

Gorman North Strategic Release Mapping and Analysis

Prepared by

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Note: The information and data used in the mapping and analysis is subject to clarification or amendment due to changes in legislation, agencies, organisations, plans and status over time. It is the responsibility of the user to ensure compliance with the current situation.

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Acknowledgment

This report details the ecological values of lands that are part of Gomeroi Country. Lock the Gate acknowledges and pays respects to Gomeroi Elders past and present, and all Gomeroi people fighting to protect country.

Executive Summary

The Gorman North Strategic Release (GNSR) is an area of 16,722 Ha, with the northern extent just one kilometre south of the township of Narrabri within the Narrabri Local Government Area, in a region of NSW referred to as the Western Slopes. The GNSR is in the Namoi River Catchment, within the South Brigalow biogeographic region.

The area encompasses a number of very significant groundwater resource areas. The GNSR encompasses part of the recharge area of the Great Artesian Basin and it is included in the NSW Great Artesian Basin Groundwater Sources Plan 2008. It also includes areas of alluvial aquifers on the Namoi River floodplain used for irrigation, and supplies significant stock and domestic water. There are 182 bores mapped in the area by the Bureau of Meteorology Groundwater Information System, with the majority being for general water supply, irrigation or stock and domestic.

Important surface water systems in the area flow directly into the Namoi River. There are a total of 35.2km of channel streams in the GNSR, with three creeks draining north into the Namoi River in the coal release area - Jacks Creek, Sandy Creek, and Pine Creek. 14.2km of the streams is in good condition, and 19.3km of the streams has a high amount of fragility. There are 160.5 ha of Groundwater Dependent Ecosystems mainly along these creek systems.

Vegetation mapping shows that 13,502.5 ha, or 80%, of the GNSR remains covered in relatively intact woody native vegetation, with 5,252 ha, 40%, of that vegetation reserved as State Forest and remainder on private properties with some grazing activity. Outside the State Forest tenure are more than 220 private rural properties with some modified pastures and residential and farm infrastructure. There is no National Park Estate or Crown Land in the study area.

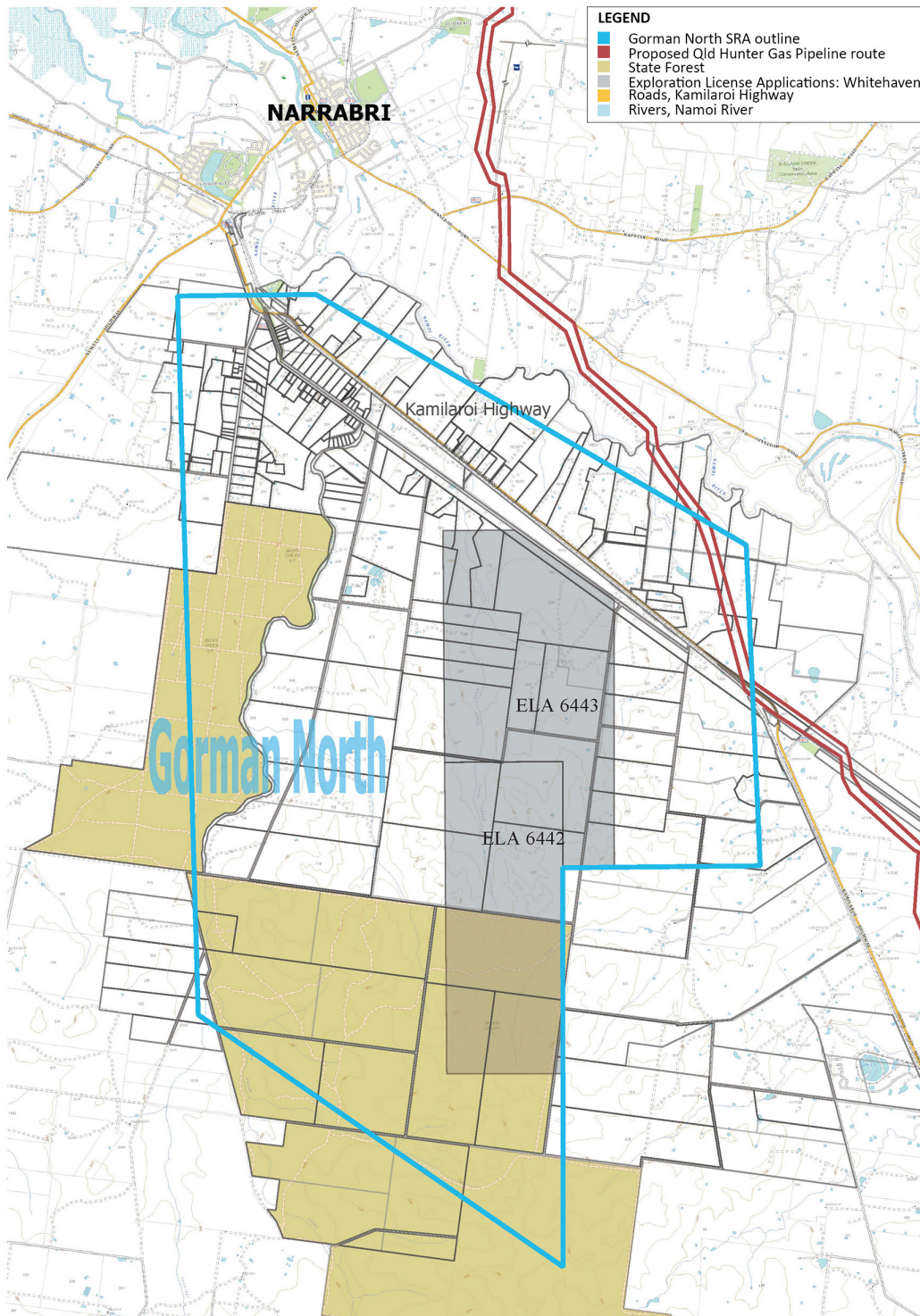
There was one Aboriginal heritage site formally listed in the NSW Aboriginal Land Council register available through the Aboriginal Heritage Information Management System.

Native woody tree cover is dominated by Western Slopes Dry Sclerophyll Forests. Altogether, 16 native vegetation communities were identified in the GNSR, with four being associated with threatened ecological communities, covering 0.8% of the area.

There is a substantial diversity of wildlife that have been recorded in the area, including threatened species. Overall, 162 native animal species have been recorded, including 12 threatened species. These include three endangered species under NSW environmental laws - the Black-striped Wallaby, Koala and Five-clawed Worm-skink and 9 vulnerable species. There have also been 283 native plant species recorded in the area, including 2 threatened species - *Bertya opponens* and *Pomaderris queenslandica*. Extensive areas in the GNSR do not have any records of native species, indicating that they are likely to have been poorly surveyed.

The vegetation in the GNSR forms the north-eastern part of the Pilliga forest, which is the largest patch of temperate woodland left in eastern Australia. The Pilliga is a crucial refuge for numerous threatened species, and is a stronghold particularly for Black-striped Wallaby, Pale-headed Snake,

Southern Long-eared Bat, Pilliga Mouse, Yellow-bellied Sheathtail Bat and Barking Owl¹. It is also crucial to a suite of declining woodland birds like the Turquoise Parrot, Speckled Warbler, Grey-crowned Babbler, Varied Sittella and Little Lorikeet. The Pilliga was also previously a core habitat stronghold for the Koala but there has been a drastic and rapid decline in the species in the last 15 to 20 years.



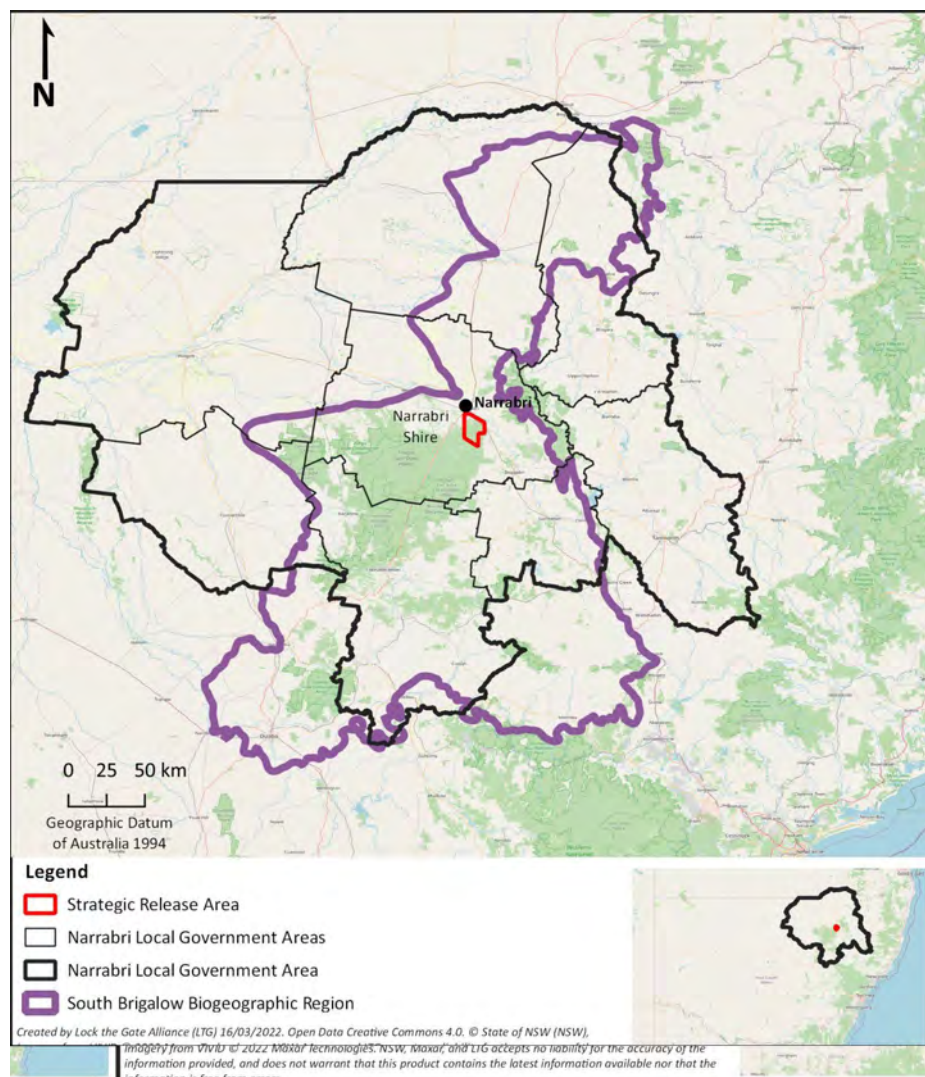
¹ <https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/projects/2020/03/narrabri-gas-project/correspondence/edo/milledge-narrabri-gas-project-ipc-advice-final.pdf>

Gorman North Strategic Release (GNSR)

Gorman North was one of six areas identified by the NSW Government in its June 2020 Future of Coal Statement as being potentially available for release under the Strategic Release Framework. This Framework is supposed to ensure that there is a Preliminary Regional Issues Assessment prior to considering whether an area is appropriate for release for coal exploration. One of these areas, Hawkins-Rumker, near Mudgee, has so far been through a Preliminary Regional Issues Assessment and the Strategic Release process and was deemed not suitable for release for coal exploration. No further Preliminary Regional Issues Assessments have been initiated and the NSW Government is now considering an application for two Exploration Licences in the Gorman North area under so-called “Operational Allocation,” which would by-pass this process.

