

Appendix 1. Mapping of Wimmera biodiversity assets, agricultural natural capital assets and susceptibility to natural disasters and emergency events

Mapping of the locations of the Wimmera's biodiversity assets, agricultural natural capital assets and susceptibility to natural disasters and emergency events like flood and fire are key pieces of information informing where preparedness, response and recovery actions should occur.

Biodiversity assets

Threatened species

This Plan includes maps showing where priority Wimmera threatened species have been observed and recorded based on records in the Victorian Biodiversity Atlas (VBA).

VBA threatened species records included in this Plan are based on the most recent version of VBA data available when the maps were developed, dated 23 December 2023.

A small number of threatened species maps include locations where Wimmera CMA and stakeholders have recorded species, but records are not yet available in the VBA. Stakeholders reported that they have submitted these records to the VBA and they are awaiting verification by DEECA administrators.

This data includes Swift Parrot records stored in Birdlife Australia's Birddata database, Australasian bittern sighting recorded by Wimmera CMA's Lake Hindmarsh bird monitoring project, and Eltham Copper Butterfly records provided by DEECA and the Wetland Revival Trust.

Maps included in this Plan provide an indication of species locations but will not remain current if new observations or species locations are recorded after this Plan is completed.

Organisations implementing this Plan and undertaking emergency preparedness, response and recovery activities can access and view VBA species locations, which are publicly available online:

- VBA: <https://www.environment.vic.gov.au/biodiversity/victorian-biodiversity-atlas>.
- DEECA's Naturekit Victoria mapping tool: <https://www.environment.vic.gov.au/biodiversity/naturekit>.

The data including shapefiles can be downloaded from: <https://www.data.vic.gov.au/>.

Further information is provided in the Monitoring and Data section of the Emergency Preparedness and Response Plan for Biodiversity and Agricultural Natural Capital Assets in the Wimmera region (Section 15).

Table 2 provides a guide to the figure number for each threatened ecological community mapped in this document.

Table 1. Threatened species maps.

Threatened species	Environment Protection and Biodiversity Conservation Act (1999) status	Figure number
South-eastern Red-tailed Black Cockatoo (<i>Calyptrorhynchus banksii graptogyne</i>)	Endangered	Figure 1
Malleefowl (<i>Leipoa ocellata</i>)	Vulnerable	Figure 2
Swift Parrot (<i>Lathamus discolor</i>)	Critically Endangered	Figure 3
Threatened Orchid Species (<i>Caladenia</i> , <i>Thelymitra</i> , <i>Prasophyllum</i> , <i>Pterosylis</i> , <i>Dipodium spp</i>)	Critically Endangered Endangered	Figure 4
Forked Spyridium (<i>Spyridium furculentum</i>)	Endangered	Figure 5
Avenue Cassinia (<i>Cassinia tegulata</i>)	Critically Endangered	Figure 6
Gariwerd and Surrounds – Threatened Species	Critically Endangered Endangered Vulnerable	Figure 7
Wimmera Nationally Threatened Grassland Species	Critically Endangered Endangered Vulnerable	Figure 8
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	Endangered	Figure 9
Eltham Copper Butterfly (<i>Paralucia pyrodiscus lucida</i>)	Endangered	Figure 10

Figure 1. Map of recorded observations of South-eastern Red-tailed Black Cockatoo (*Calyptorhynchus banksii graptogyne*) in the Wimmera region based on Victorian Biodiversity Atlas records.

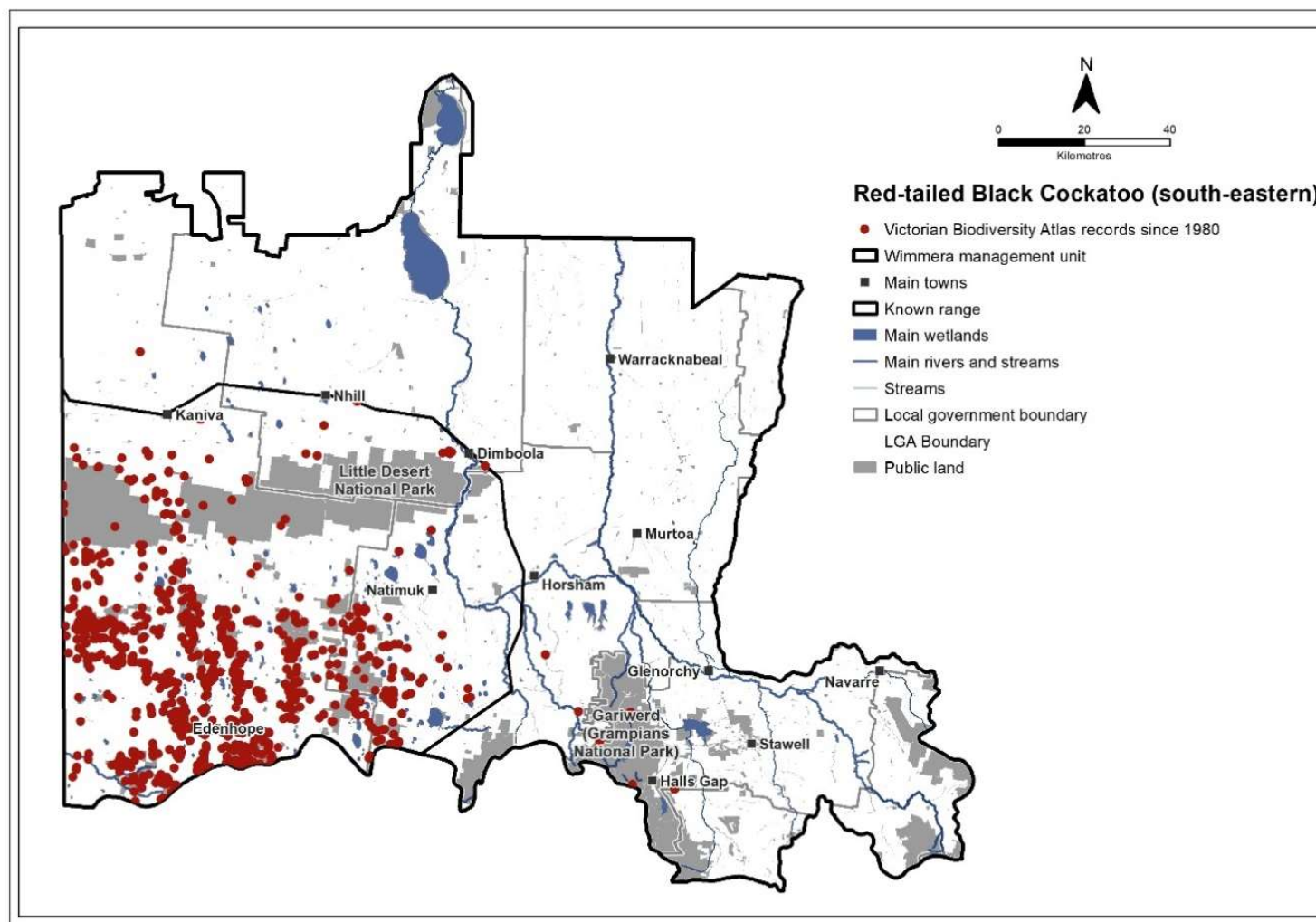


Figure 2. Map of recorded observations of Malleefowl (*Leipoa ocellata*) in the Wimmera region based on Victorian Biodiversity Atlas records, also showing Little Desert Reference Areas where use of machinery and fire retardant for fire suppression should not be carried out other than in extreme circumstances.

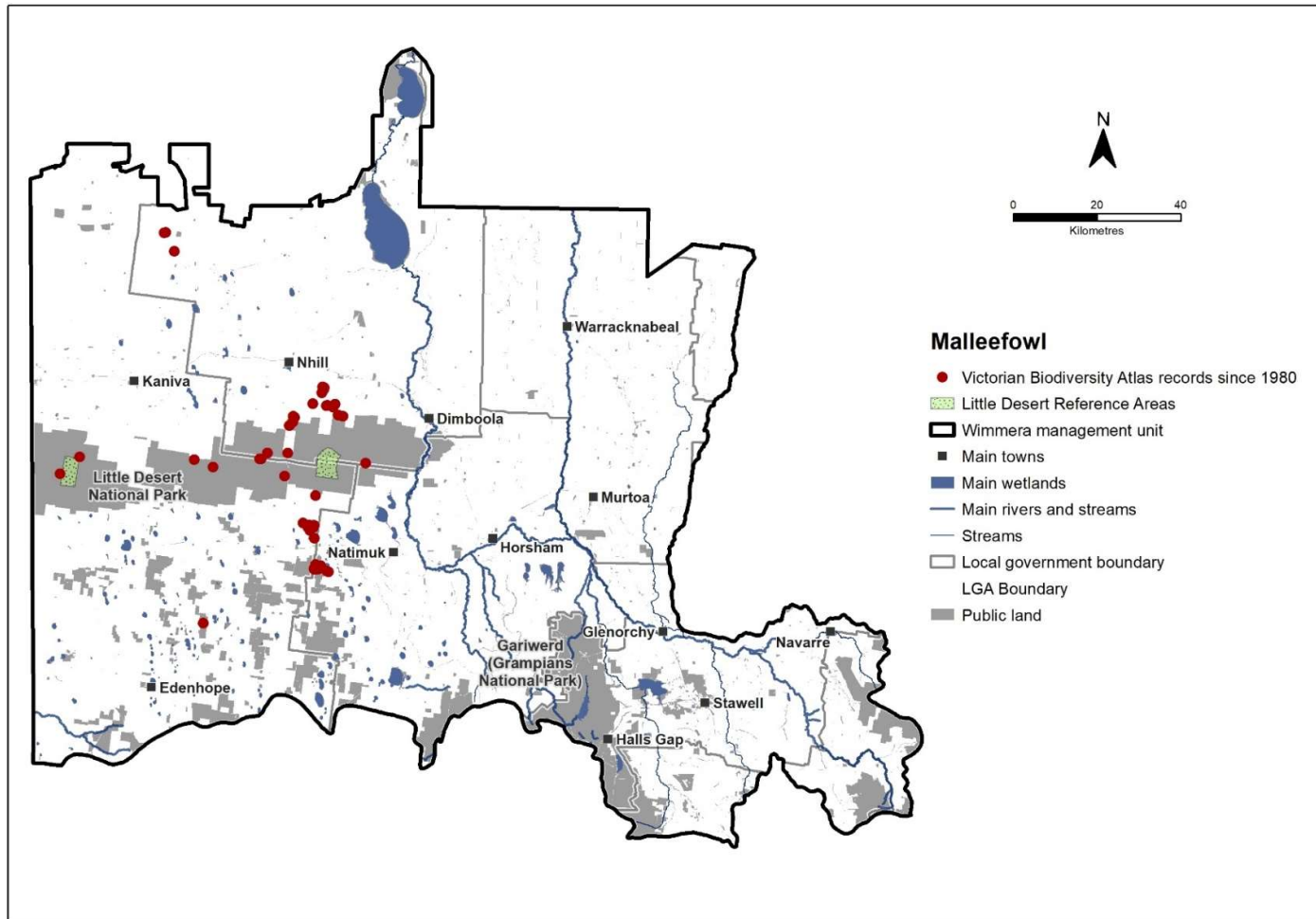


Figure 3. Map of recorded observations of Swift Parrot (*Lathamus discolor*) in the Wimmera region based on Victorian Biodiversity Atlas and Birdlife Australia's Birdata records (as at February 2024).

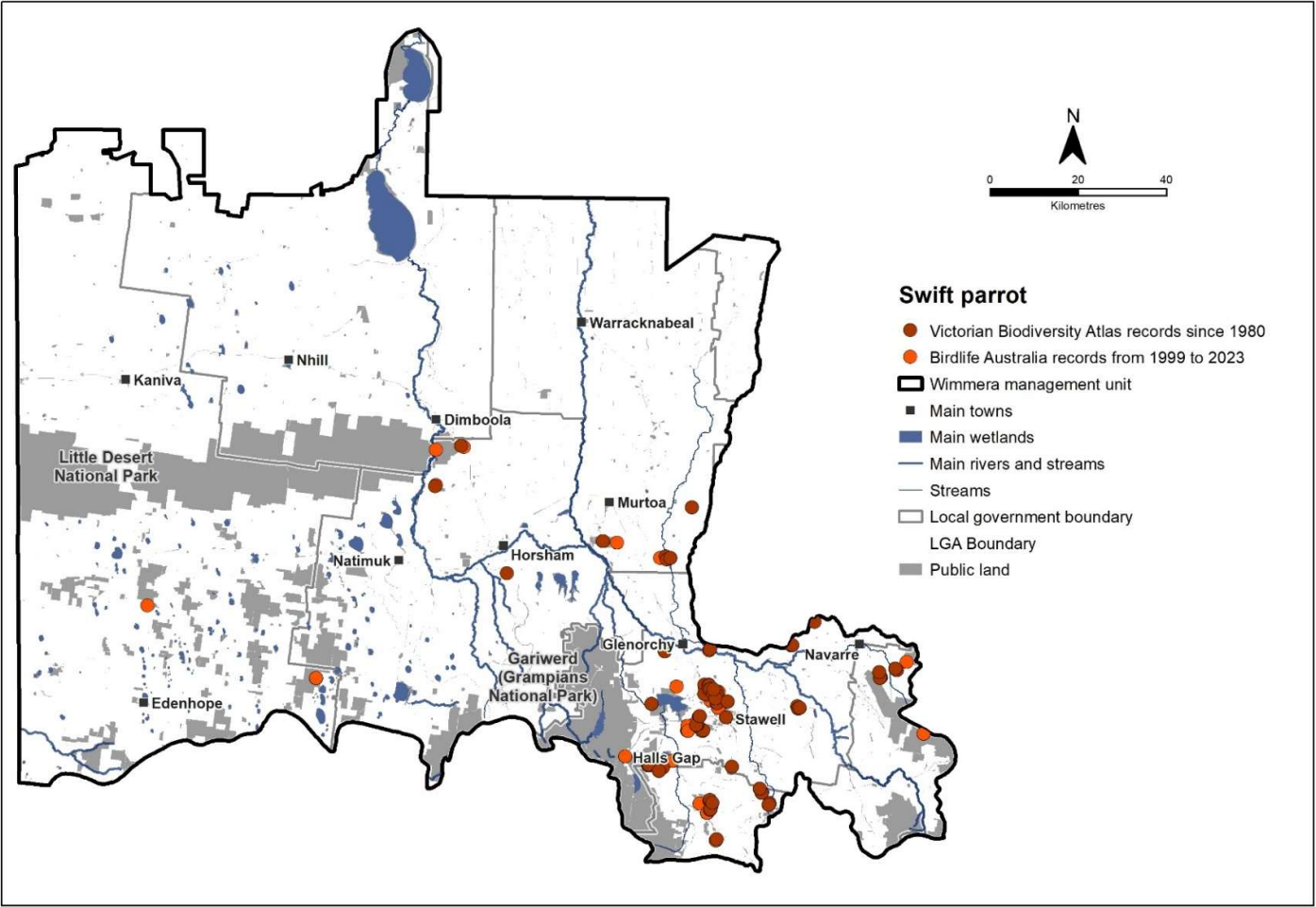


Figure 4. Map of recorded observations of nationally threatened orchid species in the Wimmera region based on Victorian Biodiversity Atlas records.

