



Tetraria australiensis Fire Management Plan

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Western Australia.*

Tonkin Highway Extension (EPBC
2019-8608)

January 2021

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Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
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Reviewer:	Freea Itzstein-Davey Senior Environment Officer Elizabeth Johnston Senior Environment Officer	Rev 0	2/02/2021

1 PURPOSE

1.1 Proposed Action background

Main Roads Western Australia (Main Roads) is proposing to extend Tonkin Highway from Thomas Road in Oakford to South Western Highway in Mundijong (the Project). The Proposed Action encompasses approximately 305 ha of road reserve, with a disturbance footprint of 230 ha.

The Proposed Action is located within the Shire of Serpentine-Jarrahdale on the Swan Coastal Plain in Western Australia. The Project is approximately 30 km south-east of the Perth Central Business District and approximately 3.5 km west of Byford. The Project spans approximately 14 km in length.

Key components of the Proposed Action include:

- Approximately 14 kilometres of four lane dual carriageway road from Thomas Road to South Western Highway;
- Construction/upgrades of intersections at Thomas Road, Orton Road, Mundijong Road and South Western Highway;
- A grade separated interchange at Bishop Road catering for the Perth to Bunbury rail line and freight line;
- A principal shared path along the corridor; and
- Installation of associated road infrastructure, such as lighting, noise and retaining walls, safety barriers, stopping bays and traffic monitoring devices

1.2 Purpose of this Plan

In accordance with the EPBC 2019- 8603 request for additional information a Fire Management Plan for *Tetraria australiensis* is required. The purpose of this Fire Management Plan is to address risks and fire management actions for *Tetraria australiensis* from the Tonkin Highway Extension project. The main objective of this Plan is to ensure there is no increased risk of fire impacts on for *Tetraria australiensis* as a result of construction activities associated the Proposed Action.

2 ECOLOGY AND SURVEY RESULTS

2.1 Ecology and population information

Tetraria australiensis is a rhizomatous tufted perennial herb growing to 1 m high occurring on sand over clay flats (WA Herbarium 1998)(Plate 1). This taxon is listed as Vulnerable under both the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is endemic to Western Australia, occurring over a range of approximately 197 km from Ferndale (Perth) in the north to near Busselton in the south (Western Australian Herbarium 1998-).

DBCA data indicates that 66 locations of *Tetraria australiensis* are known comprising 21,500 individuals (Woodman 2020; DBCA unpublished data). At least three of the populations occur in conservation tenure (Watkins Road Nature Reserve, Lambkin Nature Reserve, Ruabon Nature Reserve) (Woodman 2020).



Plate 1: *Tetraria australiensis* (T) (Woodman 2020)

2.2 Survey results

During the biological survey of the Proposed Action area, *Tetraria australiensis* was recorded within VTs 2 and 4, which represent the preferred habitat for this species (Woodman 2020). Habitat within the Proposed Action area ranged from tall sparse shrubland of *Jacksonia sternbergiana*, *Kingia australis* and *Xanthorrhoea preissii* over mixed sedges and shrubs on brown sandy loam soils on seasonally moist flats, to mid open forest of *Corymbia calophylla* over shrubland dominated by *Xanthorrhoea preissii* and *Kingia australis* over sedges and forbs on grey or brown sand or sandy loam on dry flats (Woodman 2020).

A single main population occurs within the Proposed Action area in the Mundijong Road reserve and two smaller populations recorded in the Survey Area (Woodman 2020). The main population has previously been recorded by DBCA and is known as TPFL Population 10 (Woodman 2020). Another recorded population, TPFL Population 8, occurs immediately north of the eastern end of the Proposed Action area along Mundijong Road near the Mundijong sports complex. TPFL Populations 8 and 10 are likely to be sub-populations of a single population (Woodman 2020). TPFL Population 8 has not been subject to recent assessments due to access constraints; however, the last DBCA survey recorded 483 individuals (Woodman 2020). This number is still considered accurate (Woodman 2020).

