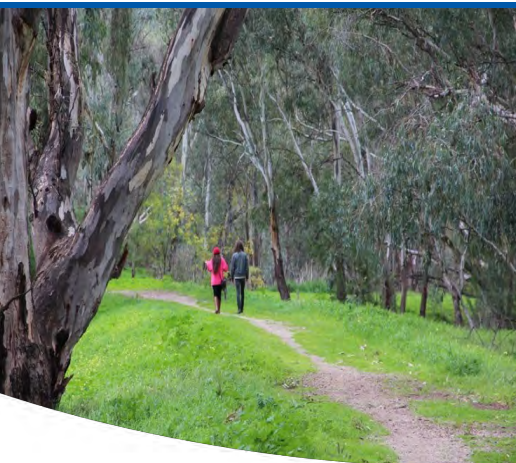




Township Bushfire Mitigation Plan

2016






Authorisation

This Township Bushfire Mitigation Plan has been supported by a working group consisting of representatives from CFA, DELWP and Council on behalf of the Swan Hill Municipal Fire Management Planning Committee (MFMP).

The plan has been considered by all agencies listed within the Action Plan as reflecting the intent of their organisation and the commitment to work together to deliver treatments set out in this Plan.

This plan was endorsed through a formal motion by the MEMPC at their meeting of 8 December 2016.

Signed:  Date: 13-12-16

Cr Les McPhee
Chair
Municipal Emergency Management Planning Committee
Swan Hill Rural City Council



Endorsement

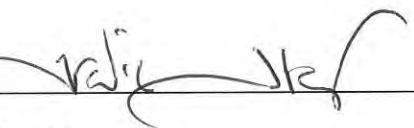
Those here by undersign have review and affirm their support and approval of the plan for their organisations

Signed:  Date: 8/12/2016

Harold Rovere
Municipal Fire Prevention Officer
Swan Hill Rural City Council

Signed:  Date: 8/12/16

John Breaks
Operations Officer, District 18
Country Fire Authority

Signed:  Date: 8 Dec 2016

Travis Storer
Team Leader, Fire Training and Capability Loddon Mallee
Forest Fire Management Victoria
Department of Environmental, Land, Water and Planning

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Acronyms

CBD	Central Business District
CFA	Country Fire Authority
DEECD	Department of Education and Early Childhood Development
DG	Dangerous Goods
DHS	Department of Human Services
DPCD	Department of Planning and Community Development
EMMV	Emergency Management Manual Victoria
EPA	Environmental Protection Agency
EMPO	Emergency Management Projects Officer
CFA	Country Fire Authority
DELWP	Department of Environment, Land, Water and Planning
SHRCC	Swan Hill Rural City Council
TBMP	Township Bushfire Mitigation Plan
MEMPC	Municipal Emergency Management Planning Committee
MEMP	Municipal Emergency Management Plan
FDI	Fire Danger Index
FFDI	Forest Fire Danger Index
FCL	Fire Control Line
GFDI	Grass Fire Danger Index
PMP	Project Management Plan
VFRR	Victorian Fire Risk Register

Introduction

The development of this Township Bushfire Mitigation Plan (TBMP) has been prepared on behalf of the Swan Hill Municipal Fire Management Planning Committee (MFMP).

Development of the planning process for the TBMP has been consistent with the International Standard for Risk Management ISO31000.

The Plan aims to mitigate the risk of bushfire to six townships within the Swan Hill municipality. Townships detailed within this document are considered the municipalities most at risk to a bushfire.

Objectives set for this plan;

- Determine strategic Fire Lines along roads to protect townships from bushfire
- Develop a Mitigation Treatment Plan with identified treatments by agencies to mitigate the risk of bushfire
- Using detailed maps, outline strategic Fire Lines along roads for each township to assist in managing the response to an oncoming bush fire

Fire Line- definition (also known as a firebreak or fire control line) For the purposes of this plan, a 'Fire Line' is a linear fuel reduced area, either natural or constructed that is used to limit the spread of fire and provide access for fire fighters.

Plan Endorsement and Adoption

The endorsement of the Township Bushfire Mitigation Plan has come from the MFMP. A workgroup consisting of CFA Operations, DELWP and Council representatives were responsible to support the development of the plan. It has been passed to appropriate stakeholders for discussion and feedback before final sign off by the MEMPC.

The plan is considered a Sub-Plan to the MEMP and supports the work already identified in the MFMP (2011).

The TBMP has a five-year time line from the date it is endorsed by the MEMPC and will be reviewed annually, with a comprehensive review completed in year five.

The plan will be reviewed and amended:

1. Annually in association with the MFMP;
2. Following significant incidents or change in risk exposure if required;

When a review is undertaken and amendments are made to the Plan, the amended plan is then endorsed by the MFMP and passed on to the MEMP to be 'adopted'.

Townships

Following analysis of bushfire risk within the Municipal Fire Management Plan (MFMP) and the CFA Victorian Fire Risk Register (VFRR) and discussions with CFA Operations, six townships were identified as being at significant risk to a bushfire.

These townships have had a Mitigation Action Plan completed as part of this document.

These towns are;

- Nyah/Nyah West
- Manangatang
- Boundary Bend
- Woorinen South
- Chinkapook
- Ultima

“Worst Most Likely Case” Scenario

Development of the TBMP has considered a 'Worst Most Likely Case' for bushfire. This 'Worst Most Likely Case' scenario would be expected to occur from September to November during grain harvest in the rural areas. Cereal crops are fully cured, with heavy fuel loads from unharvested crops. On a hot, windy day during this time, fires could spread quickly and build intensity, possibly causing significant damage and concern for each of the townships.

Using DELWP scientific fire mapping information, a specific 'Worst Most Likely Case' fire scenario was mapped to detail the fire risk for each township.

The "Worst Most Likely Case" scenario was based on a maximum 38 degree day, with 12% percent relative humidity, winds 30-40kph from the NNW, changing to 40-50kph from the West/South West later in the day. In this scenario, the FDI would reach "Severe" (FFDI of 75 and GFDI 90). This type of weather event is possible to occur from September to November in the mallee and fuel loads have been set to

reflect this time of year. This scenario would allow a fire to fully develop and change the eastern flank into the head fire, which could impact the towns.

Scientific information was prepared by DELWP to allow analysis of the fire risk in this scenario and what a fire may look like in these conditions.

Development of Plan

The development of this plan has involved a systematic planning format aligned with ISO31000. Initial planning involved development of a Project Management Plan (PMP-see Appendix F). The PMP detailed the scope, process, aims and objectives, and stakeholder involvement in development of the plan.

An environmental scan process was completed to understand the risk of a bushfire affecting these townships. Sourcing DELWP scientific evidence and Emergency Management Plans provided a good understanding of the risk for each township.

Plans considered as part of the environmental scan process included;

- Swan Hill Municipal Fire Management Plan (MFMP)
- CFA Brigade Local Response Plans (where applicable)
- Community Information Guides (where applicable)
- DELWP Fire Operation Plans
- DELWP Loddon Mallee Strategic Fire Management Plan
- CFA 150m Targeted Properties (where applicable)

A number of key stakeholders were involved in the development of this plan. Emergency Service agencies including CFA and DELWP (Fire Management), as well as staff from SHRCC and Council's Emergency Management Projects Officer (EMPO) (Swan Hill and Mildura) formed as a workgroup to analyse key information and identify mitigation treatments.

At a local level, CFA brigade Captains and Lieutenants from the specific townships were involved in identifying possible mitigation around their towns. Additional landholder agencies including VicRoads, V-Line, Vic Track and Council were engaged in final decision making for mitigation treatments they were responsible for.

Mitigation Treatment Development

A comprehensive environmental scanning process was completed for each township to understand its bushfire risk.

Aerial maps were developed for each township;

1. A strategic map of the town allowing an understanding of the road network surrounding each township
2. A close up of the township detailing the urban/township interface.

To ensure community knowledge and ownership in the plan process, these maps were used in meetings with CFA brigade Captains and Lieutenants.

Brigade members were asked;

- To outline their concerns of a bushfire heading towards their town
- Identify mitigation they think would be appropriate to mitigate risk to their town
- Identify possible strategic Fire Lines along roads which they would use to defend the town
- Identify mitigation treatments at the township/urban interface

This mapping information was then used as part of a comprehensive analysis planning workshop, facilitated by the Emergency Management Projects Officer (EMPO) and attended by SHMFMP members from CFA Operations, DELWP (Fire Management) and Council.

At this workshop, DELWP scientific fire modelling information ‘Phoenix’ was used to provide evidence of what the bushfire scenario may look like and enable educated decisions on proposed mitigation treatments for each township.

DELWP scientific information that was used within the analysis workshop included;

- ‘Phoenix’ fire scenario modelling
- Fire intensity mapping for each township
- House loss probability mapping
- Ember density mapping

Mitigation treatments identified by the brigades were analysed to ensure it was appropriate and further mitigation was proposed where required based on the scientific evidence.

From the analysis workshop, two mitigation maps were developed for each township (where applicable);

1. Map of strategic Fire Lines along roads surrounding the township (if applicable)
2. Township bushfire mitigation treatments at the township/urban interface

Following the analysis workshop, discussions were held with brigade captains at each town as part of a ‘ground truthing’ exercise which was completed with the workgroup consisting of CFA Operations and DELWP (fire management), and two Council staff including Technical Officers responsible for roads. This exercise involved meeting with local brigades at each town, travelling around each town considering the risk and exposures already identified and then enabled discussion and consensus by the workgroup on what treatments would be appropriate for each town. Identified treatments were then used to develop the Mitigation Action Plan for each town.

Within the Mitigation Action Plan, notes on the mitigation area are detailed. The ‘Lead Agency’ for mitigation is based on the agency who is the public land manager. Additional ‘Support Agencies’ are those agencies that may also manage some of the mitigation area or whom may be responsible to complete mitigation works on the land. CFA in a number of cases will support mitigation areas through burns identified as the ‘Recommended Treatment’. Timelines involving support from CFA may change, depending on the capacity of the brigade to perform the works required.

Each treatment has an identified ‘Priority’ based on timelines to complete the works;

1. Works to be completed within 2 year period
2. Works to be completed within 2-5 year period

Public Land Managers

The management of public land and roads has been considered in the development of mitigation treatments. There are a number of agencies that manage specific areas in and around townships. These include;

DELWP, with Parks Victoria manages fire on Victoria's public land. There is areas of public land within the municipality. Many rural townships have parcels of public land in and around the townships which must be managed for fire. This includes reducing the risk of fire, containing outbreaks and managing environmental effects.

Vic Track has responsibilities for rail reserves in regard to fire prevention. Vic Track focuses its fire prevention program in around townships and built up areas. The responsibility for maintenance of rail corridors is spread between Vic Track and V/Line within the Swan Hill municipality. Vic Track is not a rail operator and has primary responsibility for land on closed lines, disused stations and odd lots adjacent to rail reserves.

V/Line are responsible for management of rail corridors that they lease in the municipality. Some of the rail corridors within the municipality are leased by V/Line and as such are considered an important stakeholder in assisting in mitigation along rail reserves for the TBMP's.

Management of the road network within the Swan Hill municipality is shared between VicRoads and SHRCC. VicRoads manage most of the arterial roads within the municipality, with SHRCC responsible for rural roads and streets within townships. Road responsibilities have been taken into account in developing specific actions along road reserves for both highways and rural roads.

Roadsides are the areas within the road reserve which are not used for motorised vehicle traffic, including land either side of the road and between carriageways. VicRoads has developed a Roadside Management Strategy to outline how these areas are managed.

SHRCC is an important stakeholder in the development of the TBMP's. Council has responsibility for most rural roads in the municipality, as well as town parks and some properties in our townships.



Township Specific Mitigation Plans



Manangatang

Environmental Scan

Geographic Area and Layout

Manangatang is a small township along the Mallee Highway within the mallee district. It has a population of 479¹. The area is a well-known cereal and sheep farming area. The township has a P-12 school, hotel and a number of shops within its main street.

Bushfire Risk

The risk of bushfire coming towards the town is based on potential for crop or stubble fires leading to the township/urban interface. Most properties on the boundary are surrounded by rural paddocks or public managed land.

Water Supply

The town has a reticulated water supply within the township.

Aircraft Support

Depending on the time of year, aircraft support for fires in the area may be available in a relatively short time from Sea Lake where air support is located to provide provision over the grain harvest period from October to December.

Air support outside of these months or for additional support would have to be accessed from areas some distance from the municipality.

Access/Egress Roads

Primary Access/Egress to the township is from the Mallee Highway. A secondary access/egress is along the Robinvale- Sea Lake Road.

Brigade Support

The local CFA brigade has sufficient capacity, with support often sourced from brigades close by at Chinkapook, Boundary Bend and Robinvale . The Manangatang Fire Brigade is a member of the Robinvale Fire Brigades Group.

¹ Population Source 2011 Census

Fuel Type

The Manangatang township is surrounded predominantly from rural properties, many of which are cereal crops leading into summer. At the urban/township interface there is a small area of mallee vegetation to the northern area of the township, managed by DELWP and PV.

<i>Appendix B: Township Bushfire Mitigation Plan Actions</i>									
<u>Township</u>	<u>Mitigation Number</u>	<u>Notes on Mitigation Area</u>	<u>Recommended Treatment</u>	<u>Desired Outcome</u>	<u>Lead Agency</u>	<u>Support Agency</u>	<u>Priority</u>	<u>Complete</u>	<u>Special Management Zone</u>
Manangatang	1	Sutton Road will be considered the main FCL for a fire coming from the NW towards the township. The road is to be maintained to allow for fire fighting purposes. Roadside vegetation is considered to be acceptable but will need to be monitored if this changes.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		1		
Manangatang	2	Laneway on West side of township to be developed as a secondary FCL at the township/urban interface. Laneway needs some works to amend pot holes and to allow use by fire services. Roadside vegetation is currently acceptable but will need to be monitored.	Develop and implement ongoing road treatment plan for laneway to enable fire service access in an emergency	Laneway is structured to allow fire services to use this laneway in times of fire.	SHRCC		2		
Manangatang	3	Vegetation area between rail reserve and Robinvale Sea-Lake Road at the south of township needs to be monitored for fire risk. Workgroup suggested fuel load is 'moderate', and if fire is in this area, it shouldn't cause to many concerns for the township. However the workgroup suggested biannual monitoring of this area	Monitor this area on biannual basis to consider fuel loads and risk to the township.	Vegetation area is monitored for potential fire risk	CFA		2		
Manangatang	4	CFA brigade should hold discussions with the private land holder of property surrounding the township from the south west to ensure that an appropriate mineral earth break is in place for the fire season.	CFA hold discussions with PLH for development of mineral earth break for fire season	Mineral earth break is in place in lead in to the fire season	CFA		2		



Chinkapook Environmental Scan

Geographic Area and Layout

Chinkapook is a small rural township within the Swan Hill Rural City Council area located 60kms north west of Swan Hill. The township has a public hall, local CFA brigade station and wheat silos and bunkers for rural farms.

Bushfire Risk

The risk of bushfire coming towards the town is based on potential for crop or stubble fires leading towards the township, which is surrounded by public land managed by DELWP and PV on many sides.

Water Supply

The town has a reticulated water supply within the township.

Aircraft Support

Depending on the time of year, aircraft support for fires in the area may be available in a relatively short time from Sea Lake where air support is located to provide provision over the grain harvest period from October to December.

Air support outside of these months or for additional support would have to be accessed from areas some distance from the municipality.

Access/Egress Roads

Primary Access/Egress to the township is from the Chinkapook Nyah-West Road. A secondary access/egress is along the Robinvale-Sea lake Road.

Brigade Support

The local CFA brigade has limited capacity, with support often sourced from brigades close by. The Chinkapook Fire Brigade is a member of the Robinvale Fire Brigades Group.

Fuel Type

Chinkapook is surrounded predominantly from rural properties, many of which are cereal crops leading into summer. At the urban/township interface there is an area of mallee vegetation surrounding many sides of the township.

<i>Appendix B: Township Bushfire Mitigation Plan Actions</i>									
<u>Township</u>	<u>Mitigation Number</u>	<u>Notes on Mitigation Area</u>	<u>Recommended Treatment</u>	<u>Desired Outcome</u>	<u>Lead Agency</u>	<u>Support Agency</u>	<u>Priority</u>	<u>Completion</u>	<u>Special Management Zone</u>
Chinkapook	1	There is some concern of the Box Flat Bushland Reserve that surrounds the township from the north and west side of the town. A planned burn was completed approximately 5 years ago. Current fuel load has been estimated to be 'moderate' with an indicative fuel load of 8 tonnes per hectare. DELWP will consider most appropriate method of mitigation for this area for current and future timelines.	DELWP to determine appropriate mitigation measures to reduce the risk for now and in the future. Feedback to the MFMPC on what mitigation will be.	DELWP implements most appropriate mitigation method to reduce risk for now and in the future.	DELWP		2		
Chinkapook	2	Area of land in town around the silos and CFA brigade building to have a burn completed by the local CFA brigade to reduce fuels within the township.	proposed burn of fuels conducted by the Chinkapook CFA	Reduce fuels on open land within the township	Land manager agency to be determined	CFA	2		

Boundary Bend Environmental Scan

Geographic Area and Layout

Boundary Bend is a small town located along the Murray River, 50kms east of Robinvale and 90kms north of Swan Hill. It has a population of 254². The township is a popular spot for fishing and camping along the river. The township is now well regarded for its olive and almond plantations which have been planted in recent times in large volumes.

Bushfire Risk

The risk of a large scale bushfire occurring at Boundary bend is limited, however there is a potential for fire coming from the park lands next to the Murray River to the north and north west of town.

Water Supply

The town has a reticulated water supply within the township.

Aircraft Support

Depending on the time of year, aircraft support for fires in the area may be available in a relatively short time from Sea Lake where air support is located to provide provision over the grain harvest period from October to December.

Air support outside of these months or for additional support would have to be accessed from areas some distance from the municipality.

Access/Egress Roads

Primary Access/Egress to the township is from the Murray Valley Highway. A secondary access/egress is along the Boundary Bend-Kooloonong Road.

² 2011 Census Data

Brigade Support

The local CFA brigade has good capacity, with support often sourced from brigades close by at Chinkapook, and Robinvale. The Boundary Bend Fire Brigade is a member of the Robinvale Fire Brigades Group.

Fuel Type

Boundary Bend is surrounded predominantly from rural properties, many of which are almond and olive plantations. To the north and north west there is an area of mallee vegetation along the river, which much of the town lies.

Appendix B: Township Bushfire Mitigation Plan Actions

<u>Township</u>	<u>Mitigation Number</u>	<u>Notes on Mitigation Area</u>	<u>Recommended Treatment</u>	<u>Desired Outcome</u>	<u>Lead Agency</u>	<u>Support Agency</u>	<u>Priority</u>	<u>Completion</u>	<u>Special Management Zone</u>
Boundary Bend	1	Tracks along the river area to the north, north west of township need to be maintained to allow access for fire fighters in times of emergency. Local brigade has identified the risk of fire crossing the river from NSW into Victoria. This area is managed by PV Robinvale.	Maintain tracks along the river to enable emergency services to fight a fire in times of emergency.	Fire services have accessibility to fight fires along the river around Boundary Bend.	DELWP		1		



Woorinen South Environmental Scan

Geographic Area and Layout

Located 11kms north west of Swan Hill, Woorinen South has a population of 311³. It contains a number of small businesses and has a diverse agricultural area producing stone fruit, wine grapes, cereal crops, wool and vegetables.

