

Abridged Threatened Species Nomination Form

For nominations under the Common Assessment Method (CAM) where supporting information is available, but not in a format suitable for demonstrating compliance with the CAM, and assessment against the IUCN Red List threat status.

Cover Page *(Office use only)*

Species name (scientific and common name):	<i>Ptilotus fasciculatus</i> , Fitzgerald's Mulla-mulla
Nomination for (addition, deletion, change):	Deletion
Nominated conservation category and criteria:	None

Scientific committee assessment of eligibility against the criteria:		
This assessment is consistent with the standards set out in Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding.		Yes <input type="checkbox"/> No <input type="checkbox"/>
A.	Population size reduction	•
B.	Geographic range	•
C.	Small population size and decline	•
D.	Very small or restricted population	•
E.	Quantitative analysis	•

Outcome:			
Scientific committee Meeting date:			
Scientific committee comments:			
Recommendation:			
Ministerial approval:		Date of Gazettal/ Legislative effect:	

Nomination summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	<i>Ptilotus fasciculatus</i>			
Common name:	Fitzgerald's Mulla-mulla			
Family name:	Amaranthaceae	Fauna <input type="checkbox"/>	Flora <input checked="" type="checkbox"/>	
Nomination for:	Listing <input type="checkbox"/>	Change of status <input type="checkbox"/>	Delisting <input checked="" type="checkbox"/>	
1. Is the species currently on any conservation list, either in a State or Territory, Australia or Internationally? 2. Is it present in an Australian jurisdiction, but not listed?		Provide details of the occurrence and listing status for each jurisdiction in the following table		
Jurisdiction	State / Territory in which the species occurs	Date listed or assessed (or N/A)	Listing category i.e. critically endangered or 'none'	Listing criteria i.e. B1ab(iii)+2ab(iii)
International (IUCN Red List)				
National (EPBC Act)		18/8/2006	Endangered	Criterion 2, EPBC Act
State / Territory	1. WA	14/8/2001	Endangered	D1
	2. WA	28/12/2016	None	
	3.			
Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:				
<ul style="list-style-type: none"> this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria; 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> surveys of the species were adequate to inform the assessment; 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> the conclusion of the assessment remains current and that any further information that may have become available since the assessment was completed supports or is consistent with the conclusion of the assessment. 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Re-assessment by the WA TSSC has determined that the species is not threatened and does not meet any IUCN criteria			
Nominated national conservation status: category and criteria				
Presumed extinct (EX) <input type="checkbox"/>	Critically endangered (CR) <input type="checkbox"/>	Endangered (EN) <input type="checkbox"/>	Vulnerable (VU) <input type="checkbox"/>	
None (least concern) <input checked="" type="checkbox"/>	Data Deficient <input type="checkbox"/>	Conservation Dependent <input type="checkbox"/>		

What are the IUCN Red List criteria that support the recommended conservation status category?					
Eligibility against the IUCN Red List criteria (A, B, C, D and E)					
Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For delisting , provide details for why the species no longer meets the requirements of the current conservation status.					
A.	Population size reduction (evidence of decline)	<ul style="list-style-type: none"> No observed reduction in population Does not meet criteria 			
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	<ul style="list-style-type: none"> B1 – EOO 24,000km² using convex hull (>20,000km²) B2 – AOO 92 km² (<500 km²) Number of locations greater than 11 based on clusterings of discrete slat lake occurrences that could be subject to common regional threatening processes (see map below). Not severely fragmented, and no decline or extreme fluctuations observed, estimated, inferred or projected Does not meet criteria 			
C.	Small population size and decline (population size, distribution and evidence of decline)	<ul style="list-style-type: none"> Number of individuals is 64,838+ (>10,000) Does not meet criteria 			
D.	Very small or restricted population (population size)	<ul style="list-style-type: none"> Number of individuals is 64,838+ (>1,000) No significant threatening process which could drive species to critically endangered or extinct in a very short time. Does not meet criteria 			
E.	Quantitative analysis (statistical probability of extinction)	<ul style="list-style-type: none"> No Data – unable to assess 			
Summary of assessment information					
EOO	24,000km ² (convex hull method)	AOO	92km ² (2x2km grid method).	Generation length	unknown
No. locations	11	Severely fragmented	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		
No. subpopulations	29	No. mature individuals	64,838 plus		
Percentage global population within Australia		100			
Percentage population decline over 10 years or 3 generations		None recorded			
Threats (detail how the species is being impacted)					
Threat (describe the threat and how it impacts on the		Extent (give details of impact on		Impact (what is the level of threat to	

<i>species. Specify if the threat is past, current or potential)</i>	<i>whole species or specific subpopulations)</i>	<i>the conservation of the species)</i>		
Land clearing	Minimal and generally restricted to roadside populations	Low impact. Extensive clearing does not seem to be continuing.		
Grazing by sheep, rabbits and kangaroos	Moderate	Low impact		
Land degradation due to salinity and poor drainage	Minimal Some populations more likely to be affected from neighbouring private landholders and inappropriate salinity management	Potentially moderate impact in localised areas, however not enough information to quantify.		
Weeds	Minimal	Moderate impact		
Management and Recovery				
Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
<i>List all relevant recovery or management plans (including draft, in-preparation, out-of-date, national and State/Territory recovery plans, recovery plans for other species or ecological communities, or other management plans that may benefit or be relevant to the nominated species).</i> <ul style="list-style-type: none"> None 				
<i>List current management or research actions, if any, that are being undertaken that benefit the conservation of the species.</i> <ul style="list-style-type: none"> N/A 				
<i>List further recommended management or research actions, if any, that would benefit the conservation of the species.</i> <ul style="list-style-type: none"> N/A 				
Nomination prepared by:				
Contact details:				
Date submitted:	14/2/2017			
<i>If the nomination has been refereed or reviewed by experts, please provide their names and contact details:</i>				



