accurate indicator of Grazing ABCD due to potentially high cover of Non-preferred (increaser or 1P) pasture species (e.g. *Aristida spp*), dominance of stoloniferous species such as Indian couch (*Bothriochloa pertusa*), or various forms of vegetation litter.
- LCAT V1 used ground cover values aligned to the GLM Stocktake method where 40 % is the median value. LCAT V2 simplifies ground cover values and sets 50 % as the median value.



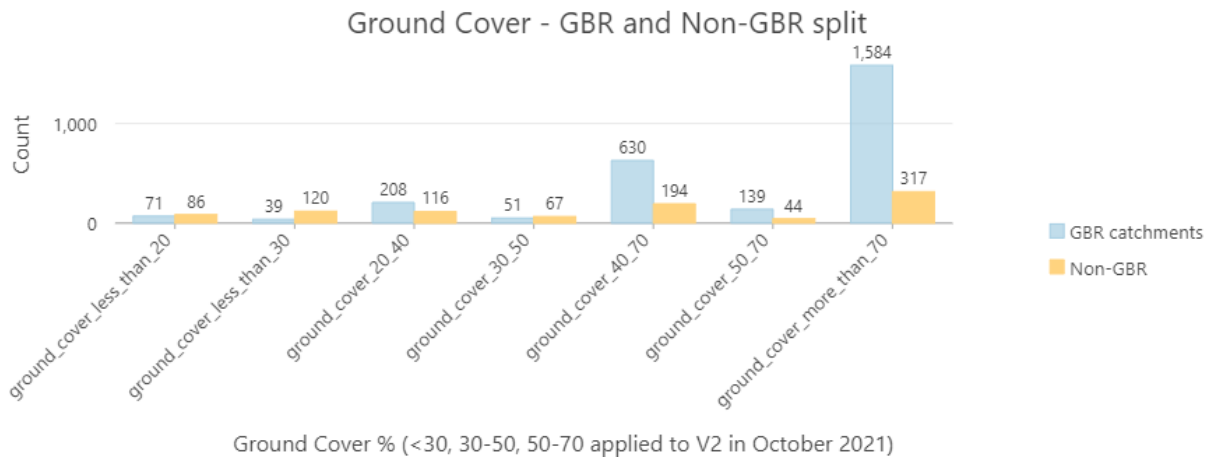
**Figure 46** Ground Cover (%)—Queensland.



**Figure 47** Ground Cover (%)—GBR Catchments.



**Figure 48** Ground Cover (%)—Non-GBR.



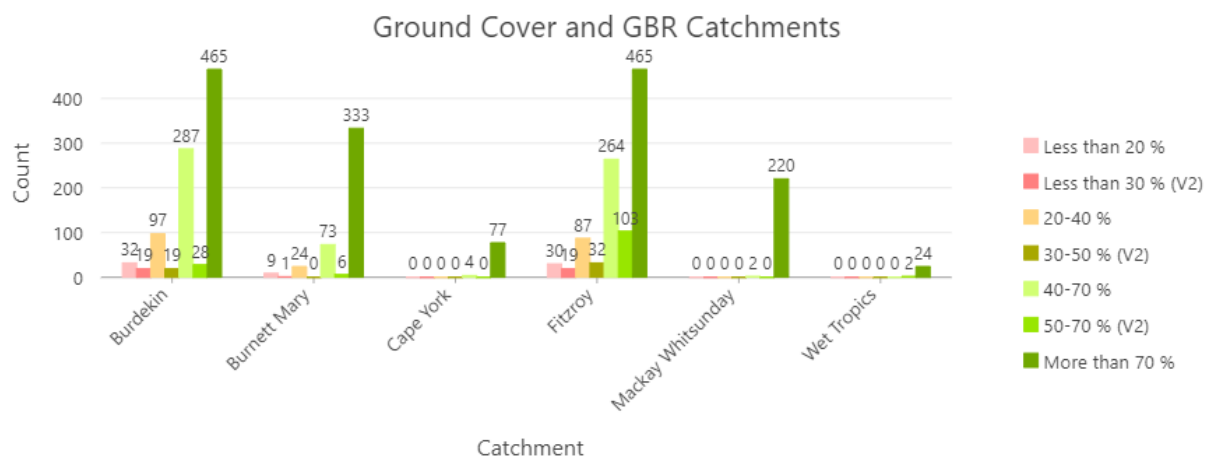
**Figure 49** Ground Cover (%)—Comparison of GBR Catchments and Non-GBR.

**Table 42** Percentage (%) of Sites with Organic Ground Cover Values—Regional Comparison.

Region	Organic Ground Cover %							Total %
	< 20	< 30 (V2)	20 - 40	30 - 50 (V2)	40 - 70	50 - 70 (V2)	> 70	
GBR Catchments	3	1	8	2	23	5	58	100
Non-GBR	9	13	12	7	21	5	34	100
Queensland	4	4	9	3	22	5	52	100

**Note:**

- 58 % of sites in GBR Catchments had organic ground cover greater than 70 %.
- A minimum of 63 % of sites have ground cover greater than 50 % (unknown proportion above 50 % within the LCAT V1 range of 40 – 70 %).
- 86 % of sites are above a previously ‘acceptable’ minimum ground cover threshold of 40 %.



**Figure 50** Ground Cover (%) of Individual GBR Catchments—GBR Catchments.

**Table 43** Percentage (%) of Sites with Organic Ground Cover Values in GBR Catchments.

Organic Ground Cover %	GBR Catchments (Priority Catchments shaded)					
	Burdekin	Burnett Mary	Cape York	Fitzroy	Mackay Whitsunday	Wet Tropics
< 20	3	2	0	3	0	0
< 30 (V2)	2	0	0	2	0	0
20 - 40	10	5	0	9	0	0
30 - 50 (V2)	2	0	0	3	0	0
40 - 70	30	16	5	26	1	0
50 - 70 (V2)	3	1	0	10	0	8
> 70	49	75	95	47	99	92
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Count of Sites</b>	<b>947</b>	<b>446</b>	<b>81</b>	<b>1000</b>	<b>222</b>	<b>26</b>

**Note:**

- 75 % of sites in the Burnett Mary had ground cover greater than 70 %.
- 49 % of sites in the Burdekin and 47 % of the Fitzroy had ground cover greater than 70 %.
- A minimum of 52 % of sites in the Burdekin and 57 % of the Fitzroy have ground cover greater than 50 % (unknown proportion above 50 % within the LCAT V1 range of 40 – 70 %).
- 82 % of sites in the Burdekin and 83 % of the Fitzroy are above a previously ‘acceptable’ minimum ground cover threshold of 40 %.

**Table 44** Percentage (%) of Sites with Organic Ground Cover Values in Burdekin Sub-Catchments.

Organic Ground Cover %	Burdekin Sub-Catchments							
	Black	Bowen	Don	Haughton	Lower Burdekin River	Ross	Suttor	Upper Burdekin
< 20	0	2	0	0	5	0	4	4
< 30 (V2)	0	8	0	0	3	0	1	1
20 - 40	0	1	5	3	13	42	12	11
30 - 50 (V2)	0	4	0	3	2	0	1	3
40 - 70	0	10	24	19	26	50	53	20
50 - 70 (V2)	0	1	10	11	3	0	1	4
> 70	100	74	61	65	48	8	29	57
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Count of Sites</b>	<b>3</b>	<b>107</b>	<b>41</b>	<b>37</b>	<b>151</b>	<b>12</b>	<b>282</b>	<b>314</b>

**Note:**

- Values in the Black and Ross may be unreliable due to fewer sites assessed.
- Sites in at least 6 of the 8 Burdekin Sub-catchments have ground cover greater than 50 % (unknown proportion above 50 % within the LCAT V1 range of 40 – 70 %).
- Sub-catchments that have a high proportion of sites with less than 50 % ground cover include the Bowen (15 %), Lower Burdekin (23 %), Ross (42 %), Suttor (18 %), and Upper Burdekin (19 %).
- The high proportion of sites with ground cover values greater than 70 % may include sites dominated by Indian couch (*Bothriochloa pertusa*).

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**Table 45** Percentage (%) of Sites with Organic Ground Cover Values in the Burnett Mary Sub-Catchment.

Organic Ground Cover %	Burnett Mary Sub-Catchments				
	Baffle Creek	Burnett River	Burrum River	Kolan River	Upper Mary River
< 20	2	2	4	0	5
< 30 (V2)	0	0	0	1	0
20 - 40	0	7	16	3	3
30 - 50 (V2)	-	-	-	-	-
40 - 70	3	20	24	12	20
50 - 70 (V2)	0	1	0	3	0
> 70	95	69	56	80	72
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Count of Sites</b>	<b>60</b>	<b>206</b>	<b>25</b>	<b>90</b>	<b>65</b>

**Note:**

- No data in the 30 – 50 % range indicates LCAT V1 was used for most site assessments.
- Sites in all Burnett Mary Sub-catchments have ground cover greater than 50 % (unknown proportion above 50 % within the LCAT V1 range of 40 – 70 %).
- The Burrum River catchment has at least 20 % of sites with less than 40 % ground cover.

**Table 46** Percentage (%) of Sites with Organic Ground Cover Values in the Fitzroy Sub-Catchment.

Organic Ground Cover %	Fitzroy Sub-Catchments										
	Boyne River	Calliope River	Comet River	Dawson River	Fitzroy River	Isaac River	Mackenzie River	Nogoa River	Shoal water	Styx River	Waterpark Creek
< 20	0	0	0	4	3	1	9	4	0	0	0
< 30 (V2)	0	0	6	3	2	0	0	1	0	0	0
20 - 40	9	22	2	10	8	3	11	10	23	0	50
30 - 50 (V2)	0	0	11	3	4	2	0	2	0	0	0
40 - 70	18	39	0	27	19	30	55	37	8	14	25
50 - 70 (V2)	0	0	39	4	12	4	0	18	0	0	0
> 70	73	39	42	48	52	59	25	27	69	86	25
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Ct of Sites</b>	<b>11</b>	<b>18</b>	<b>62</b>	<b>248</b>	<b>265</b>	<b>145</b>	<b>55</b>	<b>165</b>	<b>13</b>	<b>14</b>	<b>4</b>

**Note:**

- Values in the Boyne, Shoalwater, Styx and Waterpark Creek may be unreliable due to fewer sites assessed.
- Sites in at least 7 of the 11 Fitzroy Sub-catchments have ground cover greater than 50 % (unknown proportion above 50 % within the LCAT V1 range of 40 – 70 %).
- The proportion of sites with ground cover greater than 70 % is significantly lower than in the Burdekin and Burnett Mary Sub-catchments.
- Sub-catchments that have a high proportion of sites with less than 50 % ground cover include the Calliope (22 %), Lower Comet (19 %), Dawson (20 %), Fitzroy (17 %), Mackenzie (20 %), Nogoa (17 %), Shoalwater (23 %), and Waterpark Creek (50 %).

## Burdekin Sub-catchment—C and B condition

**Note (Refer to Table 86):**

- Identifying relationships between ground cover and C and B condition is problematic.
- 462 of 947 sites (49 %) in the Burdekin catchment have been determined as C condition.
- 208 of 947 sites (22 %) in the Burdekin catchment have been determined as B condition.

**Table 47** Percentage (%) of Sites with Organic Ground Cover Values for C and B land condition in Burdekin Sub-Catchments.

Organic Ground Cover %	Burdekin Sub-Catchments															
	Black		Bowen		Don		Haughton		Lower Burdekin		Ross		Suttor		Upper Burdekin	
C and B condition	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B
< 20	-	-	0	-	0	-	0	-	1	-	0	-	1	-	0	-
< 30 (V2)	-	-	18	-	0	-	0	-	0	-	0	-	1	-	1	-
20 - 40	-	-	0	-	4	-	0	-	9	-	67	-	13	-	10	-
30 - 50 (V2)	-	-	0	7	0	0	4	0	0	0	0	0	2	0	3	0
40 - 70	-	-	18	5	29	13	13	20	32	11	17	100	57	58	29	13
50 - 70 (V2)	-	-	0	0	11	13	9	0	3	5	0	0	2	1	3	5
> 70	100	-	64	89	57	75	74	80	54	84	17	0	26	41	54	82
<b>Total</b>	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<b>Count of Sites</b>	<b>2</b>	<b>0</b>	<b>44</b>	<b>44</b>	<b>28</b>	<b>8</b>	<b>23</b>	<b>5</b>	<b>74</b>	<b>19</b>	<b>6</b>	<b>2</b>	<b>133</b>	<b>69</b>	<b>152</b>	<b>61</b>

**Note:**

- The Ross is the only sub-catchment demonstrating separation between C and B based on ground cover. However, fewer sites have been assessed.

## Burnett Mary Sub-catchment—C and B condition

**Note (Refer to Table 86):**

- 168 of 446 sites (38 %) in the Burnett Mary catchment have been determined as C condition.
- 186 of 446 sites (42 %) in the Burnett Mary catchment have been determined as B condition.

**Table 48** Percentage (%) of Sites with Organic Ground Cover Values for C and B land condition in Burnett Mary Sub-Catchments.

Organic Ground Cover %	Burnett Mary Sub-Catchments									
	Baffle Creek		Burnett River		Burrum River		Kolan River		Upper Mary River	
C and B condition	C	B	C	B	C	B	C	B	C	B
< 20	-	-	-	-	-	-	-	-	-	-
< 30 (V2)	0	-	0	-	0	-	3	-	0	-
20 - 40	0	-	11	-	25	-	3	-	7	-
30 - 50 (V2)	-	-	-	-	-	-	-	-	-	-
40 - 70	9	-	28	14	17	29	18	5	13	28
50 - 70 (V2)	0	-	3	1	0	0	3	0	0	0
> 70	91	100	59	85	58	71	74	95	80	72
<b>Total</b>	100	100	100	100	100	100	100	100	100	100
<b>Count of Sites</b>	<b>23</b>	<b>25</b>	<b>80</b>	<b>85</b>	<b>12</b>	<b>7</b>	<b>38</b>	<b>37</b>	<b>15</b>	<b>32</b>

**Note:**

- No sub-catchment is demonstrating separation between C and B based on ground cover.



## Fitzroy Sub-catchment—C and B condition

**Note (Refer to Table 86):**

- 372 of 1000 sites (37 %) in the Fitzroy catchment have been determined as C condition.
- 299 of 1000 sites (30 %) in the Fitzroy catchment have been determined as B condition.

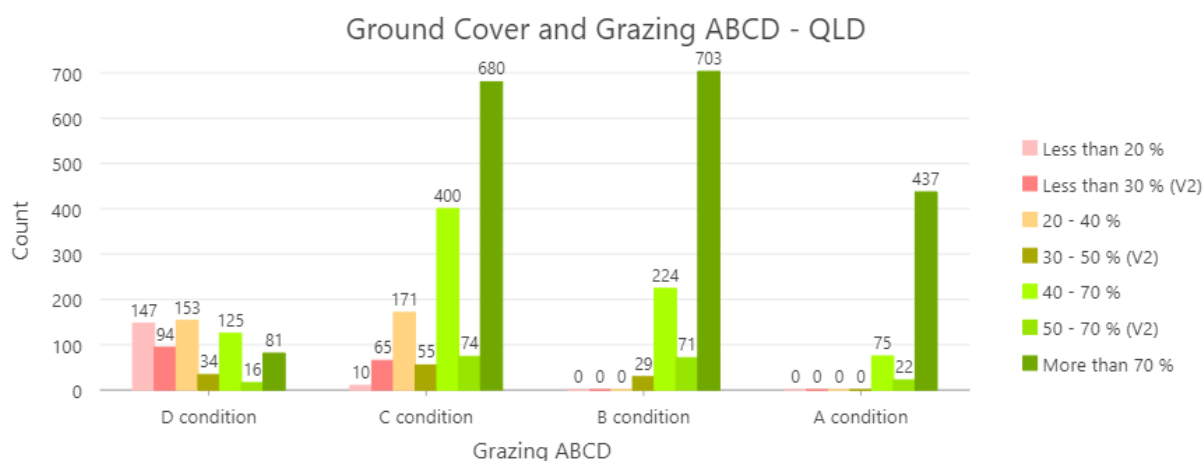
**Table 49** Percentage (%) of Sites with Organic Ground Cover Values for C and B land condition in Fitzroy Sub-Catchments.

Organic Ground Cover %	Fitzroy Sub-Catchments																					
	Boyne		Calli		Comet		Daws		Fitz		Isaac		Mack		Nogoa		Shoal		Styx		Water	
C and B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B
< 20	0	-	0	-	0	-	2	-	1	-	0	-	0	-	0	-	0	-	0	-	0	-
< 30 (V2)	0	-	0	-	6	-	6	-	2	-	0	-	0	-	0	-	0	-	0	-	0	-
20 - 40	17	-	29	-	6	-	24	-	9	-	1	-	19	-	17	-	43	-	0	-	100	-
30 - 50 (V2)	0	0	0	0	6	30	6	0	5	0	1	0	0	0	6	2	0	0	0	0	0	0
40 - 70	17	20	43	0	0	0	33	32	26	17	36	31	57	88	42	45	0	50	50	0	0	0
50 - 70 (V2)	0	0	0	0	63	30	7	5	16	17	4	4	0	0	19	30	0	0	0	0	0	0
> 70	67	80	29	100	19	40	22	63	41	65	57	64	24	12	15	23	57	50	50	100	0	100
<b>Total</b>	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<b>Count</b>	6	5	14	2	16	20	85	75	96	86	69	45	21	17	52	44	7	2	4	2	2	1

**Note (Refer to Table 86):**

- Waterpark Creek is the only sub-catchment demonstrating separation between C and B based on ground cover. The Calliope and Comet show some separation.
- However, fewer sites have been assessed in both sub-catchments.

## Ground Cover and Grazing ABCD



**Figure 51** Ground Cover (%) and Grazing ABCD—Queensland.

**Note:**

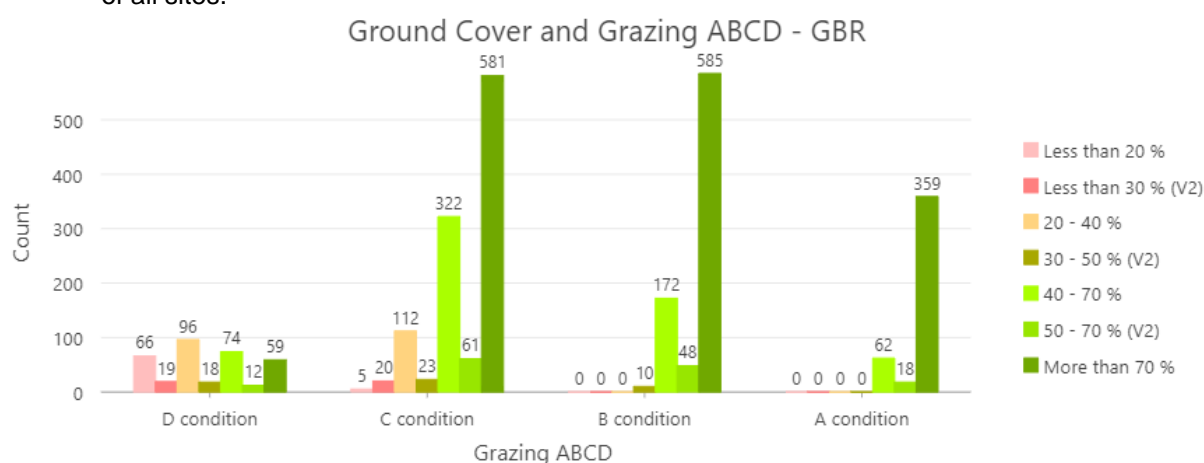
- Sites determined to be A, B, or C condition have higher counts of sites with ground cover greater than 40 – 70 %.
- Sites determined to be in D condition have a spread of ground cover values indicating other drivers of reduced land condition are significant.

**Table 50** Percentage (%) of Sites with Organic Ground Cover Values and Grazing ABCD—Queensland.

Organic Ground Cover %	Grazing ABCD GBR Catchments				Total % Qld	Total Count Qld
	D condition	C condition	B condition	A condition		
< 20	23	1	0	0	4	157
< 30 (V2)	14	4	0	0	4	159
20 - 40	24	12	0	0	9	324
30 - 50 (V2)	5	4	3	0	3	118
40 - 70	19	27	22	14	22	824
50 - 70 (V2)	2	5	7	4	5	183
> 70	12	47	68	82	52	1901
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>NA</b>
<b>Count of Qld</b>	<b>650</b>	<b>1455</b>	<b>1027</b>	<b>534</b>	<b>NA</b>	<b>3666</b>

**Note:**

- High proportions of sites with greater than 70 % ground cover exist in C condition (47 %), B condition (68 %), and A condition (82 %).
- The most frequently assessed ground cover value is greater than 70 %, at 52 % of all sites.
- The second most frequently assessed ground cover value is a combined 40 - 70 %, at 27 % of all sites.



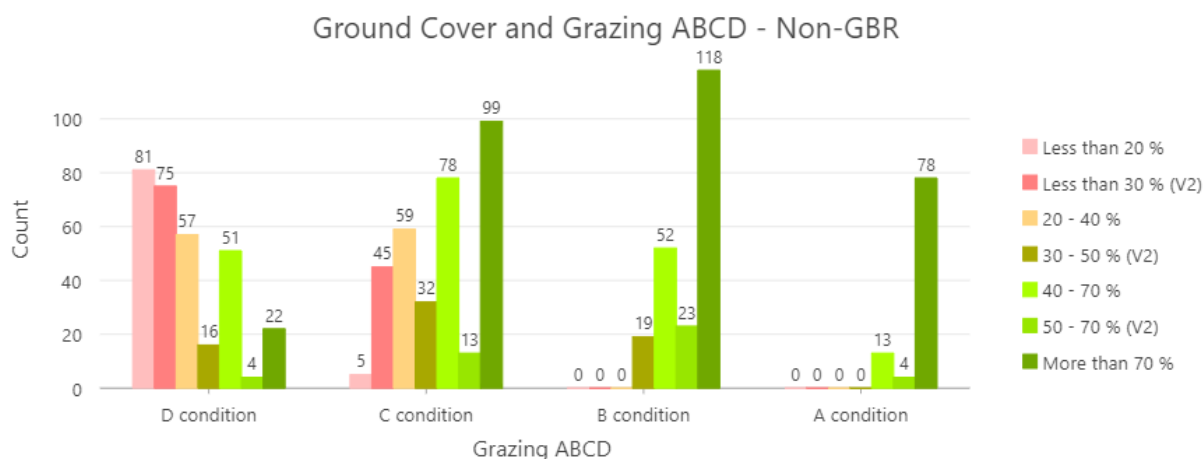
**Figure 52** Ground Cover (%) and Grazing ABCD—GBR Catchments.

**Table 51** Percentage (%) of Sites with Organic Ground Cover Values and Grazing ABCD—GBR Catchments.

Organic Ground Cover %	Grazing ABCD GBR Catchments				Total % GBR	Total Count GBR
	D condition	C condition	B condition	A condition		
< 20	19	0	0	0	3	71
< 30 (V2)	6	2	0	0	1	39
20 - 40	28	10	0	0	8	208
30 - 50 (V2)	5	2	1	0	2	51
40 - 70	22	29	21	14	23	630
50 - 70 (V2)	3	5	6	4	5	139
> 70	17	52	72	82	58	1584
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>NA</b>
<b>Count of GBR</b>	<b>344</b>	<b>1124</b>	<b>815</b>	<b>439</b>	<b>NA</b>	<b>2722</b>

**Note:**

- 58 % of sites in GBR Catchments had ground cover greater than 70 % and a combined 28 % in the 40 – 70 % range.
- A minimum 57 % of sites determined to be in C condition have ground cover more than 50 %.
  - Potentially as high as 86 % if the 40 – 70 % value is included (unknown proportion above 50 % within the 40 – 70 % value).
- 58 % of sites determined to be in D condition have ground cover less than 50 %.
- A minimum of 78 % of sites determined to be in B condition have ground cover of more than 50 %.
  - Potentially as high as 99 % if the 40 – 70 % value is included (unknown proportion above 50 % within the 40 – 70 % value).
- A minimum of 86 % of sites determined to be in A condition have ground cover of more than 50 %.
  - Potentially as high as 100 % if the 40 – 70 % value is included (unknown proportion above 50 % within the 40 – 70 % value).



**Figure 53** Ground Cover (%) and Grazing ABCD—Non-GBR.

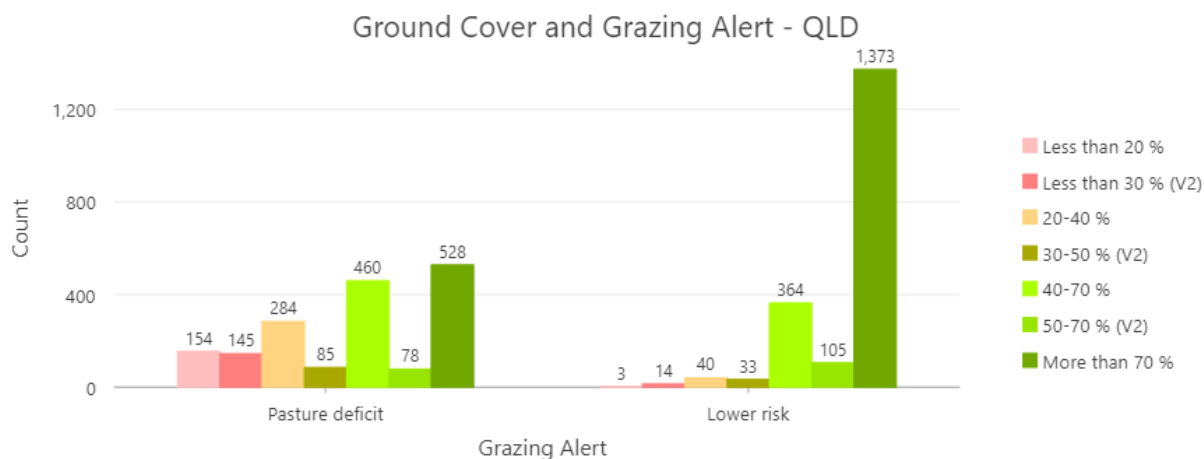
**Table 52** Percentage (%) of Sites with Organic Ground Cover Values and Grazing ABCD—Non-GBR.

Organic Ground Cover %	Grazing ABCD GBR Catchments				Total % Non-GBR	Total Count Non-GBR
	D condition	C condition	B condition	A condition		
< 20	26	2	0	0	9	86
< 30 (V2)	25	14	0	0	13	120
20 - 40	19	18	0	0	12	116
30 - 50 (V2)	5	10	9	0	7	67
40 - 70	17	24	25	14	21	194
50 - 70 (V2)	1	4	11	4	5	44
> 70	7	30	56	82	34	317
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>NA</b>
<b>Count of Non-GBR</b>	<b>306</b>	<b>331</b>	<b>212</b>	<b>95</b>	<b>NA</b>	<b>944</b>

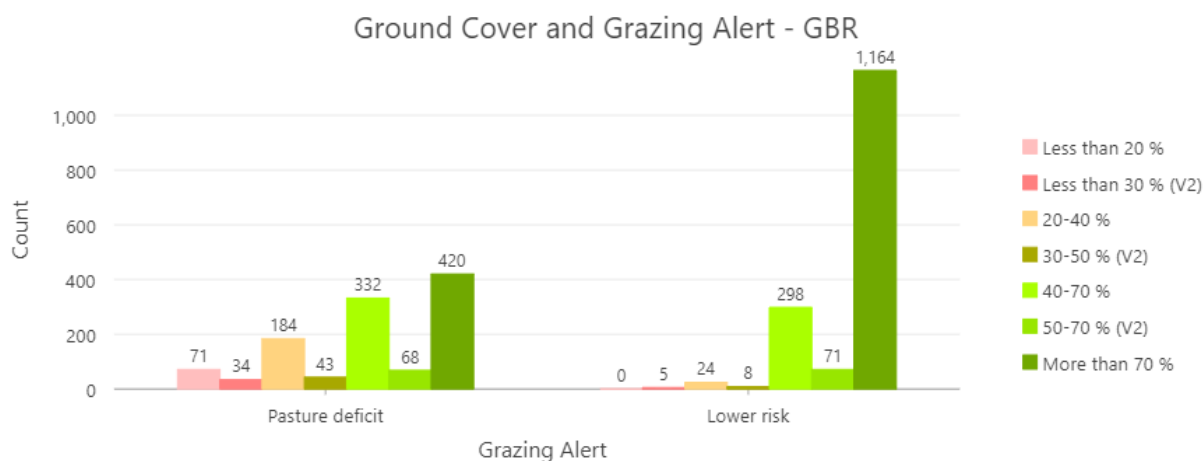
**Note:**

- 34 % of sites in the Non-GBR has ground cover greater than 70 % and a combined 26 % in the 40 – 70 % range.

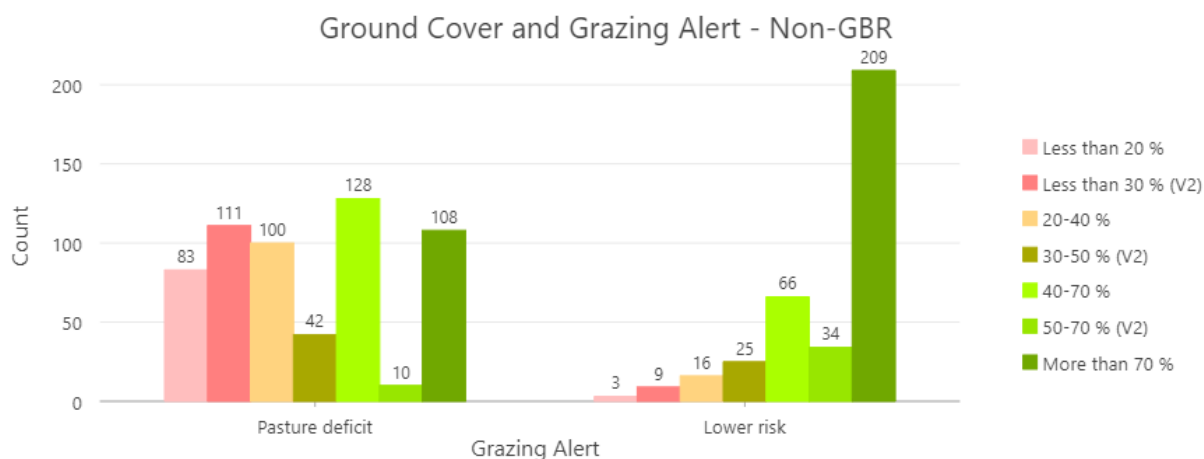
- Different from the GBR Catchments, a minimum 34 % (57 % GBR) of sites determined to be in C condition have ground cover more than 50 %.
  - Potentially as high as 58 % (86 % GBR) if the 40 – 70 % value is included (unknown proportion above 50 % within the 40 – 70 % value).
  - A lack of sites dominated by stoloniferous species in the Non-GBR may be the difference.
- 74 % of sites determined to be in D condition have ground cover less than 50 %.
  - 51 % of these have ground cover less than 30 %.



**Figure 54** Ground Cover (%) and Pasture Deficit—Queensland.



**Figure 55** Ground Cover (%) and Pasture Deficit—GBR Catchments.



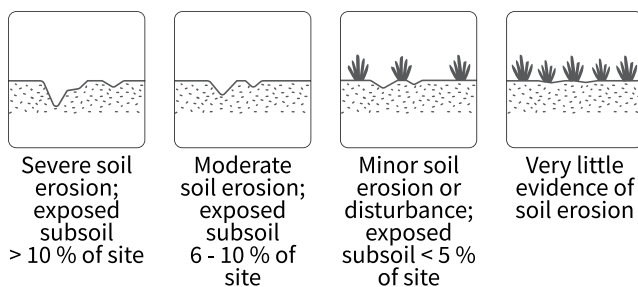
**Figure 56** Ground Cover (%) and Pasture Deficit—Non-GBR.

**Note (Refer to 4.3.3):**

- Sites having ground cover less than 50 % and a pasture deficit (less than 1000 kg/ha TSDM), are more prevalent in the Non-GBR.
  - However, sites having ground cover less than 50 % and no pasture deficit (lower risk) are also more prevalent in the Non-GBR.
- Sites in both the GBR and Non-GBR are equally likely to have a pasture deficit or not have a pasture deficit where ground cover is more than 40 – 70 %.
- Ground cover is not a clear indicator of kg/ha TSDM.

### 3.2.2 Land Surface Condition—Observed Data

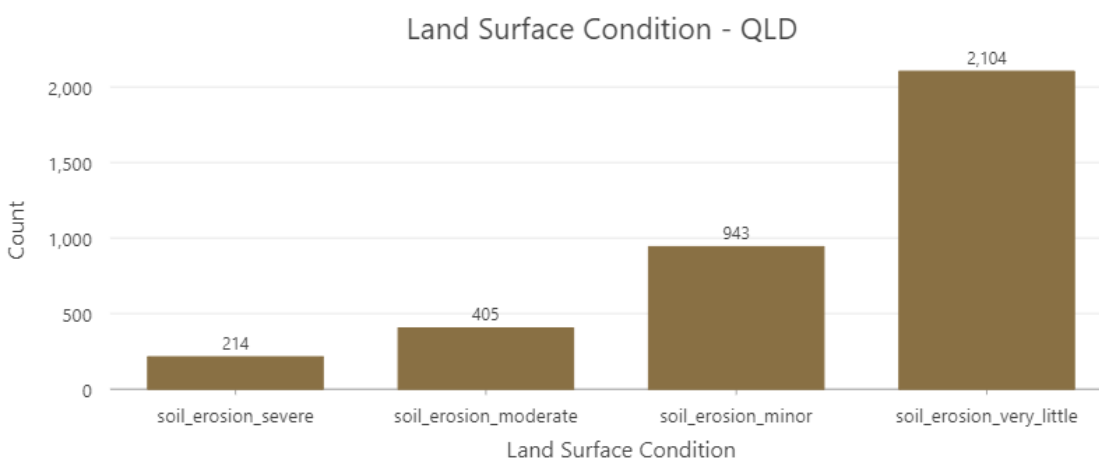
What is the most severe condition of ALL erosion on the site?



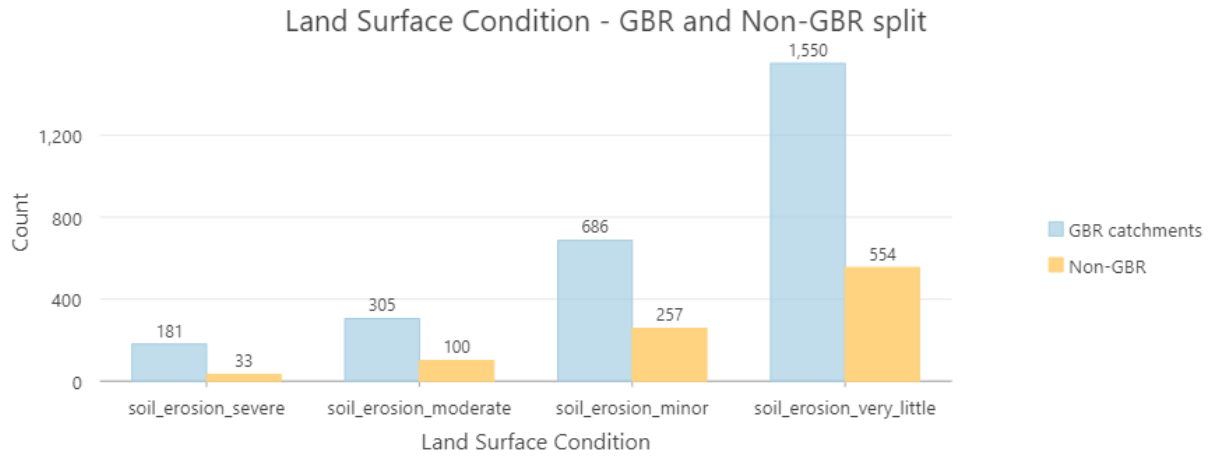
**Image 8** Land Surface Condition Values.

**Note:**

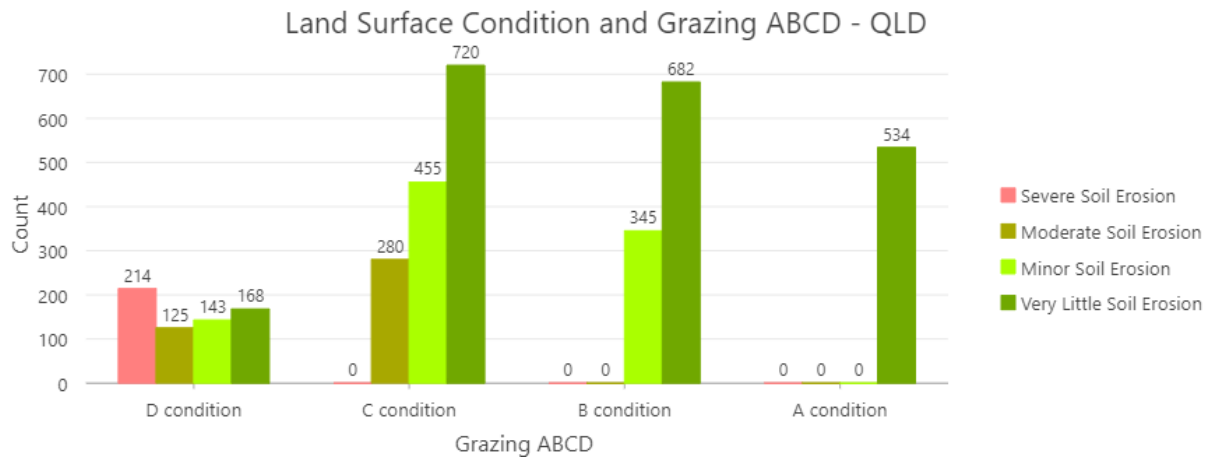
- Land surface condition is often complex and difficult to assess correctly. It requires careful observation of the site and the dimensions associated with erosion process definitions.
  - It is the land condition indicator most likely to be incorrectly assessed.
- Higher counts of *Moderate* and *Severe soil erosion*, than those observed and recorded would be expected given the high proportion of Sites assessed as C and D condition.



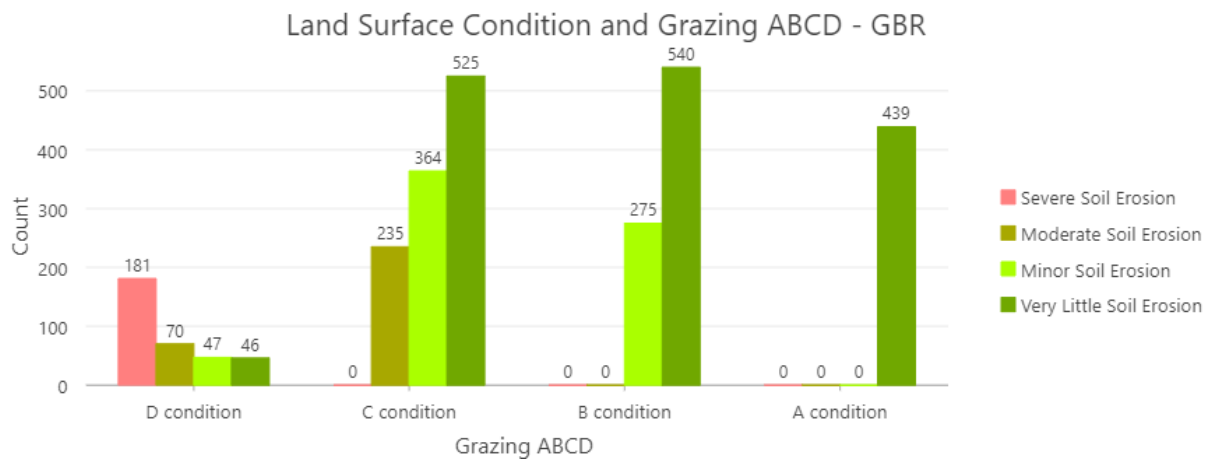
**Figure 57** Land Surface Condition—Queensland.



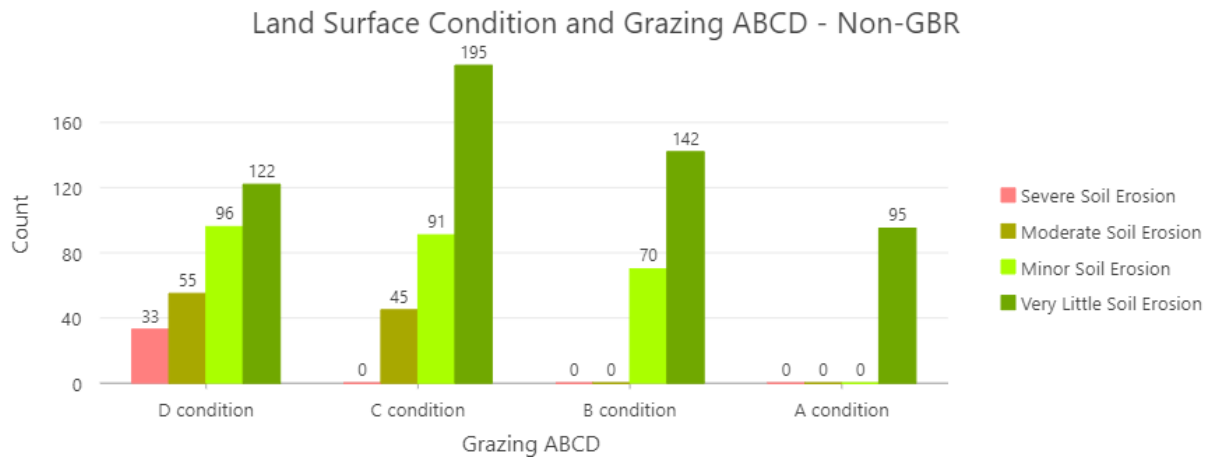
**Figure 58** Land Surface Condition—Comparison of GBR Catchments and Non-GBR.



**Figure 59** Land Surface Condition and Grazing ABCD—Queensland.



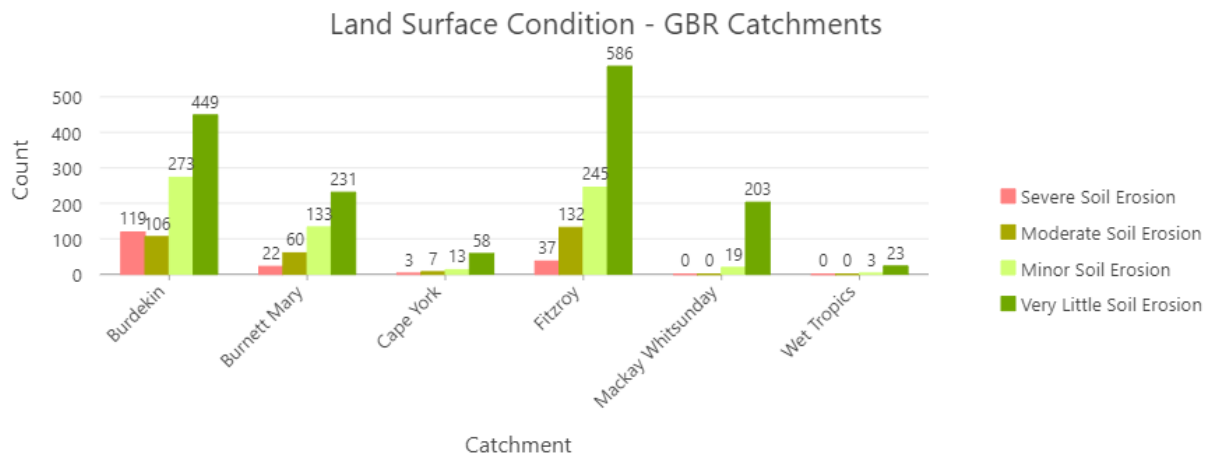
**Figure 60** Land Surface Condition and Grazing ABCD—GBR Catchments.



**Figure 61** Land Surface Condition and Grazing ABCD—Non-GBR.

**Note:**

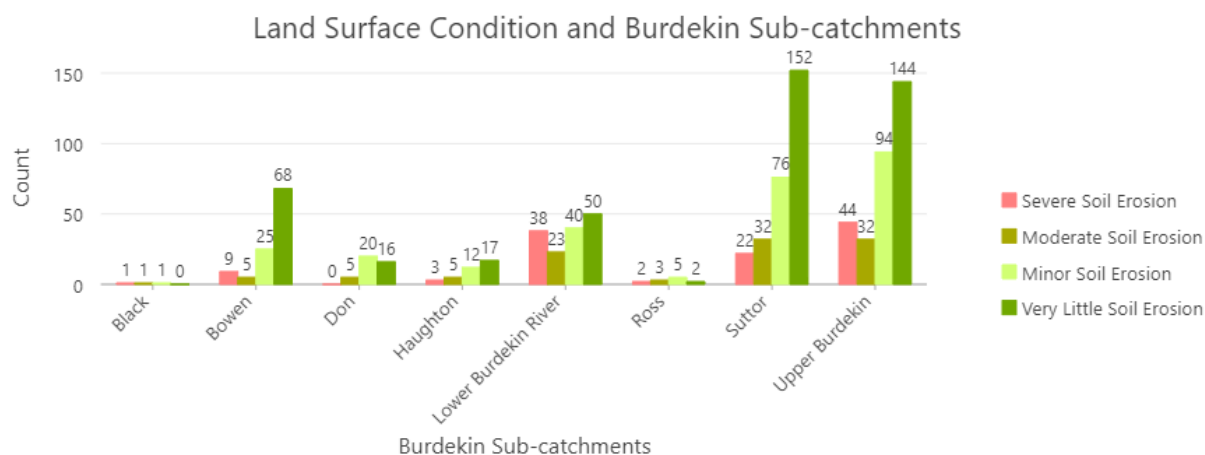
- A site with *Severe* or *Moderate Soil Erosion* is automatically D or C. *Minor* or *Very Little Soil Erosion* can exist in any ABCD condition state.
- The high count of *Minor Soil Erosion* in B would benefit from monitoring for any decline into C.
- The high count of *Minor* and *Moderate Soil Erosion* in C would benefit from monitoring as combined, they are equivalent to the *Minor Soil Erosion* value in C.
- 1172 (or 43 %) of sites in GBR Catchments had *Minor, Moderate* or *Severe Soil Erosion*.



