

Example site, Brigalow Belt

The Brigalow Belt · 56.5 km² · checked 2026-10-17

NUMBAT (Native vegetation Uncertainty Mapping: Bioregional Accuracy Testing) checks the Queensland Herbarium's map of regional ecosystems, the state's map of native vegetation types, against satellite data every 20 m, and shows where the map is most likely to be wrong. This report gives the result for the area, the places reviewed, and the field sites inside it.

Prepared	2026-10-18, with NUMBAT
Map checked	Queensland Herbarium regional ecosystem mapping, Remnant 2021, v13.1
NUMBAT's reading	The Brigalow Belt: satellite embeddings 2021 to 2025, geology, soil and terrain

1 Summary

NUMBAT checked 2,632 ha of mapped remnant vegetation, every 20 m, against its own reading of the satellite and ground data.

 Green: NUMBAT agrees with the map	1,002 ha	38%
 Amber: NUMBAT is unsure	1,041 ha	40%
 Pink: NUMBAT reads another type	589 ha	22%

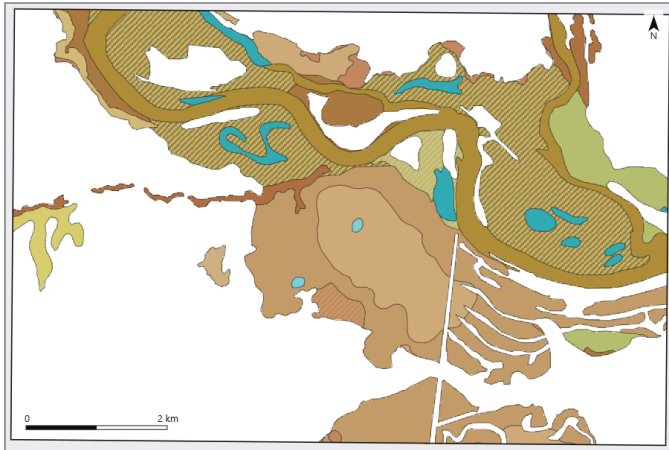
Pink marks a place worth a look; on its own it does not prove the map wrong. At the field sites of the Brigalow Belt, the map's type was wrong at about 2 in 10 green places, 3 in 10 amber and 4 in 10 pink ones.

Places in doubt. 32 polygons where NUMBAT disagrees with the map over at least half of the area it read, 1 ha or more: 3 need a visit and 29 are not yet reviewed. No regrowth patch is unlike its type over at least half of it, 1 ha or more.

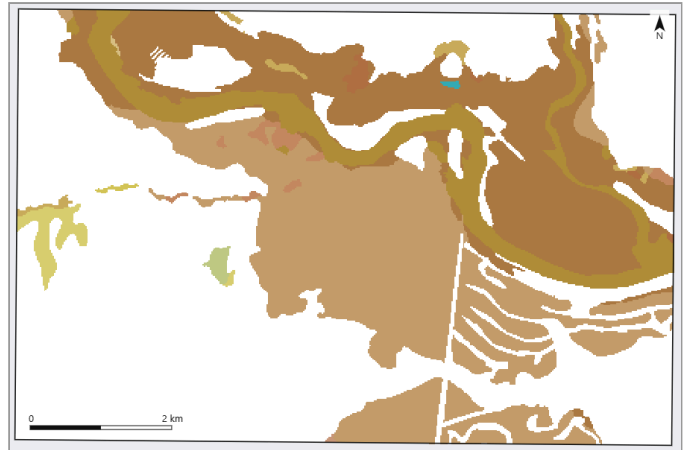
Field sites. 48 published field sites lie in the area. The map's type matched the type the ecologist recorded at 32 of 48, NUMBAT's best guess at 21, and it was among NUMBAT's three guesses at 29.

A higher conservation class. On 215 ha, NUMBAT's three best guesses include a type of a higher conservation class than the one mapped. A map error matters most there.