Location information

The GNSR is an area of 16,722 Ha, with the northern extent a kilometre south of the township of Narrabri within the Narrabri Local Government Area, in a region of NSW referred to as the Western Slopes. The GNSR is in the Namoi River Catchment, within the South Brigalow biogeographic region (Map 1).



Map 1 Locality of the Gorman North Strategic Release within in Administrative boundaries and the South Brigalow Biogeographic Region

Aim of the assessment

This mapping and analysis of GNSR area is a desktop review utilising available relevant spatial data provided by state and federal governments and agencies to indicate the natural, historical, cultural, social and economical values in this region. This assessment is limited to publicly available data, and other values may exist or be known that can not be found in available digital databases.

Methods

Geographic Information Systems (GIS) software was used to compile relevant spatial data, and perform analysis and calculation. Map Grid of Australia 1994 Zone 55 geographic projection was used for spatial analysis. Area calculations were done using a planimetric model based on the chosen geographic projection system using Quantum GIS Software.

All data was licensed and used appropriately within its terms.

Values and constraints

Land tenure

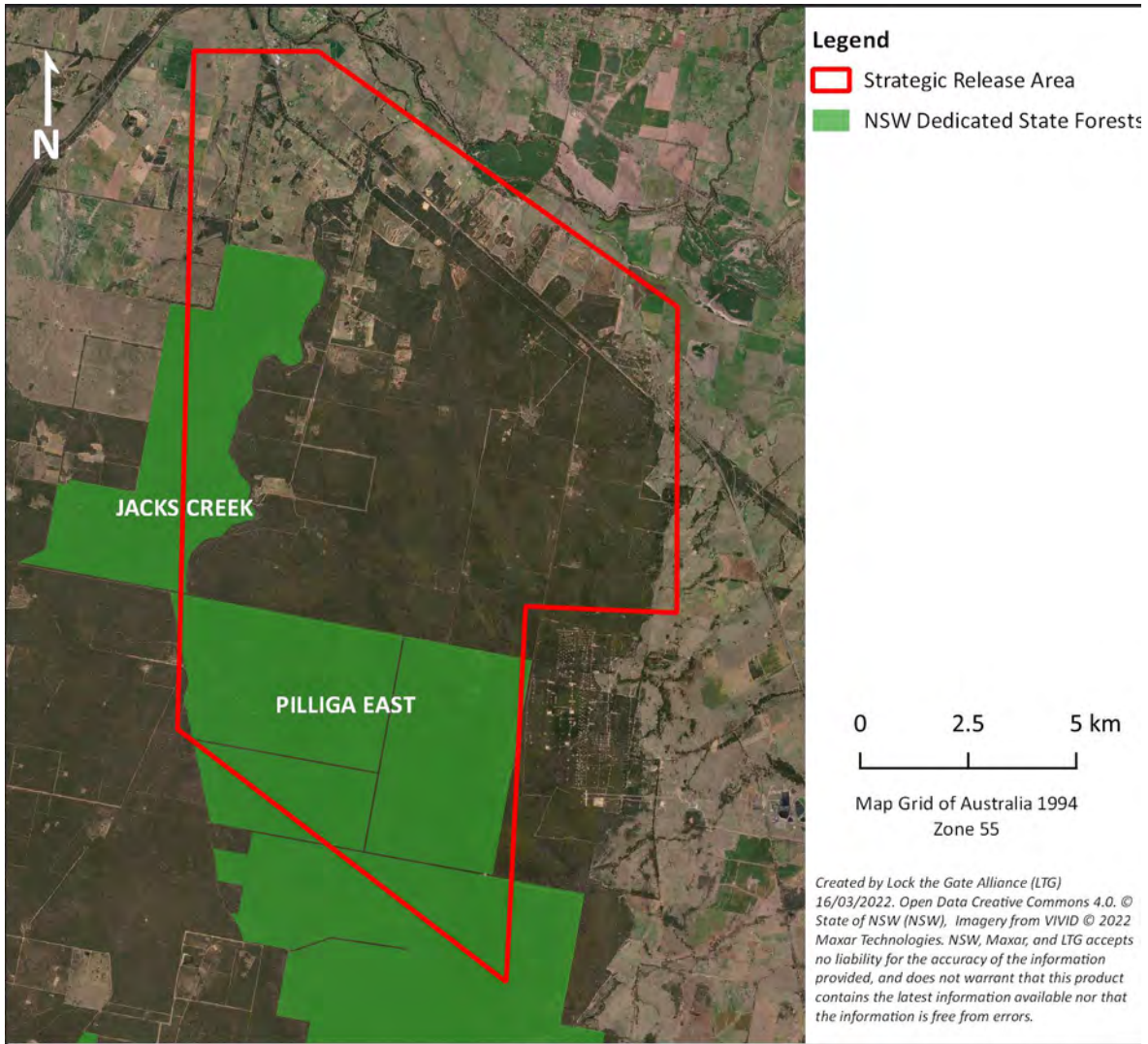
There is approximately 5,252 ha of State Forest within GNSR (Table 1), covering 31% of the area. There are no National Parks or Reserves, or Crown Land in the GNSR, and the remaining area is mostly private rural property (Figure 2).

Table 1 Area of State Forest within the GNSR using State of NSW State Forest data

<https://datasets.seed.nsw.gov.au/dataset/state-forest>

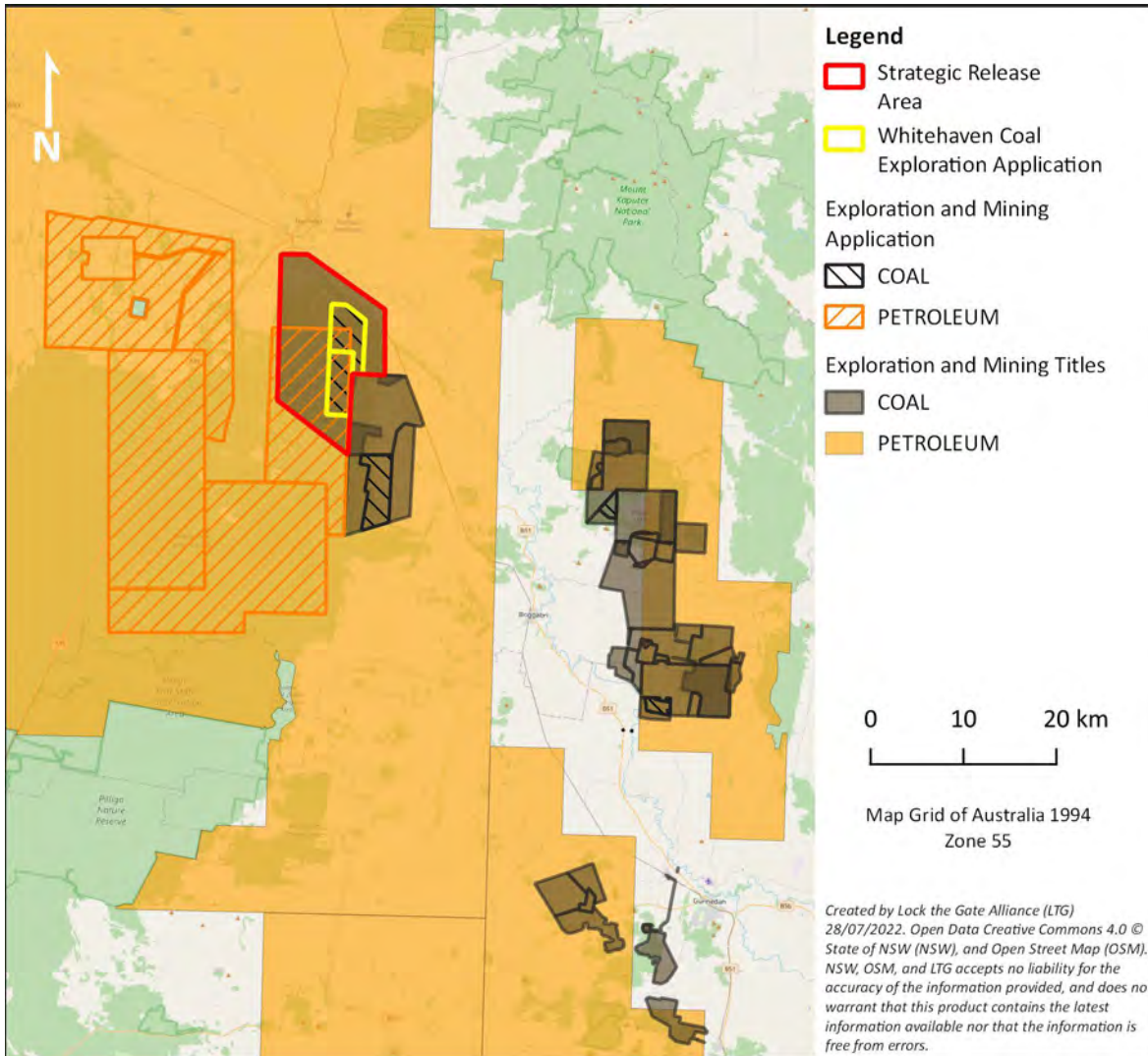
NOTE: Currency of the data used is 2013-2016, shifts in cadastre since may not be replicated in the Legal State Forest Boundary.

State Forest	Area within GNSR (ha)
Jacks Creek	4,875
Pilliga East	377



Map 2 State forest within Gorman North Strategic Release

Map 3 shows the distribution of petroleum and coal and titles within the vicinity of the GNSR. It also shows two Whitehaven Coal coal exploration licence applications that have recently been submitted within the area of the GNSR. This map highlights the scale of the cumulative threat to the region from coal and CSG.



Map 3 Distribution of coal and petroleum titles revealing cumulative scale of threats to the region

Aboriginal Culture and Heritage

There was one Aboriginal heritage site identified in the NSW Aboriginal Land Council register available through the Aboriginal Heritage Information Management System. The location of this site delivered from the search is on the eastern boundary, west of Turravon, the exact location is not authorised to be presented in this report.

No heritage sites within the GNSR were discovered in National and State registers.

