



Victoria Bonaparte bioregion

Description

Area: 72 600 km²

The Victoria Bonaparte bioregion is found in Western Australia (WA) and the Northern Territory (NT) and includes dissected plateaus and alluvial plains and a number of river basins. Eucalypt woodlands are the dominant vegetation community. Tenure includes pastoral leases, Aboriginal land and conservation reserves. The main industries are cattle grazing, horticulture and tourism. Major population centres are Wyndham and Kununurra in WA, and Timber Creek and Daly River in the NT.

Location

The Victoria Bonaparte bioregion crosses the NT–WA border south of the coast (74% of area is in the NT, 26% is in WA). Figure 1 shows the location of the Victoria Bonaparte bioregion, while Figure 2 shows the location of Western Australian Rangeland Monitoring System (WARMS) and Tier 1 monitoring sites in WA and the NT, respectively.

Figure 1 Location of the Victoria Bonaparte bioregion

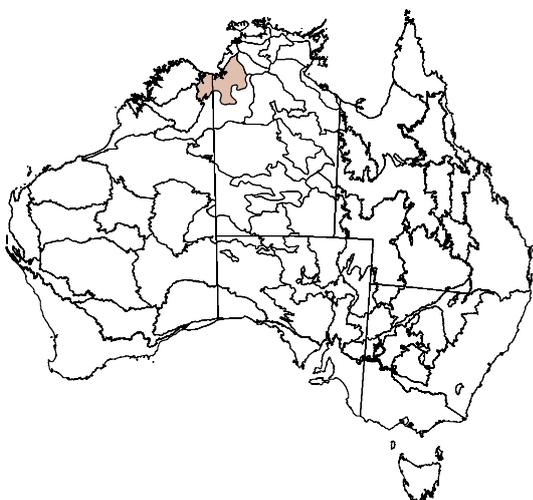
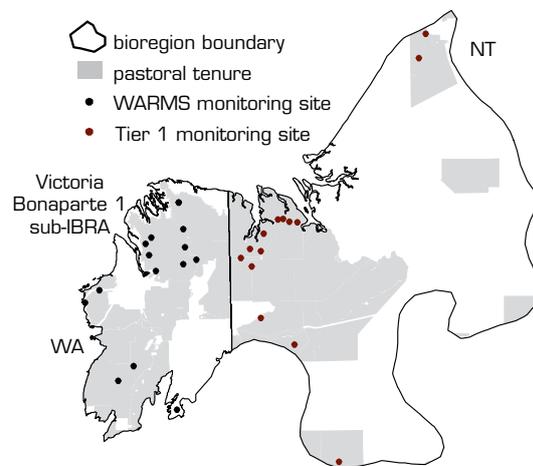


Figure 2 WARMS (WA) and Tier 1 (NT) monitoring sites shown on the pastoral tenure of both jurisdictions



Data sources available

Data sources include:

- WARMS, Victoria Bonaparte 1 (VBI) sub-Interim Biogeographic Regionalisation for Australia (IBRA) only, which provides moderate reliability for reporting change, with a small number of dispersed sites, quantitative data, and a focus on perennial species (which helps to filter short-term seasonal variability)
- NT Tier 1, which provides low to moderate reliability, with a small number of sites with a patchy distribution, estimated data, and a focus on perennial herbage species
- domestic stocking density, which provides moderate reliability
- fire extent, intensity and frequency, which provides high reliability
- dust
- distance from water

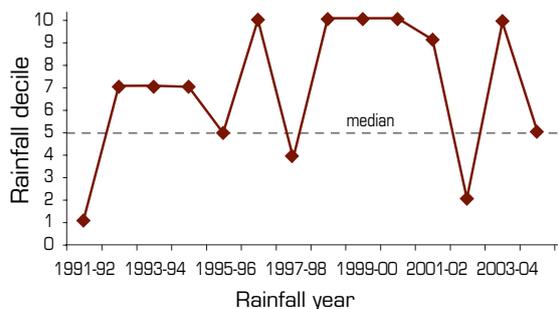


- distribution and relative abundance of invasive animals and weeds
- land use
- conservation estate
- land values.