Occurrences of *Ptilotus fasciculatus*

Summary of subpopulation information (detailed information to be provided in the relevant sections of the form)							
Location (include coordinates)	Department subpopulati on number	Land tenure	Survey information:		Area of subpopul ations (km ²)	Site / habitat Condition	Threats (note if past, present or future)
			Date of last survey	No. mature individuals			
1. Shire of Carnamah, 31km East of Northampton -28.323444 S, 114.952221 E Geraldton District,	Subpopulati on 6A and 6B and 21	Local government reserves	22/09/2008	1000+	0.1007	Healthy populations with 1000+ plants No apparent historic change in number	Past: unknown; Present: Possible salinization, clearing, gravel extraction Future: waterlogging and salinity likely
2. Private property, 13km NE of Carnamah -29.609032 S 115.988667 E Moora District	Subpopulati on 2A and 2B	Private property, and adjacent road reserve	4/11/1992	8	0.01	Unknown	Historically grading and clearing; Future: waterlogging and salinity
3. Private property, 15km ESE of Coorow -29.922014 S 116.177284 E Moora District	Subpopulati on 1 and 5	Private Property/ Freehold	29/08/2001	851	0.28	Unknown	Historically clearing and grazing, may still be continuing
4. Private property and UCL, Wubin Gunyidi Road -30.126438 S 116.195994 E Moora District	Subpopulati on 4A, 4B, and 12	Private property and UCL	2009 Pop 4A+B: Pop 12:	10,006 200	0.091	Healthy populations , no historic information	No imminent threats, populations appear salt tolerant, some low impact grazing by rabbits and weed competition
5. Salt River east and south of Mount Caroline -31.805278 S 117.661944 E Central Wheatbelt District	Subpopulati on 8, 9, and 15	Private Property and Crown Lease	Pop 8 2003 Pop 9 2003 Pop 15 2011	270 100 20	0.68	Healthy populations, no historic information	Past: unknown; Present: Possible salinization, clearing, grazing by stock & rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds

6. Kwolyin Nature Reserve -32.584305 S 117.419043 E Central Wheatbelt District	Subpopulation 10	Nature Reserve	14/10/2009	1000	0.19	Poor condition, some dead	Past: unknown
	New pop Shackleton Nature Reserve	Nature Reserve	Nov 2014	487	0.0043	Healthy	Present: Wind and rain erosion Possible salinization, clearing, grazing by stock & rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds
7. Private property adjacent to Mokamie Nature Reserve -31.953494 S 117.948636 E Central Wheatbelt District	Subpopulation 13, and 22	Private and Nature Reserve	26/11/2014	120	0.0025	Healthy plants, no observed decline	Past: unknown; Present: Possible salinization, clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds
8. South east of Quairading, along the Salt River -32.043929 S 117.450877 E Central Wheatbelt District	Subpop 14A & B	Road reserve, Private property	13/12/2011	928	0.0196	Moderately healthy	Past: unknown; Present: Possible salinization, clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant), firebreak maintenance Future: waterlogging and increased salinity, weeds
	Subpop 14C	Rail reserve	30/10/2013	388	0.003	Healthy	
	Subpop 14D	Private property	21/10/2013	530	0.01	Healthy	
	Subpop 14E	Nature Reserve	17/12/2011	13	0.0016	Moderately healthy	
	Subpop 16 A & B	Private property	06/01/2012	3682	0.15	Moderate to poor	
	Subpop 17	Private property	26/01/2012	2370	0.02	Poor	
	Subpop 18A	Nature Reserve	09/02/2012	5048	0.15	Poor	
	Subpop 18B	Private property	17/02/2012	12474	0.02	Poor	
	Subpop 18C	Nature Reserve	19/02/2013	5000	0.005	Healthy	
	Subpop 19	Nature Reserve	23/12/2011	120	0.0006	Moderate	
	New subpop Rick Ladyman	Private Property	3/11/2012	751	0.0015	Healthy	
	New subpop Neil Richards	Private Property	21/01/2014	9359	0.09		

9. Yenyening Nature reserve, Shire of Quairading -32.211667 S 117.289444 E Central Wheatbelt District	Subpopulation 7	Nature Reserve	13/10/2002	unknown	Unknown	Unknown	unknown
10. Seagroatt Nature Reserve and Red Lake Nature Reserve -32.166455 S 118.419043 E Central Wheatbelt District	Subpopulation 11 and 20 and 23 New subpop Wandagil NR	Nature Reserve	18/12/2013 13/10/2012	557 6670	0.067 0.002	Healthy	Past: unknown; Present: Increased nitrification and acidification as a result of neighbouring deep drain into reserve (Seagroatt), clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds
11. Kondinin Salt Marsh Nature Reserve -32.584305 S 118.419043 E Central Wheatbelt District	Subpopulation 3A and 3B	Nature Reserve	10/11/2010	2886	0.109	Moderately healthy	Past: unknown; Present: Possible salinization, clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds
			Total	64,838	1.998		

Threatened species nomination

For nominations to the WA Threatened Species Scientific Committee (and the Minister for Environment) to amend threatened species listings under the WA *Wildlife Conservation Act 1950* or their IUCN Red List threat status.

Cover Page (Office use only)

Species name (scientific and common name):	<i>Ptilotus fasciculatus</i> , Fitzgerald's Mulla-mulla
Nomination for (addition, deletion, change):	Delisting
Nominated conservation category and criteria:	P4

TSSC assessment of eligibility against the criteria:		
A.	Population size reduction	<ul style="list-style-type: none"> No observed reduction in population Does not meet criteria
B.	Geographic range	<ul style="list-style-type: none"> B1 – EOO >20,000km² B2 – AOO 92 km² (<500 km²) but 11 locations, not severely fragmented, and no decline or extreme fluctuations observed, estimated, inferred or projected Does not meet criteria
C.	Small population size and decline	<ul style="list-style-type: none"> Number of individuals >10,000 (64,838+) Does not meet criteria
D.	Very small or restricted population	<ul style="list-style-type: none"> Number of individuals >10,000 (64,838+) No significant threatening process which could drive species to critically endangered or extinct in a very short time. Does not meet criteria
E.	Quantitative analysis	<ul style="list-style-type: none"> No Data – unable to assess

Outcome:	
TSSC Meeting date:	22/6/2016
TSSC comments:	Reasons for de-listing summarised, no objection.
Recommendation:	Delist and list as Priority 4