The Pilliga forest, which is partly covered by the GNSR, is of outstanding cultural value and significance to Gomeroi Traditional Owners².

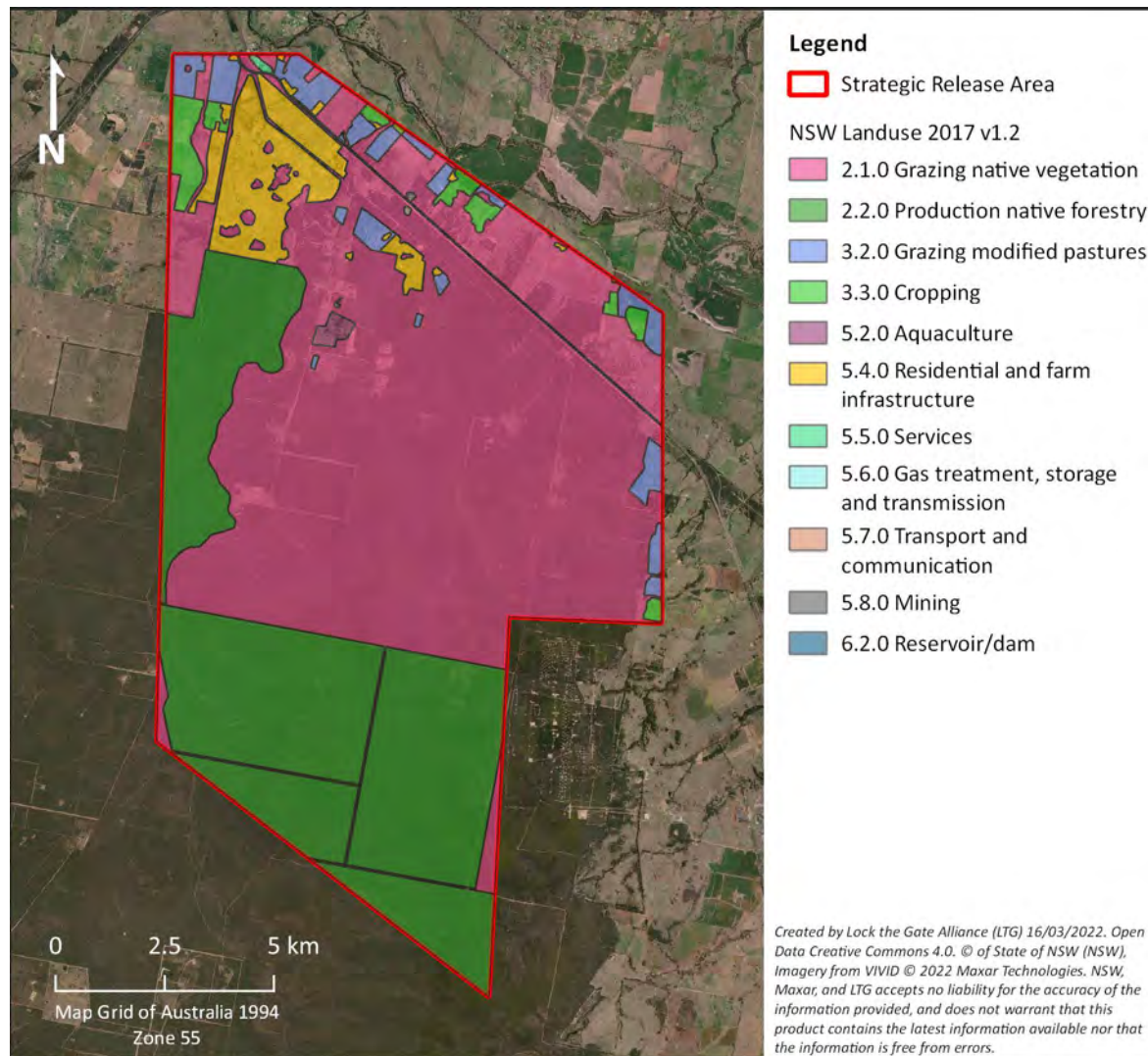
² <https://www.google.com/url?sa=t&rct=j&q=&esc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjO-9vM8Jr5AhXNTmwGHa6DAIlgQFnoECDkQAQ&url=https%3A%2F%2Fwww.wilderness.org.au%2Fthe-pilliga-cultural-heritage-report&usg=AOvVaw0MSMhuxMH3ltGlnZonLC0h>

Landuse

NSW Land Use Mapping 2017

Map 4 shows the land use classes within the GNSR using the NSW Land Use Mapping current to 2017. Appendix A shows a table with the area calculated for each of these Tertiary and Secondary land uses within the GNSR.

The GNSR is located just a few kilometres from the town of Narrabri with the north eastern part of the area popular with those seeking lifestyle blocks and small agricultural holdings.



Map 4 NSW Landuse Mapping 2017 within the Gorman North Strategic Release

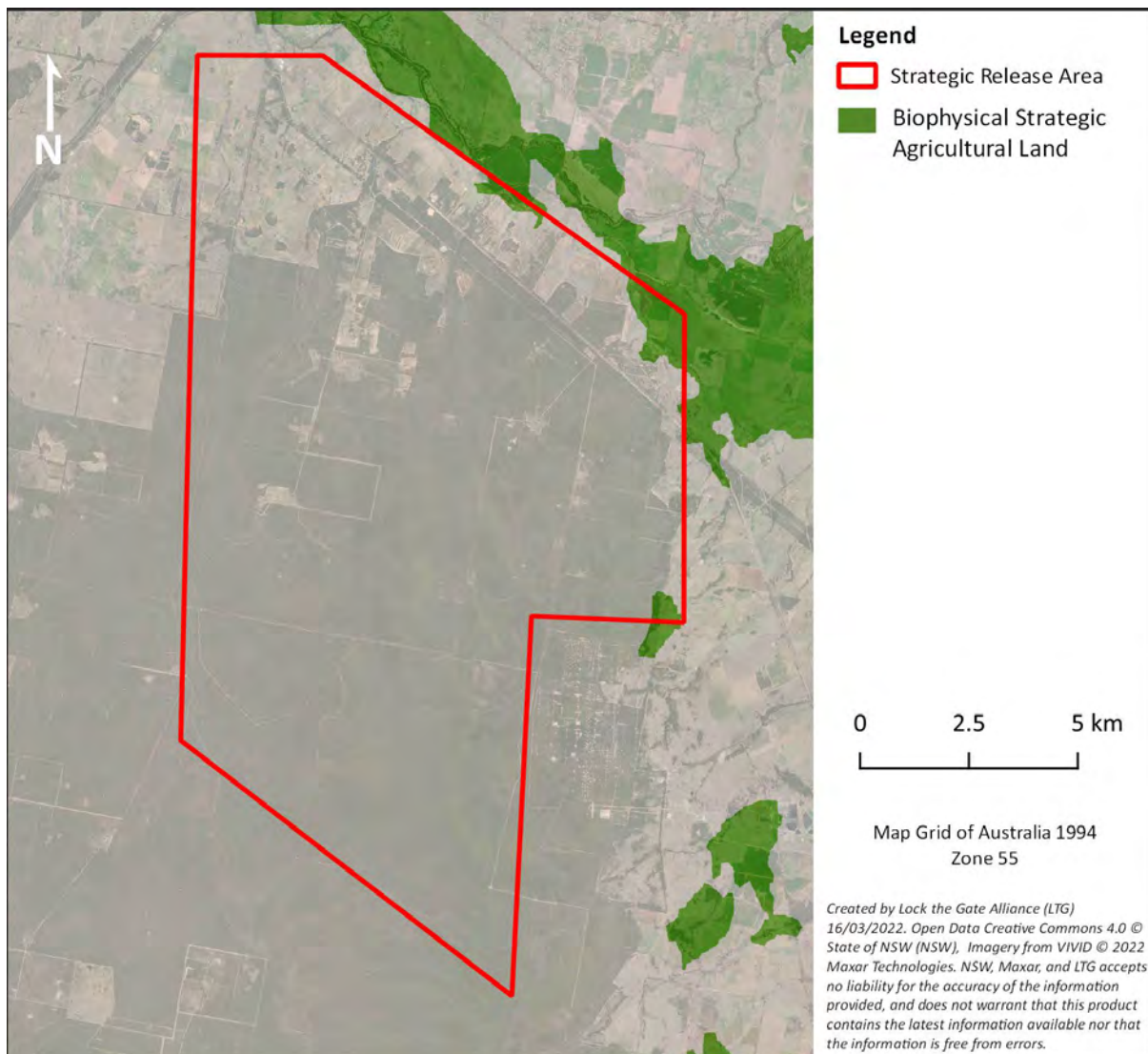
<https://datasets.seed.nsw.gov.au/dataset/nsw-landuse-2017-v1p2-f0ed>

Strategic Agricultural Land

Biophysical Strategic Agricultural Land (BSAL) was sourced from the NSW Department of Planning, Industry and Environment.³

³<https://datasets.seed.nsw.gov.au/dataset/srlup-salbiophysical>

Map 5 displays BSAL data in the GNSR, covering areas on the Namoi River floodplain and amounting to 300 Hectares in total.