DBCA data indicates previous surveys of TPFL population 10 have recorded 1,054 individuals (Woodman 2020). Targeted surveys for *Tetraria australiensis* were conducted in September and October 2019 by Woodman (2020). While this was not conducted during the known flowering period for *Tetraria australiensis* (November – December) the species is identifiable without the presence of flowers and thus can be identified year-round (Woodman 2020). Targeted surveys were undertaken at multiple locations where habitat suitable for the species occurred within the broader Survey Area (Woodman 2020). Woodman (2020) recorded a total of 1,214 individuals within the Survey Area, of which 1,208 at 290 locations fell within the Proposed Action area. Of these, 165 are proposed to be cleared. These individuals are considered part of TPFL Population 10.

An additional population of *Tetraria australiensis* was opportunistically recorded well to the west of the Proposed Action area, at which six individuals were recorded at a single location (Woodman 2020).

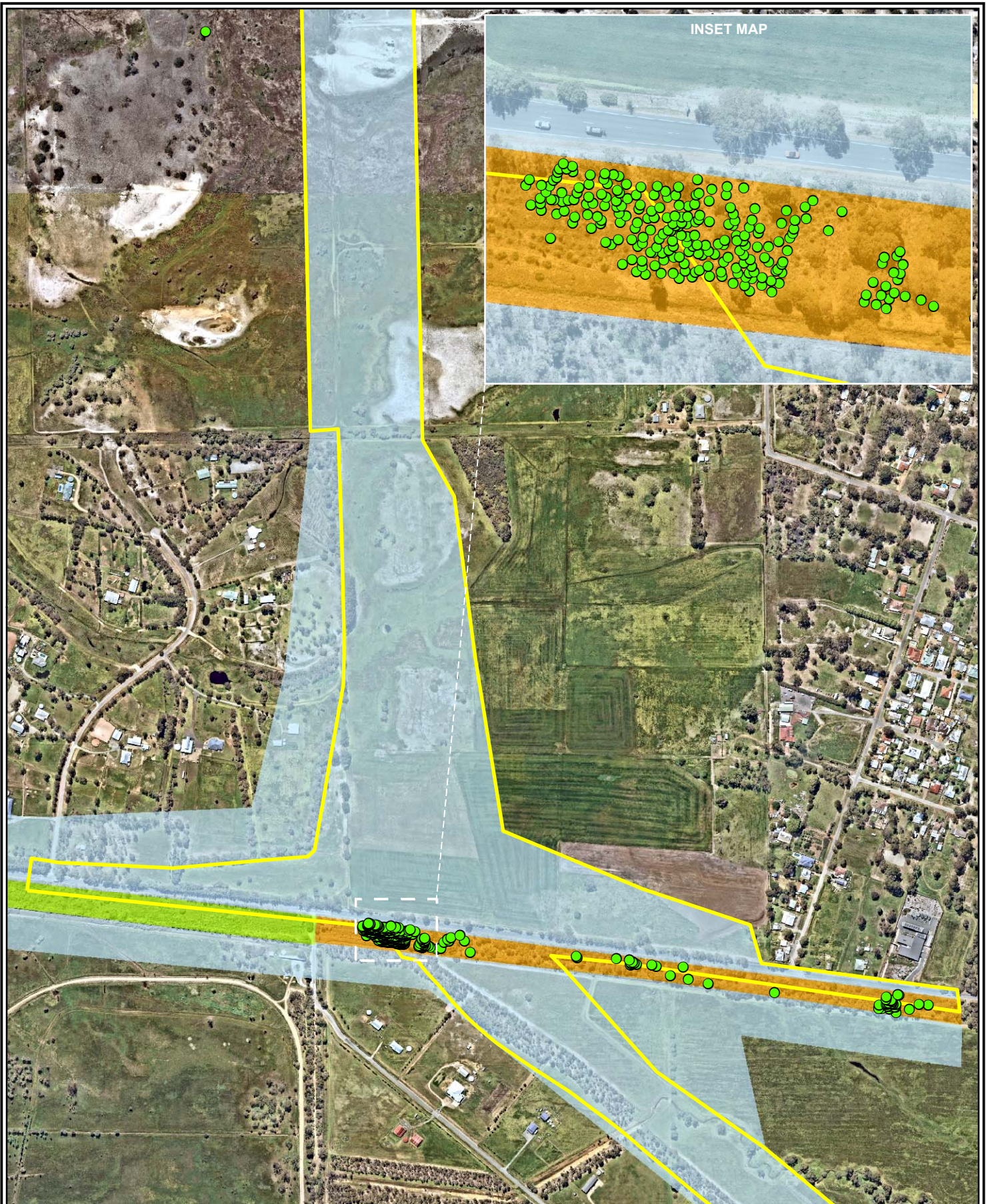
The locations of *Tetraria australiensis* individuals within the Proposed Action area and surrounds are shown in Figure 1.