Bushfire Risk

The risk of bushfire coming towards the town is based on potential for crop or stubble fires leading to the township/urban interface. Most properties on the boundary are surrounded by rural paddocks or public managed land which is located to the north and north west of the township.

Water Supply

The town has a reticulated water supply within the township.

Aircraft Support

Depending on the time of year, aircraft support for fires in the area may be available in a relatively short time from Sea Lake where air support is located to provide provision over the grain harvest period from October to December.

Air support outside of these months or for additional support would have to be accessed from areas some distance from the municipality.

Access/Egress Roads

Primary Access/Egress to the township is from the Woorinen-Vinifera Road or North South Road.

Brigade Support

The local CFA brigade has good capacity, with support often sourced from brigades close by. The Woorinen South Fire Brigade is a member of the Mid-Murray Fire Brigades Group.

³ 2011 Census Data

Fuel Type

Woorinen South is surrounded predominantly from rural properties. Many of these to the north, north west and south of the town are cereal-based crops. At the urban /township interface, there is an area of mallee vegetation to the northern area of the township, managed by DELWP and PV.

<i>Appendix B: Township Bushfire Mitigation Plan Actions</i>									
<u>Township</u>	<u>Mitigation</u>		<u>Recommended</u>						<u>Special Management</u>
	<u>Number</u>	<u>Notes on Mitigation Area</u>	<u>Treatment</u>	<u>Desired Outcome</u>	<u>Lead Agency</u>	<u>Support Agency</u>	<u>Priority</u>	<u>Complete</u>	<u>Zone</u>
Woorinen South	1	Woorinen South Bushland Reserve, north east corner is considered a significant risk if a fire starts or ends up in this reserve. Currently there is no mineral earth break between private property boundary and the reserve. Fuel hazard is considered "high". Mitigation works along this area needs to be completed to reduce the fire risk to these homes and the community.	Proposed works to be completed include a mineral earth break along the property and reserve boundary, and clear existing tracks within the reserve to the west of the boundary.	Development of mineral earth break between the reserve and private properties to north east.	DELWP		1		
Woorinen South	2	Area of public land at the back of homes along Woorinen-Vinefera Road and between the football oval has become an area where car bodies and rubbish have been displaced. Suggested works by the Swan Hill MFMPPO to monitor this area for fire prevention has been suggested.	Swan Hill MFPO to monitor this area of land for fire prevention and issue notices where required.	The area of land is not used to displace waste on public land	SHRCC		1		
Woorinen South	3	Area of land in town around the rail line and CFA brigade building to have a burn completed by the local CFA brigade to reduce fuels surrounding the township to the south.	proposed burn of fuels on open land conducted by the Woorinen South CFA	Reduce fuels on open land within the township	Land manager agency to be determined	CFA	2		
Woorinen South	4	Bulga Road considered FCL from the south west for the township. Well developed and maintained road, no extra works identified for this road.	Maintain current road management regime	Road is maintained in current form to provide a FCL for brigades in time of emergency.	SHRCC		2		



Nyah/Nyah West Environmental Scan

Geographic Area and Layout

These two townships are located 27kms north west of Swan Hill. Nyah has a population of 256⁴ and Nyah West 477⁵. Nyah is located along the Murray Valley Highway, while Nyah West is located 4.5kms east of Nyah along the Nyah West Road.

Bushfire Risk

The risk of bushfire coming towards the town is based on potential for crop or stubble fires leading to the township/urban interface of both Nyah and Nyah West. Most properties on the boundary are surrounded by rural paddocks.

Water Supply

The town has a reticulated water supply within the township.

Aircraft Support

Depending on the time of year, aircraft support for fires in the area may be available in a relatively short time from Sea Lake where air support is located to provide provision over the grain harvest period from October to December.

Air support outside of these months or for additional support would have to be accessed from areas some distance from the municipality.

Access/Egress Roads

Primary Access/Egress for Nyah is via the Murray Valley Highway. A secondary access/egress is along Nyah West Road. For the township of Nyah West, primary access/egress is via Chinkapook-Nyah West Road with a secondary access/egress road being Ross Road.

⁴ 2011 Census Data

⁵ 2011 Census Data

Brigade Support

The local CFA brigade has limited capacity, with support often sourced from brigades close by. The Nyah West Fire Brigade is a member of the Mid-Murray Fire Brigades Group.

Fuel Type

Nyah and Nyah West townships are surrounded predominantly from rural properties, many of which are cereal crops leading into summer. At the urban/township interface there is an area of public land to the north west of Nyah which is considered a risk to a number of homes abutting this land.

Appendix B: Township Bushfire Mitigation Plan Actions									
Township	Mitigation Number	Notes on Mitigation Area	Recommended Treatment	Desired Outcome	Lead Agency	Support Agency	Priority	Complete	Special Management Zone
Nyah	1	Yarraby Road will be considered a FCL for Nyah, allowing emergency services to fight a fire coming from the north of the township. The road is a well maintained bitumen road. Reduction of roadside vegetation is required in some areas along the road towards Nyah West.	Develop slashing treatment plan (on North side of road) of appropriate areas along the road.	Reduction in roadside vegetation along north side of road (where applicable)	SHRCC		1		
Nyah	1	Yarraby Road will be considered a FCL for Nyah, allowing emergency services to fight a fire coming from the north of the township. The road is a well maintained bitumen road. Reduction of roadside vegetation is required in some areas along the road towards Nyah West.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2		
Nyah	2	Nyah Bushland Reserve to the north of the township. Local brigade has concerns with this area and the risk to the township if a fire occurs in this area. Discussion with DELWP has considered the fuel hazard to be 'high'. Currently there is no mineral earth break between the private property boundary and the reserve. Mitigation options to be considered include creating a fire break to fit tankers along the boundary or clear existing tracks within the reserve to allow better access to the reserve for fire fighting purposes.	DELWP to determine appropriate mitigation measures to reduce the risk for now and in the future. Feedback to the MFMPCC on what mitigation will be.	To reduce the risk to private homes along the boundary to the reserve, to enable fire fighting agencies access to protect homes.	DELWP		2		
Nyah West	1	Yarraby Road will be considered a FCL for Nyah West, allowing emergency services to fight a fire coming from the north of the township. The road is a well maintained bitumen road.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2		
Nyah West	2	Ross Road to be considered a FCL to protect fore from the west of the township. Road and roadside vegetation are considered acceptable for this purpose.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2		
Nyah West	3	Bodinnar Road to be used as a FCL to protect fire coming from south west. Road is not wide and reduction of fuel loads along roadside vegetation on both sides of road will enable better protection and support for brigades.	Complete strip burn along roadside vegetation (east side of road) to enable larger break and support for fire fighters on the FCL.	provide a wider break for the FCL to be implemented in times of emergency.	SHRCC	CFA	1		
Nyah West	3	Bodinnar Road to be used as a FCL to protect fire coming from south west. Road is not wide and reduction of fuel loads along roadside vegetation on both sides of road will enable better protection and support for brigades.	Complete strip burn along roadside vegetation (west side of road) to enable larger break and support for fire fighters on the FCL.	provide a wider break for the FCL to be implemented in times of emergency.	SHRCC	CFA	2		
Nyah West	4	Area at the township/urban interface to the north of the township to be monitored for unsightly land notices	Swan Hill MFPO to monitor this area of land for unsightly property and issue notices where required.	Reduce unsightly land occurrences at the township/urban interface	SHRCC		2		
Nyah West	5	The local CFA brigade considers the area of land surrounding the station and rail reserve to be a fire risk. Determination of land owner and works to be completed to reduce the fuel load in this area is required.	Determine owner of land in this area and consider mitigation treatments to be implemented to reduce the risk to the community.	Identify land owner to then organise mitigation of fuel load on this land.	SHRCC		2		



Ultima Environmental Scan

Geographic Area and Layout

Ultima is a small township with a population of 333⁶, set 30kms south west of Swan Hill. It has a strong rural farming community, which provides support to the township area.

Bushfire Risk

The risk of bushfire coming towards the town is based on potential for crop or stubble fires leading to the township/urban interface. Most properties on the boundary are surrounded by rural paddocks or public managed land.

Water Supply

The town has a reticulated water supply within the township.

Aircraft Support

Depending on the time of year, aircraft support for fires in the area may be available in a relatively short time from Sea Lake where air support is located to provide support over the grain harvest period from October to December.

Air support outside of these months or for additional support would have to be accessed from areas some distance from the municipality.

Access/Egress Roads

Primary Access/Egress to the township is from the Sea Lake-Swan Hill Road. A secondary access/egress is along the Ultima-Culgoa Road.

⁶ 2011 Census Data

Brigade Support

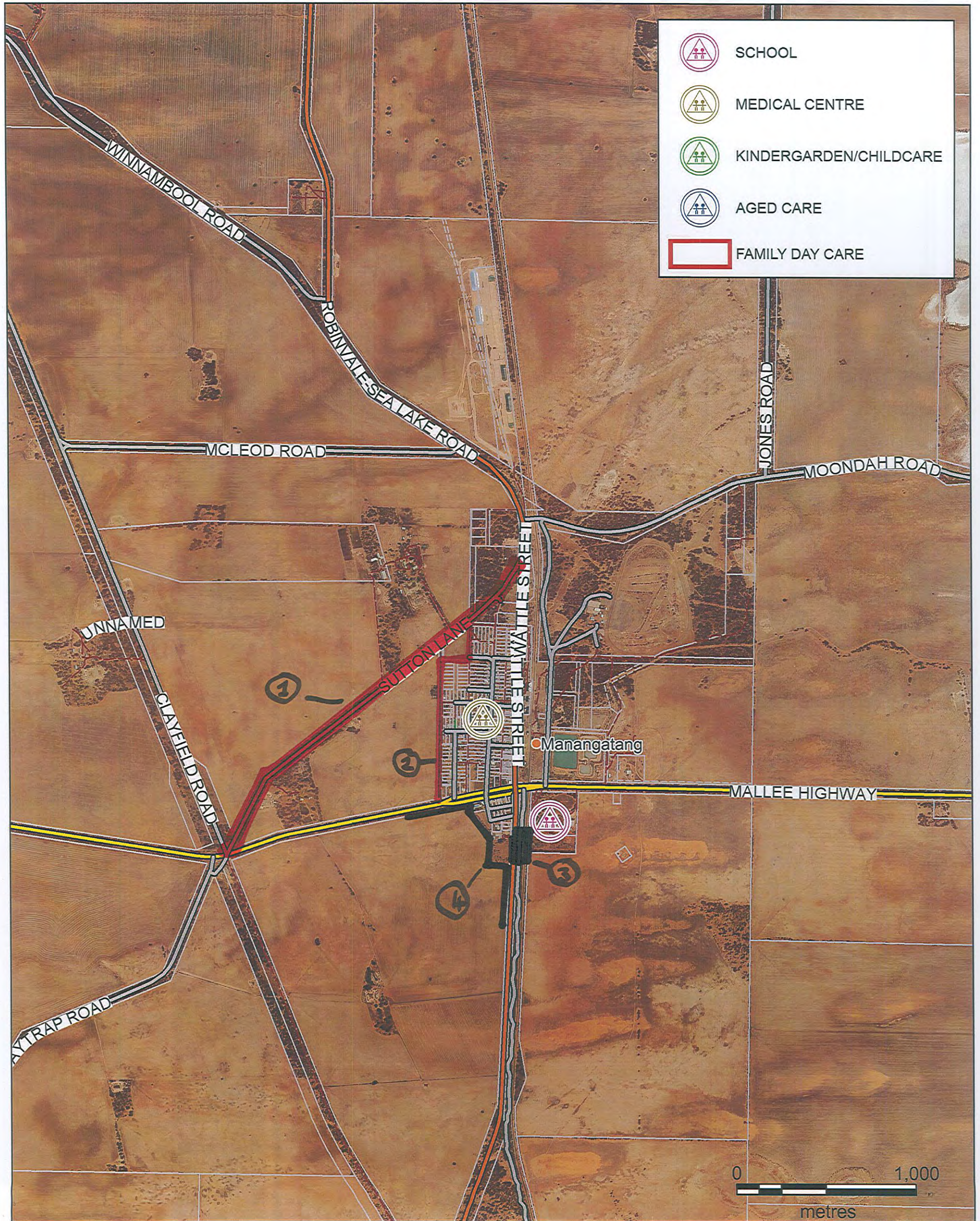
The local CFA brigade has limited capacity, with support often sourced from brigades closer to Swan Hill. The Ultima Fire Brigade is a member of the Mid-Murray Fire Brigades Group.

Fuel Type

The Ultima township is surrounded predominantly by rural properties, many of which are cereal crops leading into summer. These paddocks abut most areas of the town. On the east side of the township is public land managed by DELWP.

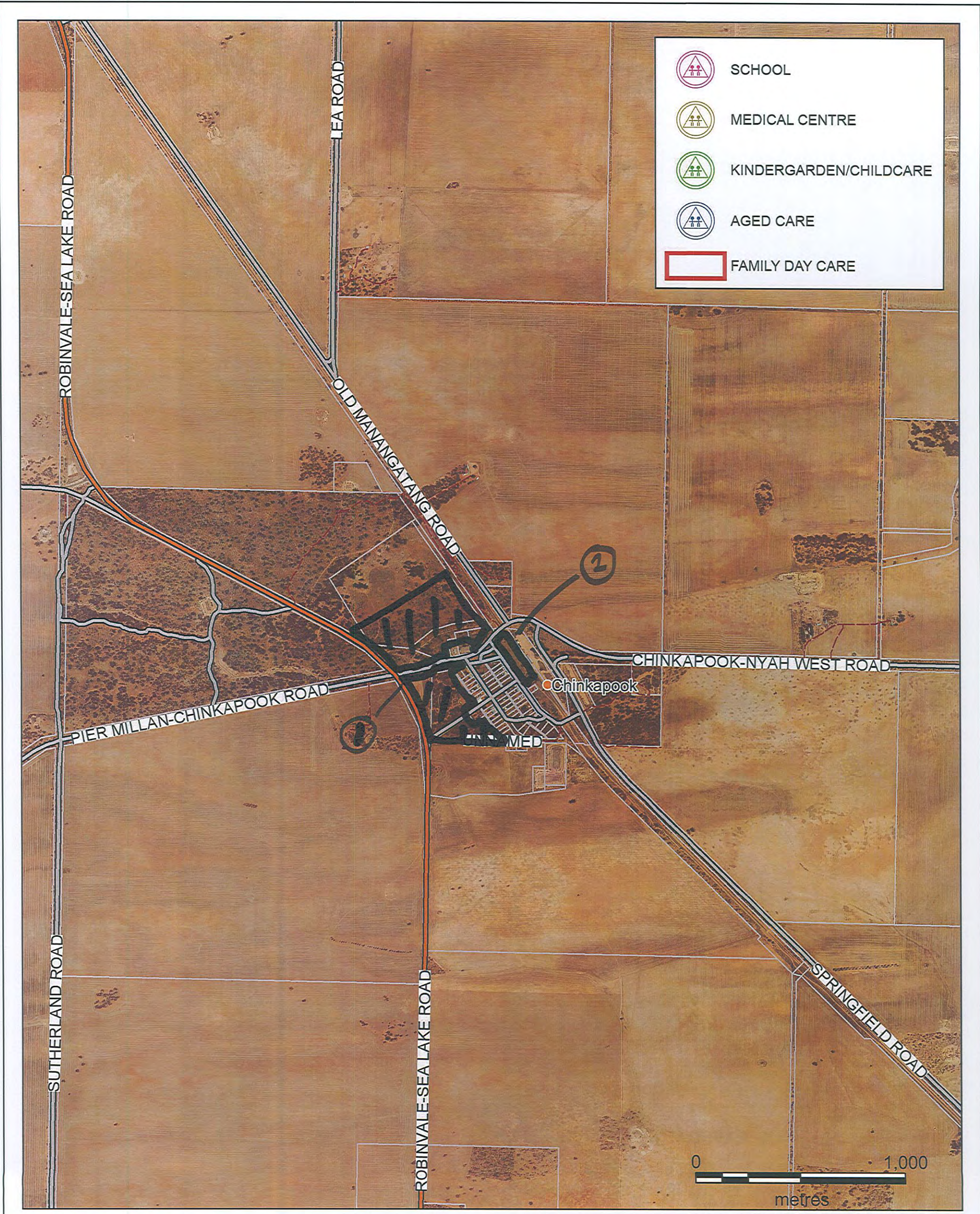
<i>Appendix B: Township Bushfire Mitigation Plan Actions</i>									
<u>Township</u>	<u>Mitigation</u>		<u>Recommended</u>						<u>Special Management</u>
	<u>Number</u>	<u>Notes on Mitigation Area</u>	<u>Treatment</u>	<u>Desired Outcome</u>	<u>Lead Agency</u>	<u>Support Agency</u>	<u>Priority</u>	<u>Complete</u>	<u>Zone</u>
Ultima	1	The Culgoa-Ultima Road is considered a FCL for the township, for a fire from the north west and south west. There is some vegetation on the road side but the workgroup did not consider that any works needed to be completed at this time. Ongoing monitoring of the roadside vegetation is suggested.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2		
Ultima	1	The Culgoa-Ultima Road is considered a FCL for the township, for a fire from the north west and south west. There is some vegetation on the road side but the workgroup did not consider that any works needed to be completed at this time. Ongoing monitoring of the roadside vegetation is suggested.	Monitor road side vegetation area on biannual basis to consider fuel loads and risk to the township.	Roadside vegetation does not affect the use of the road as an effective FCL.	CFA		2		
Ultima	2	CFA brigade should hold discussions with the private land holder of property surrounding the township from the west of the township to ensure that an appropriate mineral earth break is in place for the fire season, when the paddock is in crop.	CFA hold discussions with PLH for possible development of mineral earth break around crop on west side of township in lead in to fire season.	Mineral earth break is in place around crop in lead in to the fire season.	CFA		2		
Ultima	3	Taverner Street to be used as a FCL for fire coming towards the township from the south. Road is appropriate but ongoing monitoring of roadside vegetation is required by local CFA brigade to monitor this. Currently vegetation is acceptable but needs to be monitored.	Monitor road side vegetation area on biannual basis to consider fuel loads and risk to the township.	Roadside vegetation does not affect the use of the road as an effective FCL.	CFA		2		