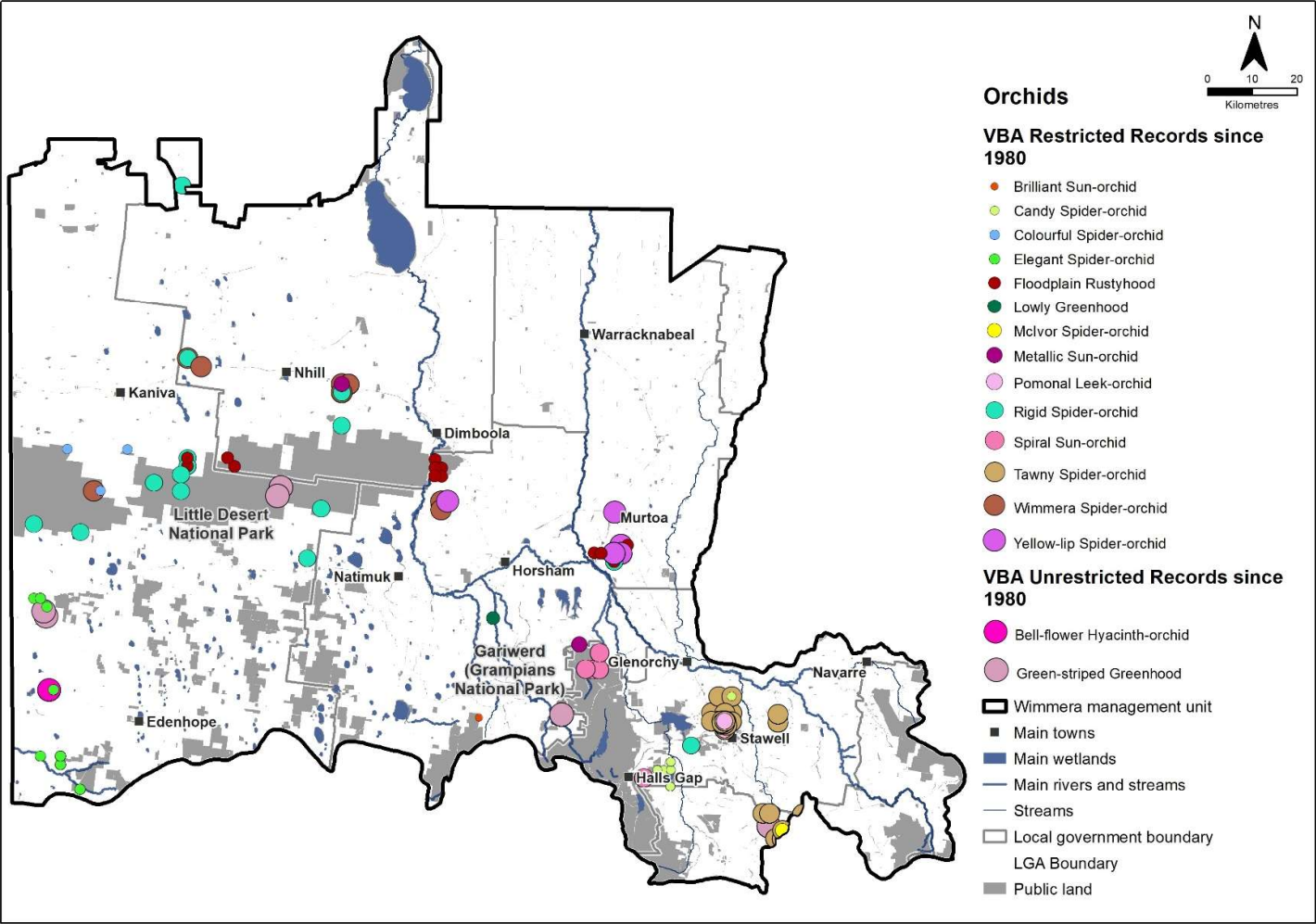


Figure 5. Map of recorded observations of Forked Spyridium (*Spyridium furculentum*) in the Wimmera region based on Victorian Biodiversity Atlas records.

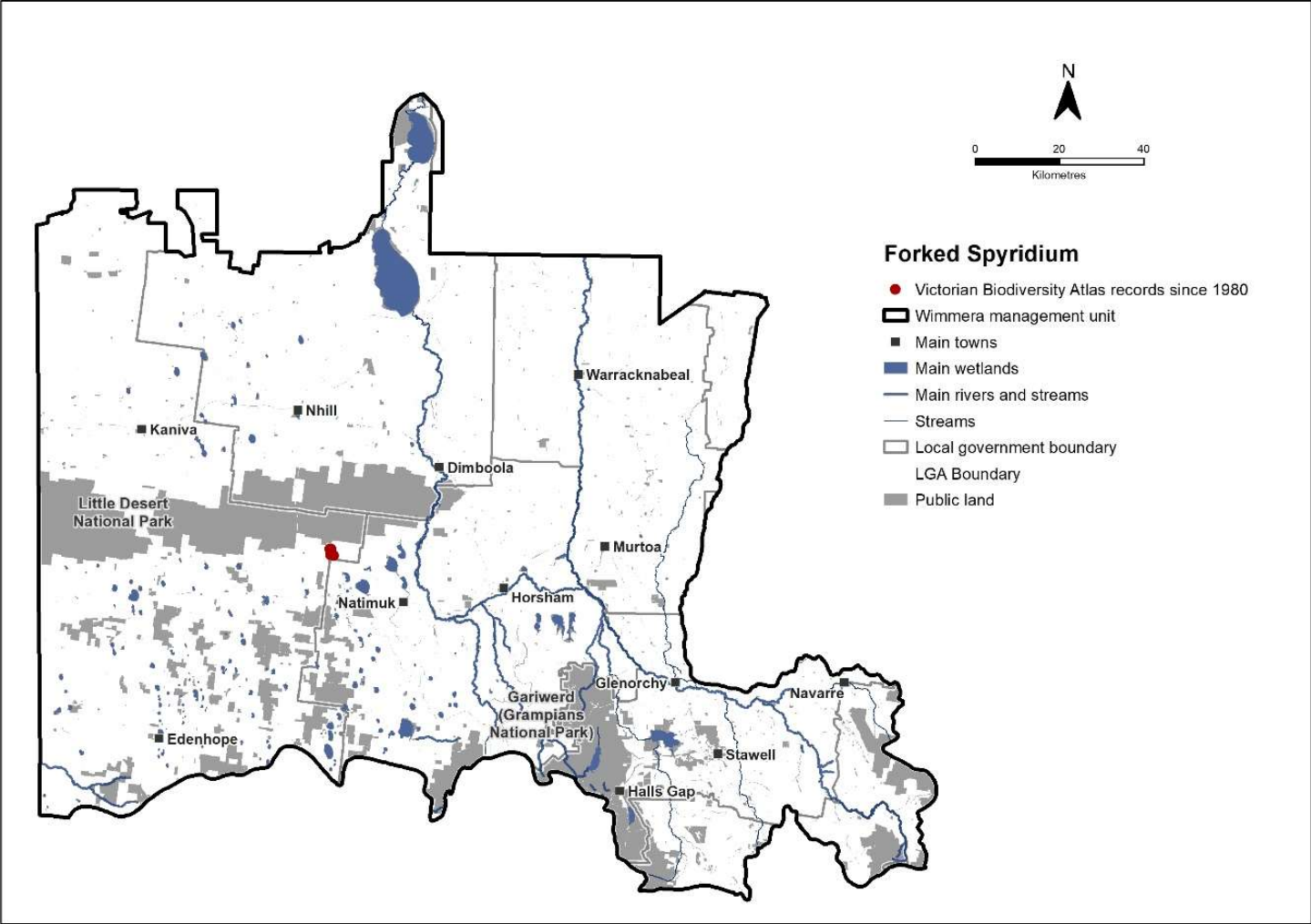


Figure 6. Map of recorded observations of Avenue cassinia (*Cassinia tegulata*) in the Wimmera region based on Victorian Biodiversity Atlas records.

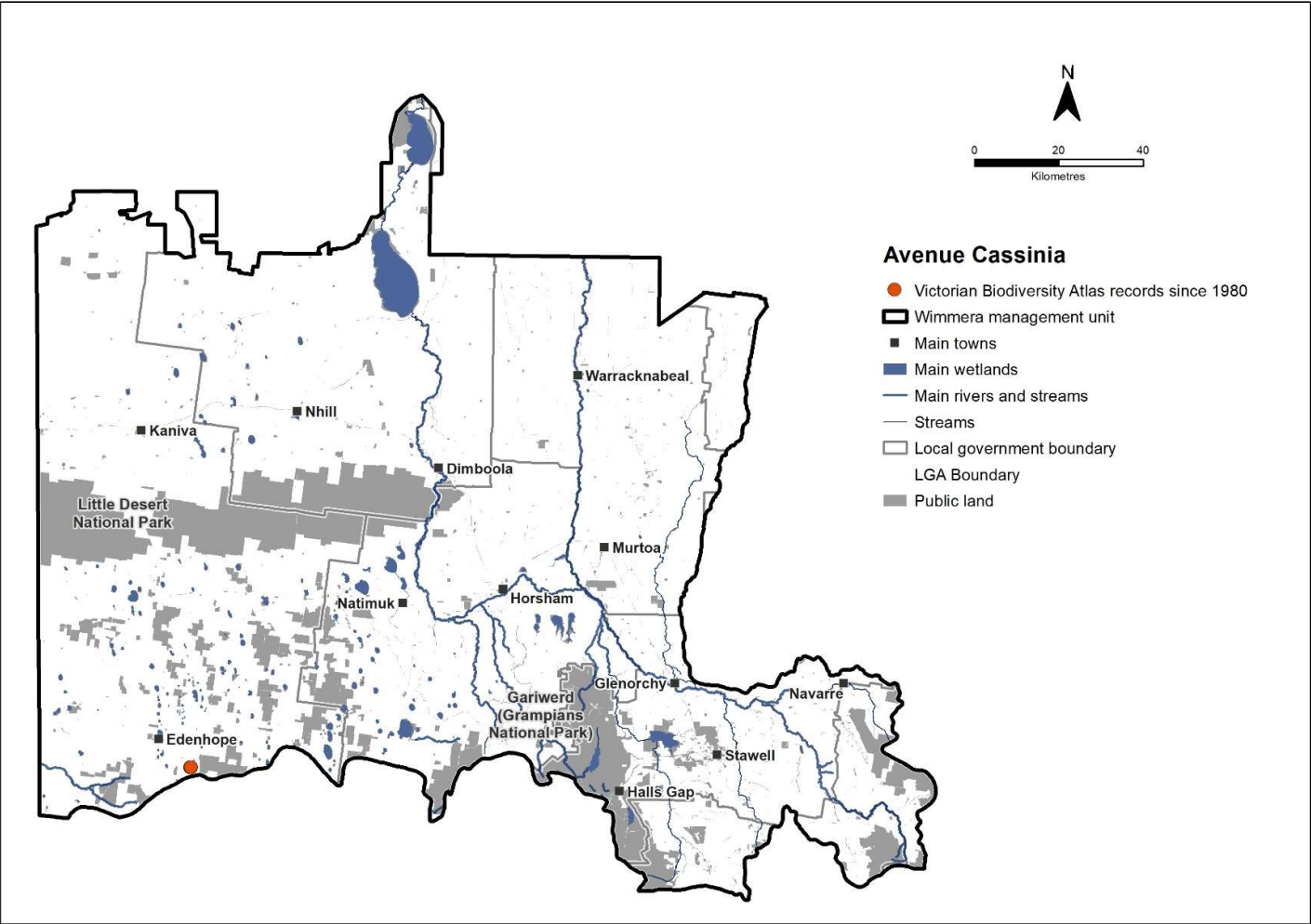


Figure 7. Map of recorded observations of nationally threatened species located in Gariwerd (Grampians National Park and surrounds) in the Wimmera region, based on Victorian Biodiversity Atlas records.

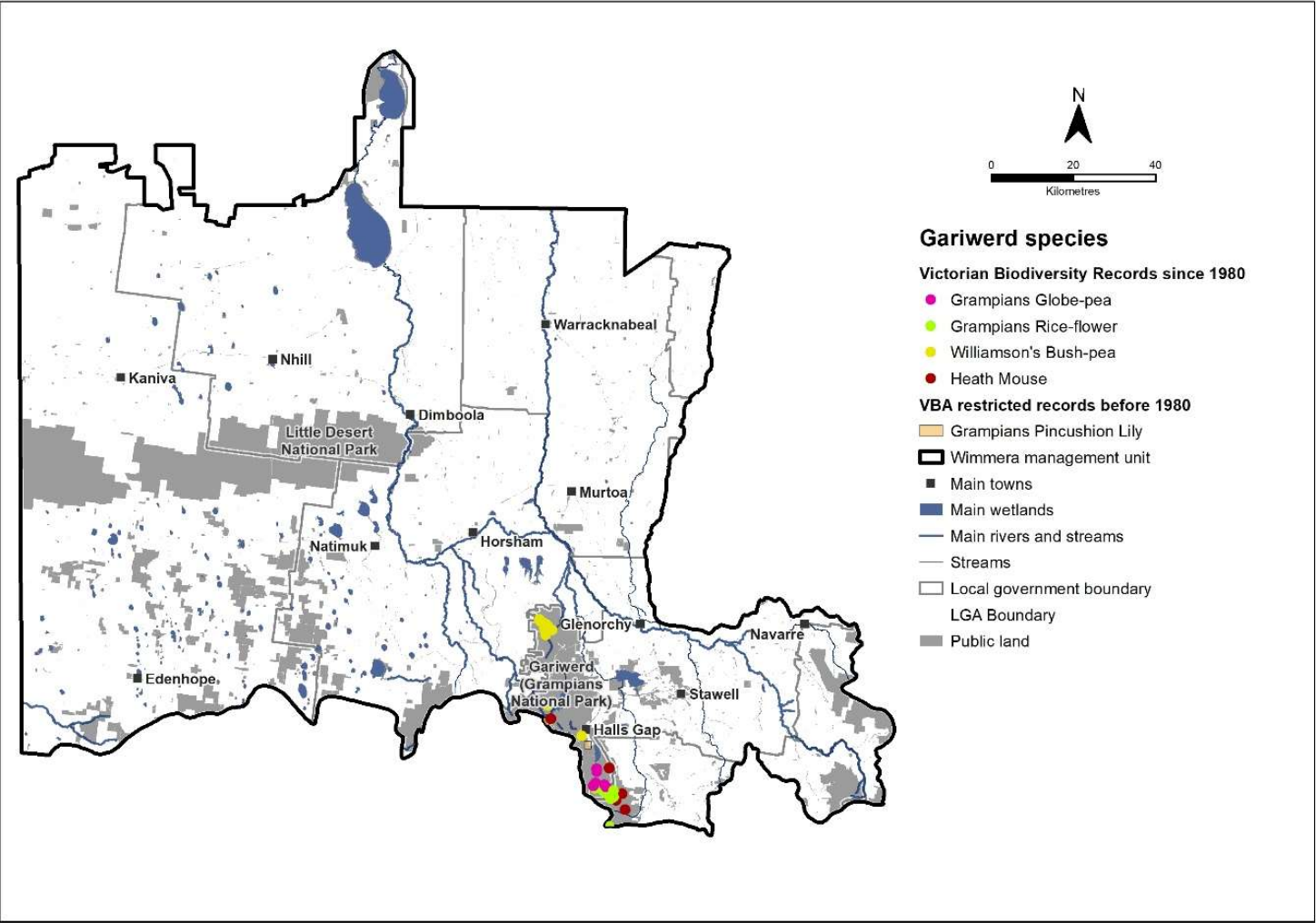


Figure 8. Map of recorded observations of nationally threatened species and ecological communities associated with Wimmera grasslands, based on Victorian Biodiversity Atlas records and Victorian ecological vegetation class mapping (considered likely or possible equivalents of nationally threatened ecological communities).