2.3 Local distribution

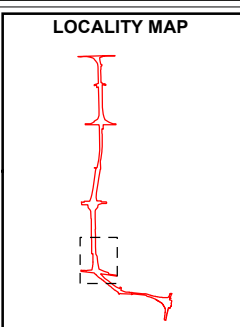
Tetraria australiensis has been recorded at 16 locations within a 5 km radius of the Proposed Action (Woodman 2020). Due to limitations of the abundance information provided in DBCA and Western Australian Herbarium spatial datasets, the number of individuals within a 5 km radius of the Proposed Action area cannot be explicitly quantified. However, it is estimated at approximately 3,000 individuals (DBCA unpublished data). Targeted surveys are currently being undertaken within vegetated areas considered to contain suitable habitat for the species on the Swan Coastal Plain to improve population estimates within 5 km of the Proposed Action and to focus future conservation efforts.

2.4 Fire

Inappropriate fire regimes are listed as a key threat to *Tetraria australiensis* in the Conservation Advice for the species (DEWHA 2008). The species is a fire ephemeral and re-sprouts and flowers on mass after fire, and the appropriate fire regime (intensity and interval) is not known (DEWHA 2008). The species is also not known to flower without a fire trigger. Too frequent fires may enable grassy weeds such as veldt grass to become established and outcompete slower growing *Tetraria australiensis*



- Legend**
- Proposed Action
 - *Tetraria australiensis* (V) locations
- Phytophthora* Dieback status
- Excluded
 - Infested
 - Uninfested unprotectable



Scale 1:9,000 at A4		0 100 200 Meters	
Coord. Sys. GDA 1994 MGA Zone 50		↑	
Job No: 58910			
Client: Main Roads Western Australia			
Version: A	Date: 20-Jan-2021		
Drawn By: hsullivan	Checked By: DN		

Tonkin Highway Extension WA

TETRARIA AUSTRALIENSIS LOCATIONS AND PHYTOPHTHORA DIEBACK STATUS WITHIN THE AREA OF THE PROPOSED ACTION

FIGURE 1

3 RISK ASSESSMENT

The construction of the Proposed Action has the potential to impact populations of *Tetraria australiensis* through an increased risk of fire resulting in damage or loss of individuals associated with an increase in human activity.

A qualitative risk assessment was conducted in accordance with the DotEE Environmental Management Plan Guidelines to assess the risk associated with construction. The bushfire risk has been allocated a likelihood and consequence rating using the criteria in Table 3.1 and Table 3.2. These ratings were then combined using Table 3.3 to generate a risk rating of low, medium, high or severe. The outcomes of the risk assessment are presented in Table 4.

Table 3.1: Likelihood of Occurrence

Qualitative Measures for likelihood (How likely is it that this event/issue after control strategies have been put in place)	
Highly likely	Is expected to occur in most circumstances.
Likely	Will probably occur during the life of the project.
Possible	Might occur during the life of the project.
Unlikely	Could occur but considered unlikely or doubtful.
Rare	May occur in exceptional circumstances.

Table 3.2: Consequence

Qualitative Measures for consequence (what will be the consequence/result if this issue does occur rating)	
Minor	Minor incident of environmental damage that can be reversed.
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts.
High	Substantial instances of environmental damage that could be reversed with intensive efforts.
Major	Major loss of environmental amenity and real danger of continuing.
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage.