	SCHOOL
	MEDICAL CENTRE
	KINDERGARDEN/CHILDCARE
	AGED CARE
	FAMILY DAY CARE

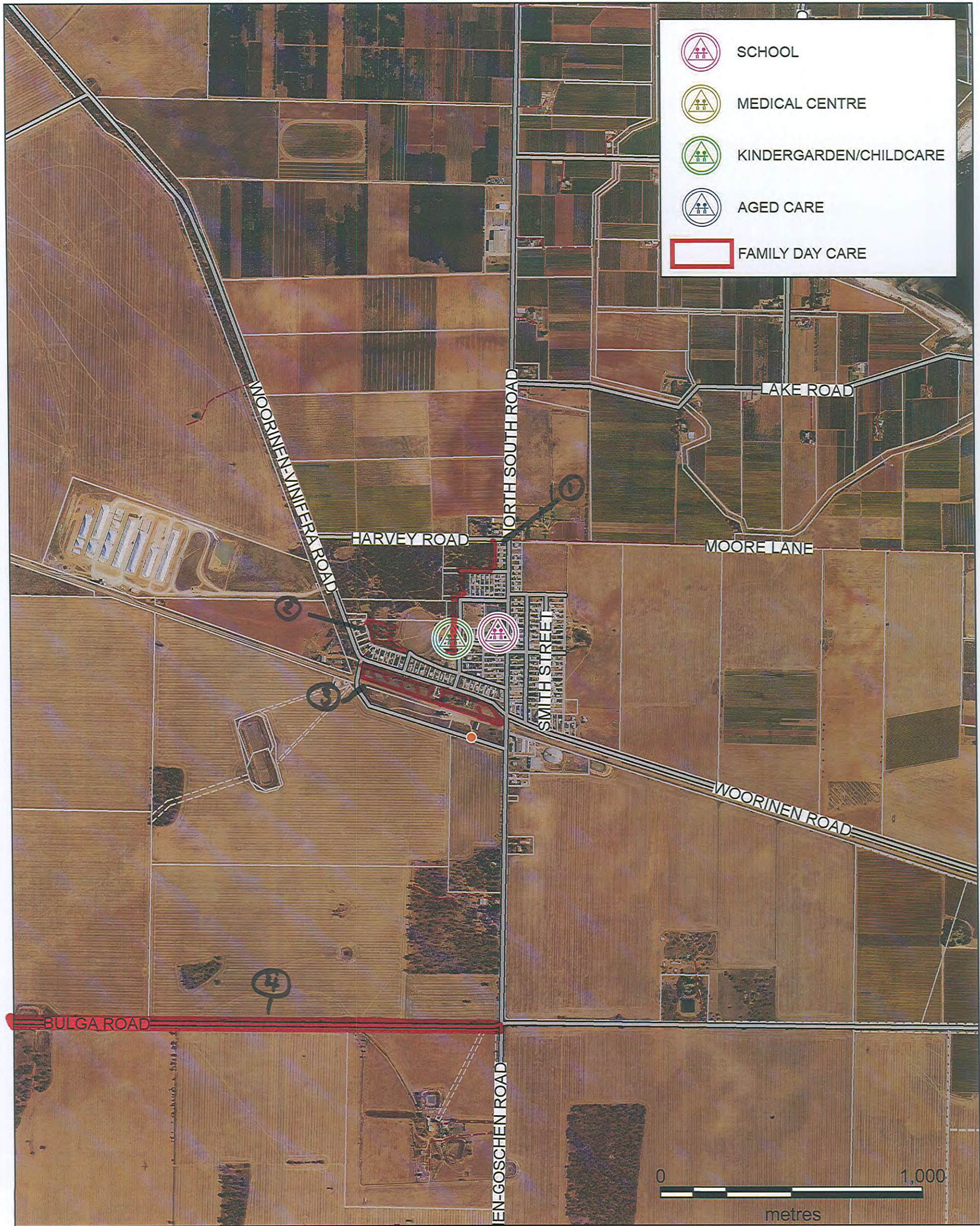
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DRAWN: D.MARTIN	<p>NORTH</p>		00 000	<p>MANANGATANG</p>
CHECKED: CHECKED			01/01	
APPROVED: APPROVED				
MAPINFO FILENAME: HAZMAT.WOR				









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DRAWN: D.MARTIN	 <p>NORTH</p>		00 000	CHINKAPOOK
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APPROVED: APPROVED				
MAPINFO FILENAME: HAZMAT.WOR				



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DRAWN: D.MARTIN	<p>NORTH</p>		00 000	<p>BOUNDARY BEND</p>
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APPROVED: APPROVED				
MAPINFO FILENAME: HAZMAT.WOR				



-  SCHOOL
-  MEDICAL CENTRE
-  KINDERGARDEN/CHILDCARE
-  AGED CARE
-  FAMILY DAY CARE

SURVEYED: N/A	DATE: 5/11/14
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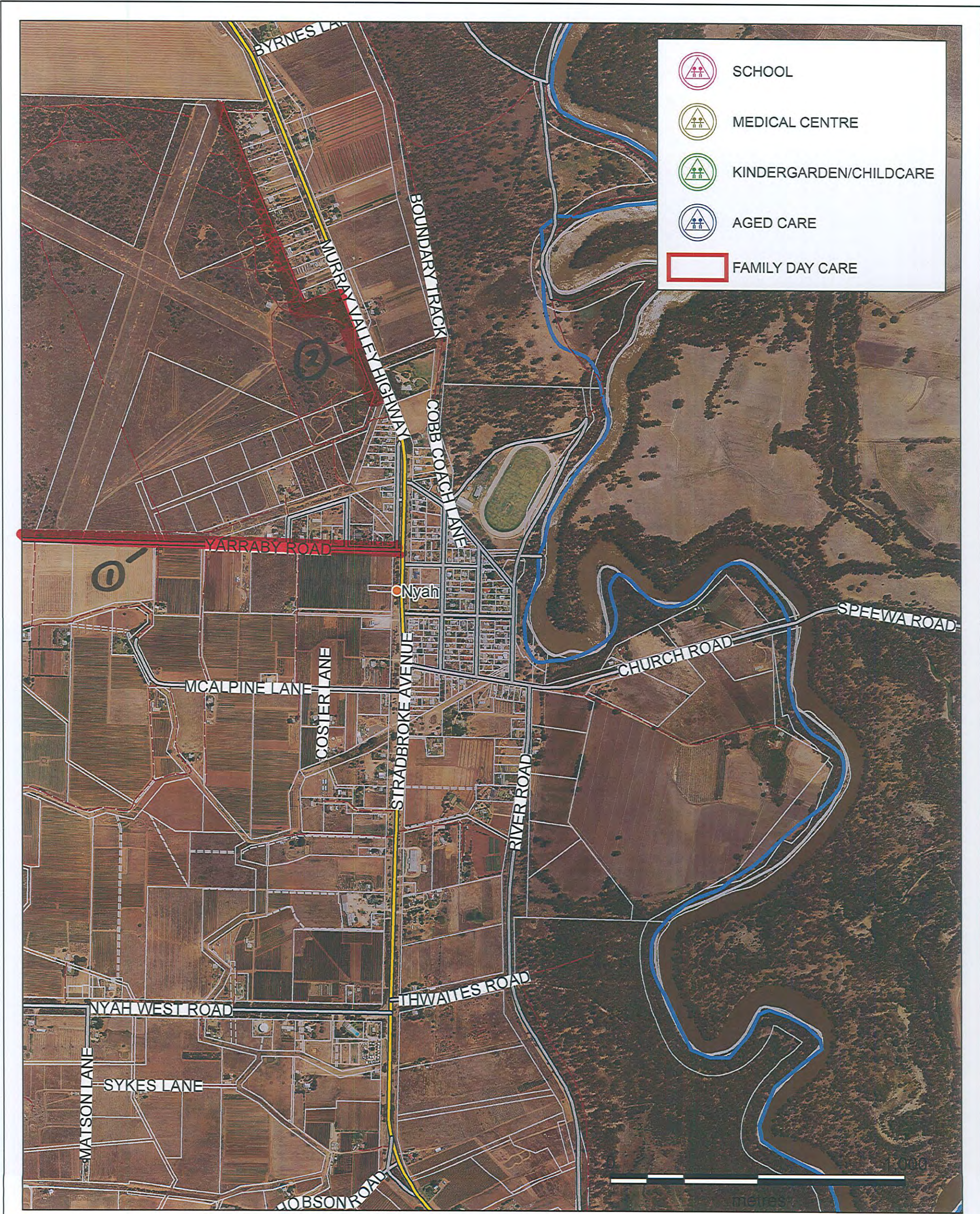


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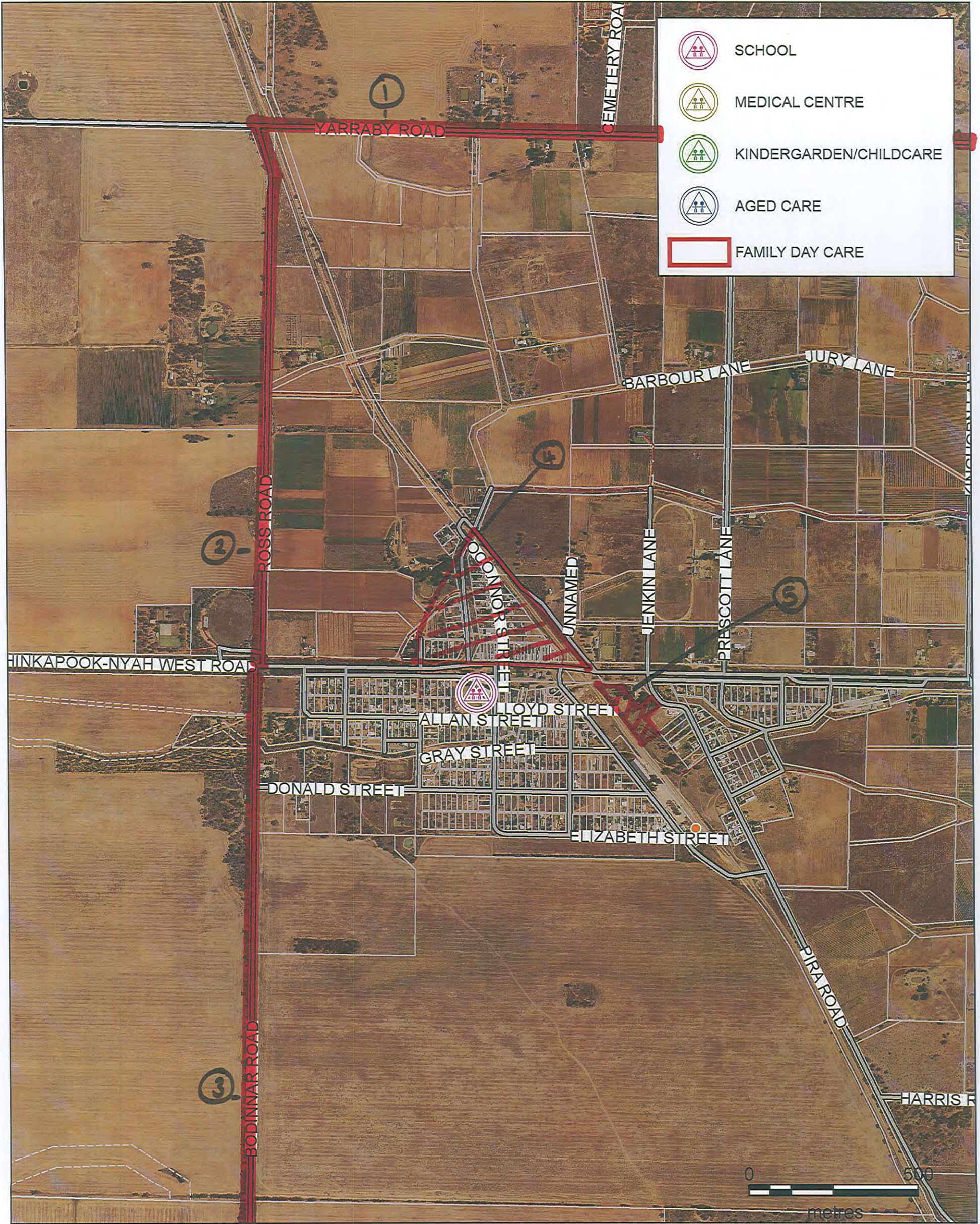
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TITLE:

WOORINEN
SOUTH



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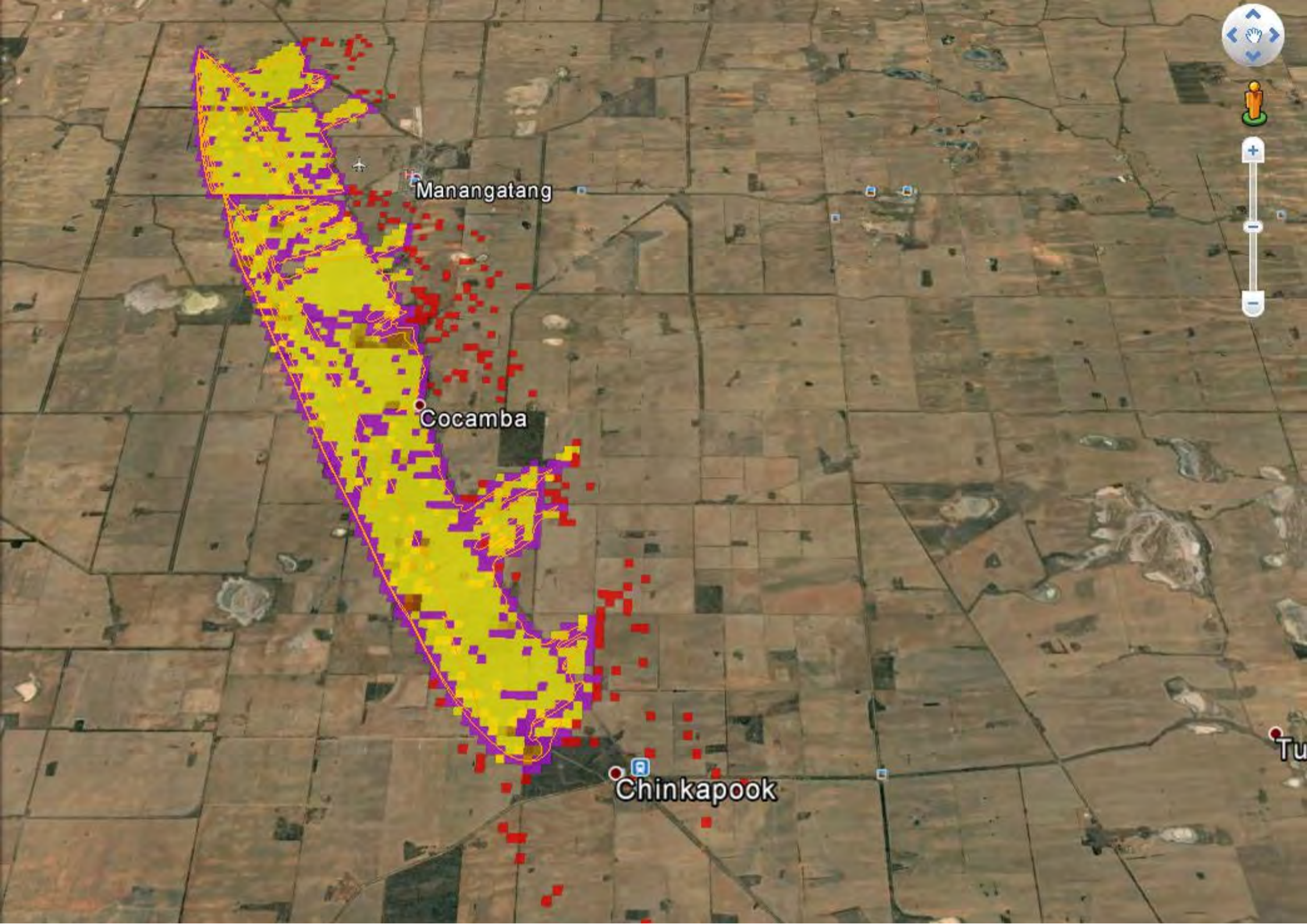


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MAPINFO FILENAME: HAZMAT.WOR				

Township Bushfire Mitigation Plan Actions by Priority

<u>Township</u>	<u>Mitigation Number</u>	<u>Notes on Mitigation Area</u>	<u>Recommended Treatment</u>	<u>Desired Outcome/s</u>	<u>Lead Agency</u>	<u>Support Agency</u>	<u>Priority</u>	<u>Completed</u>	<u>Special Management Zone</u>
Manangatang	1	Sutton Road will be considered the main FCL for a fire coming from the NW towards the township. The road is to be maintained to allow for fire fighting purposes. Roadside vegetation is considered to be acceptable but will need to be monitored if this changes.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		1		
Woorinen South	1	Woorinen South Bushland Reserve, north east corner is considered a significant risk if a fire starts or ends up in this reserve. Currently there is no mineral earth break between private property boundary and the reserve. Fuel hazard is considered "high". Mitigation works along this area needs to be completed to reduce the fire risk to these homes and the community.	Proposed works to be completed include a mineral earth break along the property and reserve boundary, and clear existing tracks within the reserve to the west of the boundary.	Development of mineral earth break between the reserve and private properties to north east.	DELWP		1		
Woorinen South	2	Area of public land at the back of homes along Woorinen-Vinefera Road and between the football oval has become an area where car bodies and rubbish have been displaced. Suggested works by the Swan Hill MFMPO to monitor this area for fire prevention has been suggested.	Swan Hill MFPO to monitor this area of land for fire prevention and issue notices where required.	The area of land is not used to displace waste on public land	SHRCC		1		
Nyah	1	Yarraby Road will be considered a FCL for Nyah, allowing emergency services to fight a fire coming from the north of the township. The road is a well maintained bitumen road. Reduction of roadside vegetation is required in some areas along the road towards Nyah West.	Develop slashing treatment plan (on North side of road) of appropriate areas along the road.	Reduction in roadside vegetation along north side of road (where applicable)	SHRCC		1		
Nyah West	3	Bodinnar Road to be used as a FCL to protect fire coming from south west. Road is not wide and reduction of fuel loads along roadside vegetation on both sides of road will enable better protection and support for brigades.	Complete strip burn along roadside vegetation (east side of road) to enable larger break and support for fire fighters on the FCL.	provide a wider break for the FCL to be implemented in times of emergency.	SHRCC	CFA	1		
Boundary Bend	1	Tracks along the river area to the north, north west of township need to be maintained to allow access for fire fighters in times of emergency. Local brigade has identified the risk of fire crossing the river from NSW into Victoria. This area is managed by PV Robinvale.	Maintain tracks along the river to enable emergency services to fight a fire in times of emergency.	Fire services have accessibility to fight fires along the river around Boundary Bend.	DELWP		1		
All		Road manager to maintain current road management regime for major roads leading into/out of townships to enable community to move from oncoming fire.	Maintain current road management regime	roads safe for movement of community in times of danger	VicRoads SHRCC		1		
Manangatang	2	Laneway on West side of township to be developed as a secondary FCL at the township/urban interface. Laneway needs some works to amend pot holes and to allow use by fire services. Roadside vegetation is currently acceptable but will need to be monitored.	Develop and implement ongoing road treatment plan for laneway to enable fire service access in an emergency	Laneway is structured to allow fire services to use this laneway in times of fire.	SHRCC		2		
Manangatang	3	Vegetation area between rail reserve and Robinvale Sea-Lake Road at the south of township needs to be monitored for fire risk. Workgroup suggested fuel load is 'moderate', and if fire is in this area, it shouldn't cause too many concerns for the township. However the workgroup suggested biannual monitoring of this area	Monitor this area on biannual basis to consider fuel loads and risk to the township.	Vegetation area is monitored for potential fire risk	CFA		2		
Manangatang	4	CFA brigade should hold discussions with the private land holder of property surrounding the township from the south west to ensure that an appropriate mineral earth break is in place for the fire season.	CFA hold discussions with PLH for development of mineral earth break for fire season	Mineral earth break is in place in lead in to the fire season	CFA		2		
Woorinen South	3	Area of land in town around the rail line and CFA brigade building to have a burn completed by the local CFA brigade to reduce fuels surrounding the township to the south.	proposed burn of fuels on open land conducted by the Woorinen South CFA	Reduce fuels on open land within the township	Land manager agency to be determined	CFA	2		
Woorinen South	4	Bulga Road considered FCL from the south west for the township. Well developed and maintained road, no extra works identified for this road.	Maintain current road management regime	Road is maintained in current form to provide a FCL for brigades in time of emergency.	SHRCC		2		
Nyah	1	Yarraby Road will be considered a FCL for Nyah, allowing emergency services to fight a fire coming from the north of the township. The road is a well maintained bitumen road. Reduction of roadside vegetation is required in some areas along the road towards Nyah West.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2		