Map 5 Biophysical Strategic Agricultural Land

Water

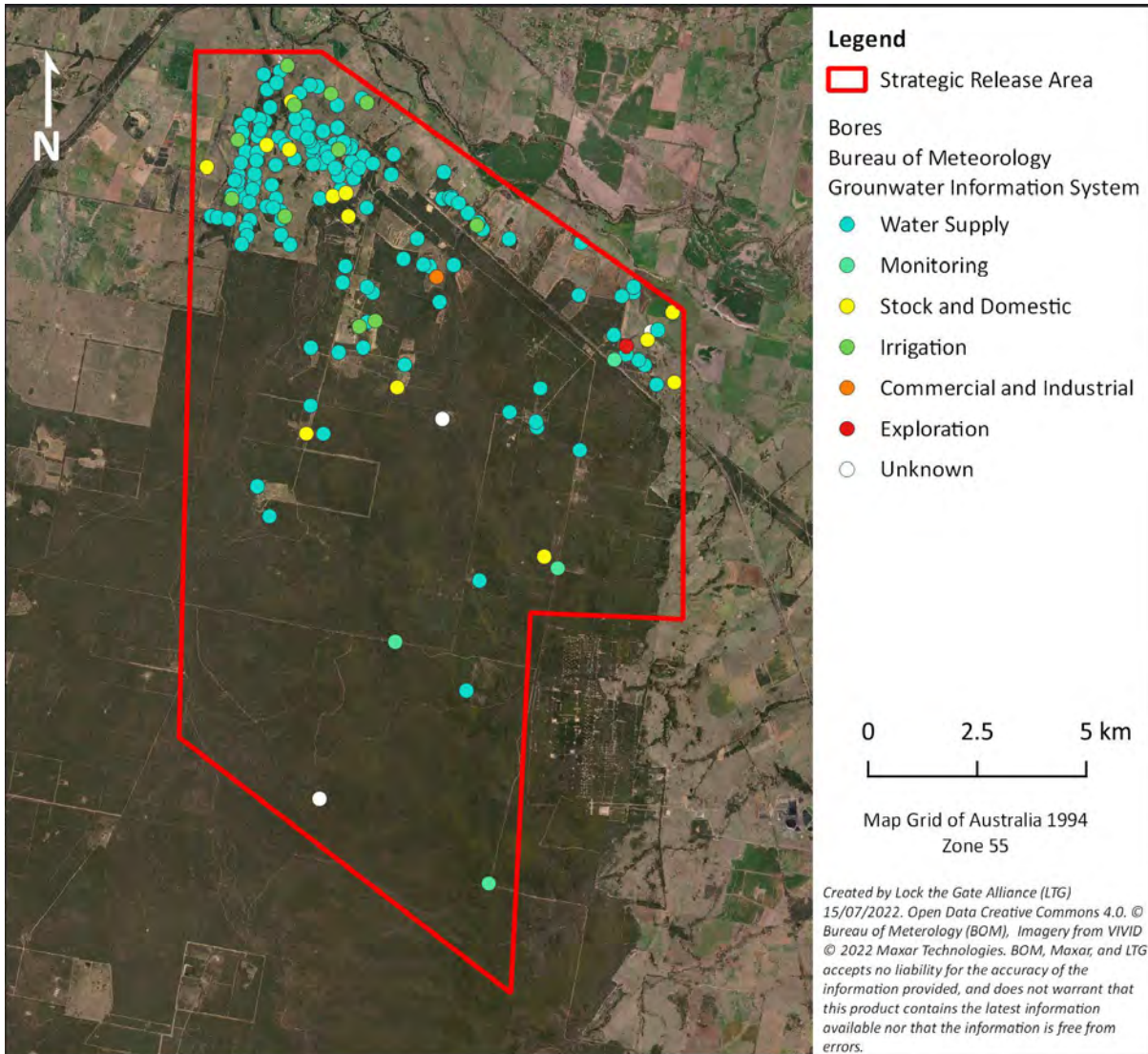
Bores

182 bores were identified using the Bureau of Meteorology Groundwater Information System. The majority of bores are for general water supply (Map 6). The number of bores by purpose are as follows:

- Water Supply: 146
- Irrigation: 11
- Stock and Domestic: 13
- Commercial and Industrial: 1
- Monitoring: 4

- Exploration: 1
- Unknown: 6

There is a high density of water bores closer to Narrabri in the north eastern section of the GNSR area. This is a relatively densely populated area that has no municipal water supplies, thus residents rely on bores for their water needs.



Map 6 Bores recorded in the Bureau of Meteorology Groundwater Information System within the Gorman North Strategic Release

Groundwater Productivity

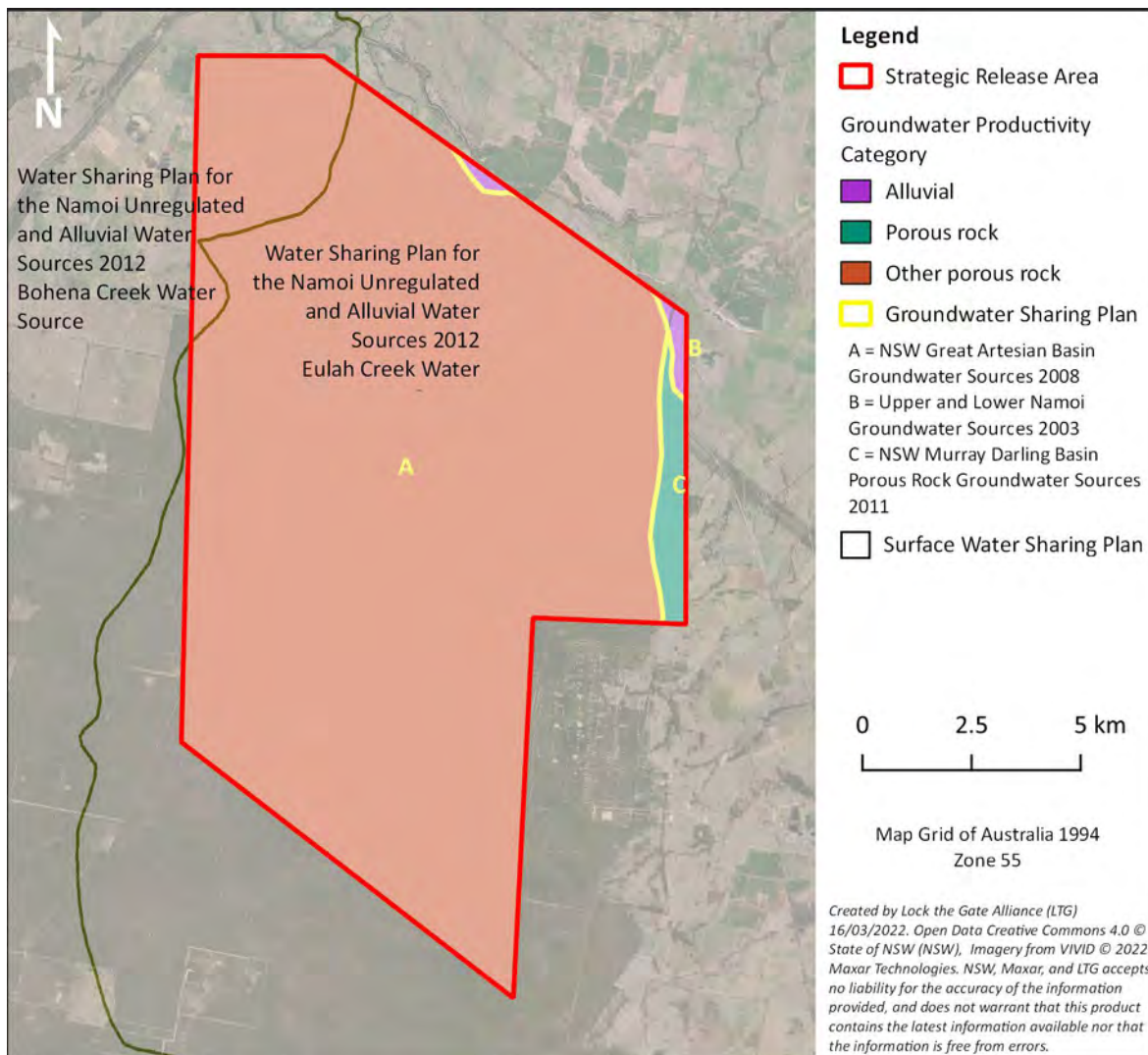
Groundwater Productivity in NSW - 2013 was sourced from the Department of Primary Industries (Office of Water).⁴

⁴ <https://datasets.seed.nsw.gov.au/dataset/highly-productive-groundwater-in-nsw>

Map 7 displays groundwater by category (alluvial, porous rock, fractured rock), the groundwater by surface water sharing plan areas, and the groundwater by groundwater water sharing plan areas, in the GNSR.

There are 120.9 hectares of the GNSR mapped as highly productive alluvial areas by the groundwater productivity layer. The majority of the area is highly productive 'other porous rock'.

For surface water, the *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012* relates to the GNSR area, for both the Eulah Creek Water Source and Bohena Creek Water Source. Statistics could not be calculated for surface water sharing plan area as the data was only available in WMS format.



Map 7 Groundwater by categories, the groundwater by surface water sharing plan areas, and the groundwater by groundwater water sharing plan areas, in the GNSR.

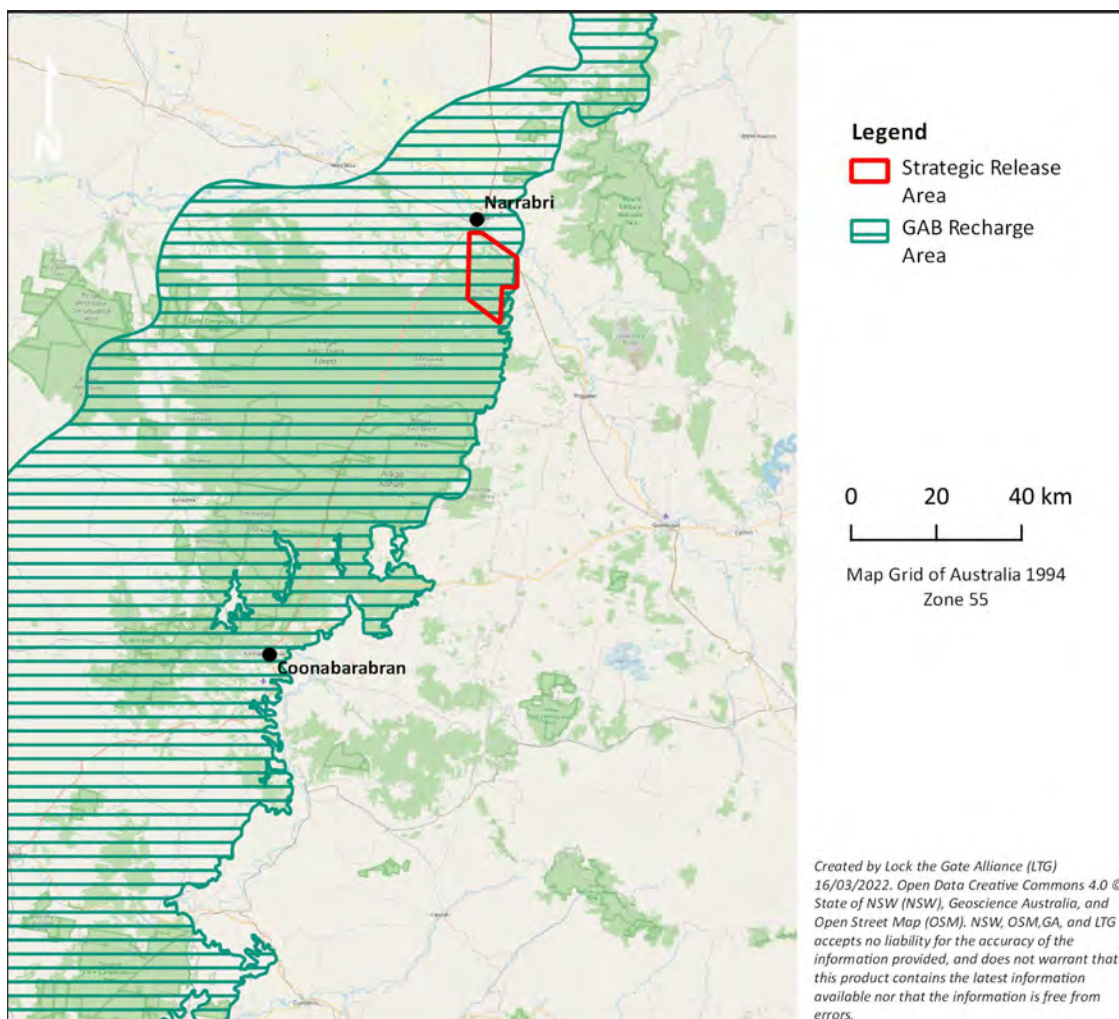
The *NSW Great Artesian Basin Groundwater Sources 2008* plan covers the majority of the area (Map 7). The Great Artesian Basin (GAB), which extends across 22% of the Australian continent, contains the equivalent of 115 658 Sydney Harbours of ancient groundwater⁵.