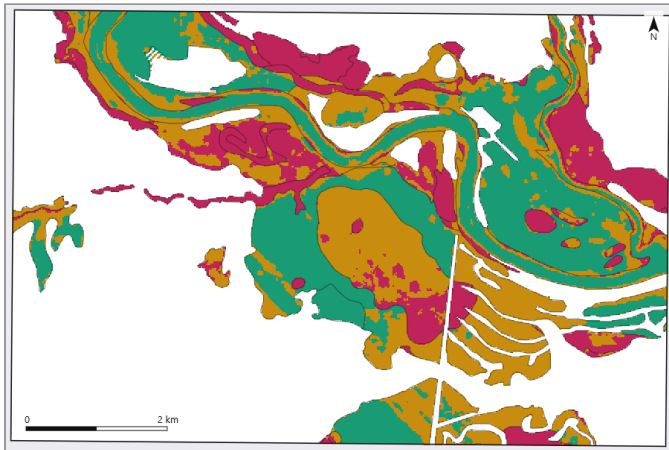
2 Maps



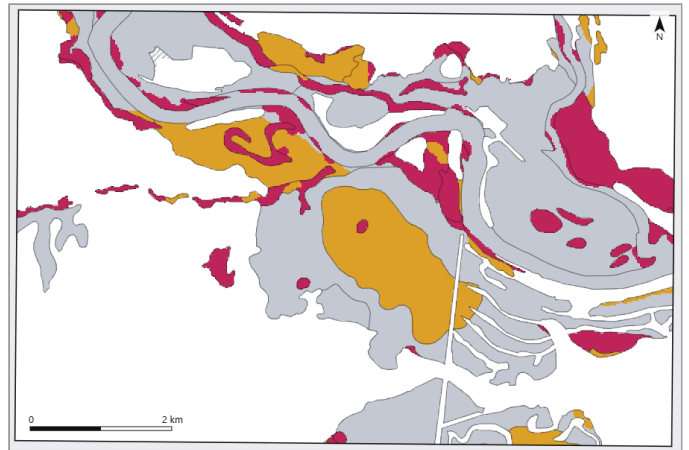
The Herbarium's map. Each type in its own colour; stripes: a mosaic.



NUMBAT's best guess. Its commonest guess within 100 m, in the same colours.



The check. ■ agrees ■ unsure ■ another type; stripes: regrowth.



Where NUMBAT differs. ■ the mapped type ■ same broad group ■ another group.

Grid north (UTM, EPSG:32755); 20 m pixels; the Herbarium's polygon lines and the area's boundary drawn over.

3 Places reviewed

The polygons where NUMBAT disagrees with the map over at least half of the area it read, 1 ha or more. Those marked for a visit come first, then the rest, the largest doubt first. "NUMBAT reads" is its commonest guess over the polygon with its share of the votes.

#	Map's type	NUMBAT reads	Area (ha)	In doubt (ha)	Your answer	Your note	Point (lat, lon)
1	11.3.7	11.3.2 21%	101	95	Needs a visit		-22.15332, 148.36574
2	11.3.2 70% / 11.3.7 25% / 11.3.1 5%	11.5.3 26%	146	74	Needs a visit		-22.15245, 148.31783
3	11.5.9b	11.3.2 25%	49	49	Needs a visit		-22.14083, 148.32489
4	11.3.3c	11.3.2 13%	28	27	Not reviewed		-22.14305, 148.29505
5	11.3.1	11.5.3 20%	25	25	Not reviewed		-22.15802, 148.32040
6	11.3.27b	11.5.3 15%	21	20	Not reviewed		-22.15117, 148.31917
7	11.3.4 80% / 11.3.7 20%	11.5.3 25%	38	19	Not reviewed		-22.15406, 148.34111
8	11.3.27b	11.5.3 10%	18	18	Not reviewed		-22.15837, 148.34426
9	11.3.7	11.5.3 41%	24	18	Not reviewed		-22.17716, 148.36616
10	11.5.9b	11.5.3 27%	16	16	Not reviewed		-22.17208, 148.34672
11	11.5.9b	11.5.3 24%	15	15	Not reviewed		-22.18898, 148.35638
12	11.3.27b	11.3.2 21%	15	15	Not reviewed		-22.13873, 148.31576
13	11.4.8	11.3.1 19%	13	13	Not reviewed		-22.14294, 148.33189
14	11.3.27b	11.3.2 26%	11	11	Not reviewed		-22.16133, 148.35747
15	11.3.27b	11.3.2 16%	12	9.3	Not reviewed		-22.14429, 148.34257
16	11.4.8	11.3.3 24%	4.2	4.2	Not reviewed		-22.13957, 148.34544
17	11.3.27b	11.3.25 32%	4.2	4.2	Not reviewed		-22.14636, 148.31060
18	11.3.2 95% / 11.3.1 5%	11.5.3 33%	4.7	3.6	Not reviewed		-22.13923, 148.36463
19	11.3.1	11.4.9 9%	3.5	3.5	Not reviewed		-22.15887, 148.30567
20	11.3.1	11.8.11 12%	3.4	3.4	Not reviewed		-22.15784, 148.29868
21	11.4.8	11.3.2 20%	2.6	2.6	Not reviewed		-22.14316, 148.34838
22	11.3.27b	11.3.2 29%	2.5	2.5	Not reviewed		-22.16649, 148.36761
23	11.3.27b	11.3.2 30%	4.8	2.5	Not reviewed		-22.16112, 148.36116
24	11.5.9b	11.3.3 15%	2.4	2.4	Not reviewed		-22.13585, 148.31418
25	11.3.27b	11.3.2 29%	3.2	2.3	Not reviewed		-22.16504, 148.36779
26	11.5.17	11.5.3 52%	2.3	2.3	Not reviewed		-22.16226, 148.33227
27	11.4.9	11.3.2 19%	2.3	2.3	Not reviewed		-22.14064, 148.32586
28	11.5.17	11.5.3 29%	2.2	2.2	Not reviewed		-22.16955, 148.32439
29	11.3.2	11.5.3 36%	2.4	1.4	Not reviewed		-22.17825, 148.36539
30	11.4.8	11.3.2 32%	1.2	1.2	Not reviewed		-22.14365, 148.35478
31	11.4.9	11.3.2 14%	1.6	1.2	Not reviewed		-22.14163, 148.29213