Table 3.3: Risk Rating

Likelihood	Consequence				
	Minor	Moderate	High	Major	Critical
Highly likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

Table 4 Outcomes of Risk Assessment

Management objective / Desired outcome	Potential impacts	Relevant management measures / actions	Residual risk rating		
			Likelihood	Consequence	Risk
Avoid impacts to <i>Tetraria australiensis</i> through increased risk of fire.	Damage to retained individuals and habitat for <i>Tetraria australiensis</i> from accidental fires resulting from construction activities.	<ul style="list-style-type: none"> All personnel will be educated on bushfire prevention, including the risk of disposing of cigarette butts on the ground. No fires to be lit at any time. All hot works to be undertaken in accordance with the Contractor's safety procedures which will be reviewed and approved by Main Roads Environmental Management Representative prior to works. All vehicles, plant and equipment to be fitted with fire extinguishers and restricted to designated cleared areas. Fire danger ratings and Shire vehicle movement are to be observed and their requirements implemented. Clearing operations shall not be undertaken on total harvest ban days unless an exemption has been approved. Smoking will be restricted to designated smoking areas. 	Rare	Moderate	Low

4 FIRE MANAGEMENT ACTIONS

Table 5 details the fire management measures to be implemented in order to address the proposed fire risk to *Tetraria australiensis* associated with the Proposed Action. The table shows each management measure identified in the risk assessment alongside the implementation timing of each, their completion criteria and required monitoring to determine when each completion criterion is met.

Table 5 Fire Management Actions

Management objective	Management measure	Performance target / completion criteria	Timing	Monitoring / reporting activity	Corrective Action Trigger(s)	Corrective action	Corrective action responsibility
Avoid impacts to <i>Tetraria australiensis</i> through increased risk of fire	Daily fire danger ratings will be obtained from the Bureau of Meteorology and communicated to personnel during the daily pre-start meeting.	No operation of vehicles, plant or equipment in contravention of fire danger ratings or Council movement bans.	All activities.	Pre-start and Toolbox meeting agenda items and minutes.	Vehicle movements or activities involving risk of ignition being undertaken in conditions of high fire danger and/or fire bans. Fire originating from work area(s).	Refresher training conducted within one week of incident. Incident investigation undertaken and report provided within one week. Impacted areas to be included in revegetation plans within two weeks.	Construction Contractor Environmental Management Representative
	Restrict or prohibit vehicle movements during times of increased fire risk or total fire bans in vegetated areas.						
	Smoking must only take place in designated smoking areas.	No smoking outside of designated smoking areas.	All activities.	Pre-start and Toolbox meeting agenda items and minutes.	Smoking outside of designated smoking areas observed.	Responsible personnel identified and asked to stop immediately. Refresher training within one week of incident.	
	All hot works to be undertaken in accordance with contractor safety procedures, which will be reviewed by	No ignitions / fires started as a result of hot works.	During hot works such as welding.	Monthly site inspections to confirm required controls are in place, with incident reports	Hot work procedures not implemented or followed correctly.	Incident investigation and report undertaken within one week. Impacted areas included in	Construction Contractor Environmental Management Representative

Management objective	Management measure	Performance target / completion criteria	Timing	Monitoring / reporting activity	Corrective Action Trigger(s)	Corrective action	Corrective action responsibility
	the Construction Contractor Environmental Management Representative prior to works.			completed as required.		revegetation plans within two weeks. Refresher training conducted within one week of incident.	
	All vehicles, plant and equipment to be fitted with an appropriate exhaust system shielding and will be restricted to designated cleared areas.	No ignitions / fires started as a result of hot vehicle exhausts, plant or equipment No impact to <i>Tetraria australiensis</i> as a result of ignitions or fires originating from work areas.	During construction.	Incident reports related to fires if an incident occurs.	Fire originating from work area(s).	Incident investigation undertaken and report provided within one week. Impacted areas to be included in revegetation plans within two weeks. Refresher training conducted within one week of incident.	Construction Contractor Environmental Management Representative
	Environmental weeds within the construction site boundary will be treated as required according to their Control Codes and on advice from the Department of	No new occurrences or spread of Environmental weeds within the construction site boundary as a result of fire during	During construction.	1 month, 3 months and 1 year following a fire caused by construction activities.	New occurrence or spread of Environmental weeds as a result of fire origination from construction of the project.	Application of weed eradication techniques for the weed species. Review of Clean on Entry (CoE) process.	Construction Contractor Environmental Management Representative