⁵ <http://www.abwua.com.au/-Research/ArtMID/3343/ArticleID/531068/Great-Artesian-Basin-Recharge-Systems-and-Extent-Of-petroleum-and-Gas-Leases>

The GNSR is situated within an area that is recognised as part of a recharge zone of the GAB. A report prepared for The Artesian Bore Water Users Association (ABWUA) found that within NSW the main occurrence of recharge >30 mm is in the east Pilliga between Coonabarabran and Narrabri, in which the GNSR is situated (Map 8)⁶.

Water from the GAB water resource is released under pressure to the surface, by groundwater captured in these recharge areas, out through natural springs and artesian bores across its extent. Dewatering of aquifers associated with the GAB has the potential to impact water flowing to the surface, including through bores across the basin⁷.

Large areas have been approved for coal and CSG exploration and production licenses in GAB recharge zones in north-west NSW, despite the likely cumulative impact of these activities on groundwater resources and artesian pressure not being well understood⁸.



Map 8 Great Artesian Basin (GAB) recharge areas. GAB recharge data retrieved from Geoscience Australia <https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/75842>

⁶ see footnote 8

⁷ <http://www.abwua.com.au/-Research/ArtMID/3343/ArticleID/531068/Great-Artesian-Basin-Recharge-Systems-and-Extent-Of-petroleum-and-Gas-Leases>

⁸ see footnote 8

Streams

The GNSR falls within the Namoi River catchment, a major perennial river that is part of the Barwon catchment of the Murray–Darling basin. Three major creeks from within the GNSR flow south into the Namoi River which is located just north of the GNSR. These streams from west to east are - Jacks Creek, Sandy Creek and Pine Creek (Map 9).

There are a total of 35.2km of channel streams identified from the River Styles Spatial Layer for New South Wales⁹. 14.2km of the streams are in good condition (Table 2), and 19.3km of the streams have a high amount of fragility (Table 3).

The condition of the Jacks Creek tributary of the Namoi River, approximately 100m in the GNSR, has a 'poor' condition rating. The creek then changes to a 'good' condition rating for approximately 3km, before degrading to moderate condition as it enters the State Forest. Sandy Creek has a good condition rating for 3.9km on coming into the GNSR from the north, with the remaining 8.1km in moderate condition as it enters native vegetation. Pine Creek coming into the GNSR in the south east of the GNSR is rated as being in good condition. Both Sandy Creek and Pine Creek are rated as highly fragile throughout the GNSR, and Jack's Creek is considered highly fragile outside the State Forest and in areas where native vegetation has been cleared or modified (Map 5).

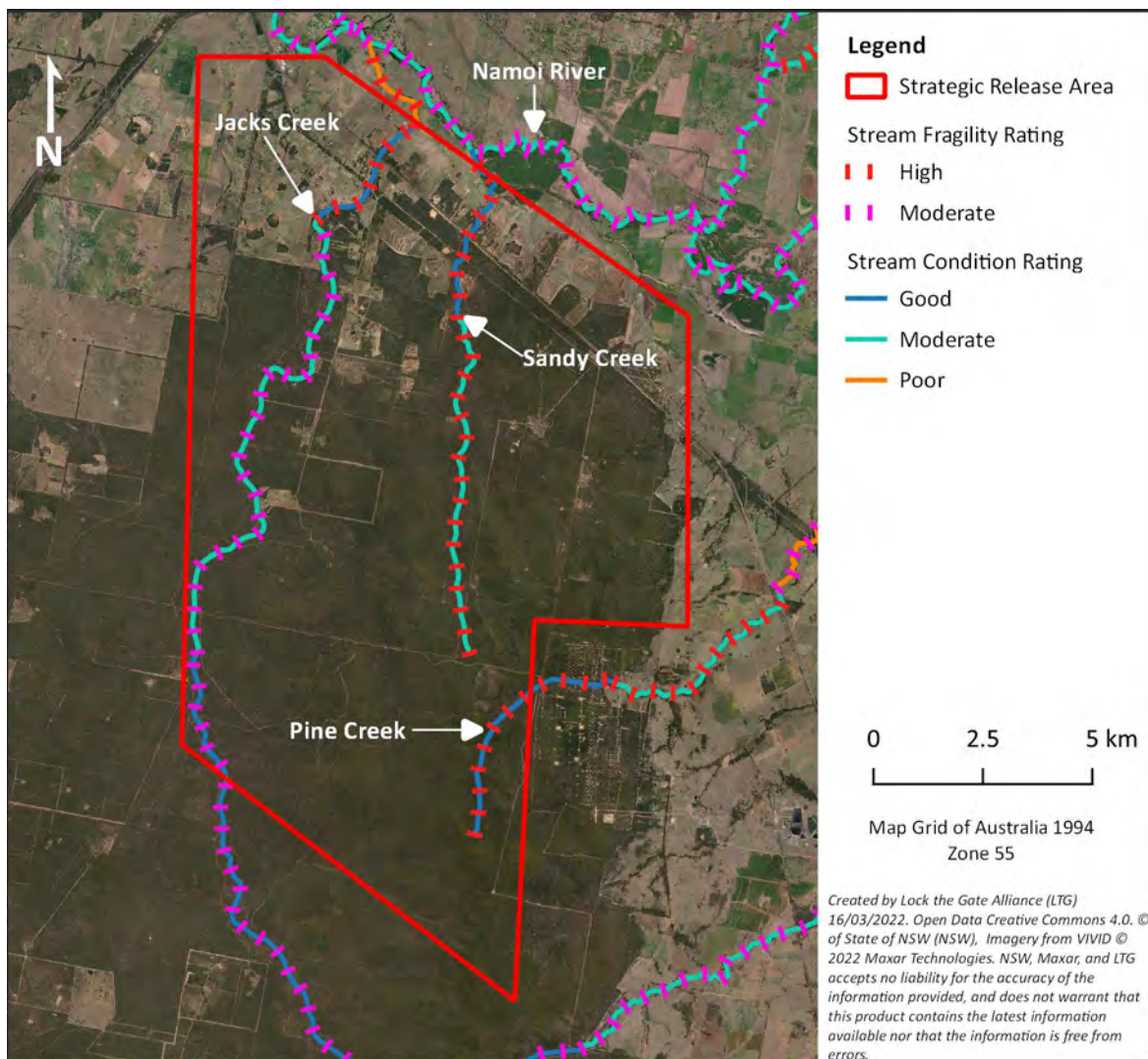
Table 2 Length of stream channel condition rating based on the NSW River Styles Spatial Layer for New South Wales

Stream Condition Rating	Length (km)
Poor	0.1
Moderate	20.9
Good	14.2

Table 3 Length of stream channel fragility rating based on the NSW River Styles Spatial Layer for New South Wales

Stream Fragility Rating	Length (km)
Moderate	15.9
High	19.3

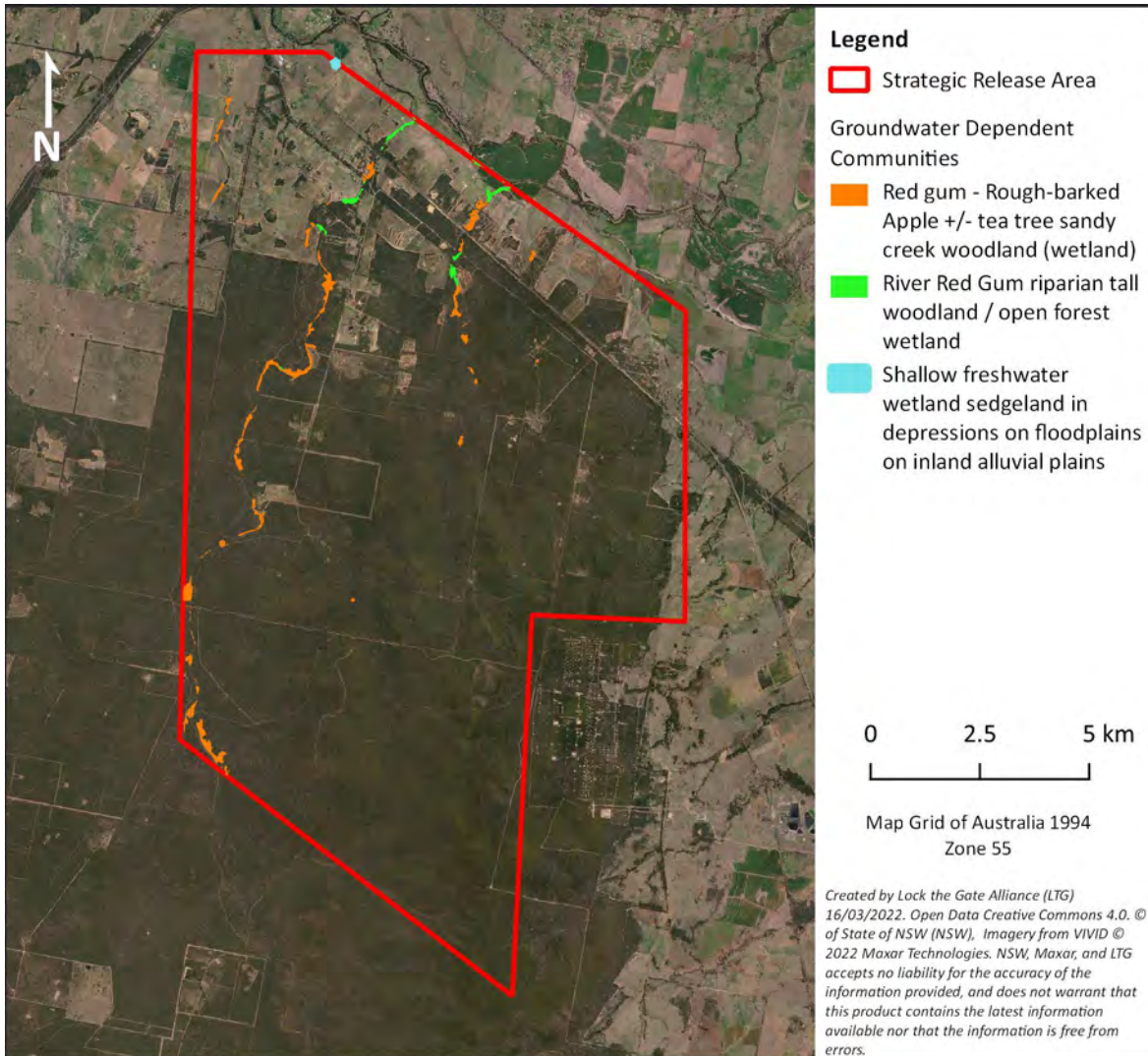
⁹ <https://data.gov.au/data/dataset/06fb694b-d2f1-4338-ab65-a707c02f11d7>



Map 9 River Styles Spatial Layer for New South Wales with condition and fragility rating
<https://data.gov.au/data/dataset/06fb694b-d2f1-4338-ab65-a707c02f11d7>

Groundwater Dependent Ecosystems

NSW Groundwater Dependent Ecosystems (GDE) have been identified using the High Ecological Value Aquatic Ecosystems (HEVAE) framework developed by the Australian Commonwealth Government. Three GDE's were found in the GNSR, covering 160.5 ha of this area (Map 10). The GDE described as *Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains* is a very small patch on a rural property on the northern boundary of the GNSR, and is likely to be already modified. *Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland)* GDE class has the greatest occurrence mostly along Jacks Creek and Sandy Creek, as well as small patches of *Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland)* closer to where the creeks branch off from the Namoi River in the north.