Nyah	2	Nyah Bushland Reserve to the north of the township. Local brigade has concerns with this area and the risk to the township if a fire occurs in this area. Discussion with DELWP has considered the fuel hazard to be 'high'. Currently there is no mineral earth break between the private property boundary and the reserve. Mitigation options to be considered include creating a fire break to fit tankers along the boundary or clear existing tracks within the reserve to allow better access to the reserve for fire fighting purposes.	DELWP to determine appropriate mitigation measures to reduce the risk for now and in the future. Feedback to the MFMPC on what mitigation will be.	To reduce the risk to private homes along the boundary to the reserve, to enable fire fighting agencies access to protect homes.	DELWP		2
Nyah West	1	Yarraby Road will be considered a FCL for Nyah West, allowing emergency services to fight a fire coming from the north of the township. The road is a well maintained bitumen road.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2
Nyah West	2	Ross Road to be considered a FCL to protect fore from the west of the township. Road and roadside vegetation are considered acceptable for this purpose.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2
Nyah West	3	Bodinnar Road to be used as a FCL to protect fire coming from south west. Road is not wide and reduction of fuel loads along roadside vegetation on both sides of road will enable better protection and support for brigades.	Complete strip burn along roadside vegetation (west side of road) to enable larger break and support for fire fighters on the FCL.	provide a wider break for the FCL to be implemented in times of emergency.	SHRCC	CFA	2
Nyah West	4	Area at the township/urban interface to the north of the township to be monitored for unsightly land notices	Swan Hill MFPO to monitor this area of land for unsightly property and issue notices where required.	Reduce unsightly land occurrences at the township/urban interface	SHRCC		2
Nyah West	5	The local CFA brigade considers the area of land surrounding the station and rail reserve to be a fire risk. Determination of land owner and works to be completed to reduce the fuel load in this area is required.	Determine owner of land in this area and consider mitigation treatments to be implemented to reduce the risk to the community.	Identify land owner to then organise mitigation of fuel load on this land.	SHRCC		2
Chinkapook	1	There is some concern of the Box Flat Bushland Reserve that surrounds the township from the north and west side of the town. A planned burn was completed approximately 5 years ago. Current fuel load has been estimated to be 'moderate' with an indicative fuel load of 8 tonnes per hectare. DELWP will consider most appropriate method of mitigation for this area for current and future timelines.	DELWP to determine appropriate mitigation measures to reduce the risk for now and in the future. Feedback to the MFMPC on what mitigation will be.	DELWP implements most appropriate mitigation method to reduce risk for now and in the future.	DELWP		2
Chinkapook	2	Area of land in town around the silos and CFA brigade building to have a burn completed by the local CFA brigade to reduce fuels within the township.	proposed burn of fuels conducted by the Chinkapook CFA	Reduce fuels on open land within the township	Land manager agency to be determined	CFA	2
Ultima	1	The Culgoa-Ultima Road is considered a FCL for the township, for a fire from the north west and south west. There is some vegetation on the road side but the workgroup did not consider that any works needed to be completed at this time. Ongoing monitoring of the roadside vegetation is suggested.	Develop and implement ongoing road treatment plan to maintain to current road requirements	Maintain to current road requirements	SHRCC		2
Ultima	1	The Culgoa-Ultima Road is considered a FCL for the township, for a fire from the north west and south west. There is some vegetation on the road side but the workgroup did not consider that any works needed to be completed at this time. Ongoing monitoring of the roadside vegetation is suggested.	Monitor road side vegetation area on biannual basis to consider fuel loads and risk to the township.	Roadside vegetation does not affect the use of the road as an effective FCL.	CFA		2
Ultima	2	CFA brigade should hold discussions with the private land holder of property surrounding the township from the west of the township to ensure that an appropriate mineral earth break is in place for the fire season, when the paddock is in crop.	CFA hold discussions with PLH for possible development of mineral earth break around crop on west side of township in lead in to fire season.	Mineral earth break is in place around crop in lead in to the fire season.	CFA		2
Ultima	3	Taverner Street to be used as a FCL for fire coming towards the township from the south. Road is appropriate but ongoing monitoring of roadside vegetation is required by local CFA brigade to monitor this. Currently vegetation is acceptable but needs to be monitored.	Monitor road side vegetation area on biannual basis to consider fuel loads and risk to the township.	Roadside vegetation does not affect the use of the road as an effective FCL.	CFA		2