**Figure 62** Land Surface Condition of Individual GBR Catchments—GBR Catchments.

**Note:**

- Many projects in the GBR target lands in D or C condition for land condition improvement.
- Of the priority catchments, 498 (53 %) sites in the Burdekin, 215 (48 %) sites in the Burnett Mary, and 414 (41 %) in the Fitzroy, had *Minor, Moderate*, or *Severe Soil Erosion*.



**Figure 63** Land Surface Condition of Burdekin Sub-catchments—GBR Catchments.

**Note:**

- Sub-catchments with the highest counts of assessed soil erosion (Minor, Moderate and Severe) are the Bowen—107 (36 %) sites; Lower Burdekin—101 (67 %) sites; Suttor—130 (46 %) sites; and Upper Burdekin—170 (54 %) sites.

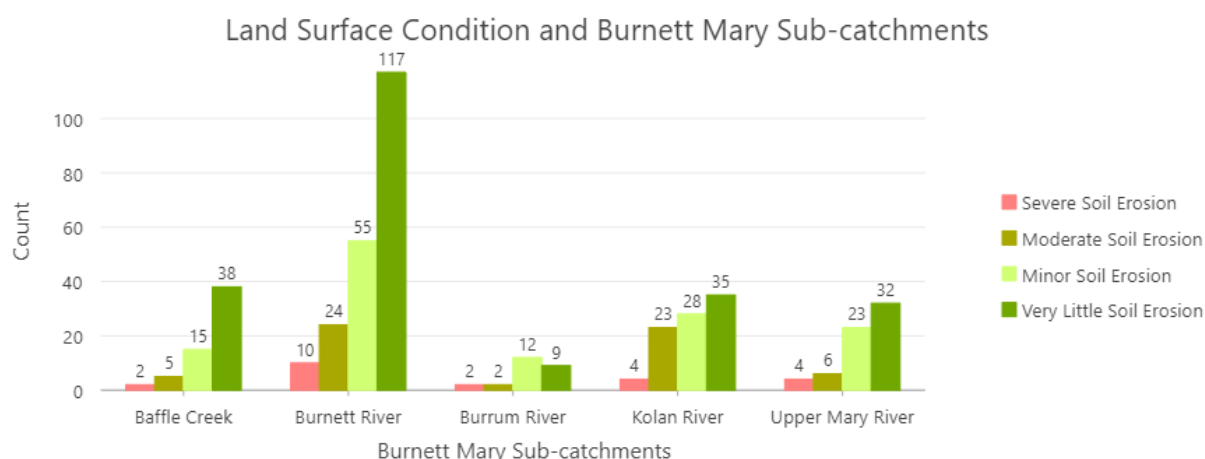
**Table 53** Percentage (%) of Moderate or Minor Erosion & Ground Cover—Burdekin Sub-Cat’s.

Organic Ground Cover %	Moderate and Minor Soil Erosion Burdekin Sub-Catchments															
	Black		Bowen		Don		Haughton		Lower Burdekin		Ross		Suttor		Upper Burdekin	
	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi
< 20	0	0	0	0	0	0	0	0	13	0	0	0	6	1	3	0
< 30	0	0	0	16	0	0	0	0	4	3	0	0	3	1	3	2
20 -40	0	0	20	0	0	10	0	0	13	18	100	20	19	9	25	14
30 -50	0	0	0	0	0	0	0	8	0	5	0	0	0	3	13	1
40 -70	0	0	60	20	40	30	0	8	43	33	0	80	50	66	41	30
50 -70	0	0	0	0	40	10	20	8	0	5	0	0	6	1	3	3
> 70	100	100	20	64	20	50	80	75	26	38	0	0	16	18	13	50

**Note:**

- In Burdekin Sub-catchments, organic ground cover greater than 50 %, has minimal bearing on the frequency of *Moderate Soil Erosion*.
- Tussock, hummock, and other erect pasture plant species were the Dominant Pasture Plant species on approximately 495 (52 %) of 947 sites.
  - Stoloniferous plant species accounted for 414 (44 %).
  - Annuals plant species accounted for 33 (3 %); and Unidentified/None 5 sites (1 %).
- Indian couch (*Bothriochloa pertusa*) was the Dominant Pasture Plant on 328 (35 %) sites.
- Buffel grass (*Cenchrus ciliaris*) was the Dominant Pasture Plant on 115 (12 %) sites.
- Black speargrass (*Heteropogon contortus*) was the Dominant Pasture Plant on 80 (8 %) sites.





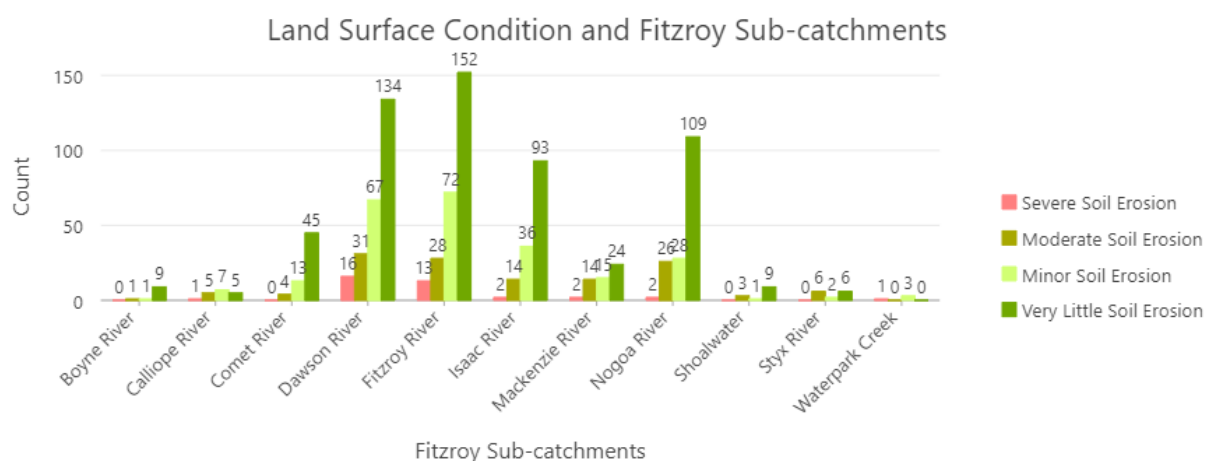
**Figure 64** Land Surface Condition of Burnett Mary Sub-catchments—GBR Catchments.

**Table 54** Percentage (%) of Sites with Moderate or Minor Soil Erosion and Organic Ground Cover Values—Burnett Mary Sub-Catchments.

Organic Ground Cover %	Moderate and Minor Soil Erosion Burnett Mary Sub-Catchments									
	Baffle		Burnett River		Burrum River		Kolan River		Upper Mary River	
	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi
< 20	0	0	0	0	0	0	0	0	17	0
< 30	0	0	0	0	0	0	0	4	0	0
20 - 40	0	0	8	11	0	25	9	0	33	0
30 - 50	-	-	-	-	-	-	-	-	-	-
40 - 70	40	0	13	35	0	33	30	14	0	30
50 - 70	0	0	8	0	0	0	0	4	0	0
> 70	60	100	71	55	100	42	61	79	50	70

**Note:**

- In Burnett Mary Sub-catchments, organic ground cover greater than 50 %, has minimal bearing on the frequency of *Moderate Soil Erosion*.
- Tussock, hummock, and other erect pasture plant species were the Dominant Pasture Plant species on approximately 324 (73 %) of 446 sites.
  - Stoloniferous plant species accounted for 87 (20 %).
  - Annuals plant species accounted for 19 (4 %); and Unidentified/None 16 (3 %).
- Black spear grass (*Heteropogon contortus*) was the Dominant Pasture on 113 (25 %) sites.
- Rhodes grass (*Chloris gayana*) was the Dominant Pasture Plant on 40 sites (9 %).
- Green panic (*Megathyrsus maximus*) was the Dominant Pasture Plant on 22 sites (5 %).



**Figure 65** Land Surface Condition of Fitzroy Sub-catchments—GBR Catchments.

**Table 55** Percentage (%) of Sites with Moderate or Minor Soil Erosion and Organic Ground Cover Values—Fitzroy Sub-Catchments.

Organic Ground Cover %	Moderate and Minor Soil Erosion Fitzroy Sub-Catchments																					
	Boyne		Calliope		Comet		Dawson		Fitzroy		Isaac		Mackenzie		Nogoa		Shoalwater		Styx		Waterpark	
	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi	Mo	Mi
< 20	0	0	0	0	0	0	6	1	14	0	7	0	36	0	15	4	0	0	0	0	-	0
< 30	0	0	0	0	25	0	13	1	4	1	0	0	0	0	0	0	0	0	0	0	-	0
20 -40	100	0	80	0	25	0	19	21	29	13	21	6	21	13	31	7	100	0	0	0	-	67
30 -50	0	0	0	0	0	23	19	1	7	6	0	3	0	0	4	0	0	0	0	0	-	0
40 -70	0	100	20	71	0	0	32	45	36	38	50	53	43	73	38	57	0	100	33	0	-	0
50 -70	0	0	0	0	50	62	6	6	11	19	7	0	0	0	8	21	0	0	0	0	-	0
> 70	0	0	0	29	0	15	3	24	0	24	14	39	0	13	4	11	0	0	67	100	-	33

**Note:**

- In Fitzroy Sub-catchments, organic ground cover greater than 50 %, had a greater bearing on the frequency of *Moderate Soil Erosion*.
- Of the 112 sites with Moderate Soil Erosion, 68 (61 %) had ground cover less than 50 %.
- Of the 265 sites with Minor Soil Erosion, 64 (24 %) had ground cover less than 50 %.
- Tussock, hummock, and other erect pasture plant species were the Dominant Pasture Plant species on approximately 801 (80 %) of 1000 sites.
  - Stoloniferous plant species accounted for 159 (16 %).
  - Annuals plant species accounted for 17 (2 %); and Unidentified/None 23 (2 %).
- Buffel grass (*Cenchrus ciliaris*) was the Dominant Pasture Plant on 306 sites (31 %).
- Indian couch (*Bothriochloa pertusa*) was the Dominant Pasture Plant on 113 sites (11 %).
- Black spear grass (*Heteropogon contortus*) was the Dominant Pasture Plant on 66 sites (7%).

**Table 56** Percentage (%) of Sites with Soil Erosion and Organic Ground Cover—GBR Catchments.

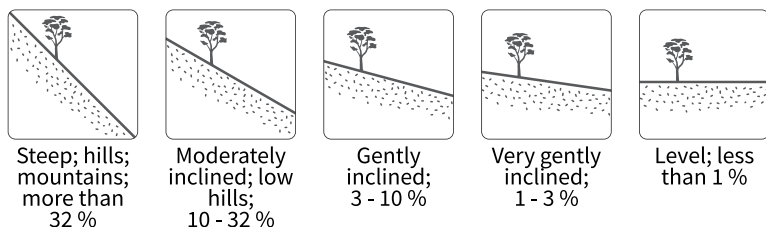
Organic Ground Cover %	Land Surface Condition—Soil Erosion—GBR Catchments				% GBR Ground Cover
	Severe	Moderate	Minor	Very little	
< 20	22	8	0	0	3
< 30 (V2)	6	3	2	1	1
20 - 40	22	21	10	2	8
30 - 50 (V2)	4	4	2	1	2
40 - 70	21	34	37	15	23
50 - 70 (V2)	5	6	6	4	5
> 70	20	25	42	76	58
<b>% of GBR Erosion</b>	<b>7</b>	<b>11</b>	<b>25</b>	<b>57</b>	<b>100</b>

**Note:**

- The value *Very Little Soil Erosion* was assessed on 57 % of sites in the GBR Catchments.
  - A minimum 80 % of sites has ground cover greater than 50 % and potentially\* up to 95 % (\*unknown proportion above 50 % within the 40 – 70 % value).
- The value *Minor Soil Erosion* was assessed on 25 % of sites in the GBR Catchments.
  - A minimum 48 % of sites has ground cover greater than 50 % and potentially\* up to 85 %.
- The value *Moderate Soil Erosion* was assessed on 11 % of sites in the GBR Catchments.
  - A minimum 36 % of sites has ground cover **less than 50 %**.
- The value *Severe Soil Erosion* was assessed on 7 % of sites in the GBR Catchments.
  - A minimum 54 % of sites has ground cover **less than 50 %**.

### 3.2.3 Slope—Observed Data

What is the average fall of the site?



**Image 9** Slope Values.

**Note:**

- Slope does not contribute to the Grazing ABCD or other primary result. It is used as an input to secondary contextual results.



**Figure 66** Modal Slope of Sites—Comparison of GBR Catchments and Non-GBR.

## 3.3 Pest Plants and Animals

### 3.3.1 Dominant Pest Plant—Observed Data

What is the most dominant pest plant or the one that is impacting land condition the most?

**Note:**

- Pest Plant species are those contained in Pt 3, Sch 1 & Pt 2, Sch 2, Biosecurity Act (Qld) 2014—Approximately 129 species.

**Table 57** Percentage (%) of Sites with Pest Plants Present—Regional Comparison.

Regions	None Observed		Pests Present		Unidentified		Other		Total
	Count	%	Count	%	Count	%			
GBR Catchments	1370	50	1029	38	160	6	163	6	2722
Non-GBR	597	63	256	27	11	1	80	9	944
Queensland	1967	54	1285	35	171	5	243	6	3666
In Doubt					171	5	243	6	

**Note:**

- Pest plants were identified on 1285 (35 %) of all sites.
  - A further 171 (5 %) may have pest plants as they were assessed as *Unidentified*.
- Pest plants may be present on 1456 (40 %) of all sites if *Unidentified* are included.
  - Pest plant identification appears to be a weakness within assessors.
- Plants considered local pests or weeds that are not contained in the Biosecurity Act (Qld) should be assessed for their impact in the pasture component of the LCAT.
  - 243 (6 %) of sites had plant species assessed within the pest plant indicator in error.

**Table 58** Dominant Pest Plant Species—Queensland.

Dominant Pest Plant Label	Count	Group Total
None observed	1967	1967
Other (for Biosecurity Act plants ONLY)	243	243
prickly pears: bunny ears; common and spiny pest; drooping tree; prickly; tiger; velvety and Westwood pears* (Management) - Opuntia spp	180	220
prickly pears - Westwood pear* (Management) - Opuntia streptacantha	5	
prickly pears - velvety tree pear* (Management) - Opuntia tomentosa	14	
prickly pears - drooping tree pear* (Management) - Opuntia monacantha syn. O. vulgaris	2	
prickly pears - common pest pear; spiny pest pear* (Management) - Opuntia stricta syn. O. inermis	3	
prickly pear - Opuntia spp. other than O. aurantiaca; O. elata; O. ficus-indica; O. microdasys; O. monacantha; O. stricta; O. streptacantha and O. tomentosa	16	194
lantanas: creeping lantana and common lantana* (Management) - Lantana camara and montevidensis	144	
lantana - lantana; common lantana* (Management) - Lantana camara	42	
lantana - creeping lantana* (Management) - Lantana montevidensis	8	171
Unidentified	171	
rubber vines: ornamental and rubber vines* (Management) - Cryptostegia grandiflora and madagascariensis	126	
rubber vines - rubber vine* (Management) - Cryptostegia grandiflora	2	
rubber vines - rubber vine* (Management) - Cryptostegia grandiflora	18	

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Dominant Pest Plant Label	Count	Group Total
parthenium* (Management) - Parthenium hysterophorus	138	138
rat's tail grasses: American; giant Parramatta and giant rat's tail grasses* (Management) - Sporobolus jacquemontii; fertilis; pyramidalis and natalensis	86	118
rats tail grasses - giant Parramatta grass* (Management) - Sporobolus fertilis	1	
rat's tail grasses - giant rat's tail grass* (Management) - Sporobolus pyramidalis and S. natalensis	27	
rat's tail grasses - giant Parramatta grass* (Management) - Sporobolus fertilis	2	
rat's tail grasses - American rat's tail grass* (Management) - Sporobolus jacquemontii	2	
prickly acacia* (Management) - Vachellia nilotica	109	109
chinee apple* (Management) - Ziziphus mauritiana	72	72
sicklepods* (or foetid and hairy cassia) (Management) - Senna tora; hirsuta and obtusifolia	60	62
sicklepods - sicklepod* (Management) - Senna obtusifolia	1	
sicklepods - hairy cassia* (Management) - Senna hirsuta	1	
harrisia cactus* (Management) - Harrisia martinii; tortuosa; and pomanensis	44	49
harrisia cactus - Harrisia spp. syn. Eriocereus spp. other than H. martinii; H. tortuosa and H. pomanensis syn. Cereus pomanensis	5	
fireweed* (Management) - Senecio madagascariensis	35	35
mimosa pigra* (Eradication) - Mimosa pigra	27	27
acacias non-indigenous to Australia* - Acaciella spp.; Mariosousa spp.; Senegalia spp. and Vachellia spp. other than Vachellia nilotica; Vachellia farnesiana	26	26
belly-ache bush* (Management) - Jatropha gossypifolia and hybrids	20	20
parkinsonia* (Management) - Parkinsonia aculeata	17	17
cholla cactus - Cylindropuntia spp. and hybrids other than C. fulgida; C. imbricata; C. prolifera; C. rosea; C. spinosior and C. tunicata	1	9
cholla cacti* (Eradication) - Cylindropuntia fulgida; imbricata; rosea; tunicata; prolifera; spinosior	7	
cholla cacti -devil's rope pear* (Management) - Cylindropuntia imbricata	1	
tobacco weed* (Management) - Elephantopus mollis	8	8
mother of millions* (Management) - Bryophyllum delagoense (syn. B. tubiflorum) and Kalanchoe delagoensis	5	6
mother of millions hybrid* (Management) - Bryophyllum x houghtonii	1	
annual ragweed* (Management) - Ambrosia artemisiifolia	6	6
African boxthorn* (Management) - Lycium ferocissimum	6	6
giant sensitive plant* (Management) - Mimosa diplotricha var. diplotricha	5	5
lagarosiphon - Lagarosiphon major	2	2
water mimosa* (Eradication) - Neptunia oleracea	1	1
tropical soda apple* (Eradication) - Solanum viarum	1	1
snake cactus* (Eradication) - Cylindropuntia spinosior	1	1
Singapore daisy* (Management) - Sphagneticola trilobata syn. Wedelia trilobata	1	1
ornamental gingers - white ginger* (Management) - Hedychium coronarium	1	1
Mexican bean tree* (Eradication) - Cecropia spp.	1	1
kochia - Bassia scoparia syn. Kochia scoparia	1	1
groundsel bush* (Management) - Baccharis halimifolia	1	1
Captain Cook tree* (or yellow oleander) (Management) - Cascabela thevetia (syn. Thevetia peruviana)	1	1
blackberry* (Management) - Rubus anglocandicans; Rubus fruticosus aggregate	1	1

**Table 59** Dominant Pest Plant Species—GBR catchments.

Dominant Pest Plant - GBR catchments	Count	Group Total
None observed	1370	1370
lantanas: creeping lantana and common lantana* (Management) - Lantana camara and montevidensis	125	169
lantana - lantana; common lantana* (Management) - Lantana camara	37	
lantana - creeping lantana* (Management) - Lantana montevidensis	7	
prickly pears: bunny ears; common and spiny pest; drooping tree; prickly; tiger; velvety and Westwood pears* (Management) - Opuntia spp	153	163
prickly pears - Westwood pear* (Management) - Opuntia streptacantha	5	
prickly pears - common pest pear; spiny pest pear* (Management) - Opuntia stricta syn. O. inermis	2	
prickly pear - Opuntia spp. other than O. aurantiaca; O. elata; O. ficus-indica; O. microdasys; O. monacantha; O. stricta; O. streptacantha and O. tomentosa	3	
Other (for Biosecurity Act plants ONLY)	163	163
Unidentified	160	160
parthenium* (Management) - Parthenium hysterophorus	138	138
rubber vines: ornamental and rubber vines* (Management) - Cryptostegia grandiflora and madagascariensis	114	134
rubber vines - rubber vine* (Management) - Cryptostegia grandiflora	20	
rats tail grasses - giant Parramatta grass* (Management) - Sporobolus fertilis	3	110
rat's tail grasses - giant rat's tail grass* (Management) - Sporobolus pyramidalis and S. natalensis	27	
rat's tail grasses - American rat's tail grass* (Management) - Sporobolus jacquemontii	2	
rat's tail grasses: American; giant Parramatta and giant rat's tail grasses* (Management) - Sporobolus jacquemontii; fertilis; pyramidalis and natalensis	78	
chinee apple* (Management) - Ziziphus mauritiana	72	72
sicklepods* (or foetid and hairy cassia) (Management) - Senna tora; hirsuta and obtusifolia	55	57
sicklepods - sicklepod* (Management) - Senna obtusifolia	1	
sicklepods - hairy cassia* (Management) - Senna hirsuta	1	
harrisia cactus* (Management) - Harrisia martinii; tortuosa; and pomanensis	38	43
harrisia cactus - Harrisia spp. syn. Eriocereus spp. other than H. martinii; H. tortuosa and H. pomanensis syn. Cereus pomanensis	5	
mimosa pigra* (Eradication) - Mimosa pigra	26	26
acacias non-indigenous to Australia* - Acaciella spp.; Mariosousa spp.; Senegalia spp. and Vachellia spp. other than Vachellia nilotica; Vachellia farnesiana	26	
belly-ache bush* (Management) - Jatropha gossypifolia and hybrids	20	20
parkinsonia* (Management) - Parkinsonia aculeata	15	15
prickly acacia* (Management) - Vachellia nilotica	11	11
tobacco weed* (Management) - Elephantopus mollis	8	8
cholla cacti* (Eradication) - Cylindropuntia fulgida; imbricata; rosea; tunicata; prolifera; spinosior	7	8
cholla cacti - devil's rope pear* (Management) - Cylindropuntia imbricata	1	
giant sensitive plant* (Management) - Mimosa diplotricha var. diplotricha	5	5

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Dominant Pest Plant - GBR catchments	Count	Group Total
mother of millions* (Management) - Bryophyllum delagoense (syn. B. tubiflorum) and Kalanchoe delagoensis	4	4
fireweed* (Management) - Senecio madagascariensis	4	4
annual ragweed* (Management) - Ambrosia artemisiifolia	3	3
lagarosiphon - Lagarosiphon major	2	2
water mimosa* (Eradication) - Neptunia oleracea	1	1
tropical soda apple* (Eradication) - Solanum viarum	1	1
snake cactus* (Eradication) - Cylindropuntia spinosior	1	1
Singapore daisy* (Management) - Sphagneticola trilobata syn. Wedelia trilobata	1	1
ornamental gingers - white ginger* (Management) - Hedychium coronarium	1	1
Mexican bean tree* (Eradication) - Cecropia spp.	1	1
kochia - Bassia scoparia syn. Kochia scoparia	1	1
groundsel bush* (Management) - Baccharis halimifolia	1	1
Captain Cook tree* (or yellow oleander) (Management) - Cascabela thevetia (syn. Thevetia peruviana)	1	1
blackberry* (Management) - Rubus anglocandicans; Rubus fruticosus aggregate	1	1
African boxthorn* (Management) - Lycium ferocissimum	1	1

**Table 60** Dominant Pest Plant Species—Non-GBR.

Dominant Pest Plant - Non-GBR	Count	Group Total
None observed	597	597
prickly acacia* (Management) - Vachellia nilotica	98	98
Other (for Biosecurity Act plants ONLY)	80	80
prickly pears: bunny ears; common and spiny pest; drooping tree; prickly; tiger; velvety and Westwood pears* (Management) - Opuntia spp	27	57
prickly pears - velvety tree pear* (Management) - Opuntia tomentosa	14	
prickly pears - drooping tree pear* (Management) - Opuntia monacantha syn. O. vulgaris	2	
prickly pears - common pest pear; spiny pest pear* (Management) - Opuntia stricta syn. O. inermis	1	
prickly pear - Opuntia spp. other than O. aurantiaca; O. elata; O. ficus-indica; O. microdasys; O. monacantha; O. stricta; O. streptacantha and O. tomentosa	13	
fireweed* (Management) - Senecio madagascariensis	31	31
lantanas: creeping lantana and common lantana* (Management) - Lantana camara and montevidensis	19	25
lantana - lantana; common lantana* (Management) - Lantana camara	5	
lantana - creeping lantana* (Management) - Lantana montevidensis	1	
rubber vines: ornamental and rubber vines* (Management) - Cryptostegia grandiflora and madagascariensis	12	12
Unidentified	11	11
rat's tail grasses: American; giant Parramatta and giant rat's tail grasses* (Management) - Sporobolus jacquemontii; fertilis; pyramidalis and natalensis	8	8
harrisia cactus* (Management) - Harrisia martinii; tortuosa; and pomanensis	6	6
sicklepods* (or foetid and hairy cassia) (Management) - Senna tora; hirsuta and obtusifolia	5	5
African boxthorn* (Management) - Lycium ferocissimum	5	5

Dominant Pest Plant - Non-GBR	Count	Group Total
annual ragweed* (Management) - <i>Ambrosia artemisiifolia</i>	3	3
parkinsonia* (Management) - <i>Parkinsonia aculeata</i>	2	2
mother of millions* (Management) - <i>Bryophyllum delagoense</i> (syn. <i>B. tubiflorum</i> ) and <i>Kalanchoe delagoensis</i>	1	2
mother of millions hybrid* (Management) - <i>Bryophyllum x houghtonii</i>	1	
mimosa pigra* (Eradication) - <i>Mimosa pigra</i>	1	1
cholla cactus - <i>Cylindropuntia</i> spp. and hybrids other than <i>C. fulgida</i> ; <i>C. imbricata</i> ; <i>C. prolifera</i> ; <i>C. rosea</i> ; <i>C. spinosior</i> and <i>C. tunicata</i>	1	1

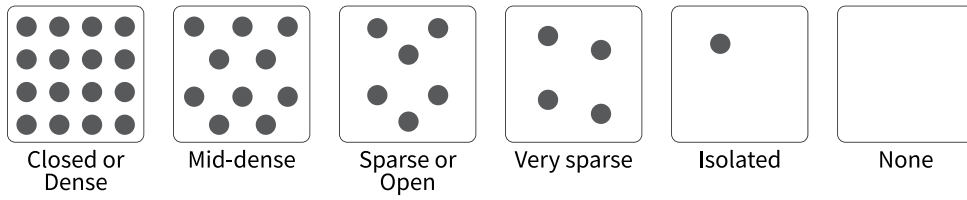
**Table 61** First, Second, and Third Most Dominant Pest Plant Where Observed (Not in association).

Order	Dominant Pest Plant	Ct	Second Dominant	Ct	Third Dominant	Ct
1	prickly pears: bunny ears; common and	220	rubber vines: ornamental and rubber vin	19	belly-ache bush* (Management) - <i>Jatro</i>	2
2	lantanas: creeping lantana and common	194	Unidentified	18	prickly acacia* (Management) - <i>Vachelli</i>	2
3	Unidentified	171	chinee apple* (Management) - <i>Ziziphus</i>	8	acacias non-indigenous to Australia* - <i>A</i>	1
4	rubber vines: ornamental and rubber vin	146	lantanas: creeping lantana and common	6	chinee apple* (Management) - <i>Ziziphus</i>	1
5	parthenium* (Management) - <i>Partheniur</i>	138	sicklepods* (or foetid and hairy cassia)	5	harrisia cactus* (Management) - <i>Harris</i>	1
6	rat's tail grasses: American; giant Parral	118	mesquites: honey; algarroba and Quilpie	4	rubber vines: ornamental and rubber vin	1
7	prickly acacia* (Management) - <i>Vachelli</i>	109	parkinsonia* (Management) - <i>Parkinson</i>	3	yellow oleander* (or Captain Cook tree)	1
8	chinee apple* (Management) - <i>Ziziphus</i>	73	giant sensitive plant* (Management) - <i>N</i>	2		
9	sicklepods* (or foetid and hairy cassia)	62	harrisia cactus* (Management) - <i>Harris</i>	2		
10	harrisia cactus* (Management) - <i>Harris</i>	44	prickly acacia* (Management) - <i>Vachelli</i>	2		
11	fireweed* (Management) - <i>Senecio mad</i>	35	annual ragweed* (Management) - <i>Ambr</i>	1		
12	mimosa pigra* (Eradication) - <i>Mimosa p</i>	27	belly-ache bush* (Management) - <i>Jatro</i>	1		
13	acacias non-indigenous to Australia* - <i>A</i>	26	fireweed* (Management) - <i>Senecio mad</i>	1		
14	belly-ache bush* (Management) - <i>Jatro</i>	20	mimosa pigra* (Eradication) - <i>Mimosa p</i>	1		
15	parkinsonia* (Management) - <i>Parkinson</i>	17	parthenium* (Management) - <i>Partheniur</i>	1		
16	cholla cacti* (Eradication) - <i>Cylindropun</i>	8	prickly pears - velvety tree pear* (Mana	1		
17	tobacco weed* (Management) - <i>Elepha</i>	8				
18	African boxthorn* (Management) - <i>Lyciu</i>	6				
19	annual ragweed* (Management) - <i>Amb</i>	6				
20	giant sensitive plant* (Management) - <i>N</i>	5				
21	harrisia cactus - <i>Harris</i> spp. syn. <i>Eri</i>	5				
22	mother of millions* (Management) - <i>Bry</i>	5				
23	lagarosiphon - <i>Lagarosiphon major</i>	2				
24	blackberry* (Management) - <i>Rubus ang</i>	1				
25	Captain Cook tree* (or yellow oleander)	1				
26	cholla cactus - <i>Cylindropuntia</i> spp. and	1				
27	groundsel bush* (Management) - <i>Bacch</i>	1				
28	kochia - <i>Bassia scoparia</i> syn. <i>Kochia s</i>	1				
29	Mexican bean tree* (Eradication) - <i>Cecr</i>	1				
30	mother of millions hybrid* (Management)	1				
31	ornamental gingers - white ginger* (Mar	1				
32	Singapore daisy* (Management) - <i>Spha</i>	1				
33	snake cactus* (Eradication) - <i>Cylindropu</i>	1				
34	tropical soda apple* (Eradication) - <i>Sola</i>	1				
35	water mimosa* (Eradication) - <i>Neptunia</i>	1				

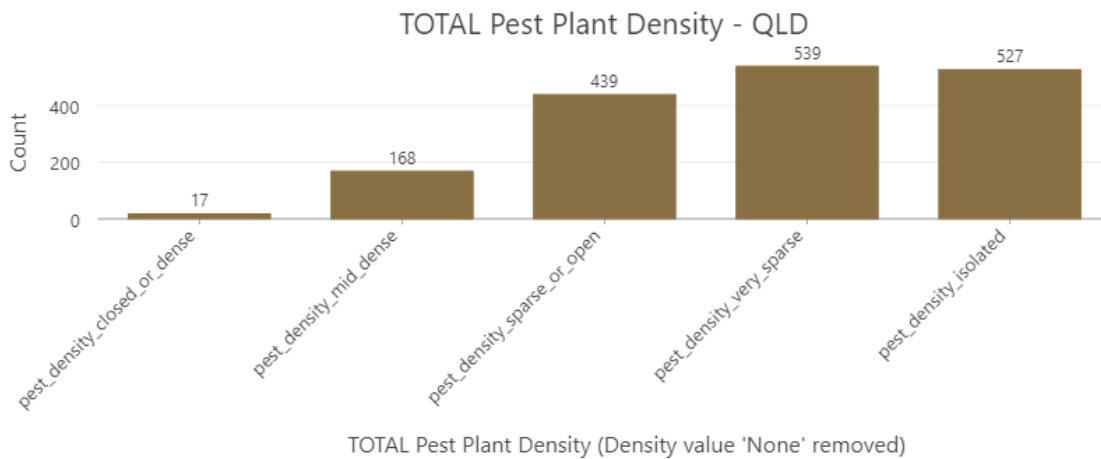


### 3.3.2 Total Pest Plant Density—Observed Data

What is the density of ALL pest plants on the site?



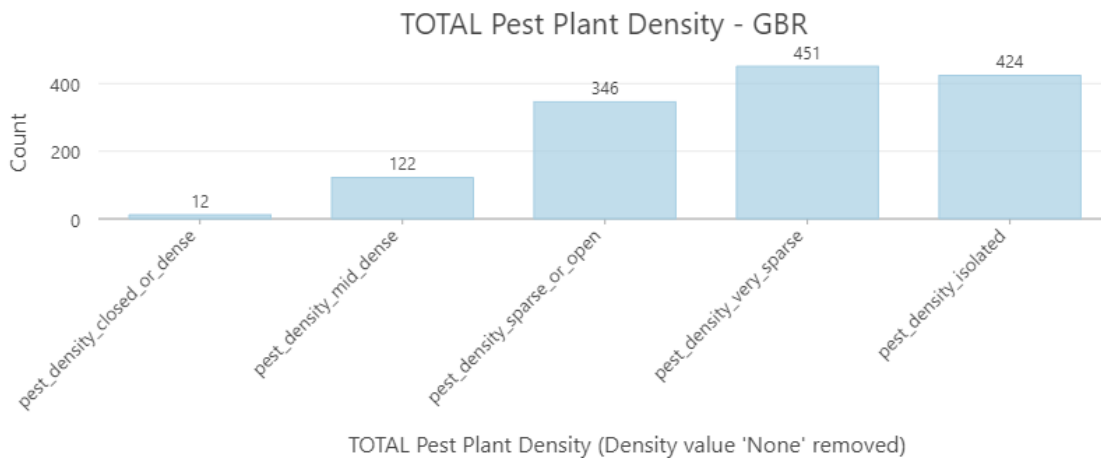
**Image 10** Total Pest Plant Density Values.



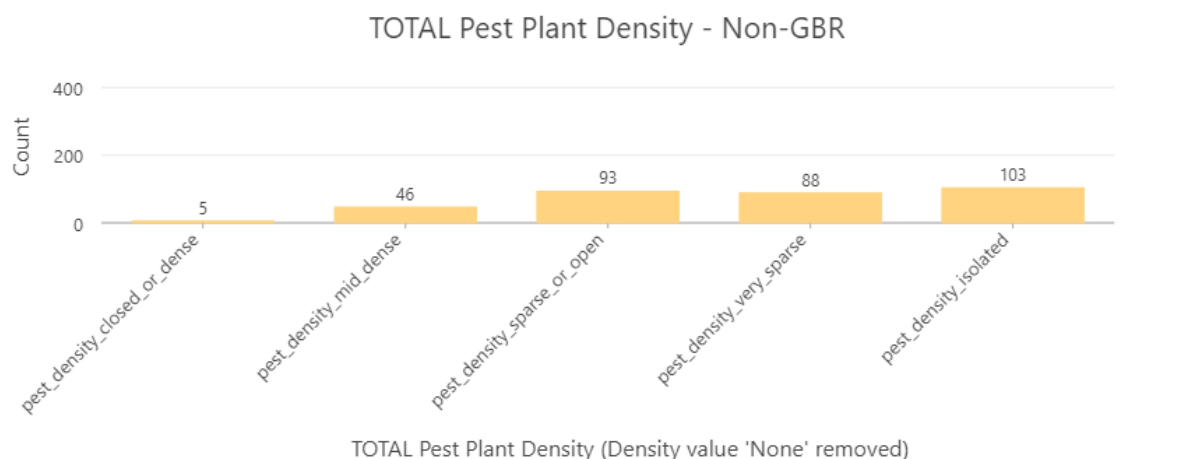
**Figure 67** Total Pest Plant Density (excludes *None Observed*)—Queensland.

**Table 62** Percentage (%) Total Pest Plant Density—Regional Comparison.

Region	% Total Pest Plant Density					
	Closed or Dense	Mid-dense	Sparse or Open	Very sparse	Isolated	None
GBR Catchments	0	4	13	17	16	50
Non-GBR	1	5	10	9	11	65
<b>Queensland</b>	<b>0</b>	<b>5</b>	<b>12</b>	<b>15</b>	<b>14</b>	<b>54</b>

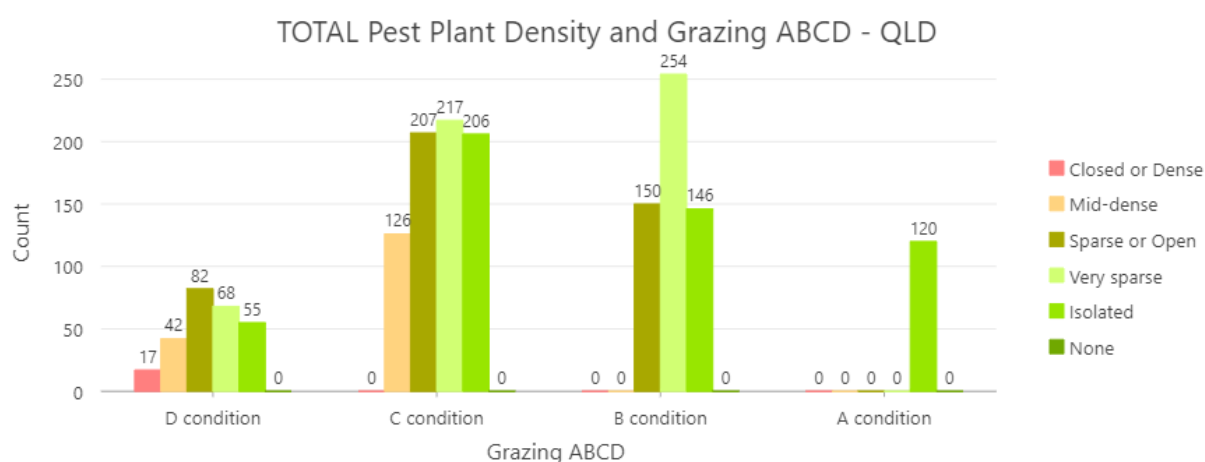


**Figure 68** Total Pest Plant Density (excludes *None Observed*)—GBR Catchments.



TOTAL Pest Plant Density (Density value 'None' removed)

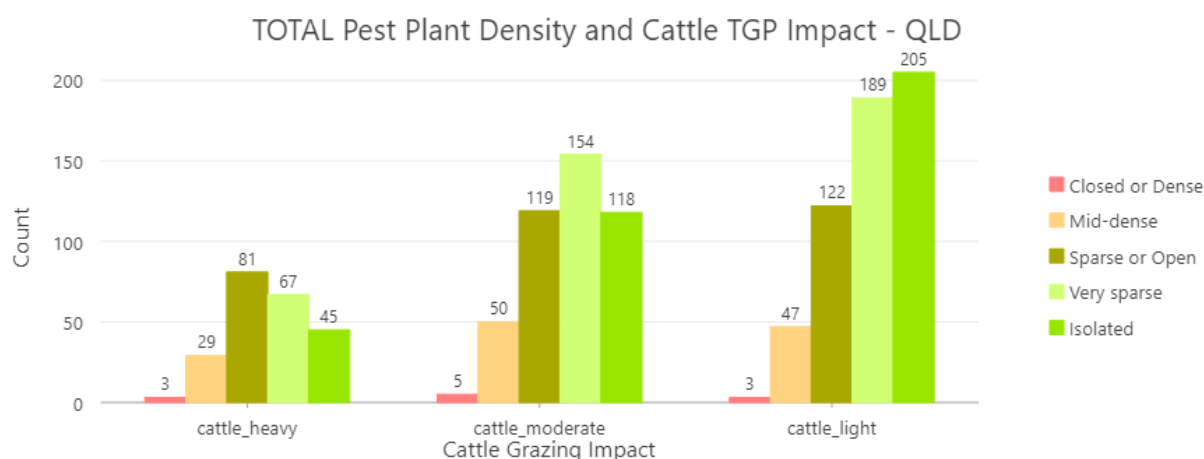
**Figure 69** Total Pest Plant Density (excludes *None Observed*)—Non-GBR.



**Figure 70** Total Pest Plant Density and Grazing ABCD—Queensland.

**Note:**

- Sites determined to be in A or B condition cannot have Total Pest Plant Densities of *Closed or Dense* (D condition) and *Mid-dense* (C condition).
- 1690 of 3666 sites (46 %) have Pest Plants present.
  - 550 (33 %) are on sites determined to be in B condition.
    - Of these, 150 sites (27 %) with a density of *Sparse or Open* pose a risk of increase.
  - 756 (45 %) are in sites determined to be in C condition.
    - Of these, 207 (27 %) with a density of *Sparse or Open* pose a risk of increase.
    - 126 (17 %) have a density of *Mid-dense*—significantly reducing productivity and requiring high on-going input costs to manage and recover.



**Figure 71** Total Pest Plant Density and Cattle Total Grazing Pressure Impact—Queensland.

**Note:**

- Of the 1690 sites assessed with Pest Plants present, 1237 sites (73 %) also had a Total Grazing Pressure (TGP), including Cattle, recorded.
- 225 sites (18 %) had a TGP value of *Heavy*; 446 (36 %) *Moderate*; and 566 (46 %) *Light*.
  - 113 sites (50 %) with *Heavy* TGP had a Total Pest Plant Density of *Sparse or Open*, *Mid-dense*, or *Closed or Dense*; 174 sites (39 %) *Moderate* TGP; 176 sites (30 %) *Light* TGP.

### 3.3.3 Pest Animals

Either sighted or signs of recent activity within or near the site.

**Note:**

- An observation of a pest animal does not influence Grazing ABCD or any other primary result.
  - Their impacts will form part of several components of the assessment e.g. pig diggings reducing pasture density, ground cover or causing soil erosion.
- Pest animals are contextual data and an input to some secondary contextual results.

**Table 63** Dominant Pest Animal Species—Regional Comparison.

Biosecurity Act Queensland Pest Animals (and agreed additions)	Region		
	GBR Catchments	Non-GBR	Queensland
None observed	2295	820	3115
feral pig* (Management) - <i>Sus scrofa</i>	221	79	300
wild dog (Management) - <i>Canis lupus familiaris</i>	79	10	89
rabbit* (Management) - <i>Oryctolagus cuniculus</i>	56	21	77
feral deer - all species* (Management) - <i>Axis</i> ; <i>Dama</i> ; <i>Cervus</i> and <i>Rusa</i> spp	27	2	29
feral horse* - <i>Equus ferus</i> spp	26	-	26
feral deer - chital* (Management) - <i>Axis axis</i>	10	-	10
Unidentified	2	4	6
feral deer -red* (Management) - <i>Cervus elaphus</i>	-	4	4
feral goat* (Management) - <i>Capra hircus</i>	-	4	4
fox* (Management) - <i>Vulpes</i>	4	-	4
feral cattle* - <i>Bos</i> spp	2	-	2
<b>Pest Animal Site Total and Region %</b>	<b>427 (16 %)</b>	<b>124 (13 %)</b>	<b>551 (15 %)</b>
<b>Total Sites</b>	<b>2722</b>	<b>944</b>	<b>3666</b>

## 3.4 Understorey and Overstorey

### 3.4.1 Dominant Understorey (Shrub) Layer Plant— Observed Data from LCAT Advanced

What is the most dominant (by weight) understorey plant (woody shrub or immature tree) that is less than 2 m tall? Exclude pasture plants and pest plants.

**Note:**

- The Dominant Understorey (Shrub) Layer Plant was recorded in 754 LCAT Advanced assessments. Second and Third most dominant species and densities are not included.
- Species and counts shown in rows shaded pale red should not have been assessed within this indicator.