<i>Ministerial approval:</i>	28/12/2016	<i>Government Gazette:</i>	06/01/2017
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Nomination summary *(to be completed by nominator)*

Current conservation status					
Scientific name:	<i>Ptilotus fasciculatus</i>				
Common name:	Fitzgerald's Mulla-mulla				
Family name:	Amaranthaceae	Fauna <input type="checkbox"/>		Flora <input checked="" type="checkbox"/>	
Nomination for:	Listing <input type="checkbox"/>		Change of status <input type="checkbox"/>	Delisting <input checked="" type="checkbox"/>	
Is the species currently on any conservation list, either in WA, Australia or Internationally?		Yes <input checked="" type="checkbox"/> If Yes; complete the following table		No <input type="checkbox"/> If No; go to the next question	
Jurisdiction	List or Act name	Date listed or assessed	Listing category i.e. critically endangered	Listing criteria i.e. B1ab(iii)+2ab(iii)	
International	IUCN Red List				
National	EPBC Act	18/Aug/2006	Endangered	Criterion 2, EPBC Act	
State of WA	WC Act	14/AUG/2001	Endangered	D1	
	DPaW Priority list	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
Other States or Territories					
Nominated conservation status: category and criteria (including recommended categories for deleted species)					
Presumed extinct (EX) <input type="checkbox"/> Critically endangered (CR) <input type="checkbox"/> Endangered (EN) <input type="checkbox"/> Vulnerable (VU) <input type="checkbox"/>					
None <input type="checkbox"/> Priority 1 <input type="checkbox"/> Priority 2 <input type="checkbox"/> Priority 3 <input type="checkbox"/> Priority 4 <input checked="" type="checkbox"/> Other Specially Protected (Conservation Dependent) <input type="checkbox"/>					
What criteria support the conservation status category above? <i>Refer to Appendix A table 'Summary of the five criteria (A-E)' and the check version that can be completed to indicate all criteria options</i>					
Eligibility against the criteria					
<i>Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For delisting, provide details for why the species no longer meets the requirements of the current conservation status.</i>					
A.	Population size reduction	<ul style="list-style-type: none"> No observed reduction in population Does not meet criteria 			
B.	Geographic range	<ul style="list-style-type: none"> B1 – EOO >20,000km² B2 – AOO 92 km² (<500 km²) but 11 locations, not severely fragmented, and no decline or extreme fluctuations observed, estimated, inferred or projected Does not meet criteria 			

C.	Small population size and decline	<ul style="list-style-type: none"> Number of individuals >10,000 (64,838+) Does not meet criteria
D.	Very small or restricted population	<ul style="list-style-type: none"> Number of individuals >10,000 (64,838+) No significant threatening process which could drive species to critically endangered or extinct in a very short time. Does not meet criteria
E.	Quantitative analysis	<ul style="list-style-type: none"> No Data – unable to assess
Reasons for change of status		
Genuine change <input type="checkbox"/> New knowledge <input checked="" type="checkbox"/> Taxonomic change <input type="checkbox"/> Previous mistake <input type="checkbox"/> Other <input type="checkbox"/>		
Increased survey effort over the last 6 years has significantly increased known occurrences and numbers of plants.		
Summary of assessment information <i>(detailed information to be provided in the relevant sections of the form)</i>		
EOO	24,000km ² using convex hull	AOO 92 km ² using 2x2km grid method. Area of occupied habitat 1.875km ² .
		Generation length Unknown
No. locations	11	Severely fragmented Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
No. subpopulations	29	No. mature individuals 64,838 plus many more
Percentage global population within WA		100%
Percentage global population within Australia		100%
Percentage population decline over 10 years or 3 generations		0

Summary of subpopulation information (detailed information to be provided in the relevant sections of the form)

Table 1. Location information - See attached maps in Appendix C showing Locations

Location (include coordinates)	Department subpopulation number	Land tenure	Survey information:		Area of subpopulations (km ²)	Site / habitat Condition	Threats (note if past, present or future)	Specific management actions
			Date of last survey	No. mature individuals				
1. Shire of Carnamah, 31km East of Northampton -28.323444 S, 114.952221 E Geraldton District,	Subpopulation 6A and 6B and 21	Local government reserves	22/09/2008	1000+	0.1007	Healthy populations with 1000+ plants No apparent historic change in number	Past: unknown; Present: Possible salinization, clearing, gravel extraction Future: waterlogging and salinity likely	
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Location (include coordinates)	Department subpopulation number	Land tenure	Survey information:		Area of subpopulations (km ²)	Site / habitat Condition	Threats (note if past, present or future)	Specific management actions
			Date of last survey	No. mature individuals				
5. Salt River east and south of Mount Caroline -31.805278 S 117.661944 E Central Wheatbelt District	Subpopulation 8, 9, and 15	Private Property and Crown Lease	Pop 8 2003 Pop 9 2003 Pop 15 2011	270 100 20	0.68	Healthy populations, no historic information	Past: unknown; Present: Possible salinization, clearing, grazing by stock & rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds	
6. Kwolyin Nature Reserve -32.584305 S 117.419043 E Central Wheatbelt District	Subpopulation 10	Nature Reserve	14/10/2009	1000	0.19	Poor condition, some dead	Past: unknown Present: Wind and rain erosion Possible salinization, clearing, grazing by stock & rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds	
	New pop Shackleton Nature Reserve	Nature Reserve	Nov 2014	487	0.0043	Healthy		
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8. South east of Quairading, along the Salt River -32.043929 S 117.450877 E Central Wheatbelt District	Subpop 14A & B	Road reserve, Private property	13/12/2011	928	0.0196	Moderately healthy	Past: unknown; Present: Possible salinization, clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant), firebreak maintenance Future: waterlogging and increased salinity, weeds	
	Subpop 14C	Rail reserve	30/10/2013	388	0.003	Healthy		
	Subpop 14D	Private property	21/10/2013	530	0.01	Healthy		
	Subpop 14E	Nature Reserve	17/12/2011	13	0.0016	Moderately healthy		
	Subpop 16 A & B	Private property	06/01/2012	3682	0.15	Moderate to poor		