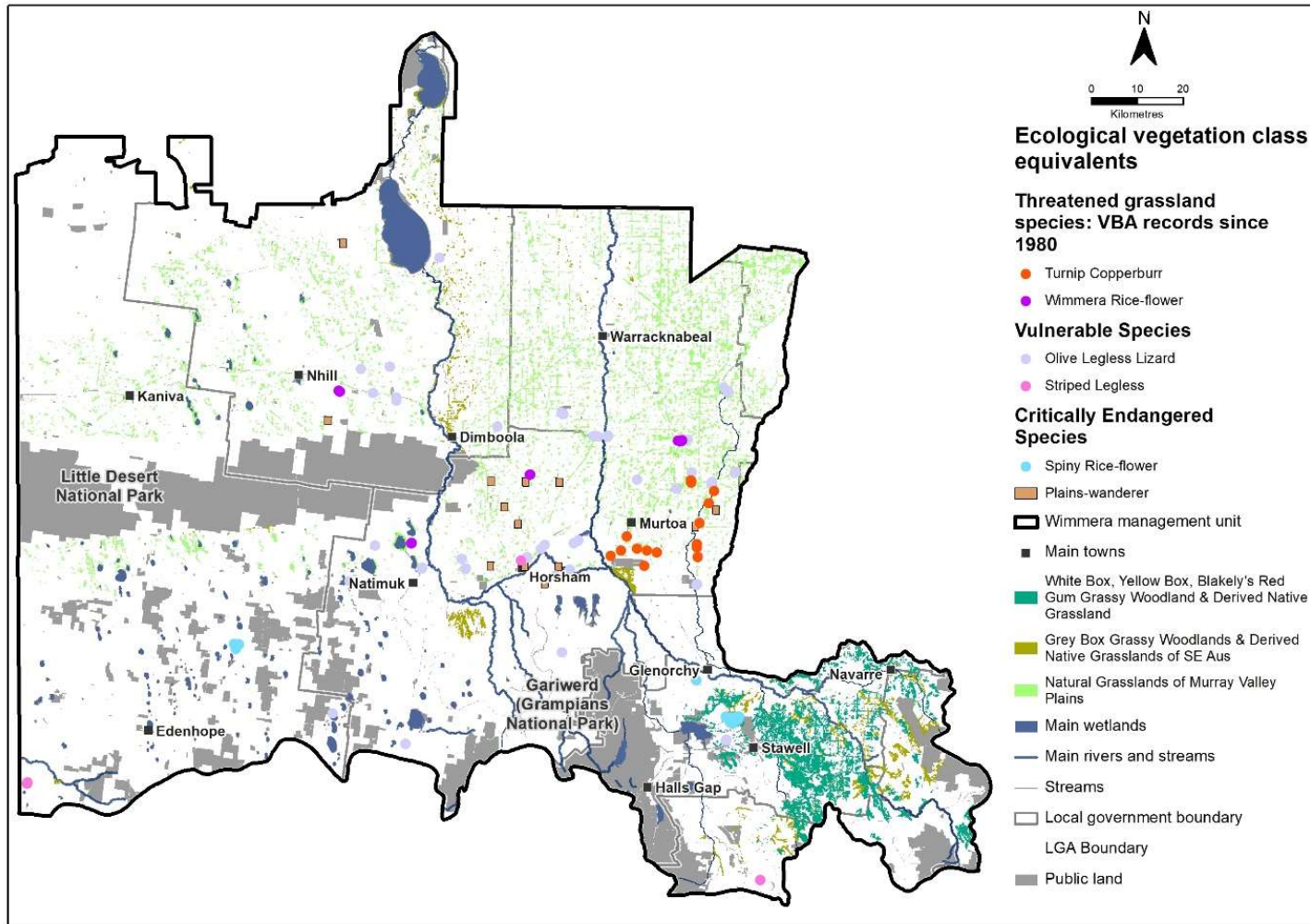


Figure 9. Map of recorded observations of Australasian Bittern (*Botaurus poiciloptilus*) in the Wimmera, based on Victorian Biodiversity Atlas records and Wimmera CMA's bird monitoring surveys at Lake Hindmarsh during 2023.

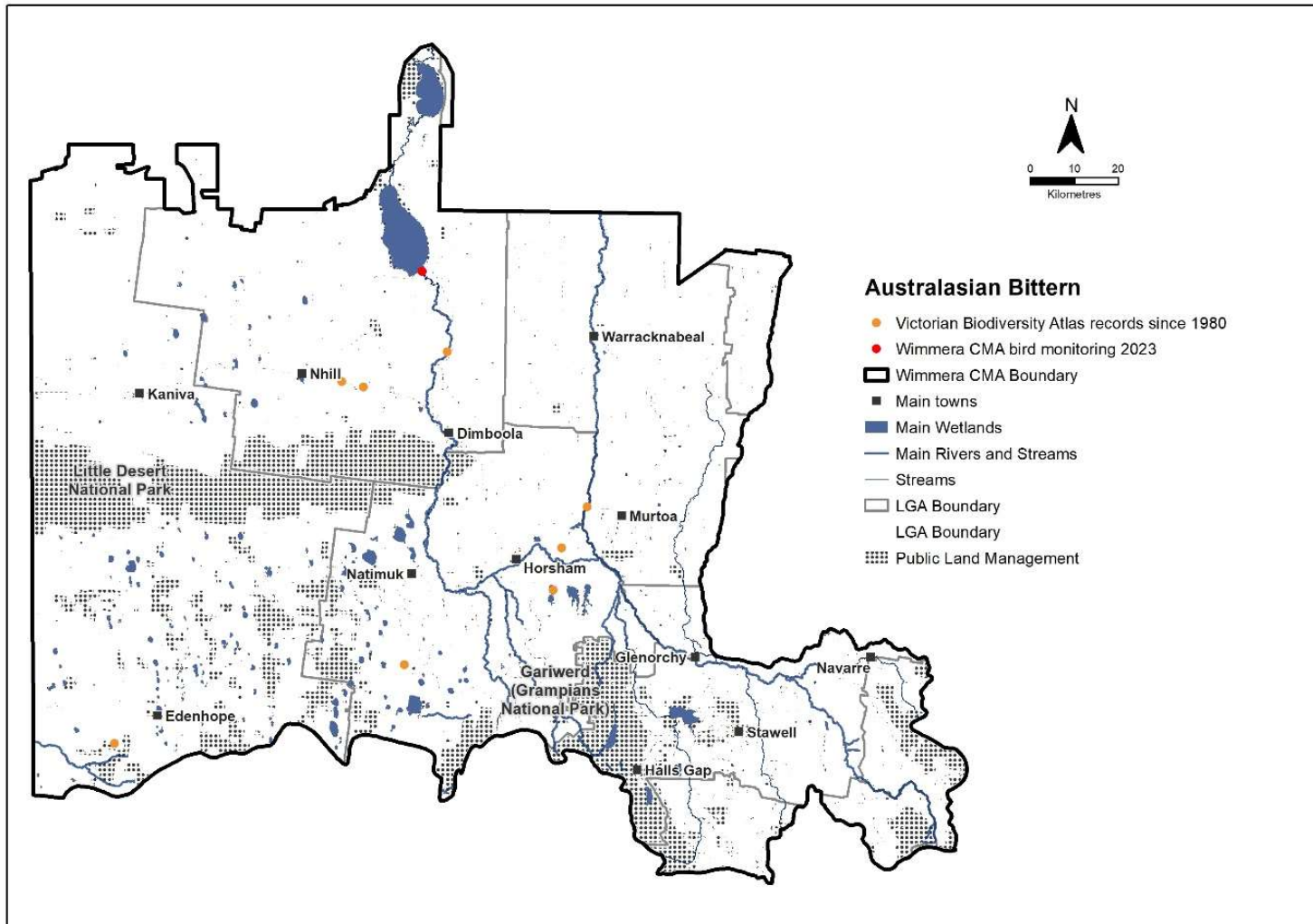
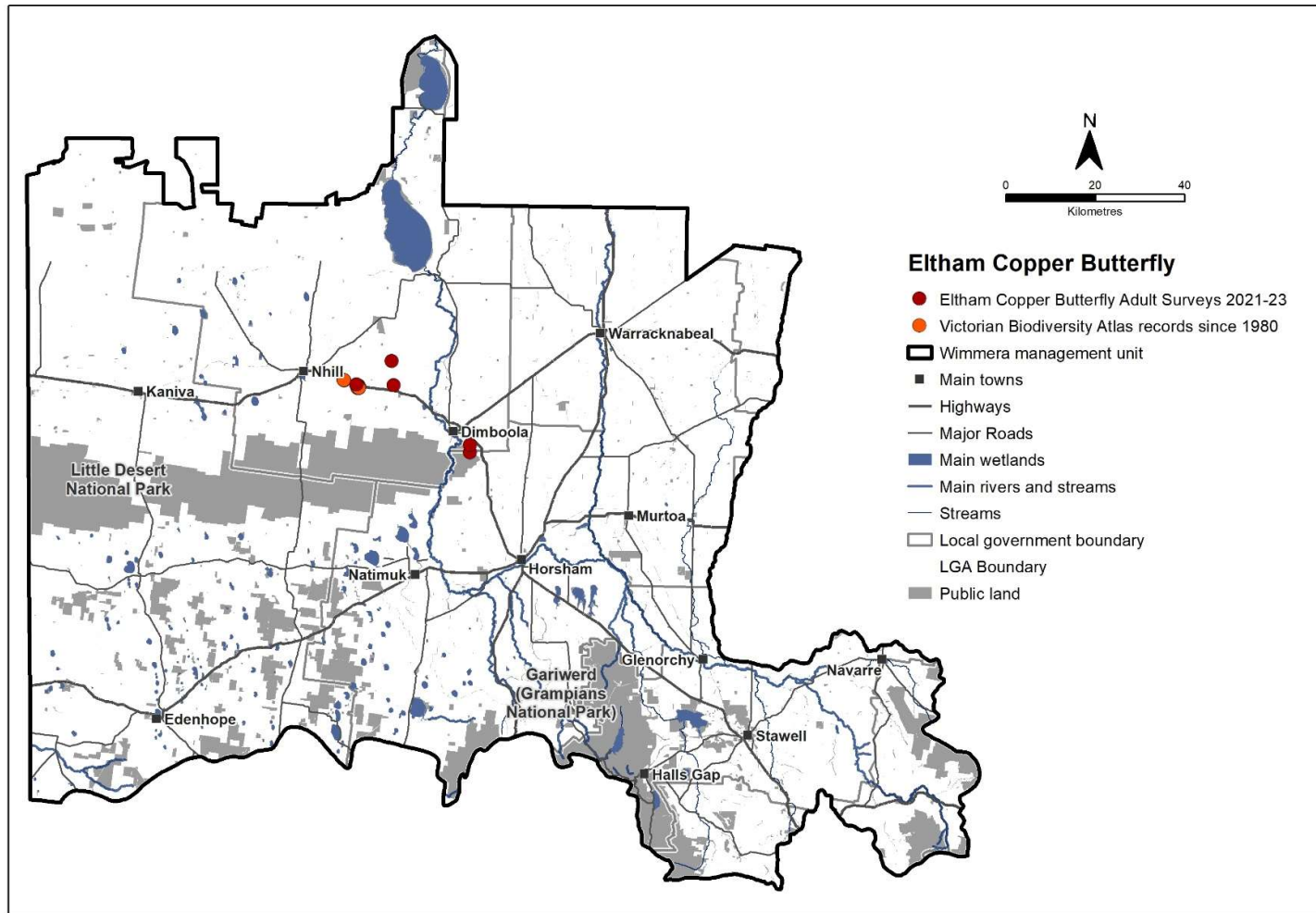


Figure 10. Map of recorded observations of Eltham Copper Butterfly (*Paralucia pyrodiscus lucida*) in the Wimmera, based on Victorian Biodiversity Atlas records and survey data provided by Wetland Revival Trust and DEECA.



Threatened ecological communities

Seven nationally threatened ecological communities occur in the Wimmera. Table 2 provides a guide to the figure number for each threatened ecological community mapped in this document.

Table 2. Threatened ecological communities located in the Wimmera.

Threatened ecological community	Environment Protection and Biodiversity Conservation Act (1999) status	Figure number
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregion	Endangered	Figure 11
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Figure 12
Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Figure 13
Mallee Bird Community of the Murray Darling Depression Bioregion	Endangered	Figure 14
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Figure 15
Plains Mallee Box Woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	Critically Endangered	Figure 16
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Figure 17
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Figure 18

Wimmera CMA has prepared maps showing likely locations of threatened ecological communities. The maps include the following data:

- The Australian Government's mapping of Ecological Communities of National Environmental Significance Distributions 2020 mapping (DAWE, 2021). This data can be downloaded from the Australian Government Department of Climate Change, Energy, the Environment and Water's 'Find Environmental Data' geoportal:
<https://www.environment.gov.au/fed/catalog/search/resource/details.page?uuid=%7B184A3793-2526-48F4-A268-5406A2BE85BC%7D>.
- Mapping of Victorian Ecological Vegetation Classes (EVCs) considered to be likely equivalents to the EPBC-listed threatened ecological communities. This is consistent with EVCs identified in the Conservation Advice and National Recovery Plan for the ecological community (DSE, 2005). This data can be downloaded from Victoria's DataVic open data platform:
<https://discover.data.vic.gov.au/dataset/native-vegetation-modelled-2005-ecological-vegetation-classes-with-bioregional-conservation-sta>.

Note that it is unknown whether all mapped EVC locations currently meet the criteria for the threatened ecological community. This depends on their species composition and condition and has not been assessed for most locations. These sites would require an on-ground assessment to determine if they meet the criteria for the threatened ecological community. The following maps provide a guide for potential existing locations of the threatened community and sites that could be managed and improved to meet the criteria over time.

Figure 11. Map of the estimated extent of Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregion in the Wimmera.