**Table 64** Dominant Understorey (shrub layer) Plant Species—Regional Comparison.

Dominant Understorey Plant Label	Count QLD	Count GBR	Count Non-GBR
<b>Data from 754 LCAT Advanced assessments. Counts sorted on GBR column.</b>			
None observed	345	145	200
currant bush - Carissa	51	48	3
Unidentified	45	30	15
eucalyptus - Eucalyptus	12	10	2
bloodwoods - Corymbia	9	9	0
mimosa bush - Acacia farnesiana	91	8	83
box - Eucalyptus	11	8	3
whitewood - Atalaya hemiglauca	13	7	6
conkerberry - Carissa lanceolata	13	6	7
broad-leaved tea tree - Melaleuca	6	6	0
prickly pine - Bursaria incana	6	6	0
wattles - Acacia	6	6	0
Dallachy's gum - Corymbia dallachiana	5	5	0
ironbarks - Eucalyptus	7	4	3
gum - Eucalyptus	5	4	1
messmate - Eucalyptus tetradonta	4	4	0
Moreton Bay ash - Corymbia tessellaris	7	3	4
paperbark - Melaleuca	3	3	0
teatree - Melaleuca	3	3	0
brigalow - Acacia harpophylla	3	2	1
currant bush - Carissa ovata	3	2	1
dead finish - Acacia tetragonophylla	3	2	1
quinine - Petalostigma banksii	3	2	1
lantana* - Lantana camara	2	2	0
lillypilly - Acmena	2	2	0
Other	2	2	0
paperbark teatree - Melaleuca	2	2	0
pea bush - Sesbania	2	2	0
poplar gum - Eucalyptus platyphylla	2	2	0

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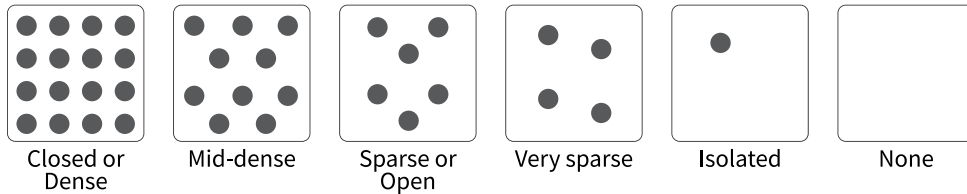
Dominant Understorey Plant Label	Count QLD	Count GBR	Count Non-GBR
soap bush - <i>Alphitonia excelsa</i>	2	2	0
limebush - <i>Citrus glauca</i>	4	1	3
beefwood - <i>Grevillea striata</i>	3	1	2
desert oak - <i>Acacia coriacea</i>	3	1	2
coolibah - <i>Eucalyptus coolabah</i>	2	1	1
quinine bush - <i>Petalostigma pubescens</i>	2	1	1
silver-leaved ironbark - <i>Eucalyptus melanophloia</i>	2	1	1
acacia - <i>Acacia</i>	1	1	0
black teatree - <i>Melaleuca bracteata</i>	1	1	0
black wattle - <i>Acacia leiocalyx</i>	1	1	0
chinee apple* - <i>Ziziphus mauritiana</i>	1	1	0
corkwood wattle - <i>Acacia bidwillii</i>	1	1	0
ghost gum - <i>Corymbia</i>	1	1	0
grey box - <i>Eucalyptus leptophleba</i>	1	1	0
hibiscus - <i>Hibiscus</i>	1	1	0
leopardwood - <i>Flindersia maculosa</i>	1	1	0
mountain coolibah - <i>Eucalyptus orgadophila</i>	1	1	0
narrow-leaved ironbark - <i>Eucalyptus crebra</i>	1	1	0
prickly acacia - <i>Acacia nilotica</i>	1	1	0
prickly acacia* - <i>Acacia nilotica</i>	1	1	0
river red gum - <i>Eucalyptus camaldulensis</i>	1	1	0
rubervine* - <i>Cryptostegia grandiflora</i>	1	1	0
sally wattle - <i>Acacia salicina</i>	1	1	0
tamarind - <i>Diploglottis diphylostegia</i>	1	1	0
yellow wood - <i>Terminalia</i>	1	1	0
yellowwood - <i>Terminalia oblongata</i>	1	1	0
false sandalwood - <i>Eremophila mitchellii</i>	8	0	8
gidgee - <i>Acacia cambagei</i>	6	0	6
poplar box - <i>Eucalyptus populnea</i>	6	0	6
eremophila - <i>Eremophila</i>	5	0	5
gutta percha - <i>Excoecaria parvifolia</i>	5	0	5
cassia - <i>Senna</i>	4	0	4
gundabluie - <i>Acacia victoriae</i>	3	0	3
mulga - <i>Acacia aneura</i>	3	0	3
wilga - <i>Geijera parviflora</i>	2	0	2
blue gum - <i>Eucalyptus tereticornis</i>	1	0	1
caustic bush - <i>Euphorbia tannensis</i>	1	0	1
creek bottlebrush - <i>Melaleuca viminalis</i>	1	0	1
cypress pine - <i>Callitris columellaris</i>	1	0	1
gum topped ironbark - <i>Eucalyptus decorticans</i>	1	0	1
hopbush - <i>Dodonaea</i>	1	0	1
lignum - <i>Muehlenbeckia florulenta</i>	1	0	1
narrow-leaved tea-tree - <i>Melaleuca citrolens</i>	1	0	1
narrow-leaved tea tree - <i>Melaleuca</i>	1	0	1

**Table 65** First, Second, and Third Most Dominant Understorey (Shrub) Layer Plant Where Observed (Not in association).

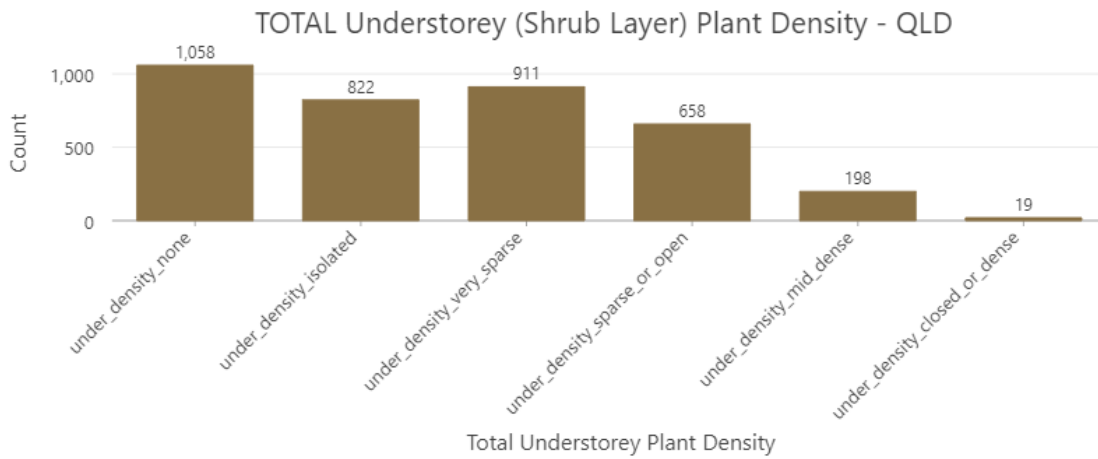
Order	Dominant Understorey	Ct	Second Dominant	Ct	Third Dominant	Ct
1	mimosa bush - Acacia farnesiana	91	Unidentified	27	Unidentified	21
2	currant bush - Carissa ovata	54	whitewood - Atalaya hemiglauca	13	currant bush - Carissa ovata	5
3	Unidentified	45	wattles - Acacia	12	ironbarks - Eucalyptus	4
4	conkerberry - Carissa lanceolata	13	currant bush - Carissa ovata	11	whitewood - Atalaya hemiglauca	3
5	whitewood - Atalaya hemiglauca	13	ironbarks - Eucalyptus	10	poplar gum - Eucalyptus platyphylla	3
6	eucalyptus - Eucalyptus	12	box - Eucalyptus	8	Other	3
7	box - Eucalyptus	11	mimosa bush - Acacia farnesiana	8	eucalyptus - Eucalyptus	3
8	bloodwoods - Corymbia	9	bloodwoods - Corymbia	6	dead finish - Acacia tetragonophylla	3
9	false sandalwood - Eremophila mitchellii	8	Dallachy's gum - Corymbia dallachiana	6	wattles - Acacia	2
10	ironbarks - Eucalyptus	7	false sandalwood - Eremophila mitchellii	6	pea bush - Sesbania	2
11	Moreton Bay ash - Corymbia tessellaris	7	beefwood - Grevillea striata	5	Moreton Bay ash - Corymbia tessellaris	2
12	wattles - Acacia	7	eremophila - Eremophila	5	mimosa bush - Acacia farnesiana	2
13	broad-leaved tea tree - Melaleuca	6	Moreton Bay ash - Corymbia tessellaris	5	gum - Eucalyptus (Corymbia)	2
14	gidgee - Acacia cambagei	6	poplar gum - Eucalyptus platyphylla	5	gidgee - Acacia cambagei	2
15	poplar box - Eucalyptus populnea	6	desert oak - Acacia coriacea	4	Dallachy's gum - Corymbia dallachiana	2
16	prickly pine - Bursaria incana	6	gundabluie - Acacia victoriae	4	conkerberry - Carissa lanceolata	2
17	Dallachy's gum - Corymbia dallachiana	5	teatree - Melaleuca	4	bloodwoods - Corymbia	2
18	eremophila - Eremophila	5	black wattle - Acacia leiocalyx	3	beefwood - Grevillea striata	2
19	gum - Eucalyptus	5	cassia - Senna	3	bauhinia - Lysiphylum	2
20	gutta percha - Excoecaria parvifolia	5	conkerberry - Carissa lanceolata	3	wait-a-while - Capparis lasiantha	1
21	paperbark teatree - Melaleuca	5	dead finish - Acacia tetragonophylla	3	teatree - Melaleuca	1
22	cassia - Senna	4	gidgee - Acacia cambagei	3	silver-leaved ironbark - Eucalyptus mela	1
23	limebush - Citrus glauca	4	prickly pine - Bursaria incana	3	quinine bush - Petalostigma pubescens	1
24	messmate - Eucalyptus tetrodonta	4	eucalyptus - Eucalyptus	2	narrow-leaved ironbark - Eucalyptus cre	1
25	beefwood - Grevillea striata	3	gutta percha - Excoecaria parvifolia	2	narrow-leaved bloodwood - Corymbia	1
26	brigalow - Acacia harpophylla	3	leopardwood - Flindersia maculosa	2	myrtle - Calytrix	1
27	desert oak - Acacia coriacea	3	messmate - Eucalyptus tetrodonta	2	mulga - Acacia aneura	1
28	gundabluie - Acacia victoriae	3	narrow-leaved ironbark - Eucalyptus cre	2	messmate - Eucalyptus tetrodonta	1
29	mulga - Acacia aneura	3	Other	2	limebush - Citrus glauca	1
30	quinine - Petalostigma banksii	3	reid river box - Eucalyptus brownii	2	lillypilly - Acmena	1
31	teatree - Melaleuca	3	soap bush - Alphitonia excelsa	2	leopardwood - Flindersia maculosa	1
32	coolibah - Eucalyptus coolabah	2	wild orange - Capparis	2	hopbush - Dodonaea	1
33	dead finish - Acacia tetragonophylla	2	yellow wood - Terminalia	2	hibiscus - Hibiscus	1
34	lillypilly - Acmena	2	bauhinia - Lysiphylum	1	false sandalwood - Eremophila mitchellii	1
35	narrow-leaved tea-tree - Melaleuca citro	2	black tea-tree - Melaleuca acacioides	1	eremophila - Eremophila	1
36	Other	2	blue gum - Eucalyptus tereticornis	1	dysentery bush - Grewia retusifolia	1
37	pea bush - Sesbania	2	box - Eucalyptus brownii	1	desert oak - Acacia coriacea	1
38	poplar gum - Eucalyptus platyphylla	2	broom bush - Apophyllum anomalum	1	corkwood wattle - Acacia bidwillii	1
39	quinine bush - Petalostigma pubescens	2	bulloak - Allocasuarina luehmannii	1	broad-leaved tea tree - Melaleuca	1
40	silver-leaved ironbark - Eucalyptus mela	2	coolibah - Eucalyptus coolabah	1	box - Eucalyptus brownii	1
41	soap bush - Alphitonia excelsa	2	corkwood wattle - Acacia bidwillii	1		
42	wilga - Geijera parviflora	2	cypress pine - Callitris columellaris	1		
43	yellowwood - Terminalia oblongata	2	figs - Ficus	1		
44	black teatree - Melaleuca bracteata	1	grey box - Eucalyptus leptophleba	1		
45	black wattle - Acacia leiocalyx	1	hibiscus - Hibiscus	1		
46	blue gum - Eucalyptus tereticornis	1	kurrajong - Brachychiton collinus	1		
47	caustic bush - Euphorbia tannensis	1	mint bush - Prostanthera suborbicularis	1		
48	corkwood wattle - Acacia bidwillii	1	mulga - Acacia aneura	1		
49	creek bottlebrush - Melaleuca viminalis	1	myrtle - Calytrix	1		
50	cypress pine - Callitris columellaris	1	narrow-leaved tea tree - Melaleuca	1		
51	ghost gum - Corymbia	1	paperbark - Melaleuca	1		
52	grey box - Eucalyptus leptophleba	1	poplar box - Eucalyptus populnea	1		
53	gum topped ironbark - Eucalyptus decor	1	quinine bush - Petalostigma pubescens	1		
54	hibiscus - Hibiscus	1	river she-oak - Casuarina cunninghamia	1		
55	hopbush - Dodonaea	1	sally wattle - Acacia salicina	1		
56	leopardwood - Flindersia maculosa	1	screw palms - Pandanus	1		
57	lignum - Muehlenbeckia florulenta	1	silver-leaved ironbark - Eucalyptus mela	1		
58	mountain coolibah - Eucalyptus orgadop	1	wilga - Geijera parviflora	1		
59	narrow-leaved ironbark - Eucalyptus cre	1				
60	river red gum - Eucalyptus camaldulens	1				
61	sally wattle - Acacia salicina	1				
62	tamarind - Diploglottis diphylostegia	1				

### 3.4.2 Total Understorey (Shrub) Layer Density—Observed Data

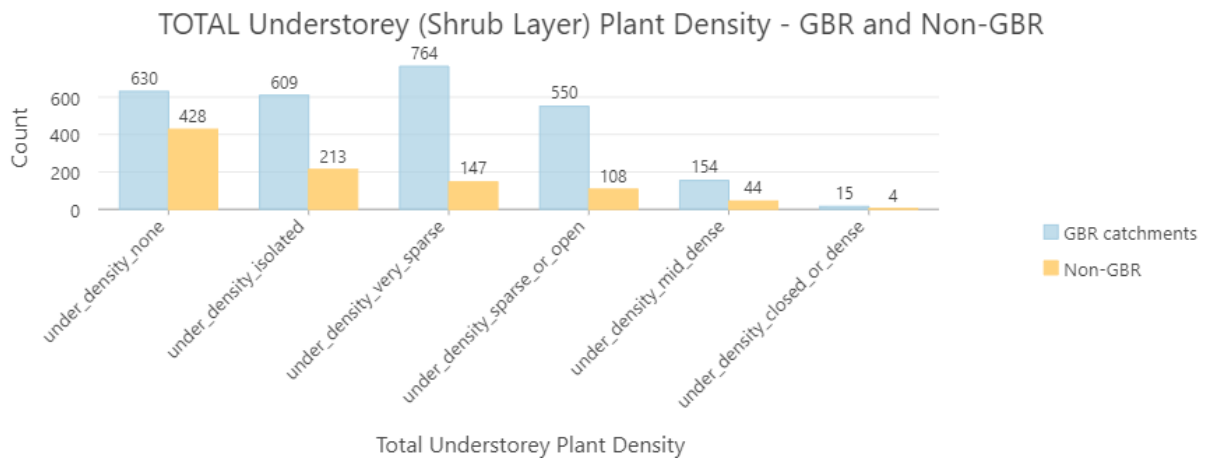
What is the density of ALL understorey plants (woody shrubs or immature tree) that are less than 2 m tall? Exclude pasture plants and pest plants.



**Image 11** Total Understorey (Shrub) Layer Values.



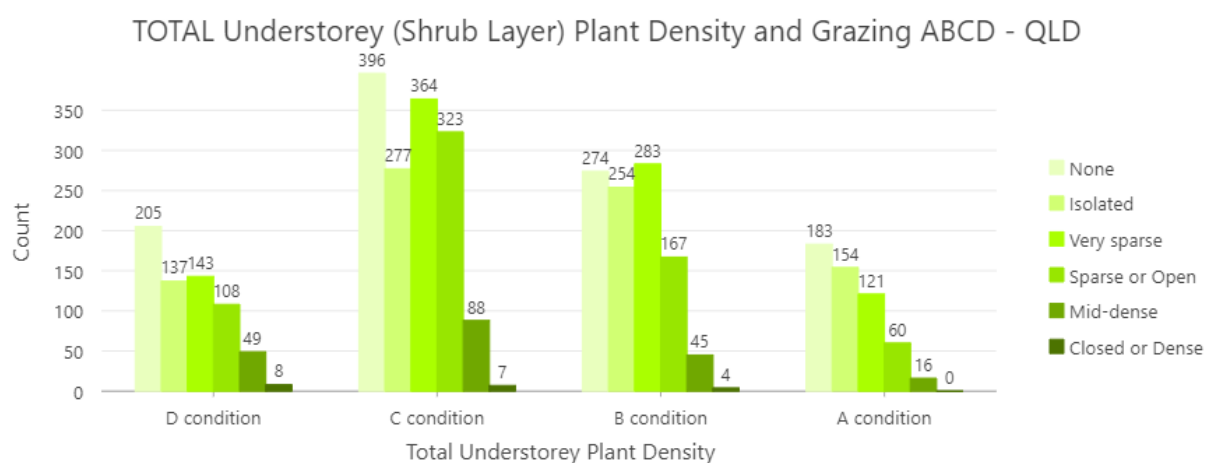
**Figure 72** Total Understorey (shrub layer) Plant Density—Queensland.



**Figure 73** Total Understorey (shrub layer) Plant Density—GBR Catchments and Non-GBR.

**Table 66** Percentage (%) Total Understorey (Shrub) Layer Density—Regional Comparison.

Region	% Total Understorey (Shrub) Layer Density					
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense
GBR Catchments	23	22	28	20	6	1
Non-GBR	45	23	16	11	5	0
<b>Queensland</b>	<b>29</b>	<b>22</b>	<b>25</b>	<b>18</b>	<b>5</b>	<b>1</b>



**Figure 74** Total Understorey (shrub layer) Plant Density and Grazing ABCD—Queensland.

**Table 67** Percentage (%) Total Understorey (Shrub) Layer Density and Grazing ABCD—Queensland.

Total Understorey (Shrub) Layer Density	Grazing ABCD				Queensland Total %
	D condition	C condition	B condition	A condition	
None	32	27	27	34	29
Isolated	21	19	25	29	22
Very sparse	22	25	28	23	25
Sparse or Open	17	22	16	11	18
Mid-dense	8	6	4	3	5
Closed or Dense	1	0	0	0	1

**Note:**

- Understorey shrub densities largely reflect the structure found in the extensive grazing lands of the west and the managed/modified landscapes predominant in the east.

### 3.4.3 Dominant Overstorey (Tree) Layer Plant—Observed Data from LCAT Advanced

What is the most dominant (by weight) live overstorey plant that is more than 2 m tall? Typically trees but may include woody shrubs that are more than 2 m. Exclude pasture plants and pest plants.

**Note:**

- The Dominant Overstorey (Tree) Layer Plant was recorded in 754 LCAT Advanced assessments. Second and Third most dominant species and densities are not included.
- Species and counts shaded pale red should not have been assessed within this indicator.



**Table 68** Dominant Overstorey (tree layer) Plant Species—Regional Comparison.

Dominant Overstorey Plant Label	Count QLD	Count GBR	Count Non-GBR
<b>Data from 754 LCAT Advanced assessments. Counts sorted on GBR column.</b>			
None observed	322	91	231
ironbarks - Eucalyptus	50	39	11
narrow-leaved ironbark - Eucalyptus crebra	32	29	3
box - Eucalyptus	26	25	1
bloodwoods - Corymbia	25	22	3
Moreton Bay ash - Corymbia tessellaris	21	20	1
Unidentified	22	13	9
Eucalyptus - Eucalyptus	17	11	6
poplar gum - Eucalyptus platyphylla	11	11	0
Dallachy's gum - Corymbia dallachiana	10	10	0
Queensland blue gum - Eucalyptus tereticornis	12	10	2
false sandalwood - Eremophila mitchellii	12	9	3
reid river box - Eucalyptus brownii	9	9	0
brigalow - Acacia harpophylla	10	6	4
gum - Eucalyptus (Corymbia)	11	6	5
bauhinia - Lysiphyllum	4	4	0
paperbark - Melaleuca	4	4	0
silver-leaved ironbark - Eucalyptus melanophloia	10	4	6
blackbutt - Eucalyptus pilularis	3	3	0
ghost gum - Corymbia	7	3	4
Leichhardt's tree - Nauclea orientalis	3	3	0
black tea-tree - Melaleuca acacioides	2	2	0
blackwood - Acacia argyrodendron	2	2	0
ghost gum - Corymbia dallachiana	2	2	0
grey box - Eucalyptus leptophleba	2	2	0
mountain coolibah - Eucalyptus orgadophila	2	2	0
poplar box - Eucalyptus populnea	15	2	13
beefwood - Grevillea striata	5	1	4
black wattle - Acacia leiocalyx	1	1	0
black wattle - Acacia salicina	1	1	0
box - Eucalyptus brownii	1	1	0
broad-leaved tea tree - Melaleuca	1	1	0
cabbage palm - Livistona australis	1	1	0
cedar - Palaquium	1	1	0
coolibah - Eucalyptus coolabah	12	1	11
ironwood - Acacia excelsa	2	1	1
leopardwood - Flindersia maculosa	1	1	0
messmate - Eucalyptus tetradonta	1	1	0
napunyah - Eucalyptus thozetiana	1	1	0
Normanton box - Eucalyptus normantonensis	1	1	0
quinine bush - Petalostigma pubescens	1	1	0
river red gum - Eucalyptus camaldulensis	1	1	0
spotted gum - Corymbia citriodora	1	1	0

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Dominant Overstorey Plant Label	Count QLD	Count GBR	Count Non-GBR
teatree - Melaleuca	1	1	0
wattles - Acacia	1	1	0
boree - Acacia cana	1	0	1
corkwood wattle - Acacia bidwillii	8	0	8
dead finish - Acacia tetragonophylla	3	0	3
gidgee - Acacia cambagei	18	0	18
gum-topped bloodwood - Corymbia	1	0	1
gutta percha - Excoecaria parvifolia	1	0	1
hakea - Hakea	1	0	1
mimosa bush - Acacia farnesiana	2	0	2
mulga - Acacia aneura	3	0	3
myall - Acacia pendula	4	0	4
narrow-leaved tea-tree - Melaleuca citrolens	3	0	3
prickly acacia - Acacia nilotica	4	0	4
serpentine ironbark - Corymbia xanthope	1	0	1
silver-leaved box - Eucalyptus pruinosa	3	0	3
supplejack - Ventilago viminalis	7	0	7
vinetree - Ventilago viminalis	2	0	2
whitewood - Atalaya hemiglauca	11	0	11
yapunyah - Eucalyptus ochrophloia	1	0	1

**Table 69** First, Second, and Third Most Dominant Overstorey (Tree) Layer Plant Where Observed (Not in association).

Order	Dominant Overstorey	Ct	Second Dominant	Ct	Third Dominant	Ct
1	ironbarks - Eucalyptus	50	bloodwoods - Corymbia	30	bloodwoods - Corymbia	19
2	narrow-leaved ironbark - Eucalyptus cre	32	ironbarks - Eucalyptus	25	Unidentified	12
3	box - Eucalyptus	26	Moreton Bay ash - Corymbia tessellaris	17	whitewood - Atalaya hemiglauca	9
4	bloodwoods - Corymbia	25	gum - Eucalyptus	17	Moreton Bay ash - Corymbia tessellaris	8
5	Unidentified	22	Unidentified	16	poplar gum - Eucalyptus platyphylla	7
6	Moreton Bay ash - Corymbia tessellaris	21	poplar gum - Eucalyptus platyphylla	11	Eucalyptus - Eucalyptus	5
7	gidyea - Acacia cambagei	18	whitewood - Atalaya hemiglauca	10	teatree - Melaleuca	4
8	Eucalyptus - Eucalyptus	17	Eucalyptus - Eucalyptus	10	reid river box - Eucalyptus brownii	4
9	poplar box - Eucalyptus populnea	15	box - Eucalyptus	10	ironbarks - Eucalyptus	4
10	false sandalwood - Eremophila mitchellii	12	poplar box - Eucalyptus populnea	9	myrtle - Calytrix	3
11	coolibah - Eucalyptus coolabah	12	narrow-leaved ironbark - Eucalyptus cre	8	baubinia - Lysiphyllum	3
12	whitewood - Atalaya hemiglauca	11	false sandalwood - Eremophila mitchellii	7	prickly pine - Bursaria incana	2
13	poplar gum - Eucalyptus platyphylla	11	beefwood - Grevillea striata	7	poplar box - Eucalyptus populnea	2
14	gum - Eucalyptus (Corymbia)	11	baubinia - Lysiphyllum gilvum	7	narrow-leaved ironbark - Eucalyptus cre	2
15	silver-leaved ironbark - Eucalyptus mela	10	gidgee - Acacia cambagei	6	lillypilly - Acmena	2
16	Dallachy's gum - Corymbia dallachiana	10	teatree - Melaleuca	5	leopardwood - Flindersia maculosa	2
17	brigalow - Acacia harpophylla	10	silver-leaved ironbark - Eucalyptus mela	5	lemon-scented gum - Corymbia citriodor	2
18	reid river box - Eucalyptus brownii	9	river red gum - Eucalyptus camaldulens	5	kurrajong - Brachychiton collinus	2
19	corkwood wattle - Acacia bidwillii	8	blue gum - Eucalyptus tereticornis	5	ghost gum - Corymbia dallachiana	2
20	blue gum - Eucalyptus tereticornis	8	reid river box - Eucalyptus brownii	4	false sandalwood - Eremophila mitchellii	2
21	supplejack - Ventilago viminalis	7	wattles - Acacia	3	box - Eucalyptus	2
22	myall - Acacia pendula	7	paperbark teatree - Melaleuca	3	bottle tree - Brachychiton	2
23	ghost gum - Corymbia	6	mulga - Acacia aneura	3	beefwood - Grevillea striata	2
24	beefwood - Grevillea striata	5	ghost gum - Corymbia dallachiana	3	river she-oak - Casuarina cunninghamia	1
25	Queensland blue gum - Eucalyptus tere	4	ghost gum - Corymbia	3	quinine - Petalostigma banksii	1

26	paperbark - Melaleuca	4	dead finish - Acacia tetragonophylla	3	paperbark teatree - Melaleuca	1
27	bauhinia - Lysiphyllum	4	Dallachy's gum - Corymbia dallachiana	3	paperbark - Melaleuca	1
28	silver-leaved box - Eucalyptus pruinosa	3	black tea-tree - Melaleuca acacioides	3	myall - Acacia pendula	1
29	narrow-leaved tea-tree - Melaleuca citro	3	western bloodwood - Corymbia terminal	2	mountain coolibah - Eucalyptus orgadop	1
30	Leichhardt's tree - Nauclea orientalis	3	spotted gum - Corymbia citriodora	2	messmate - Eucalyptus tetradonta	1
31	dead finish - Acacia tetragonophylla	3	Queensland bluebush - Chenopodium a	2	lancewood - Acacia shirleyi	1
32	blackbutt - Eucalyptus pilularis	3	narrow-leaved bloodwood - Corymbia	2	gutta percha - Excoecaria parvifolia	1
33	vinetree - Ventilago viminalis	2	myall - Acacia pendula	2	gum - Eucalyptus	1
34	mountain coolibah - Eucalyptus orgadop	2	limebush - Citrus glauca	2	gidgee - Acacia cambagei	1
35	mimosa bush - Acacia farnesiana	2	Leichhardt's tree - Nauclea orientalis	2	figs - Ficus	1
36	ironwood - Acacia excelsa	2	desert oak - Acacia coriacea	2	desert oak - Acacia coriacea	1
37	grey box - Eucalyptus leptophleba	2	corkwood wattle - Acacia bidwillii	2	dead finish - Acacia tetragonophylla	1
38	ghost gum - Corymbia dallachiana	2	coolibah - Eucalyptus coolabah	2	cypress pine - Callitris columellaris	1
39	blackwood - Acacia argyrodendron	2	bottle tree - Brachychiton	2	corkwood wattle - Acacia bidwillii	1
40	black tea-tree - Melaleuca acacioides	2	black wattle - Acacia leiocalyx	2	Cooktown ironwood - Erythrophleum ch	1
41	yapunyah - Eucalyptus ochrophloia	1	yellowjack - Corymbia leichhardtii	1	conkerberry - Carissa lanceolata	1
42	wattles - Acacia	1	yellow wood - Terminalia	1	Clarkson's bloodwood - Corymbia clarks	1
43	teatree - Melaleuca	1	supplejack - Ventilago viminalis	1	broad-leaved tea tree - Melaleuca	1
44	spotted gum - Corymbia citriodora	1	smooth-barked apple gum - Angophora	1	blue gum - Eucalyptus tereticornis	1
45	serpentine ironbark - Corymbia xanthop	1	silver-leaved box - Eucalyptus pruinosa	1		
46	river red gum - Eucalyptus camaldulens	1	sally wattle - Acacia salicina	1		
47	quinine bush - Petalostigma pubescens	1	Queensland blue gum - Eucalyptus tere	1		
48	Normanton box - Eucalyptus normanton	1	Other	1		
49	napunyah - Eucalyptus thozetiana	1	Normanton box - Eucalyptus normanton	1		
50	messmate - Eucalyptus tetradonta	1	messmate - Eucalyptus tetradonta	1		
51	leopardwood - Flindersia maculosa	1	lillypilly - Acmena	1		
52	hakea - Hakea	1	lemon-scented gum - Corymbia citriodo	1		
53	gutta percha - Excoecaria parvifolia	1	kurrajong - Brachychiton collinus	1		
54	gum-topped bloodwood - Corymbia	1	gutta percha - Excoecaria parvifolia	1		
55	cedar - Palaquium	1	gum-topped bloodwood - Corymbia	1		
56	cabbage palm - Livistona australis	1	grey box - Eucalyptus leptophleba	1		
57	broad-leaved tea tree - Melaleuca	1	grevilleas - Grevillea	1		
58	box - Eucalyptus brownii	1	emu apple - Owenia acidula	1		
59	boree - Acacia cana	1	cypress pine - Callitris columellaris	1		
60	black wattle - Acacia salicina	1	creek bottlebrush - Melaleuca viminalis	1		
61	black wattle - Acacia leiocalyx	1	butter bush - Senna artemisioides	1		
62			budgeroo - Lysicarpus angustifolius	1		
63			broad-leaved tea tree - Melaleuca	1		
64			blackwood - Acacia argyrodendron	1		
65			blackbutt - Eucalyptus pilularis	1		

### 3.4.4 Total Overstorey (Tree) Layer Plant Density— Observed Data

What is the density of ALL live overstorey plants that are more than 2 m tall?  
Typically trees but may include woody shrubs that are more than 2 m. Exclude  
pasture plants and pest plants.

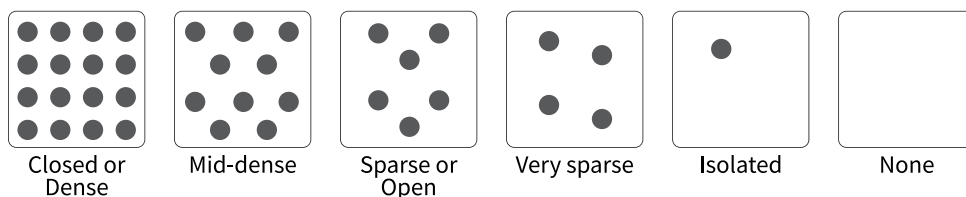
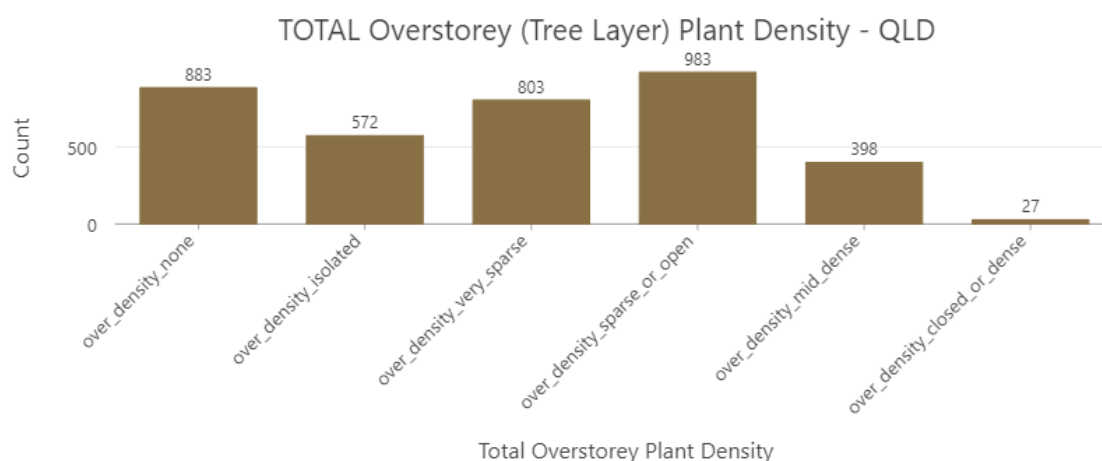
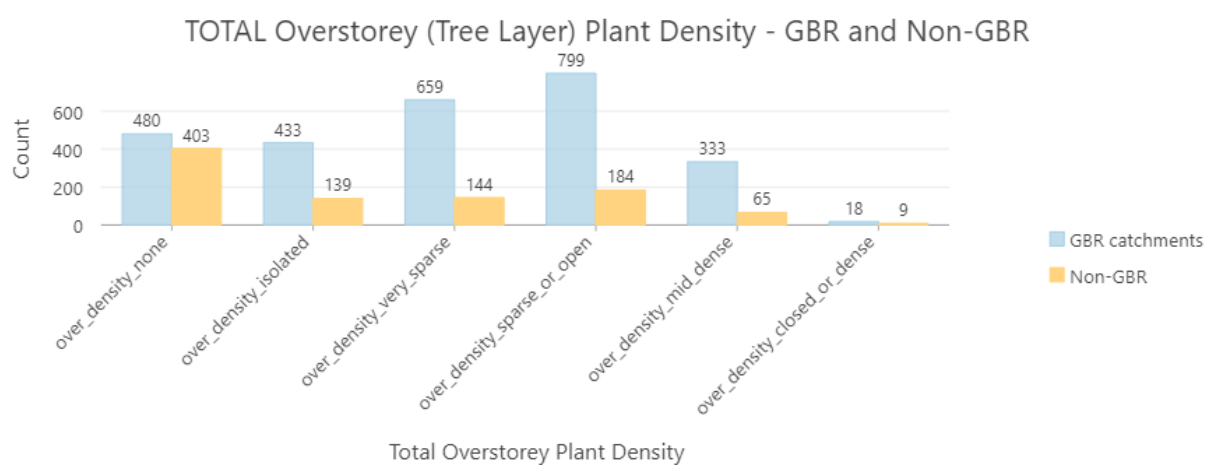


Image 12 Total Overstorey (Tree) Layer Values.



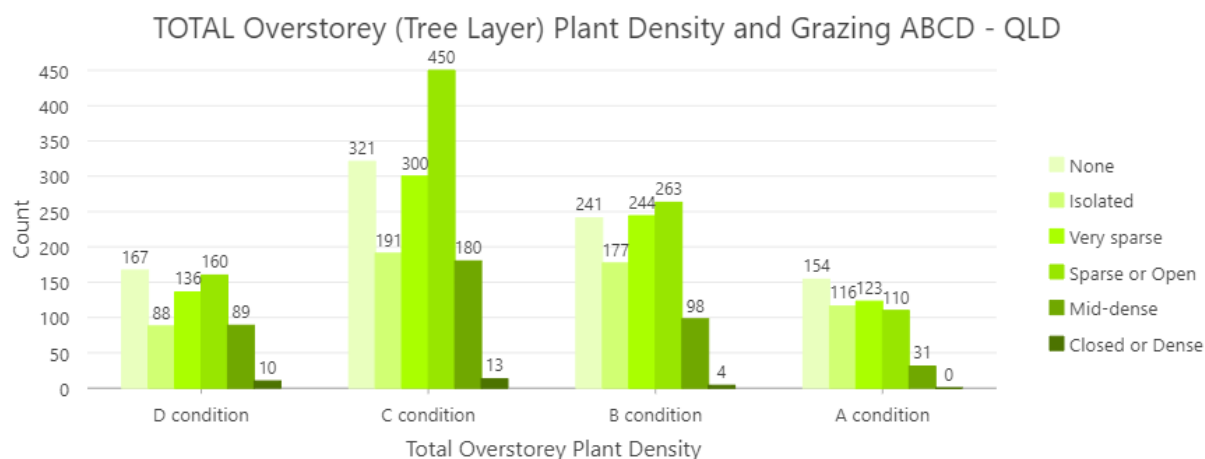
**Figure 75** Total Overstorey (tree layer) Plant Density—Queensland.



**Figure 76** Total Overstorey (tree layer) Plant Density—GBR Catchments and Non-GBR.

**Table 70** Percentage (%) Total Overstorey (Tree) Layer Density—Regional Comparison.

Region	% Total Overstorey (Tree) Layer Density					
	None	Isolated	Very sparse	Sparse or Open	Mid-dense	Closed or Dense
GBR Catchments	18	16	24	29	12	1
Non-GBR	43	15	15	19	7	1
<b>Queensland</b>	<b>24</b>	<b>16</b>	<b>22</b>	<b>27</b>	<b>11</b>	<b>1</b>



**Figure 77** Total Overstorey (tree layer) Plant Density and Grazing ABCD—Queensland.

**Table 71** Percentage (%) Total Overstorey (Tree) Layer Density and Grazing ABCD—Queensland.

Total Overstorey (Tree) Layer Density	Grazing ABCD				Queensland Total %
	D condition	C condition	B condition	A condition	
None	26	22	23	29	24
Isolated	14	13	17	22	16
Very sparse	21	21	24	23	22
Sparse or Open	25	31	26	21	27
Mid-dense	14	12	10	6	11
Closed or Dense	2	1	0	0	1

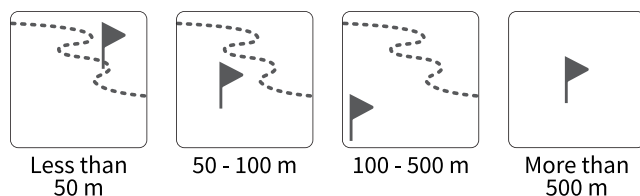
**Note:**

- Overstorey tree densities largely reflect the structure found in the extensive grazing lands of the west and the managed/modified landscapes predominant in the east.

## 3.5 Riparian Zone

### 3.5.1 Distance from Any Permanent or Semi-permanent Watercourse or Waterbody—Observed Data

Exclude small stock dams and small excavations that are <1 ha.



**Image 13** Distance from Any Permanent or Semi-permanent Watercourse or Waterbody Values.

**Note:**

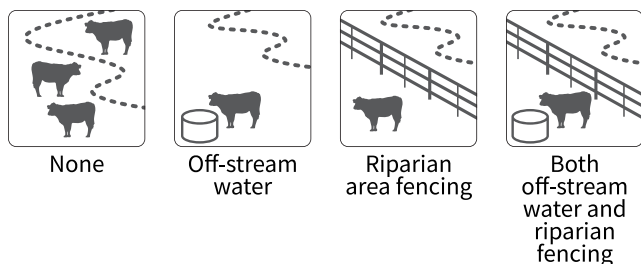
- The LCAT requires an assessor to determine the distance a land condition Site is from any permanent or semi-permanent watercourse or waterbody.
  - Riparian Zone indicators do not contribute to the Grazing ABCD Result.
- Where the distance is 100 m or less, presence of riparian zone infrastructure is recorded, and riparian zone disturbance and stream bank erosion assessed.
  - These indicators do influence any primary land condition result and are used as inputs to contextual secondary results only.
- Where the distance is 50 m or less, additional indicators including watercourse profile, bank slope, bank sediment size, and watercourse dimensions are assessed.
  - This distance opens an additional primary result—*Indicative Riparian Zone Stability*.

**Table 72** Count and Percentage (%) of Site Proximity to Water—Regional Comparison.

Regions	Distance from Watercourse or Waterbody								Total	
	Riparian				Non-riparian					
	< 50 m		50 – 100 m		100 – 500 m		> 500 m			
	Count	%	Count	%	Count	%	Count	%	Count	%
GBR catchments	265	10	285	10	556	20	1616	59	2722	100
Non-GBR	62	7	50	5	119	13	713	76	944	100
<b>Queensland</b>	<b>327</b>	<b>9</b>	<b>335</b>	<b>9</b>	<b>675</b>	<b>18</b>	<b>2329</b>	<b>64</b>	<b>3666</b>	<b>100</b>
<b>Count Rip. and Non-rip.</b>	<b>662</b>				<b>3004</b>				<b>3666</b>	<b>NA</b>
<b>% Riparian and Non-rip.</b>	<b>18</b>				<b>72</b>				<b>NA</b>	<b>100</b>

### 3.5.2 Management of Riparian Zone—Observed Data

Is infrastructure used to manage stock access to the riparian zone?



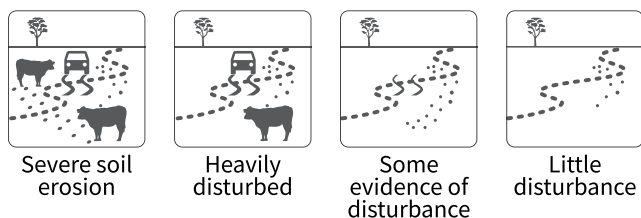
**Image 14** Riparian Zone Infrastructure Values.

**Table 73** Count & Percentage (%) of Riparian Zone Infrastructure by Infrastructure Type—Regional.

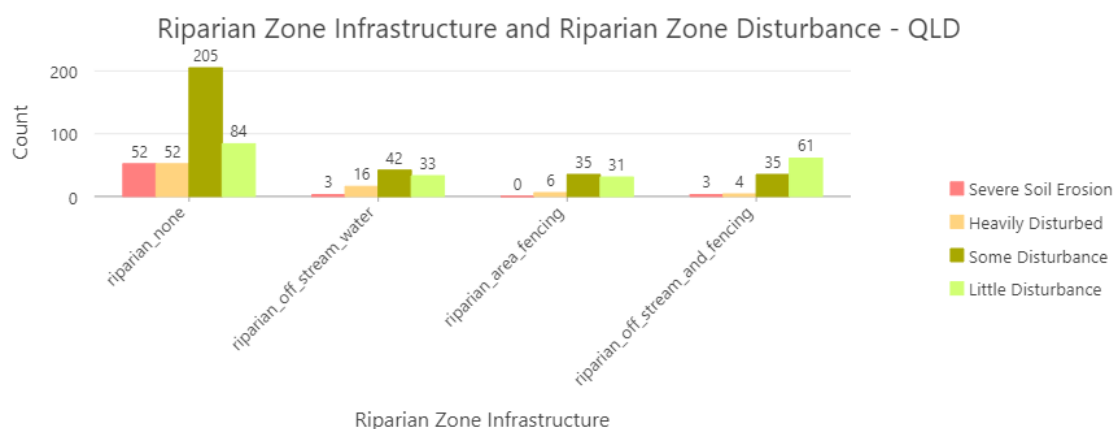
Regions	Management of Riparian Zone (Riparian Zone Infrastructure)												Total Count
	None			Off-stream Water			Riparian Fencing			Off Water & Fencing			
	Ct.	% Infra	% Reg	Ct.	% Infra	% Reg	Ct.	% Infra	% Reg	Ct.	% Infra	% Reg	
GBR catchments	313	80	11	87	93	3	56	78	2	94	91	3	550
Non-GBR	80	20	8	7	7	1	16	22	2	9	9	1	112
<b>Queensland</b>	<b>393</b>	<b>100</b>	<b>11</b>	<b>94</b>	<b>100</b>	<b>3</b>	<b>72</b>	<b>100</b>	<b>2</b>	<b>103</b>	<b>100</b>	<b>3</b>	<b>662</b>

### 3.5.3 Riparian Zone Disturbance—Observed Data

What is the most severe erosional impact of livestock, pests or vehicles within the riparian area?



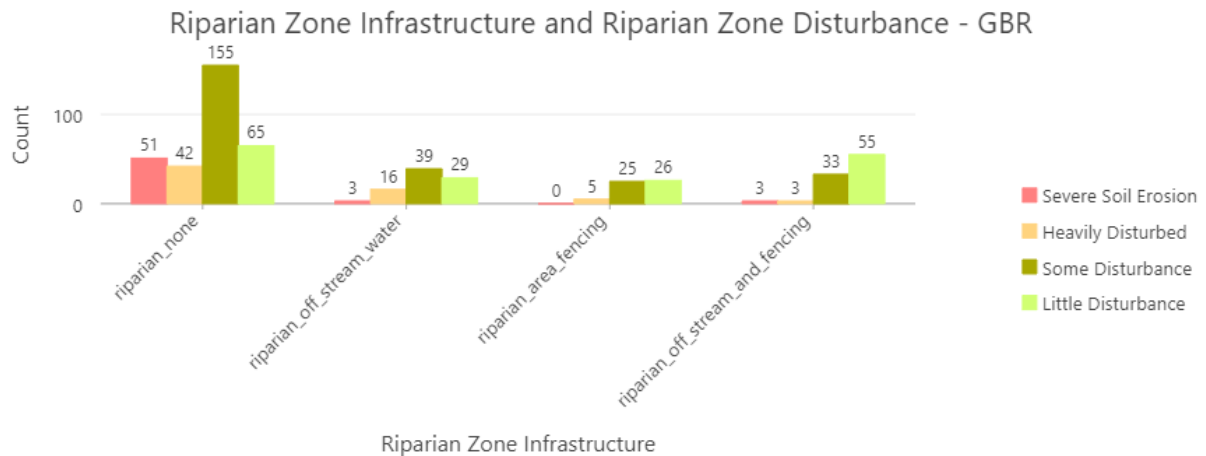
**Image 15** Riparian Zone Disturbance Values.



**Figure 78** Riparian Zone Infrastructure and Riparian Zone Disturbance—Queensland.

**Note:**

- 662 sites in Queensland include an assessment of Riparian Zone impacts.



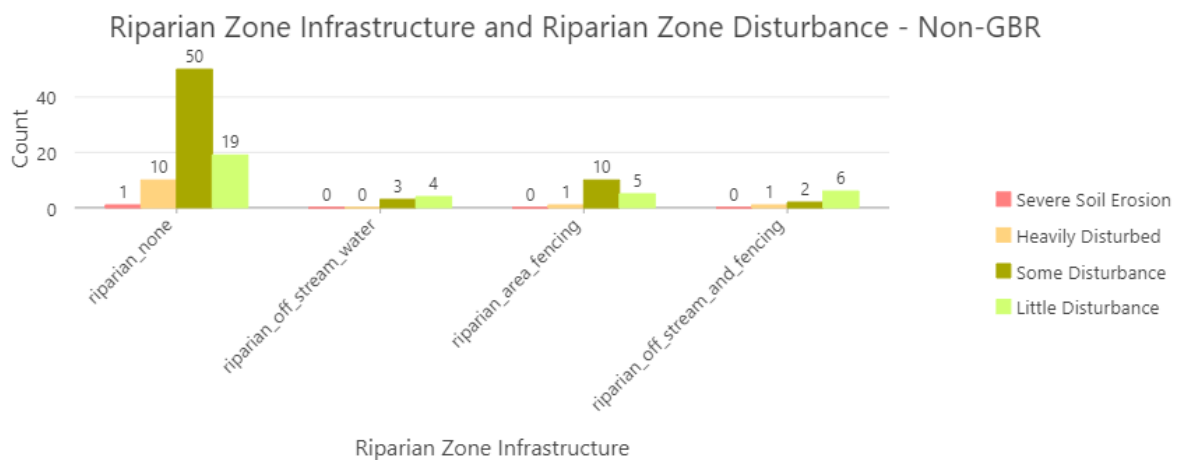
**Figure 79** Riparian Zone Infrastructure and Riparian Zone Disturbance—GBR Catchments.

**Table 74** Percentage (%) Riparian Zone Disturbance and Riparian Zone Infrastructure—GBR Catchments.

Riparian Zone Disturbance	Riparian Zone Infrastructure—GBR Catchments			
	None	Off-stream Water	Riparian Area Fencing	Riparian Area Fencing and Off-stream Fencing
Severe Soil Erosion	16	3	0	3
Heavily Disturbed	13	18	9	3
Some Disturbance	50	45	45	35
Little Disturbance	21	33	46	59

**Note:**

- 550 sites (83 %) in GBR Catchments include an assessment of Riparian Zone impacts.
- 400 (73 %) of the 550 sites have *None* or *Off-stream Water* infrastructure.
- 112 (28 %) have riparian zones with *Severe Soil Erosion* or are *Heavily Disturbed*. 145 sites (36 %) including *Some Disturbance*.
- 150 (27 %) of the 550 sites have *Riparian Area Fencing* or both *Off-stream Water* and *Riparian Area Fencing* infrastructure.
- 58 sites (39 %) have riparian zones with *Some Disturbance* and increases to 139 sites (93 %) including *Little Disturbance*.
  - 11 (7 %) have *Severe Soil Erosion* or are *Heavily Disturbed*.