Location (include coordinates)	Department subpopulation number	Land tenure	Survey information:		Area of subpopulations (km ²)	Site / habitat Condition	Threats (note if past, present or future)	Specific management actions
			Date of last survey	No. mature individuals				
	Subpop 17	Private property	26/01/2012	2370	0.02	Poor		
	Subpop 18A	Nature Reserve	09/02/2012	5048	0.15	Poor		
	Subpop 18B	Private property	17/02/2012	12474	0.02	Poor		
	Subpop 18C	Nature Reserve	19/02/2013	5000	0.005	Healthy		
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9. Yenyening Nature reserve, Shire of Quairading -32.211667 S 117.289444 E Central Wheatbelt District	Subpopulation 7	Nature Reserve	13/10/2002	unknown	Unknown	Unknown	unknown	
10. Seagroatt Nature Reserve and Red Lake Nature Reserve -32.166455 S 118.419043 E Central Wheatbelt District	Subpopulation 11 and 20 and 23 New subpop Wandagil NR	Nature Reserve	18/12/2013 13/10/2012	557 6670	0.067 0.002	Healthy	Past: unknown; Present: Increased nitrification and acidification as a result of neighbouring deep drain into reserve (Seagroatt), clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds	

Location (include coordinates)	Department subpopulation number	Land tenure	Survey information:		Area of subpopulations (km ²)	Site / habitat Condition	Threats (note if past, present or future)	Specific management actions
			Date of last survey	No. mature individuals				
11. Kondinin Salt Marsh Nature Reserve -32.584305 S 118.419043 E Central Wheatbelt District	Subpopulation 3A and 3B	Nature Reserve	10/11/2010	2886	0.109	Moderately healthy	Past: unknown; Present: Possible salinization, clearing, dumping of rubbish, grazing by rabbits, weed invasion (Ice plant) Future: waterlogging and increased salinity, weeds	
			Total	64,838	1.998			

Nomination detail

Please refer to the Departments guidelines on nominating species for amendment of the Western Australian threatened species lists at http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Threatened_Species_Nomination_Guidelines_2014.pdf

For technical information on terminology used in this form, and the intent of information requirements, as they relate to an assessment of this nomination against the IUCN Red List criteria, refer to the 2001 *IUCN Red List Categories and Criteria. Version 3.1*

http://www.iucnredlist.org/documents/redlist_cats_crit_en.pdf

and *Guidelines for Using the IUCN Red List Categories and Criteria Version 11* (February 2014)

<http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf>

Section 1: Taxonomy

1.1 Current taxonomy			
Species name and Author:		<i>Ptilotus fasciculatus</i> W.Fitzg.	
Subspecies name(s) and Author:		N/A	
Is the species/subspecies conventionally accepted?		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Is there any controversy about the taxonomy?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If not conventionally accepted and/or if there is any controversy; provide details:			
Has the species/subspecies been formally named?		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Has the species/subspecies been recently described?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If the species has not been formally named or described; is it in the process of being described? Is there an anticipated date for the publication of the description? Has a type specimen been deposited? And if so provide the registration number and where deposited.			
If there are any closely related taxa provide details and include key distinguishing features:		<i>Ptilotus fasciculatus</i> was previously taxonomically confused with <i>Ptilotus caespitosus</i> (presumed extinct). Fitzgerald's Mulla-mulla is similar to <i>P. caespitosus</i> , varying in having slightly longer flowers with broad apices to the petals, plus variations in the arrangement of hairs on the flowers, and position of style on ovary	
1.2 Taxonomic history			
Are there recent synonyms for the species?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes; provide details of synonyms:			
Have there been recent changes in the taxonomy or nomenclature?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes; provide details of changes:			

1.3 Hybridisation

Is there any known hybridism with other species in the wild?

Yes ☐

No ☐

Unknown ☒

If Yes; Where does this occur and how frequently?

Section 2: Species information

2.1 Morphology / physical description



Mokamie Nature Reserve, Bert Hort 4 Dec 2013



Ptilotus fasciculatus Bert Hort 31 October 2013

Species description:

Fitzgerald's Mulla-mulla is a perennial herb that has short leafy branches and upright, simple flowering stems. It has spherical flower spikes on white, woolly stems that are up to 13cm tall. Flowering has been recorded from September to December, with peak flowering occurring in November.

Fitzgerald's Mulla-mulla is extremely easy to find during the flowering season.

2.2 Biology (provide details)

Little is known about the reproduction of this species but flowers can be seen between September and December. No seeds have been collected nor pollination vectors observed. It is likely that some vegetative reproduction is occurring as the plants can form large mats covering in some cases >1m sq. The role of disturbance is not known.