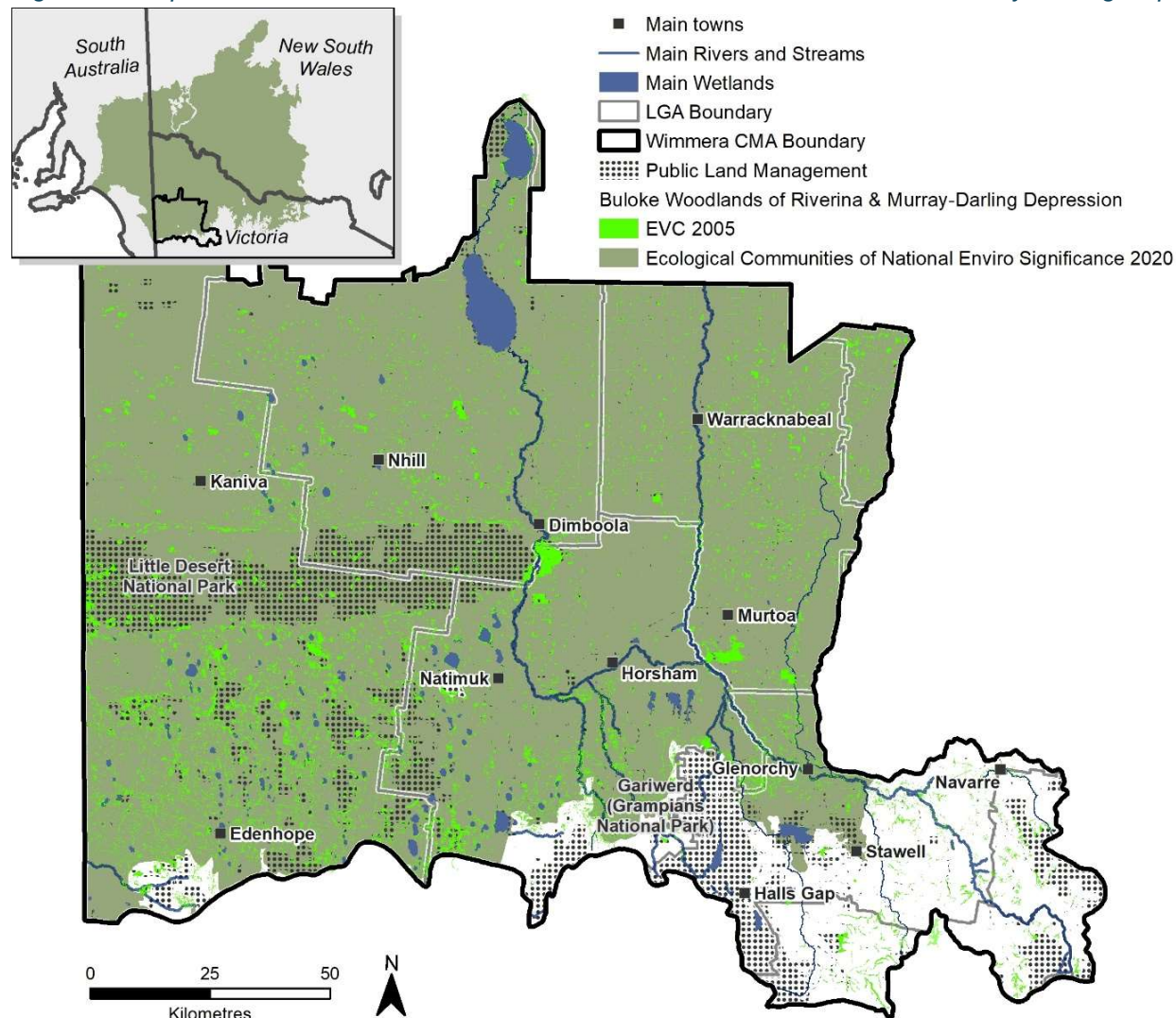


Figure 12. Map of the estimated extent of Grassy Eucalypt Woodland of the Victorian Volcanic Plain in the Wimmera.

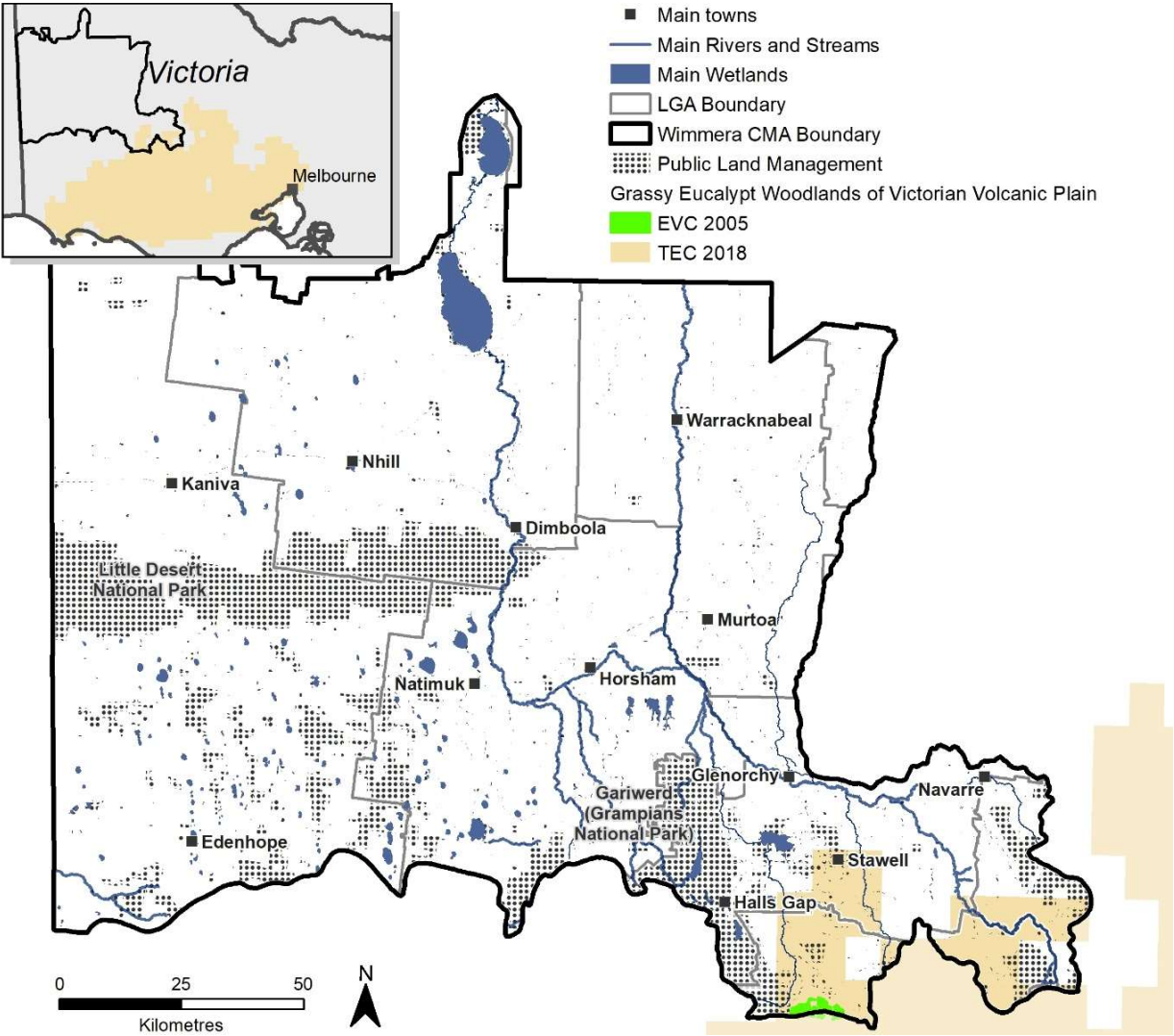


Figure 13. Map of the estimated extent of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia in the Wimmera.

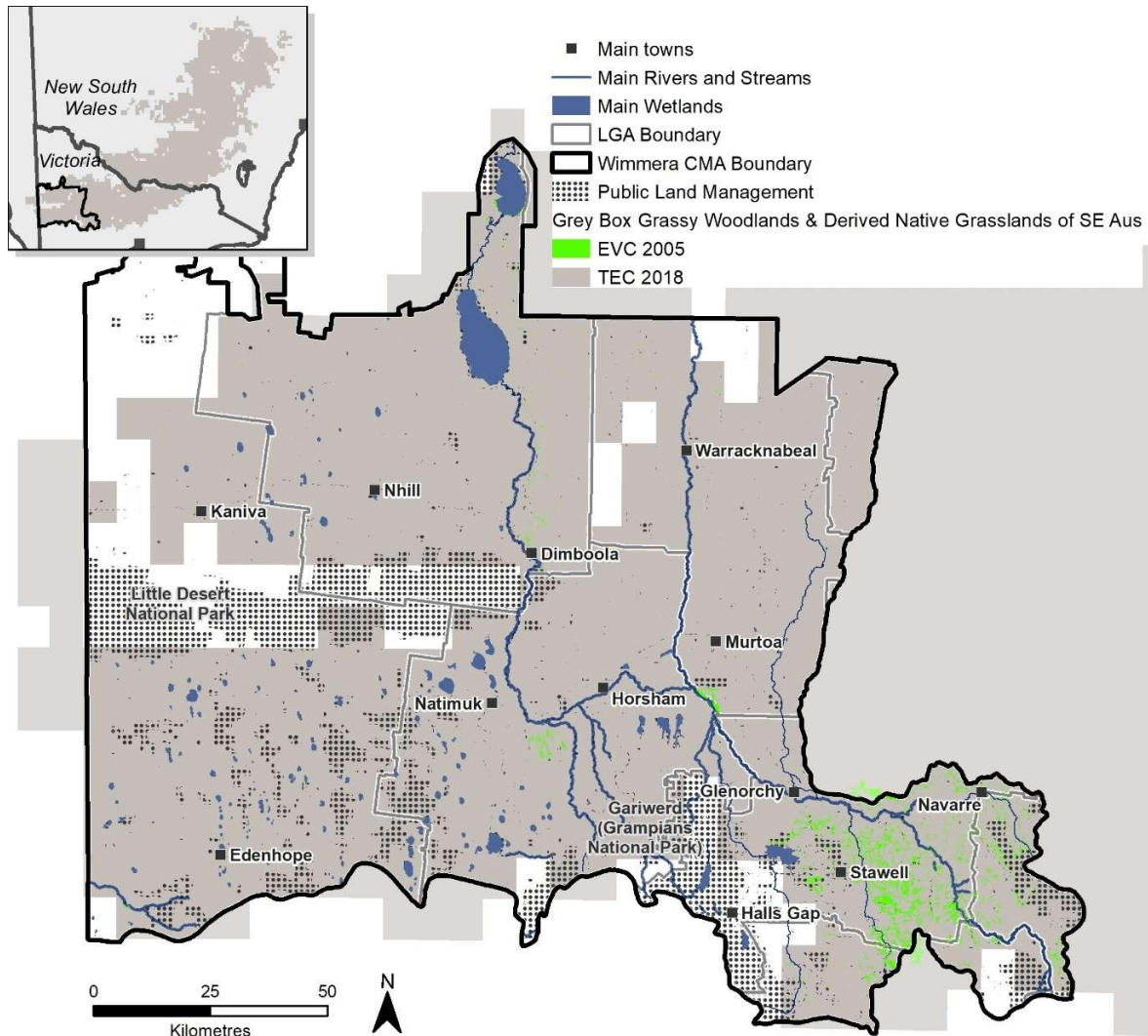


Figure 14. Map of the estimated extent of Mallee Bird Community of the Murray Darling Depression Bioregion in the Wimmera.

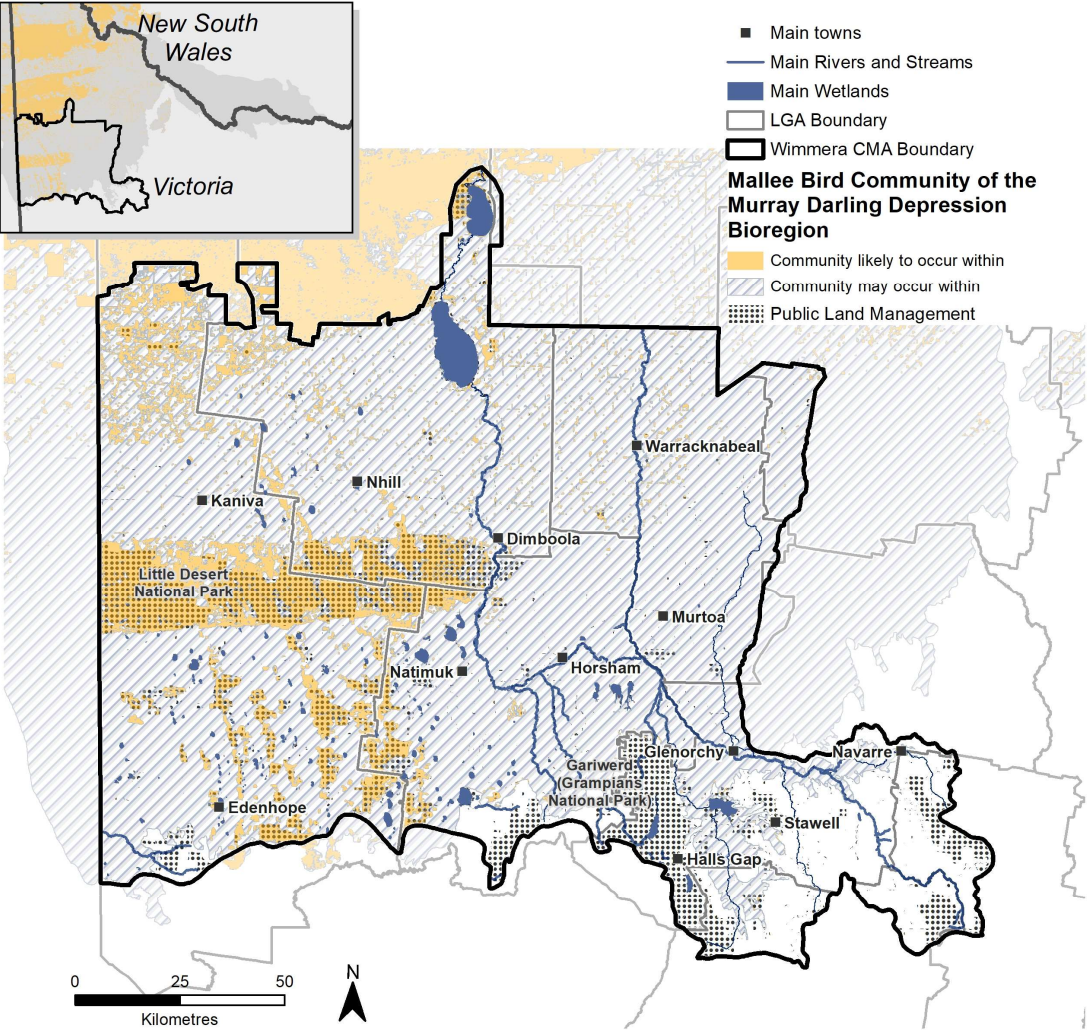


Figure 15. Map of the estimated extent of Natural Grasslands of the Murray Valley Plains in the Wimmera.

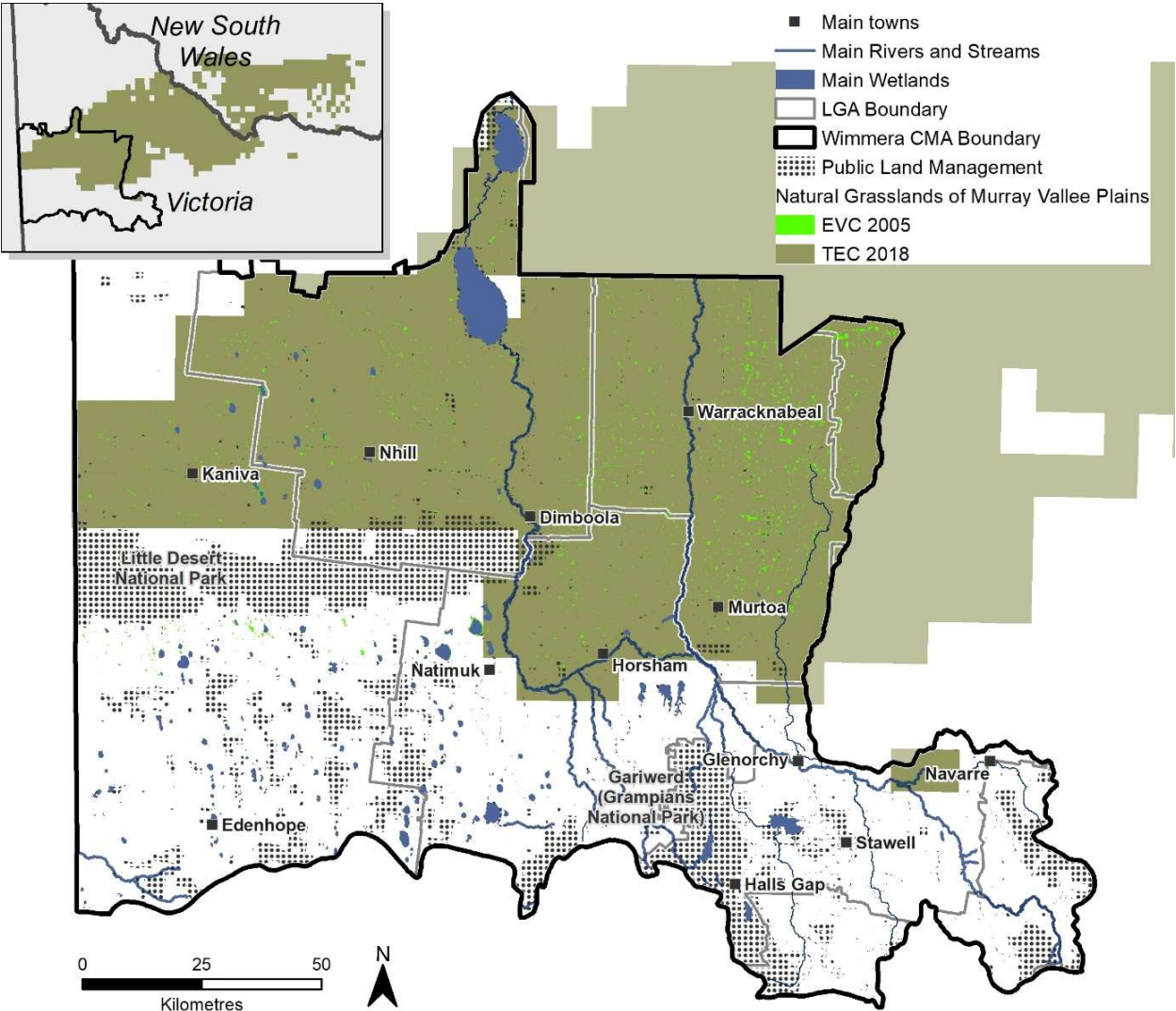


Figure 16. Map of the estimated extent of Plains Mallee Box Woodland of the Murray Darling depression and Riverina bioregions in the Wimmera.