Climate

The climate of the Victoria Bonaparte bioregion is subtropical. Most of the annual rainfall occurs between November and March. Spatially averaged median (1890–2005) rainfall is 818 mm (April to March rainfall year; see Figure 3).

Figure 3 Decile rainfall for the period 1991–1992 to 2004–2005



Annual rainfall is for the 12-month period 1 April to 31 March.

Decile rainfall was above the median for most of the reporting period. The year 1991–1992 was very dry, as was 2002–2003.

Note that regional averaging of rainfall conceals spatial variability. Some parts of the Victoria Bonaparte bioregion may have experienced better *seasonal quality* and others worse during the 1992–2005 period.

Landscape function

WA, Victoria Bonaparte 1 sub-IBRA

WARMS, perennial grass frequency

When *seasonal quality* was above average, 17% of sites showed a decline in perennial grass frequency. It is not possible to report change when *seasonal quality* was below average.

<i>Seasonal quality</i>	Number of site-by-year combinations	Decline: frequency < 0.90	No change: 0.90 ≤ frequency < 1.10	Increase: frequency ≥ 1.10
Above average	12	17%	58%	25%
Average	10	10%	60%	30%
Below average	n/a	n/a	n/a	n/a

Northern Territory

Tier 1, index based on composition (by biomass) and cover of perennial herbage species

Insufficient sites were assessed to report change reliably following both above- and below-average *seasonal quality*.

<i>Seasonal quality</i>	Number of site-by-year combinations	Percentage of reassessed sites showing:		
		Decline: > 3 decrease in index	No change	Increase: > 3 increase in index
Above average	3	n/a	n/a	n/a
Average	11	36%	36%	27%
Below average	5	n/a	n/a	n/a

Sustainable management

Critical stock forage

WA, Victoria Bonaparte 1 sub-IBRA

WARMS, frequency of decreaser perennial grass species

When *seasonal quality* was above average, 8% of sites showed a decline in the frequency of decreaser perennial grass species. It is not possible to report change when *seasonal quality* was below average.

Seasonal quality	Species group	Number of site-by-year combinations	Percentage of reassessed sites showing:		
			Decline: frequency < 0.90	No change: 0.90 ≤ frequency < 1.10	Increase: frequency ≥ 1.10
Above average	Decreaser	12	8%	50%	42%
	Intermediate	n/a	n/a	n/a	n/a
	Increaser	n/a	n/a	n/a	n/a
Average	Decreaser	10	10%	60%	30%
	Intermediate	n/a	n/a	n/a	n/a
	Increaser	n/a	n/a	n/a	n/a
Below average	Decreaser	n/a	n/a	n/a	n/a
	Intermediate	n/a	n/a	n/a	n/a
	Increaser	n/a	n/a	n/a	n/a

Northern Territory

Tier I, composition (by biomass) of palatable perennial (2P) herbage species

No sites showed decline when *seasonal quality* was above average. It is not possible to report change following below-average *seasonal quality*.

Seasonal quality	Number of site-by-year combinations	Percentage of reassessed sites showing:		
		Decline: > 20% decrease in 2P grasses	No change	Increase: > 20% increase in 2P grasses
Above average	20	0%	90%	10%
Average	27	4%	59%	37%
Below average	5	n/a	n/a	n/a

Plant species richness

This section reports for the Victoria Bonaparte I sub-IBRA in WA only.

When *seasonal quality* was above average, 58% of WARMS sites showed a decline in species richness of native perennial plants. No sites were assessed when *seasonal quality* was below average.

Seasonal quality	Number of site-by-year combinations	Decline: richness index < 0.80	No change: 0.80 ≤ richness index < 1.20	Increase: richness index ≥ 1.20
Above average	12	58%	33%	8%
Average	10	10%	30%	60%
Below average	0	n/a	n/a	n/a

Change in woody cover

Western Australia

Crown cover of woody species increased by 13% on average, and remained the same or increased on 82% of WARMS sites. On no sites did cover drop below 50% of the initially recorded value.