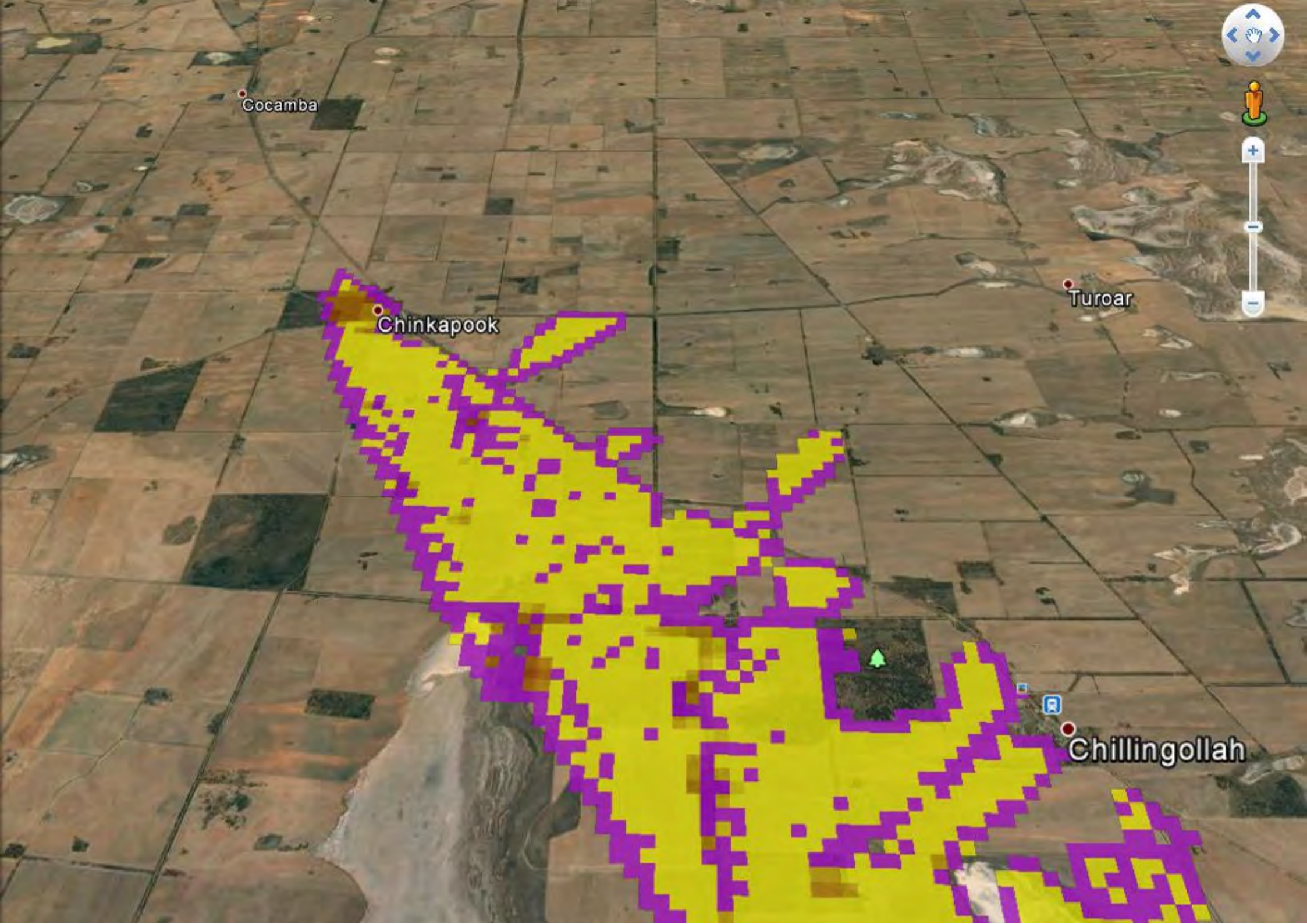


Manangatang

Cocamba

Chinkapook

Tu

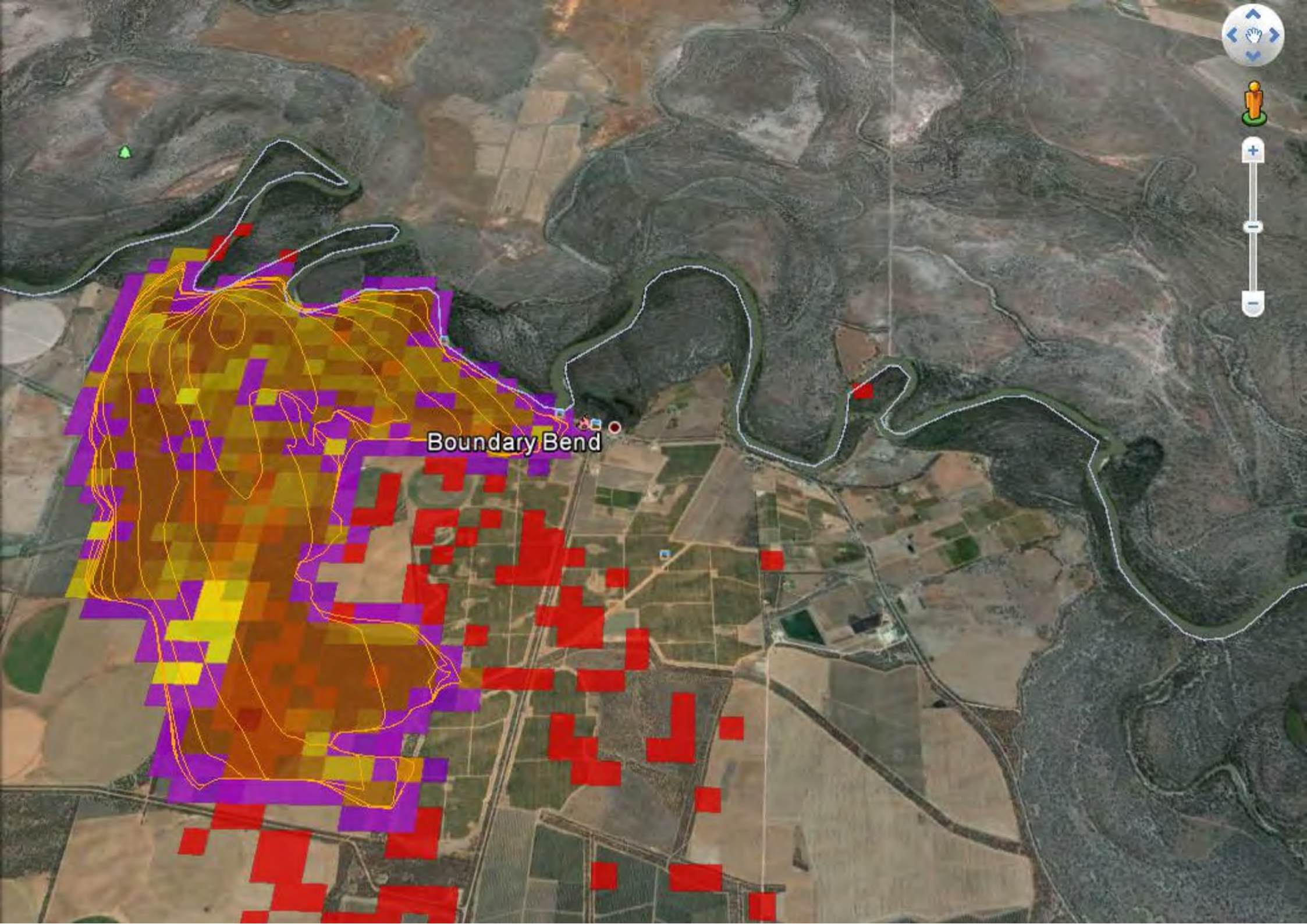


Cocamba

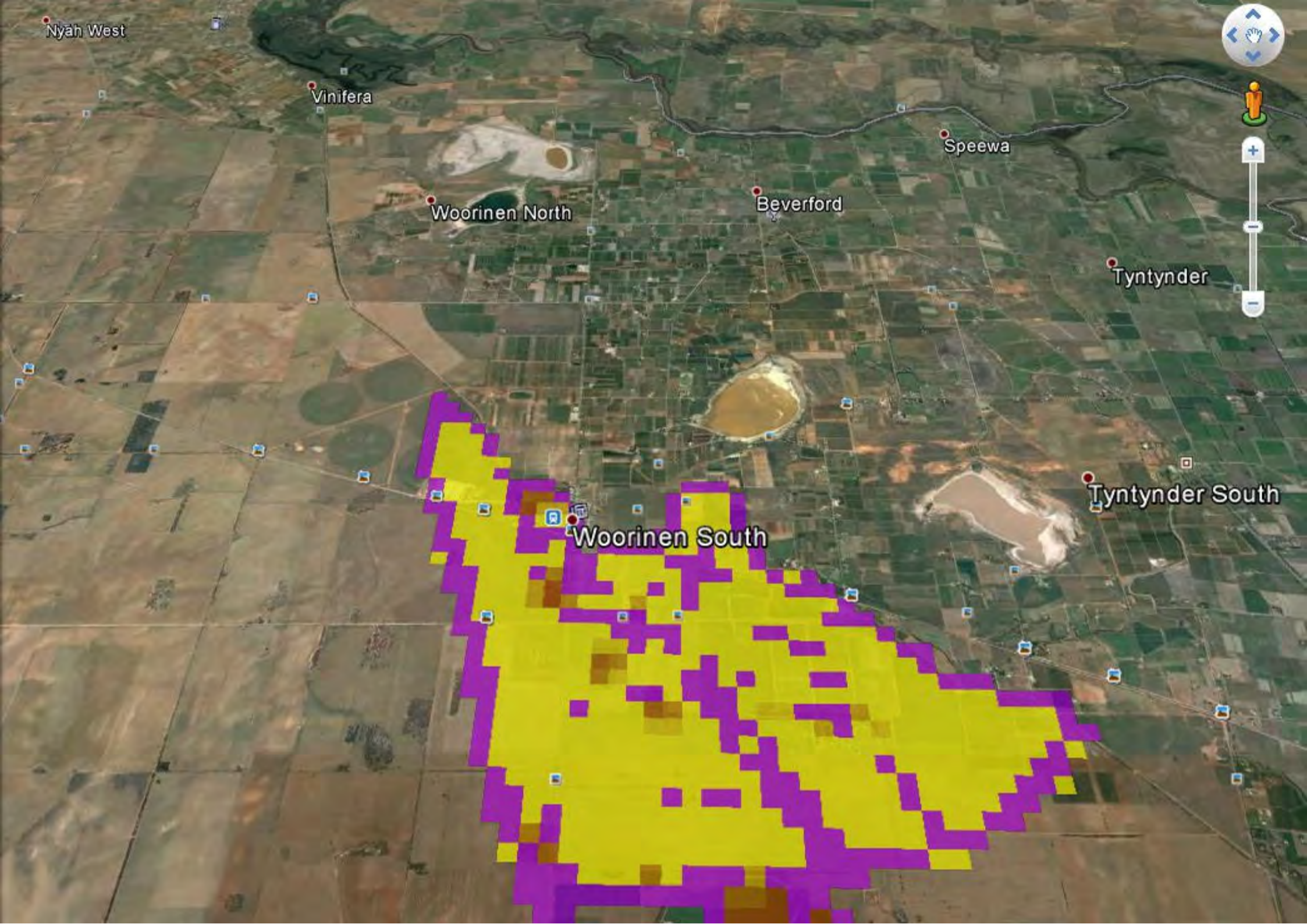
Chinkapook

Turoar

Chillingollah



Boundary Bend



Nyah West

Vinifera

Woorinen North

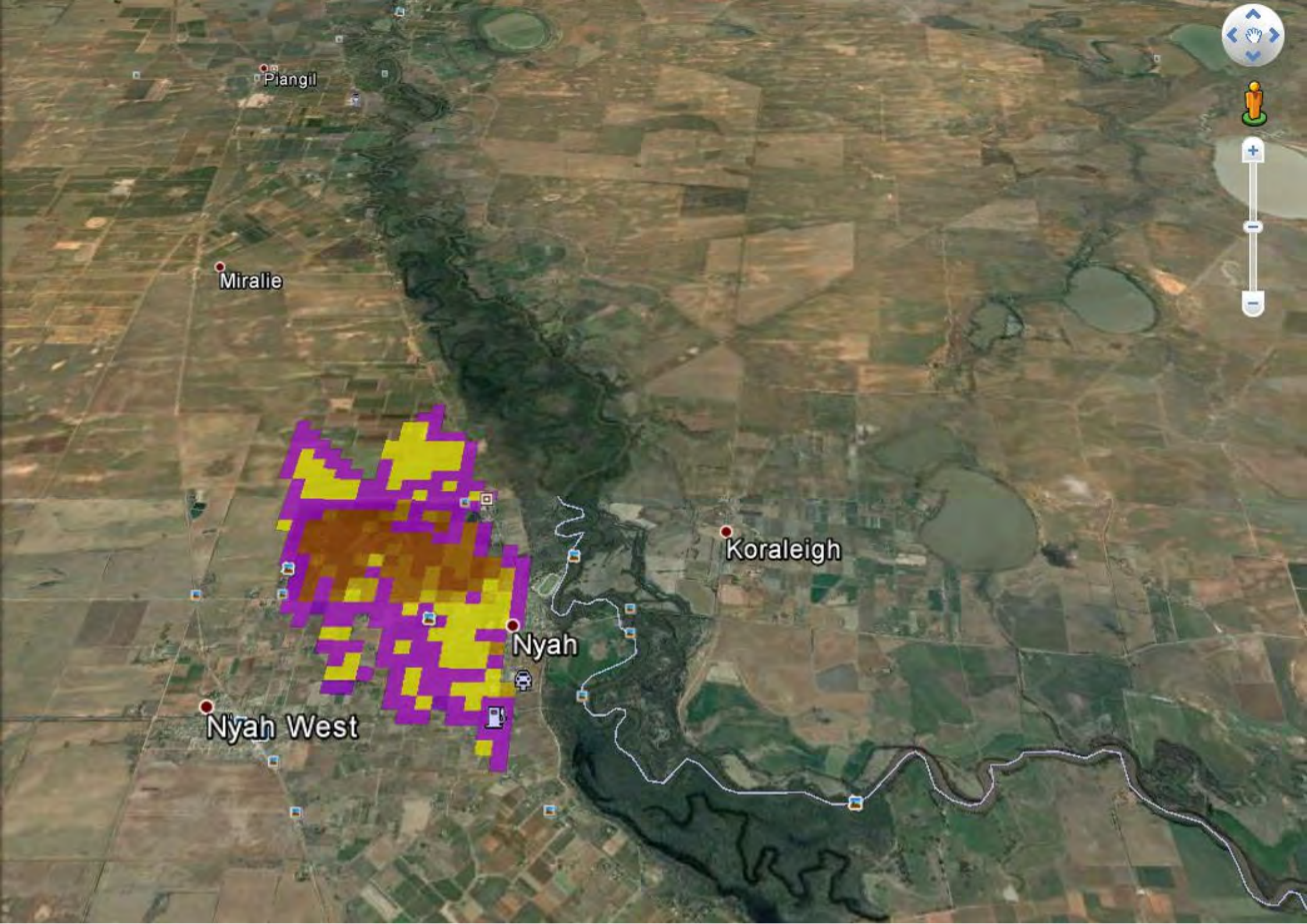
Beverford

Speewa

Tyntynder

Woorinen South

Tyntynder South



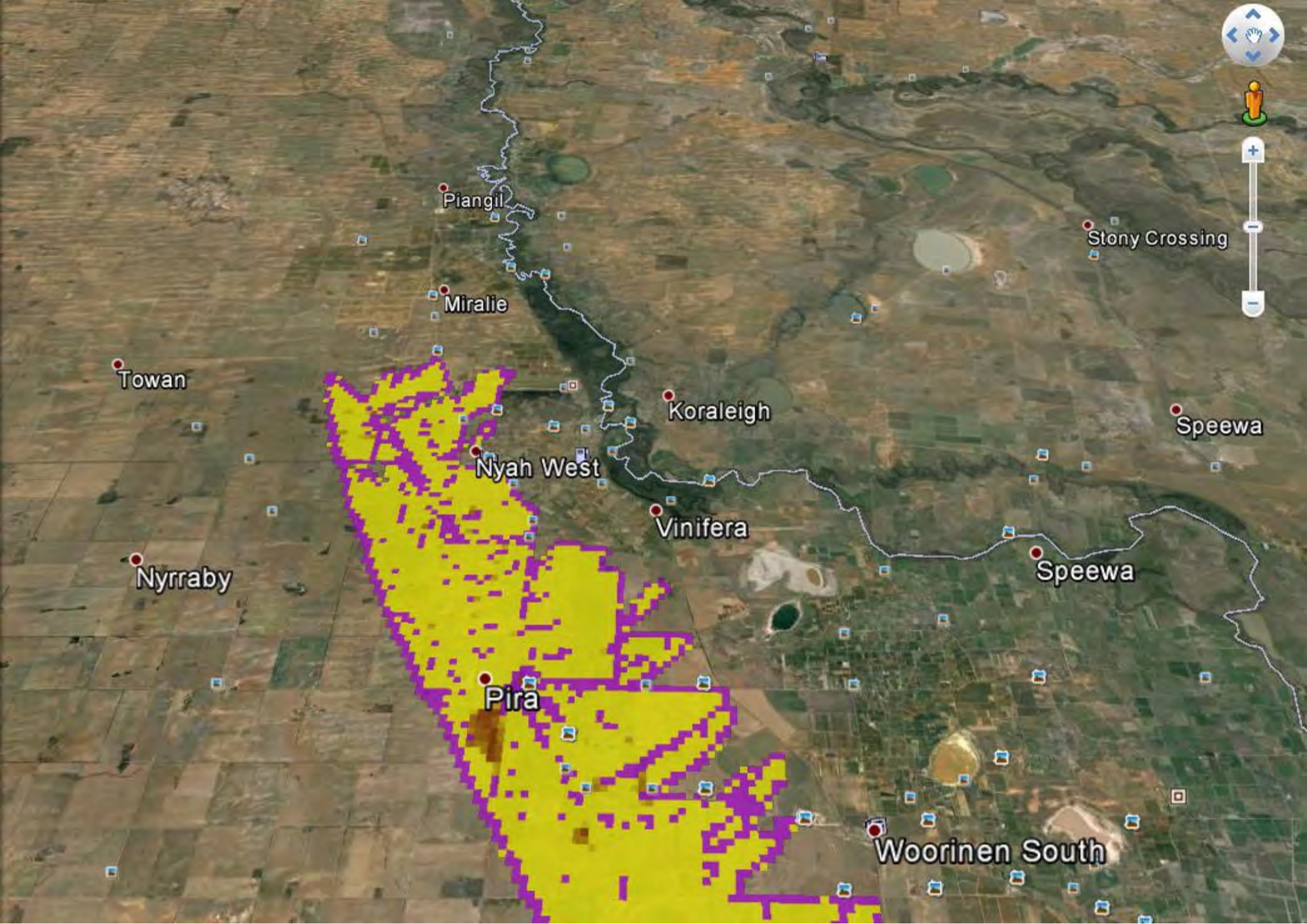
Piangil

Miralie

Nyah West

Nyah

Koraleigh



Piangil

Stony Crossing

Miralie

Towan

Koraleigh

Speewa

Nyah West

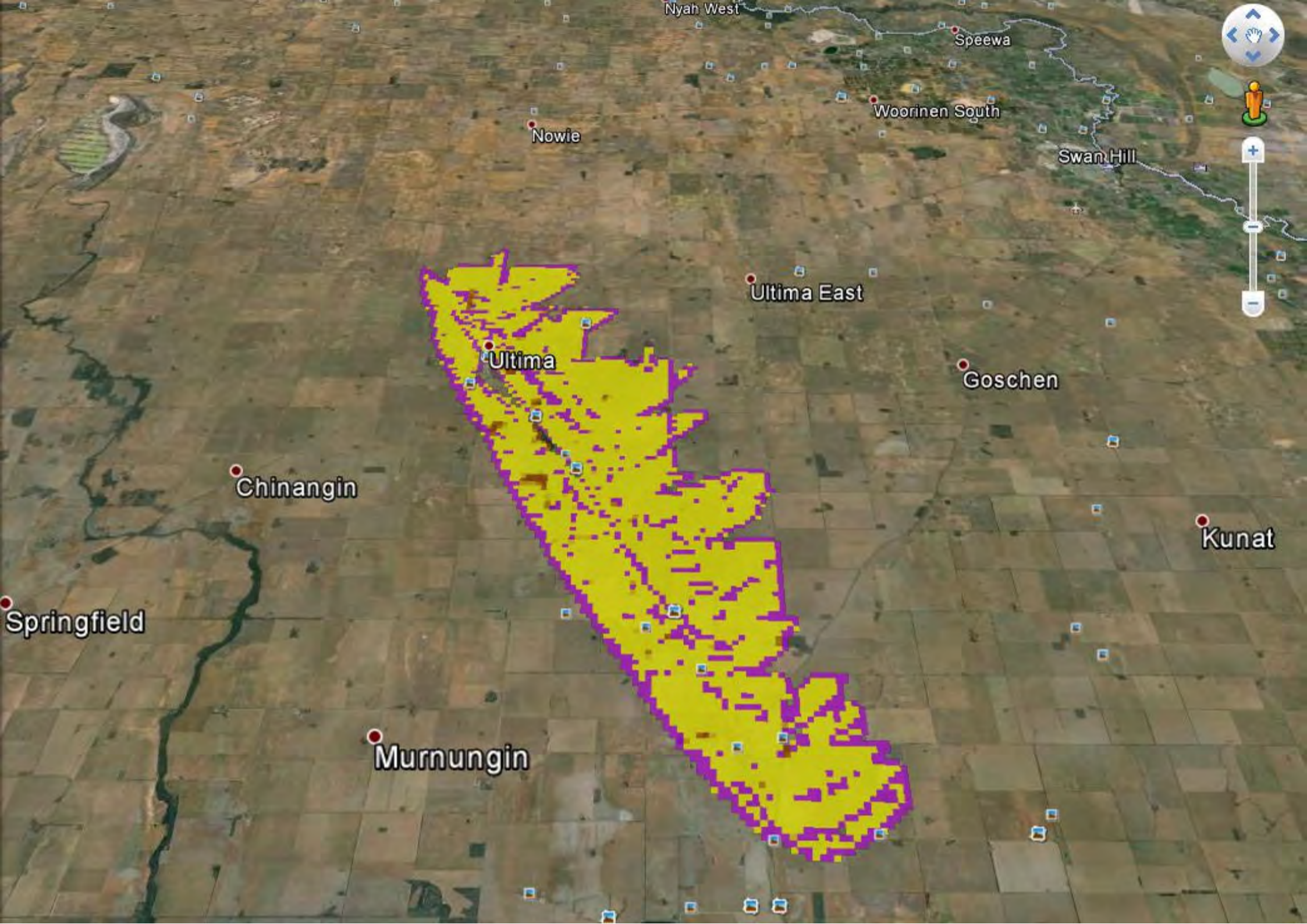
Vinifera

Speewa

Nyrraby

Pira

Woorinen South



Springfield

Chinangin

Murnungin

Ultima

Ultima East

Goschen

Kunat

Nowie

Nyah West

Speewa

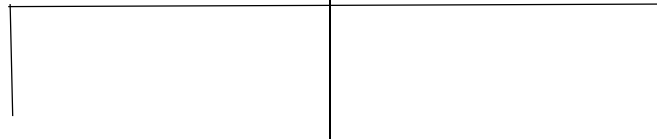
Woorinen South

Swan Hill

Exercise Director (Robert Tindall, MRCC)



Deputy Exercise Director (Jarrod Delahunty, MRCC)



Exercise Planner

Exercise Logistics Officer

Exercise Evaluator

(Jarrod Delahunty, MRCC)

(Jarrod Delahunty, MRCC)

(Colin Firth, VicPol)



**Project Management Plan for
Township Bushfire Mitigation
Sub Plans.**

Document Control Page

Document Information

	Information
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Document Owner	Jarrold Delahunty
Last Update	

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0.2		
0.3		
1.0		

Document Approvals

Role	Name
Document Owner	Jarrold Delahunty
Coordinator	Robert Tindall
General Manager	
Chief Executive Officer	

INTRODUCTION

Township Bushfire Mitigation Sub-Plans will be developed within the Swan Hill municipality to support community safety. A number of identified townships have been proposed to have these plans developed, based on their potential threat of a bushfire.

These plans will be considered a Sub-Plan to the MEMP and support the work already identified in the MFMP (2011).

The planning process for the development of the TBMSPs will be consistent with the International Standard for Risk Management ISO31000.

PROJECT AIM

To mitigate the risk to specific townships of an oncoming bushfire within the Swan Hill municipality.

- Determine strategic fire management roads including development of fire control lines to alleviate the risk of fire affecting LIFE, PROPERTY, ENVIRONMENT
- Determine mitigation treatments to achieve fire management roads
- Identify treatments at township/urban interface to protect the township in case of bush fire.

PROJECT OBJECTIVES

- Determine strategic fire management roads, including fire control lines along roads to protect at risk townships of bushfire
- Develop a Mitigation Plan to detail proposed treatments and actions by agencies to mitigate the risk of bushfire affecting townships
- Using detailed maps, outline strategic fire management roads for each township to assist in managing the response to an on coming bush fire
- Identify and map hazards and exposures at the township/urban interface with proposed mitigation treatments to protect the township in case of bushfire.

GEOGRAPHIC BOUNDARIES

The Township Bushfire Mitigation Sub-Plans (TBMSP's) will focus on townships identified as being at risk to a bushfire.

Plans are to be developed for these townships;

- Manangatang
- Chinkapook
- Ultima
- Woorinen South
- Nyah/Nyah West
- Boundary Bend

SCOPE

Township Bushfire Mitigation Sub-Plans (TBMSP's)

To identify and propose mitigation treatments on public lands surrounding specific townships to reduce the risk of bushfire affecting the towns.

TBMSP's will focus on identified at risk townships of bushfire within the Swan Hill municipality. Plans will focus on mitigation treatments of public land holders in these key areas;

1. Mitigation treatments of bushfire at the township/urban interface
2. Mitigation treatments of identified fire control lines along roads surrounding the townships.

Robust analysis will be completed to determine applicable mitigation treatments in the plan for each township, using GIS information to support decision making.

PROJECT DELIVERABLES

- Township Bushfire Mitigation Sub-Plan document
- Maps of strategic fire management roads, including fire control lines for townships
- Maps of township mitigation treatments at township/urban interface

- Mitigation Treatment Action plan
- Collaborative engagement of stakeholders to develop TBMSP's.

PROJECT MILESTONES

TASK	DATE
Develop Project Management Plan	Nov 2014
Identify Proposed fire control lines and mitigation treatments	June 2015
Finalise Analysis of proposed mitigation activities	Sept 2015
Completion of Draft TBMSP's	Sept 2015
Final TBMSP's complete	Oct 2015
Endorsement of TBMSP's at MEMP	Nov 2015

RESOURCES

The EM Projects Officer at Mildura Rural City Council will be responsible to develop the Township Bushfire Mitigation Plans for the Swan Hill municipality. Additional support from key stakeholders may be used to assist in the development of these plans.

GIS SUPPORT IN PLANNING

It is envisaged that the use of GIS will play an important part in the development of the Township Bushfire Mitigation Sub-Plans. The use of applicable data sets to understand the risk, exposures and vulnerability will allow more informed decision making and analysis. There are two maps proposed to form part of each TBMSP.

The two maps are;

1. strategic fire management roads and fire control lines for townships
2. Township bushfire exposures and identified treatments

GIS Datasets envisaged to be used in the planning and analysis includes;

- Fire Intensity data
- VFRR
- DEPI, Phoenix data
- Municipal Vulnerable Facilities Register dataset
- DEPI fire plans
- LGA datasets
- Environmental Data Sets
- Other applicable datasets as required

STAKEHOLDER ENGAGEMENT

Stakeholder Engagement forms an important part of development of the Township Bushfire Mitigation Sub- Plans. Following the framework adopted for the MFMP, stakeholder engagement for these plans again will follow the IAP2 Framework for stakeholder engagement.

Anticipated Stakeholder Involvement Includes;

- CFA
- LGA
- VicRoads
- DEPI
- VicTrack
- V/Line
- **others to be determined as part of stakeholder engagement plan

Engagement/Communication Objectives

- Develop ownership by key stakeholders in these plans
- Build understanding with key stakeholders of the risks
- Demonstrate agencies working together
- Build and understand roles/responsibilities
- Agency obligations are understood and commitment to achieving end result.

Stakeholder Analysis-Hazmat Incident Plan

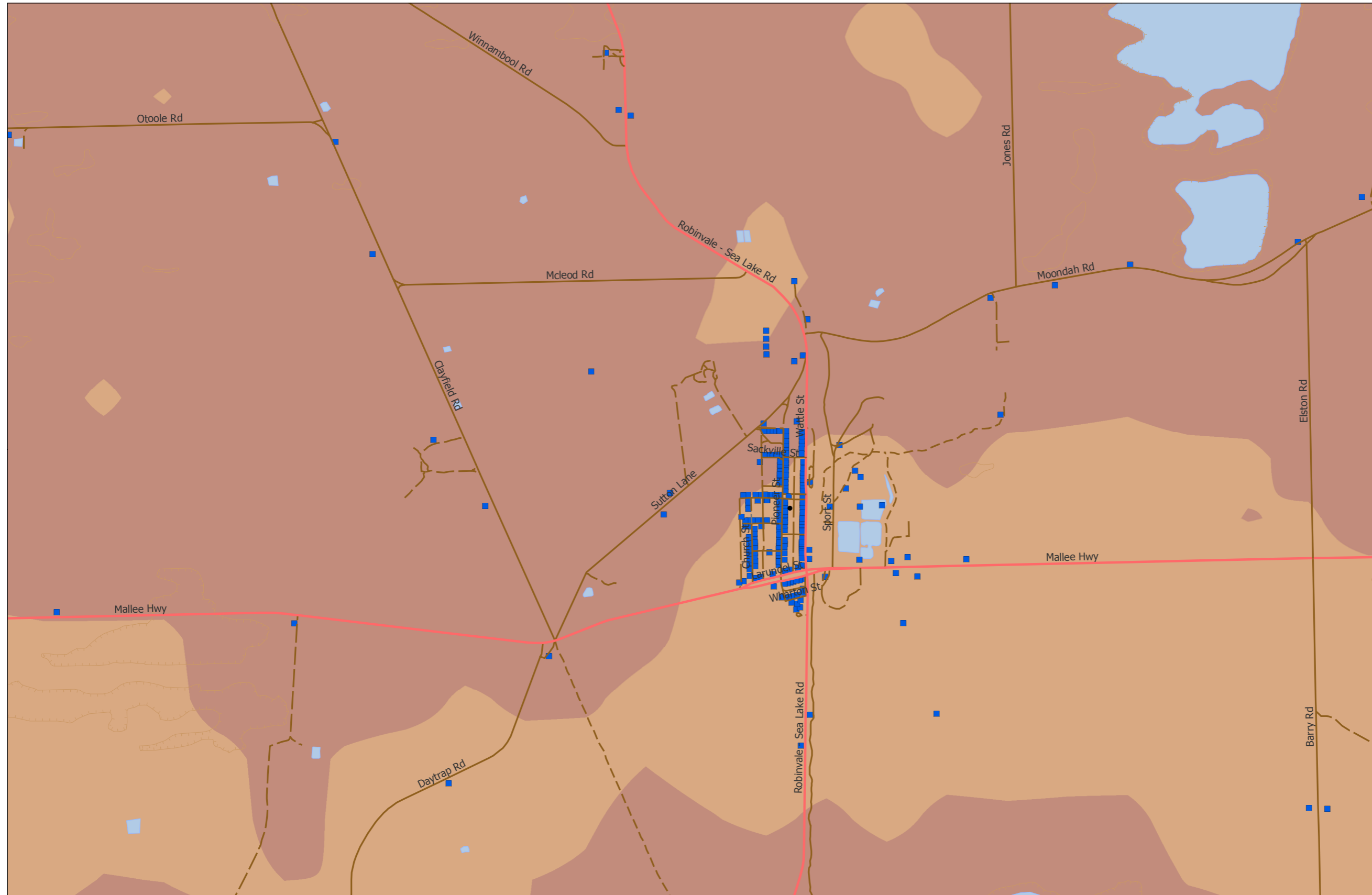
Stakeholder	Interest in TBMSP	IAP2 Engagement Approach
CFA Operations Staff	Response Agency	Collaborate
CFA Vegetation Management Officer	Response Agency	Collaborate
CFA Local Brigades	Response Agency	Collaborate
General public	Affected land owner	Consult
VicTrack	Public Land Manager	Collaborate
V/Line	Public Land Manager	Collaborate
VicRoads	Public Land Manager	Collaborate
LGA-Roads and Infrastructure	Public Land Manager	Collaborate
LGA-Parks	Public Land Manager	Collaborate
LGA-Emergency Management Team	EM Planning and Relief management	Collaborate
DEPI	Public Land Manager, GIS support in planning	Collaborate
Parks Vic	Public Land Manager	Collaborate
Community Planning Groups	Private land owners, represent township	Consult
Fire Scientist experts	Provide advice on possible mitigation treatments	Involve
MFMP	Plan managers	Collaborate
Environmental Groups	Environment interest	Consult

WORK BREAKDOWN STRUCTURE

MONITOR AND REVIEW REQUIREMENTS

As part of the monitoring and review process for this Project Management Plan, the EM Projects Officer will review the WBS schedule for each Township Bushfire Mitigation Sub-Plan and report to key stakeholders on progression on a regular basis.