2.3 Ecology (provide details)

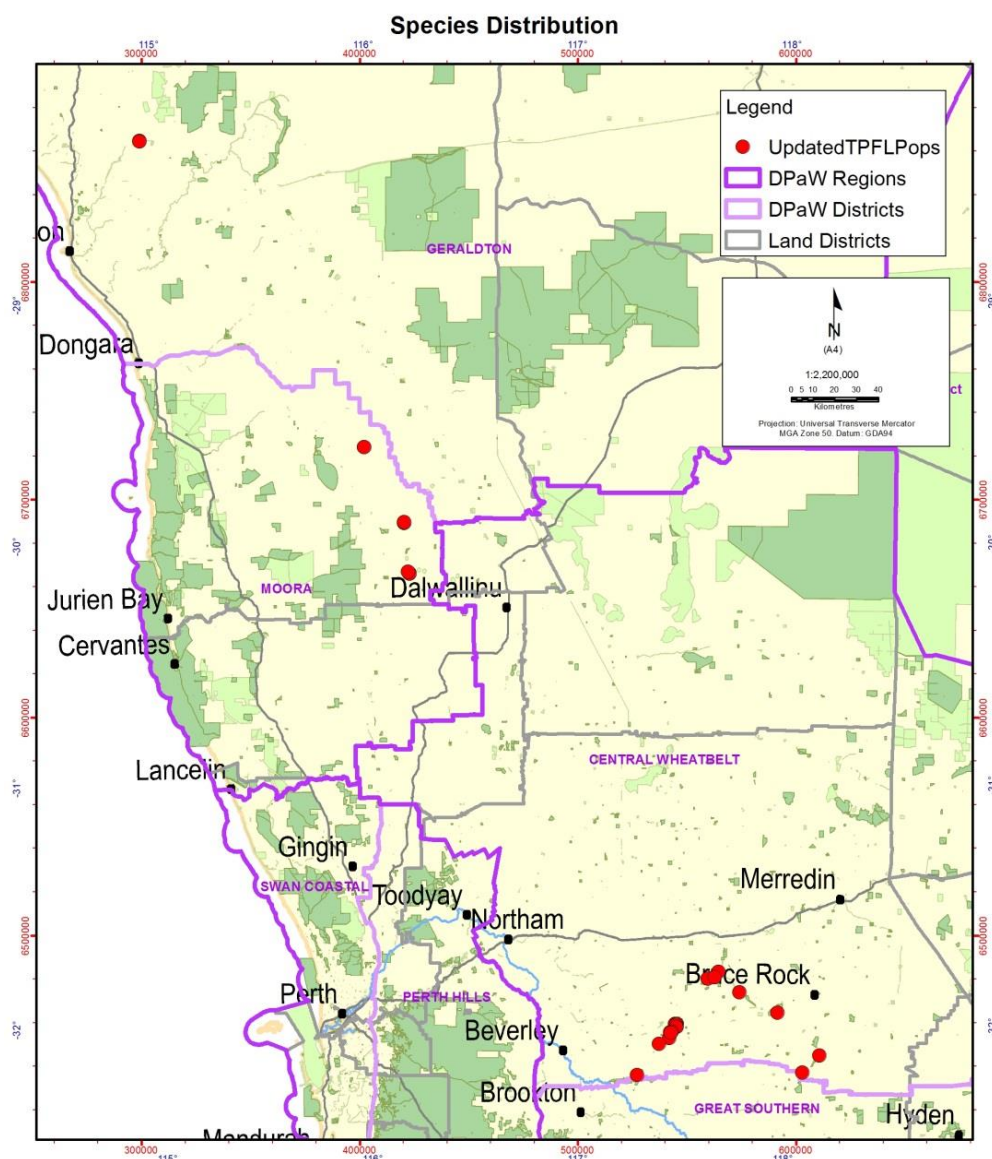
Fitzgerald's Mulla-mulla grows in white-grey, sandy-loam, clay soils in moist, saline conditions, often around salt lakes. It is found in open shrubland.

Species associated include; *Acacia acuminata*, *A. tetragonophylla*, *Allocasuarina campestris*, *Dianella revoluta*, *Atriplex* sp., *Melaleuca thyoides*, *M. lateriflora*, *Frankenia parvula*., *Rhagodia* sp., *Eragrostis dielsii*, *Sarcocornia blackiana*, *Eremophila eriocalyx* and *Roycea pycnophylloides*, *Scaevola tortuosa*, *Tecticornia halocnemoides*, *T. Lepidosperma*, *T. Leptoclada* subsp *inclusa*, *Disphyma crassifolium* subsp. *clavellatum*, *Wilsonia humilis*.

Section 3: Geographic range

3.1 Distribution

Insert map(s) of the species distribution, or provide as an attachment:



What is the current distribution of the species within Western Australia?	<p>The Fitzgerald's Mulla-mulla is endemic to Western Australia. It is currently known from twenty nine (29) subpopulations located in a roughly linear range parallel to the coast, in areas surrounding Kondinin, Carnamah and Coorow in the Midwest region and in the Shires of Kellerberrin, Bruce Rock, Narembeen and Quairading in the Wheatbelt region.</p> <p>Its distribution is strongly linked with Halophyll and Sarcophyll Communities composed of samphire, salt-bush and blue-bush with scattered trees or scrub found scattered around salt lakes and along saline drainage systems.</p>		
What percentage of the species distribution is within WA?	100%		
What is the current distribution of the species within the other Australian States and Territories?	0%		
Does the species occur outside of Australia?			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
If Yes, what percentage of the species distribution is within Australia, or what is the significance of the occurrence in Australia?	N/A		
What is the current international trend for the species?	N/A		
3.2 Migration			
Is the species migratory?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the migration within WA or within Australia or international?			
3.3 Extent of Occurrence (EOO) within Australia			
What is the current EOO?	Approximately 24,363 km ²		
How has this been calculated?	Calculated by drawing a convex hull around all known locations.		
What is the historical EOO?	<p>For the original nomination in 2000, the species was known only from 2 populations on the eastern side of Moora District near Carnamah and Coorow.</p> <p>For the Federal listing advice in August 2006 EOO was estimated at 22,300 km².</p>		
What is the current EOO trend?	Decreasing <input type="checkbox"/> Increasing <input type="checkbox"/> Stable <input checked="" type="checkbox"/>		
Provide details on the current trend – quantify if possible	Based on analysis of suitable habitat (Halophyll and Sarcophyll communities – predominantly around the periphery of salt lakes and saline drainage systems) EOO could increase but only marginally.		
If there has been a change in EOO when did this change occur?	N/A		

Was the change observed, estimated, inferred or projected?	N/A		
If the EOO is decreasing / declining, is it continuing?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is the continuing decline observed, estimated, inferred or projected?	N/A		
Is there extreme fluctuation in EOO?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>If Yes, provide details:</i>	N/A		
3.4 Area of Occupancy (AOO) within Australia			
What is the current AOO?	<p>92 km² using 2x2km cells as per IUCN recommended method.</p> <p>Area of occupied habitat 1. 99km² based on known and estimated area of occupancy figures from report forms.</p>		
How has this been calculated?	<p>IUCN calculation: A 2km x 2km grid was overlaid over known population points and the number of 'cells' occupied counted. The calculation is then the number of cells occupied by the area of one cell.</p> <p>Note: when 1km x 1km cell was used, AOO = 28km², and for 0.5kmx0.5km cell AOO = 19km².</p> <p>Most report forms have an estimated area of occupancy of the subpopulation provided in square meters and this was used to calculate area of occupied habitat.</p>		
What is the historical AOO?	<p>August 2006 Federal listing advice estimated AOO at 1.4 km² based on few known locations at the time. Increase in AOO due to discovery of new subpopulations/locations.</p> <p>Real change unlikely to be significant due to occurrence in naturally saline areas that have not been cleared in the same way as arable land.</p>		
What is the current AOO trend?	Decreasing <input type="checkbox"/> Increasing <input type="checkbox"/> Stable <input checked="" type="checkbox"/>		
<i>Provide details on the current trend – quantify if possible</i>	Uncertain if there is enough information to inform on trends. It is suspected it is stable for now. Any increase is likely to be due to finding new locations, and decline not expected as saline areas are not being cleared.		
If there has been a change in AOO when did this change occur?	N/A		
Was the change observed, estimated, inferred or projected? Give details.	N/A		
If the AOO is decreasing / declining, is it continuing?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is the continuing decline observed, estimated, inferred or projected? Give details.	N/A		
Is there extreme fluctuation in AOO?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<i>If Yes, provide details:</i>	N/A		