Northern Territory

Based on the Australian Greenhouse Office definition and mapping of forest extent¹, there is some forest cover in the NT part of the Victoria Bonaparte bioregion (7.60% of NT bioregion area in 1991, increasing by 1.90% to 9.50% in 2004). There is good coverage of Landsat data for reporting this result.

Distance from stock water

The percentage of sub-IBRA area within three kilometres of permanent and semipermanent sources of stock water is summarised in the following table. Note that for WA, the locations of stock waterpoints were sourced from state mapping of lease infrastructure, and watered area is reported as the percentage of pastoral tenure within each sub-IBRA. NT data were obtained from Geoscience Australia's GEODATA TOPO 250K vector product (Series 3, June 2006), and watered area is the percentage of sub-IBRA area. These differences mean that the percentage watered area reported by each data type is not directly comparable.

¹ See <http://www.greenhouse.gov.au/ncas/reports/tech09.html>

Sub-IBRA	Western Australia		Northern Territory	
	% sub-IBRA within 3 km of water	% sub-IBRA area analysed	% sub-IBRA within 3 km of water	% sub-IBRA area analysed
Victoria Bonaparte P1 (VB1)	9.5	64.9	2.0	100
Victoria Bonaparte P2 (VB2)			8.3	100
Victoria Bonaparte P3 (VB3)			7.7	100

IBRA = Interim Biogeographic Regionalisation for Australia;
VB = Victoria Bonaparte

Note that this analysis does not include the locations of natural waters, which in this bioregion can provide many additional sources of water for stock, particularly in the early dry season. It is not possible to report change in watered area for the 1992–2005 period for either jurisdiction.

Weeds

Weeds known to occur in the Victoria Bonaparte bioregion include:

Common name	ubs
Bellyache bush	<i>Jatropha gossypifolia</i>
Calotrope	<i>Calotropis procera</i>
Chinee apple	<i>Zizyphus mauritiana</i>
Chinese violet	<i>Asystasia gangetica</i> subsp. <i>micrantha</i>
Grader grass	<i>Themeda quadrivalvis</i>
Hymenachne	<i>Hymenachne amplexicaulis</i>
Hyptis	<i>Hyptis suaveolens</i>
Lantana	<i>Lantana camara</i>
Mimosa	<i>Mimosa pigra</i>
Mission grass	<i>Pennisetum polystachion</i>
Noogoora burr	<i>Xanthium occidentale</i>
Parkinsonia	<i>Parkinsonia aculeata</i>
Prickly acacia	<i>Acacia nilotica</i> subsp. <i>indica</i>
<i>Salvinia molesta</i>	<i>Salvinia molesta</i>
Sicklepod	<i>Senna obtusifolia</i> and <i>S. tora</i>
<i>Sida</i> spp.	<i>Sida</i> spp.

See www.anra.gov.au for distribution maps

Components of total grazing pressure

Domestic stocking density

Domestic stocking density data apply to the pastoral tenure of both WA and the NT. The grazed area of the Victoria Bonaparte bioregion decreased from 62% in 1992 to 45% in 2001. Based on data from the Australian Bureau of Statistics and taking account of the reduced area grazed over time, domestic stocking density increased substantially over the 1992–2004 period and was much higher than the 1983–1991 average from 1998 onwards. Stocking density in 2001 and 2002 was 65% above the 1983–1991 baseline. The extended period of above-average seasonal quality (see Figure 3 of decile rainfall, above) probably contributed to increased stocking, particularly from 1997 onwards. Note that spatial averaging conceals likely variation in stocking density trends across the bioregion.

Kangaroos

There are no suitable data for reporting change in kangaroo populations.