Manangatang House Loss Probability FFDI 75

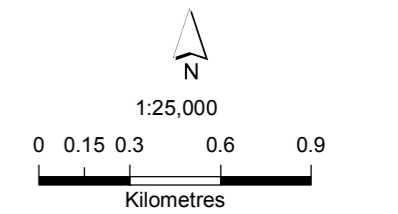


Legend

- Main Road (Sealed)
- Local Road
- 2wd
- 4wd
- Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- Contour (Dep)
- Contour Index (Dep)
- Coastline
- State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area
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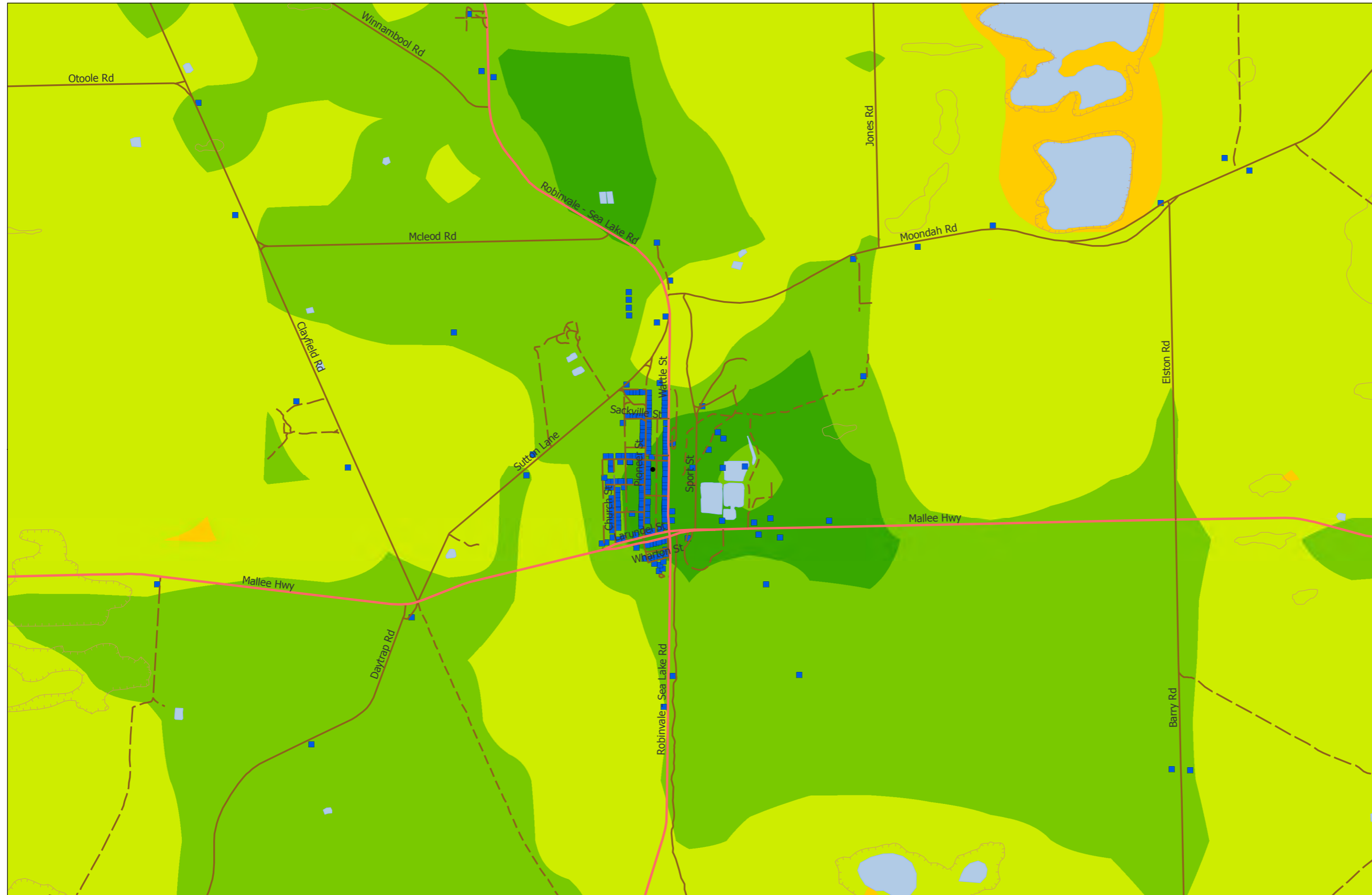
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Additional information
 Spatial data is sourced from the Victorian Spatial Data Library (VSDL).
 Map Produced By <branch> <month> <year>
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PROJECTION: Universal Transverse Mercator (UTM) Projection
DATUM: Horizontal: Geocentric Datum of Australia (GDA)
 Vertical: Australian Height Datum (AHD)
GRID: Grid Interval 1000 metres
 Map Grid of Australia 1994 (MGA94) Zone 54/55

Manangatang Intensity FFDI 75



Legend

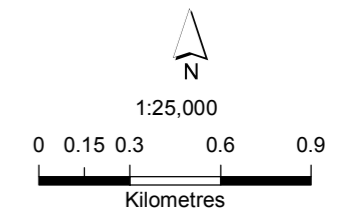
- Main Road (Sealed)
- Local Road
- - - 2wd
- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- ▨ Wetland Area

kw/m

- 0 - 500
- 500 - 2,000
- 2,000 - 4,000
- 4,000 - 10,000
- 10,000 - 30,000
- 30,000 - 100,000



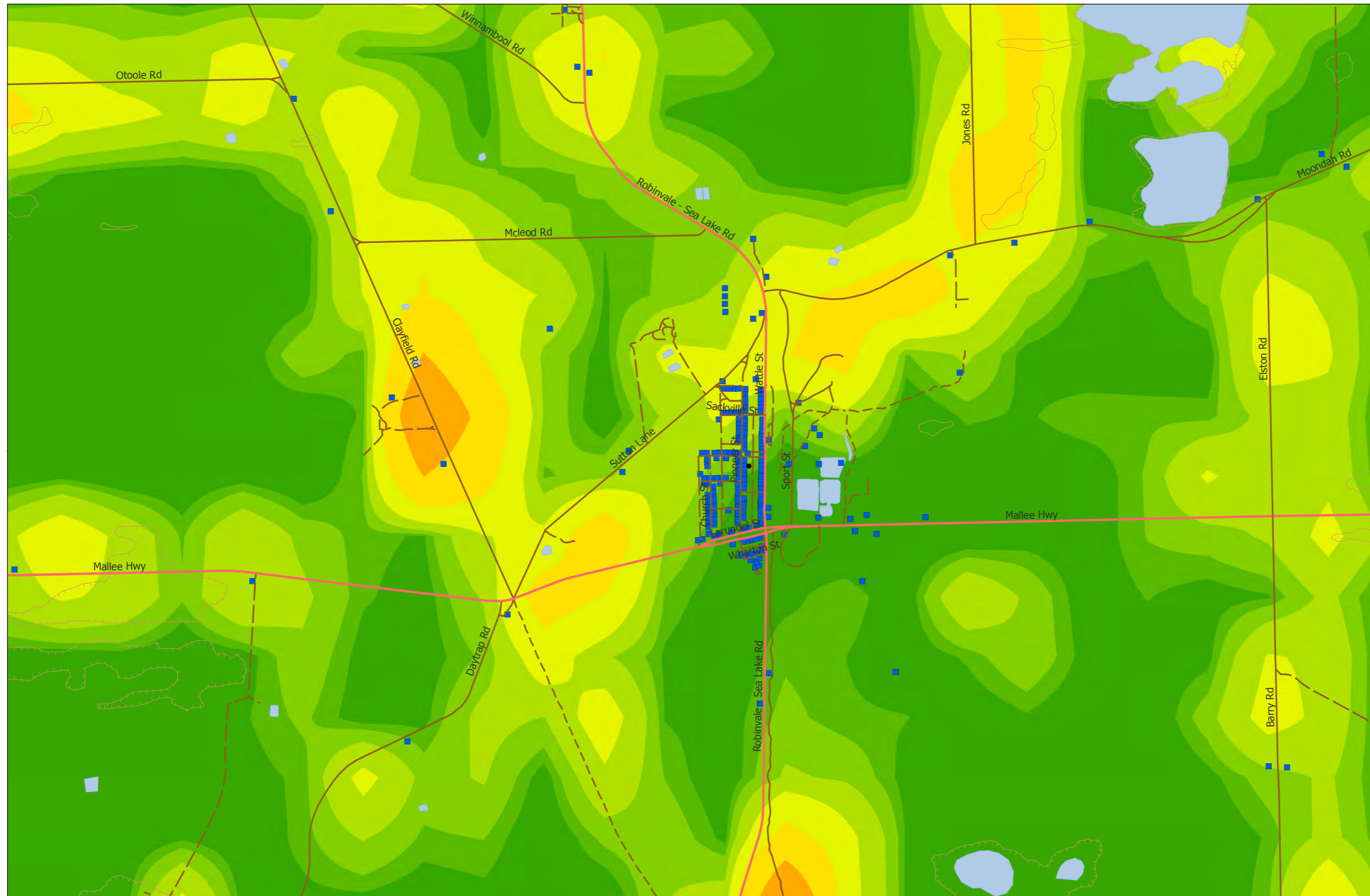
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 Vertical: Australian Height Datum (AHD)
GRID: Grid Interval 1000 metres
 Map Grid of Australia 1994 (MGA94) Zone 54/55

Manangatang Ember Density FFDI 75



Legend

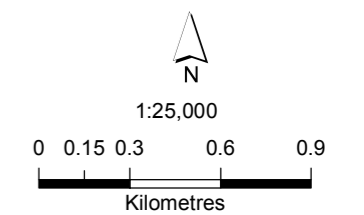
- Main Road (Sealed)
- Local Road
- 2wd
- 4wd
- - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- Contour (Dep)
- Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- ▨ Wetland Area

per/sqm

- 0 - 0.066903762
- 0.066903762 - 0.100141472
- 0.100141472 - 0.167045234
- 0.167045234 - 0.301714963
- 0.301714963 - 0.572789939
- 0.572789939 - 1.118433297
- 1.118433298 - 2.216751844
- 2.216751845 - 4.427543221
- 4.427543222 - 8.877616949
- 8.87761695 - 17.83511353



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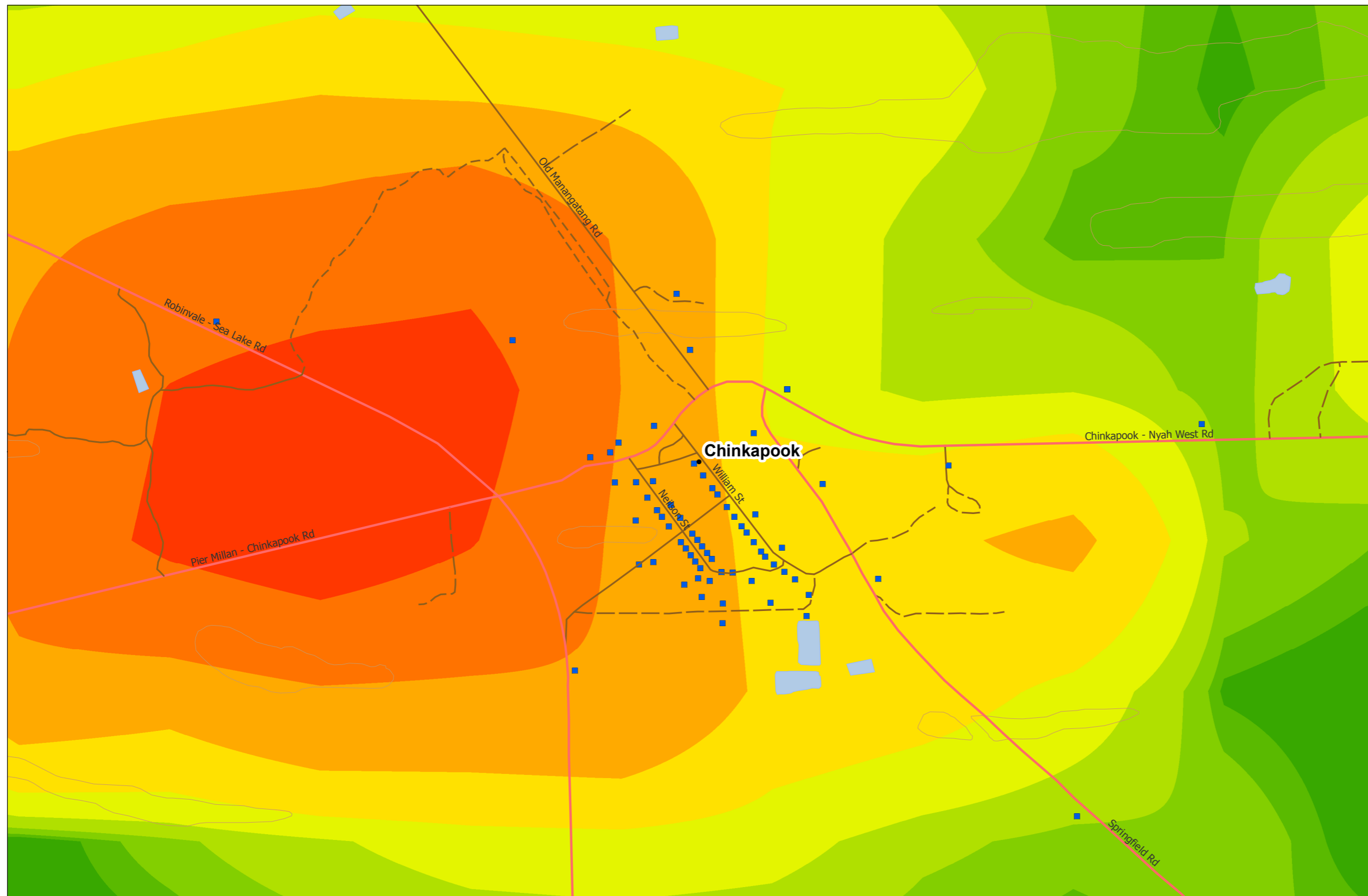
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GRID: Grid Interval 1000 metres
 Map Grid of Australia 1994 (MGA94) Zone 54/55

Chinkapook Ember Density FFDI 75



Legend

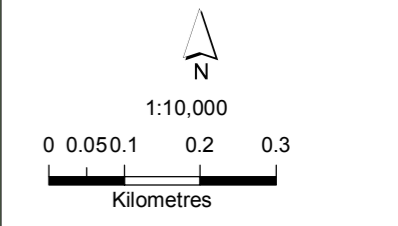
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- Local Road
- - 2wd
- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- ▨ Wetland Area

per/sqm

- 0 - 0.066903762
- 0.066903762 - 0.100141472
- 0.100141472 - 0.167045234
- 0.167045234 - 0.301714963
- 0.301714963 - 0.572789939
- 0.572789939 - 1.118433297
- 1.118433298 - 2.216751844
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- 8.87761695 - 17.83511353



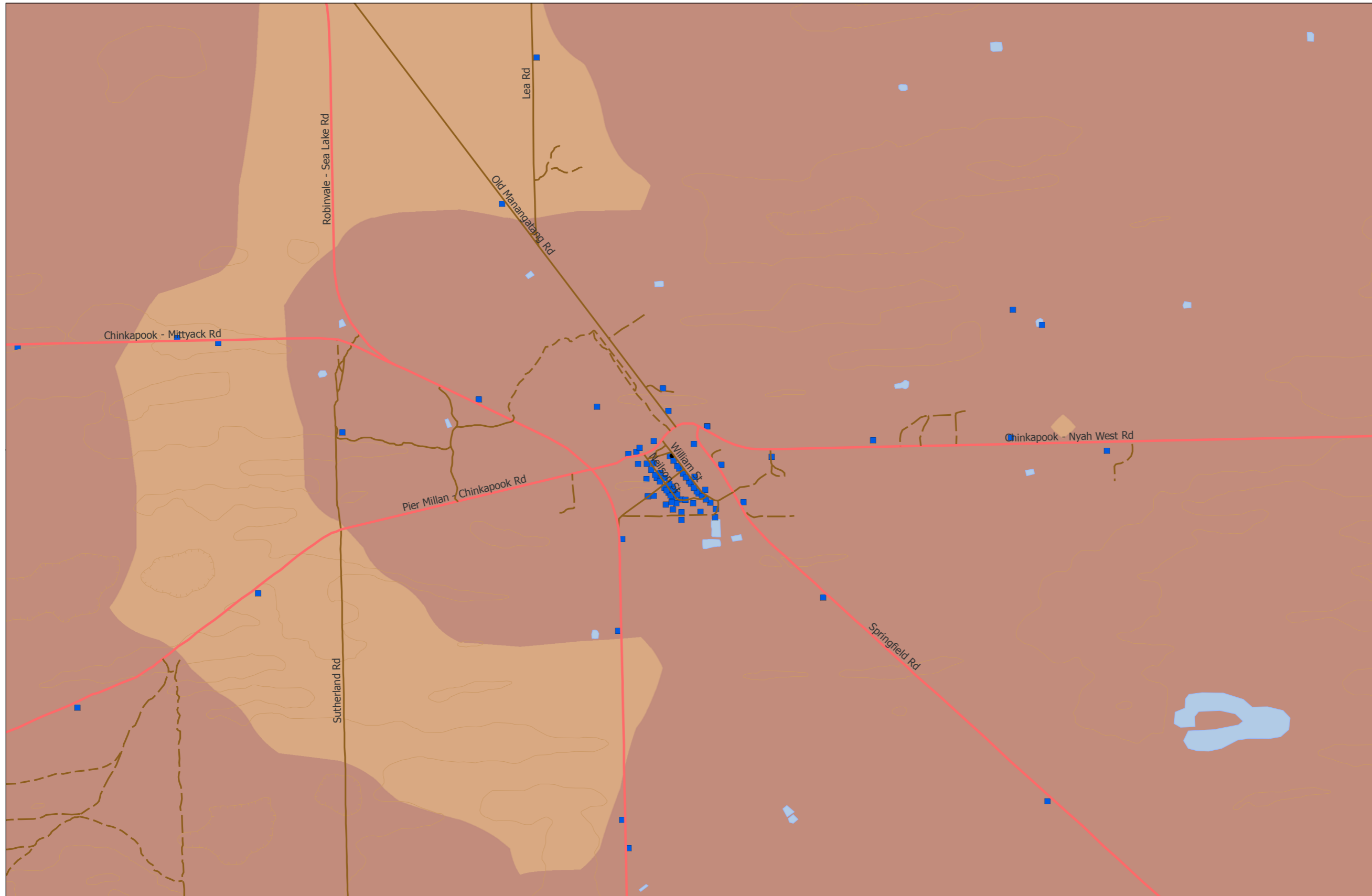
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Chinkapook House Loss Probability FFDI 75