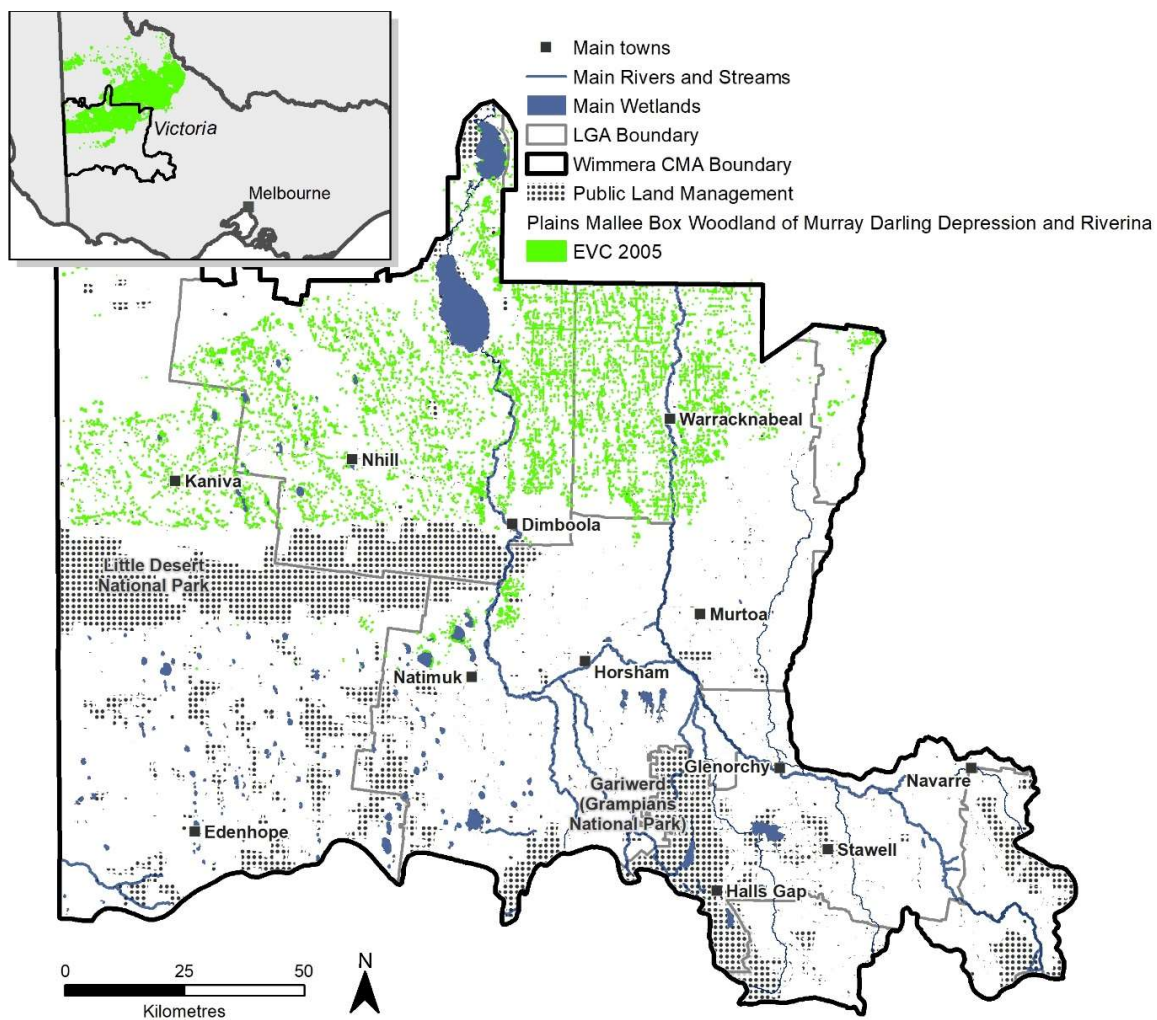


Figure 17. Map of the estimated extent of Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains in the Wimmera.

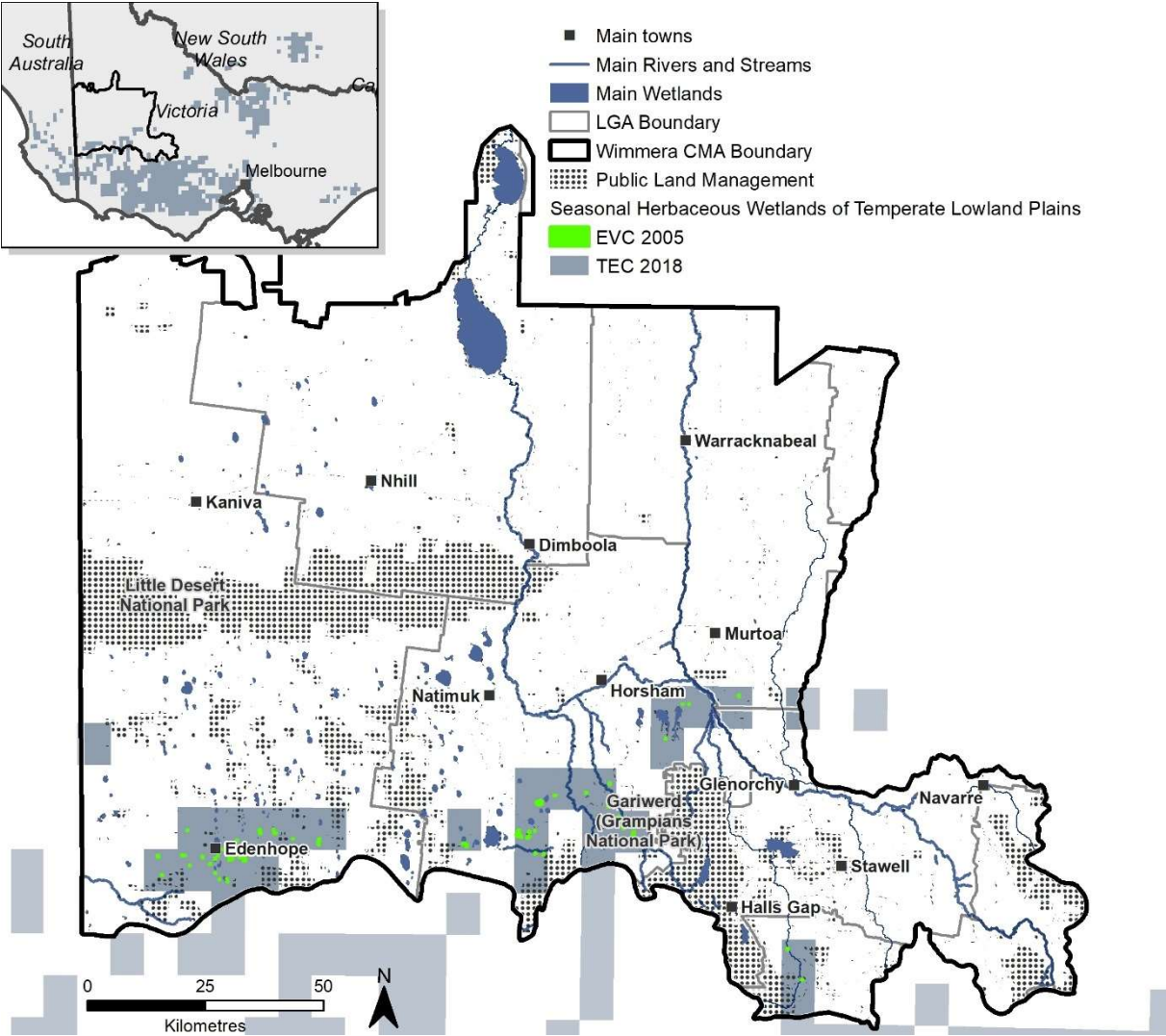
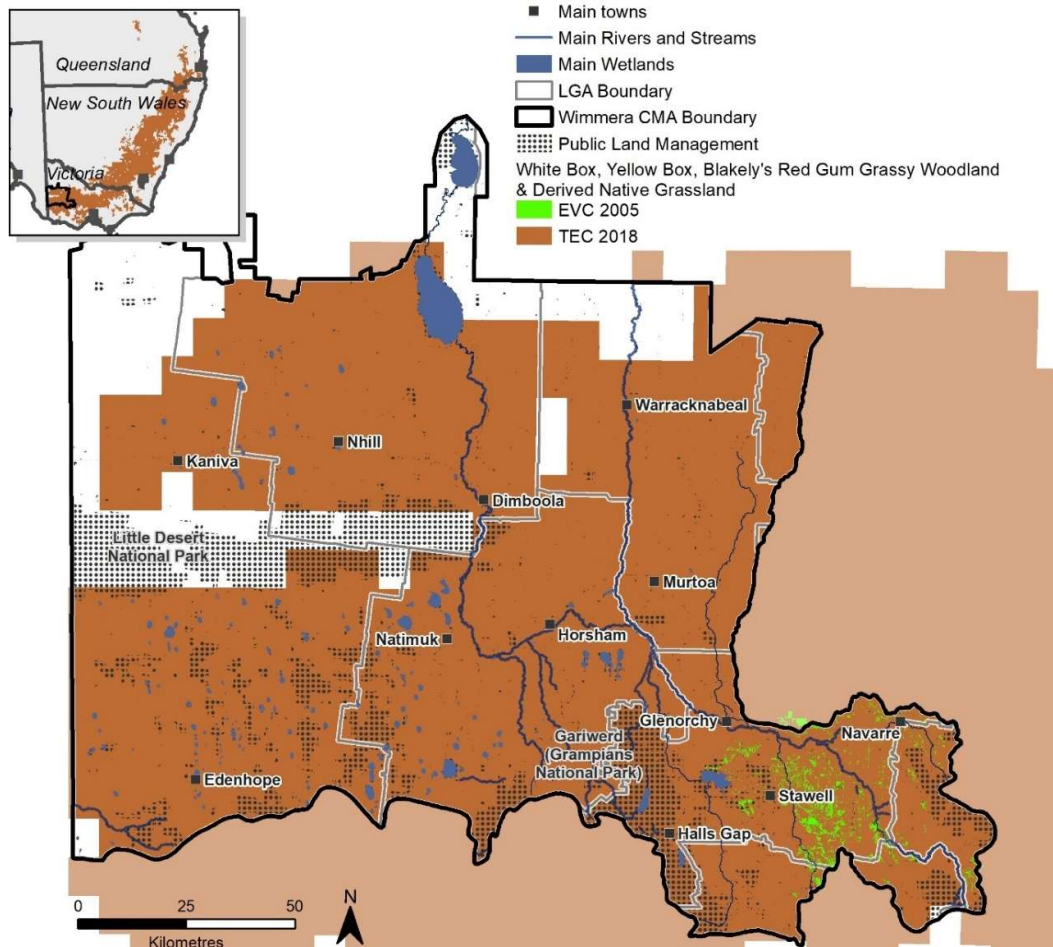


Figure 18. Map of the estimated extent of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Wimmera.



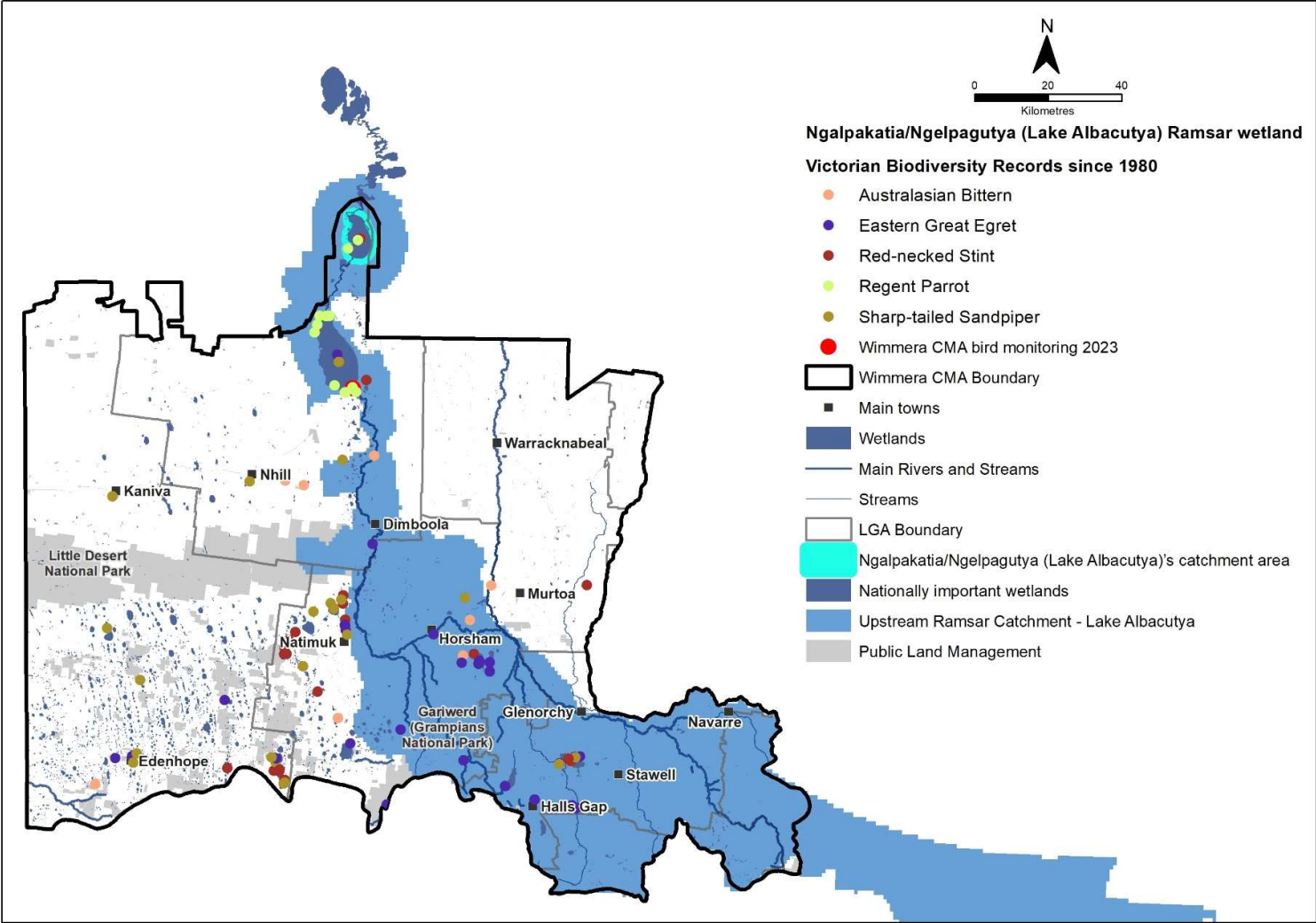
Ramsar sites

The Wimmera's sole Ramsar site is the Ngalpakatia/Ngelpagutya (Lake Albacutya) Ramsar site (Figure 19).