**Figure 80** Riparian Zone Infrastructure and Riparian Zone Disturbance—Non-GBR.

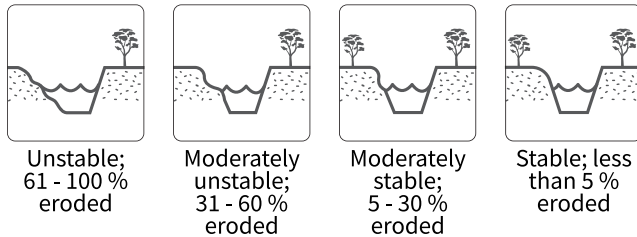


**Note:**

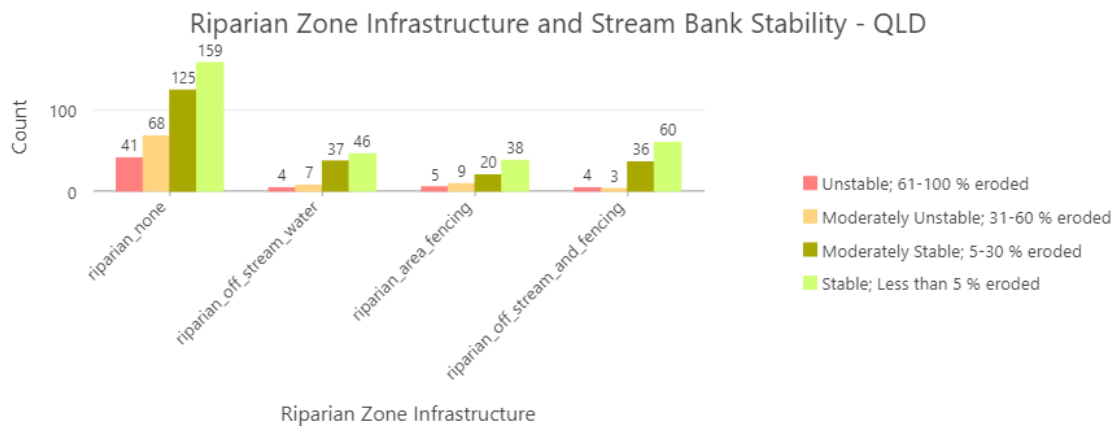
- 112 sites (17 %) in the Non-GBR include an assessment of Riparian Zone impacts.
- 87 (78 %) of the 112 sites have *None* or *Off-stream Water* infrastructure.
- 64 (57 %) have *Severe Soil Erosion*, are *Heavily Disturbed* or have *Some Disturbance*.
- 34 sites (30 %) have riparian zones with *Little Disturbance*.

### 3.5.4 Stream Bank Erosion—Observed Data

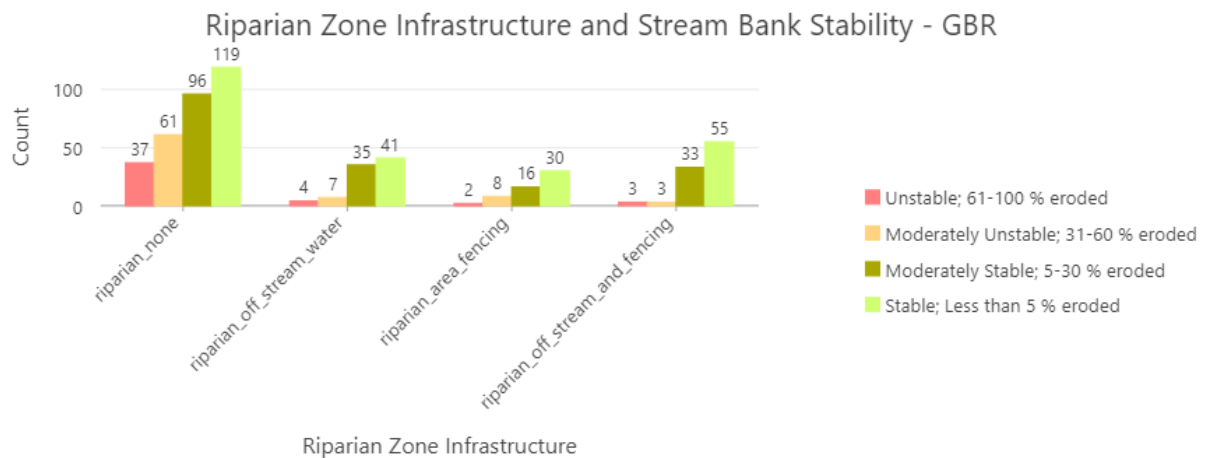
What is the relative stability of the sighted stream banks?



**Image 16** Stream Bank Erosion Values.



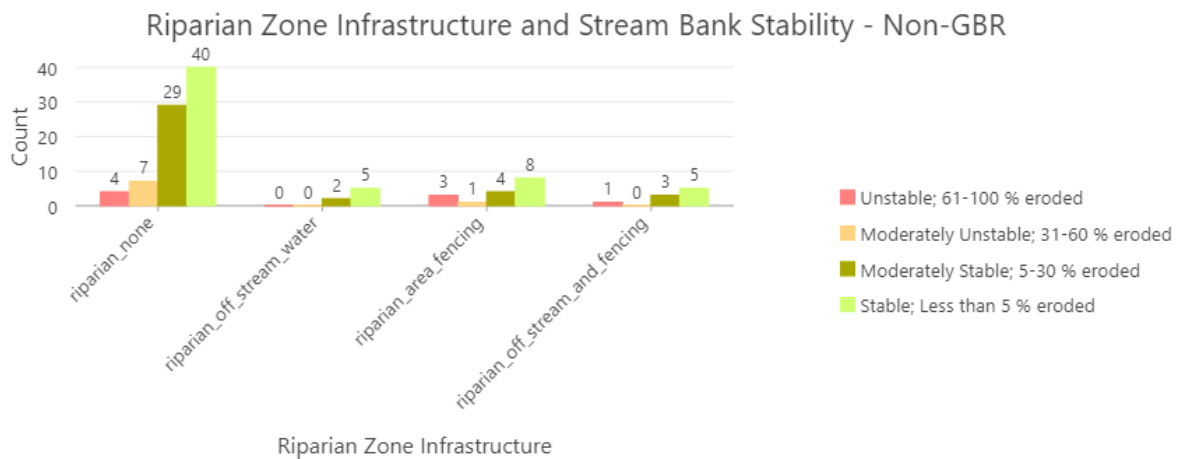
**Figure 81** Riparian Zone Infrastructure and Stream Bank Erosion—Queensland.



**Figure 82** Riparian Zone Infrastructure and Stream Bank Erosion—GBR Catchments.

**Note:**

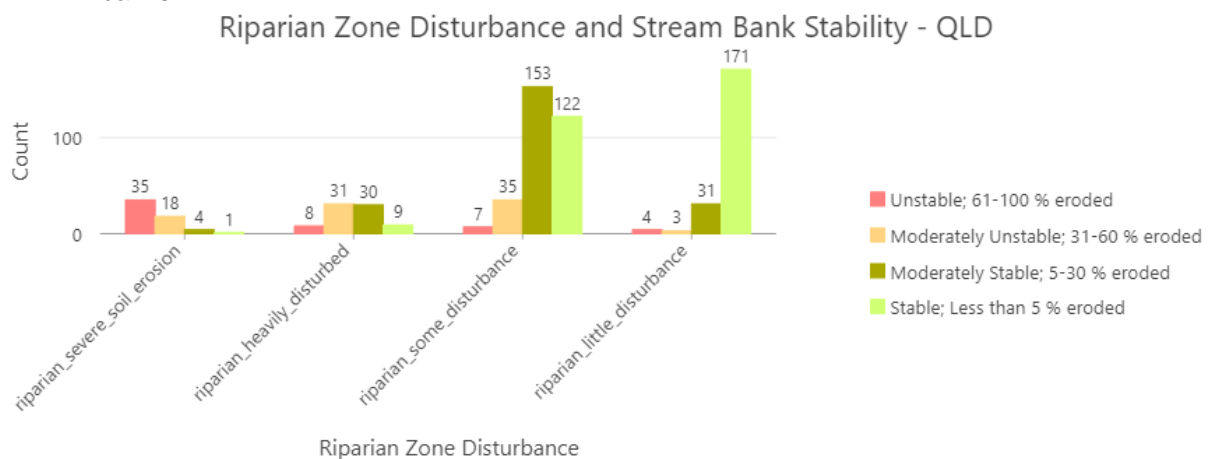
- 550 sites (83 %) in the GBR Catchments include an assessment of Riparian Zone impacts.
- 400 (73 %) of the 550 sites have *None* or *Off-stream Water* infrastructure.
- 109 (27 %) have riparian zones with *Unstable* or *Moderately Unstable banks*. 240 sites (60 %) including *Moderately Stable*.
- 150 (27 %) of the 550 sites have *Riparian Area Fencing* or both *Off-stream Water* and *Riparian Area Fencing* infrastructure.
- 49 sites (33 %) have riparian zones that are *Moderately Stable* and increases to 1349 sites (89 %) including *Stable*.
  - 16 (11 %) have riparian zones with *Unstable* or *Moderately Unstable* banks.



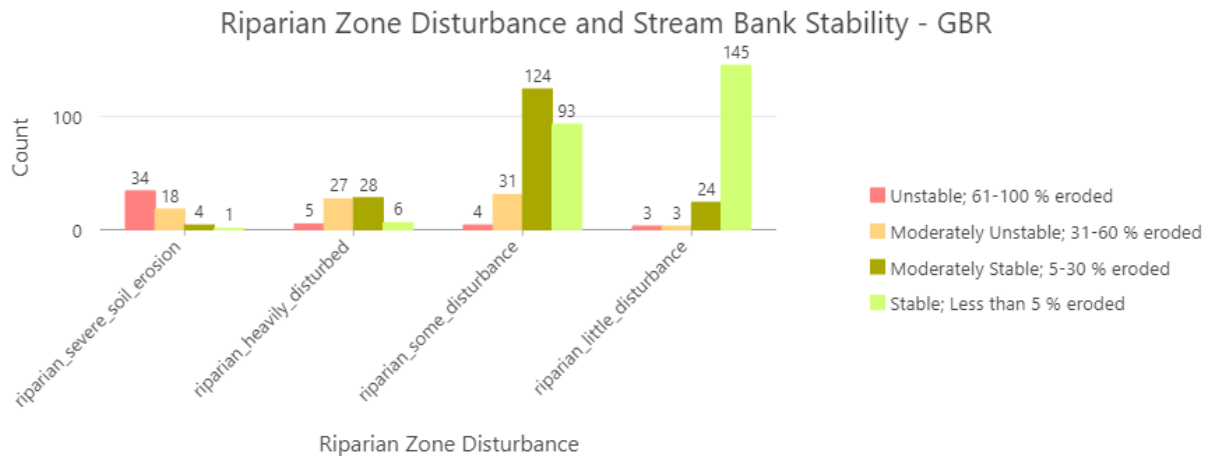
**Figure 83** Riparian Zone Infrastructure and Stream Bank Erosion—Non-GBR.

**Note:**

- 112 sites (17 %) in the Non-GBR include an assessment of Riparian Zone impacts.
- 54 sites (48 %) have riparian zones with *Unstable*, *Moderately Unstable*, or *Moderately Stable* banks.



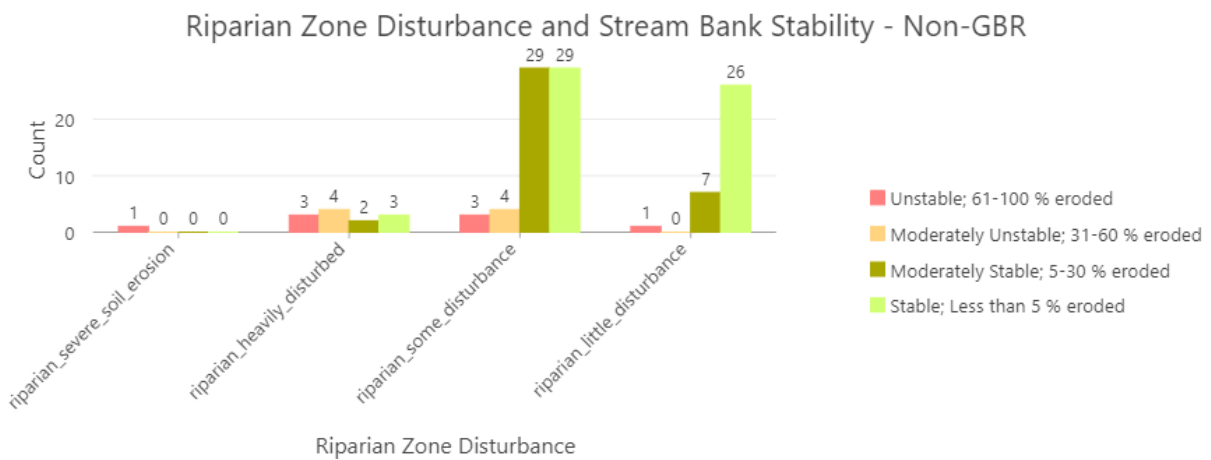
**Figure 84** Riparian Zone Disturbance and Stream Bank Erosion—Queensland.



**Figure 85** Riparian Zone Disturbance and Stream Bank Erosion—GBR Catchments.

**Note:**

- 550 sites (83 %) in the GBR Catchments include an assessment of Riparian Zone impacts.
- 123 (22 %) sites have riparian zones with *Severe Soil Erosion* or are *Heavily Disturbed*.
  - 84 (68 %) have *Unstable* or *Moderately Unstable* banks.
  - 427 (78 %) have *Some Disturbance* or *Little Disturbance*.
- 245 sites (45 %) have riparian zones with *Stable* banks.

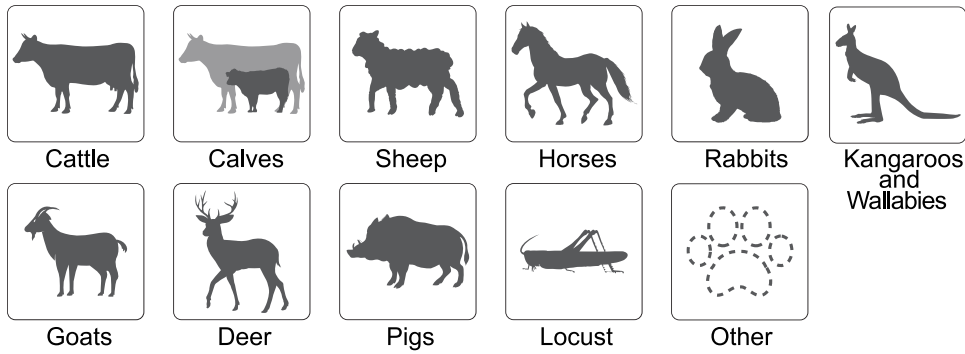


**Figure 86** Riparian Zone Disturbance and Stream Bank Erosion—Non-GBR.

**Note:**

- 112 sites (17 %) in the Non-GBR include an assessment of Riparian Zone impacts.
- 13 (12 %) of the 112 have riparian zones with *Severe Soil Erosion* or are *Heavily Disturbed*.
  - 8 (62 %) have *Unstable* or *Moderately Unstable* banks.
  - 99 (88 %) have *Some Disturbance* or *Little Disturbance*.
- 58 sites (52 %) have riparian zones with *Stable* banks.

### 3.6 Total Grazing Pressure

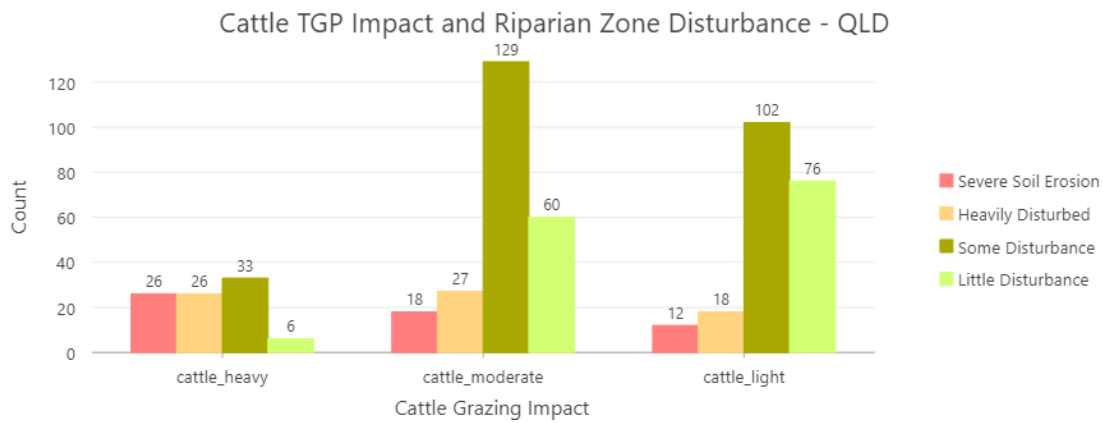


**Image 17** Total Grazing Pressure Values.

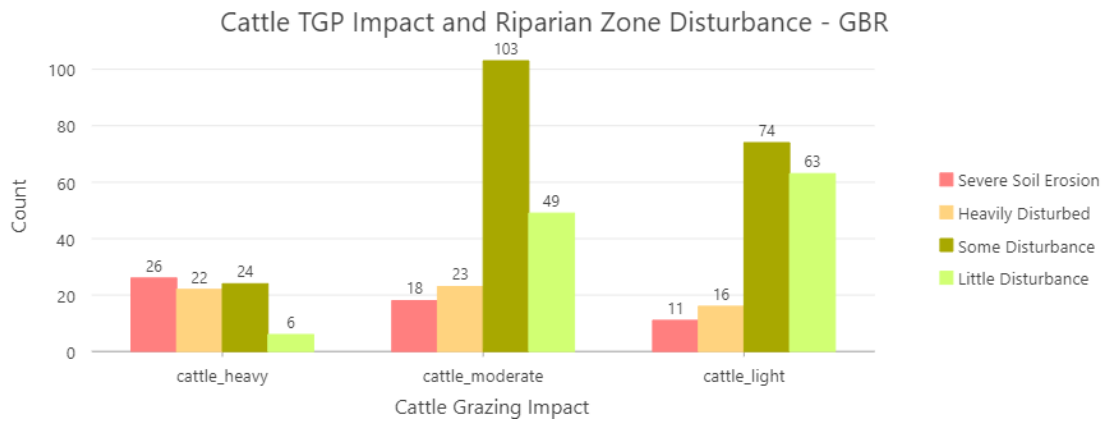
**Note:**

- Total grazing pressure does not contribute to the Grazing ABCD or other primary result. It is used as an input to secondary contextual results.

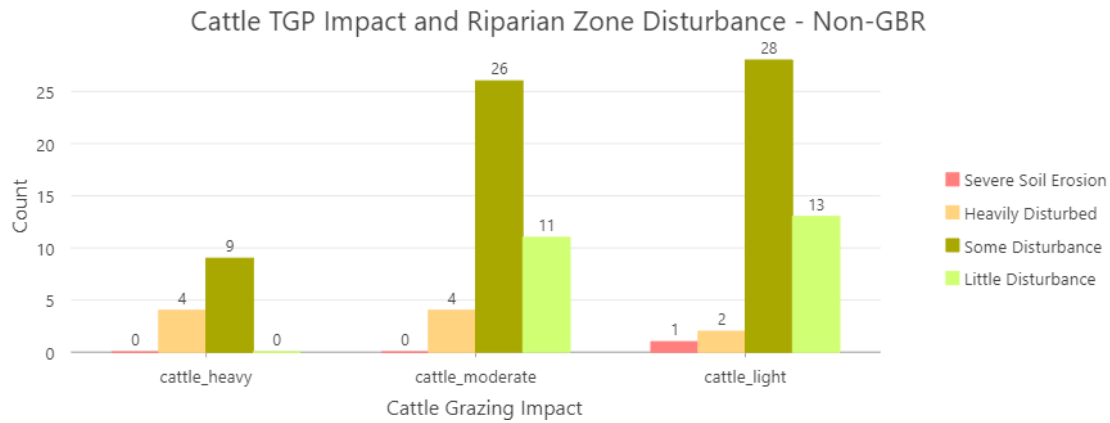
#### 3.6.1 Grazing Pressure in Riparian Zones



**Figure 87** Total Grazing Pressure of Cattle and Riparian Zone Disturbance—Queensland.



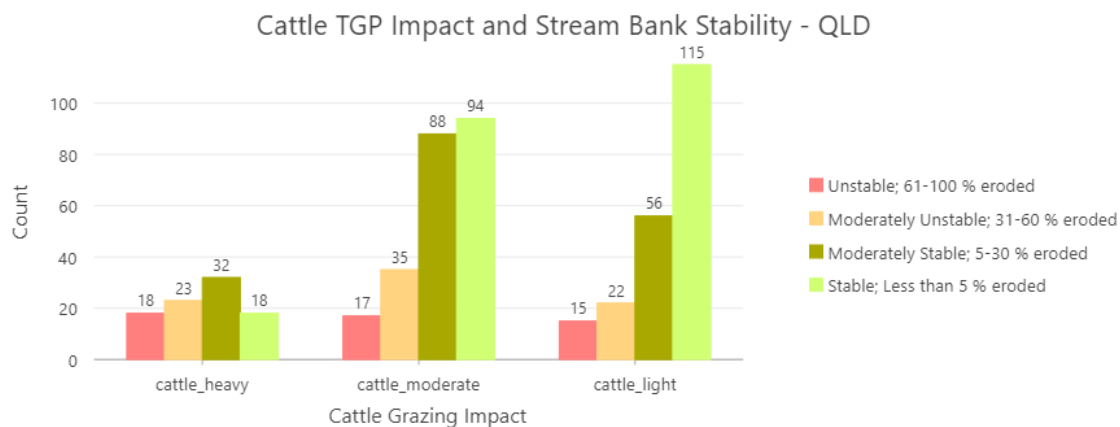
**Figure 88** Total Grazing Pressure of Cattle and Riparian Zone Disturbance—GBR Catchments.



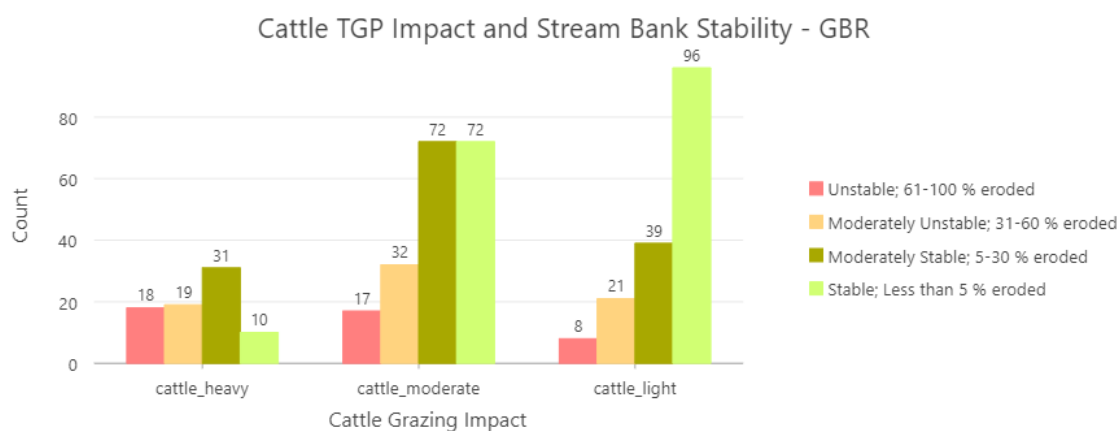
**Figure 89** Total Grazing Pressure of Cattle and Riparian Zone Disturbance—Non-GBR.

**Note:**

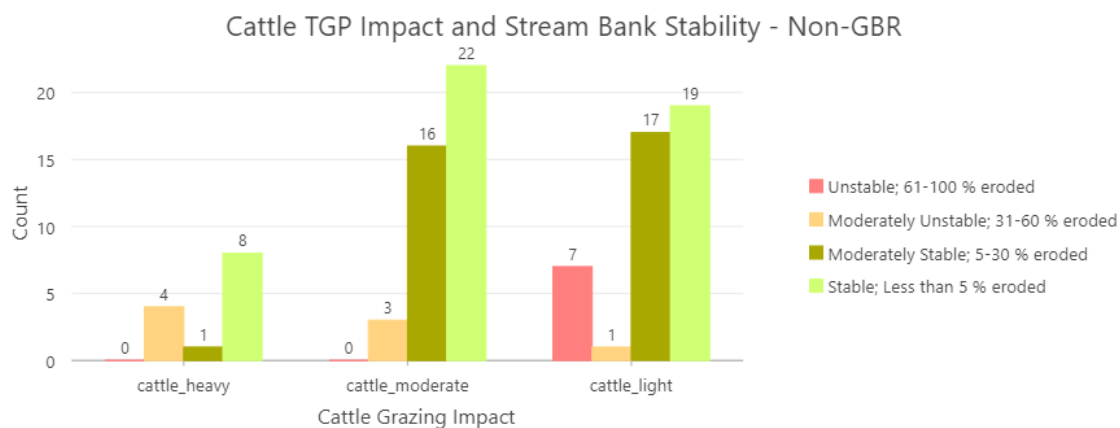
- 533 sites in Queensland include an assessment of Riparian Zone impacts and Total Grazing Pressure (TGP) of *Cattle*.
  - 325 (61 %) of the 533 sites have *Heavy* or *Moderate* Cattle TGP.
- 435 sites (82 %) are in the GBR Catchments, and 98 sites (18 %) in the Non-GBR.
- Of the 435 GBR Catchment sites, 271 (62 %) have *Heavy* or *Moderate* Cattle TGP.
  - 89 sites (33 %) have riparian zones with *Severe Soil Erosion* or are *Heavily Disturbed*.



**Figure 90** Total Grazing Pressure of Cattle and Stream Bank Erosion—Queensland.



**Figure 91** Total Grazing Pressure of Cattle and Stream Bank Erosion—GBR Catchments.

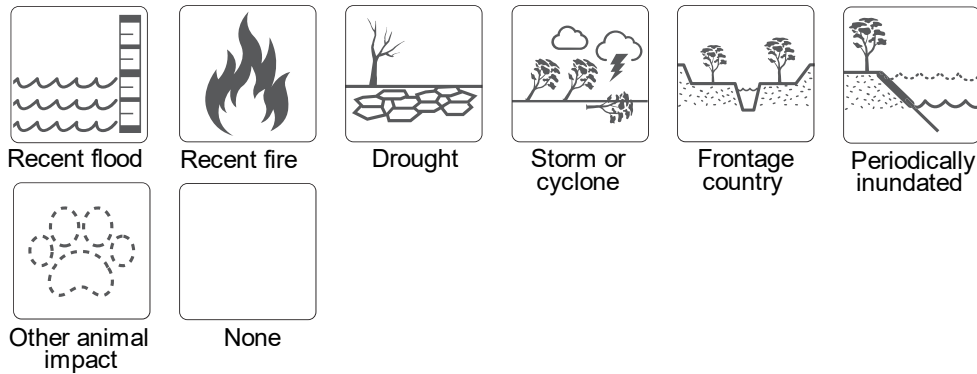


**Figure 92** Total Grazing Pressure of Cattle and Stream Bank Erosion—Non-GBR.

**Note:**

- 533 sites in Queensland include an assessment of Riparian Zone impacts and Total Grazing Pressure (TGP) of *Cattle*.
  - 325 (61 %) of the 533 sites have *Heavy* or *Moderate* Cattle TGP.
- 435 sites (82 %) are in the GBR Catchments, and 98 sites (18 %) in the Non-GBR.
- Of the 435 GBR Catchment sites, 271 (62 %) have *Heavy* or *Moderate* Cattle TGP.
  - 86 sites (32 %) have riparian zones with *Unstable* or *Moderately Unstable* banks.

### 3.7 Site Impacts



**Image 18** Site Impacts Values.

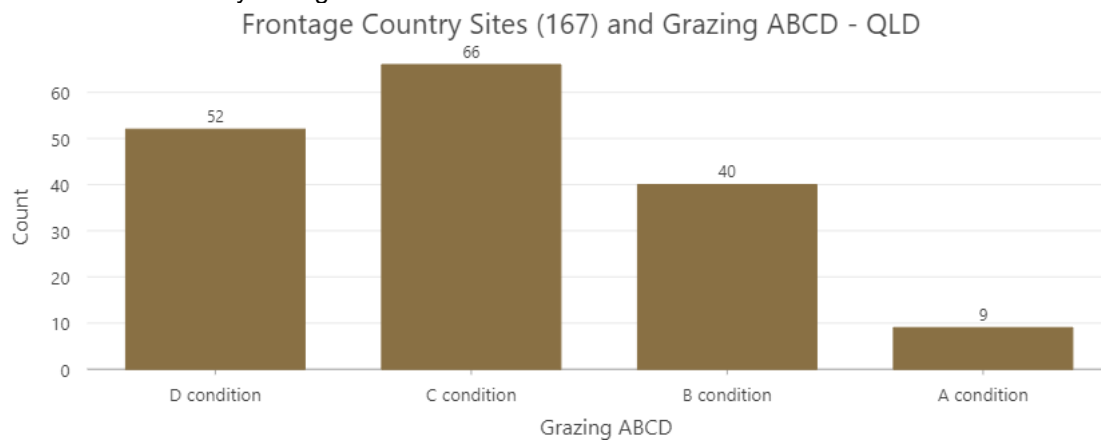
**Note:**

- Site Impacts do not contribute to the Grazing ABCD or other primary result. It is used as an input to secondary contextual results.

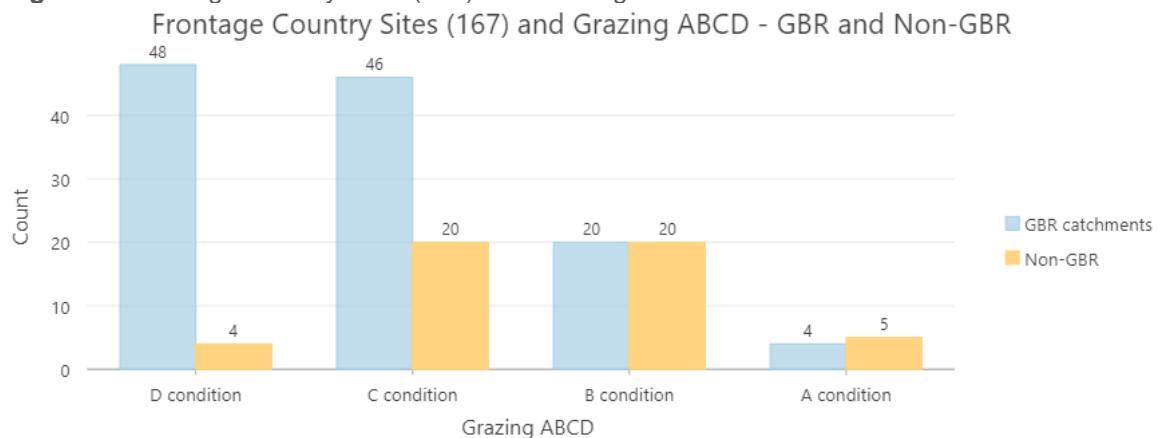
#### 3.7.1 Frontage Country Sites

**Note:**

- *Frontage Country* is a contextual value identified and selected by the assessor.
- It is relatively subjective based on the actual or perceived location of the site. The actual number may be higher or lower.



**Figure 93** Frontage Country Sites (167) and Grazing ABCD—Queensland.



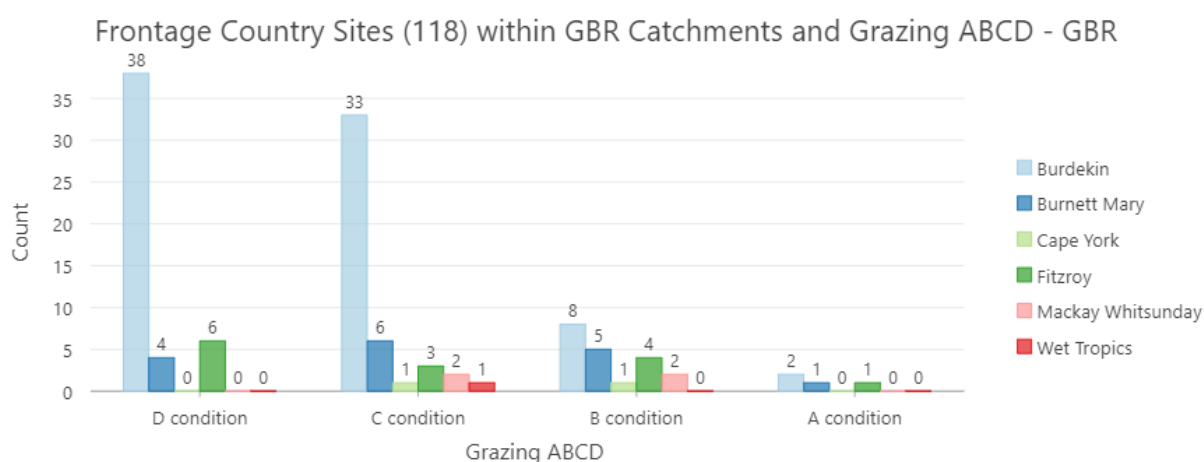
**Figure 94** Frontage Country Sites (167) and Grazing ABCD—GBR Catchments and Non-GBR.

**Table 75** Percentage (%) of Grazing ABCD for Frontage Country Sites (167)—Regional Comparison.

Region	Grazing ABCD of Frontage Country Sites			
	D condition	C condition	B condition	A condition
GBR Catchments	41	39	17	3
Non-GBR	8	41	41	10
Queensland	31	40	24	5

**Note:**

- 167 sites were identified as *Frontage Country*.
- In the GBR Catchments, 48 sites (41 %) were determined to be in D condition; and 46 (39 %) in D condition.
  - 24 (20 %) were determined to be in either B or A condition.



**Figure 95** Frontage Country Sites (118) and Grazing ABCD—Comparison of GBR Catchments.

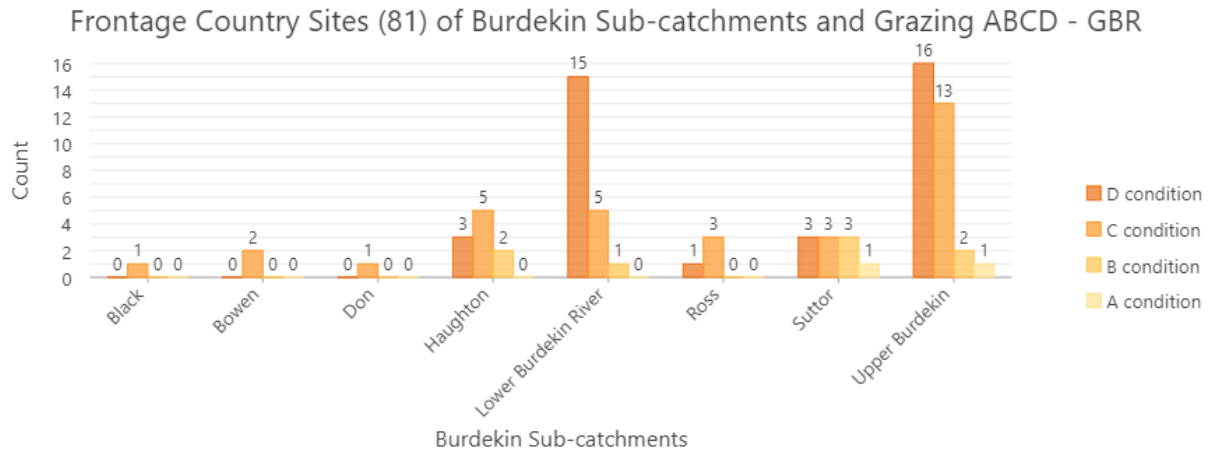
**Table 76** Percentage (%) of Grazing ABCD for Frontage Country Sites (118)—GBR Catchments.

GBR Catchment	Grazing ABCD of Frontage Country Sites—GBR Catchments			
	D condition	C condition	B condition	A condition
Burdekin	47	41	10	2
Burnett Mary	25	38	31	6
Cape York	0	50	50	0
Fitzroy	43	21	29	7
Mackay Whitsunday	0	50	50	0
Wet Tropics	0	100	0	0
<b>Total</b>	<b>41</b>	<b>39</b>	<b>17</b>	<b>3</b>

**Note:**

- 88 % of sites identified as being within *Frontage Country* in the Burdekin catchment were determined to be in D or C condition.
- 63 % of sites identified as being within *Frontage Country* in the Burnett Mary catchment were determined to be in D or C condition.
- 64 % of sites identified as being within *Frontage Country* in the Fitzroy catchment were determined to be in D or C condition.





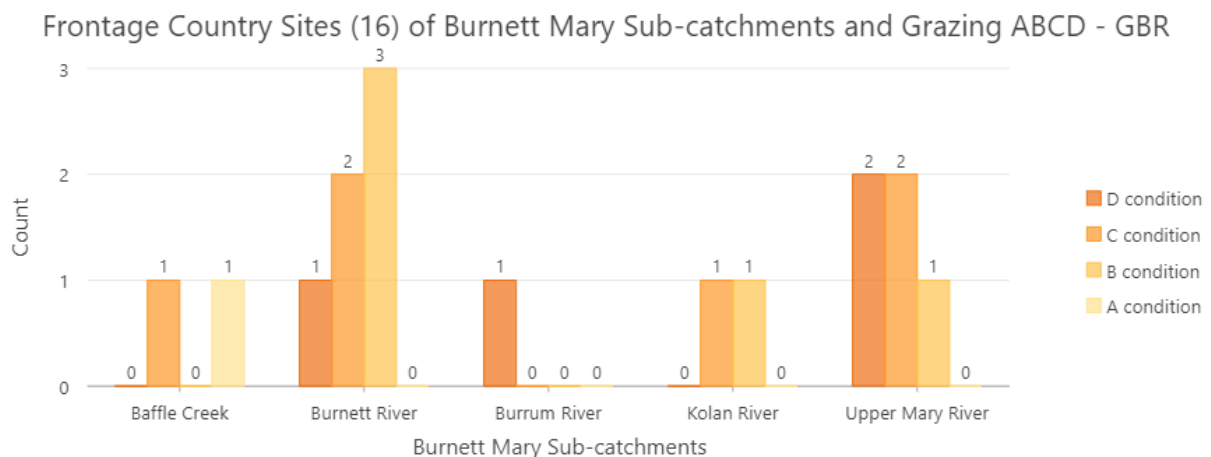
**Figure 96** Burdekin Sub-catchment Frontage Country Sites (81) and Grazing ABCD—GBR Catchments.

**Table 77** Percentage (%) of Grazing ABCD for Burdekin Sub-catchment Frontage Country Sites (81)—GBR Catchments.

Burdekin Sub-catchments	Grazing ABCD of Frontage Country Sites—Burdekin Sub-Catchments			
	D condition	C condition	B condition	A condition
<b>Burdekin</b>	<b>47</b>	<b>41</b>	<b>10</b>	<b>2</b>
Black	0	100	0	0
Bowen	0	100	0	0
Don	0	100	0	0
Haughton	30	50	20	0
Lower Burdekin	71	24	5	0
Ross	25	75	0	0
Suttor	30	30	30	10
Upper Burdekin	50	41	6	3
<b>Total</b>	<b>47</b>	<b>41</b>	<b>10</b>	<b>2</b>

**Note:**

- 81 sites were identified as being within *Frontage Country* in the Burdekin catchment.
- 95 % in the Lower Burdekin Sub-catchment were determined to be in D or C condition.
- 91 % in the Upper Burdekin Sub-catchment were determined to be in D or C condition.
- The Haughton, Ross and Suttor have high percentages from fewer sites.



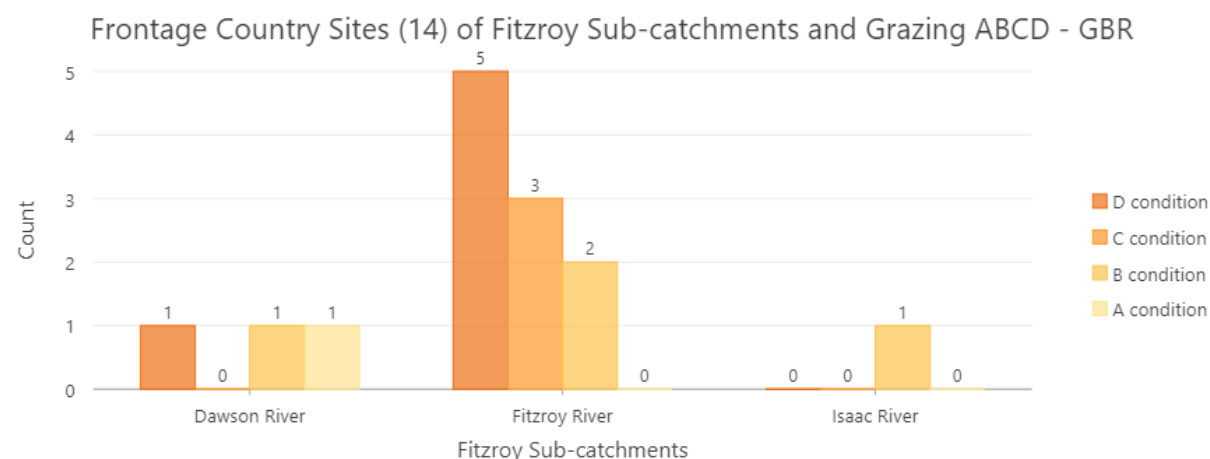
**Figure 97** Burnett Mary Sub-catchment Frontage Country Sites (16) and Grazing ABCD—GBR.

**Table 78** Percentage (%) of Grazing ABCD for Burnett Mary Sub-catchment Frontage Country Sites (16)—GBR Catchments.

Burnett Mary Sub-catchments	Grazing ABCD of Frontage Country Sites—Burnett Mary Sub-Catchments			
	D condition	C condition	B condition	A condition
<b>Burnett Mary</b>	<b>25</b>	<b>38</b>	<b>31</b>	<b>6</b>
Baffle Creek	0	50	0	50
Burnett River	17	33	50	0
Burrum River	100	0	0	0
Kolan River	0	50	50	0
Upper Mary River	40	40	20	0
<b>Total</b>	<b>25</b>	<b>38</b>	<b>31</b>	<b>6</b>

**Note:**

- 16 sites were identified as being within *Frontage Country* in the Burnett Mary catchment.
- 50 % (from 6 sites) in the Burnett River Sub-catchment were determined to be in D or C condition.
- All other Sub-catchments have high percentages from fewer sites.



**Figure 98** Fitzroy Sub-catchment Frontage Country Sites (81) and Grazing ABCD—GBR Catchments.

**Table 79** Percentage (%) of Grazing ABCD for Fitzroy Sub-catchment Frontage Country Sites (81)—GBR Catchments.

Fitzroy Sub-catchments	Grazing ABCD of Frontage Country Sites—Fitzroy Sub-Catchments			
	D condition	C condition	B condition	A condition
<b>Fitzroy</b>	<b>43</b>	<b>21</b>	<b>29</b>	<b>7</b>
Dawson River	33	0	33	33
Fitzroy River	50	30	20	0
Isaac River	0	0	100	0
<b>Total</b>	<b>43</b>	<b>21</b>	<b>29</b>	<b>7</b>

**Note:**

- 81 sites were identified as being within *Frontage Country* in the Fitzroy catchment.
- 80 % (from 10 sites) in the Fitzroy River Sub-catchment were determined to be in D or C condition.
- All other Sub-catchments have high percentages from fewer sites or no data.

## 4 Calculated Results Data

### Introduction

The LCAT uses a framework of land condition indicators and their associated values. Each indicator and value are assigned one-or-more weightings calibrated to one-or-more results. Fifteen results are calculated using algorithms to resolve the multitude of possible combinations of observed and recorded data inputs.

Results are categorised in this report as Primary-1, Primary-2, and Secondary. Other data observed and recorded may be contextual only. Tables 80 and 81 describe the Result Sets and the indicators that contribute to them.

Throughout this section, each result will have its *Determination*, *Result Values* (presented left to right as poorest to best), and Interpretation described before data is presented.

Please note that all results are calculated from visual assessment of indicator values.

**Table 80** LCAT Versions and Result Sets.

LCAT Version	Implementation Date	Result	Result Set
V 1	March 2020	Grazing ABCD	Primary-1
		Indicative Pasture Biomass	Secondary
		Erosion Hazard	
		Grazing Alert	
		Water Quality Hazard	
		Water Contamination Hazard	
		Fire Potential	
		Invasive Pest Plant Hazard	
		Impact on Natural State	
		Site Score	Primary-1
V 2	November 2021	Drivers of Reduced GLM Land Condition	Primary-1
		Indicative Landscape Stability/Function (Prototype)	Primary-2
		Indicative Riparian Zone Stability (Prototype)	
		Indicative Natural Capital (Prototype)	
		Indicative Carbon Store (Prototype)	

**Table 81** LCAT Standard Indicators and Contribution to Calculated Result Sets.

Survey Version	Functional Group	Land Condition Indicator	Contributes to Result Set
STD, ADV	Pasture - Composition	Dominant pasture plant	Primary-1; Primary-2; Secondary
STD, ADV		Dominant pasture plant density	Primary-1; Primary-2; Secondary
STD, ADV		Dominant pasture plant growth phase	Primary-1; Primary-2; Secondary
STD, ADV		TOTAL perennial pasture plant density	Primary-1; Primary-2; Secondary
STD, ADV	Pasture – Forage Condition	Pasture tussock height	Primary-2; Secondary
STD, ADV		Pasture quality	Primary-1; Primary-2; Secondary
STD, ADV	Land Surface - Groundcover	Ground cover	Primary-1; Primary-2; Secondary
STD, ADV		Land surface condition	Primary-1; Primary-2; Secondary
STD, ADV		Slope (%)	Primary-2; Secondary

Survey Version	Functional Group	Land Condition Indicator	Contributes to Result Set
STD, ADV	Pest Plants and Animals	Dominant pest plant	Contextual
STD, ADV		TOTAL pest plant density	Primary-1; Primary-2; Secondary
STD, ADV		Pest plants seeding or flowering	Contextual
STD, ADV		Pest animals	Contextual
STD, ADV	Vegetation	TOTAL understorey plant density	Primary-1; Primary-2; Secondary
STD, ADV		TOTAL overstorey plant density	Primary-1; Primary-2; Secondary
STD, ADV	Riparian Zone	Distance from watercourse /waterbody	Primary-2 <sup>2</sup> ; Secondary
STD, ADV		Management of riparian zone	Primary-2 <sup>2</sup> ; Secondary
STD, ADV		Riparian zone disturbance	Primary-2 <sup>2</sup> ; Secondary
STD, ADV		Stream bank erosion	Primary-2 <sup>2</sup> ; Secondary
STD, ADV		Watercourse Profile	Contextual
STD, ADV		Stream Bank Slope (degrees)	Contextual
STD, ADV		Dominant Bank Sediment Size (mm)	Contextual
STD, ADV		Average Bank Height (m)	Contextual
STD, ADV		Average Watercourse Width (m)	Contextual
STD, ADV		Site Impacts	Total grazing pressure
STD, ADV	Site impacts		Secondary; Contextual
ADV	Plus 65 additional indicators		Contextual

<sup>1</sup> One to two values contribute a minor reduction.