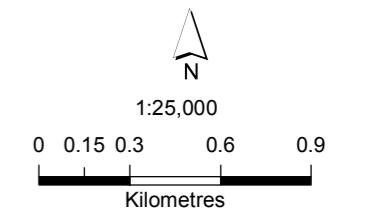
Legend

- Main Road (Sealed)
- Local Road
- - - 2wd
- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

	0.003975307 - 0.075665101
	0.075665101 - 0.147354895
	0.147354895 - 0.219044689
	0.219044689 - 0.290734483
	0.290734483 - 0.362424277
	0.362424277 - 0.434114071
	0.434114071 - 0.505803864
	0.505803864 - 0.577493658
	0.577493658 - 0.649183452



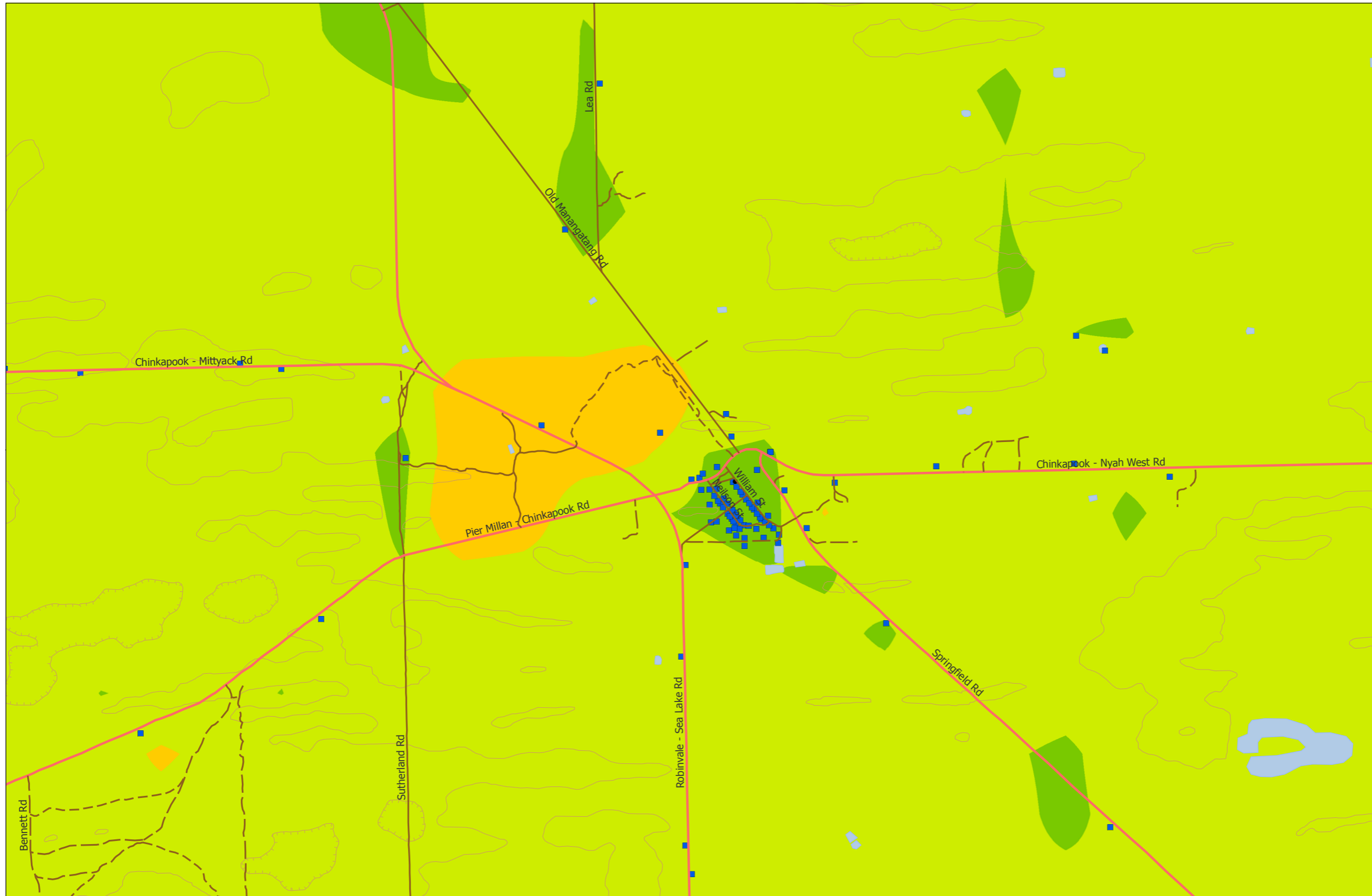
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Chinkapook Intensity FFDI 75



Legend

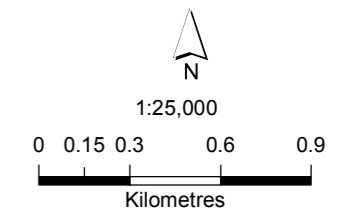
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- Local Road
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- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- - - Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

kw/m

- 0 - 500
- 500 - 2,000
- 2,000 - 4,000
- 4,000 - 10,000
- 10,000 - 30,000
- 30,000 - 100,000



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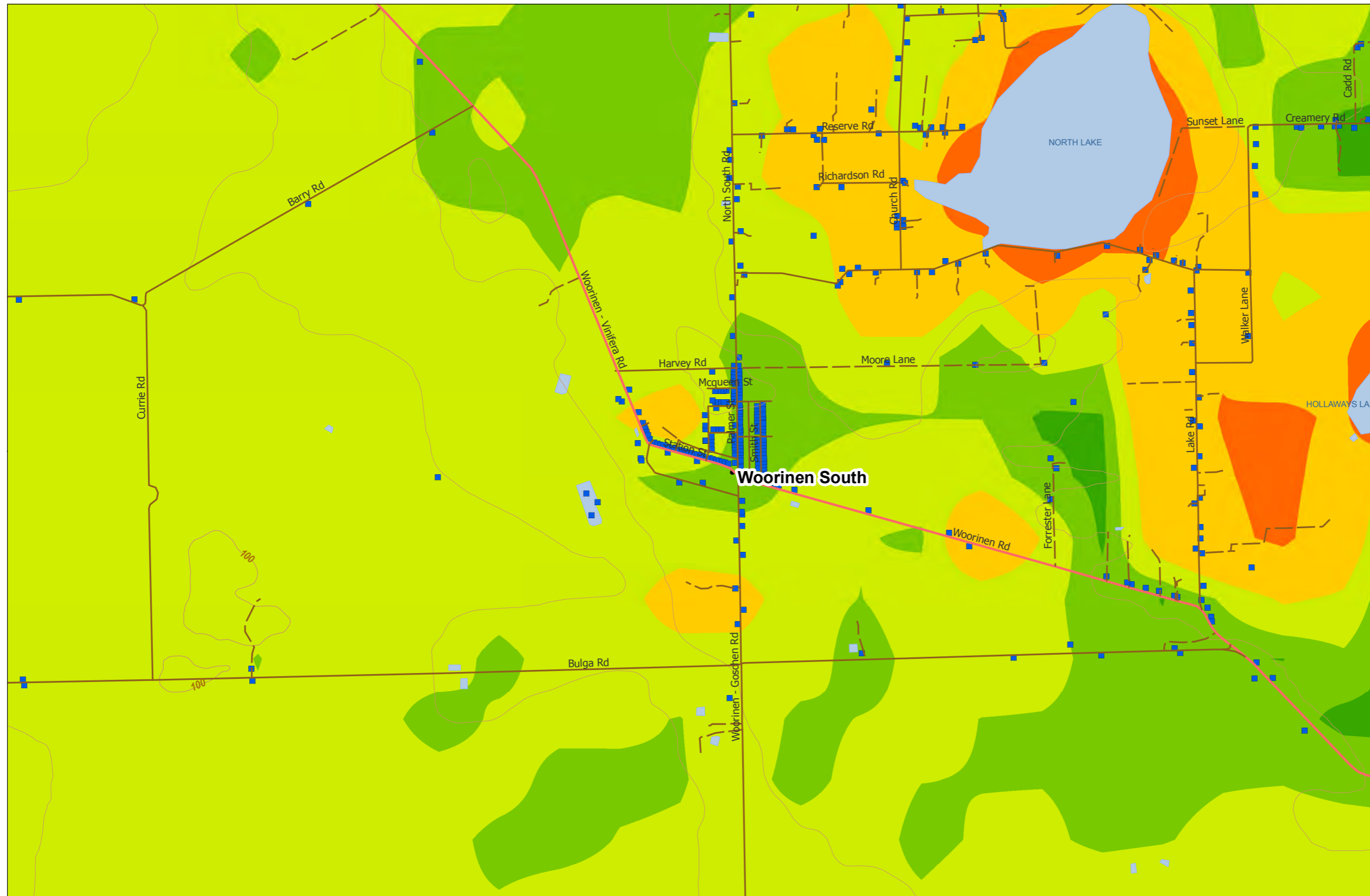
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Boundary Bend

No DELWP mapping was completed for Boundary Bend because of the limited fire risk to the township of a large broad front bushfire occurring within the area. Fire can occur in the river area but it would be difficult to develop into a large broad front bushfire.

Woorinen South Intensity FFDI 75



Legend

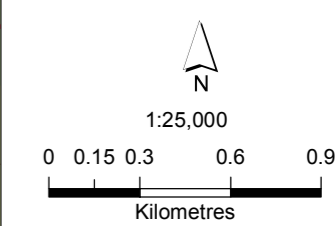
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- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- ▨ Wetland Area

kw/m

- 0 - 500
- 500 - 2,000
- 2,000 - 4,000
- 4,000 - 10,000
- 10,000 - 30,000
- 30,000 - 100,000



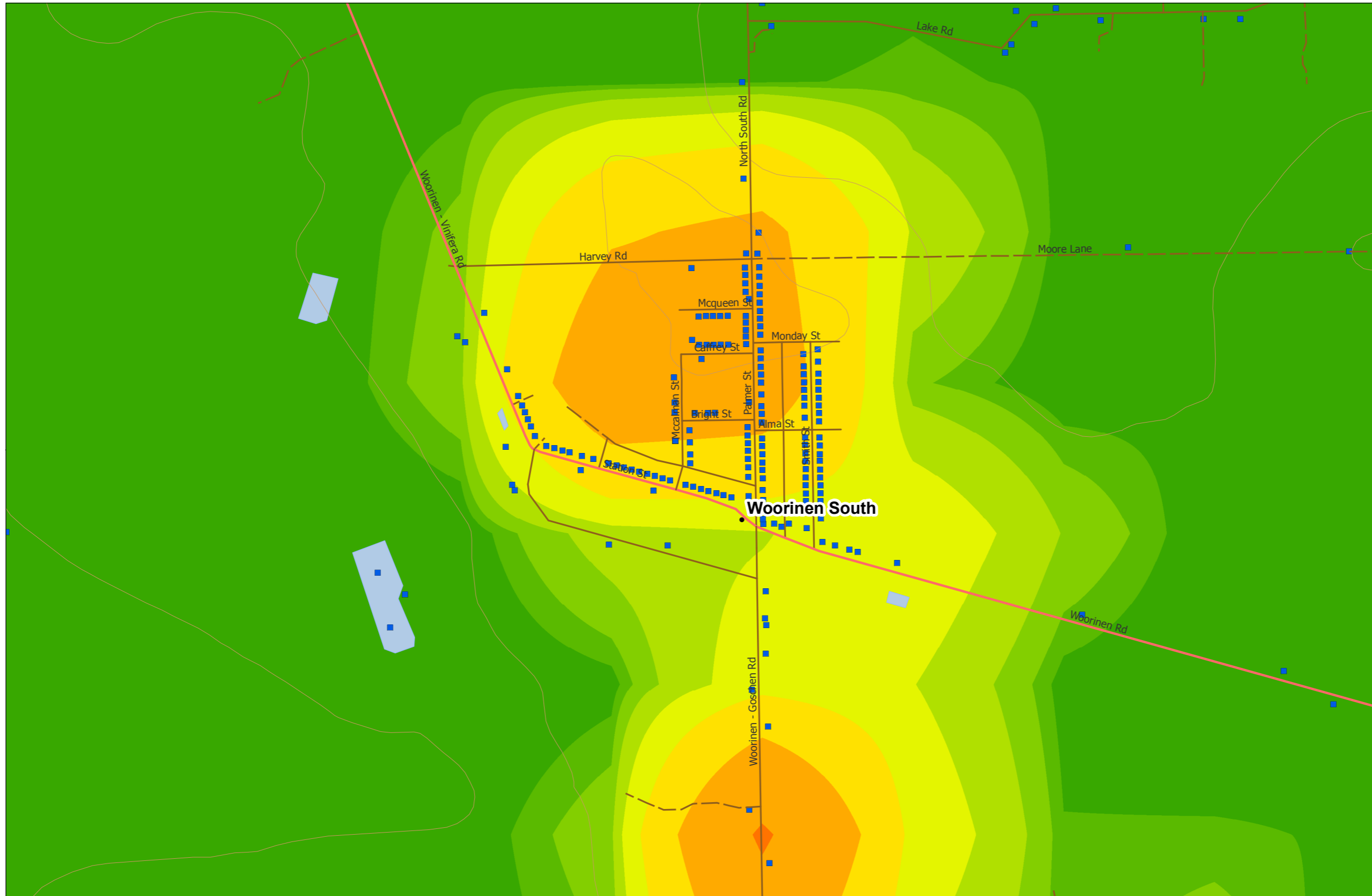
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Woorinen South Ember Density FFDI 75



Legend

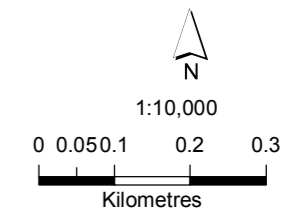
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- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

per/sqm

- 0 - 0.066903762
- 0.066903762 - 0.100141472
- 0.100141472 - 0.167045234
- 0.167045234 - 0.301714963
- 0.301714963 - 0.572789939
- 0.572789939 - 1.118433297
- 1.118433298 - 2.216751844
- 2.216751845 - 4.427543221
- 4.427543222 - 8.877616949
- 8.87761695 - 17.83511353



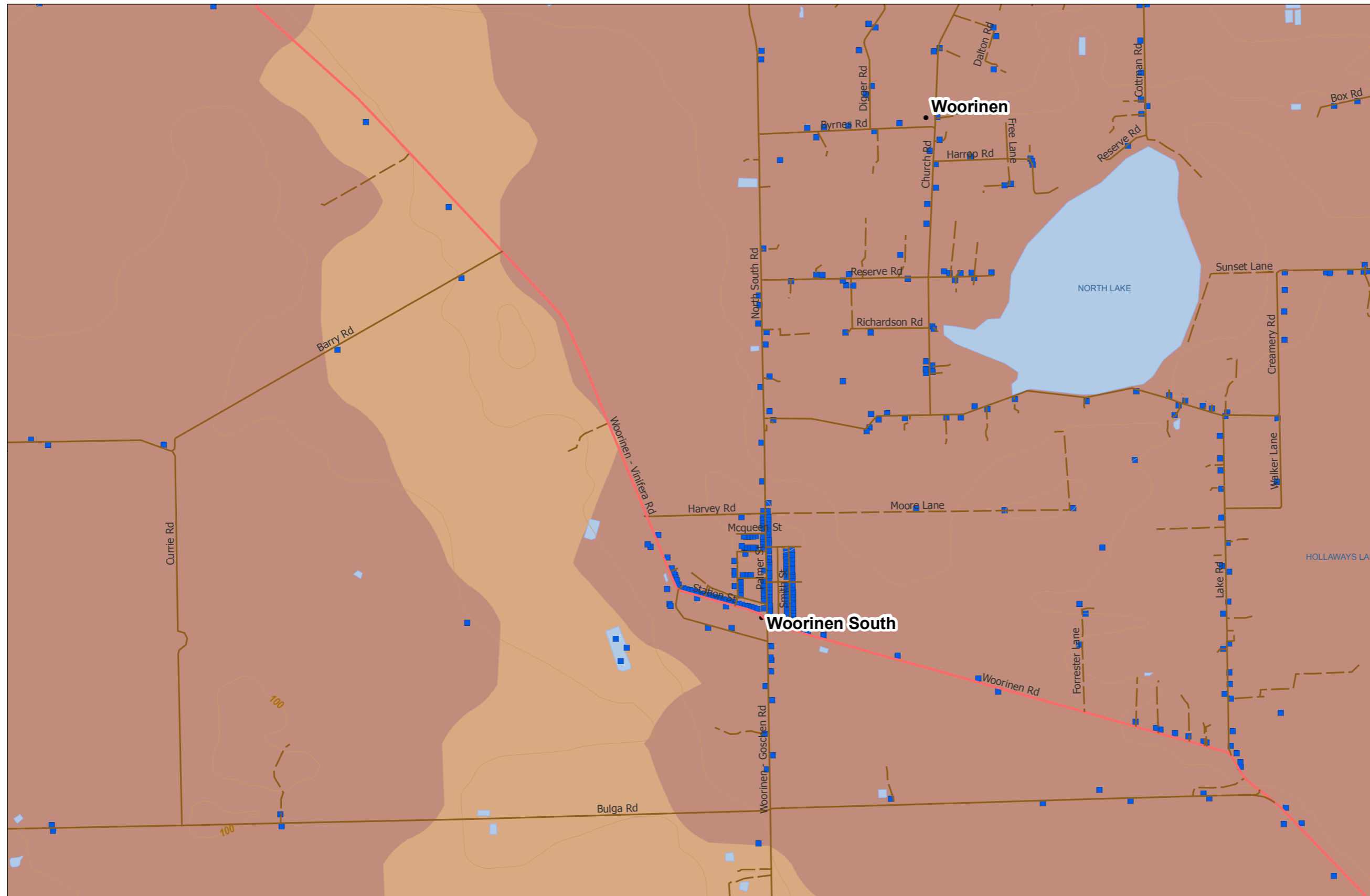
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Woorinen South House Loss Probability FFDI 75

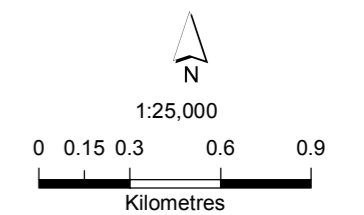


Legend

- Main Road (Sealed)
- Local Road
- - - 2wd
- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- Contour (Dep)
- Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area
- 0.003975307 - 0.075665101
- 0.075665101 - 0.147354895
- 0.147354895 - 0.219044689
- 0.219044689 - 0.290734483
- 0.290734483 - 0.362424277
- 0.362424277 - 0.434114071
- 0.434114071 - 0.505803864
- 0.505803864 - 0.577493658
- 0.577493658 - 0.649183452