Invasive animals

Invasive animal species known to occur in the Victoria Bonaparte bioregion include:

Common name	Scientific name
Feral pig	<i>Sus scrofa</i>
Wild dog	<i>Canis</i> spp.
Feral cat	<i>Felis catus</i>
Cane toad	<i>Bufo marinus</i>
Water buffalo	<i>Bubalus bubalis</i>
Camel	<i>Camelus dromedaries</i>
Donkey	<i>Equus asinus</i>
Horse	<i>Equus caballus</i>

See www.anra.gov.au for distribution maps

Products that support reporting of landscape function and sustainable management

Fire

Fire data apply to the whole bioregion. Large parts of the Victoria Bonaparte bioregion were burnt in all years between 1997 and 2005. The highest percentage areas burnt in 2001, 2002 and 2004 were probably related to increased fuel accumulation in preceding wetter years.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
% area burnt	32.4	37.8	38.2	28.9	41.5	41.2	26.6	36.6	24.6

Fires were a mixture of early dry-season (cooler) burns (January to July; particularly in 1998, 1999, 2002 and 2005) and later hotter fires (August to December), particularly in 2001 and 2004.

The frequency of fire between 1997 and 2005 was high compared with all rangeland bioregions, with a mean frequency (\log_{10} transformed) of 0.56.

Dust

Dust data relate to the whole bioregion. The mean Dust Storm Index value (1992–2005) was 1.46, which was a low value compared with all rangeland bioregions. Dust levels were negligible in the far east of the bioregion and low elsewhere.

Biodiversity

More than 15% of the bioregion is protected in reserves (Collaborative Australian Protected Areas Database, Biodiversity Working Group indicator: Protected areas; see **Section 7 of Chapter 3** of *Rangelands 2008 — Taking the Pulse*).

For the NT, there were 270 bird species, more than 100 reptile species and approximately 2000 plant taxa recorded by 2005 (Biodiversity Working Group indicators: Fauna surveys and Flora surveys).

The WA portion of the bioregion has Ramsar-listed wetlands (Biodiversity Working Group indicator: Wetlands).

For the entire bioregion, there are (Biodiversity Working Group indicator: Threatened species):

- 2 threatened plant species
- 1 threatened mammal species
- 10 threatened bird species
- 1 threatened reptile species
- 1 threatened fish species.

Socioeconomic characteristics

Land use and value

The grazed area of the Victoria Bonaparte bioregion has decreased from 62% in 1992 to 45% in 2001.

In the WA part of the bioregion, the average 'lease and improvement' values for pastoral leases in the Kimberley increased more than five-fold between 1992 and 2005.

Key management issues and features

Key features and issues of the Victoria Bonaparte bioregion include the following:

- WA:
 - The threat of woody thickening will continue to be monitored.
 - Market demand for live cattle at specified weights has encouraged managers to turn off young cattle and better match animal numbers to feed supply. Combined with good seasons, pastoralists have an excellent operating environment in which to show improved land management.
 - Most commercial enterprises (of viable size) are profitable.

- Infrastructure development has made more pastoral land accessible to livestock and raised the potential for increased livestock numbers.
- A number of noxious weed species have established populations but have not yet become widespread. They are the subject of ongoing surveillance.
- Cane toads threaten the bioregion.
- In Western Australia, the area is part of the donkey eradication program, and donkey numbers are decreasing.
- Fire management is being seen as increasingly important. Late dry-season fires tend to homogenise the vegetation structure, with mid-storey vegetation particularly at risk. These fires also contribute significantly to greenhouse gas emissions.
- About 6.2% of the bioregion (and VBI sub-IBRA) is within the conservation estate.
- A long run of generally good to very good rainfall years has produced probably the best sequence of rainfall on record, better even than the mid-1970s.
- Included in the bioregion is the planned expansion for stage 2 of the Ord River irrigation area. This will further increase irrigated agriculture, and some pastoral leasehold land will be resumed for this purpose.
- NT:
 - Cattle numbers in the bioregion have increased over the period due to the run of good seasons and increased infrastructure development. Buildup of cattle numbers after the national Brucellosis and Tuberculosis Eradication Campaign has also contributed to this increase.
 - Donkeys are controlled with shooting programs. Large numbers have been removed in recent years.
 - Aboriginal leases are slowly being developed as cattle stations, with Amanbidji being the most developed.
 - Controlled burning programs are run by the Bushfires Council to reduce the number of uncontrolled late dry-season wildfires.