Map 10 NSW Groundwater Dependent Ecosystems (GDE) identified using the High Ecological Value Aquatic Ecosystems (HEVAE) framework developed by the Australian Commonwealth Government
<https://datasets.seed.nsw.gov.au/dataset/hevae-vegetation-groundwater-dependent-ecosystems-border-rivers-gwydir>

Table 4 Area of each groundwater dependent ecosystem class found with the GNSR

GDE Class within the GNSR	Area (ha)
<i>Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland)</i>	132.8
<i>Rough-barked Apple +/- tea tree sandy creek woodland (wetland)</i>	27.4
<i>Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains</i>	.3

Biodiversity

Vegetation extent

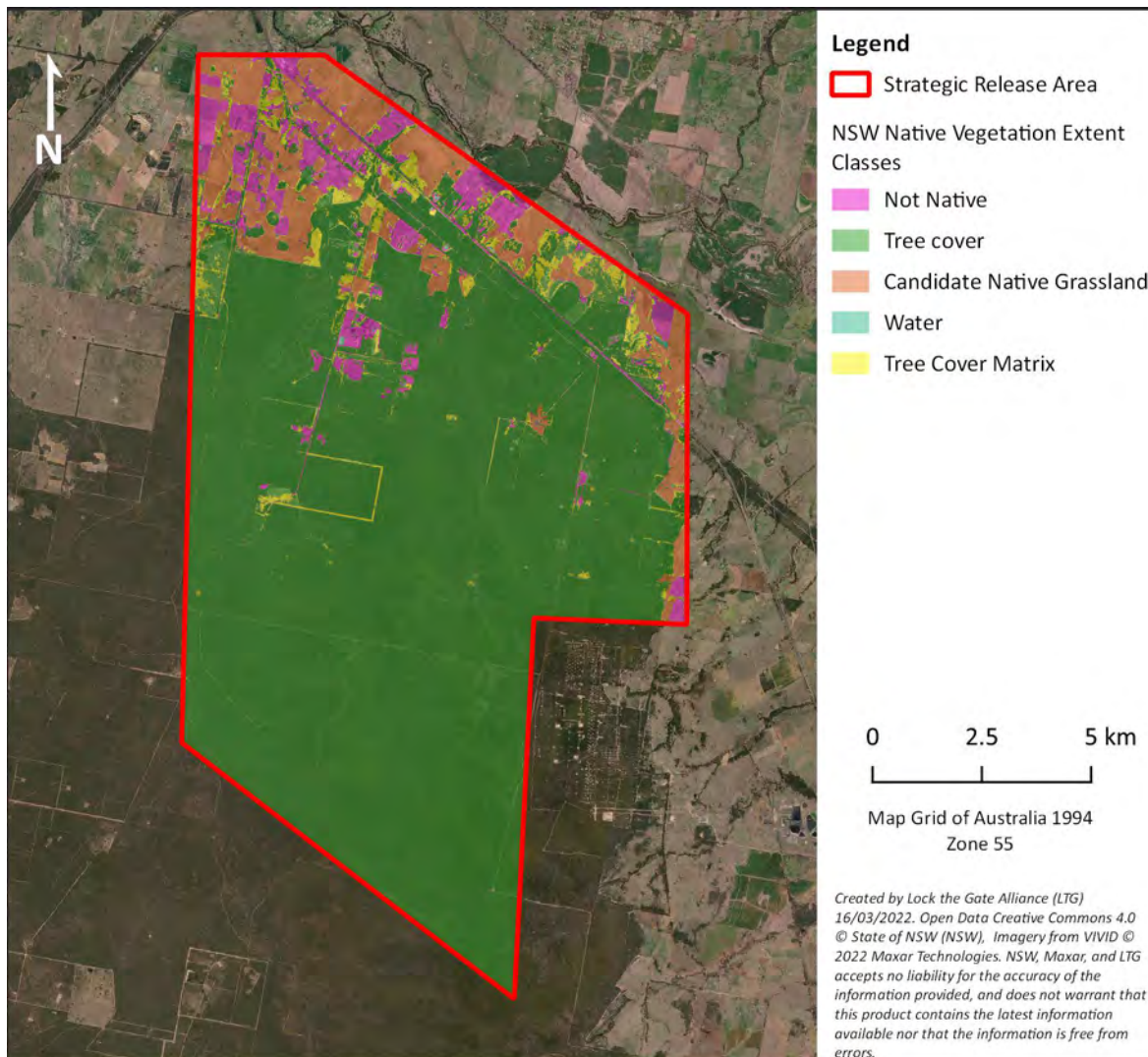
The NSW Native Vegetation Extent 5m Raster v1.2¹⁰ developed under the State Vegetation Type Map program combines the best available information on vegetation extent for NSW classified into 5 types - Not Native, Tree Cover, Candidate Native Grasslands, Forestry Plantations, Water.

The data was vectorised for the analysis, and it was calculated there is 13,502.5 ha of native woody tree cover, which is 80% of the GNSR, as well as 1,557.8 Ha identified as Candidate Native Grasslands (Table 5). 976.8 ha is considered not native. No forestry plantations were identified from this data. Map 11 shows the distribution of the vegetation extent types within the GNSR.

Table 5 NSW Native Vegetation Extent Classes and area calculations

<i>Pixel Value</i>	<i>Type</i>	<i>Description</i>	<i>Area Hectares</i>
0	Not Native	Not Native Vegetation	976.77
1	Tree Cover	Trees > 2m in height	13,502.45
2	Candidate Native Grasslands	Potential native grassland visually assessed from a single data 50cm aerial image	1,557.79
3	Forestry Plantations	Softwood plantations	0
4	Water	All water bodies	24.29
5	Tree Cover Matrix	Not woody pixels between native woodland trees.	660.22

¹⁰ <https://datasets.seed.nsw.gov.au/dataset/nsw-native-vegetation-extent-5m-raster-v1-0>



Map 11 Distribution of NSW Native Vegetation Extent 5m Raster v1.2 types
<https://datasets.seed.nsw.gov.au/dataset/nsw-native-vegetation-extent-5m-raster-v1-0>

Vegetation communities

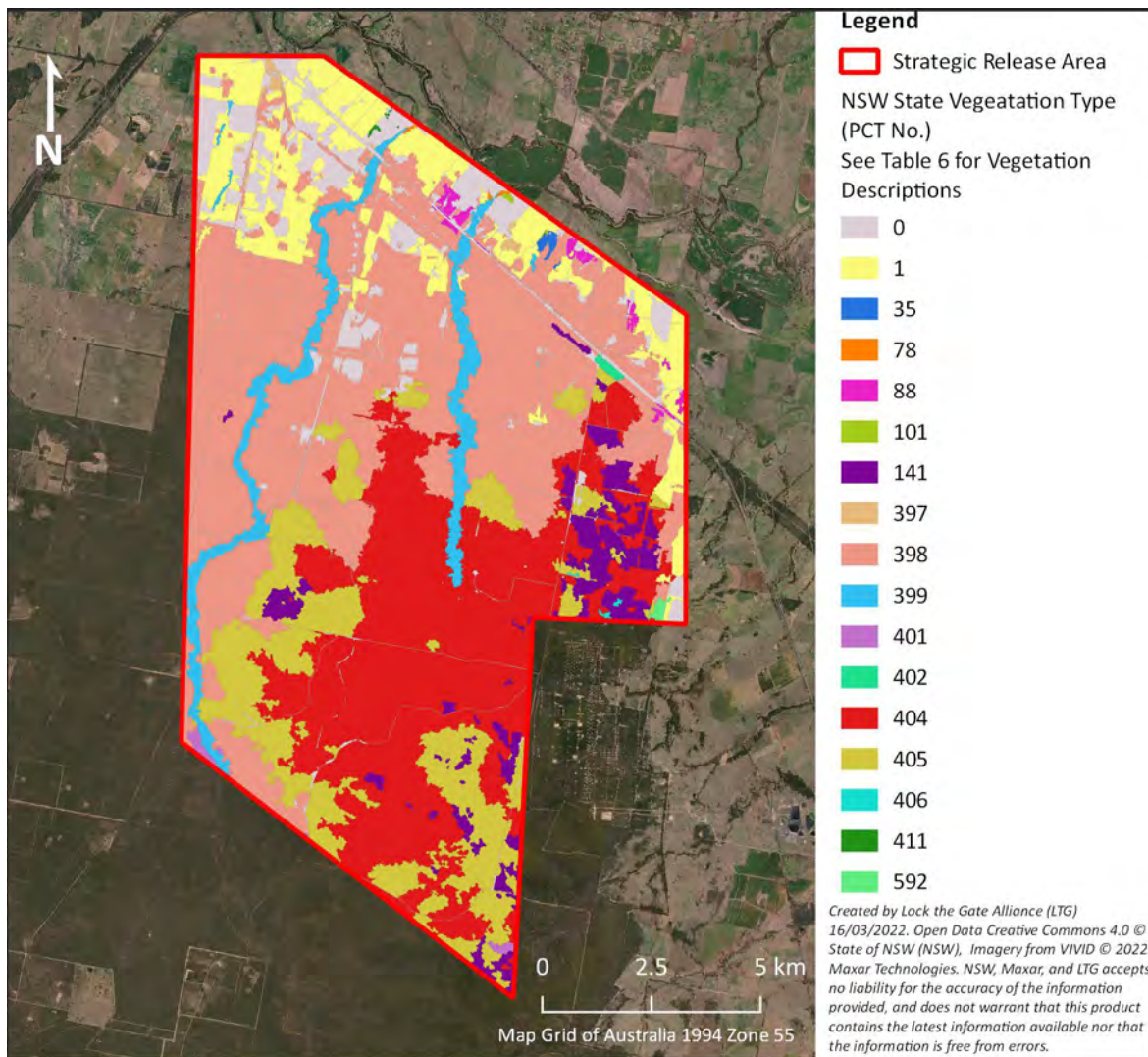
Vegetation was sourced from the NSW Office of Environment and Heritage (OEH): State Vegetation Type Map: Border Rivers Gwydir / Namoi Region Version 2.0. VIS_ID 4467 400MB¹¹. This data includes Plant Community Types (PCT), the master community-level typology used in NSW planning and assessment tools and vegetation mapping and management programs (Table 6 and Map 12).