Does the species have a restricted AOO?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<i>If Yes, provide details:</i>	The species is restricted to a very specific landform i.e. just above the high water mark in the saline drainage systems. However, saline drainage systems are not uncommon in the WA agricultural region.	
3.5 Number of Locations		
<p>'Locations' are defined as a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat. (IUCN 2001).</p>		
At how many locations does the species occur?	There are eleven locations characterised by clustered subpopulations disconnected from other locations by cleared land and breaks in suitable habitat. See map attached for Location and associated Parks and Wildlife subpopulations.	
Has there been a change in the number of locations?		Decrease <input type="checkbox"/> Increase <input checked="" type="checkbox"/> No change <input type="checkbox"/>
If there has been a change, when did this change occur?	Fourteen new subpopulations were discovered between 2011 and 2014. These were found predominantly in the Shires of Quairading and Bruce Rock.	
Was the change observed, estimated, inferred or projected? Give details.	<p>The change is observed.</p> <p>All 14 new subpopulations were discovered as a consequence of numerous surveys all conducted by Bert Hort, a volunteer for the Department who lives in Quairading. Bert has spent many hours searching and recording new populations during the species flowering time from October and well into summer for the past 5 years.</p>	
If the number of locations is decreasing / declining, is it continuing?		Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the continuing decline observed, estimated, inferred or projected? Give details.	N/A	
Is there extreme fluctuation in the number of locations?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>If Yes, provide details:</i>		
Does this species occur on any off-shore islands?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>If Yes, provide details:</i>		
3.6 Fragmentation		
Is the distribution fragmented?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>The phrase 'severely fragmented' refers to the situation in which increased extinction risks to the taxon results from the fact that most of its individuals are found in small and relatively isolated subpopulations (in certain circumstances this may be inferred from habitat information). These small subpopulations may go extinct, with a reduced probability of recolonization.</p>		
Is the distribution severely fragmented?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>If Yes, provide details:</i>	There is a disjunct location north east of Geraldton which is isolated from all other known locations by 170 km. It occurs in a very small patch of suitable habitat none of which is protected by conservation estate and which is over 50km away from the next	

	<p>nearest suitable habitat. It is unknown if this area has been surveyed for the species or not.</p> <p>The other locations are all found on narrow strings of habitat found along saline drainage lines and edges of salt lakes. See maps attached. This separation of habitat is natural and thus does not represent a risk to the species.</p>
3.7 Land tenure	
Is the species known to occur on lands managed primarily for nature conservation? i.e. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<i>If Yes; provide details:</i>	Nineteen (19) out of 29 subpopulations occur wholly or partially on Conservation Estate (Nature Reserves). These populations consist of approximately 21,949 mature plants. A further four occur on Crown Reserve, Crown Lease, or Unallocated Crown Land (UCL) containing approximately 1,470 plants.
Is the species known to occur on lands that are under threat? i.e. mining tenement, zoned for development	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<i>If Yes; provide details:</i>	<p>There are some areas under threat, predominantly from inappropriate deep drains on neighbouring farmland, which drain into the habitat for the species and destroy the low-lying areas. Only a few locations are under direct threat or have been impacted by this in the past.</p> <p>According to the tenement and tenure information on the department's corporate data there are no mining leases over the known distribution of the species. Population surveys at Location 1 (subpopulation 6A and 6B) and Location 11 (subpopulation 3A and 3B) indicate that they may be threatened by gravel mining and gypsum mining, however, no further details are available and the threat seems minimal.</p>
Provide details of other land tenures where the species occurs as this relates to the species conservation status	Aside from a few populations that occur on road and rail reserves and UCL the species occurs predominantly on private property and within nature reserves with approximately 60% of plants occurring on private property and 35% occurring within nature reserves.

Section 4: Habitat

4.1 Habitat (provide details in response to the question below)	
Describe the habitat suitable for the species (biological and non-biological). Include descriptions of specific purpose habitat (e.g. foraging, breeding, roosting, seasonal migration, different life stages).	<p>Fitzgerald's Mulla-mulla grows in white-grey, sandy-loam, clay soils in moist, saline conditions, often around salt lakes. It is found in open shrubland.</p> <p>Species associated with Fitzgerald's Mulla-mulla include; <i>Acacia acuminata</i>, <i>A. tetragonophylla</i>, <i>Allocasuarina campestris</i>, <i>Dianella revoluta</i>, <i>Atriplex</i> sp., <i>Melaleuca thyoides</i>, <i>M. lateriflora</i>, <i>Frankenia parvula</i>, <i>Rhagodia</i> sp., <i>Eragrostis dielsii</i>, <i>Sarcocornia blackiana</i>, <i>Eremophila eriocalyx</i> and <i>Roycea pycnophylloides</i>, <i>Scaevola tortuosa</i>, <i>Tecticornia halocnemoides</i>, <i>T. Lepidosperma</i>, <i>T. Leptoclada</i> subsp. <i>inclusa</i>, <i>Disphyma crassifolium</i> subsp. <i>clavellatum</i>, <i>Wilsonia humilis</i>.</p>