<sup>2</sup> Contributes to Indicative Riparian Zone Stability only.

## 4.1 Primary-1 Results

### 4.1.1 Grazing Land Management ABCD—Calculated Result

#### Determination

Considers long-term indicators of land condition including dominant pasture species; dominant pasture density; dominant pasture growth phase (limited); total perennial pasture density; pasture quality (limited); groundcover; land surface condition; total pest plant density; total understorey density; and total overstorey density.

Indicators and their values calibrated to determine a result based on the multitude of combinations possible from the increased minimum-set of long-term land condition indicators. However, some ‘sledge-hammer’ weightings are applied to some values in some indicators to correctly resolve a result where the balance of observed indicators is ‘good’, however one indicator may be more significant e.g. all indicators have a high or ‘good’ value and the dominant pasture species is an increaser (1P).

Calibrated to align/replicate Stocktake results (where the Stocktake method is applied according to its guidance).

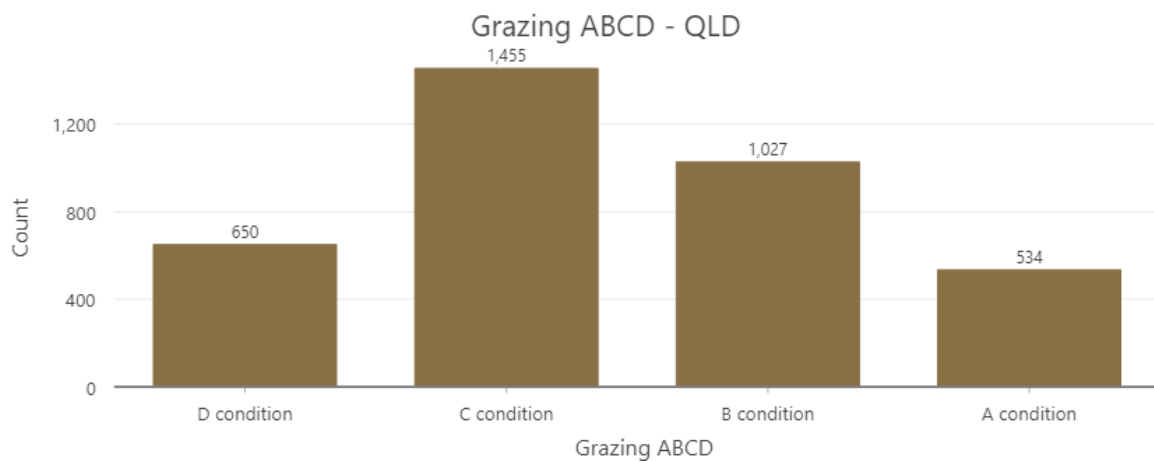
## Result values

Grazing ABCD	D condition	C condition	B condition	A condition
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## Interpretation

Grazing land management ABCD has become a standard way of communicating the productive capacity of land. Where D condition retains about 20% of the original carrying capacity compared with A condition (100%); C retains 55%; and B retains 80%; where A is 100%.

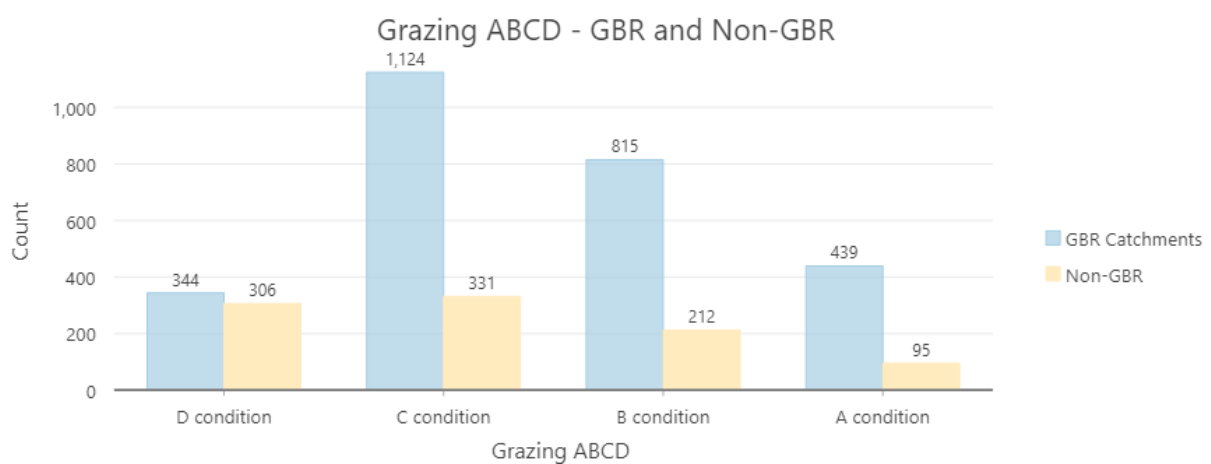
Refer to the Grazing Land Management ABCD framework, rolling ball concept and Stocktake literature for more information.



**Figure 99** Count of Grazing Land Management (GLM) Grazing ABCD—Queensland.

### Note:

- LCAT Sites generally target expected C and D condition land as part of remediation projects. Increasingly, more randomised, and more representative sampling is occurring.



**Figure 100** Great Barrier Reef Catchment (GBR) and Non-GBR Grazing ABCD.

**Table 82** Regional and Queensland Percentage (%) of Sites and Counts of Sites and Grazing ABCD.

Region	Grazing ABCD					Total
	Value	D condition	C condition	B condition	A condition	
GBR Catchments	% ABCD	13%	41%	30%	16%	
	Count	344	1124	815	439	2722
Non-GBR	% ABCD	32%	35%	22%	10%	
	Count	306	331	212	95	944
Queensland	% ABCD	18%	40%	28%	14%	
	Count	650	1455	1027	534	3666
<b>Total</b>		<b>650</b>	<b>1455</b>	<b>1027</b>	<b>534</b>	<b>3666</b>

**Note:**

- Proportionally, C, B, and A condition is similar between GBR catchments and Non-GBR located sites.

**Table 83** Priority GBR Catchments and Sub-catchments and Grazing ABCD % of Sub-catchment.

Priority Catchments	Grazing ABCD % of Sub-catchment			
	D condition	C condition	B condition	A condition
<b>Burdekin</b>	<b>19%</b>	<b>49%</b>	<b>22%</b>	<b>10%</b>
Black	33%	67%	0%	0%
Bowen	9%	41%	41%	8%
Don	7%	68%	20%	5%
Haughton	16%	62%	14%	8%
Lower Burdekin River	35%	49%	13%	3%
Ross	33%	50%	17%	0%
Suttor	16%	47%	24%	13%
Upper Burdekin	19%	48%	19%	13%
<b>Burnett Mary</b>	<b>9%</b>	<b>38%</b>	<b>42%</b>	<b>12%</b>
Baffle Creek	3%	38%	42%	17%
Burnett River	10%	39%	41%	10%
Burrum River	12%	48%	28%	12%
Kolan River	8%	42%	41%	9%
Upper Mary River	9%	23%	49%	18%
<b>Fitzroy</b>	<b>11%</b>	<b>37%</b>	<b>30%</b>	<b>22%</b>
Boyne River	0%	55%	45%	0%
Calliope River	6%	78%	11%	6%
Comet River	6%	26%	32%	35%
Dawson River	11%	34%	30%	25%
Fitzroy River	14%	36%	32%	17%
Isaac River	7%	48%	31%	14%
Mackenzie River	15%	38%	31%	16%
Nogoa River	12%	32%	27%	30%
Shoalwater	0%	54%	15%	31%
Styx River	29%	29%	14%	29%
Waterpark Creek	25%	50%	25%	0%

## 4.1.2 Drivers of Reduced GLM Land Condition—Calculated Result

### Determination

Considers key indicators of long-term land condition. Lists triggered indicators (below calibrated thresholds) in order of their location within the survey i.e. they are not listed in order of priority. One or more indicators listed indicate reduced grazing land management land condition according to the determination of that result. The significance of any indicator's impact is shown by the value recorded for that indicator.

### Result values

	D, C, or B condition	A condition
Drivers of Reduced GLM Land Condition	Dominant pasture species; Dominant pasture density; Dominant pasture growth phase; Total perennial pasture density; Pasture quality; Low ground cover; Soil erosion; Pest plants; Total understorey density; Total overstorey density	No reduction

### Interpretation

Used to learn or communicate the reasons for why a site has been determined to have a declined grazing land condition. May be used to focus land management activities or practice change. Useful in understanding and communicating the many potentially different causes of a particular B, C or D result. For example a site may be in B condition due to increased, under or overstorey density as opposed to dominance of intermediate 2P pasture species, as opposed to presence of pest plants at low densities.

The Drivers of Reduced GLM Land Condition result was introduced in LCAT Version 2 in November 2021. This result lists one or more key long-term land condition indicators that has contributed to declined condition. Of the total 3,666 sites, 765 (including 117 with *No reduction* i.e. A condition) have the new result. The GBR catchments have 486 sites (including 99 *No reduction*) and Non-GBR has 279 sites (including 18 *No reduction*).

**Table 84** GBR Catchments and Count of Sites of Driver of Reduced Grazing Land Condition.

Driver of Reduced Grazing Land Condition	GBR Catchments (No data Cape York & Mackay Whitsunday)				Total
	Burdekin	Burnett Mary	Fitzroy	Wet Tropics	
Dominant pasture species	66	2	74	7	149
Dominant pasture density	56	13	135	1	205
Dominant pasture growth phase	38	-	46	5	89
Pasture quality	2	-	1	-	3
Total perennial pasture density	33	-	81	1	115
Low ground cover	39	-	49	-	88
Soil erosion	71	11	95	2	179
Pest plants	46	2	117	3	168
Total understorey density	11	-	8	1	20
Total overstorey density	31	-	12	2	45
<b>Total</b>	<b>119</b>	<b>18</b>	<b>242</b>	<b>8</b>	<b>387</b>

**Table 85** Percentage (%) of Sites and their Driver of Reduced Land Condition in GBR Catchments.

Driver of Reduced Grazing Land Condition	GBR Catchments (No data Cape York & Mackay Whitsunday)				% of Total Count
	Burdekin	Burnett Mary	Fitzroy	Wet Tropics	
Dominant pasture species	55	11	31	88	17
Dominant pasture density	47	72	56	13	14
Dominant pasture growth phase	32	0	19	63	10
Pasture quality	2	0	0	0	0.5
Total perennial pasture density	28	0	33	13	9
Low ground cover	33	0	20	0	10
Soil erosion	60	61	39	25	18
Pest plants	39	11	48	38	12
Total understorey density	9	0	3	13	3
Total overstorey density	26	0	5	25	8
<b>Total Site Count</b>	<b>119</b>	<b>18</b>	<b>242</b>	<b>8</b>	<b>387</b>

### 4.1.3 Site Scores—Calculated Result

#### Determination

Numeric representation of the calculated Grazing land management ABCD result. Shown as 4 equal, 25 point bands between 0 and 100. In some instances, to account for the occurrence of a minimal number or significantly negative indicator observations, site scores may differ significantly across score bands.

#### Result values

Grazing ABCD	D	C	B	A
Site Score	0 - 25	26 - 50	51 - 75	76 - 100

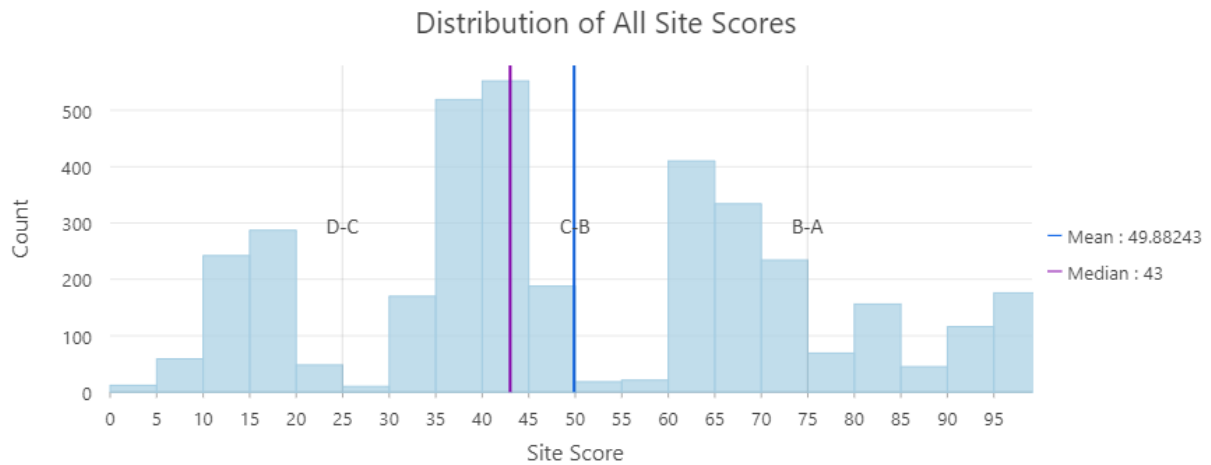
#### Interpretation

Carefully used to communicate where a site sits within an A, B, C or D band. This can be used to highlight subtle increases in scores (for example with C) rather than potential continual focus and communication of a C result due to the time and inputs required to demonstrate improvement/change. Equally, may be used to indicate declining condition not clearly recognised through the ABCD bands. In all situations, the GLM ABCD and site score should be communicated in conjunction with all observed indicator values or the Drivers of reduced GLM land condition result, to better describe land condition and provide context e.g. a site is in C condition due to dominance of 1P (increaser) pasture species. Refer to section 5 for additional information on site scores.

**Note:**

- In the LCAT, Grazing ABCD aligns to Site Scores in 25 point ranges indicated by the 25, 50 and 75 break points i.e. D = 0-25; C= 26-50; B = 51-75; A = 76-100.

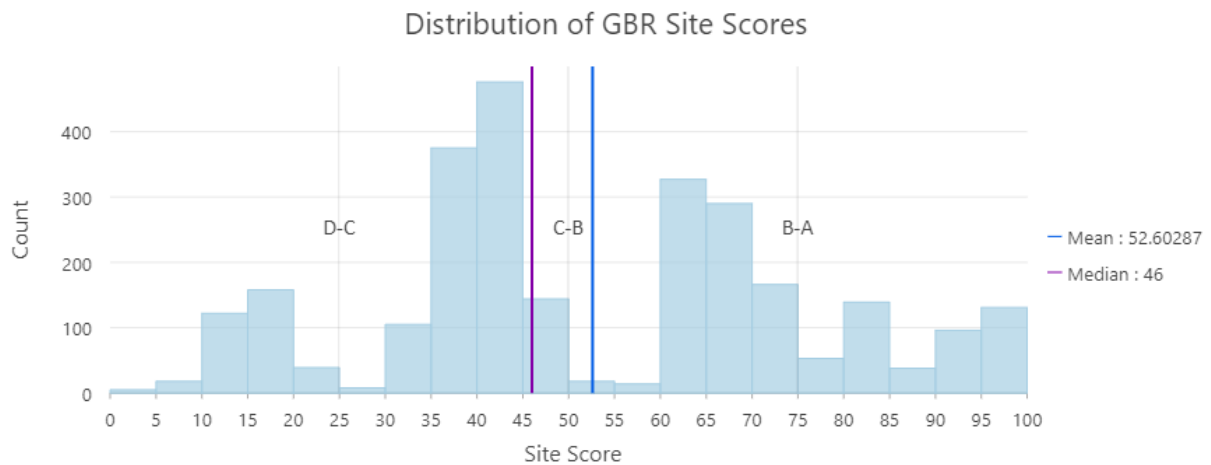




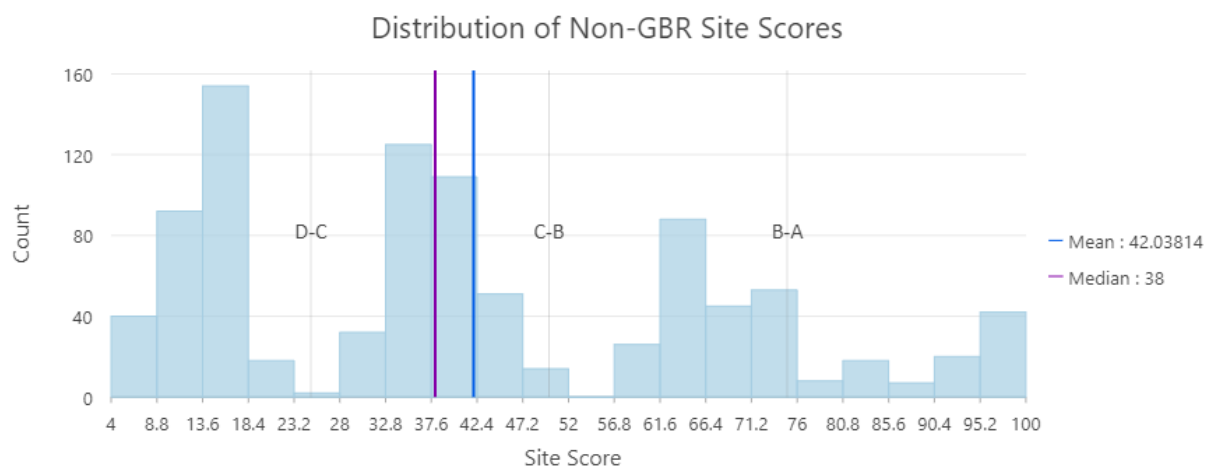
**Figure 101** Distribution of all site scores—Queensland.

**Table 86** Regional and Queensland Mean and Median Site Score (out of 100) and Grazing ABCD.

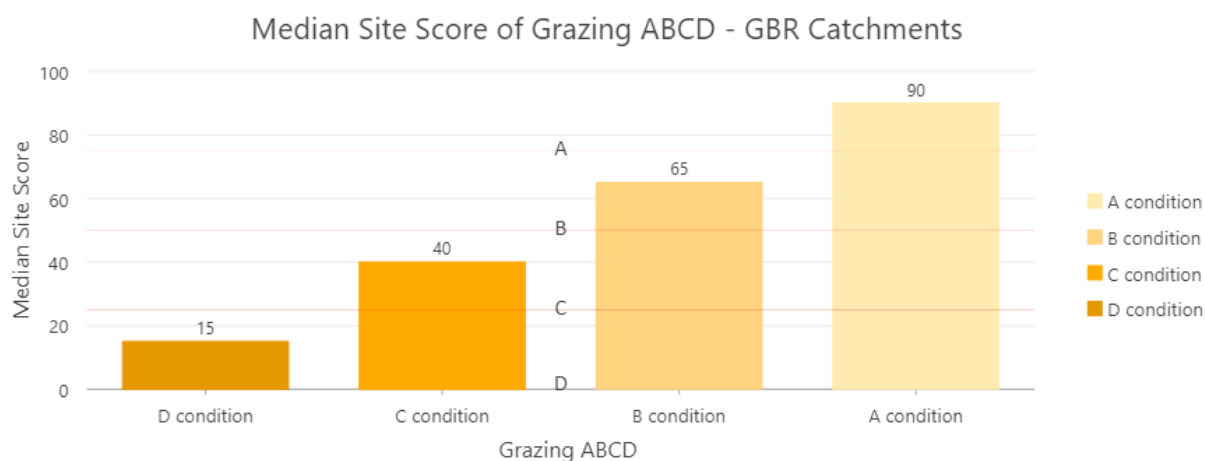
Region	Mean and Median Site Score of Grazing ABCD								Total	
	D condition		C condition		B condition		A condition			
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
GBR Catchments	15	15	40	40	66	65	89	90	53	46
Non-GBR	13	14	38	38	67	66	91	94	42	38
<b>Queensland</b>	<b>14</b>	<b>15</b>	<b>40</b>	<b>40</b>	<b>66</b>	<b>65</b>	<b>89</b>	<b>91</b>	<b>50</b>	<b>43</b>



**Figure 102** Distribution of site scores—GBR catchments.



**Figure 103** Distribution of site scores—Non-GBR catchments.



**Figure 104** Median Site Scores of Grazing ABCD—GBR catchments.

**Table 87** Median Site Score in Sub-catchments of Priority GBR Catchments and Grazing ABCD.

Priority Catchments	Grazing ABCD Median Site Scores				Total
	D condition	C condition	B condition	A condition	
<b>Burdekin site count</b>	<b>182</b>	<b>462</b>	<b>208</b>	<b>95</b>	<b>947</b>
Black	21.0	40.5	-	-	
Bowen	17.5	41.0	71.0	97.0	
Don	15.0	42.5	70.5	91.5	
Haughton	16.0	42.0	66.0	90.0	
Lower Burdekin River	16.0	41.0	66.0	93.0	
Ross	15.0	36.5	62.0	-	
Suttor	16.0	40.0	64.0	82.5	
Upper Burdekin	15.0	40.0	66.0	87.5	
<b>Burnett Mary site count</b>	<b>38</b>	<b>168</b>	<b>186</b>	<b>54</b>	<b>446</b>
Baffle Creek	15.0	40.0	69.0	91.5	
Burnett River	15.0	40.0	65.0	85.0	
Burrum River	17.0	42.5	63.0	80.0	
Kolan River	16.0	39.0	66.0	86.5	
Upper Mary River	16.0	41.0	65.0	91.0	

Priority Catchments	Grazing ABCD Median Site Scores				Total
	D condition	C condition	B condition	A condition	
<b>Sub-Catchment</b>					
<b>Fitzroy site count</b>	<b>111</b>	<b>372</b>	<b>299</b>	<b>218</b>	<b>1000</b>
Boyne River	-	41.5	65.0	-	
Calliope River	18.0	38.0	69.0	85.0	
Comet River	15.5	40.5	64.0	82.0	
Dawson River	14.0	39.0	64.0	85.0	
Fitzroy River	13.0	40.0	66.0	95.0	
Isaac River	15.5	40.0	65.0	90.0	
Mackenzie River	13.5	38.0	64.0	85.0	
Nogoa River	15.0	38.0	64.0	82.0	
Shoalwater	-	45.0	62.0	92.0	
Styx River	13.5	37.0	74.0	94.0	
Waterpark Creek	12.0	36.0	72.0	-	
<b>Total</b>	<b>331</b>	<b>1002</b>	<b>693</b>	<b>367</b>	<b>2393</b>

## 4.2 Primary-2 Results

### 4.2.1 Indicative Landscape Stability and Function (Prototype)—Calculated Result

#### Determination

Considers dominant pasture species; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture tussock height; pasture quality; groundcover; land surface condition; total pest plant density; total understorey density; and total overstorey density. Based on logic and thresholds that consider the inherent stability provided by perennial plants and the likelihood that ecological processes (function) are able to be maintained by a landscape. Relies on having sufficient vegetation structure in all vegetation layers (stratum) and an absence or minimal erosion processes. Native or non-native pasture species and perennial pasture category (3P, 2P and 1P) are considered equal.

Differs from Grazing ABCD in that the pasture species category—based on productivity—does not necessarily reduce stability if a perennial and of sufficient structure. For example, Grazing land condition may be C based on the dominance of a 1P pasture species (e.g. Wiregrass or *Aristida spp*), however, its density and condition, coupled with other indicator values, provide a stable (with regard soil and resilience) environment which has the structural attributes to enable water and nutrient cycling to occur.

Two results per category are shown e.g. Stable or Unstable/Poor. The first part referring to indicative stability and the second part referring to indicative function. In the example used, land in a very declined state may be either stable (e.g. eroded to bedrock) or unstable (actively eroding). The four result categories are equivalent to the Grazing ABCD categories although calibrated for its different purpose i.e. Stable or Unstable/Poor is 'equivalent' to a Grazing ABCD, D condition.

## Result values

Indicative Landscape Stability/Function	Stable or Unstable / Poor	Declined / Low	Vulnerable / Moderate	High / High
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## Interpretation

Indicates that despite lower production values contributed by particular pasture species or higher vegetation densities, the inherent stability of the site may be high. Higher results may indicate a lesser risk to reduced water quality (sediment loss) and greater reliance to climate and management impacts.

### Note:

The Indicative *Landscape Stability and Function (Prototype)* result was introduced in LCAT Version 2 in November 2021.

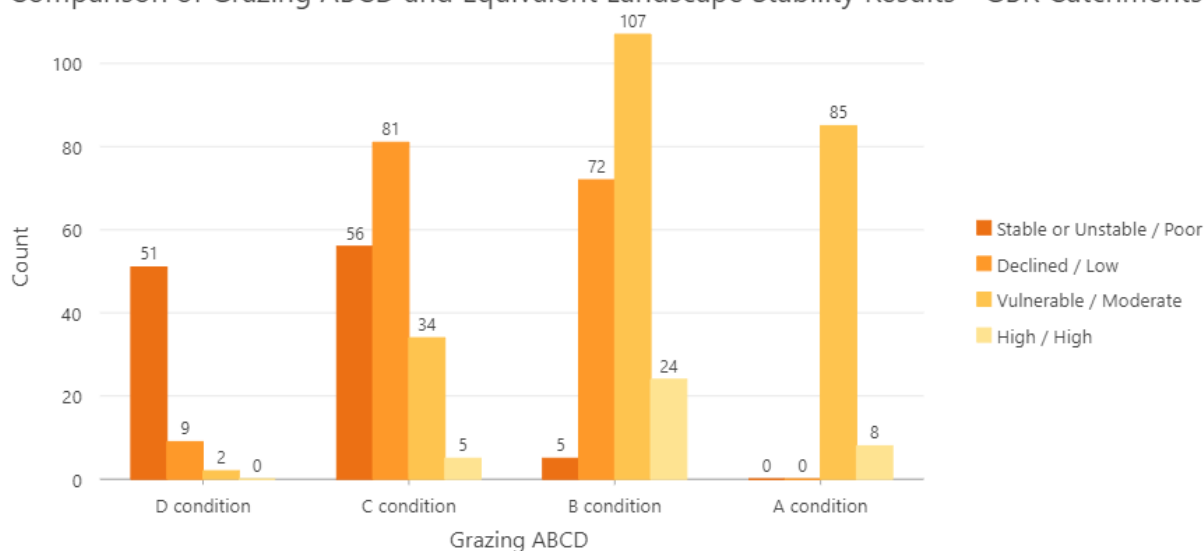
This result was introduced to identify instances where the determined condition according to the Grazing Land Management (GLM) ABCD framework, pose a lesser risk to water quality than the framework may indicate.

The use of a 'productivity' aligned framework may lead to a proportion of LCAT site results being in C condition due to the dominance of a 1P (non-preferred) species despite it being present in very high densities, with no other 'discounting' attributes such as soil erosion. Sites dominated by 1P (and 2P) species (or lower proportions of 3P species) may be highly stable and functioning, (particularly where understorey and/or overstorey shrub and tree densities are acceptable) and pose little to no water quality risk, despite being determined as in poor (C) condition.

Of the total 3,666 LCAT sites, 818 include both Indicative Landscape and Function and Grazing ABCD results.

The following comparison considers only those sites within the GBR catchments—a total of 539 sites.

Comparison of Grazing ABCD and Equivalent Landscape Stability Results - GBR Catchments



**Figure 105** Comparison of Grazing ABCD and Equivalent Landscape Stability and Function—GBR Catchments.

**Table 88** Count of Sites Comparing Landscape Stability and Function and Grazing ABCD—GBR Catchments.

Indicative Stability and Function	Grazing ABCD				Total
	D condition	C condition	B condition	A condition	
Stable or Unstable / Poor	51	56	5	-	112
Declined / Low	9	81	72	-	162
Vulnerable / Moderate	2	34	107	85	228
High / High	-	5	24	8	37
<b>Total</b>	<b>62</b>	<b>176</b>	<b>208</b>	<b>93</b>	<b>539</b>

**Table 89** Percentage (%) of Landscape Stability Function in Grazing ABCD (i.e. % of column)—GBR Catchments.

Indicative Stability and Function	Grazing ABCD				Total
	D condition	C condition	B condition	A condition	
Stable or Unstable / Poor	82	32	2	0	21
Declined / Low	15	46	35	0	30
Vulnerable / Moderate	3	19	51	91	42
High / High	0	3	12	9	7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note** (Tables 88 and 89):

- Of C condition sites, 81 (or 46 %) were considered to be in the equivalent Declined / Low state.
  - Of C condition sites, 39 (or 22 %) were considered ‘more stable’ (Vulnerable / Moderate + High/ High) than C condition implies.
  - Of C condition sites, 56 (or 32 %) were considered ‘less stable’ (Stable or Unstable / Poor) than C condition implies.
- Of B condition sites, 107 (or 51 %) were considered to be in the equivalent Vulnerable / Moderate state.
  - Of B condition sites, 24 (or 12 %) were considered ‘more stable’ (High / High) than B condition implies.
  - Of B condition sites, 77 (or 37 %) were considered ‘less stable’ (Declined / Low + Stable or Unstable / Poor) than B condition implies.
- Of A condition sites, 85 (or 91 %) were considered ‘less stable’ (Vulnerable / Moderate) than A condition implies.

OR...

**Table 90** Count of Sites Comparing Grazing ABCD and Landscape Stability and Function—GBR Catchments.

Dominant Pasture Plant Category	Indicative Stability and Function				Total
	Stable or Unstable / Poor	Declined / Low	Vulnerable / Moderate	High / High	
<b>D condition</b>	51	9	2	-	62
<b>C condition</b>	56	81	34	5	176
<b>B condition</b>	5	72	107	24	208
<b>A condition</b>	-	-	85	8	93
<b>Total</b>	<b>112</b>	<b>162</b>	<b>228</b>	<b>37</b>	<b>539</b>

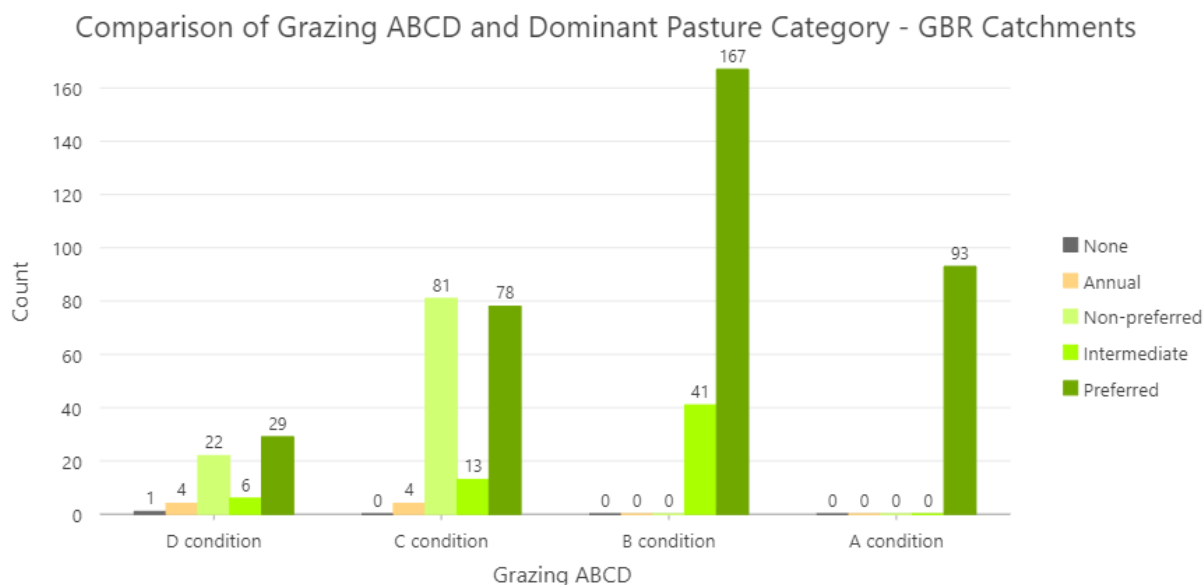
**Table 91** Percentage (%) of Grazing ABCD in Landscape Stability and Function (i.e. % of column)—GBR Catchments.

Dominant Pasture Plant Category	Indicative Stability and Function				Total
	Stable or Unstable / Poor	Declined / Low	Vulnerable / Moderate	High / High	
D condition	46	6	1	0	12
C condition	50	50	15	14	33
B condition	4	44	47	65	39
A condition	0	0	37	22	17
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note** (Tables 90 and 91):

- Of Declined / Low sites, 81 (or 50 %) were considered to be in the equivalent C condition state.
  - Of Declined / Low sites, 72 (or 44 %) were considered better than C condition and 9 site (or 6 %), less than C condition.
- Of Vulnerable / Moderate sites, 107 (or 47 %) were considered to be in the equivalent B condition state.
  - Of Vulnerable / Moderate sites, 36 (or 16 %) were considered to be less than B condition (C and D condition).
  - Of Vulnerable / Moderate sites, 85 (or 37 %) were considered to be better than B condition (A condition).
- Of High / High sites, 8 (or 22 %) were considered to be in the equivalent A condition state.
  - Of High / High sites, 24 (or 65 %) were considered to be in B condition.
  - Of High / High sites, 5 (or 14 %) were considered to be in C condition.
- Further investigation is need into the use of Grazing ABCD and Indicative Landscape Stability and Function to validate P2R practice change of reported projects.

### Other Grazing ABCD and Indicative Landscape Stability and Function data.



**Figure 106** Comparison of Grazing ABCD and Dominant Pasture Category—GBR Catchments.

**Table 92** Count of Sites Comparing Grazing ABCD with Dominant Pasture Category—GBR Catchments.

Dominant Pasture Plant Category	Grazing ABCD				Total
	D condition	C condition	B condition	A condition	
NO	1	-	-	-	1
A	4	4	-	-	8
N	22	81	-	-	103
I	6	13	41	-	60
P	29	78	167	93	367
<b>Total</b>	<b>62</b>	<b>176</b>	<b>208</b>	<b>93</b>	<b>539</b>

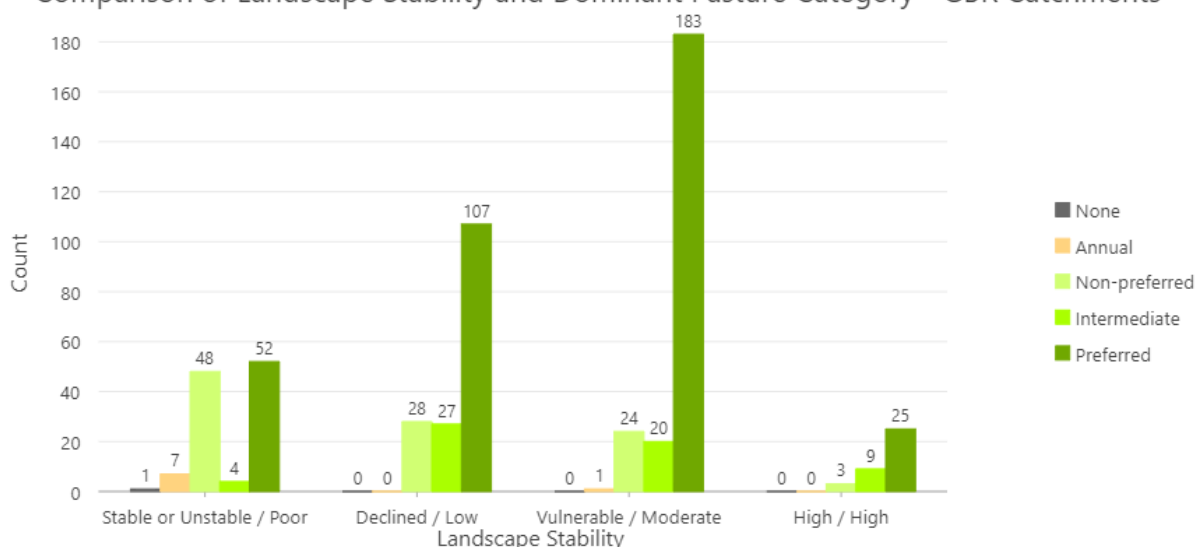
**Table 93** Percentage (%) of Grazing ABCD with Dominant Pasture Category—GBR Catchments.

Dominant Pasture Plant Category	Grazing ABCD				Total
	D condition	C condition	B condition	A condition	
NO	2	0	0	0	0
A	6	2	0	0	1
N	35	46	0	0	19
I	10	7	20	0	11
P	47	44	80	100	68
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Note:**

- The clear influence of the Dominant Pasture Plant Category (equivalent to the proportion of 3Ps) on the Grazing ABCD result is shown in Tables 92 and 93 e.g. 46 % of Sites in C condition are dominated by 1P or non-preferred species. Non-preferred species cannot be the dominant pasture by TSDM kg/ha if a site is in B or A condition.

Comparison of Landscape Stability and Dominant Pasture Category - GBR Catchments



**Figure 107** Comparison of Landscape Stability and Function and Dominant Pasture Category—GBR Catchments.

**Table 94** Count of Sites Comparing Indicative Landscape Stability and Function with Dominant Pasture Category—GBR Catchments.

Dominant Pasture Plant Category	Indicative Stability and Function				Total
	Stable or Unstable / Poor	Declined / Low	Vulnerable / Moderate	High / High	
NO	1	-	-	-	1
A	7	-	1	-	8
N	48	28	24	3	103
I	4	27	20	9	60
P	52	107	183	25	367
<b>Total</b>	<b>112</b>	<b>162</b>	<b>228</b>	<b>37</b>	<b>539</b>

**Table 95** Percentage (%) of Indicative Landscape Stability and Function with Dominant Pasture Category—GBR Catchments.

Dominant Pasture Plant Category	Indicative Stability and Function				Total
	Stable or Unstable / Poor	Declined / Low	Vulnerable / Moderate	High / High	
NO	1	0	0	0	0
A	6	0	0	0	1
N	43	17	11	8	19
I	4	17	9	24	11
P	46	66	80	68	68
<b>Total</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100</b>

**Note** (Tables 94 and 95):

- There is no clear influence of the Dominant Pasture Plant Category on the Indicative Landscape Stability and Function result in Tables 93 and 94 e.g. Only 17 % of Sites in a Declined / Low state are dominated by 1P or Non-preferred species. 66 % of Sites in a Declined / Low state are dominated by 3P or preferred species. These sites (dominated by 3Ps) clearly have one or more drivers of land condition other than dominant pasture category.

## 4.2.2 Indicative Riparian Zone Stability (Prototype)— Calculated Result

### Determination

Considers dominant pasture; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture quality; groundcover; land surface condition; total pest plant density; total understorey density; total overstorey density; distance from water; management of the riparian zone; riparian area disturbance; stream bank erosion; and total grazing pressure.

Triggered when the distance to a watercourse or waterbody is <50 m. Based on logic and thresholds such as appropriate densities of perennial plants are present in all vegetation layers (stratum) and pest plants and erosion processes are minimal.

Similar to Water quality hazard, however, perennial vegetation structure presence and management of the riparian zone are key.



## Result values

Indicative Riparian Zone Stability	Least intact	Declined	Vulnerable	More intact
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## Interpretation

Indicates the level of impact that perennial vegetation and appropriate riparian zone management is having on the stability of the riparian zone. May indicate risk levels associated with erosive forces during flood events. Can be used to focus management practices and protection of riparian zones that improve water quality and maintain the biodiversity and function of waterways.

**Table 96** Count of Sites with an Indicative Riparian Zone Stability Result and GBR Catchments and Sub-catchments—GBR Catchments.

GBR Catchment	Indicative Riparian Zone Stability		Total
	Least intact	Declined	
<b>Sub-catchment</b>			
<b>Burdekin</b>	<b>17</b>		<b>17</b>
Black	1		1
Don	2		2
Haughton	2		2
Lower Burdekin River	5		5
Suttor	2		2
Upper Burdekin	5		5
<b>Burnett Mary</b>	<b>12</b>		<b>12</b>
Baffle Creek	3		3
Burnett River	8		8
Kolan River	1		1
<b>Fitzroy</b>	<b>12</b>	<b>1</b>	<b>13</b>
Dawson River	2		2
Fitzroy River	8	1	9
Nogoa River	2		2
<b>Wet Tropics</b>	<b>8</b>		<b>8</b>
Johnstone River	8		8
<b>Grand Total</b>	<b>49</b>	<b>1</b>	<b>50</b>

## 4.2.3 Indicative Natural Capital (Prototype)—Calculated Result

### Determination

Considers dominant pasture species; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture tussock height; pasture quality; groundcover; land surface condition; total pest plant density; total understorey density; and total overstorey density. Based on logic and thresholds that indicate sites with a higher proportion and density of native pasture species, higher groundcover, few erosion processes and pest plants, and presence of perennial understorey and overstorey plants, the greater the 'structure' and inherent natural capital. Accounts for non-native pasture species but does not differentiate non-native under and overstorey species (will be added in future update).

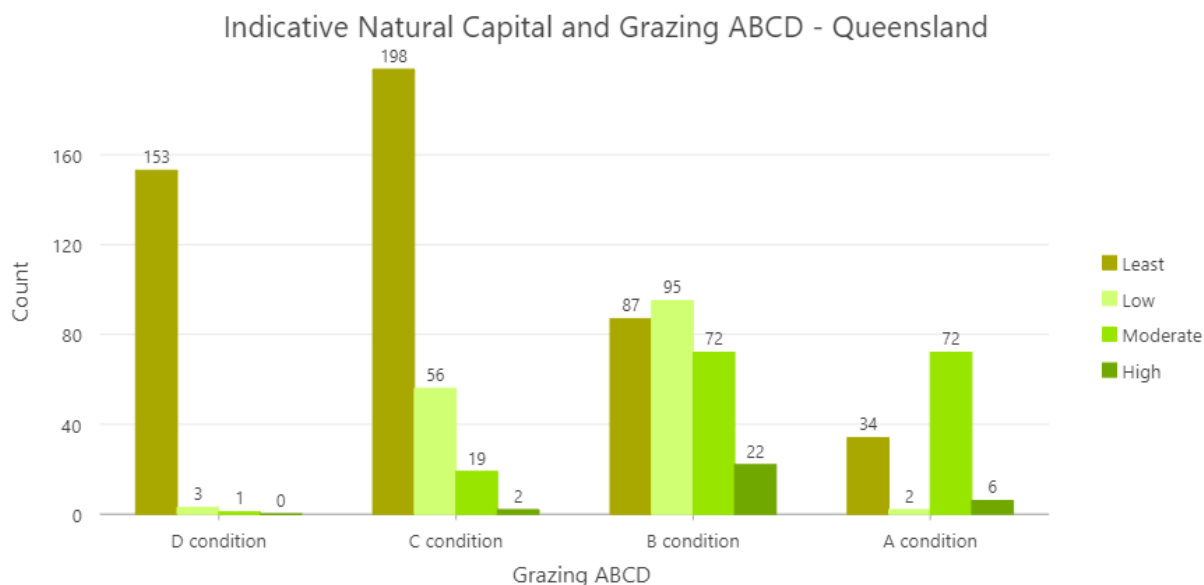
Similar to Impact on natural state, however calibration thresholds differ. For example, more lenient on native intermediate (2P) and increaser (1P) species to recognise these native pasture species as being natural (e.g. Wanderrie dominated grasslands of the Mulga Bioregion) and greater value placed on higher under, and overstorey densities.

## Result values

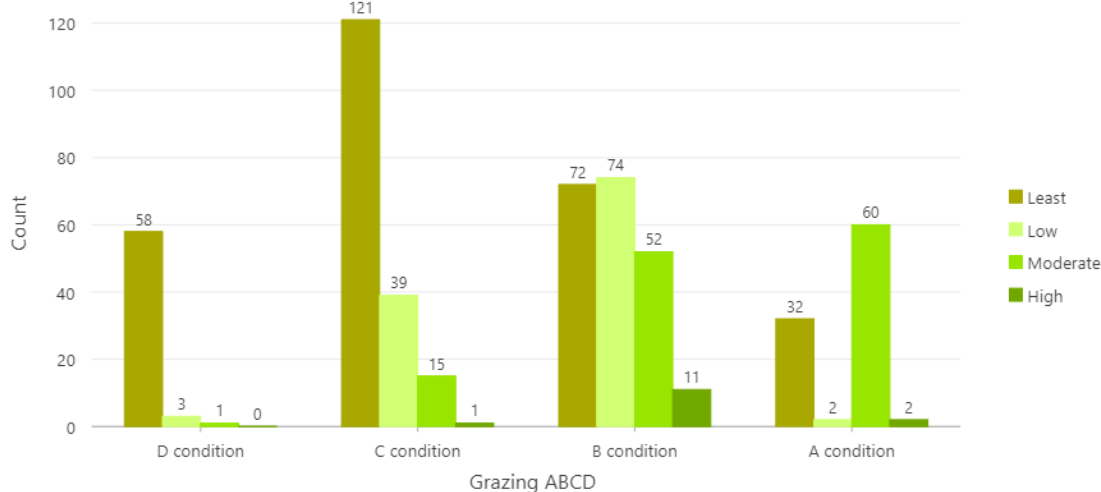
Indicative Natural Capital	Least	Low	Moderate	High
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## Interpretation

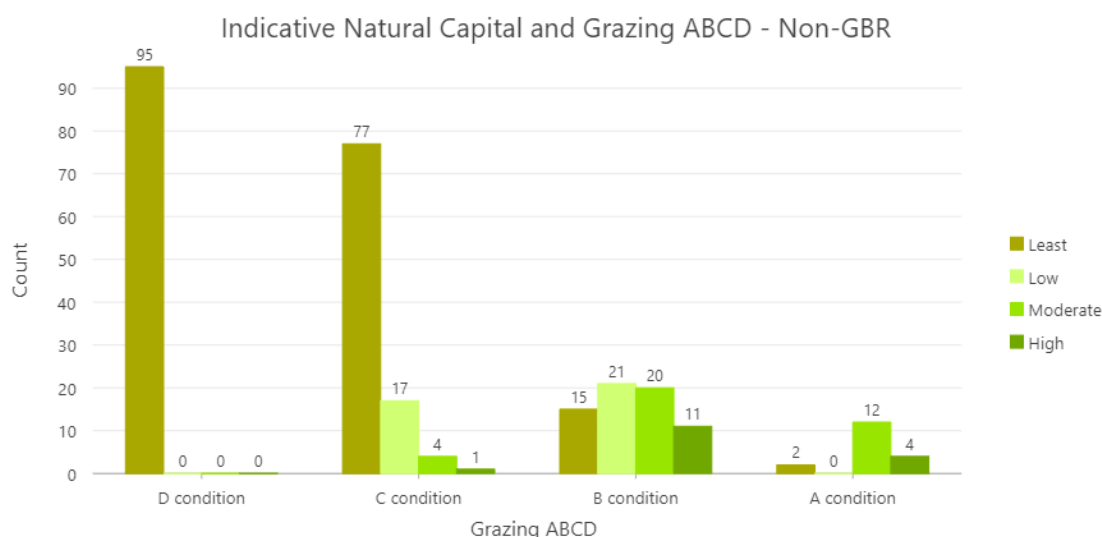
Indicates the observed landscape and natural resource values reflect structure and function in all vegetation layers (stratum) with minimal external impacts (with the exception that it currently does not differentiate non-native under and overstorey species). Is not a surrogate or replacement for more rigorous biodiversity and vegetation survey methods but may be used to infer or indicate logical natural 'values'.