NSW BioNet systems associates the PCT with threatened ecological communities (TEC), and the BioNet Vegetation Classification system was used to identify these (Table 7 and Map 13).

Including candidate native grasslands, 16 native vegetation communities were identified in the GNSR, with four being associated with threatened ecological communities (TEC). The area is dominated by *Western Slopes Dry Sclerophyll Forests*. *Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest in the Brigalow Belt South Bioregion and Nandewar Bioregion* dominating the central area of the GNSR to western boundary, and *Red Ironbark - White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests* in the south east of the GNSR (Map 12).

¹¹ https://datasets.seed.nsw.gov.au/dataset/border-rivers-gwydir-namoi-regional-native-vegetation-map-version-2-0-vis_id-420443dc7

There are four TEC within the GNSR, covering 0.8% of the region. TEC are in small patches mainly in the north of the GNSR on rural properties where some vegetation has been modified, and with some small patches of *Rough-barked Apple - red gum - cypress pine woodland on sandy flats* in the forested areas in the south of the GNSR (Map 13).

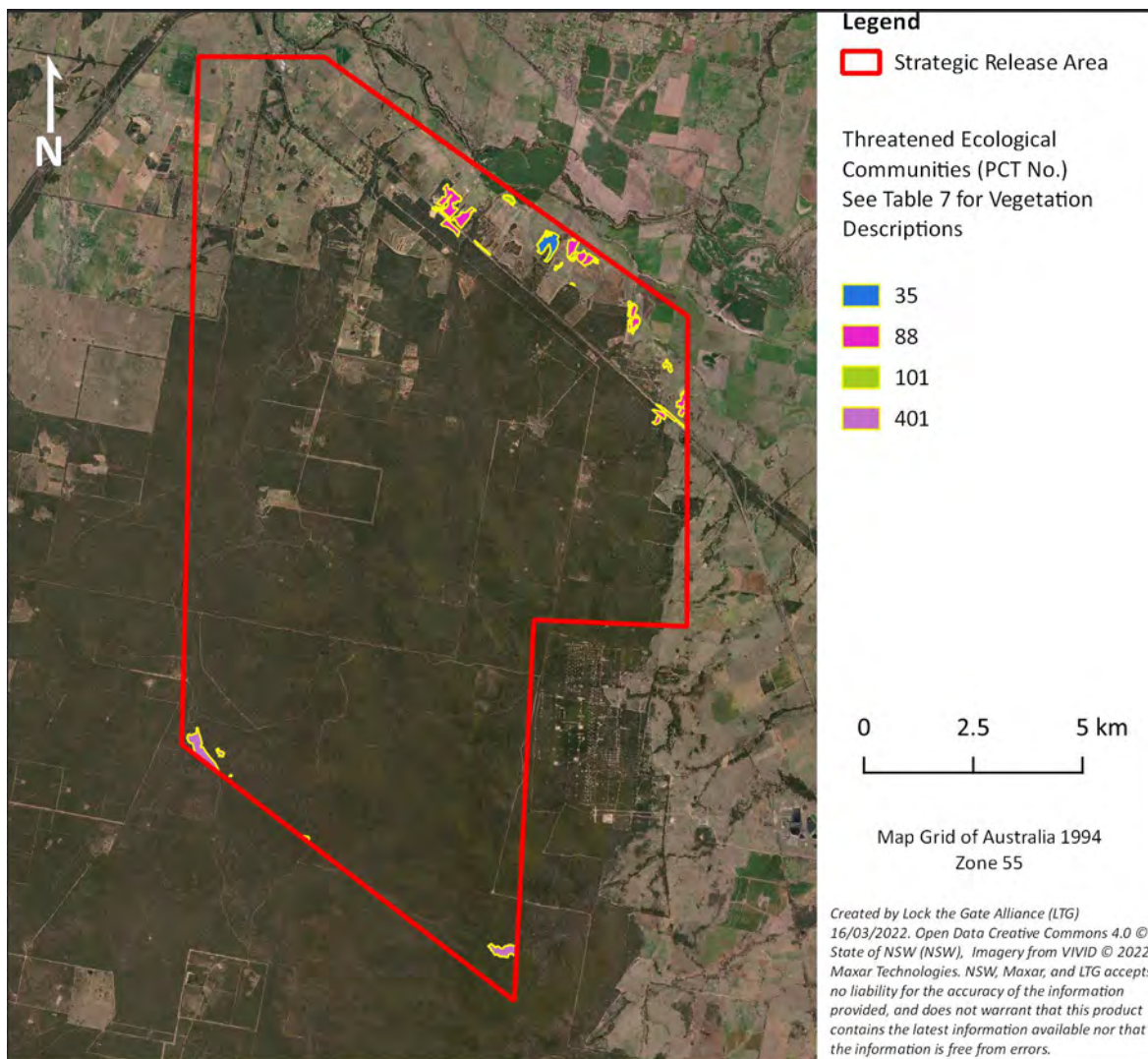


Map 12 Distribution of NSW State Vegetation Types within GNSR

Table 6 NSW State Vegetation Types within GNSR

Class	PCT Name	PCT ID	Hectares in GNSR
Western Slopes Dry Sclerophyll Forests	Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion	398	5885
Western Slopes Dry Sclerophyll Forests	Red Ironbark - White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests	404	4306
Western Slopes Dry Sclerophyll Forests	White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions	405	2086
Candidate Native Grasslands	Candidate Native Grasslands	1	1582
Non-Native	Non-Native	0	1284
Pilliga Outwash Dry Sclerophyll Forests	Broombush - wattle very tall shrubland of the Pilliga to Goonoo regions, Brigalow Belt South Bioregion	141	682
Western Slopes Dry Sclerophyll Forests	Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion	399	658
Pilliga Outwash Dry Sclerophyll Forests	Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion	88	81
Pilliga Outwash Dry Sclerophyll Forests	Poplar Box - White Cypress Pine shrub grass tall woodland of the Pilliga - Warialda region, Brigalow Belt South Bioregion	397	51

Western Slopes Dry Sclerophyll Forests	Rough-barked Apple -red gum - cypress pine woodland on sandy flats, mainly in the Pilliga Scrub region	401	36
Brigalow Clay Plain Woodlands	Brigalow - Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	35	17
Western Slopes Dry Sclerophyll Forests	Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest in the Brigalow Belt South Bioregion and Nandewar Bioregion	592	15
Western Slopes Dry Sclerophyll Forests	Mugga Ironbark - White Cypress Pine - gum tall woodland on flats in the Pilliga forests and surrounding regions, Brigalow Belt South Bioregion	402	15
Inland Riverine Forests	River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	78	8
Western Slopes Dry Sclerophyll Forests	White Bloodwood - Motherumbah - Red Ironbark shrubby sandstone hill woodland / open forest mainly in east Pilliga forests	406	6
Pilliga Outwash Dry Sclerophyll Forests	Buloke - White Cypress Pine woodland on outwash plains in the Pilliga Scrub and Narrabri regions, Brigalow Belt South Bioregion	411	5
Brigalow Clay Plain Woodlands	Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	101	4



Map 13 Distribution of National and NSW State Threatened Ecological communities within GNSR

Table 7 National and NSW State Threatened Ecological Community Association within GNSR

PCT Name	PCT ID	Hectares	Legislation	Associated Threatened Ecological Community
Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion	88	81	EPBC Act	Poplar Box Grassy Woodland on Alluvial

Rough-barked Apple -red gum - cypress pine woodland on sandy flats, mainly in the Pilliga Scrub region	401	36	<i>BC Act and EPBC Act</i>	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner
Brigalow - Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	35	17	<i>BC Act and EPBC Act</i>	Artesian Springs Ecological Community in the Great Artesian Basin Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions
Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	101	4	<i>BC Act and EPBC Act</i>	Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South

Native Protected and Threatened Species

Species data was sourced from the NSW Department of Planning, Industry and Environment BioNet Species database.

Map 14 and Table 9 displays native flora records, and Map 15 and Tables 10-13 and List 2 display fauna records from BioNet, in the GNSR. A total of 445 native species were identified in the GNSR, 14 of which are threatened species under the NSW *Biodiversity Conservation Act 2016 (BC Act 2016)*.

Appendix 2 contains a complete listing of native species in the GNSR. Table 8 provides a summary of the number of threatened and protected flora and fauna species (Retrieved 13/07/2022) with BioNet records in the GNSR, according to conservation status.