#	Map's type	NUMBAT reads	Area (ha)	In doubt (ha)	Your answer	Your note	Point (lat, lon)
32	11.9.5	11.5.3 22%	1.0	1.0	Not reviewed		-22.17792, 148.33921

4 Regrowth

High value regrowth (category C) 3.9 ha and watercourse regrowth (category R) 1.2 ha lie outside the remnant. NUMBAT learned from remnant only, so it compares regrowth with the type it would grow back to (the type the vegetation management RE map gives high value regrowth, else the Herbarium's pre-clearing map): it reads as that type on 2.2 ha, partly on 2.4 ha, and as another type on 0.4 ha.

State of the regrowth, from the remnant test. The Herbarium counts vegetation as remnant where its canopy averages more than 70% of the undisturbed height and covers more than 50% of it, with the characteristic species. NUMBAT measures each patch's canopy height and cover (Meta and WRI canopy map) as shares of the remnant of the same type in the same subregion, and its own reading stands in for the species: below both tests 4.2 ha, reads as another type 0.4 ha, not assessed 0.4 ha. An indication, not a remnant determination: the canopy heights are modelled from imagery and carry error. At field sites in the Brigalow Belt, both tests were met at 59% of 207 remnant sites and 31% of 95 regrowth sites.

No regrowth patch is unlike its type over at least half of it, 1 ha or more.

5 Field sites

Published field sites in the area: the type the ecologist recorded beside the map's type at the site and NUMBAT's best guess there (✓ where they match it; letter suffixes ignored). NUMBAT's guess at each site never learned from that site's own 5 km square.

Site	Date	Report	Recorded type	Map's type	NUMBAT's guess	Colour
Q89	28/11/2016	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	green
Q106	30/11/2016	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	amber
Q107	30/11/2016	R1	11.5.3	not remnant X	11.5.3 ✓	
Q108	30/11/2016	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	amber
Q110	30/11/2016	R1	11.5.9	11.5.9b ✓	11.5.3 X	pink
Q111	30/11/2016	R1	11.3.27f	11.3.27b ✓	11.3.25 X	pink
Q112	30/11/2016	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	green
Q113	30/11/2016	R1	11.3.2	11.3.4 X	11.3.2 ✓	amber
Q114	30/11/2016	R1	11.3.4	11.3.4 ✓	11.3.25 X	pink
Q115	30/11/2016	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	amber
Q116	30/11/2016	R1	11.3.7	11.3.7 ✓	11.5.3 X	amber
Q117	30/11/2016	R1	11.3.2	11.3.2 ✓	11.5.3 X	pink
CQ7	1/06/2017	R1	11.3.27f	11.3.3c X	11.3.2 X	pink
CQ8	1/06/2017	R1	11.3.2	11.3.2 ✓	11.3.2 ✓	amber
CQ9	1/06/2017	R1	11.3.25	11.3.25 ✓	11.3.25 ✓	green
CQ10	1/06/2017	R1	11.3.27f	11.3.3c X	11.5.3 X	pink
CQ12	1/06/2017	R1	11.4.8	11.3.2 X	11.5.3 X	pink
CQ13	1/06/2017	R1	11.4.8	11.3.1 X	11.5.3 X	pink