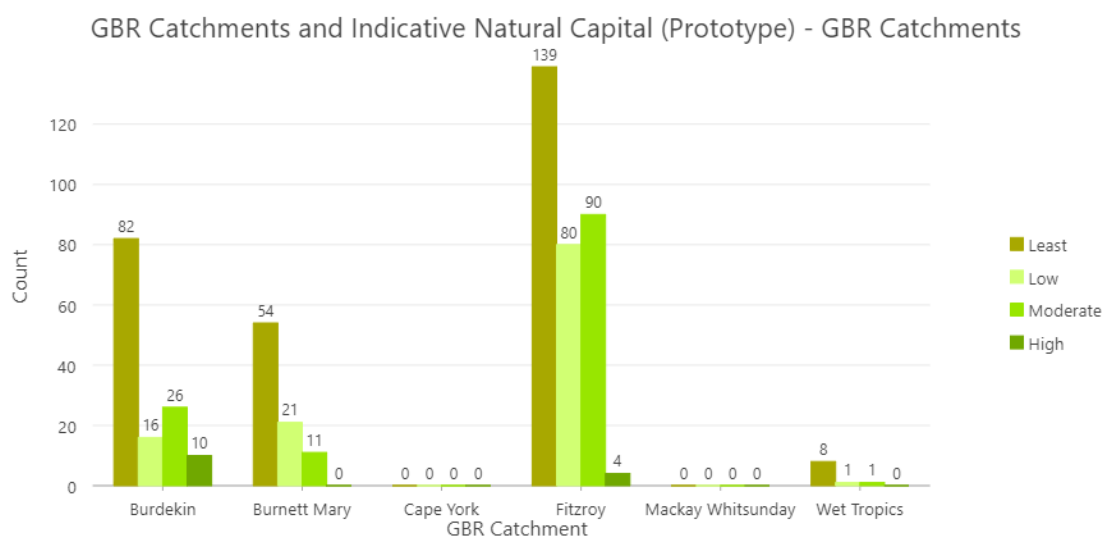
**Figure 108** Indicative Natural Capital (Prototype) and Grazing ABCD—Queensland.



**Figure 109** Indicative Natural Capital (Prototype) and Grazing ABCD—GBR Catchments.



**Figure 110** Indicative Natural Capital (Prototype) and Grazing ABCD—Non-GBR.



**Figure 111** Indicative Natural Capital (Prototype) and GBR Catchments—GBR Catchments.

**Table 97** Count of Indicative Natural Capital (Prototype) Values in GBR Catchments and Sub-catchments—GBR Catchments.

GBR Catchments	Indicative Natural Capital (Prototype)				Total
	Least	Low	Moderate	High	
<b>Sub-catchments</b>					
<b>Burdekin</b>	<b>82</b>	<b>16</b>	<b>26</b>	<b>10</b>	<b>134</b>
Black	3	-	-	-	3
Bowen	10	2	1	1	14
Don	9	1	3	2	15
Haughton	5	-	1	1	7
Lower Burdekin River	18	6	2	1	27
Suttor	9	4	5	1	19
Upper Burdekin	28	3	14	4	49
<b>Burnett Mary</b>	<b>54</b>	<b>21</b>	<b>11</b>	<b>-</b>	<b>86</b>
Baffle Creek	5	2	1	-	8
Burnett River	31	11	7	-	49

GBR Catchments	Indicative Natural Capital (Prototype)				Total
	Least	Low	Moderate	High	
Sub-catchments					
Kolan River	11	4	1	-	16
Upper Mary River	7	4	2	-	13
<b>Fitzroy</b>	<b>139</b>	<b>80</b>	<b>90</b>	<b>4</b>	<b>313</b>
Comet River	28	5	27	-	60
Dawson River	29	14	10	-	53
Fitzroy River	42	47	25	2	116
Isaac River	12	5	7	-	24
Nogoa River	28	8	20	-	56
Shoalwater	-	1	1	2	4
<b>Wet Tropics</b>	<b>8</b>	<b>1</b>	<b>1</b>		<b>10</b>
Herbert River	1	1	-	-	2
Johnstone River	7	-	1	-	8
<b>Total</b>	<b>283</b>	<b>118</b>	<b>128</b>	<b>14</b>	<b>543</b>

## 4.2.4 Indicative Carbon Store (Prototype)—Calculated Result

### Determination

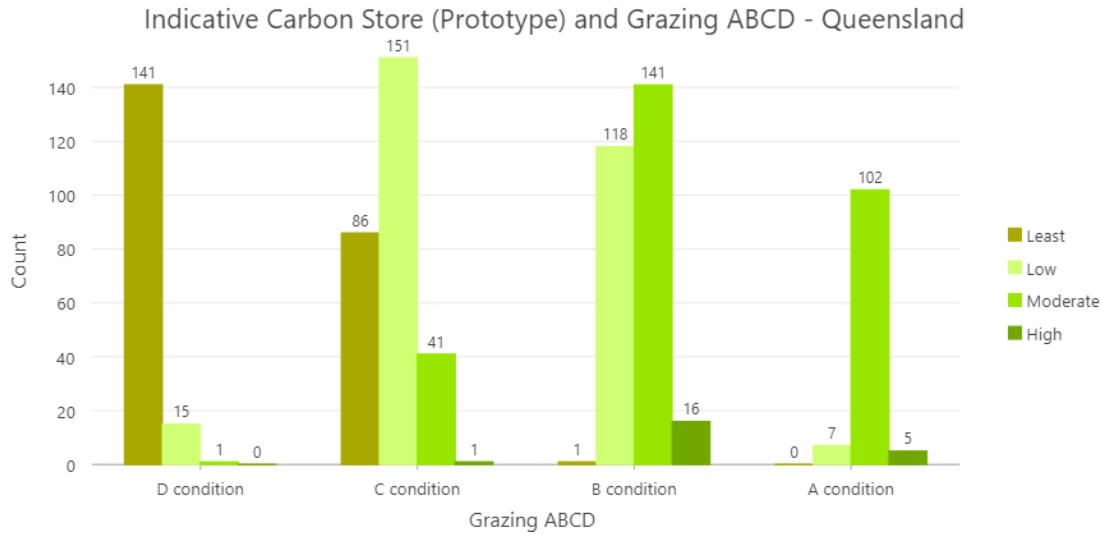
Considers dominant pasture species; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture tussock height; pasture quality; groundcover; land surface condition; slope; total pest plant density; total understorey density; and total overstorey density. Based on logic and thresholds that consider that the more productive a landscape—irrespective of whether dominated by native or non-native plant species, the better the groundcover and soil surface condition and the presence of sufficient under and overstorey plant density—the greater the production of organic matter, the higher the potential that effective nutrient cycling is occurring and the higher the likelihood of carbon being stored in soils.

### Result values

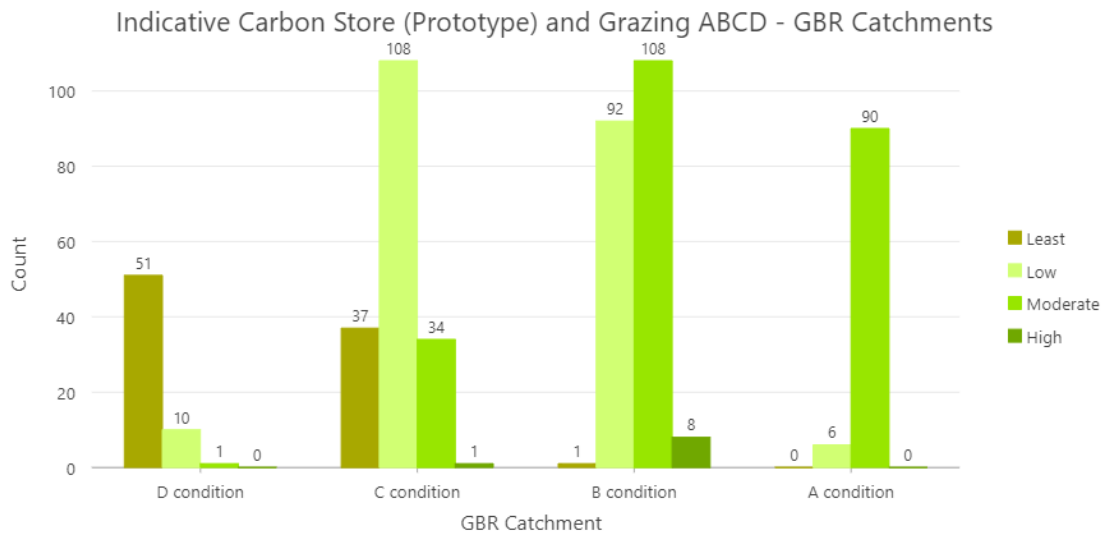
Indicative Carbon Store	Least	Low	Moderate	High
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### Interpretation

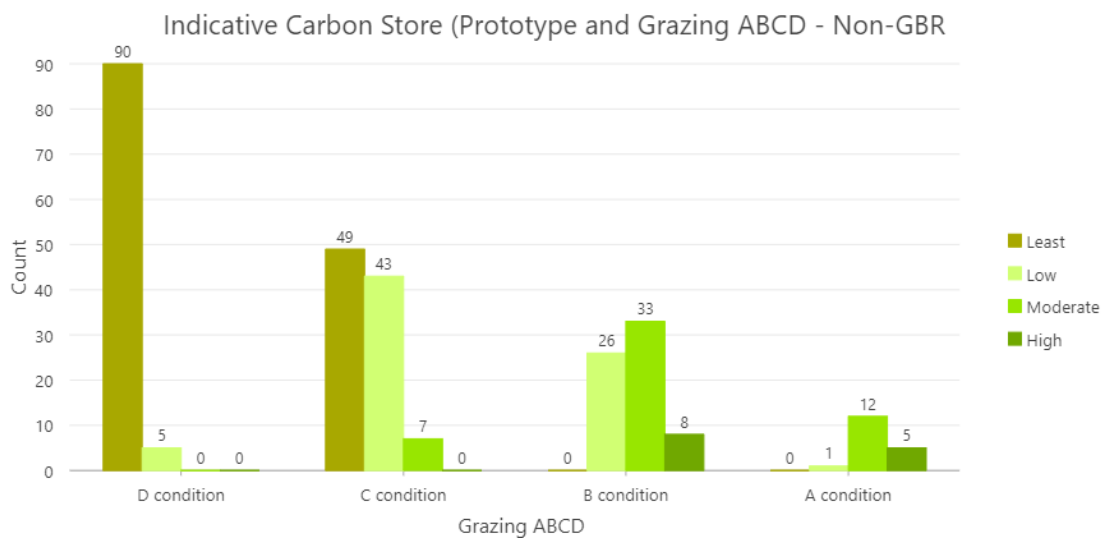
Indicative that high levels of organic matter are being made and/or retained by having high densities of perennial plants and minimising soil loss. Reinforces the benefit of retaining pasture residuals and vegetation in all layers.



**Figure 112** Indicative Carbon Store (Prototype) and Grazing ABCD—Queensland.



**Figure 113** Indicative Carbon Store (Prototype) and Grazing ABCD—GBR Catchments.



**Figure 114** Indicative Carbon Store (Prototype) and Grazing ABCD—Non-GBR.

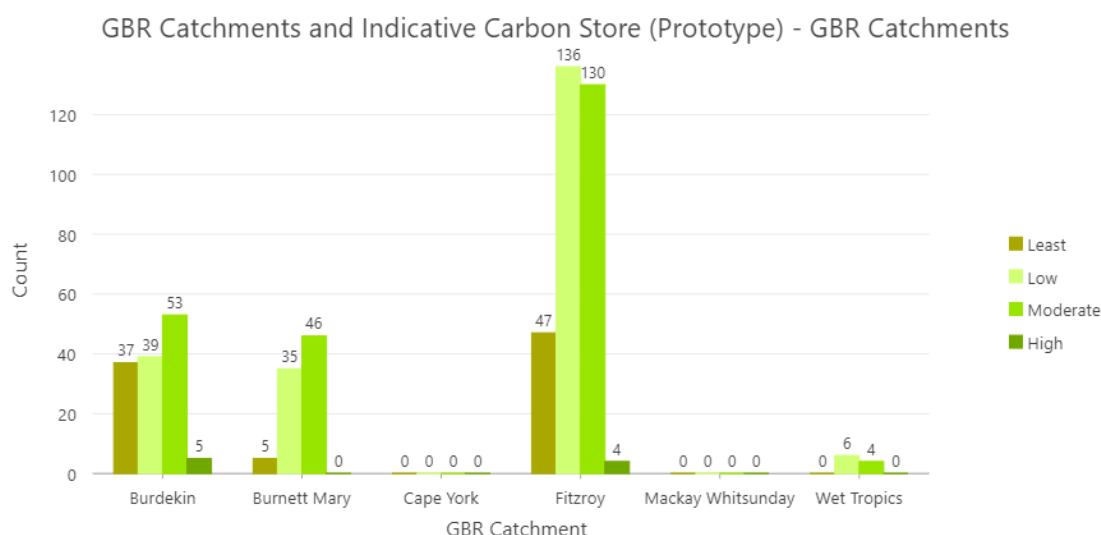


Figure 115 Indicative Carbon Store (Prototype) and GBR Catchments—GBR Catchments.

## 4.3 Secondary Results

### 4.3.1 Indicative Pasture Biomass (TSDM kg/ha)— Calculated Result

#### Determination

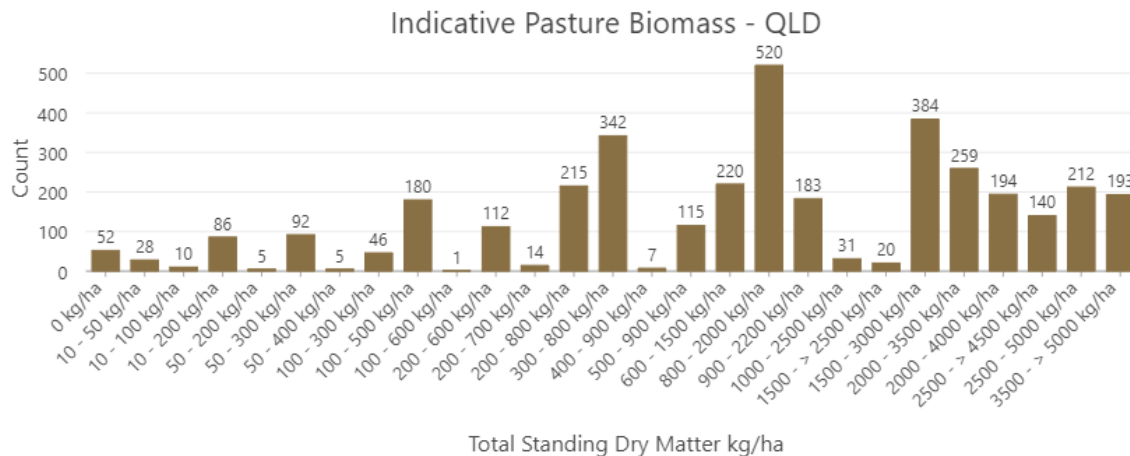
An in-built relational table calculates the indicative pasture biomass as Total Standing Dry Matter (TSDM) kg/ha. Inputs include dominant pasture density, pasture height, total perennial pasture density, total understorey density and total overstorey density. The calculation does not consider inherent weight differences between different pasture species (e.g. 3P species having greater bulk than 2P, 1P and Annual species); whether native or exotic; pasture greenness or dryness; or the density of pest plants given the breadth of their growth forms. Ranges in the lower end are narrower as the variability can be more easily considered. Ranges in the higher end are considerably broader reflecting greater variability of plant form and structure. As the total understorey and/or overstorey density increases, the expected pasture biomass decreases due to tree/grass competition. The columns of TSDM ranges shown above, do not have any relationship with land condition results. They are presented in columns according to the colour scheme of the results.

#### Result values

Indicative Biomass	0 to 100 – 300 kg/ha	100 – 500 to 500 – 900 kg/ha	600 – 1500 to 1000 – 2500 kg/ha	1500 - > 2500 to 3500 - > 5000 kg/ha
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#### Interpretation

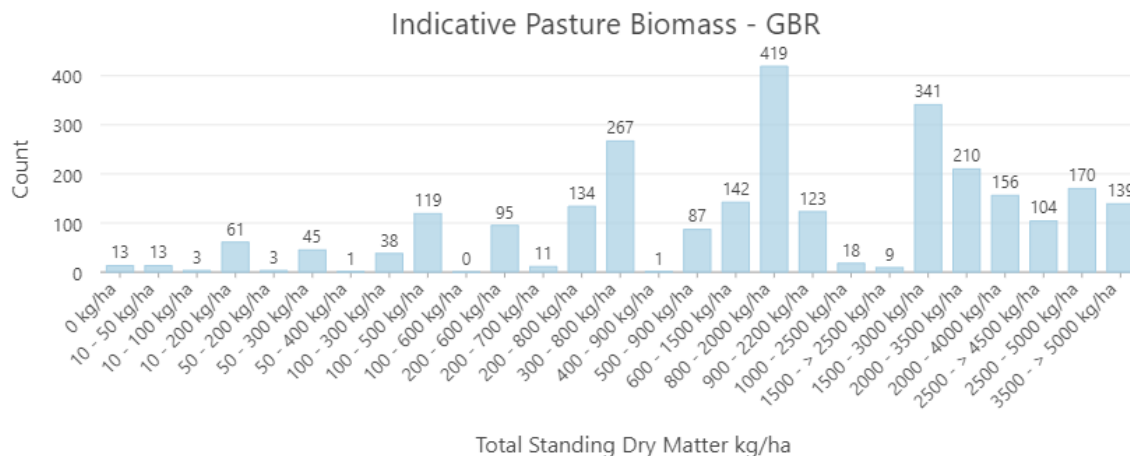
Ranges of values are indicative of the TSDM kg/ha given the combination of inputs. Ranges do not represent a minimum or maximum but rather an expected range considering all species growth forms across northern Australia. The result may be used as a starting point or guide to the estimation of TSDM kg/ha. They should not replace the more rigorous determination of TSDM kg/ha by weighing and drying clipped pasture quadrats for the purposes of forage budgeting.



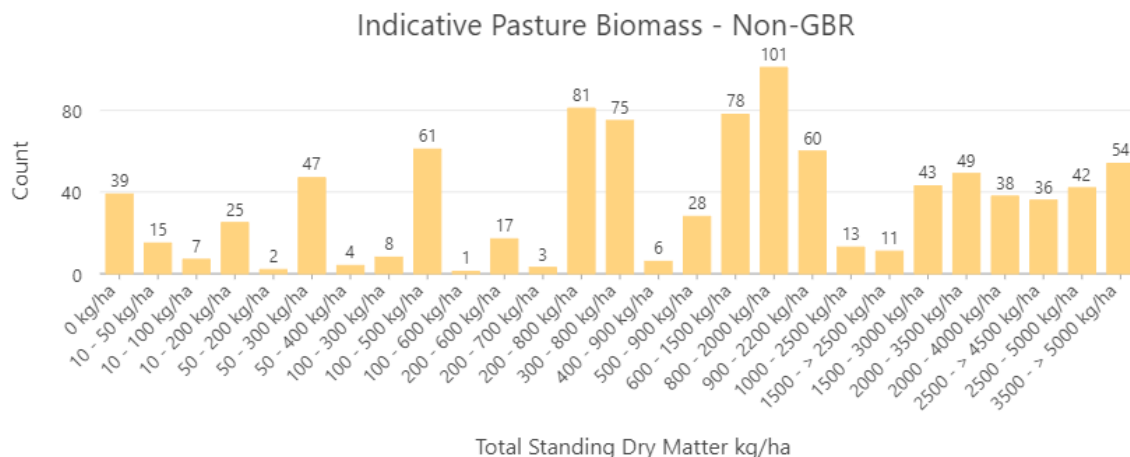
**Figure 116** Indicative Pasture Biomass (Total Standing Dry Matter kg/ha)—Queensland.

**Note:**

- Of all Sites (3666), 1530 (or 42 %) had an Indicative Pasture Biomass TSDM kg/ha equivalent to less than 1000 kg/ha (below the 800-2000 kg/ha value).
- 2136 sites (or 58 %) are above the equivalent of 1000 kg/ha.
- Within the GBR Catchments (2722 sites), 1033 sites (or 38 %) had an Indicative Pasture Biomass TSDM kg/ha equivalent to less than 1000 kg/ha.
- Retaining standing dry matter as residual pasture at approximately 1000 kg/ha is more likely to preserve pasture health and vigour.



**Figure 117** Indicative Pasture Biomass (Total Standing Dry Matter kg/ha)—GBR Catchments.



**Figure 118** Indicative Pasture Biomass (Total Standing Dry Matter kg/ha)—Non-GBR.

## 4.3.2 Erosion Hazard (Risk Advisory)—Calculated Result

### Determination

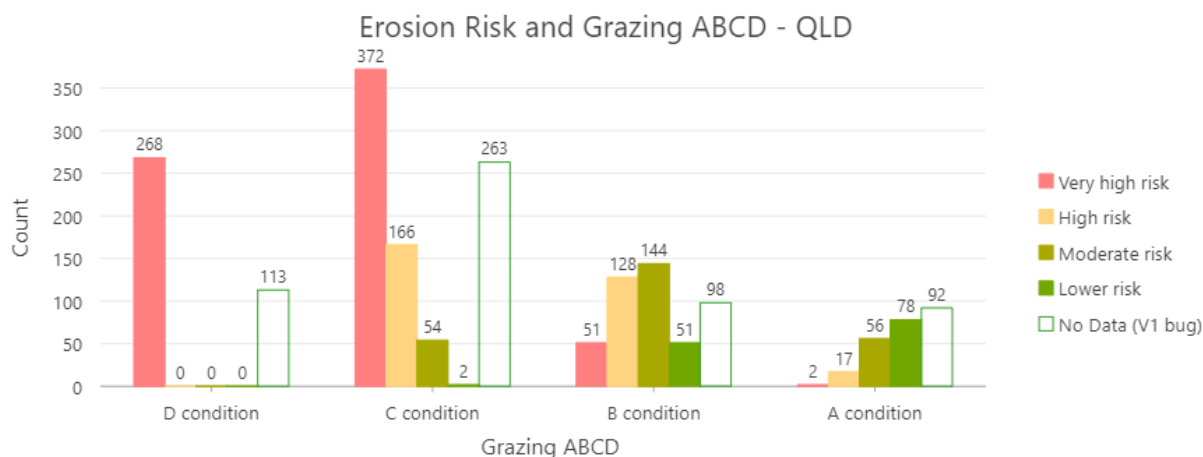
Considers dominant pasture species; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture tussock height; pasture quality; groundcover; land surface condition; slope; total pest plant density; total understorey density; total overstorey density; riparian area disturbance; stream bank erosion; and total grazing pressure. Based on logic and thresholds such as the lower the groundcover and perennial plant density and the steeper the slope, the greater the likelihood of erosion processes occurring. Includes indicators not always an indicator of land condition such as pasture height and growth phase. Where these values—irrespective of density—is significantly reduced, water is able to move more freely across a landscape.

### Result values

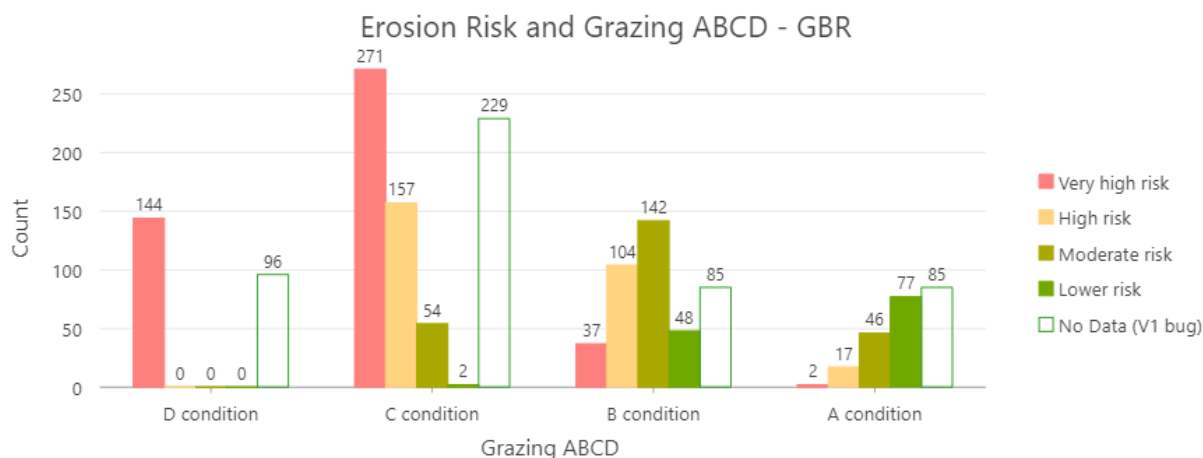
Erosion Hazard	Very high risk	High risk	Moderate risk	Lower risk
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### Interpretation

Indicates the observed landscape and natural resource values present a risk to erosion occurring. It does not indicate there is erosion, however the likelihood is high.

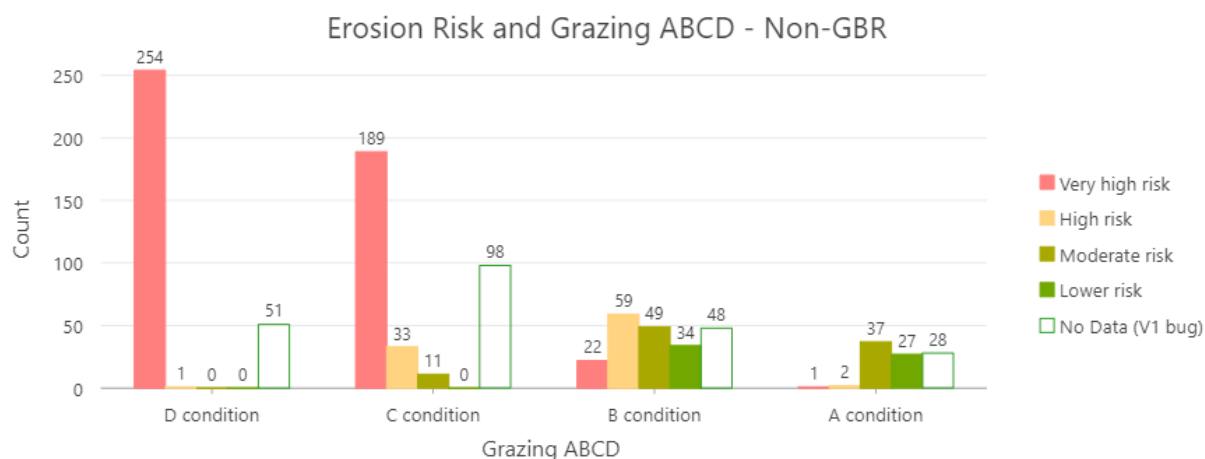


**Figure 119** Erosion Risk and Grazing ABCD—Queensland.



**Figure 120** Erosion Risk and Grazing ABCD—GBR Catchments.

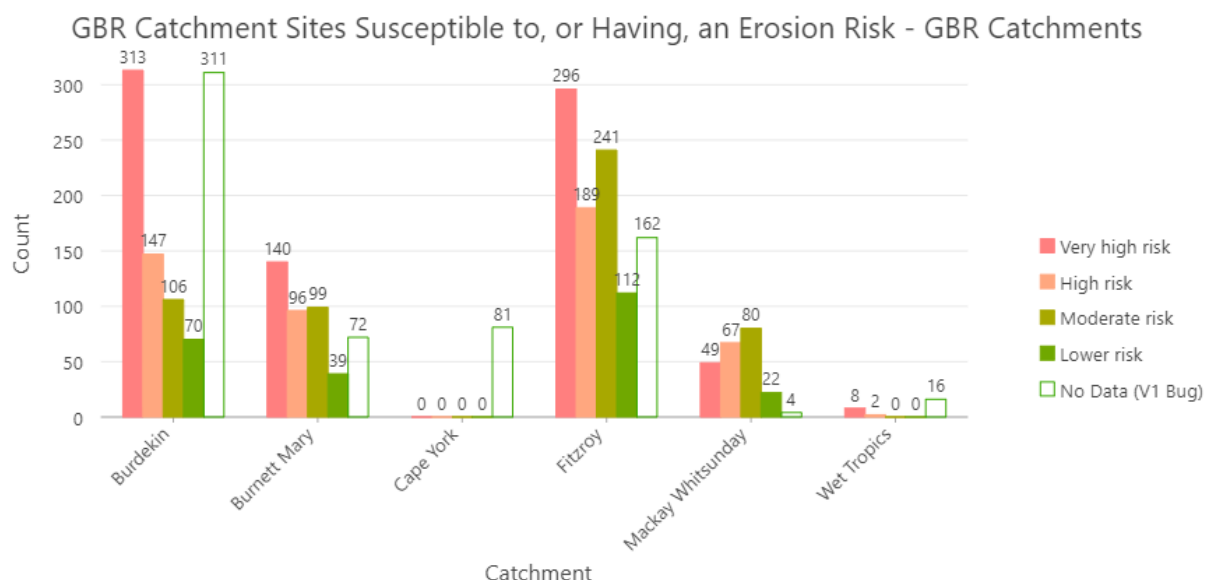




**Figure 121** Erosion Risk and Grazing ABCD—Non-GBR.

**Note:**

- On the balance of all indicators and values used to determine the *Erosion risk* result, Sites assessed in C and D condition have significant indicators of 'risk' despite the lack of erosion processes observed/assessed.



**Figure 122** Sites Susceptible to, or Having, an Erosion Risk—GBR Catchments.

**Table 98** Count of Erosion Risk Values in GBR Catchments and Sub-catchments—GBR Catchments.

GBR Catchments	Erosion Risk					Total
	Very high risk	High risk	Moderate risk	Lower risk	No Data	
<b>Sub-catchments</b>						
<b>Burdekin</b>	<b>313</b>	<b>147</b>	<b>106</b>	<b>70</b>	<b>311</b>	<b>947</b>
Black	2	1	-	-	-	3
Bowen	46	24	9	4	24	107
Don	15	9	2	-	15	41
Haughton	7	2	3	2	23	37
Lower Burdekin River	46	12	6	2	85	151
Ross	7	-	1	1	3	12
Suttor	103	61	45	30	43	282
Upper Burdekin	87	38	40	31	118	314

GBR Catchments	Erosion Risk					Total
	Very high risk	High risk	Moderate risk	Lower risk	No Data	
<b>Burnett Mary</b>	<b>140</b>	<b>96</b>	<b>99</b>	<b>39</b>	<b>72</b>	<b>446</b>
Baffle Creek	12	15	18	7	8	60
Burnett River	76	41	48	22	19	206
Burrum River	5	2	1	1	16	25
Kolan River	34	28	23	5	-	90
Upper Mary River	13	10	9	4	29	65
<b>Cape York</b>					<b>81</b>	<b>81</b>
Endeavour River	-	-	-	-	21	21
Jeannie River	-	-	-	-	6	6
Normanby River	-	-	-	-	54	54
<b>Fitzroy</b>	<b>296</b>	<b>189</b>	<b>241</b>	<b>112</b>	<b>162</b>	<b>1000</b>
Boyne River	3	3	5	-	-	11
Calliope River	2	3	2	2	9	18
Comet River	17	10	17	17	1	62
Dawson River	71	42	59	29	47	248
Fitzroy River	83	35	55	23	69	265
Isaac River	36	42	36	15	16	145
Mackenzie River	17	10	11	2	15	55
Nogoa River	58	34	52	21	-	165
Shoalwater		1	4	3	5	13
Styx River	6	8	-	-	-	14
Waterpark Creek	3	1	-	-	-	4
<b>Mackay Whitsunday</b>	<b>49</b>	<b>67</b>	<b>80</b>	<b>22</b>	<b>4</b>	<b>222</b>
O'Connell River	26	32	33	5	-	96
Pioneer River	14	14	16	4	-	48
Plane Creek	1	11	13	7	4	36
Proserpine River	8	10	18	6	-	42
<b>Wet Tropics</b>	<b>8</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>16</b>	<b>26</b>
Herbert River	1	1	-	-	-	2
Johnstone River	7	1	-	-	16	24
<b>Total</b>	<b>806</b>	<b>501</b>	<b>526</b>	<b>243</b>	<b>646</b>	<b>2722</b>

### 4.3.3 Grazing Alert (Risk Advisory)—Calculated Result

#### Determination

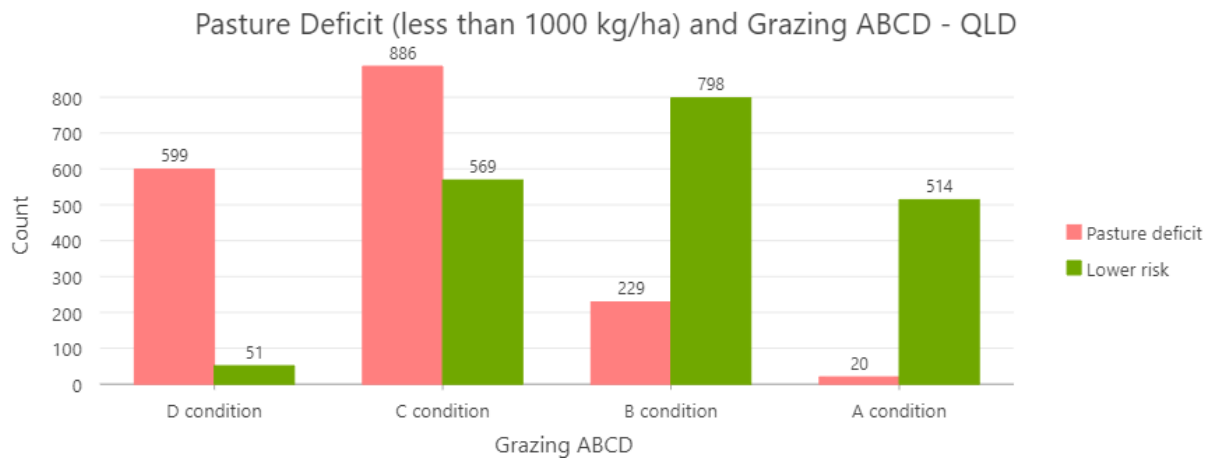
Triggered where the indicative pasture biomass TSDM kg/ha falls below the industry standard of 1000 kg/ha pasture residual. This level of pasture residual is recognised as protecting pasture plant health, providing sufficient standing dry matter to enable the pasture to respond to grazing and rain, and provide benefits to groundcover and soil retention. May be triggered where the indicative biomass ranges above have a wider range from below 1000 kg/ha e.g. 800 - 2000 and 900 – 2200 kg/ha.

#### Result values

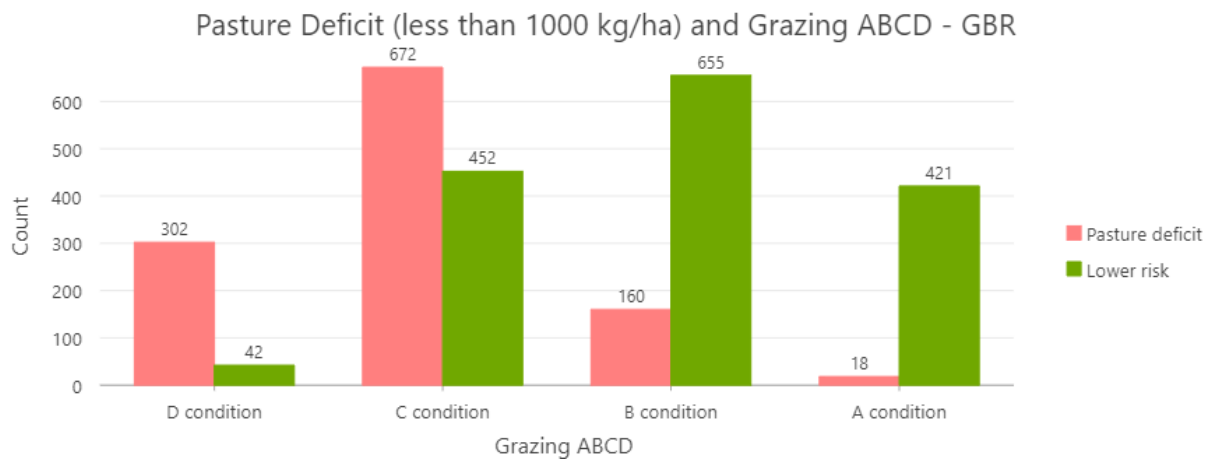
Grazing Alert	Pasture Deficit to Lower Risk
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## Interpretation

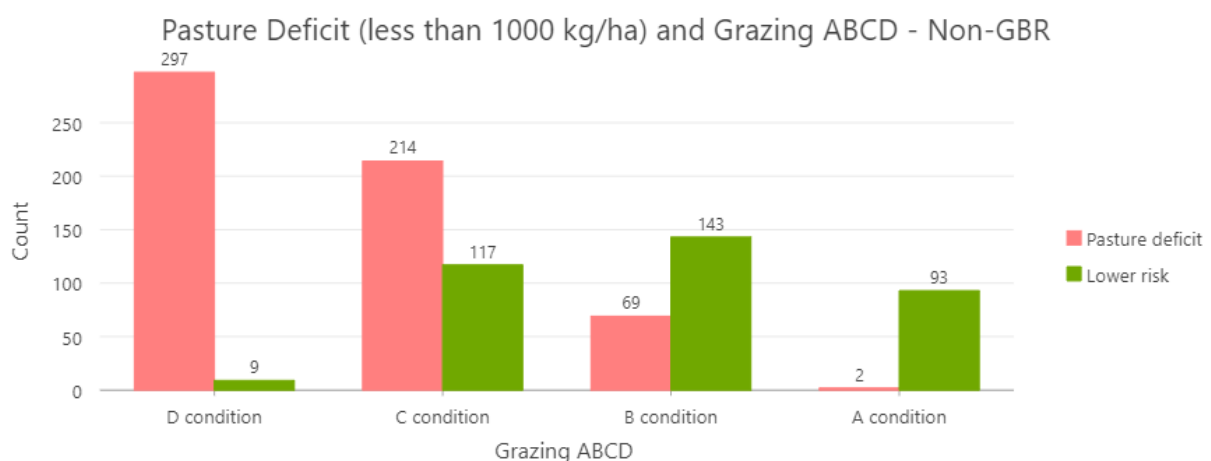
Pasture deficit is presented as an alert that pasture biomass/feed availability is declined. Risks to pasture plant health, vigour, capacity to respond and recover and soil surface condition are increased.



**Figure 123** Pasture Deficit (less than 1000 kg/ha) and Grazing ABCD—Queensland.



**Figure 124** Pasture Deficit (less than 1000 kg/ha) and Grazing ABCD—GBR Catchments.



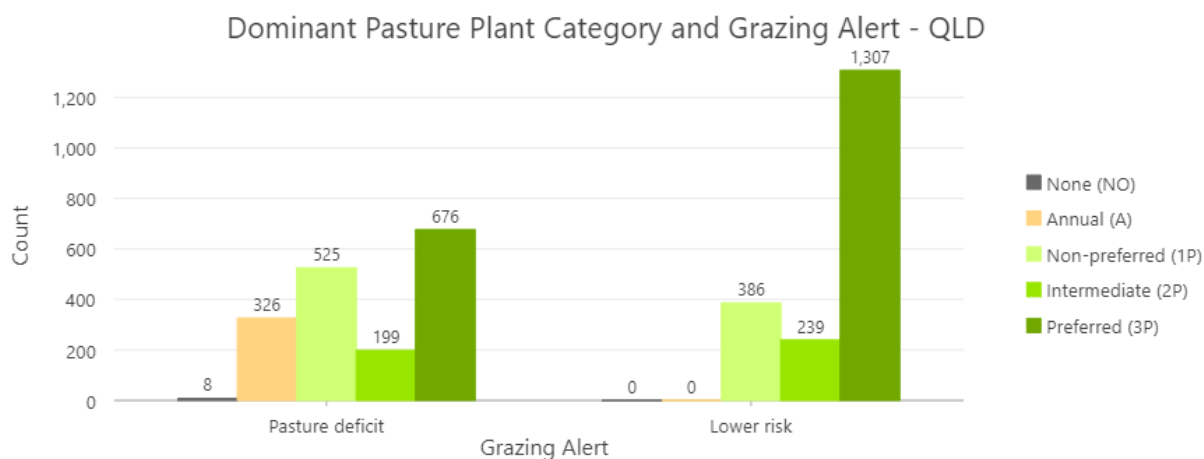
**Figure 125** Pasture Deficit (less than 1000 kg/ha) and Grazing ABCD—Non-GBR.

**Note:**

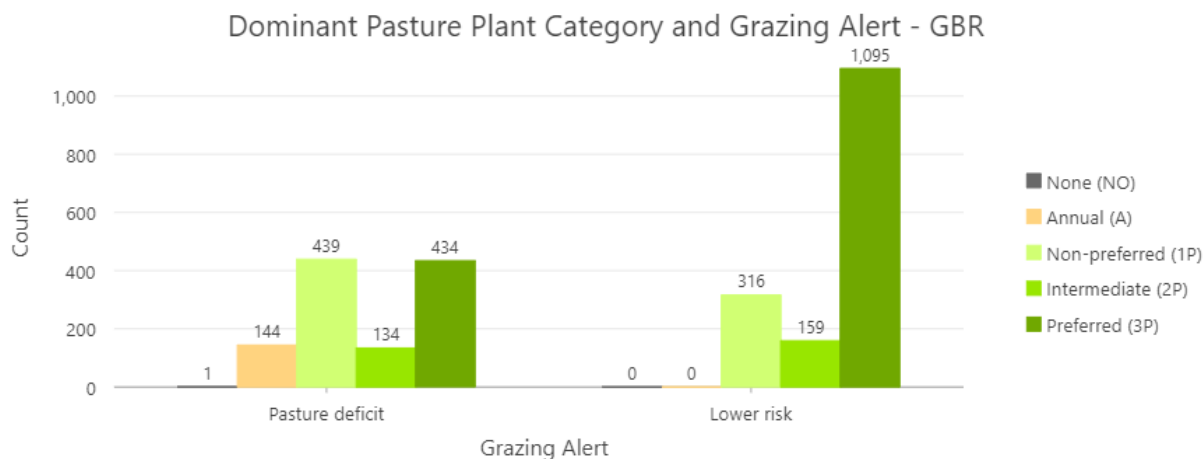
- Whilst pasture biomass (TSDM Kg/ha) does not equal land condition, sites assessed as C and D condition have a higher frequency of 'pasture deficit'.