Wimmera CMA mapped the Ngalpakatia/Ngelpagutya (Lake Albacutya) Ramsar site and its catchment area using the following data:

- The Australian Government's mapping of Ramsar Wetlands of Australia which shows the location and boundary of the Ramsar site. This data can be downloaded from the Australian Government Department of Climate Change, Energy, the Environment and Water's 'Find Environmental Data' geoportal: <https://www.environment.gov.au/fed/catalog/search/resource/details.page?uuid=%7BF49BFC55-4306-4185-85A9-A5F8CD2380CF%7D>.
- Wimmera CMA's mapping of wetland catchments created using elevation data supplemented by surface water features (SKM, 2006). This dataset is available from Wimmera CMA on request.

Figure 19. The location of the Ngalpapakatia/Ngelpagutya (Lake Albacutya) Ramsar Site and its catchment area in the Wimmera region.



Agricultural natural capital assets

Wimmera CMA mapped all agricultural natural capital assets using a single map.

The map is based on Victoria's Land Cover Time series (VLCTS) data for the time period 2015-2019. DEECA's website describes the VLCTS data as a visual and analytical snapshot of the current and previous type of land cover over different areas. That cover can include native forests, bushland, wetlands, farmland, land used for recreation, and built up areas, including towns and cities (DEECA, 2024).

Agricultural soil assets

Wimmera CMA's mapping combines the 6 agricultural land uses from the VLCTS into a single category. This combines the following land use categories: Horticulture/irrigated pastures and crops, Dryland cropping, Exotic pasture/grassland, Hardwood plantation, Conifer plantation, Other exotic tree cover.

Riparian Areas, Native Vegetation, Agroforestry and Environmental Plantings on Farms

The mapping combines the VLCTS's 7 natural environment land uses found in the Wimmera into a single category. This combines the following land use categories: Treed native vegetation, Scattered native trees, Native shrubland, Native pasture/grassland, Natural low cover, Wetland – perennial, Wetland – seasonal.

Water assets

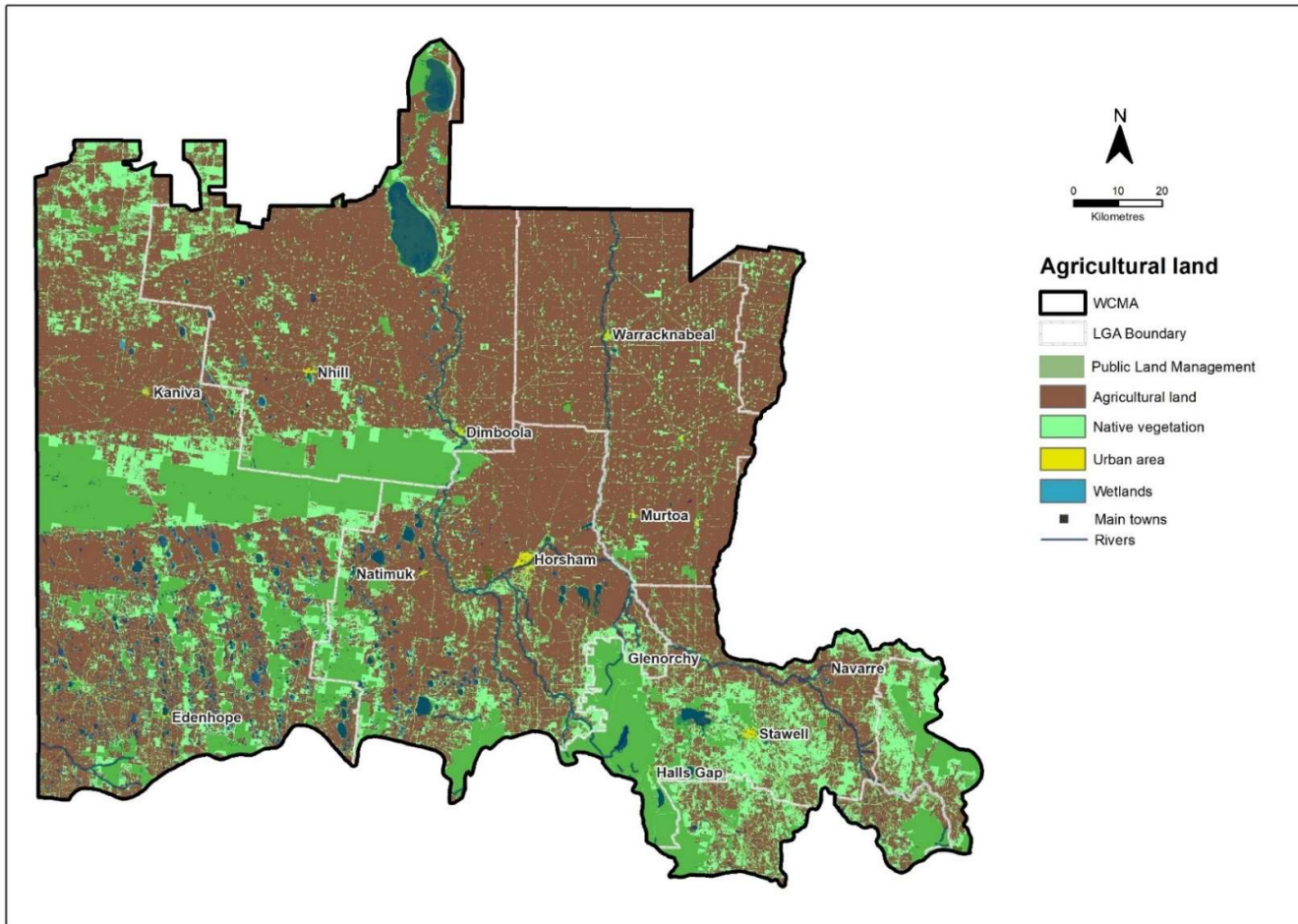
The mapping shows the location of Wimmera waterways including major rivers and streams, and wetlands based on statewide hydrology layers available from Victoria's DataVic open data platform: <https://www.data.vic.gov.au/>.

Figure 20. Map of agricultural natural capital assets in the Wimmera.

“Agricultural land” shows where agricultural soil assets are likely to occur.

“Native vegetation” shows where vegetation is likely to occur on farms in riparian areas, native vegetation remnants, agroforestry and environmental plantings on farms.

“Wetlands” and “Rivers” show where water assets (excluding dams) and riparian areas are likely to occur.



Maps of Susceptibility to Natural Disasters and Emergency Events

Bushfire – relative susceptibility

Wimmera CMA has worked with DEECA staff to deliver a bushfire risk assessment and maps for this Plan. These discussions are ongoing, as DEECA staff's time to contribute became limited due to bushfire emergencies in Victoria during February 2024. Maps will be refined and updated for the final Plan. DEECA's Bushfire Risk, Engagement and Predictive Services team provided the information in Appendix 3 to inform bushfire risk mapping and assessments for this Plan.

Figure 21. Map of relative bushfire risk based on count intensity.

Phoenix Rapidfire runs all ignitions simultaneously, with the assumption that none of these individual fires interact with each other and occur all at once. The sum of ignitions is therefore not a real measure of bushfire hazard but can be used to provide a crude ranking of locations that are more 'hazardous' than others, being where the sum is highest. This measure is provided as the count of intensity (or processed quantile or other measure).

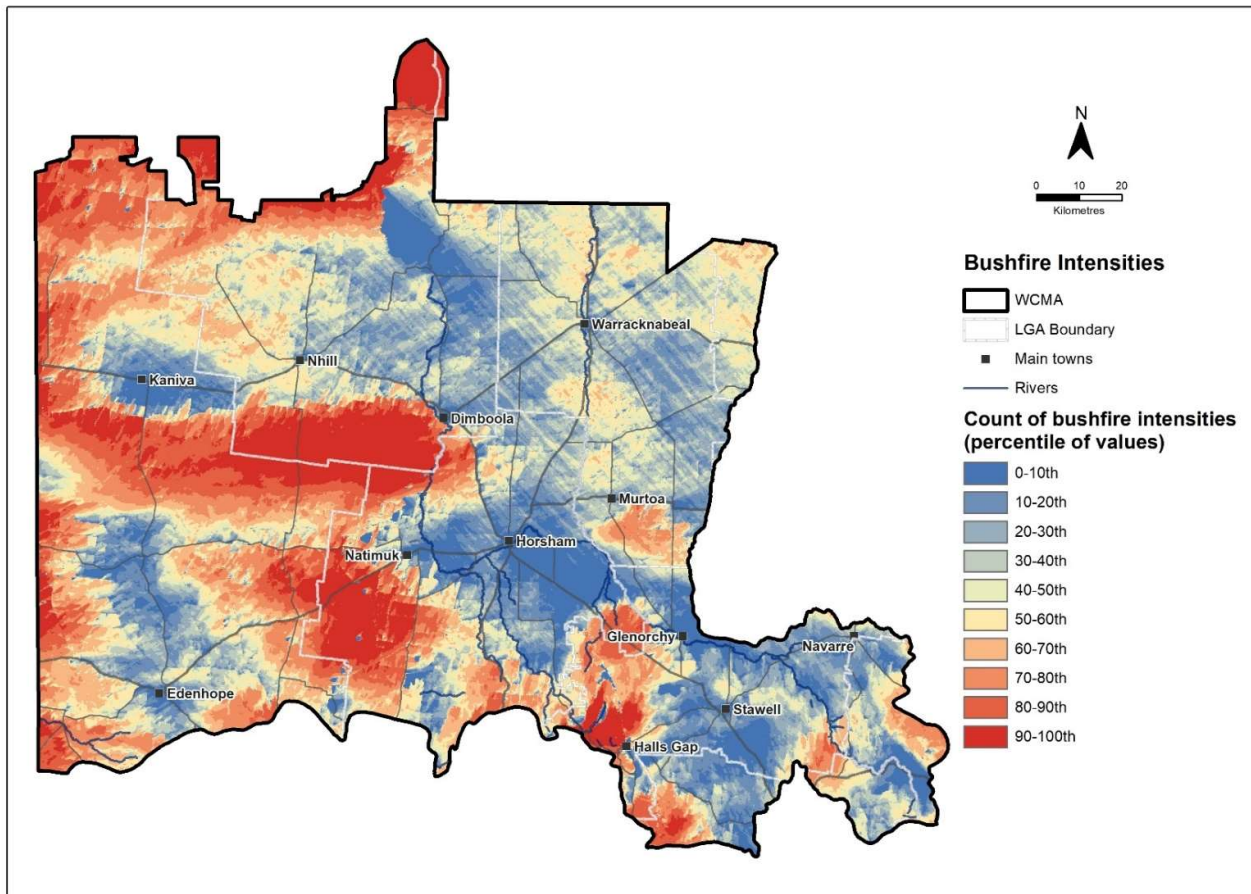
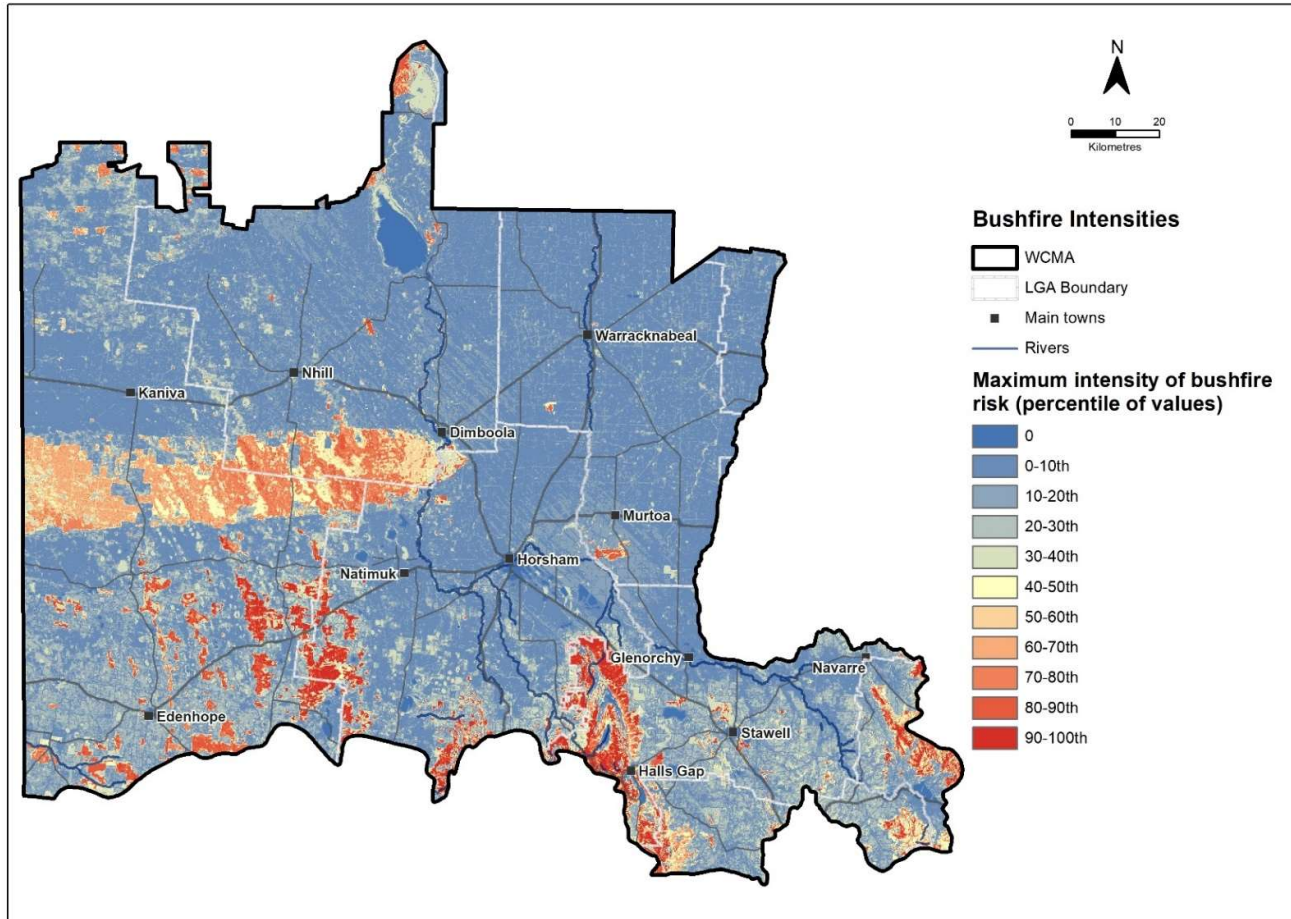


Figure 22. Map of relative bushfire risk based on maximum intensity, indicating the relative risk of severe (intense) bushfire.