Site	Date	Report	Recorded type	Map's type	NUMBAT's guess	Colour
CQ14	2/06/2017	R1	11.4.8	11.3.1 X	11.8.11 X	pink
CQ15	2/06/2017	R1	11.5.3	11.5.3 ✓	11.4.2 X	amber
CQ16	2/06/2017	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	amber
CQ17	2/06/2017	R1	11.5.17	11.5.17 ✓	11.5.3 X	pink
CQ18	2/06/2017	R1	11.5.15	11.5.3 X	11.5.3 X	green
CQ19	2/06/2017	R1	11.5.3	11.5.3 ✓	11.5.3 ✓	green
CQ22	3/06/2017	R1	11.4.8	not remnant X	11.4.9 X	
CQ23	3/06/2017	R1	11.4.8	not remnant X	11.3.1 X	
CQ26	8/06/2017	R1	11.3.25	11.3.25 ✓	11.3.25 ✓	green
CQ27	8/06/2017	R1	11.3.2	11.3.2 ✓	11.3.2 ✓	amber
CQ28	8/06/2017	R1	11.3.25	11.3.7 X	11.3.1 X	amber
CQ29	8/06/2017	R1	11.4.8	not remnant X	11.3.2 X	
CQ41	26/09/2017	R1	11.3.1	11.3.1 ✓	11.5.3 X	pink
Q42#2	26/09/2017	R1	11.3.27f	11.3.2 X	11.3.2 X	amber
CQ43	26/09/2017	R1	11.3.2	11.3.2 ✓	11.3.2 ✓	amber
CQ44	26/09/2017	R1	11.3.1	11.3.3c X	11.3.25 X	pink
RCQ24	17/11/2017	R1	11.3.2	11.3.2 ✓	11.3.2 ✓	amber
RCQ25	17/11/2017	R1	11.5.17	11.5.17 ✓	11.5.3 X	pink
1	6/03/2018	R2	11.3.25	11.3.25 ✓	11.3.25 ✓	green
2	6/03/2018	R2	11.3.7	11.3.7 ✓	11.3.2 X	amber
3	6/03/2018	R2	11.3.2	11.3.7 X	11.3.2 ✓	pink
3.25BC04@Deverill	02/05/2018	R2	11.3.25	11.3.25 ✓	11.3.25 ✓	green
Impact_3.1BC01@Wynette	19/05/2018	R2	11.3.1	11.3.1 ✓	11.5.3 X	pink
Impact_3.2BC01@Wynette	06/05/2018	R2	11.3.2	11.3.2 ✓	11.3.2 ✓	amber
3.27BC01@Wynette	06/05/2018	R2	11.3.27f	11.3.3c X	11.5.3 X	pink
3.27BC02@Wynette	07/05/2018	R2	11.3.27f	11.3.27b ✓	11.3.2 X	pink
Impact_5.17BC02@Wynette	19/05/2018	R2	11.5.17	11.5.17 ✓	11.5.3 X	pink
Impact_5.3BC02@Iffley	16/05/2018	R2	11.5.3	11.5.3 ✓	11.5.3 ✓	amber
Impact_5.3BC03@Wynette	19/05/2018	R2	11.5.3	11.5.3 ✓	11.5.3 ✓	green
Impact_5.9BC02@Wynette	19/05/2018	R2	11.5.9	11.5.9b ✓	11.5.3 X	amber

Reports: R1 Olive Downs Project draft EIS Appendix A Terrestrial Flora Assessment part A (DPM 2018); R2 Olive Downs Project draft EIS Appendix A part B (incl. Baseline Offset Survey, DPM 2018).

6 Vegetation types in the area

Each type the Herbarium mapped in the area (the first type of a mosaic), with its hectares in each colour.