**Table 99** Percentage (%) of Pasture Deficit and Grazing ABCD—Regional Comparison.

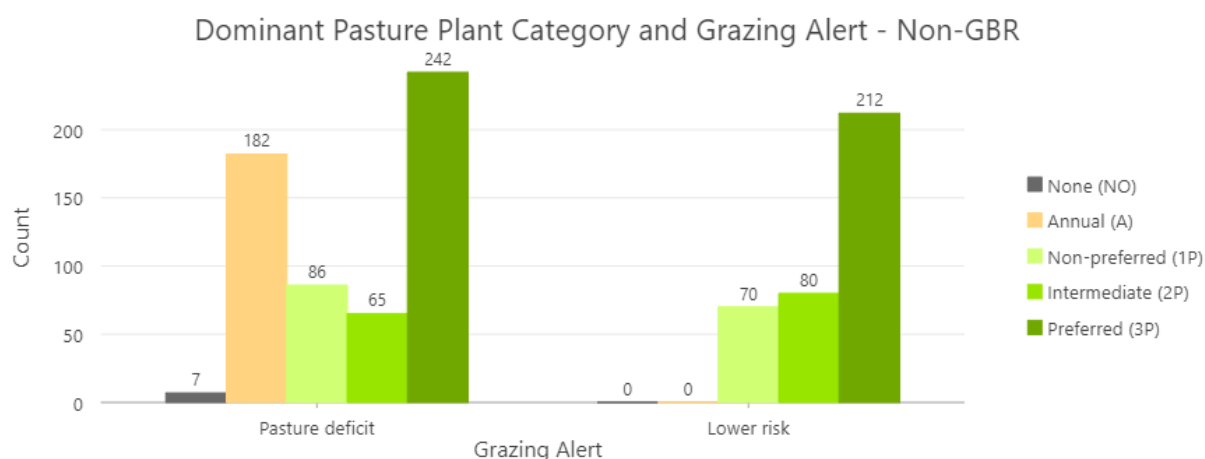
Region	Grazing Alert	Grazing ABCD				Grand Total
		D condition	C condition	B condition	A condition	
GBR Catchments	Pasture deficit	26	58	14	2	100
	Lower risk	3	29	42	27	100
	<b>GBR %</b>	<b>13</b>	<b>41</b>	<b>30</b>	<b>16</b>	<b>100</b>
Non-GBR	Pasture deficit	51	37	12	0	100
	Lower risk	2	32	40	26	100
	<b>Non-GBR %</b>	<b>32</b>	<b>35</b>	<b>22</b>	<b>10</b>	<b>100</b>
Queensland	<b>Queensland %</b>	<b>18</b>	<b>40</b>	<b>28</b>	<b>15</b>	<b>100</b>



**Figure 126** Dominant Pasture Plant Category and Pasture Deficit (less than 1000 kg/ha)—Queensland.



**Figure 127** Dominant Pasture Plant Category and Pasture Deficit (less than 1000 kg/ha)—GBR Catchments.



**Figure 128** Dominant Pasture Plant Category and Pasture Deficit (less than 1000 kg/ha)—Non-GBR.

**Note:**

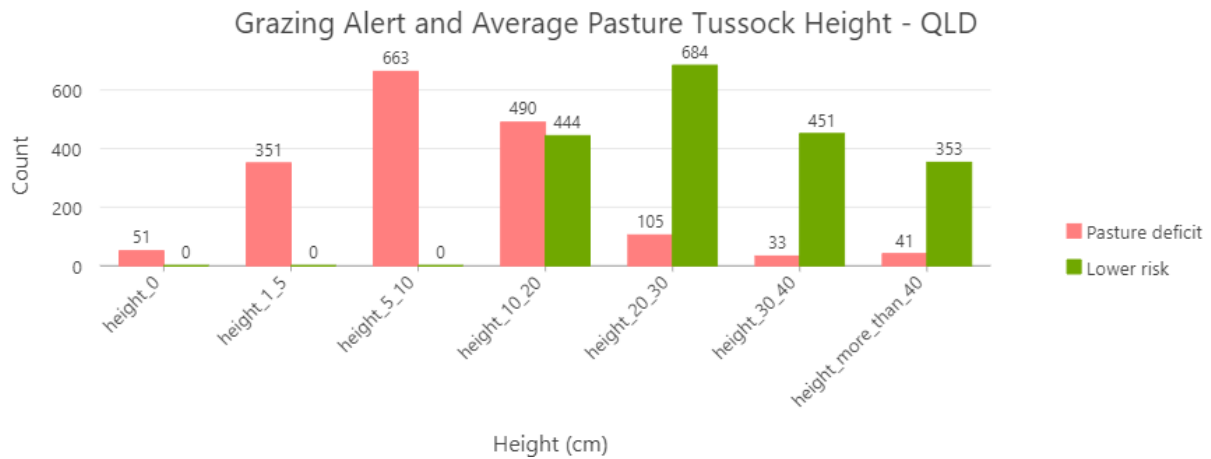
- Of all Sites (3666), 1734 (or 47 %) had a pasture deficit.
- Due to their palatability and the dominance of Preferred species at all sites assessed, Preferred species are the most frequently experiencing pasture deficit or a lower risk.

**Table 100** Percentage (%) of Dominant Pasture Plant Category by Pasture Deficit—Regional Comparison.

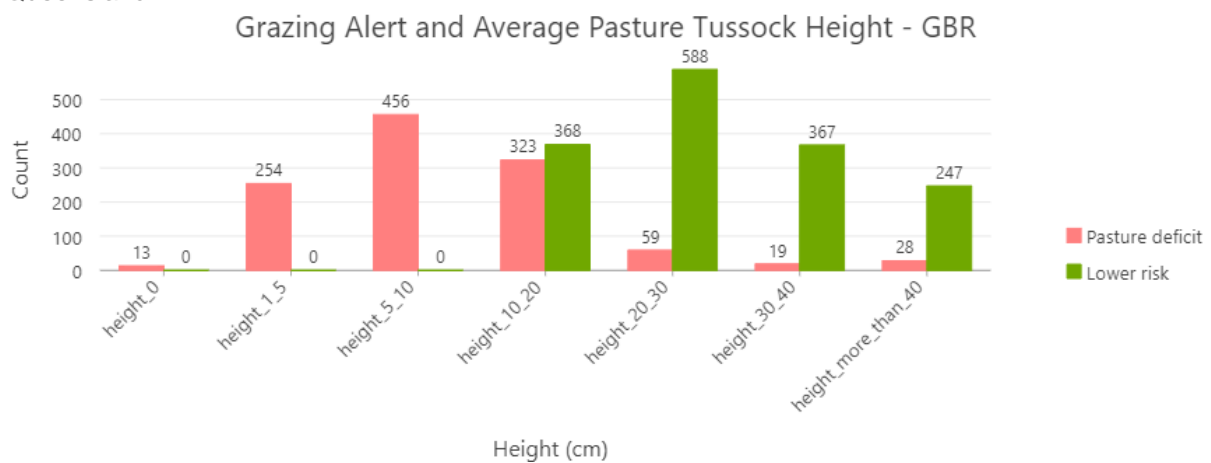
Region	Dominant Pasture Plant Category	Pasture deficit (Less than 1000 kg/ha)	Lower risk	Grand Total
GBR Catchments	NO	100	0	100
	A	100	0	100
	N	58	42	100
	I	46	54	100
	P	28	72	100
	GBR %	42	58	100
Non-GBR	NO	100	0	100
	A	100	0	100
	N	55	45	100
	I	45	55	100
	P	53	47	100
	Non-GBR %	62	38	100
Queensland	Queensland %	47	53	100

**Note:**

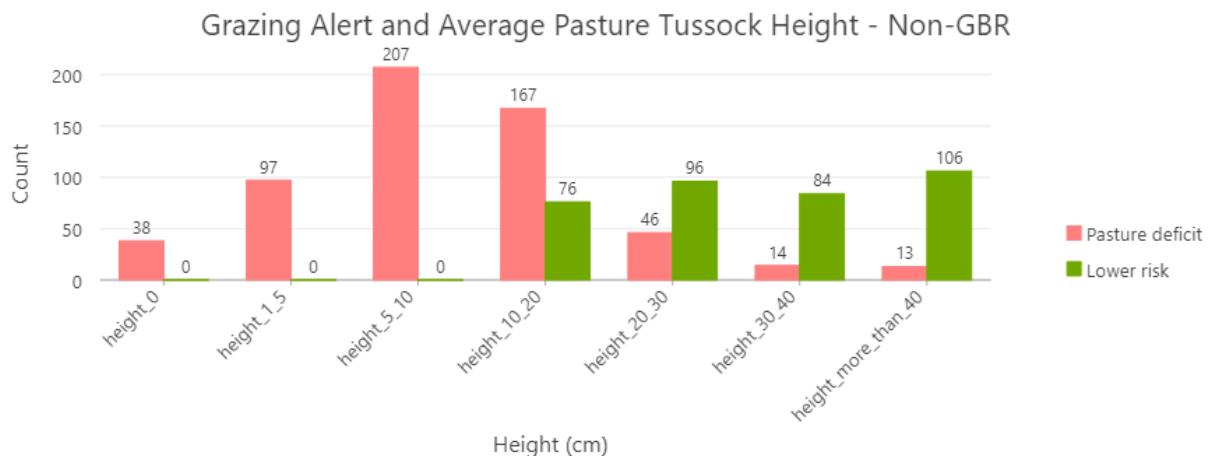
- In the GBR Catchments, the high proportion (58 %) of Sites dominated by a Non-preferred species having a pasture deficit may include sites dominated by Indian couch—a 2P or Intermediate species, however categorised as a 1P or Non-preferred species when dominant and/or greater than 30 % of the pasture TSDM kg/ha.
- In the Non-GBR Catchments, the high proportion (55%) of Sites dominated by a Non-preferred species having a pasture deficit is largely due to the frequency of sites dominated by Wiregrasses (*Aristida spp*) and Forbs.
- In the Non-GBR catchments, 53 % of sites dominated by 3P Preferred species have a pasture deficit.



**Figure 129** Pasture Deficit (less than 1000 kg/ha) and Average Pasture Tussock Height—Queensland.



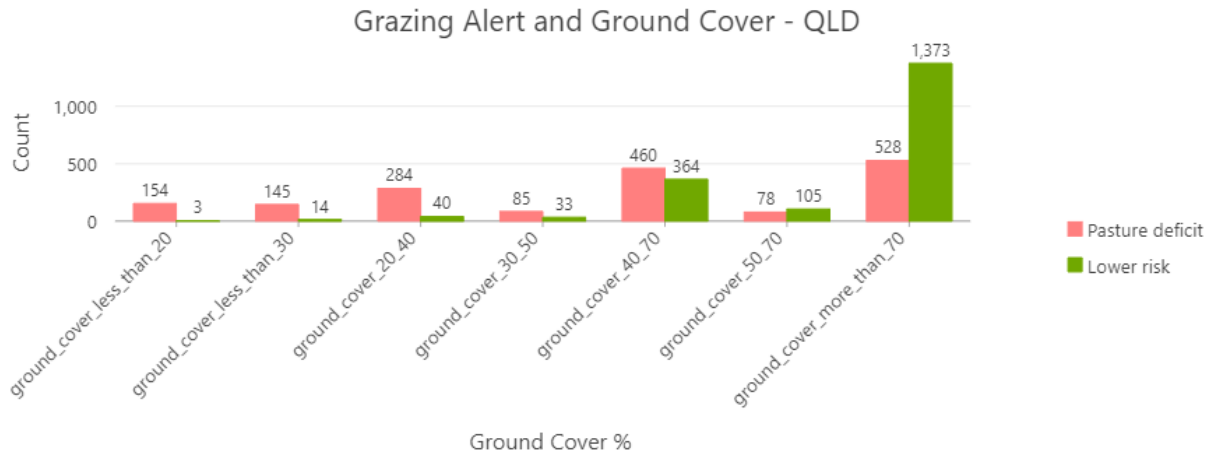
**Figure 130** Pasture Deficit (less than 1000 kg/ha) and Average Pasture Tussock Height—GBR Catchments.



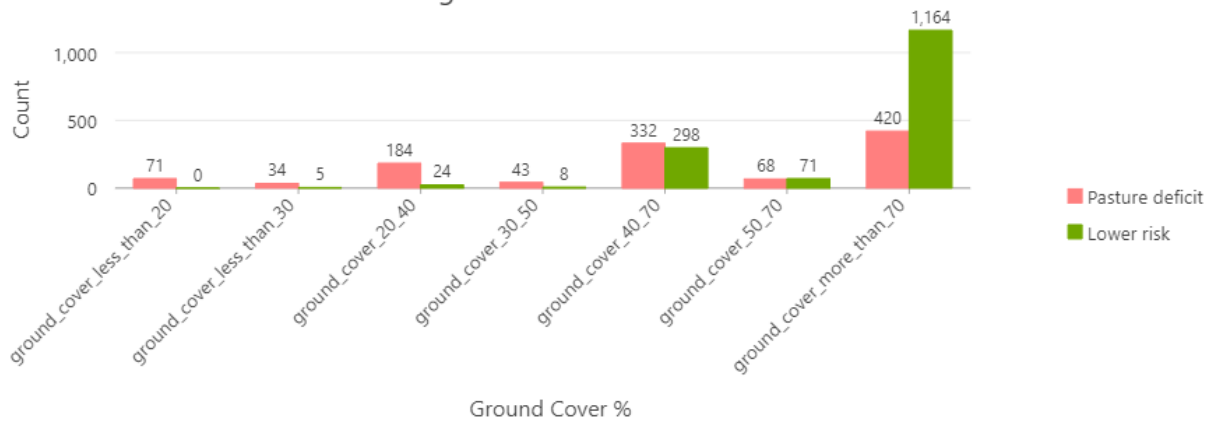
**Figure 131** Pasture Deficit (less than 1000 kg/ha) and Average Pasture Tussock Height—Non-GBR.

**Note:**

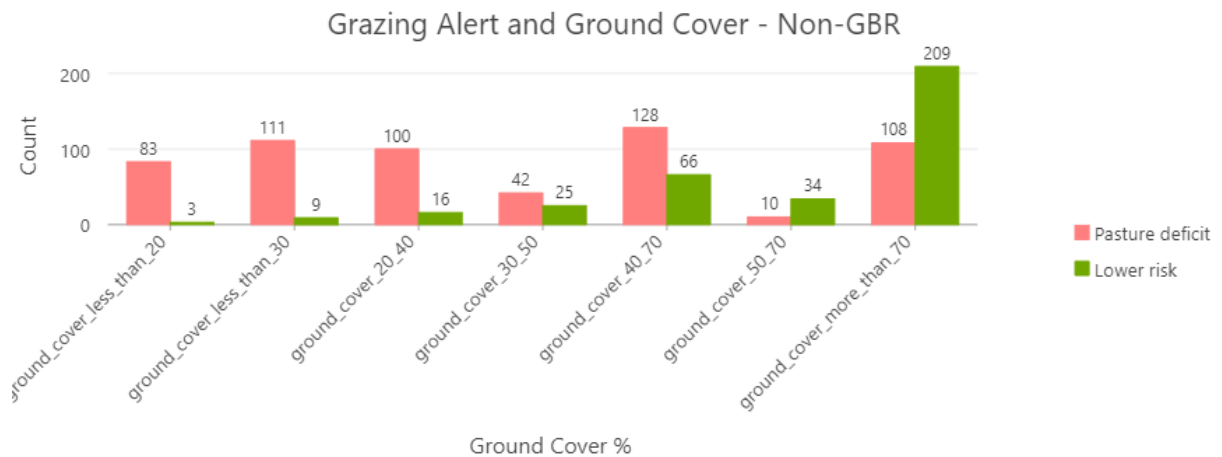
- As a rule of thumb, 10-15 cm is considered equivalent to approximately 1000 kg/ha.
- Across Queensland, the frequency of Pasture Deficit being triggered falls-off above the Average Pasture Tussock Height value of 10-20 cm.
- Higher values (> 10-20 cm) with a pasture deficit reflect decreased dominant and total perennial pasture densities.



**Figure 132** Pasture Deficit (less than 1000 kg/ha) and Ground Cover—Queensland. Grazing Alert and Ground Cover - QLD



**Figure 133** Pasture Deficit (less than 1000 kg/ha) and Ground Cover—GBR Catchments.



**Figure 134** Pasture Deficit (less than 1000 kg/ha) and Ground Cover—Non-GBR.

**Note:**

- The frequency of sites having a pasture deficit occurs relatively equally across all ground cover % values including the greater than 70 % ground cover value.
- However, sites with ground cover values of 40 – 70 % or more, have a lower frequency of pasture deficit.

**Table 101** Percentage (%) of Organic Ground Cover Values and Pasture Deficit—Regional Comparison.

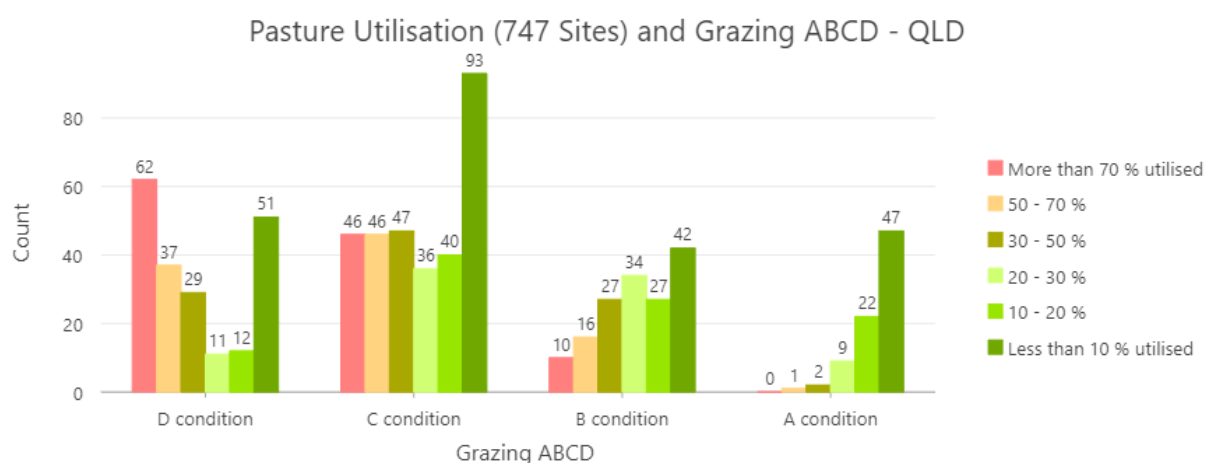
Region	Grazing Alert	Organic Ground Cover %							Total %
		< 20	< 30 (V2)	20 - 40	30 - 50 (V2)	40 - 70	50 - 70 (V2)	> 70	
GBR Catchments	Pasture deficit	100	87	88	84	53	49	27	42%
	Lower risk	0	13	12	16	47	51	73	58%
	<b>GBR %</b>	<b>45</b>	<b>25</b>	<b>64</b>	<b>43</b>	<b>76</b>	<b>76</b>	<b>83</b>	<b>74%</b>
Non-GBR	Pasture deficit	97	93	86	63	66	23	34	62%
	Lower risk	3	8	14	37	34	77	66	38%
	<b>Non-GBR %</b>	<b>55</b>	<b>75</b>	<b>36</b>	<b>57</b>	<b>24</b>	<b>24</b>	<b>17</b>	<b>26%</b>
Queensland	Pasture deficit	98	91	88	72	56	43	28	47%
	Lower risk	2	9	12	28	44	57	72	53%
	<b>QLD %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100%</b>

### Pasture Utilisation (from LCAT Advanced)—Observed Data

The amount of forage or pasture biomass (as TSDM kg/ha) present on a site does not influence land condition i.e. a site may be in good or poor condition with a TSDM of 500 kg/ha or 5000 kg/ha. The sites' condition is determined by long-term indicators of land condition such as pasture composition and density and erosion.

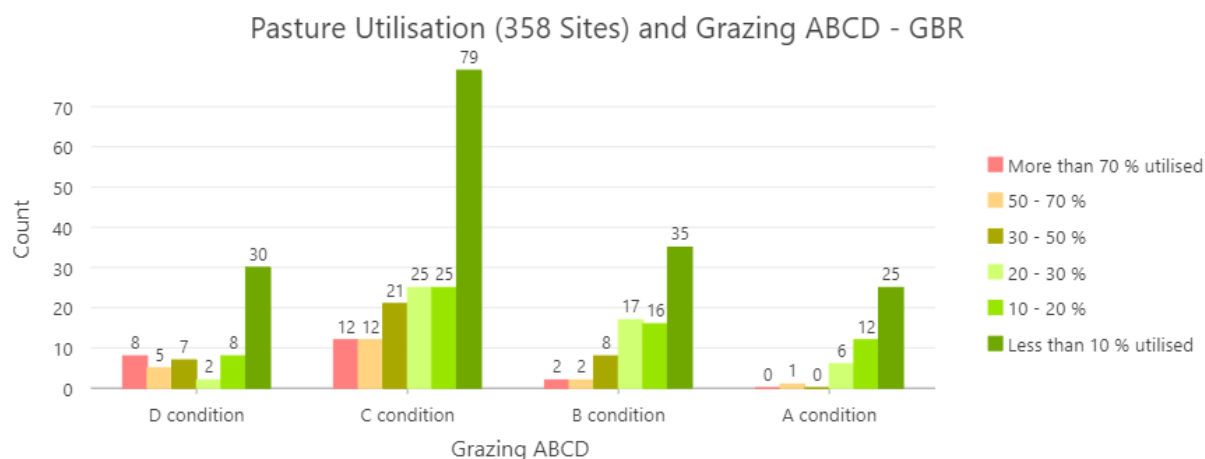
Pasture utilisation (%) is a non-mandatory question within the LCAT Advanced, Survey Type. Pasture utilisation within the LCAT is a visual observation / estimate of the proportion of TSDM consumed. It is an indicative contextual observation that does not consider the various definitions and more rigorous methods to calculate it.

Utilisation observations made within 747 LCAT Advanced sites is included as a comparison against other land condition metrics.

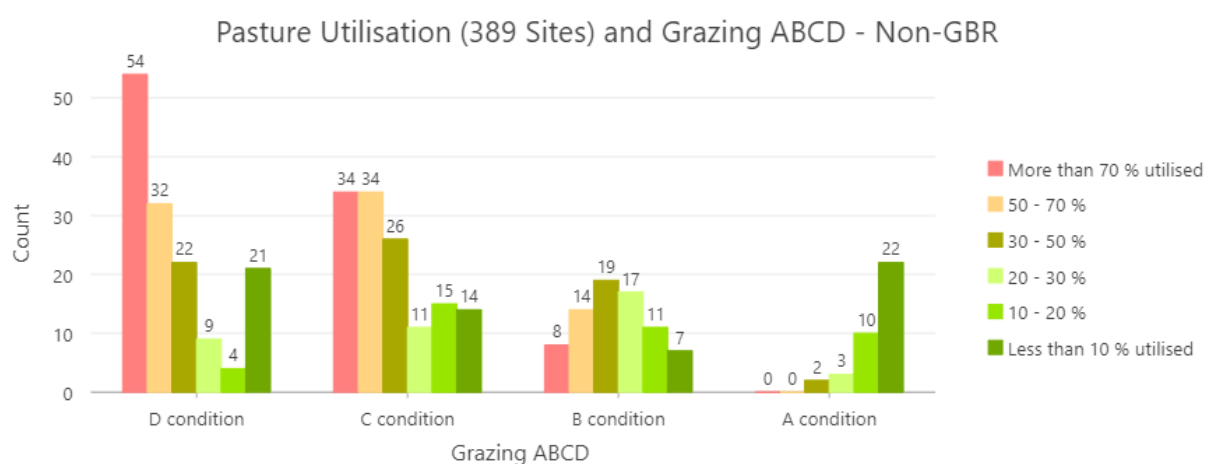


**Figure 135** Pasture Utilisation (747 Sites) and Grazing ABCD—Queensland.





**Figure 136** Pasture Utilisation (358 Sites) and Grazing ABCD—GBR Catchments.



**Figure 137** Pasture Utilisation (389 Sites) and Grazing ABCD—Non-GBR.

**Note:**

- Of the 754 Advanced Surveys completed, 747 included an assessment of Pasture Utilisation.
- Of the 747, 323 or 43 %) had a pasture utilisation value of 30 – 50 % utilised or greater.
- Sites assessed in A condition typically reflect conservative utilisation.
- Sites assessed in B condition reflect a range of utilisation from well managed to higher levels.
- Sites in C and D condition have higher proportions of utilisation at 30 – 50 % and > 70 %.
- Utilisation of < 10 % within C and D condition Sites, likely reflects the dominant pasture was a less-palatable, Non-preferred/increaser (1P) pasture species.
- D condition Sites have counts of > 70% utilisation, equal to those of < 10% utilisation in A condition Sites.

### 4.3.4 Water Quality Hazard (Risk Advisory)—Calculated Result

#### Determination

Considers dominant pasture; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture quality; groundcover; land surface condition; slope; distance from water; management of the riparian zone; riparian area disturbance; stream bank erosion; total grazing pressure; and site impacts. Refers to the risk of sediment being transported to a waterway or

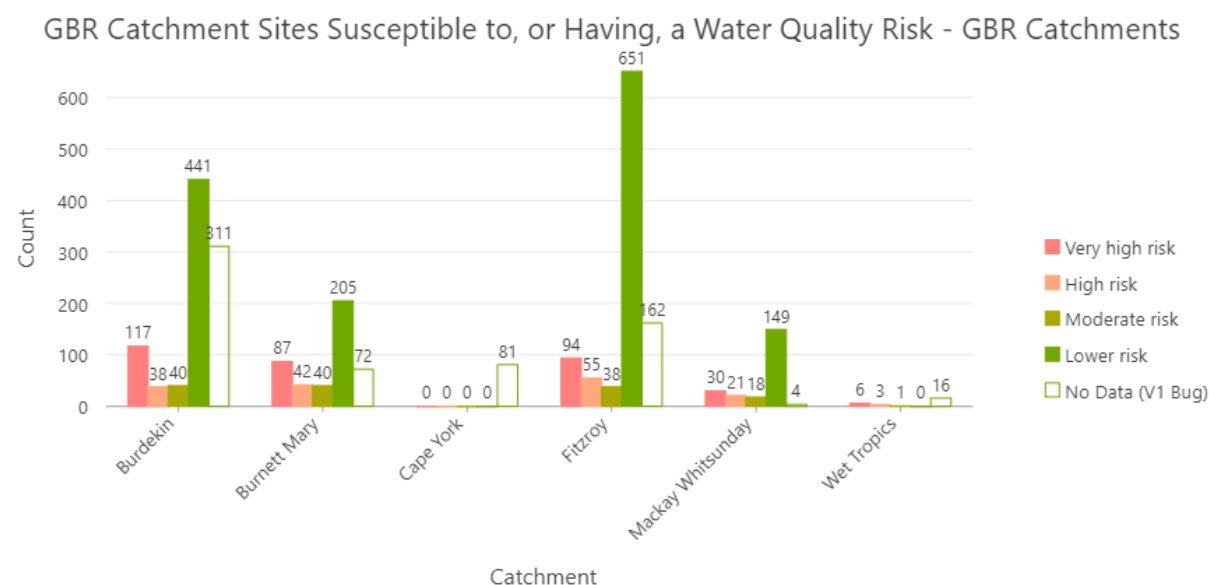
waterbody. Based on logic and thresholds such as the lower the groundcover and the steeper the slope, the greater the risk of the soil surface being eroded, and sediment transported. Similar to Erosion hazard but considers distance from water and management and impacts within riparian zones. A stable riparian buffer of >100 m has a reduced water quality risk.

## Result values

Water Quality Hazard	Very high risk	High risk	Moderate risk	Lower risk
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## Interpretation

Indicates the observed landscape and natural resource values present a risk to reduced water quality. It does not indicate there is reduced water quality.



**Figure 138** Sites in GBR Catchments, Susceptible to, or Having, a Risk to Water Quality—GBR Catchments.

**Table 102** Count of Water Quality Risk Values in GBR Catchments and Sub-catchments—GBR Catchments.

GBR Catchments	Water Quality Risk					Total
	Very high risk	High risk	Moderate risk	Lower risk	No Data	
<b>Sub-catchments</b>						
<b>Burdekin</b>	<b>313</b>	<b>147</b>	<b>106</b>	<b>70</b>	<b>311</b>	<b>947</b>
Black	2	1	-	-	-	3
Bowen	46	24	9	4	24	107
Don	15	9	2	-	15	41
Haughton	7	2	3	2	23	37
Lower Burdekin River	46	12	6	2	85	151
Ross	7	-	1	1	3	12
Suttor	103	61	45	30	43	282
Upper Burdekin	87	38	40	31	118	314
<b>Burnett Mary</b>	<b>140</b>	<b>96</b>	<b>99</b>	<b>39</b>	<b>72</b>	<b>446</b>
Baffle Creek	12	15	18	7	8	60
Burnett River	76	41	48	22	19	206
Burrum River	5	2	1	1	16	25

GBR Catchments	Water Quality Risk					Total
	Very high risk	High risk	Moderate risk	Lower risk	No Data	
<b>Sub-catchments</b>						
Kolan River	34	28	23	5	-	90
Upper Mary River	13	10	9	4	29	65
<b>Cape York</b>					<b>81</b>	<b>81</b>
Endeavour River	-	-	-	-	21	21
Jeannie River	-	-	-	-	6	6
Normanby River	-	-	-	-	54	54
<b>Fitzroy</b>	<b>296</b>	<b>189</b>	<b>241</b>	<b>112</b>	<b>162</b>	<b>1000</b>
Boyne River	3	3	5	-	-	11
Calliope River	2	3	2	2	9	18
Comet River	17	10	17	17	1	62
Dawson River	71	42	59	29	47	248
Fitzroy River	83	35	55	23	69	265
Isaac River	36	42	36	15	16	145
Mackenzie River	17	10	11	2	15	55
Nogoa River	58	34	52	21	-	165
Shoalwater	-	1	4	3	5	13
Styx River	6	8	-	-	-	14
Waterpark Creek	3	1	-	-	-	4
<b>Mackay Whitsunday</b>	<b>49</b>	<b>67</b>	<b>80</b>	<b>22</b>	<b>4</b>	<b>222</b>
O'Connell River	26	32	33	5	-	96
Pioneer River	14	14	16	4	-	48
Plane Creek	1	11	13	7	4	36
Proserpine River	8	10	18	6	-	42
<b>Wet Tropics</b>	<b>8</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>16</b>	<b>26</b>
Herbert River	1	1	-	-	-	2
Johnstone River	7	1	-	-	16	24
<b>Total</b>	<b>806</b>	<b>501</b>	<b>526</b>	<b>243</b>	<b>646</b>	<b>2722</b>

### 4.3.5 Water Contamination Hazard (Risk Advisory)— Calculated Result

#### Determination

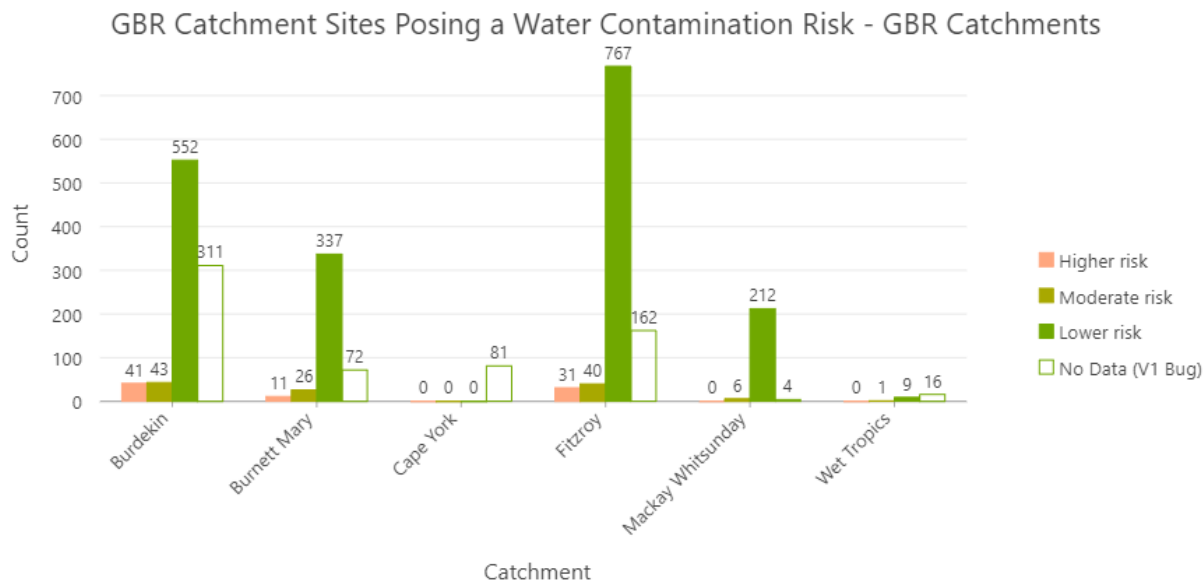
Considers dominant pasture density; total perennial pasture density; groundcover; slope; distance from water; management of the riparian zone; total grazing pressure; and site impacts. Refers to the risk of biological matter (e.g. bacteria, protozoa, effluent) being introduced to a waterway or waterbody. Based on logic and thresholds such as the higher the concentration of domestic and pest animals to a waterway or waterbody, the higher the likelihood of biological contamination occurring. Irrespective of how far and at what concentration inputs may occur from the entry point.

#### Result values

Water Contamination Hazard	Higher risk	Moderate risk	Lower risk	-
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## Interpretation

Indicates the observed key natural resource values in combination with total grazing pressure and proximity to water present a risk to increased water contamination. It does not indicate there is increased water contamination. May be used by organisations with responsibility in water quality and treatment as a ‘reminder’ to land managers with regard management of riparian zones.



**Figure 139** Sites in GBR Catchments Posing a Water Contamination Risk—GBR Catchments.

## 4.3.6 Fire Potential (Risk Advisory)—Calculated Result

### Determination

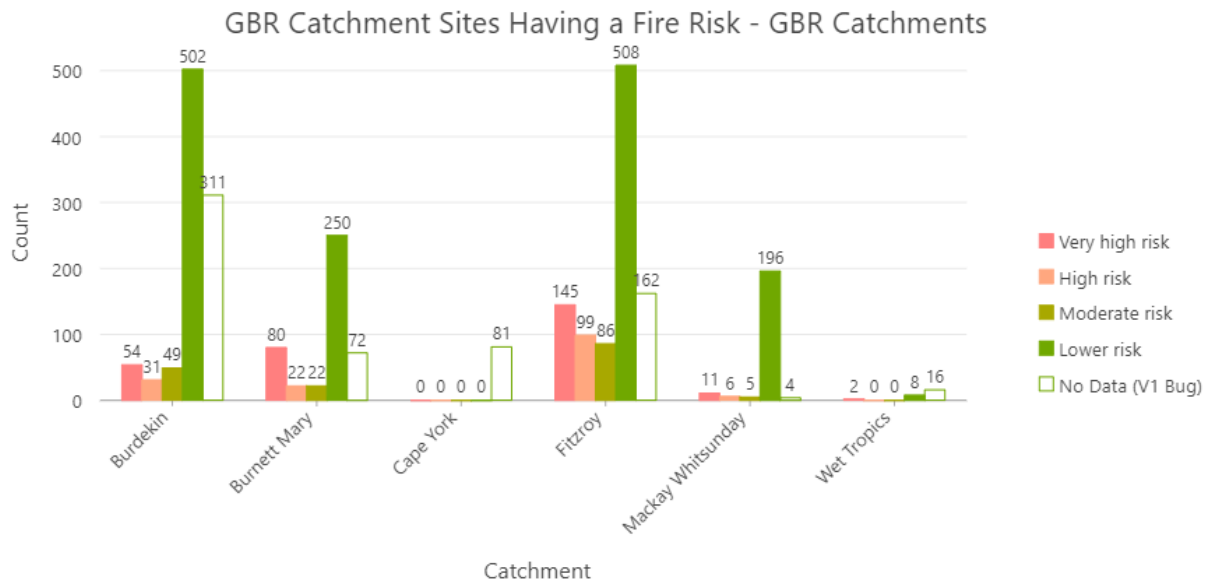
Considers dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture tussock height; pasture quality; groundcover; slope; total understorey density; and total overstorey density. Based on logic and thresholds such as the higher the pasture total sanding dry matter kg/ha when dry and the higher the woody plant densities and steeper the slope, the higher the fire risk.

### Result values

Fire Potential	Very high risk	High risk	Moderate risk	Lower risk
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### Interpretation

Presented as fire potential as it may be used as a management tool (positive use) as well as to indicate increased risk (negative impact).



**Figure 140** Sites in GBR Catchments, Having Potential for Fire—GBR Catchments.

### 4.3.7 Invasive Pest Plant Hazard (Risk Advisory)— Calculated Result

#### Determination

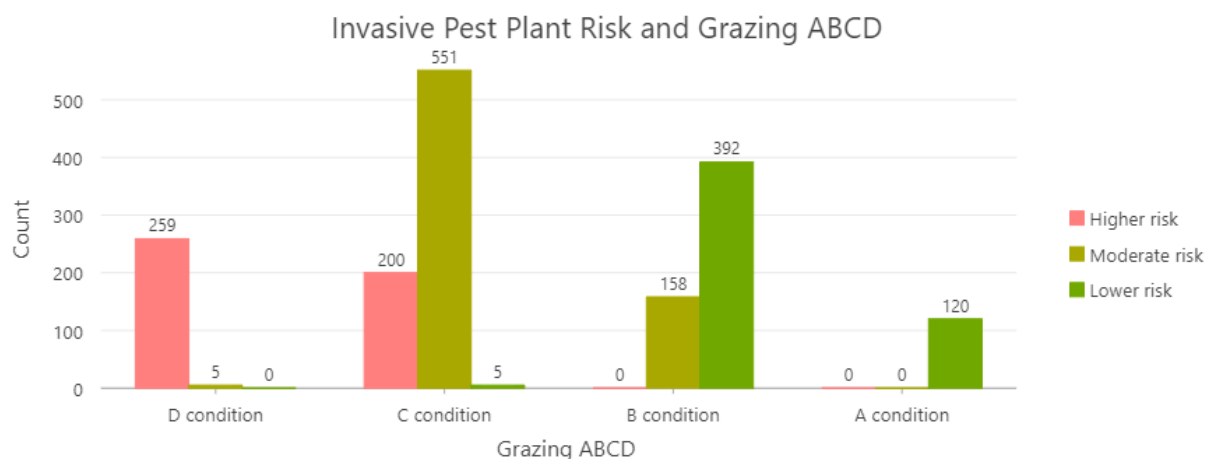
Considers dominant pasture species; dominant pasture density; total perennial pasture density; pasture quality; groundcover; land surface condition; and total pest plant density. Based on logic and thresholds such as, the more hostile the landscape becomes—as a result of decreased pasture production and health or increased erosion processes—the better the conditions and the greater the capacity for invasive and vigorous pest plants to establish.

#### Result values

Invasive Pest Plant Hazard	Higher risk	Moderate risk	Lower risk	-
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#### Interpretation

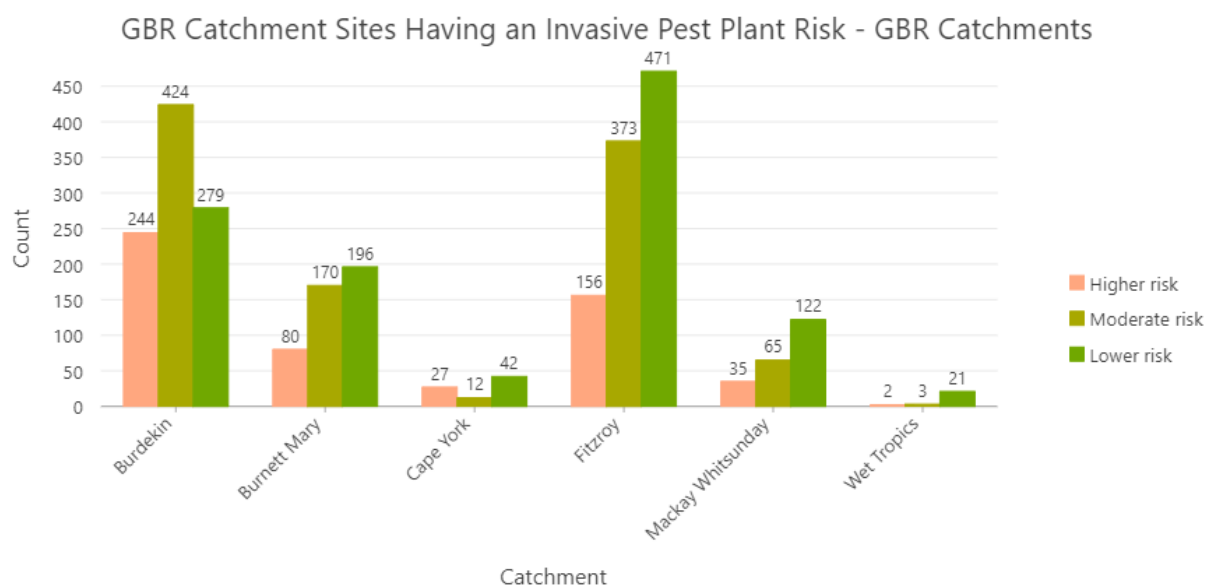
Indicates the observed landscape and natural resource values represent declining condition and present a greater likelihood of pest plants establishing. It does not indicate there are pest plants, however the likelihood is high.



**Figure 141** Invasive Pest Plant Risk and Grazing ABCD—Queensland.

**Note:**

- Sites assessed as C and D condition have one or more indicators of long-term land condition that increase the 'risk' of pest plants becoming established.



**Figure 142** Sites in GBR Catchments, Having an Invasive Pest Plant Risk—GBR Catchments.

### 4.3.8 Impact on Natural State (Risk Advisory)—Calculated Result

#### Determination

Considers dominant pasture species; dominant pasture density; dominant pasture growth phase; total perennial pasture density; pasture tussock height; pasture quality; groundcover; land surface condition; total pest plant density; total understorey density; total overstorey density; riparian area disturbance; total grazing pressure; and site impacts. Based on logic and thresholds such as the higher the proportion and density of native pasture species, the higher the groundcover and the lower erosion processes and pest plants, the less the impact on the 'natural state'. Accounts for non-native pasture species but does not recognise non-native under and overstorey species.

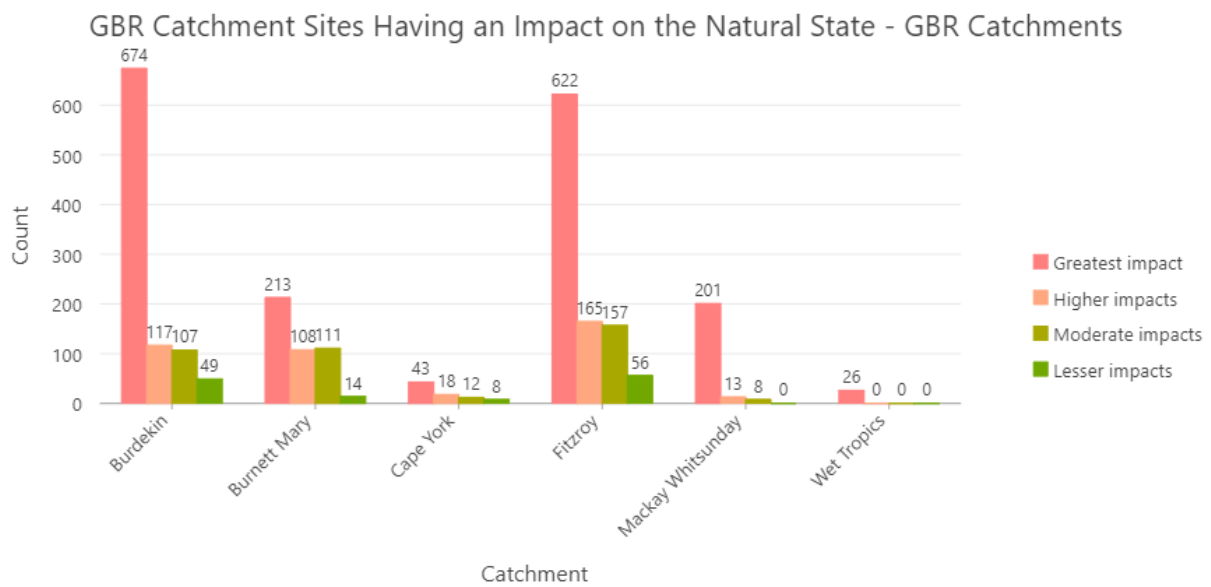
Similar to Indicative Natural Capital however calibration thresholds differ to decrease the ‘value’ attributed to less productive pasture species and accepts lessened total understorey and overstorey densities that occur in managed and modified landscapes.

### Result values

Impact on Natural State	Greatest impacts	Higher impacts	Moderate impacts	Lesser impacts
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### Interpretation

Indicates the observed landscape and natural resource values represent either the dominance of non-native pasture species, or a reduction in landscape ‘function’ as a result of less productive pasture species and increasing soil surface risks including low groundcover and erosion processes. Is not a surrogate or replacement for more rigorous biodiversity and vegetation survey methods but may be used to infer logical impacts.



**Figure 143** Sites in GBR Catchments, Having an Impact on the Natural State—GBR Catchments.

## 4 Land Type data

### 4.1 Grazing Land Management Regions

**Table 103** Count of Grazing ABCD in Grazing Land Management Regions (Land Types of Qld V6.1).

GLM Region	Grazing ABCD of Sites in GLM Regions				Total
	D condition	C condition	B condition	A condition	
Border Rivers	4	21	6		31
Burdekin	170	405	147	82	804
Cape York	10	29	22	18	79
Coastal Burnett	25	103	108	26	262
Desert Uplands	4	32	22	11	69
Fitzroy	85	288	226	177	776
Inland Burnett	47	152	158	63	420
Mackay Whitsunday	11	127	140	70	348
Maranoa Balonne	20	43	36	11	110
Mitchell Grass Downs	96	89	42	24	251
Moreton	9	47	51	27	134
Mulga	123	56	41	18	238
Northern Gulf	7	18	9		34
Null	3	7	3	1	14
Southern Gulf	31	26	11	3	71
Wet Tropics	5	12	5	3	25
<b>Grand Total</b>	<b>650</b>	<b>1455</b>	<b>1027</b>	<b>534</b>	<b>3666</b>

#### 4.1.1 Expected Pasture Density and Alluvial Land Types

**Table 104** Count of Grazing ABCD by Expected Pasture Density and Alluvial Land Types—Queensland.

Expected Pasture Density (EPD)	Grazing ABCD of Expected Pasture Density and Alluvial Land Types								Total
	D condition		C condition		B condition		A condition		
	Not Alluvial	Alluvial	Not Alluvial	Alluvial	Not Alluvial	Alluvial	Not Alluvial	Alluvial	
High EPD	392	145	991	290	636	215	344	103	2363
Moderate EPD	237	66	425	20	371	17	178	4	1211
Low EPD	17	-	28	1	15	-	10	-	70
Null	4	-	11	-	5	-	2	1	22
<b>Total</b>	<b>650</b>	<b>211</b>	<b>1455</b>	<b>311</b>	<b>1027</b>	<b>232</b>	<b>534</b>	<b>108</b>	<b>3666</b>



**Table 105** Percentage of Grazing ABCD on Alluvial Land Types of the Burdekin Catchment—GBR Catchments.

<b>Burdekin Catchment</b>	<b>Grazing ABCD</b>			
<b>Alluvial Land Types</b>	<b>D condition</b>	<b>C condition</b>	<b>B condition</b>	<b>A condition</b>
Alluvial	40	60	0	0
Blue gum / river red gum flats	0	100	0	0
Box flats	0	33	34	33
Clayey alluvials	28	46	23	3
Coastal wetlands	100	0	0	0
Coolibah floodplains	33	25	17	25
Frontage	50	0	0	50
Lakebeds	0	100	0	0
Loamy alluvials	31	44	19	6
<b>Total</b>	<b>31</b>	<b>43</b>	<b>19</b>	<b>7</b>

**Table 106** Percentage of Grazing ABCD on Alluvial Land Types of the Burnett Mary Catchment—GBR Catchments.

<b>Burnett Mary Catchment</b>	<b>Grazing ABCD</b>			
<b>Alluvial Land Types</b>	<b>D condition</b>	<b>C condition</b>	<b>B condition</b>	<b>A condition</b>
Blue gum flats	22	50	28	0
Blue gum on alluvial plains	7	44	33	15
Blue gum on cracking clay	0	30	60	10
<b>Total</b>	<b>10</b>	<b>44</b>	<b>35</b>	<b>11</b>

**Table 107** Percentage of Grazing ABCD on Alluvial Land Types of the Fitzroy Catchment—GBR Catchments.

<b>Fitzroy Catchment</b>	<b>Grazing ABCD</b>			
<b>Alluvial Land Types</b>	<b>D condition</b>	<b>C condition</b>	<b>B condition</b>	<b>A condition</b>
Alluvial brigalow	22	38	14	27
Alluvial flats and plains	0	44	44	11
Blue gum / river red gum flats	29	40	13	19
Blue gum on alluvial plains	0	57	43	0
Blue gum on cracking clay	18	32	46	4
Box flats	11	35	30	24
Coolibah floodplains	10	37	27	27
Loamy alluvials	0	67	33	0
<b>Total</b>	<b>16</b>	<b>38</b>	<b>26</b>	<b>20</b>

**Table 108** Grazing Land Management Land Types within the GBR Catchments—Grazing ABCD, Expected Pasture Density and Alluvial Land Types (Land Types of Queensland V6.1).