Management objective	Management measure	Performance target / completion criteria	Timing	Monitoring / reporting activity	Corrective Action Trigger(s)	Corrective action	Corrective action responsibility
	Primary Industries and Regional Development.	construction activities.					

5 MONITORING AND IMPLEMENTATION

5.1 Monitoring

Several monitoring and reporting activities will be undertaken to ensure management measures are implemented and completion criteria are met. The monitoring activities are linked to the management measures identified in Table 5.

The proposed monitoring schedule is provided in Table 6 and has been developed to enable an assessment of the effectiveness of management actions described in Table 5.

Table 6 Monitoring schedule

Monitoring frequency	Monitoring Activity	Performance target	Parameter(s) measured	Location	Applicable method/guidelines	Responsibility
Daily	Fire danger ratings identified and communicated at pre-start meetings	No fires as a result of construction activities.	No instances of fires starting as a result of construction activities.	Proposed Action area.	Visual inspection to confirm measures in this management plan are being implemented correctly.	Construction Contractor Environmental Management Representative.
Monthly	Site inspection to confirm compliance with hot works procedures	No fires as a result of construction activities.	No instances of fires starting as a result of construction activities.	Proposed Action area.	Visual inspection to confirm measures in this management plan are being implemented correctly.	Construction Contractor Environmental Management Representative.

Further to this, if a fire occurs during construction Main Roads will undertake a survey of the *Tetraria australiensis* local population to determine the impacts of the fire. The results of this survey will be compared against results of the survey described in section 2.2.

5.2 Roles and Responsibilities

All personnel, including sub-contractors and sub-consultants, are responsible for complying with applicable Commonwealth and State legislation, local government requirements and the conditions all licences, permits and approvals relevant to the Tonkin Highway Extension. Specific responsibilities in relation to this management plan are provided in Table 7.

Table 7 Management Plan Roles and Responsibilities

Role	Responsibilities
Construction Contractor Environmental Management Representative	<ul style="list-style-type: none"> • Implementation of this Fire Management Plan on site • Coordinating and managing all the fire management activities during the construction phase • Being the primary contact point in relation to the environmental performance of the construction phase • Reporting any activities that has, or has the potential to, result in an environmental incident immediately to the Main Roads Superintendent and other relevant personnel

Role	Responsibilities
	<ul style="list-style-type: none">• Requiring reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, the direct that relevant actions be ceased immediately should an adverse on the environment be likely to occur• Management of the construction contractor’s environmental monitoring, inspection and audit program in so far as it relates to construction activities

6 REFERENCES

Department of the Environment, Water, Heritage and the Arts. (2008). Approved Conservation Advice for *Tetraria australiensis* (Southern *Tetraria*). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from:

<http://www.environment.gov.au/biodiversity/threatened/species/pubs/10137-conservationadvice.pdf>.

Department of Fire and Emergency Services. (2019). Bush Fire Prone Areas (OBRM-013) shapefile. Available from <https://data.gov.au/dataset/ds-wa-7e62b687-e8ea-4260-8b6b-15a3ba88cb41/details?q=>.

Western Australian Herbarium 1998-Florabase, [Online], Government of Western Australia, Available from: <https://florabase.dpaw.wa.gov.au/>, [January 2020].

Woodman Environmental Consulting Pty Ltd (2020) *Tonkin Highway Extension (Thomas Road to South Western Highway) Flora and Vegetation Assessment*. Report prepared by Saligari A, Firth L and Coultas D of Woodman Environmental Consulting Pty Ltd for Main Roads. Revision 0. May 2020