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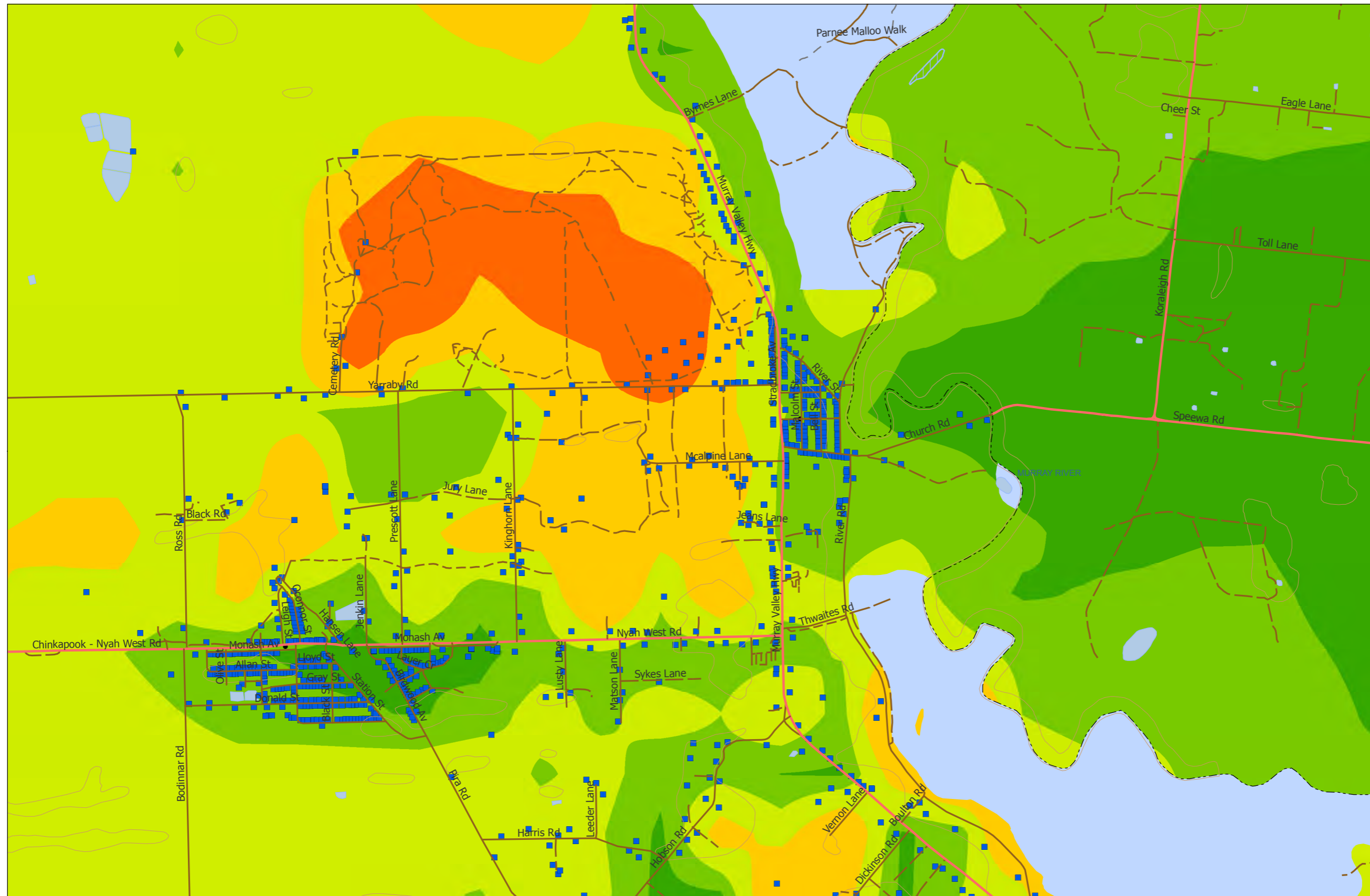
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Nyah & Nyah West Intensity FFDI 75



Legend

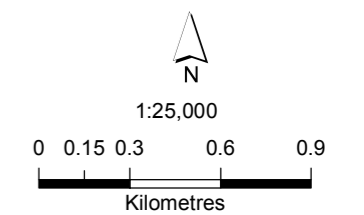
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- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- - - Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

kw/m

- 0 - 500
- 500 - 2,000
- 2,000 - 4,000
- 4,000 - 10,000
- 10,000 - 30,000
- 30,000 - 100,000



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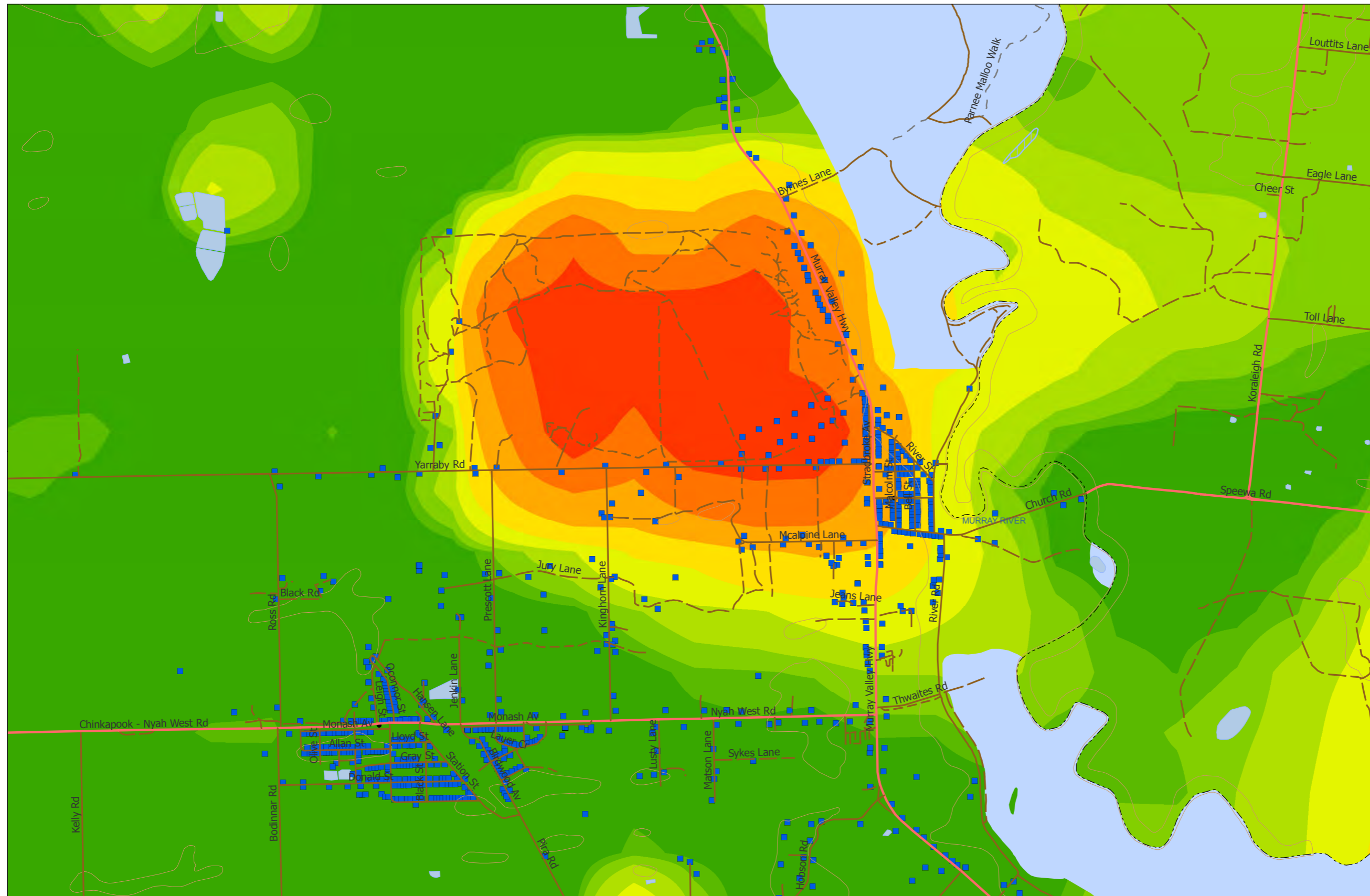
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Nyah & Nyah West Ember Density FFDI 75



Legend

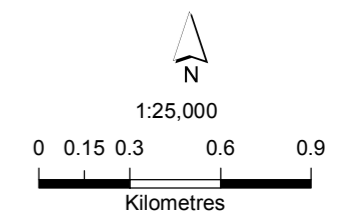
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- Local Road
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- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- Contour (Dep)
- Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

per/sqm

- 0 - 0.066903762
- 0.066903762 - 0.100141472
- 0.100141472 - 0.167045234
- 0.167045234 - 0.301714963
- 0.301714963 - 0.572789939
- 0.572789939 - 1.118433297
- 1.118433298 - 2.216751844
- 2.216751845 - 4.427543221
- 4.427543222 - 8.877616949
- 8.87761695 - 17.83511353



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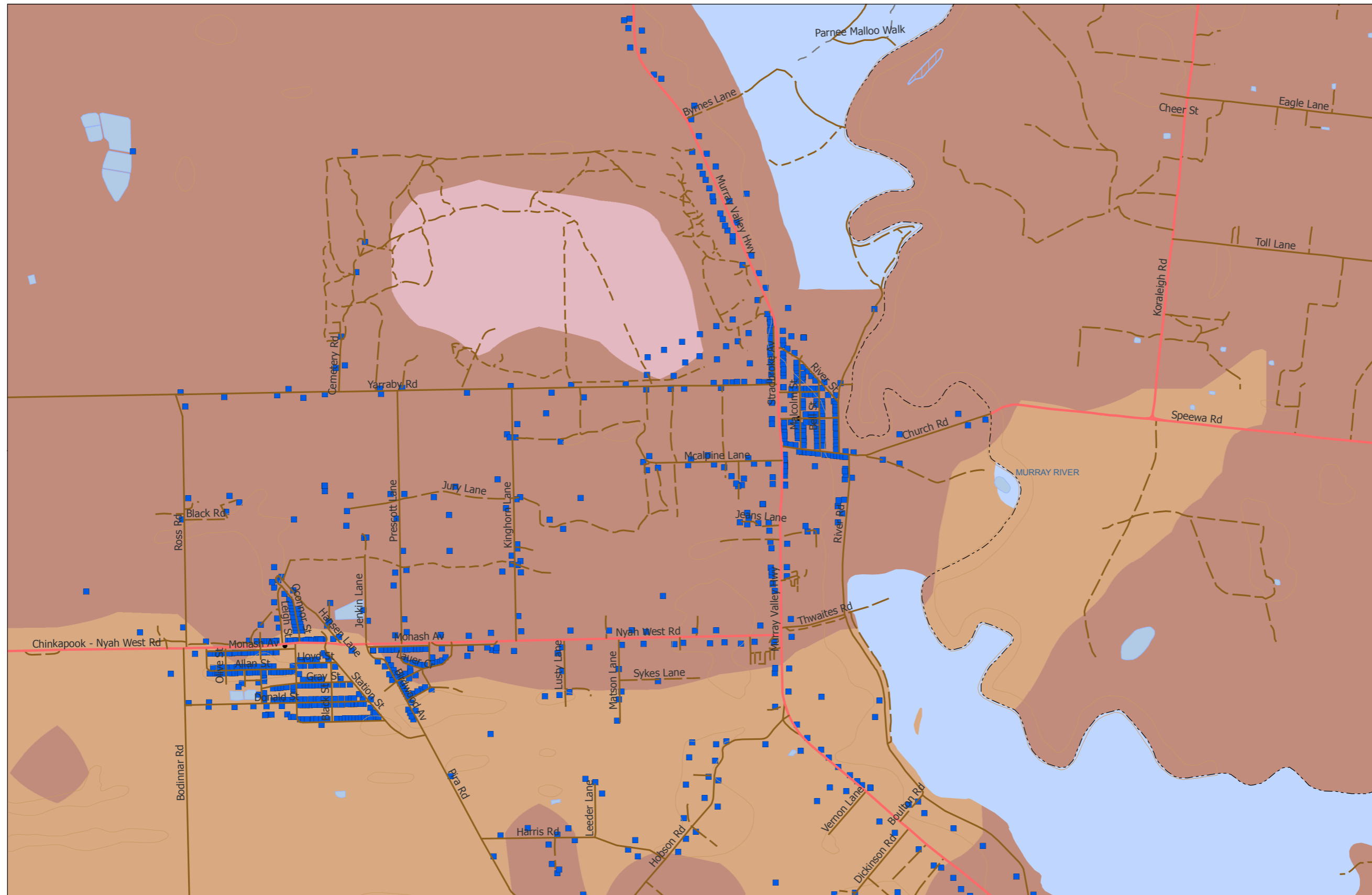
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Nyah & Nyah West House Loss Probability FFDI 75

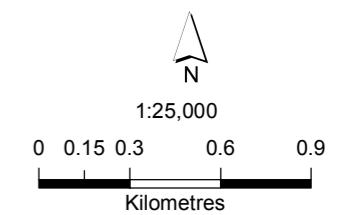


Legend

- Main Road (Sealed)
- Local Road
- - - 2wd
- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- - - Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- ▨ Wetland Area
- 0.003975307 - 0.075665101
- 0.075665101 - 0.147354895
- 0.147354895 - 0.219044689
- 0.219044689 - 0.290734483
- 0.290734483 - 0.362424277
- 0.362424277 - 0.434114071
- 0.434114071 - 0.505803864
- 0.505803864 - 0.577493658
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Ultima Intensity FFDI 75



Legend

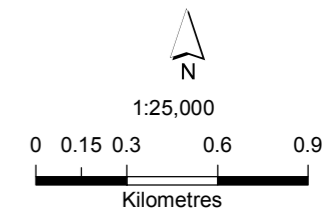
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- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

kw/m

- 0 - 500
- 500 - 2,000
- 2,000 - 4,000
- 4,000 - 10,000
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GRID: Grid Interval 1000 metres
 Map Grid of Australia 1994 (MGA94) Zone 54/55

Ultima Ember Density FFDI 75



Legend

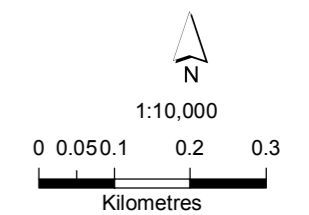
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- Town
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- Contour Index
- Contour (Dep)
- Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- Wetland Area

per/sqm

- 0 - 0.066903762
- 0.066903762 - 0.100141472
- 0.100141472 - 0.167045234
- 0.167045234 - 0.301714963
- 0.301714963 - 0.572789939
- 0.572789939 - 1.118433297
- 1.118433298 - 2.216751844
- 2.216751845 - 4.427543221
- 4.427543222 - 8.877616949
- 8.87761695 - 17.83511353



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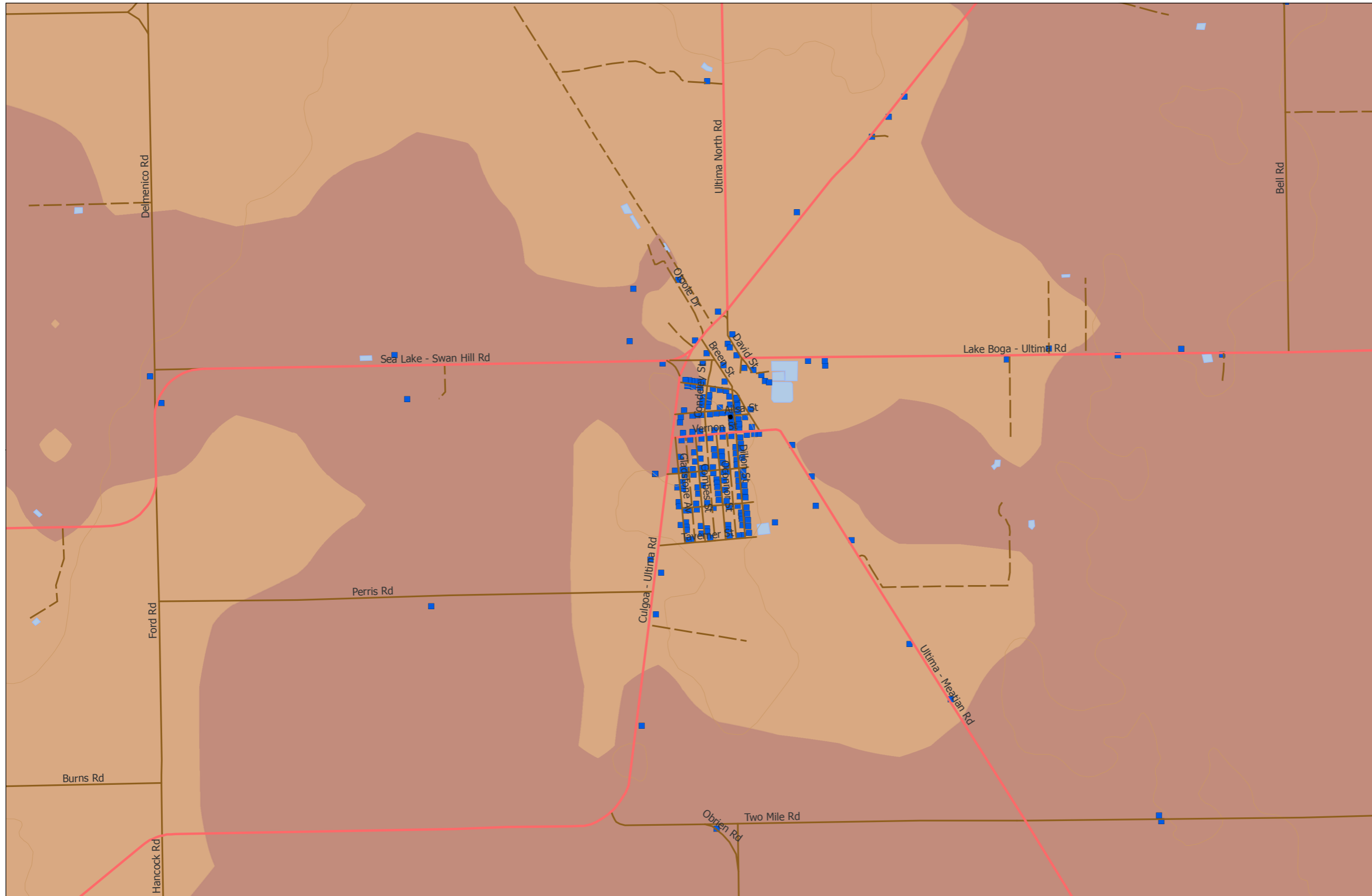
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DATUM: Horizontal: Geocentric Datum of Australia (GDA)
 Vertical: Australian Height Datum (AHD)
GRID: Grid Interval 1000 metres
 Map Grid of Australia 1994 (MGA94) Zone 54/55

Ultima House Loss Probability FFDI 75

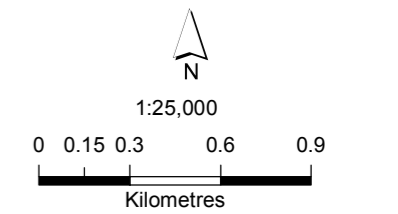


Legend

- Main Road (Sealed)
- Local Road
- - - 2wd
- - - 4wd
- - - Foot Tk
- Large Town
- Town
- Contour
- Contour Index
- - - Contour (Dep)
- - - Contour Index (Dep)
- Coastline
- - - State Border
- Houses

Waterbodies

- Subject to Inundation
- Permanent Waterbody
- ▨ Wetland Area
- 0.003975307 - 0.075665101
- 0.075665101 - 0.147354895
- 0.147354895 - 0.219044689
- 0.219044689 - 0.290734483
- 0.290734483 - 0.362424277
- 0.362424277 - 0.434114071
- 0.434114071 - 0.505803864
- 0.505803864 - 0.577493658
- 0.577493658 - 0.649183452



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