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
<b>GBR Catchments, Expected Pasture Density and Alluvial Land Types</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>Total</b>
<b>Fitzroy</b>	<b>111</b>	<b>372</b>	<b>299</b>	<b>218</b>	<b>1000</b>
<b>High Expected Pasture Density</b>	<b>78</b>	<b>239</b>	<b>182</b>	<b>137</b>	<b>636</b>
Alluvial	38	88	61	46	233
<b>BD13</b>		<b>2</b>	<b>1</b>		<b>3</b>
Loamy alluvials		2	1		3
<b>FT01</b>	<b>8</b>	<b>14</b>	<b>5</b>	<b>10</b>	<b>37</b>
Alluvial brigalow	8	14	5	10	37
<b>FT02</b>	<b>14</b>	<b>19</b>	<b>6</b>	<b>9</b>	<b>48</b>
Blue gum / river red gum flats	14	19	6	9	48
<b>FT03</b>	<b>8</b>	<b>25</b>	<b>21</b>	<b>17</b>	<b>71</b>
Box flats	8	25	21	17	71
<b>FT11</b>	<b>3</b>	<b>11</b>	<b>8</b>	<b>8</b>	<b>30</b>
Coolibah floodplains	3	11	8	8	30
<b>IB02</b>	<b>5</b>	<b>9</b>	<b>13</b>	<b>1</b>	<b>28</b>
Blue gum on cracking clay	5	9	13	1	28
<b>MO01</b>		<b>4</b>	<b>3</b>		<b>7</b>
Blue gum on alluvial plains		4	3		7
<b>MW01</b>		<b>4</b>	<b>4</b>	<b>1</b>	<b>9</b>
Alluvial flats and plains		4	4	1	9
Not Alluvial	40	151	121	91	403
<b>BD05</b>		<b>2</b>	<b>1</b>	<b>4</b>	<b>7</b>
Box country		2	1	4	7
<b>BD06</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>10</b>
Brigalow / gidgee scrubs	1	6	1	2	10
<b>BD11</b>		<b>1</b>			<b>1</b>
Goldfields country - red soils		1			1
<b>BD14</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>16</b>
Narrow-leaved ironbark on deeper soils	2	4	5	5	16
<b>BD15</b>		<b>3</b>			<b>3</b>
Narrow-leaved ironbark on shallower soils		3			3
<b>BD19</b>		<b>1</b>			<b>1</b>
Softwood scrub		1			1
<b>CB07</b>			<b>1</b>		<b>1</b>
Ironbark and bloodwood on non-cracking clay			1		1
<b>FT16</b>		<b>1</b>			<b>1</b>
Gum-topped box flats		1			1
<b>FT19</b>	<b>5</b>	<b>15</b>	<b>19</b>	<b>15</b>	<b>54</b>
Mountain coolibah woodlands	5	15	19	15	54
<b>FT22</b>	<b>4</b>	<b>11</b>	<b>15</b>	<b>6</b>	<b>36</b>
Narrow-leaved ironbark woodlands	4	11	15	6	36
<b>FT23</b>	<b>9</b>	<b>26</b>	<b>17</b>	<b>32</b>	<b>84</b>
Open downs	9	26	17	32	84

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
<b>GBR Catchments, Expected Pasture Density and Alluvial Land Types</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>Total</b>
<b>FT25</b>	<b>1</b>	<b>12</b>	<b>3</b>	<b>3</b>	<b>19</b>
Poplar box with ironbark	1	12	3	3	19
<b>FT26</b>			<b>1</b>	<b>1</b>	<b>2</b>
Poplar box / brigalow / bauhinia			1	1	2
<b>FT28</b>		<b>9</b>	<b>16</b>	<b>3</b>	<b>28</b>
Silver-leaved ironbark on duplex		9	16	3	28
<b>FT29</b>	<b>2</b>	<b>8</b>	<b>11</b>	<b>4</b>	<b>25</b>
Softwood scrub	2	8	11	4	25
<b>IB04</b>	<b>1</b>	<b>10</b>	<b>5</b>	<b>1</b>	<b>17</b>
Blue gum on loam and duplex	1	10	5	1	17
<b>IB05</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>9</b>
Box on clay	1	5	2	1	9
<b>IB10</b>	<b>9</b>	<b>18</b>	<b>15</b>	<b>4</b>	<b>46</b>
Ironbark and bloodwood on non-cracking clay	9	18	15	4	46
<b>IB12</b>			<b>2</b>	<b>1</b>	<b>3</b>
Ironbark on basalt upper slopes and benches			2	1	3
<b>MW02</b>		<b>5</b>	<b>4</b>	<b>3</b>	<b>12</b>
Coastal eucalypt forests and woodlands		5	4	3	12
<b>MW06</b>	<b>3</b>	<b>9</b>	<b>2</b>	<b>2</b>	<b>16</b>
Eucalypt hills and ranges	3	9	2	2	16
<b>MW08</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>12</b>
Poplar gum woodlands	2	5	1	4	12
<b>Moderate Expected Pasture Density</b>	<b>28</b>	<b>123</b>	<b>114</b>	<b>80</b>	<b>345</b>
Not Alluvial	28	123	114	80	345
<b>FT04</b>	<b>5</b>	<b>26</b>	<b>20</b>	<b>10</b>	<b>61</b>
Brigalow with blackbutt (Dawson gum)	5	26	20	10	61
<b>FT05</b>	<b>2</b>	<b>12</b>	<b>4</b>	<b>8</b>	<b>26</b>
Brigalow with melonholes	2	12	4	8	26
<b>FT06</b>	<b>8</b>	<b>24</b>	<b>30</b>	<b>16</b>	<b>78</b>
Brigalow softwood scrub	8	24	30	16	78
<b>FT07</b>		<b>3</b>	<b>1</b>		<b>4</b>
Bullock country		3	1		4
<b>FT10</b>	<b>1</b>		<b>2</b>		<b>3</b>
Coastal tea tree plains	1		2		3
<b>FT12</b>		<b>3</b>		<b>1</b>	<b>4</b>
Cypress pine country		3		1	4
<b>FT13</b>		<b>6</b>	<b>1</b>	<b>9</b>	<b>16</b>
Eucalypts and bloodwood on clay		6	1	9	16
<b>FT14</b>		<b>2</b>	<b>2</b>		<b>4</b>
Eucalypts and bloodwood on loamy red tableland		2	2		4
<b>FT20</b>	<b>1</b>		<b>1</b>		<b>2</b>
Narrow-leaved ironbark on ranges	1		1		2
<b>FT24</b>	<b>1</b>	<b>9</b>	<b>11</b>	<b>11</b>	<b>32</b>
Poplar box with shrubby understorey	1	9	11	11	32

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>FT27</b>		1		2	3
Serpentine ironbark		1		2	3
<b>FT30</b>		3	4		7
Spotted gum ridges		3	4		7
<b>IB01</b>		1	2		3
Bastard Scrub		1	2		3
<b>IB07</b>	5		1	3	9
Brigalow and brigalow belah	5		1	3	9
<b>IB08</b>			1	4	5
Brigalow with melonholes			1	4	5
<b>IB14</b>	5	32	33	15	85
Narrow-leaved ironbark on granite	5	32	33	15	85
<b>IB15</b>		1	1	1	3
Narrow-leaved ironbark and wattles		1	1	1	3
<b>Low Expected Pasture Density</b>	5	10	3	1	19
Not Alluvial	5	10	3	1	19
<b>FT17</b>	5	5	3	1	14
Lancewood - bendee - rosewood	5	5	3	1	14
<b>FT21</b>		5			5
Narrow-leaved ironbark with rosewood		5			5
<b>Burdekin</b>	182	462	208	95	947
<b>High Expected Pasture Density</b>	165	415	176	82	838
<b>Alluvial</b>	59	82	36	13	190
<b>BD08</b>	10	16	8	1	35
Clayey alluvials	10	16	8	1	35
<b>BD13</b>	41	58	25	7	131
Loamy alluvials	41	58	25	7	131
<b>DU05</b>				1	1
Frontage				1	1
<b>FT02</b>		1			1
Blue gum / river red gum flats		1			1
<b>FT03</b>		1	1	1	3
Box flats		1	1	1	3
<b>FT11</b>	4	3	2	3	12
Coolibah floodplains	4	3	2	3	12
<b>MW05</b>	1				1
Coastal wetlands	1				1
<b>NG03</b>	1				1
Frontage	1				1
<b>WT01</b>	2	3			5
Alluvial	2	3			5
Not Alluvial	106	333	140	69	648
<b>BD01</b>		24	3	2	29
Black basalt		24	3	2	29

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>BD03</b>		1		1	2
Blackwood scrubs on structured clays		1		1	2
<b>BD05</b>	13	16	2	3	34
Box country	13	16	2	3	34
<b>BD06</b>	4	10	5	3	22
Brigalow / gidgee scrubs	4	10	5	3	22
<b>BD07</b>		5	1		6
Brown basalt		5	1		6
<b>BD09</b>	4	5	1		10
Downs	4	5	1		10
<b>BD11</b>	25	52	5	1	83
Goldfields country - red soils	25	52	5	1	83
<b>BD14</b>	19	56	18	9	102
Narrow-leaved ironbark on deeper soils	19	56	18	9	102
<b>BD15</b>	15	30	16	4	65
Narrow-leaved ironbark on shallower soils	15	30	16	4	65
<b>BD16</b>	17	23	11	3	54
Ranges	17	23	11	3	54
<b>BD17</b>	2	51	23	26	102
Red basalt	2	51	23	26	102
<b>DU01</b>	2	6	2	1	11
Box country	2	6	2	1	11
<b>DU08</b>	1	12	7	4	24
Ironbark country	1	12	7	4	24
<b>FT19</b>		2	1		3
Mountain coolibah woodlands		2	1		3
<b>FT22</b>		1	1		2
Narrow-leaved ironbark woodlands		1	1		2
<b>FT23</b>	1	8	8	2	19
Open downs	1	8	8	2	19
<b>FT25</b>		8	2	1	11
Poplar box with ironbark		8	2	1	11
<b>MW02</b>		1			1
Coastal eucalypt forests and woodlands		1			1
<b>MW06</b>		1	4	5	10
Eucalypt hills and ranges		1	4	5	10
<b>MW09</b>	2	16	30	4	52
Wet highland rainforests	2	16	30	4	52
<b>SG01</b>		5			5
Basalt		5			5
<b>WT05</b>	1				1
Red soils	1				1
<b>Moderate Expected Pasture Density</b>	15	39	29	12	95
Not Alluvial	15	39	29	12	95

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>BD02</b>	1	1	3	1	6
Blackwood scrubs on massive soils	1	1	3	1	6
<b>BD04</b>	7	10	8	1	26
Box and napunyah	7	10	8	1	26
<b>BD18</b>	4	13	5	5	27
Silver-leaved ironbark	4	13	5	5	27
<b>BD20</b>		2			2
Yellowjacket with other eucalypts		2			2
<b>DU11</b>	1	1	1		3
Scrubs on deep clays	1	1	1		3
<b>DU12</b>			1		1
Scrubs on shallow clay			1		1
<b>DU13</b>		3	4	2	9
Yellowjacket country +/- wattles		3	4	2	9
<b>FT04</b>	1	3	4	1	9
Brigalow with blackbutt (Dawson gum)	1	3	4	1	9
<b>FT05</b>	1	4	2		7
Brigalow with melonholes	1	4	2		7
<b>FT09</b>		1			1
Coastal sand dunes		1			1
<b>FT13</b>		1		2	3
Eucalypts and bloodwood on clay		1		2	3
<b>FT20</b>			1		1
Narrow-leaved ironbark on ranges			1		1
<b>Low Expected Pasture Density</b>	1	8	3	1	13
Alluvial		1			1
<b>DU10</b>		1			1
Lakebeds		1			1
Not Alluvial	1	7	3	1	12
<b>BD12</b>	1	2			3
Lancewood - bende - rosewood	1	2			3
<b>DU09</b>		2	2		4
Jump-ups		2	2		4
<b>FT17</b>		3	1	1	5
Lancewood - bende - rosewood		3	1	1	5
<b>Null</b>	1				1
Not Alluvial	1				1
<b>AL09</b>	1				1
Water	1				1
<b>Burnett Mary</b>	38	168	186	54	446
<b>High Expected Pasture Density</b>	14	69	72	27	182
Alluvial	8	36	29	9	82
<b>CB02</b>	4	9	5		18
Blue gum flats	4	9	5		18

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>IB02</b>		3	6	1	10
Blue gum on cracking clay		3	6	1	10
<b>MO01</b>	4	24	18	8	54
Blue gum on alluvial plains	4	24	18	8	54
Not Alluvial	6	33	43	18	100
<b>CB03</b>		6	12	5	23
Blue gum, ironbark and bloodwood slopes and hollows		6	12	5	23
<b>CB07</b>	2	3			5
Ironbark and bloodwood on non-cracking clay	2	3			5
<b>CB08</b>			2	2	4
Ironbark and blue gum on basalt ridges			2	2	4
<b>IB03</b>	1	5	10	5	21
Blue gum on granite	1	5	10	5	21
<b>IB04</b>		3	2	3	8
Blue gum on loam and duplex		3	2	3	8
<b>IB05</b>		3	4	1	8
Box on clay		3	4	1	8
<b>IB09</b>	1	4	2		7
Gum-topped box	1	4	2		7
<b>IB10</b>	2	4	5	1	12
Ironbark and bloodwood on non-cracking clay	2	4	5	1	12
<b>IB12</b>			1		1
Ironbark on basalt upper slopes and benches			1		1
<b>IB13</b>		1			1
Mixed open forests on duplex and loam		1			1
<b>IB16</b>			3		3
Silver-leaved ironbark on cracking clay			3		3
<b>IB18</b>		2		1	3
Softwood scrub		2		1	3
<b>MO04</b>		1			1
Ironbark and bloodwood on non-cracking clay		1			1
<b>MO08</b>		1			1
Mixed open forests on duplex and loam		1			1
<b>MO11</b>			1		1
Tall open forests on basalt			1		1
<b>MO12</b>			1		1
Tall open forests on steep hills and mountains			1		1
<b>Moderate Expected Pasture Density</b>	<b>23</b>	<b>93</b>	<b>108</b>	<b>26</b>	<b>250</b>
Not Alluvial	23	93	108	26	250
<b>CB01</b>		3	2		5
Bloodwood and stringybark (coastal plains)		3	2		5
<b>CB04</b>	1	8	11	7	27
Gum-topped box	1	8	11	7	27
<b>CB06</b>		6			6

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Ironbark, stringybark and supplejack ridges		6			6
<b>CB09</b>	<b>14</b>	<b>48</b>	<b>55</b>	<b>6</b>	<b>123</b>
Ironbark and spotted gum on duplex and loam	14	48	55	6	123
<b>CB10</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>1</b>	<b>14</b>
Mixed eucalypts on uplifted coastal plains	2	4	7	1	14
<b>CB12</b>		<b>1</b>			<b>1</b>
Tea tree flats		1			1
<b>FT24</b>	<b>1</b>		<b>1</b>		<b>2</b>
Poplar box with shrubby understorey	1		1		2
<b>IB01</b>	<b>2</b>	<b>3</b>	<b>3</b>		<b>8</b>
Bastard Scrub	2	3	3		8
<b>IB06</b>		<b>1</b>	<b>7</b>	<b>2</b>	<b>10</b>
Box on erosive soils		1	7	2	10
<b>IB07</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>8</b>
Brigalow and brigalow belah	3	2	1	2	8
<b>IB08</b>		<b>1</b>	<b>2</b>		<b>3</b>
Brigalow with melonholes		1	2		3
<b>IB14</b>		<b>4</b>	<b>5</b>	<b>6</b>	<b>15</b>
Narrow-leaved ironbark on granite		4	5	6	15
<b>IB15</b>		<b>1</b>	<b>2</b>		<b>3</b>
Narrow-leaved ironbark and wattles		1	2		3
<b>IB17</b>		<b>2</b>			<b>2</b>
Silver-leaved ironbark on granite		2			2
<b>IB19</b>		<b>8</b>	<b>9</b>	<b>2</b>	<b>19</b>
Spotted gum ridges		8	9	2	19
<b>IB20</b>		<b>1</b>			<b>1</b>
Tall open forest on snuffy soils		1			1
<b>MB03</b>			<b>3</b>		<b>3</b>
Brigalow belah scrub			3		3
<b>Low Expected Pasture Density</b>	<b>1</b>	<b>6</b>	<b>5</b>		<b>12</b>
Not Alluvial	1	6	5		12
<b>CB05</b>	<b>1</b>	<b>6</b>	<b>5</b>		<b>12</b>
Hoop pine scrub	1	6	5		12
<b>Null</b>			<b>1</b>	<b>1</b>	<b>2</b>
Alluvial			1	1	2
<b>AL13</b>			<b>1</b>	<b>1</b>	<b>2</b>
Coastal lakes and wetlands			1	1	2
<b>Mackay Whitsunday</b>	<b>3</b>	<b>88</b>	<b>93</b>	<b>38</b>	<b>222</b>
<b>High Expected Pasture Density</b>	<b>3</b>	<b>86</b>	<b>92</b>	<b>38</b>	<b>219</b>
Alluvial	1	41	49	13	104
<b>BD13</b>		<b>2</b>			<b>2</b>
Loamy alluvials		2			2
<b>MW01</b>	<b>1</b>	<b>37</b>	<b>48</b>	<b>12</b>	<b>98</b>
Alluvial flats and plains	1	37	48	12	98



Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>MW05</b>		2	1	1	4
Coastal wetlands		2	1	1	4
Not Alluvial	2	45	43	25	115
<b>BD14</b>		1	2		3
Narrow-leaved ironbark on deeper soils		1	2		3
<b>MW02</b>		29	10	6	45
Coastal eucalypt forests and woodlands		29	10	6	45
<b>MW03</b>			4	3	7
Coastal rainforests			4	3	7
<b>MW04</b>		4	10	2	16
Coastal tea tree plains		4	10	2	16
<b>MW06</b>	2	11	15	13	41
Eucalypt hills and ranges	2	11	15	13	41
<b>MW07</b>				1	1
Marine plains and tidal flats				1	1
<b>MW09</b>			2		2
Wet highland rainforests			2		2
<b>Moderate Expected Pasture Density</b>		2	1		3
Not Alluvial		2	1		3
<b>FT15</b>		2	1		3
Eucalypts and bloodwood on sandy tablelands		2	1		3
<b>Cape York</b>	10	29	24	18	81
<b>High Expected Pasture Density</b>	5	18	10	3	36
Alluvial	1	2	2		5
<b>CYP03</b>	1				1
Bloodwoods on frontage and alluvium	1				1
<b>CYP07</b>			1		1
Vegetated swamps			1		1
<b>NG07</b>		2	1		3
Old alluvials		2	1		3
Not Alluvial	4	16	8	3	31
<b>CYP10</b>		1			1
Stringybark		1			1
<b>CYP11</b>			1		1
Bloodwoods on uplands			1		1
<b>NG04</b>		1			1
Georgetown granites		1			1
<b>NG08</b>	1	3	2		6
Range soils	1	3	2		6
<b>NG14</b>	1	5			6
Northern sandy forest	1	5			6
<b>WT02</b>	2	6	5	3	16
Black soils on basalt and granite	2	6	5	3	16
<b>Moderate Expected Pasture Density</b>	3	7	11	9	30

Sum of Count <b>GBR Catchments</b>	Count of Grazing ABCD				
GBR Catchments, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Not Alluvial	3	7	11	9	30
<b>CYP08</b>		1	4		5
Tea tree plains		1	4		5
<b>CYP09</b>	3	6	7	9	25
Box (Molloy red box and shiny-leaved box)	3	6	7	9	25
<b>Low Expected Pasture Density</b>	2	2	2	5	11
Not Alluvial	2	2	2	5	11
<b>CYP14</b>	2	2	2	5	11
Scrubs-vine forest and rainforest	2	2	2	5	11
<b>Null</b>		2	1	1	4
Not Alluvial		2	1	1	4
<b>CYTBA</b>		2	1	1	4
To be allocated		2	1	1	4
<b>Wet Tropics</b>		5	5	16	26
<b>High Expected Pasture Density</b>		5	5	13	23
Not Alluvial		5	5	13	23
<b>MW09</b>		3	5	13	21
Wet highland rainforests		3	5	13	21
<b>WT05</b>		2			2
Red soils		2			2
<b>Low Expected Pasture Density</b>				3	3
Not Alluvial				3	3
<b>CYP14</b>				3	3
Scrubs-vine forest and rainforest				3	3
<b>Grand Total</b>	344	1124	815	439	2722

**Table 109** Grazing Land Management Land Types within the GLM Regions—Grazing ABCD, Expected Pasture Density and Alluvial Land Types (Land Types of Queensland V6.1).

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>Burdekin</b>	170	405	147	82	804
<b>High Expected Pasture Density</b>	156	377	131	75	739
Alluvial	51	80	34	8	173
Loamy alluvials	41	64	26	7	138
Clayey alluvials	10	16	8	1	35
Not Alluvial	105	297	97	67	566
Narrow-leaved ironbark on deeper soils	22	63	25	14	124
Red basalt	3	52	23	26	104
Goldfields country - red soils	25	53	5	1	84
Narrow-leaved ironbark on shallower soils	15	33	16	4	68
Ranges	17	25	13	7	62
Box country	13	18	3	7	41

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Brigalow / gidgee scrubs	5	16	6	5	32
Black basalt	1	25	3	2	31
Downs	4	5	1		10
Brown basalt		5	2		7
Blackwood scrubs on structured clays		1		1	2
Softwood scrub		1			1
<b>Moderate Expected Pasture Density</b>	<b>13</b>	<b>26</b>	<b>16</b>	<b>7</b>	<b>62</b>
Not Alluvial	13	26	16	7	62
Silver-leaved ironbark	4	13	5	5	27
Box and napunyah	8	10	8	1	27
Blackwood scrubs on massive soils	1	1	3	1	6
Yellowjacket with other eucalypts		2			2
<b>Low Expected Pasture Density</b>	<b>1</b>	<b>2</b>			<b>3</b>
Not Alluvial	1	2			3
Lancewood - bende - rosewood	1	2			3
<b>Fitzroy</b>	<b>85</b>	<b>288</b>	<b>226</b>	<b>177</b>	<b>776</b>
<b>High Expected Pasture Density</b>	<b>59</b>	<b>175</b>	<b>137</b>	<b>115</b>	<b>486</b>
Alluvial	37	74	43	48	202
Box flats	8	26	22	18	74
Blue gum / river red gum flats	14	20	6	9	49
Coolibah floodplains	7	14	10	11	42
Alluvial brigalow	8	14	5	10	37
Not Alluvial	22	101	94	67	284
Open downs	10	34	25	34	103
Mountain coolibah woodlands	5	17	20	15	57
Narrow-leaved ironbark woodlands	4	12	16	6	38
Poplar box with ironbark	1	20	5	4	30
Silver-leaved ironbark on duplex		9	16	3	28
Softwood scrub	2	8	11	4	25
Poplar box / brigalow / bauhinia			1	1	2
Gum-topped box flats		1			1
<b>Moderate Expected Pasture Density</b>	<b>21</b>	<b>100</b>	<b>85</b>	<b>60</b>	<b>266</b>
Not Alluvial	21	100	85	60	266
Brigalow softwood scrub	8	24	30	16	78
Brigalow with blackbutt (Dawson gum)	6	29	24	11	70
Poplar box with shrubby understorey	2	9	12	11	34
Brigalow with melonholes	3	16	6	8	33
Eucalypts and bloodwood on clay		7	1	11	19
Spotted gum ridges		3	4		7
Eucalypts and bloodwood on loamy red tableland		2	2		4
Bullock country		3	1		4
Cypress pine country		3		1	4

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Serpentine ironbark		1		2	3
Eucalypts and bloodwood on sandy tablelands		2	1		3
Narrow-leaved ironbark on ranges	1		2		3
Coastal tea tree plains	1		2		3
Coastal sand dunes		1			1
<b>Low Expected Pasture Density</b>	<b>5</b>	<b>13</b>	<b>4</b>	<b>2</b>	<b>24</b>
Not Alluvial	5	13	4	2	24
Lancewood - bende - rosewood	5	8	4	2	19
Narrow-leaved ironbark with rosewood		5			5
<b>Inland Burnett</b>	<b>47</b>	<b>152</b>	<b>158</b>	<b>63</b>	<b>420</b>
<b>High Expected Pasture Density</b>	<b>26</b>	<b>90</b>	<b>88</b>	<b>27</b>	<b>231</b>
Alluvial	5	12	19	2	38
Blue gum on cracking clay	5	12	19	2	38
Not Alluvial	21	78	69	25	193
Ironbark and bloodwood on non-cracking clay	11	22	20	5	58
Blue gum on granite	1	15	19	10	45
Box on clay	1	13	9	2	25
Blue gum on loam and duplex	1	13	7	4	25
Mixed open forests on duplex and loam	4	7	3		14
Ironbark on basalt upper slopes and benches	2	2	3	3	10
Gum-topped box	1	4	3		8
Softwood scrub		2	1	1	4
Silver-leaved ironbark on cracking clay			4		4
<b>Moderate Expected Pasture Density</b>	<b>21</b>	<b>62</b>	<b>70</b>	<b>36</b>	<b>189</b>
Not Alluvial	21	62	70	36	189
Narrow-leaved ironbark on granite	5	36	38	22	101
Brigalow and brigalow belah	10	4	2	5	21
Spotted gum ridges		8	9	2	19
Narrow-leaved ironbark and wattles	4	4	5	1	14
Bastard Scrub	2	4	5		11
Box on erosive soils		1	7	2	10
Brigalow with melonholes		1	3	4	8
Silver-leaved ironbark on granite		2			2
Ironbark and spotted gum on duplex and loam		1	1		2
Tall open forest on snuffy soils		1			1
<b>Mackay Whitsunday</b>	<b>11</b>	<b>127</b>	<b>140</b>	<b>70</b>	<b>348</b>
<b>High Expected Pasture Density</b>	<b>11</b>	<b>127</b>	<b>140</b>	<b>70</b>	<b>348</b>
Alluvial	2	43	53	14	112
Alluvial flats and plains	1	41	52	13	107
Coastal wetlands	1	2	1	1	5
Not Alluvial	9	84	87	56	236
Wet highland rainforests	2	19	37	17	75

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Eucalypt hills and ranges	5	21	21	20	67
Coastal eucalypt forests and woodlands		35	14	9	58
Coastal tea tree plains		4	10	2	16
Poplar gum woodlands	2	5	1	4	12
Coastal rainforests			4	3	7
Marine plains and tidal flats				1	1
<b>Coastal Burnett</b>	<b>25</b>	<b>103</b>	<b>108</b>	<b>26</b>	<b>262</b>
<b>High Expected Pasture Density</b>	<b>7</b>	<b>23</b>	<b>25</b>	<b>11</b>	<b>66</b>
Alluvial	4	13	10	3	30
Blue gum flats	4	13	10	3	30
Not Alluvial	3	10	15	8	36
Blue gum, ironbark and bloodwood slopes and hollows		7	12	6	25
Ironbark and bloodwood on non-cracking clay	2	3	1		6
Ironbark and blue gum on basalt ridges	1		2	2	5
<b>Moderate Expected Pasture Density</b>	<b>17</b>	<b>74</b>	<b>78</b>	<b>15</b>	<b>184</b>
Not Alluvial	17	74	78	15	184
Ironbark and spotted gum on duplex and loam	14	49	56	7	126
Gum-topped box	1	11	13	7	32
Mixed eucalypts on uplifted coastal plains	2	4	7	1	14
Ironbark, stringybark and supplejack ridges		6			6
Bloodwood and stringybark (coastal plains)		3	2		5
Tea tree flats		1			1
<b>Low Expected Pasture Density</b>	<b>1</b>	<b>6</b>	<b>5</b>		<b>12</b>
Not Alluvial	1	6	5		12
Hoop pine scrub	1	6	5		12
<b>Mitchell Grass Downs</b>	<b>96</b>	<b>89</b>	<b>42</b>	<b>24</b>	<b>251</b>
<b>High Expected Pasture Density</b>	<b>50</b>	<b>35</b>	<b>17</b>	<b>1</b>	<b>103</b>
Alluvial	8	1	4		13
Open alluvial plains	4	1			5
Wooded alluvial plains			4		4
Flooded Mitchell grasslands	4				4
Not Alluvial	42	34	13	1	90
Open downs	42	33	9		84
Wooded downs			4	1	5
Boree wooded downs		1			1
<b>Moderate Expected Pasture Density</b>	<b>45</b>	<b>54</b>	<b>25</b>	<b>23</b>	<b>147</b>
Not Alluvial	45	54	25	23	147
Ashy downs	40	47	22	20	129
Pebbly downs	2	6	1	1	10
Soft gidgee	3	1	2	2	8
<b>Low Expected Pasture Density</b>	<b>1</b>				<b>1</b>
Not Alluvial	1				1

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Hard gidgee	1				1
<b>Mulga</b>	<b>123</b>	<b>56</b>	<b>41</b>	<b>18</b>	<b>238</b>
<b>High Expected Pasture Density</b>	<b>22</b>	<b>10</b>	<b>7</b>	<b>4</b>	<b>43</b>
Alluvial	22	10	7	4	43
Wooded alluvial plains	22	10	7	4	43
<b>Moderate Expected Pasture Density</b>	<b>96</b>	<b>44</b>	<b>34</b>	<b>14</b>	<b>188</b>
Alluvial	66	20	17	4	107
Open alluvial plains	66	20	17	4	107
Not Alluvial	30	24	17	10	81
Mulga sandplains	10	8	3	2	23
Gidgee	10	5	6	1	22
Poplar box woodlands (red soils)	2	4	4	5	15
Soft mulga	8	4	1		13
Brigalow		3	3	2	8
<b>Low Expected Pasture Density</b>	<b>5</b>	<b>2</b>			<b>7</b>
Not Alluvial	5	2			7
Hard mulga	5	2			7
<b>Moreton</b>	<b>9</b>	<b>47</b>	<b>51</b>	<b>27</b>	<b>134</b>
<b>High Expected Pasture Density</b>	<b>8</b>	<b>42</b>	<b>43</b>	<b>26</b>	<b>119</b>
Alluvial	5	35	31	22	93
Blue gum on alluvial plains	5	35	31	22	93
Not Alluvial	3	7	12	4	26
Mixed open forests on duplex and loam	3	5	8	3	19
Tall open forests on basalt		1	2		3
Ironbark and bloodwood on non-cracking clay		1	1		2
Tall open forests on steep hills and mountains			1		1
Ironbark and blue gum on clay				1	1
<b>Moderate Expected Pasture Density</b>	<b>1</b>	<b>5</b>	<b>6</b>	<b>1</b>	<b>13</b>
Not Alluvial	1	5	6	1	13
Ironbark and spotted gum ridges		5	4	1	10
Ironbark on granite	1		2		3
<b>Low Expected Pasture Density</b>			<b>2</b>		<b>2</b>
Not Alluvial			2		2
Softwood vine scrub			2		2
<b>Maranoa Balonne</b>	<b>20</b>	<b>43</b>	<b>36</b>	<b>11</b>	<b>110</b>
<b>High Expected Pasture Density</b>	<b>4</b>	<b>10</b>	<b>7</b>	<b>1</b>	<b>22</b>
Alluvial	2	9	7	1	19
Poplar box on alluvial plains	1	4	5	1	11
Coolibah floodplains	1	5	2		8
Not Alluvial	2	1			3
Mitchell grasslands	2	1			3
<b>Moderate Expected Pasture Density</b>	<b>14</b>	<b>33</b>	<b>29</b>	<b>10</b>	<b>86</b>

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Not Alluvial	14	33	29	10	86
Brigalow with melonholes	6	12	10	6	34
Brigalow belah scrub		14	8	2	24
Bloodwood-ironbark woodland on steep rocky hills	6	2	3		11
Poplar box and silver-leaved ironbark	1	1	3		5
Poplar box and brigalow		1	2	1	4
Poplar box on duplex soils		2	1		3
Cypress pine on duplex soils			2	1	3
Narrow-leaved ironbark	1	1			2
<b>Low Expected Pasture Density</b>	<b>2</b>				<b>2</b>
Not Alluvial	2				2
Hard mulga	1				1
Bendee ridges	1				1
<b>Cape York</b>	<b>10</b>	<b>29</b>	<b>22</b>	<b>18</b>	<b>79</b>
<b>High Expected Pasture Density</b>	<b>3</b>	<b>11</b>	<b>3</b>		<b>17</b>
Alluvial	2	4	2		8
Bloodwoods on frontage and alluvium	2	4	1		7
Vegetated swamps			1		1
Not Alluvial	1	7	1		9
Stringybark	1	7			8
Bloodwoods on uplands			1		1
<b>Moderate Expected Pasture Density</b>	<b>4</b>	<b>12</b>	<b>15</b>	<b>9</b>	<b>40</b>
Not Alluvial	4	12	15	9	40
Box (Molloy red box and shiny-leaved box)	3	6	7	9	25
Tea tree plains	1	6	8		15
<b>Low Expected Pasture Density</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>14</b>
Not Alluvial	2	2	2	8	14
Scrubs-vine forest and rainforest	2	2	2	8	14
<b>Null</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>8</b>
Not Alluvial	1	4	2	1	8
To be allocated	1	4	2	1	8
<b>Southern Gulf</b>	<b>31</b>	<b>26</b>	<b>11</b>	<b>3</b>	<b>71</b>
<b>High Expected Pasture Density</b>	<b>28</b>	<b>24</b>	<b>9</b>	<b>2</b>	<b>63</b>
Not Alluvial	28	24	9	2	63
Mitchell grass	22	16	5	2	45
Basalt		5	3		8
Bluegrass browntop plains	5	1			6
Sandy forest country	1	1			2
Open red country		1			1
Marine plains			1		1
<b>Moderate Expected Pasture Density</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>8</b>
Not Alluvial	3	2	2	1	8

Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
Silver-leaved box	3	2	2	1	8
<b>Desert Uplands</b>	<b>4</b>	<b>32</b>	<b>22</b>	<b>11</b>	<b>69</b>
<b>High Expected Pasture Density</b>	<b>3</b>	<b>24</b>	<b>12</b>	<b>9</b>	<b>48</b>
Alluvial			1	1	2
Frontage			1	1	2
Not Alluvial	3	24	11	8	46
Ironbark country	1	18	9	7	35
Box country	2	6	2	1	11
<b>Moderate Expected Pasture Density</b>	<b>1</b>	<b>5</b>	<b>8</b>	<b>2</b>	<b>16</b>
Not Alluvial	1	5	8	2	16
Yellowjacket country +/- wattles		3	4	2	9
Scrubs on shallow clay		1	3		4
Scrubs on deep clays	1	1	1		3
<b>Low Expected Pasture Density</b>		<b>3</b>	<b>2</b>		<b>5</b>
Alluvial		1			1
Lakebeds		1			1
Not Alluvial		2	2		4
Jump-ups		2	2		4
<b>Northern Gulf</b>	<b>7</b>	<b>18</b>	<b>9</b>		<b>34</b>
<b>High Expected Pasture Density</b>	<b>7</b>	<b>18</b>	<b>9</b>		<b>34</b>
Alluvial	4	4	2		10
Old alluvials	2	3	1		6
Frontage	1	1	1		3
Coolibah country	1				1
Not Alluvial	3	14	7		24
Bauhinia sandy forest	1	3	4		8
Northern sandy forest	1	5			6
Range soils	1	3	2		6
Georgetown granites		3			3
Marine plains			1		1
<b>Border Rivers</b>	<b>4</b>	<b>21</b>	<b>6</b>		<b>31</b>
<b>High Expected Pasture Density</b>	<b>3</b>	<b>13</b>	<b>3</b>		<b>19</b>
Alluvial	1	2	2		5
Coolibah floodplains	1	2	2		5
Not Alluvial	2	11	1		14
Cypress pine and carbeen forest on undulating sandy soils	1	3	1		5
Granite plains and rises with mixed grassy woodlands		5			5
Traprock hills with narrow-leaved ironbark and tumbledown gum	1	2			3
Traprock plains with grassy box woodlands		1			1
<b>Moderate Expected Pasture Density</b>	<b>1</b>	<b>8</b>	<b>3</b>		<b>12</b>
Not Alluvial	1	8	3		12
Bulloak country	1	8	3		12



Sum of Count <b>GLM Regions</b>	Count of Grazing ABCD				
GLM Region, Expected Pasture Density and Alluvial Land Types	D	C	B	A	Total
<b>Wet Tropics</b>	5	12	5	3	25
<b>High Expected Pasture Density</b>	5	12	5	3	25
Alluvial	2	3			5
Alluvial	2	3			5
Not Alluvial	3	9	5	3	20
Black soils on basalt and granite	2	7	5	3	17
Red soils	1	2			3
<b>Null</b>	3	7	3	1	14
<b>Null</b>	3	7	3	1	14
Alluvial				1	1
Coastal lakes and wetlands				1	1
Not Alluvial	3	7	3		13
Water	1	6	1		8
Sand	2				2
Coastal lakes and wetlands			1		1
Estuary			1		1
Mangroves		1			1
<b>Grand Total</b>	<b>650</b>	<b>1455</b>	<b>1027</b>	<b>534</b>	<b>3666</b>

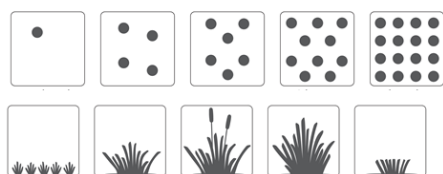
## 5 About the LCAT

### 5.1 What is the LCAT?

The Land Condition Assessment Tool (LCAT) is a fit-for-purpose, science-based assessment framework combining a simple and intuitive design with contemporary technologies.

Unlike land resource assessments which focus on land capability, the LCAT determines the current state of the land, by evaluating key indicators of long-term land condition. Climate can influence land condition as can management practices. Within the established Grazing Land Management ABCD land condition framework, for example, data from long-term grazing trials demonstrates that as land condition declines, productivity declines (e.g. land in C condition retains only about 55 of the original carrying capacity compared with A condition).

Available in Standard and Advanced versions on Esri's Survey 123 platform, a LCAT user answers a series of questions by selecting pictograms (stylised pictures) representing otherwise complex science-based concepts and land condition values—such as, pasture composition, density and 'quality', groundcover, erosion processes, pest plant impacts and vegetation densities.



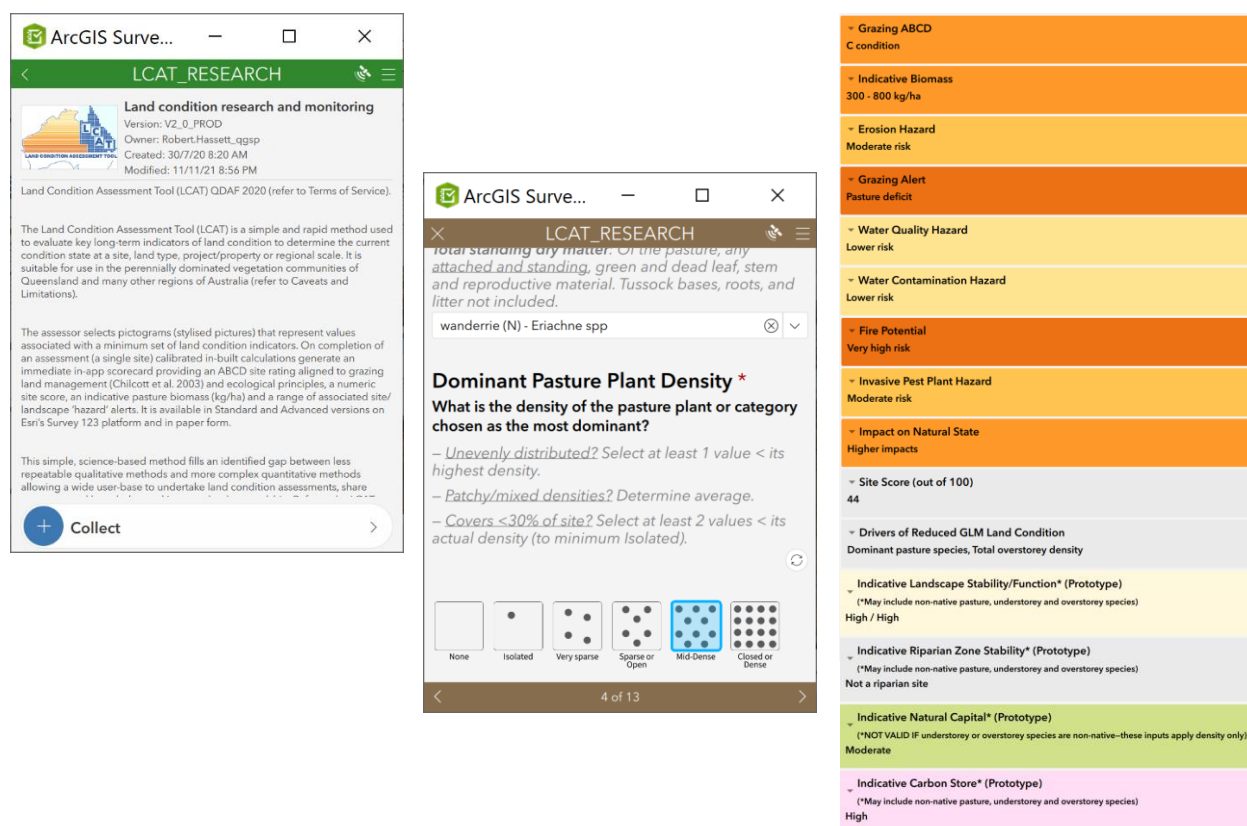
**Image 19** Example scientific values as 'pictograms'. Upper row—plant density. Lower row—Pasture growth phases.



**Image 20** Example scientific concepts as 'pictograms'. Upper row—gully stability. Lower row—Pest plant control methods.

Results are immediate, with an on-device scorecard displaying a Grazing ABCD rating aligned to grazing land management and ecological principles, a numeric site score, an indicative pasture biomass (kg/ha) and a range of potential site/landscape 'hazards' associated with water quality, fire and ecological impacts.

Impacts from natural events or management practices such as drought and total grazing pressure can be recorded to inform current land condition and risks.



**Image 21** Mobile device page format and in-field, on-device land condition site 'scorecard' (colour-blind safe colours).

The LCAT operates on or off-line on iOS, Android and Microsoft mobile and desktop devices and is also available as a printable field-form. Users are supported with comprehensive training and reference material. The simplicity and immediate feedback provided allows a user to develop their own capacity and understanding of land condition drivers and the influence of management practice change. Data are securely stored in user-group partitioned, geodatabases in the Queensland Government cloud service and periodically archived on a secure DAF server with limited user access.

## 5.2 Why was the LCAT developed?

The development objective for the design and implementation of the LCAT was to: Develop a simple, robust, cross-stakeholder endorsed method to meet contemporary needs, capacity building, consistency, and provision of data.

Across all levels of government and Industry directly or indirectly engaged in productivity gain and sustainable land management initiatives, varying methods, lack of consistency, lack of data and lack of capacity building, have been identified as key limitations to success. For example, the *Queensland Audit Office Reef Plan Report 2014-15*, identified:

- The need for a consistent approach to assessment and monitoring of land condition.
- That data gaps are a key barrier to meeting Reef Plan and Paddock to Reef goals.

Specifically, data:

- are not collected consistently
- are not verified on ground or audited
- are variable in quality and accuracy
- *are needed to improve the quality of inputs to test the P2R model* (in reference to modelling water quality benefits derived from improved farm management).

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Grazing is the most extensive land use within the Great Barrier Reef (GBR) catchments and state-wide. The P2R program identifies grazing as the priority commodity for management practice improvement. Currently, there is no sector-wide dataset of land condition and therefore no validation of practice change. Despite improvements in remote sensing technologies, current ground cover products cannot resolve the variability in land condition and the drivers of that condition. Consequently, there is an urgent need for a comprehensive, state-wide and contemporary dataset of land condition to support research and development of innovative land condition models.

Within the DAF P2R program, consistently collected and repeatable land condition data are required and used to:

- Plan, evaluate and report the effectiveness of projects and programs that aim improve land condition, productivity and sustainability; and reduce soil erosion.
- Develop condition benchmarks and validate and improve products and services derived from remote sensing and modelling.
- Conduct on-ground monitoring of land condition.
- Provide monitoring and decision support data to users including landholders.

More broadly, accurate and consistently recorded land condition data is critical to:

- Supporting resilient industries and rural communities through productive and sustainable use of grazing resources.
- Planning and decision making within the grazing and agricultural community.
- State-wide sustainable land management initiatives (e.g. P2R, GRASS).
- Accounting for and justifying expenditure of public monies (e.g. P2R, NRIP).
- Supporting sound policy development across all levels of government and Industry.
- Providing business intelligence of current condition and trend:
  - Identification and response to emerging issues (animal health, pests, pasture dieback).
  - Guiding and prioritising land management activities and responses (natural disasters).

Driven by the organisational and operational need of others, DAF Agriculture has supported the provision of the LCAT to a range of government and non-government organisations and Industry engaged in sustainable land management initiatives.

In 2020, the Reef 2050 Independent Science Panel and the Reef 2050 Executive Steering Committee endorsed that the LCAT be included as a mandatory component of monitoring and evaluation for any projects delivering outcomes in grazing lands for the Reef 2050 WQIP.

The MPA program has facilitated access to, and the state-wide training and implementation of the LCAT to more than 200 users across 20 organisations.

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END