The value of maximum intensity can be used as a 'worst-case' option for a conservative risk assessment. This value represents the worst modelled fireline intensity from any of the 70,000+ simulations used in the analysis, if using the worst-case fuel and weather scenario. Explanatory information is provided in Appendix 3.



Areas subject to flooding

The flood map shows the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding. The map combines data on maximum flood extent from flood investigations completed in the region.

Flood investigations involve a detailed technical analysis of historic information to determine future flooding possibilities and their impacts. Community participation and ground-truthing are essential parts of investigations. The map is available from Wimmera CMA on request.

The flood map does not show stormwater or overland flooding that can occur because of rainfall events, because susceptibility or risk is not mapped for this parameter. All low-lying areas in the Wimmera are susceptible to localised flooding from rainfall events.

Subsequent maps show where biodiversity assets are susceptible to flood. Maps are provided for the threatened species and ecological communities susceptible to flood.

Figure 23. The area of land inundated by the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

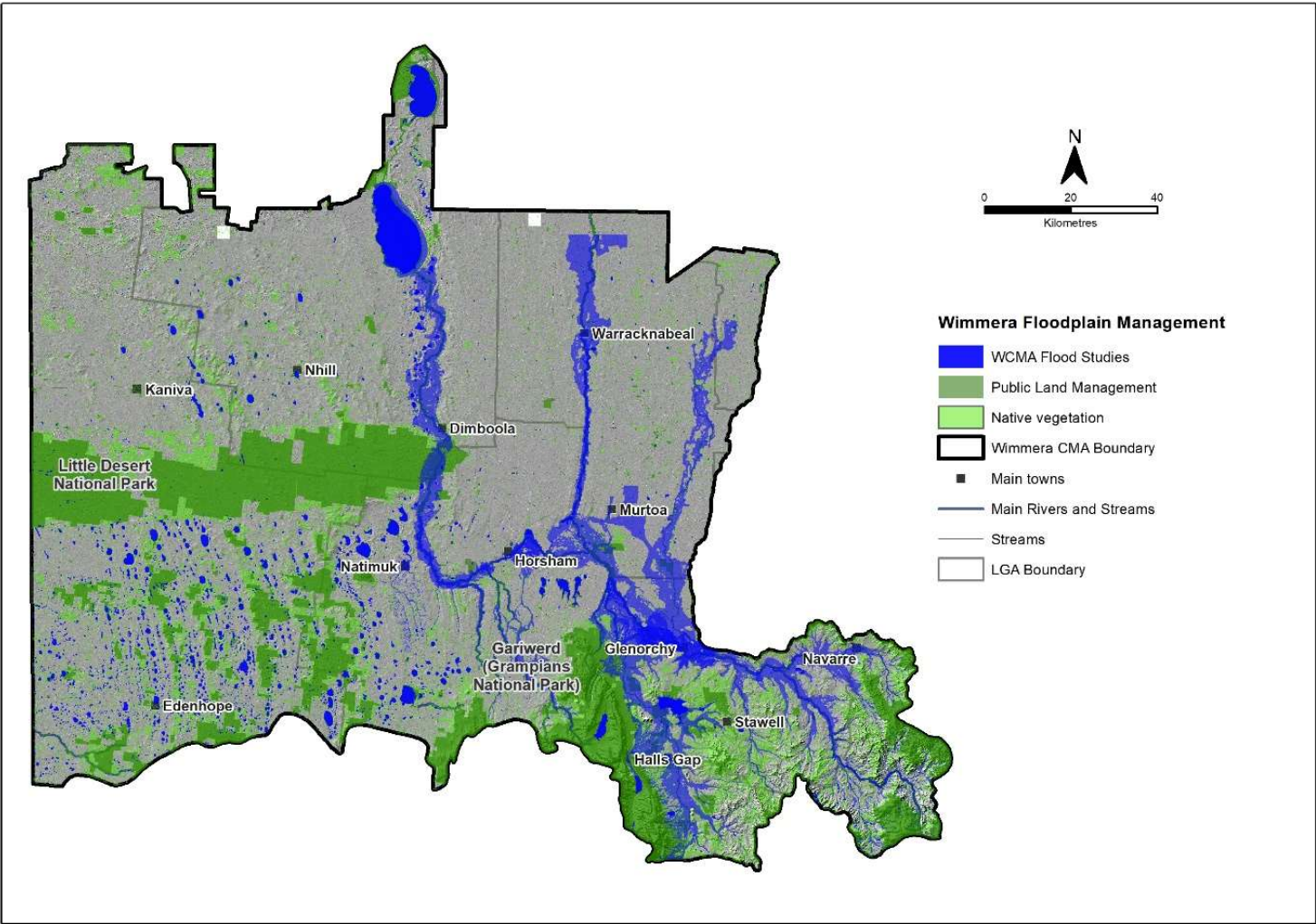


Figure 24. Map showing where Malleefowl locations and habitat coincide with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

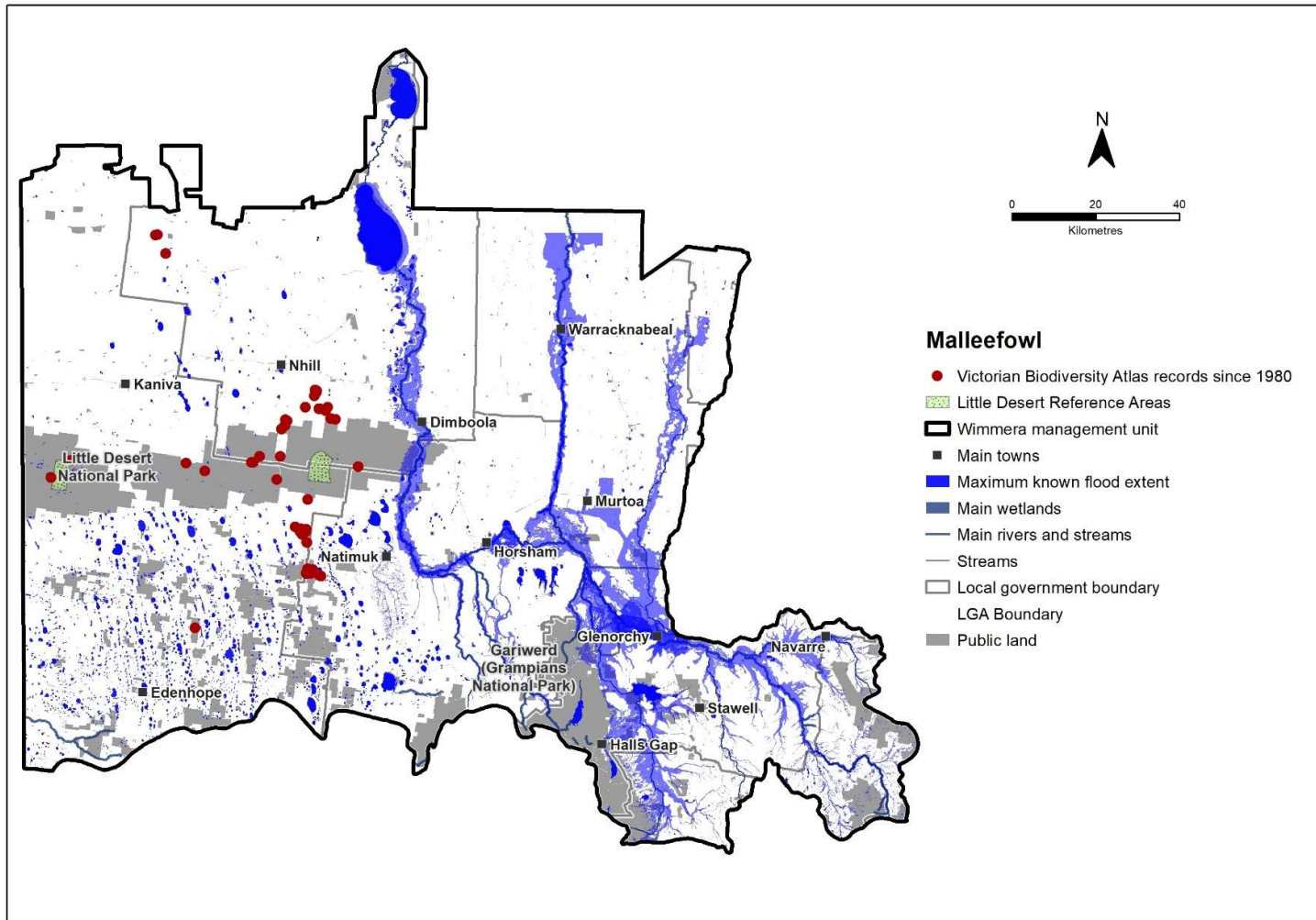


Figure 25. Map showing where national threatened orchids coincide with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

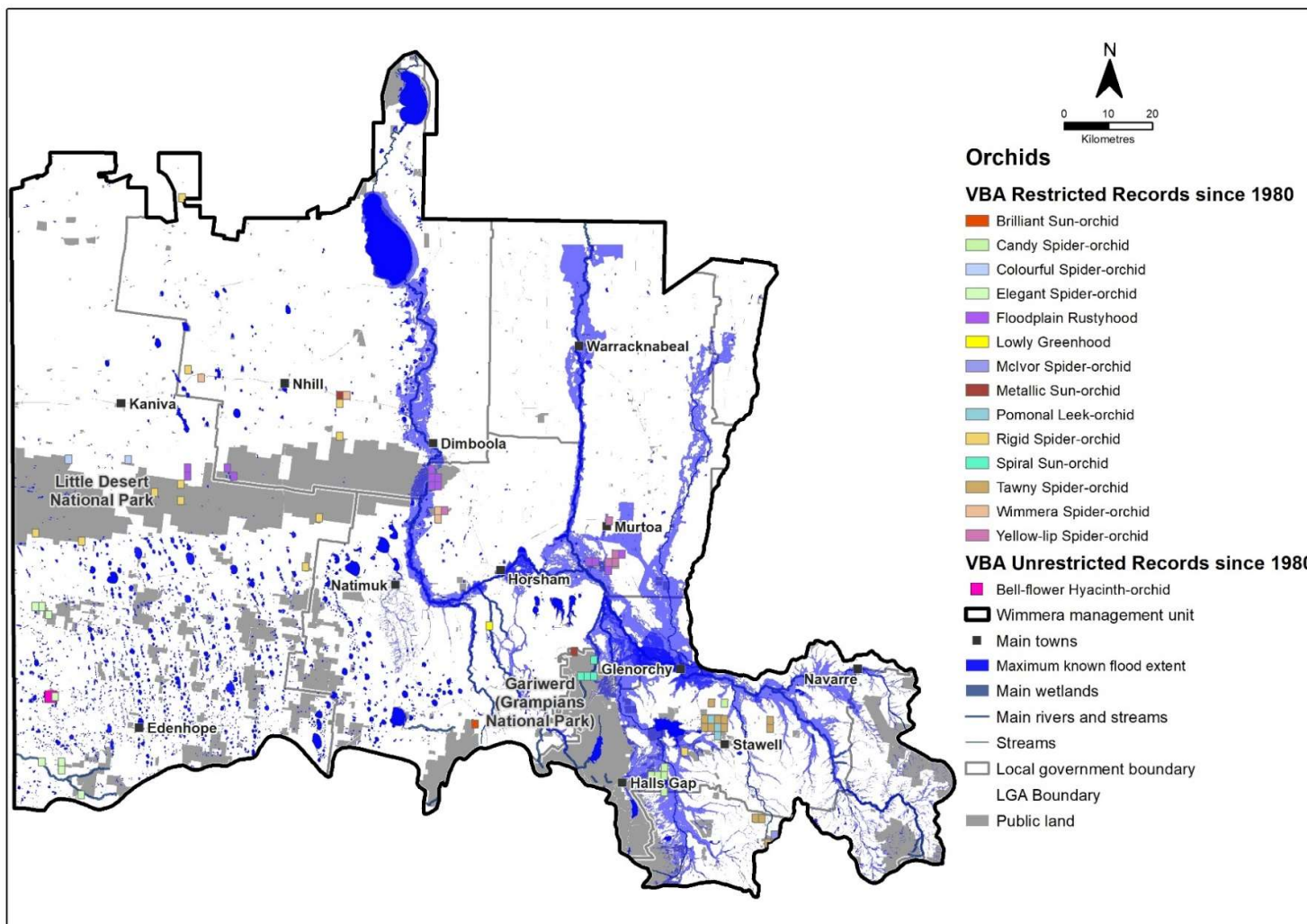


Figure 26. Map showing where nationally threatened grassland species and ecological communities coincide with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

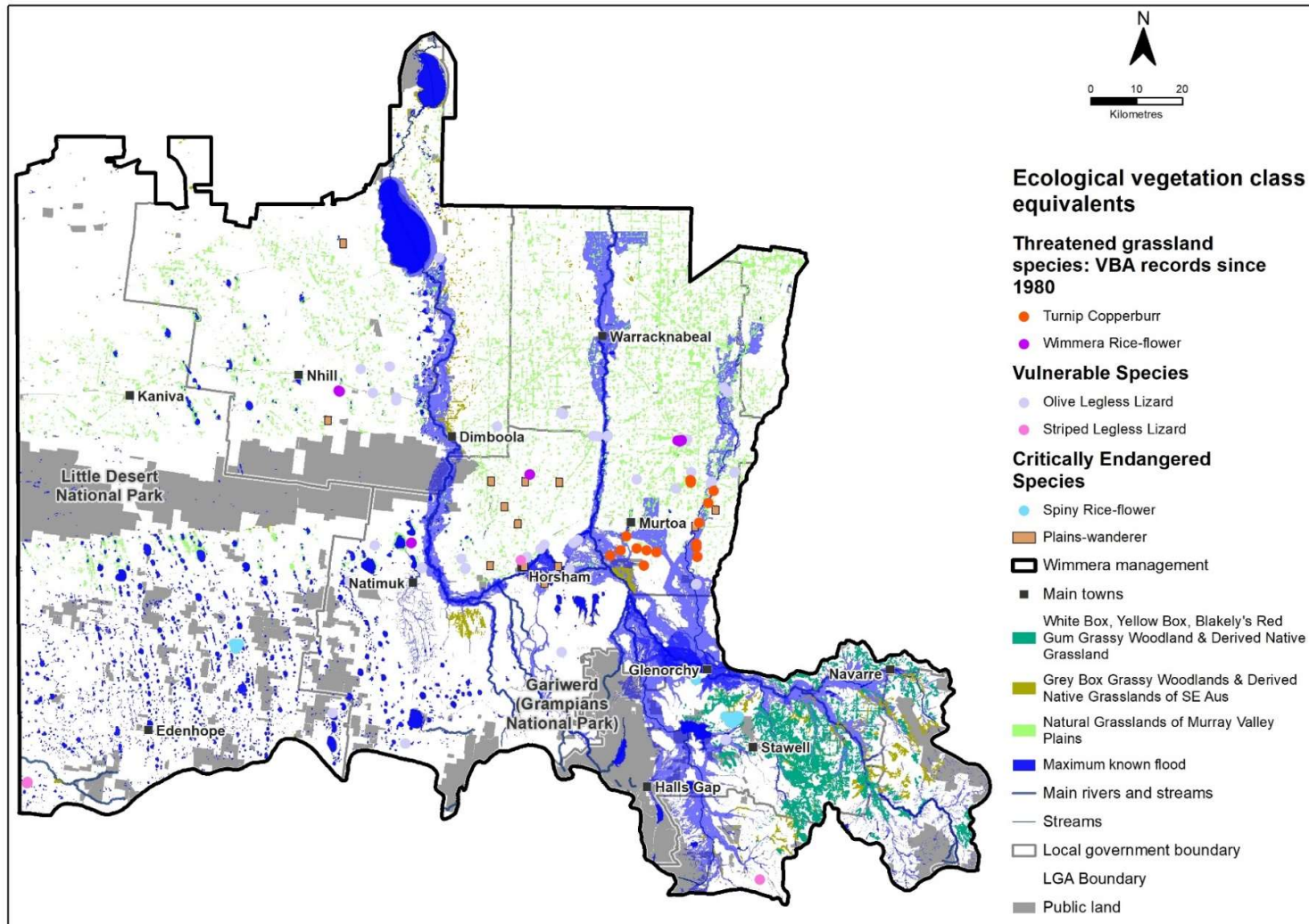


Figure 27. Map showing where Australasian Bittern records coincide with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