If the species occurs in a variety of habitats, is there a preferred habitat?		
Does the species use refugia? (include what is it and when is it used)		
Is the habitat restricted in extent or number of locations?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
If Yes, provide details:	Seems to be restricted along the edges of saline drainage systems and edges of salt lakes.	
Is this species reliant on a threatened or priority species or ecological community?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
If Yes, provide details:		
Are there any other species (sympatric species) that may affect the conservation status of the nominated species?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
If Yes, provide details:		
What is the area, extent, abundance of habitat?	Based on mapping of Halophyll and Sarcophyll communities as potential habitat, selecting the continuous vegetation with known location of <i>P. fasciculatus</i> , and clipping with mapped remnant vegetation within the Wheatbelt and Midwest regions, there is approximately 250 km ² of potential habitat.	
What is the quality of habitat?	Unknown however as the species grows in open shrubland on moist saline soils, it is assumed that the majority of the available habitat would be suitable for the species.	
Is there a decline in habitat area, extent or quality?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
If there is a decline, is the decline continuing?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Provide details:	Weed invasion is increasing slowly in general, especially in areas of high grazing pressure (rabbits, kangaroos and sheep). This grazing pressure has also been noted as causing significant soil erosion during heavy rainfall events. The extent that these disturbances will affect the species is not known, but is not significant at this time. Weed invasion is unlikely to be extreme in saline environments.	
What is the critical habitat or habitat important for the survival of the species?		

Section 5: Population

'Population' is used in a specific sense in the Red List Criteria that is different to its common biological usage. Population is here defined as the total number of mature individuals of the taxon. In the case of taxa obligately dependent on other taxa for all or part of their life cycles, biologically appropriate values for the host taxon should be used. (IUCN 2001)

'Subpopulations' are defined as geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or

less).

5.1 Subpopulations

Location (include coordinates)	Land tenure	Survey information: Date of survey and No. mature individuals	AOO	Site / habitat Condition
See attached Table 2.				

5.2 Population size (Australian context) (include how numbers were determined/calculated)

What is the total population size?	64,838
What is the number of subpopulations?	29 subpopulations
What percentage of the population is within WA?	100%
What percentage of the population is within Australia?	100%

5.3 Population dynamics (Australian context) (include how numbers were determined/calculated)

What is the number of mature individuals?	64,838
What is the number of immature individuals?	5,888
What is the number of senescing/past reproductive individuals?	Unknown
What is the maximum number of mature individuals per subpopulation?	24,892 (subpopulations 17+18)
What is the percentage of mature individuals in the largest subpopulation?	52%
What percentage of mature individuals is within WA?	100%
What percentage of global mature individuals is within Australia?	100%
What is the age of sexual maturity?	unknown
What is the life expectancy?	unknown
What is the generation length?	unknown
What is the reproductive capacity? (i.e. litter size or number of seeds)	unknown
What is the reproductive success?	unknown

5.4 Population trend

What is the current population trend	Decreasing <input type="checkbox"/>	Increasing <input checked="" type="checkbox"/>	Stable <input type="checkbox"/>
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(mature individuals)?			
What is the percentage of the population change and over what time period?		Due to survey effort, there was an increase from 318 plants from the 2001 nomination to list, to 3,300 plants in the 2006 Federal listing advice, to a minimum of 64,838 plants as at 2014. More survey effort would probably find many more as the recent volunteer surveyor only surveyed the edges of many of the populations. There is no evidence of population decline at locations.	
How has this been calculated?	Finding of new populations within the last decade.		
If the trend is decreasing; are the causes of the reduction understood?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Have the causes of the reduction ceased?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are the causes of the reduction reversible?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is the reduction continuing (continuing decline)?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Has the change been observed, estimated, inferred or is it suspected (direct observation, index of abundance appropriate to the species)?		Observed due to survey effort, with no evidence of population decline at sites.	
When was the reduction or is it anticipated to occur?		Past <input type="checkbox"/>	Present <input type="checkbox"/> Future <input type="checkbox"/>
What is the period of time for the reduction (in years and generations)?			
Has there been a reduction in the number of subpopulations?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes, provide details:			
Are there extreme fluctuations in population size?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes, provide details:			
5.5 Translocations and captive/enclosed subpopulations			
Have there been translocations (introduction or re-introduction)?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Are there proposed translocations (introduction or re-introduction)?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Are there captive/enclosed/cultivated subpopulations?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Are there proposed captive/enclosed/cultivated subpopulations?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Are there self-sustaining translocated subpopulations?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes, provide details:			
Are there translocated subpopulations that are not self-sustaining?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes, provide details:			
Are there self-sustaining captive/enclosed subpopulations?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes, provide details:			

Are there captive/enclosed subpopulations that are not self-sustaining?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
If Yes, provide details:		
Other information on translocations and captive/enclosed subpopulations for the species (including failures):		
5.6 Important subpopulations		
Identify any subpopulations that are important or necessary for the long-term survival of the species and provide details for why they are considered as such (i.e. key breeding, edge or range, maintenance of genetic diversity):		

Section 6: Survey

6.1 Survey methods (Provide details)		
What survey methods are applicable to the species?		
Are there preferred or recommended survey methods that yield better results for the species?	Survey during flowering greatly increases detectability	
Are there special requirements, techniques, expertise or other considerations that are necessary when surveying for this species?	No	
Are there reasons why the species may not be detected during surveys?	During late summer when plants die back they are hard to detect.	
Can the species be identified in the field?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Provide details:	The plant is easily detected through its unique flowers in early summer and growth habit and placement in the landscape.	
Can the species be easily confused within similar species in the field?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Provide details:	<i>Ptilotus fasciculatus</i> was previously taxonomically confused with <i>Ptilotus caespitosus</i> (presumed extinct). Fitzgerald's Mulla-mulla is similar to <i>P. caespitosus</i> , varying in having slightly longer flowers with broad apices to the petals, plus variations in the arrangement of hairs on the flowers, and position of style on ovary	
List any published survey guidelines, guidance statements, protocols, standard operating procedures or other documents that are relevant to conducting surveys for this species.		
6.2 Survey effort		
Has the species been well surveyed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Have targeted surveys been conducted for the species?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Provide details of the	Many successful surveys have been undertaken as shown by the number of new pops	