Note: Extensive areas in the GNSR are absent of BioNet records indicating they have not been surveyed. BioNet data is heavily dependent on surveys to identify species, so absence of information doesn't mean that native species are not present: it may instead reflect a lack of survey effort. For more information about the database refer to:

<https://www.environment.nsw.gov.au/wildlifeatlas/about.htm>

NSW *Biodiversity Conservation Act 2016 (BC Act 2016)* Status codes are as follows:

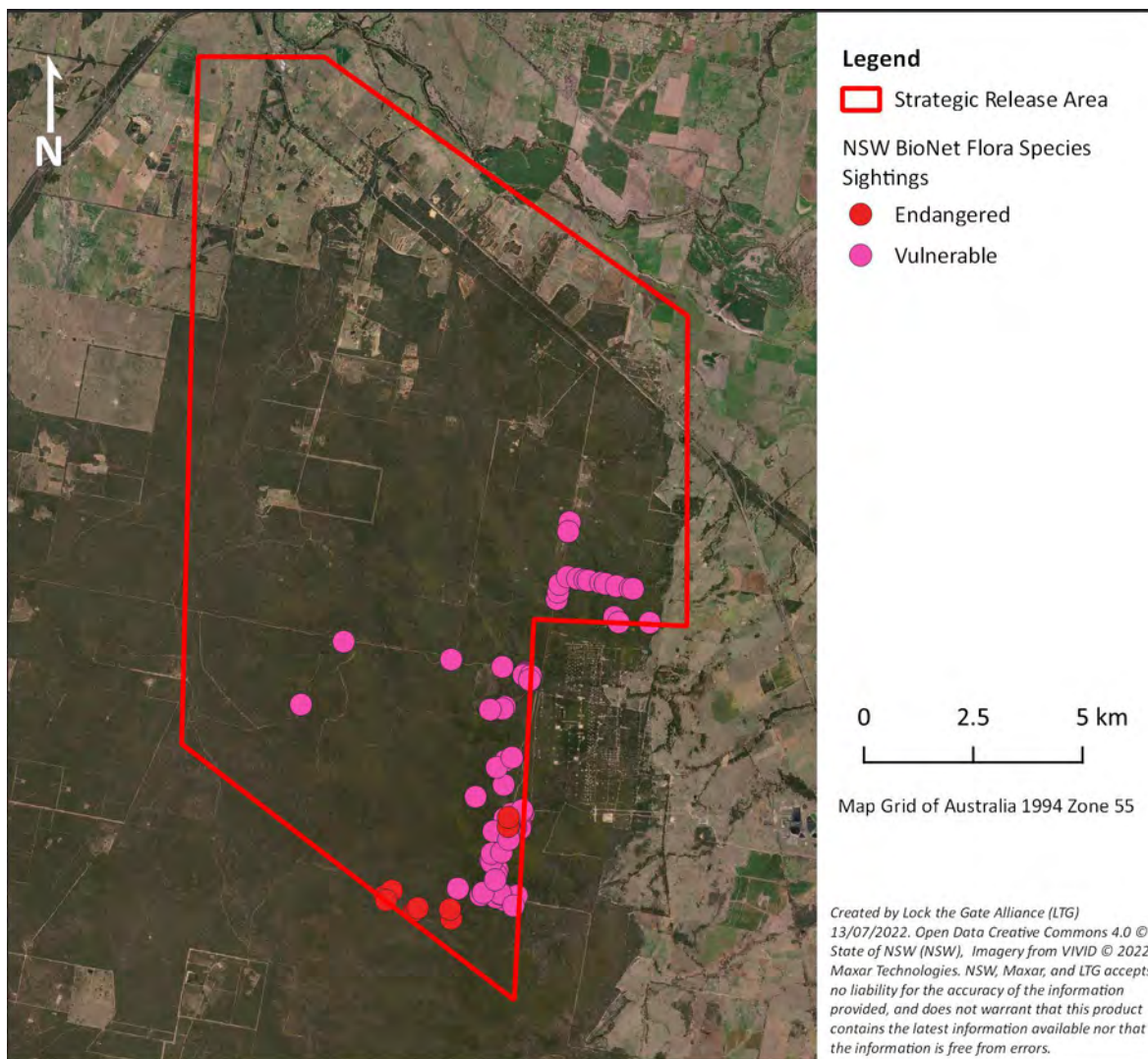
P= Protected	V=Vulnerable	FEP=Endangered Population of Fish
P13=Protected Native Plants	FCE=Critically Endangered Fish Species	FKTP=Key Threatening Process of Fish
E1=Endangered	FE=Endangered Fish Species	2=Category 2 sensitive species
E2=Endangered Population	FP= Protected Fish Species	3= Category 3 sensitive species
E4=Extinct	FV=Vulnerable Fish Species	
E4A=Critically Endangered Species	FX=Extinct Fish	

Table 8 Summary of the number of native flora and fauna species (Retrieved 13/07/2022) with BioNet records in the GNSR, according to conservation status. Full list of records in Appendix 2.

Kingdom	<i>BC Act 2016</i>	Number of Protected Native Species and Threatened Species with BioNet records
Flora	E1	1
Flora	V	1
Fauna	E1	3
Fauna	V	9

Flora

In total there were 1152 records of native flora retrieved from the BioNet database, 283 species were identified. 2 flora species are threatened under the *NSW BC Act 2016*, *Bertya opposens* is Vulnerable with 92 records, and *Pomaderris queenslandica* is Endangered with 10 records.



Map 14 Threatened flora species sightings from NSW BioNet (Retrieved 13/07/2022) within the GSNR. Full list of records in Appendix 2

Table 9 Summary of threatened flora records from NSW BioNet (Retrieved 13/07/2022) within the GSNR. Full list of records in Appendix 2.

Flora species	NSW Status	Commonwealth Status	Count
<i>Pomaderris queenslandica</i>	E1		10
<i>Bertya opponens</i>	V	V	92

Fauna

In total there were 2789 records of native fauna retrieved from the BioNet database (Map 15). 162 species were identified: 116 birds ; 19 amphibians; 18 mammals ; and 9 reptiles (Appendix 2). This

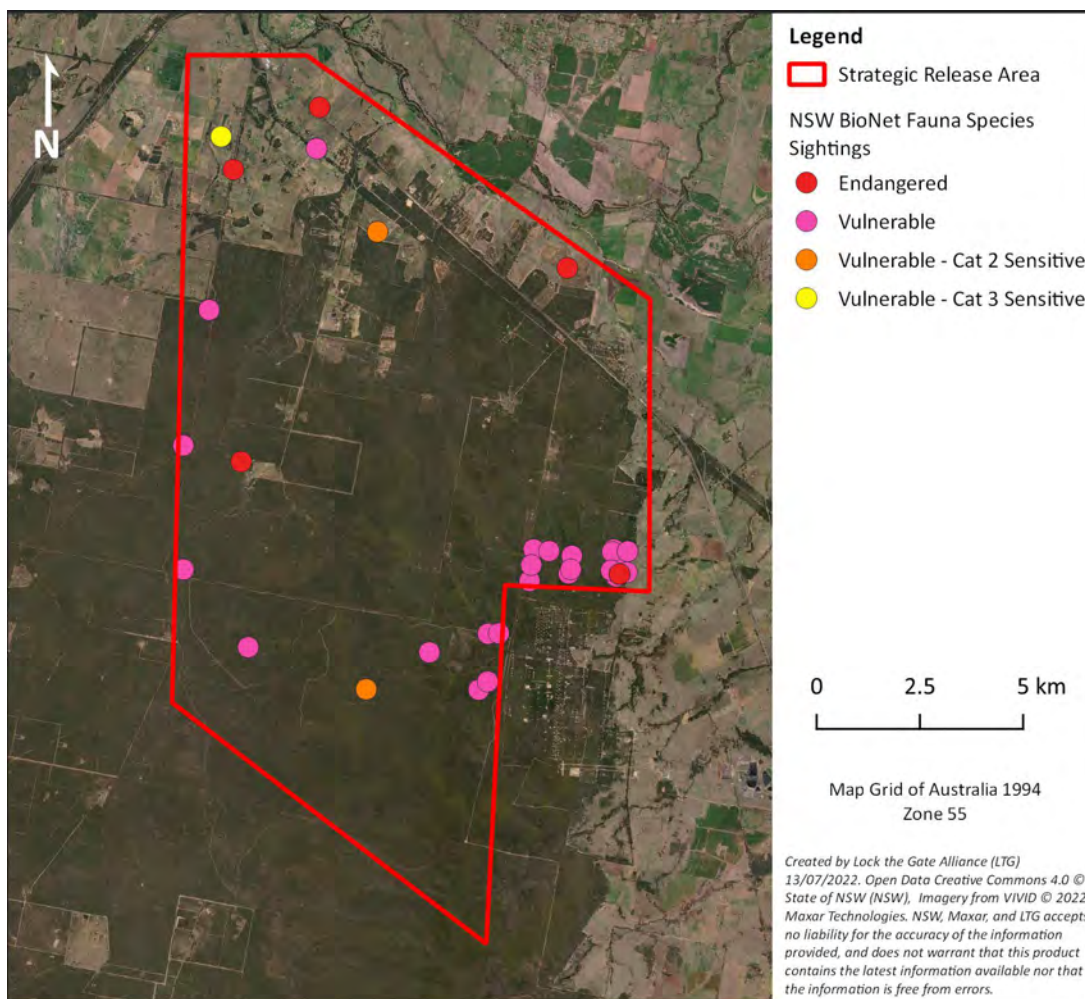
includes 12 threatened species under the *NSW Biodiversity Conservation Act* - 3 endangered and 9 vulnerable.

Endangered species include the Koala, Black-striped Wallaby and Five-clawed Worm-skink.

There are also 9 fauna species with vulnerable status under the *NSW BC Act*, 7 bird and 2 mammal species, that have been sighted in the GNSR area. The full list of vulnerable species includes:

- Squirrel Glider
- Yellow-bellied Sheathtail Bat
- Grey-crowned Babbler (eastern subspecies)
- Speckled Warbler
- Varied Sittella
- Dusky Woodswallow
- Little Lorikeet
- Glossy Black-Cockatoo
- Superb Parrot

The Superb Parrot is also listed as Vulnerable under the *EPBC Act*. The White-throated Needletail has also been sighted in the GNSR, which is listed as vulnerable and migratory under the *EPBC Act*.



Map 15 Threatened Fauna sightings from NSW BioNet (Retrieved 13/07/2022) within the GNSR. Full list of records in Appendix 2.

APPENDIX 1 Tertiary and Secondary Landuse in Gorman North Strategic Release Area

Secondary	Tertiary	Area (ha)
2.1.0 Grazing native vegetation	2.1.0 Grazing native vegetation	9580.6
2.2.0 Production native forestry	2.2.0 Production native forests	5253.5
5.4.0 Residential and farm infrastructure	5.4.0 Residential and farm infrastructure	892.9
3.2.0 Grazing modified pastures	3.2.0 Grazing modified pastures	583.6
3.3.0 Cropping	3.3.0 Cropping	322.6
5.2.0 Intensive animal production	5.2.5 Aquaculture	45
5.7.0 Transport and communication	5.7.2 Roads	26.1
5.5.0 Services	5.5.1 Commercial services	10.7
5.8.0 Mining	5.8.0 Mining	5.3
6.2.0 Reservoir/dam	6.2.0 Reservoir/dam	1.2
5.6.0 Utilities	5.6.6 Gas treatment, storage and transmission	0.1

APPENDIX 2 Native Flora and Fauna

Native species data was sourced from the NSW Department of Planning, Industry and Environment BioNet Species database.

For more information about the database refer to:

<https://www.environment.nsw.gov.au/wildlifeatlas/about.htm>

NSW Biodiversity Conservation Act 2016 (BC Act 2016) Status codes are as follows:

P= Protected

P13=Protected Native Plants

E1=Endangered

E2=Endangered Population

E4=Extinct

E4A=Critically Endangered Species

V=Vulnerable

FCE=Critically Endangered Fish Species

FE=Endangered Fish Species

FP= Protected Fish Species

FV=Vulnerable Fish Species

FX=Extinct Fish

FEP=Endangered Population of Fish

FKTP=Key Threatening Process of Fish

2=Category 2 sensitive species

3= Category 3 sensitive species