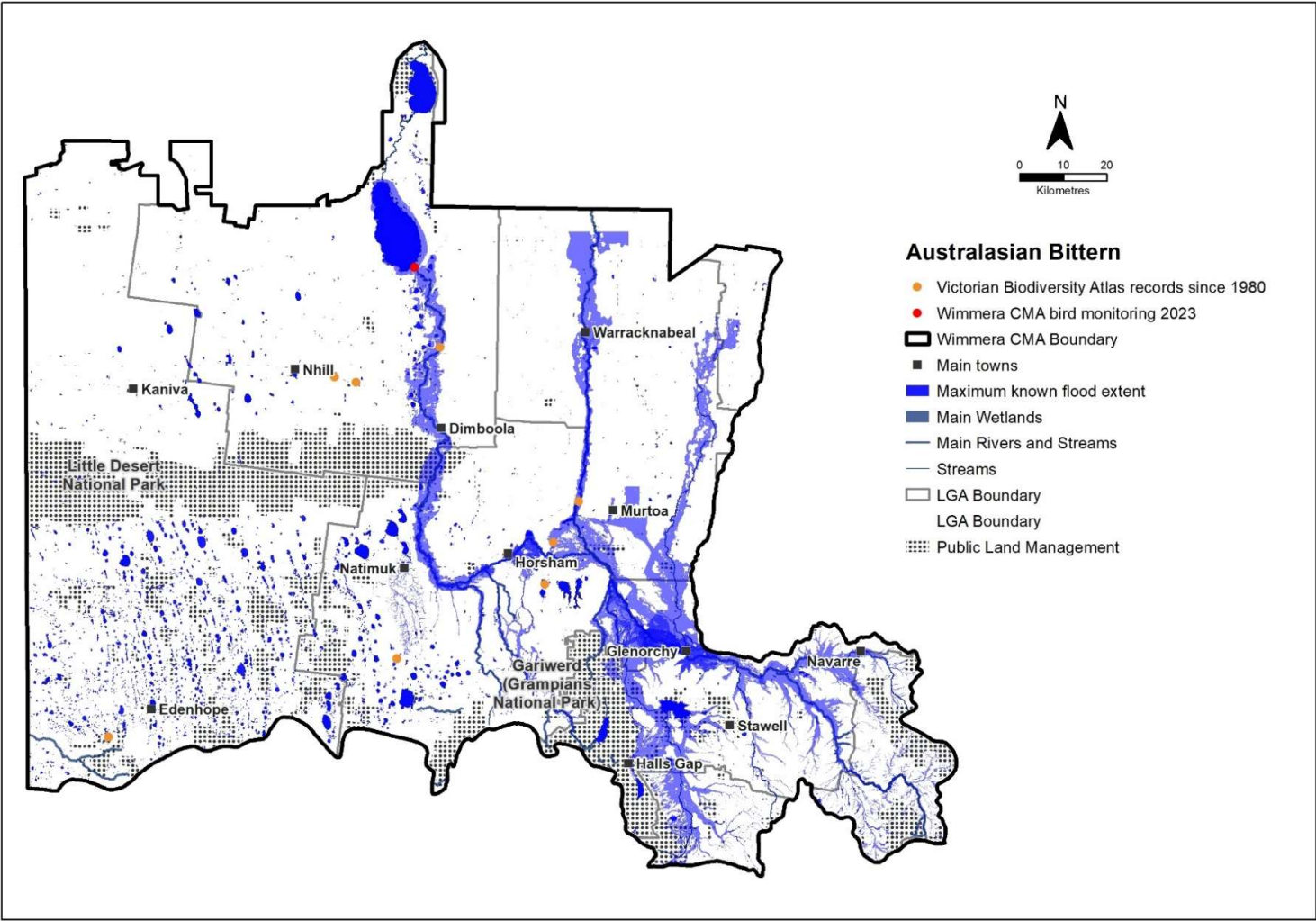


Figure 28. Map showing where the 'Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions' ecological community coincides with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

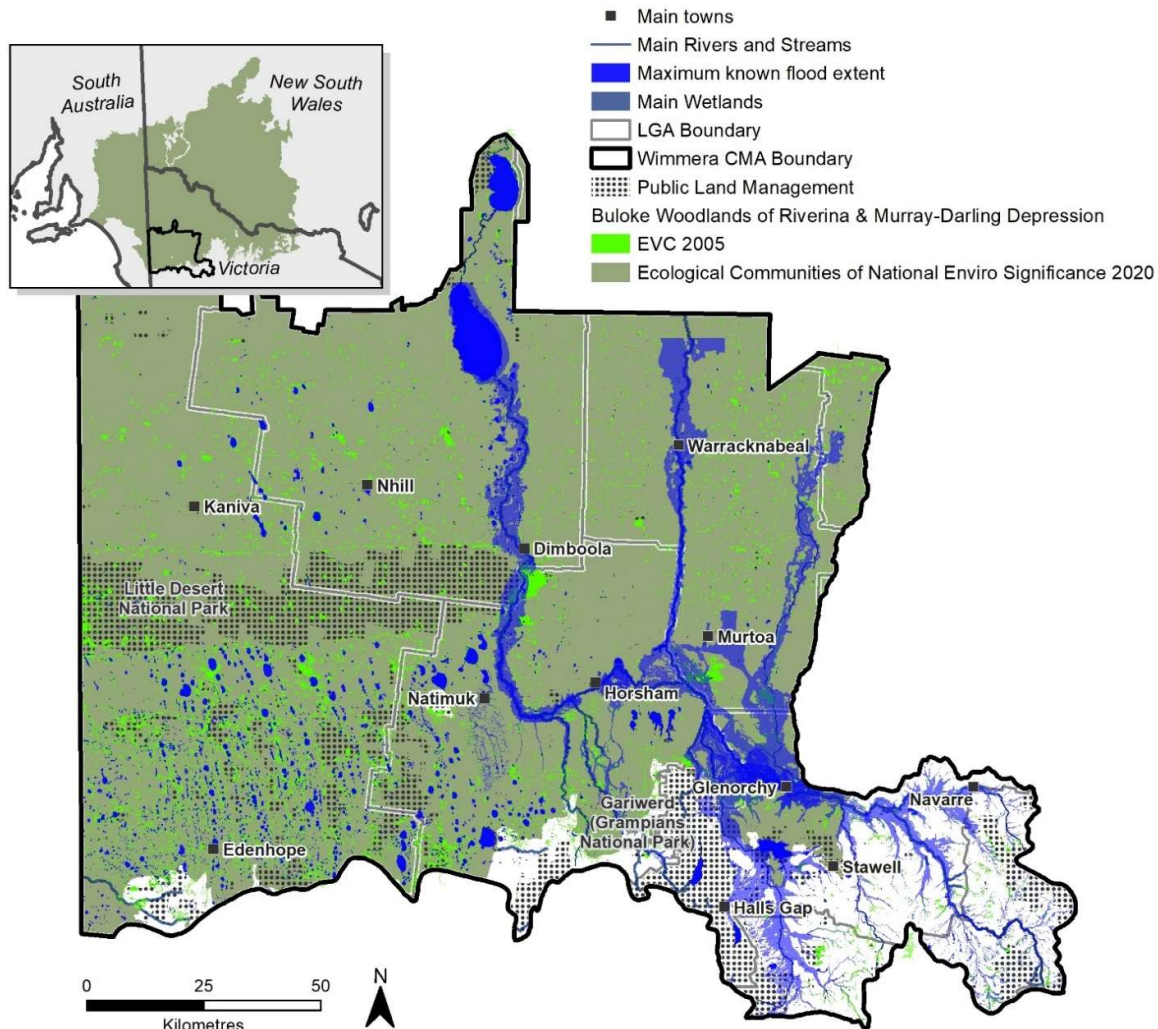


Figure 29. Map showing where the 'Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia' ecological community coincides with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

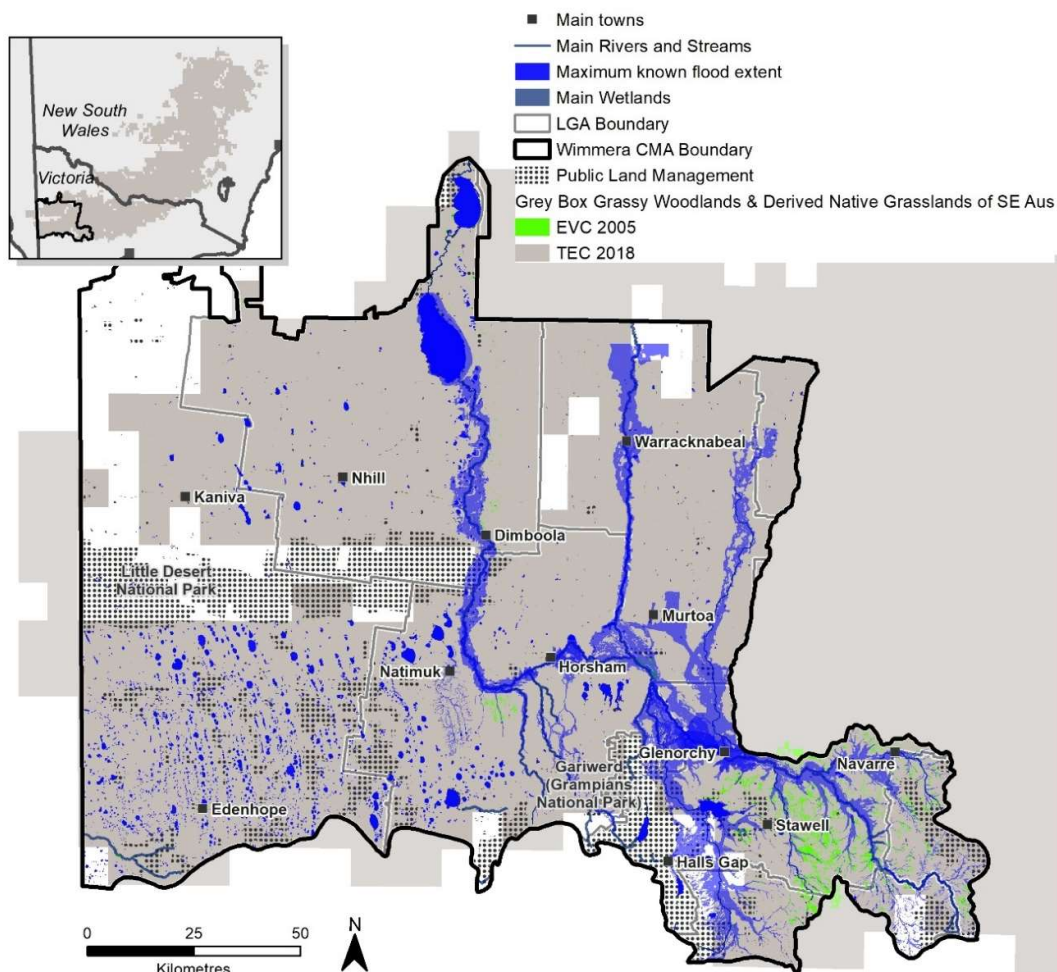


Figure 30. Map showing where the 'Plains Mallee Box Woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions' ecological community coincides with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

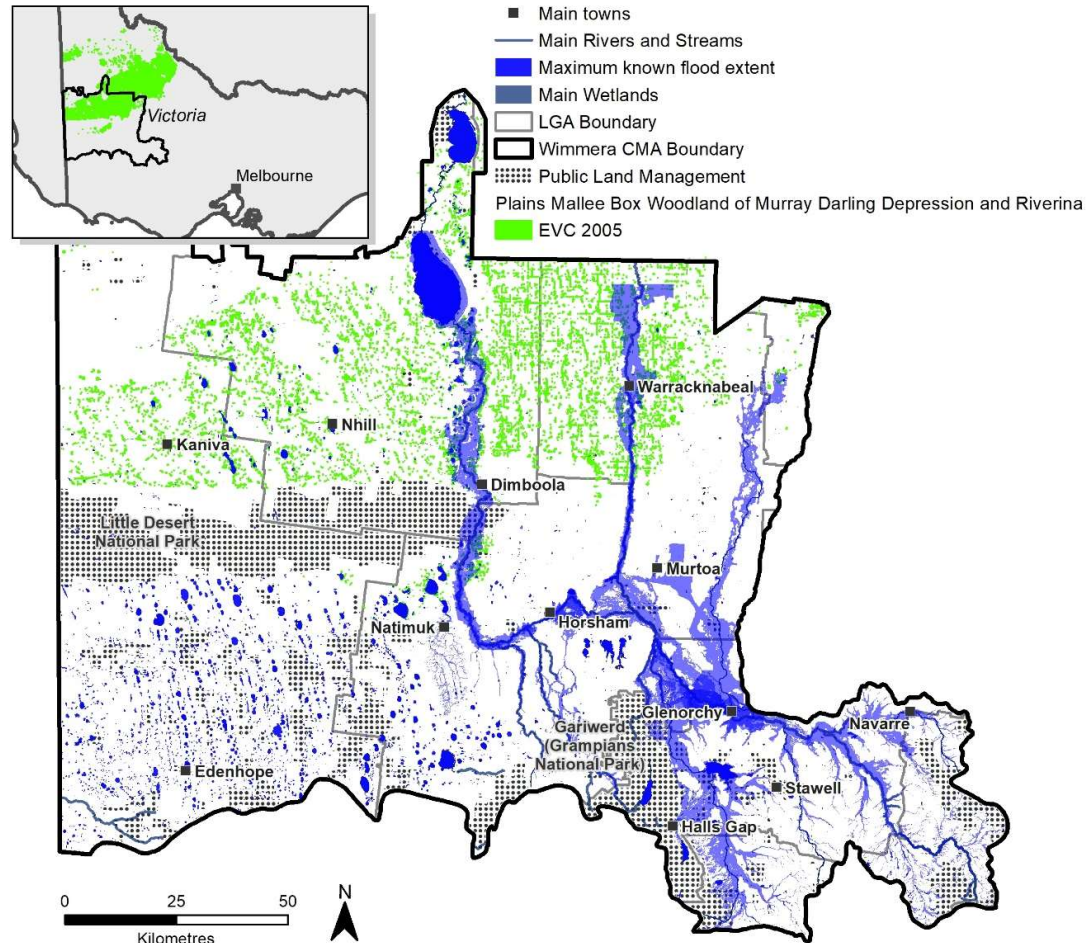


Figure 31. Map showing where the 'White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland' ecological community coincides with the probable maximum flood, or the largest flood that can occur in the Wimmera region from riverine flooding.