Type	Description	Class	Mapped (ha)	Green	Amber	Pink
11.5.3	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	Least concern	702	358	343	1.8
11.3.7	Corymbia spp. open woodland on alluvial plains	Least concern	527	280	130	117
11.3.2	Eucalyptus populnea woodland on alluvial plains	Of concern	423	132	207	84
11.3.25	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Least concern	365	208	109	48
11.5.9b	Eucalyptus crebra, E. tenuipes, Lysicarpus angustifolius +/- Corymbia spp. woodland	Least concern	316	0.0	182	134
11.3.27b	Vegetation ranges from open water +/- aquatics and emergents such as Potamogeton crispus, Myriophyllum verrucosum, Chara spp., Nitella spp	Least concern	95	0.2	9.6	85
11.3.4	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Of concern	45	0.0	24	20
11.9.3	Dichanthium spp., Astrebla spp. grassland on fine-grained sedimentary rocks	Least concern	44	24	17	2.4
11.3.1	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Endangered	38	0.0	5.8	32
11.3.3c	Eucalyptus coolabah woodland to open woodland (to scattered trees) with a sedge or grass understorey in back swamps and old channels	Of concern	28	0.0	0.9	27
11.4.8	Eucalyptus cambageana woodland to open forest with Acacia harpophylla or A. argyrodendron on Cainozoic clay plains	Endangered	24	0.0	1.6	22
11.9.2	Eucalyptus melanophloia +/- E. orgadophila woodland to open woodland on fine-grained sedimentary rocks	Least concern	14	0.0	9.8	4.2
11.4.9	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Endangered	5.3	0.0	0.8	4.6
11.5.17	Eucalyptus tereticornis woodland in depressions on Cainozoic sand plains and remnant surfaces	Endangered	4.6	0.0	0.0	4.6
11.9.5	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Endangered	1.5	0.0	0.0	1.5

7 Method and limits

What NUMBAT reads. For every 20 m: the AlphaEarth satellite embeddings (64 values that sum up how a place looks from above through the year, 2021 to 2025), the geology, the soil and the terrain.

How it learns. A random forest (200 decision trees) learns each type from every patch the Herbarium mapped as a single type in the Brigalow Belt. Every spot is read by a model that never learned from its own 5 km square, so the area is read as if NUMBAT had not seen it.

How it was tested. On 45,189 held-back patches in the Brigalow Belt, its best guess was the mapped type 44% of the time, and the mapped type was among its three best guesses 70% of the time.

The three colours. Green: the mapped type is NUMBAT's best guess, with at least 35% of its votes. Amber: the mapped type is among its three best guesses. Pink: it is not among them. Grey: NUMBAT cannot judge the type (fewer than five mapped patches of it to learn from).

The field evidence. At the published field sites of the Brigalow Belt, the map's type matched the ecologist's at 273 of 328 green sites, 296 of 423 amber and 175 of 291 pink.

Limits. NUMBAT does not draw a new map, and a single 20 m guess is often wrong. It learns from the map, so a type mapped wrongly in many places can mislead it. It learned from remnant vegetation only. Its field test leans on a few large reports, and in South East Queensland the colours sorted right from wrong less well than in the Brigalow Belt. The satellite data run to 2025, so newer clearing may not show. Read the colours as where to look, and the field visit as the answer.

8 Sources and licences

- Regional ecosystem mapping, Remnant 2021, v13.1, and the Regional Ecosystem Description Database: Queensland Herbarium, © State of Queensland (CC BY 4.0).
- AlphaEarth Foundations satellite embedding dataset: Google and Google DeepMind (CC BY 4.0).
- Queensland detailed surface geology, the Queensland digital elevation model (CC BY-SA) and the bioregions: © State of Queensland.
- Soil and Landscape Grid of Australia, version 2: CSIRO and TERN (CC BY 4.0).
- Regulated vegetation management map, vegetation management regional ecosystem map, pre-clearing regional ecosystem mapping and the Statewide Landcover and Trees Study: © State of Queensland (CC BY 4.0). Canopy height: Meta and World Resources Institute (CC BY 4.0).
- Field sites: Olive Downs Project draft EIS Appendix A Terrestrial Flora Assessment part A (DPM 2018); Olive Downs Project draft EIS Appendix A part B (incl. Baseline Offset Survey, DPM 2018).

Prepared with NUMBAT by BioGeo. NUMBAT's reading is a guide to where the map may be wrong; it is not a survey.