<i>successful and unsuccessful surveys undertaken for the species:</i>	<p>recorded. Surveys of other suitable areas also been conducted within the region.</p> <p>All 14 new subpopulations were discovered as a consequence of numerous surveys all conducted by Bert Hort, a volunteer for the Department who lives in Quairading. Bert has spent many hours searching and recording new populations during the species flowering time from October and well into summer, over a 5 year period, primarily between 2011 and 2014.</p>	
6.3 Research (Provide details)		
Has the species been well researched?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially <input type="checkbox"/>
What research has been or is being conducted?	None	
What are the knowledge gaps for the species?	Basic life history, reproduction and genetic variability.	
Research recommendations:	Research into threats and susceptibilities of the species, longevity and reproduction.	
6.4 Monitoring (Provide details)		
Is the species being monitored, either directly (targeted) or indirectly (general monitoring)?	The species was originally targeted by the district for survey under a Caring for Our Country Project. Since that project some of the subpopulations have been resurveyed. Due to the increase in number of subpopulations now known, the species is not currently a priority for monitoring. Time and resources play a part in assigning priority subpopulations for survey.	
What methods are used for monitoring?	Ground surveys	
Monitoring recommendations:		

Section 7: Threats

7.1 Threats (detail how the species is being impacted, i.e. how severe, the extent, evidence of the impact)

Threat <i>(describe how the threat impacts on the species. Include abiotic and biotic causes, human related e.g. exploitation, and biological characteristics of the species e.g. low genetic diversity)</i>	Extent <i>(give details of impact on whole species or specific subpopulations)</i>	Impact <i>(what is the level of threat to the conservation of the species)</i>	Evidence	Time period <i>(past, present, future)</i>
Land clearing	Minimal and generally restricted to roadside populations	Low impact. Extensive clearing does not seem to be continuing.	Hard to be sure but it would appear that no more than half of the pre-European area of potentially suitable habitat (Halophyll and Sarcophyll vegetation communities) have been cleared	Past, present and future
Grazing by sheep, rabbits and kangaroos	Moderate	Low impact	Populations where this has been reported as a threat all appeared healthy. Rabbits can also cause some soil erosion during heavy rainfall events.	Past, present and future
Land degradation due to salinity and poor drainage	Minimal Some populations more likely to be affected from neighbouring private landholders and inappropriate salinity management	Potentially moderate impact in localised areas, however not enough information to quantify.	Previous advice from staff at the West Australian Herbarium indicates that this species is salt tolerant although research trials have not been carried out to confirm this (R. Davis pers. comm. 2005). There is currently little evidence of the impact of salinity on these plants. However, given the trends in increasing levels of salinity, waterlogging and soil acidity across the agricultural areas as a whole, it is likely that these populations will experience significant increases in levels of salinity and waterlogging in the near future and therefore this is potentially a significant future threat, however, the impact is unknown, and given the preference for this habitat, may be minor.	Past, present and future
Weeds	Minimal	Moderate impact	Weeds, mostly ice plant, can smother the plants. Rabbits are the main reason for the weeds to be there.	Past, present and future

Section 8: Management

8.1 Current management	
Is the species managed?	Yes, directly <input type="checkbox"/> Yes, indirectly <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>If Yes; provide details of current or past management actions:</i>	There has been no active management of this species.
Does the species benefit from the management of another species or ecological community?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>If Yes; provide details:</i>	
8.2 Recovery planning	
Is there an approved Recovery Plan (RP) or Interim Recovery Plan (IRP) for the species?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>List all relevant recovery plans or interim recovery plans (including draft, in-preparation, out-of-date, national and other State/Territory plans, and plans for other species or ecological communities that may benefit or be relevant to the nominated species)</i>	
<i>List other documents that may be relevant to the management of the species or the lands on which it occurs (i.e. area management plans, conservation advices, referral guidelines)</i>	
8.3 Management recommendations	

Section 9: Nominator details

Nominator name(s):	
Contact details:	
Date submitted:	May 2016
<i>If the nomination has been refereed or reviewed by experts, please provide their names and contact details:</i>	

Section 10: References

9.1 References

Table 2 – Threatened and Priority Flora (TPFL) database subpopulation details

* Area occupied: Black – from survey report, Red – estimated based on densities from other surveys, Green – data from SPRAT profile

Location	DPAW Subpop#	Tenure	Description and Coordinates	Date of last survey	Mature plant count	Juvenile plant count	Area occupied (m2) *	Condition of population
1	6A	Shire Crown Reserve	Shire Crown Reserve CR16472. Ballawhellara Rd. 100m from NE corner of Ballawhellara Rd and Moonyoonookayuna Rd intersection. Adjacent to CR13244. GERALDTON DISTRICT. -28.328 S, 114.95122222 E.	22/09/2008	1,000		90,500	Healthy
	6B	Shire Crown Reserve	Shire Crown Reserve CR13244. NE corner of Ballawhellara Rd and Moonyoonookayuna Rd intersection. Adjacent to CR16472 GERALDTON DISTRICT. -28.33075 S, 114.95119444 E.	22/09/2008	(A+B)		10,200	Healthy
	21	Shire Crown Reserve	Crown Reserve 28869 vested with the Shire of Chapmann Valley, 30.5km east of Northhampton. Popualtion within golf course south of Chapman Valley Road. Flat area near western end of Yuna golf course. GERALDTON DISTRICT. -28.3363888 S, 114.945 E.	30/10/2003				
2	2A	Shire Road Reserve	Wittwer Road east verge where it crosses Darling Creek, ca. 1.6km north of Caron Road Carnamah Shire. MOORA DISTRICT. -29.6090316 S, 115.98866742 E.	4/11/1992	7		1,000	
	2B	Private Property	Private Property Location No. M1030 (?) Wittwer Road east verge where it crosses Darling Creek, ca. 1.6km north of Caron Road, Carnamah Shire. MOORA DISTRICT. -29.6090316 S, 115.98866742 E.	4/11/1992	1		0.01	
3	1	Private Property	Private property Location No. 7020, northern end, ca. 3km northwest of `Koobabbie` Homestead on edge of salt lakes. MOORA DISTRICT. -29.93011111 S, 116.17388889 E.	29/08/2001	851		160,000	
	5	Private Property	Private property Location No. M1298, southwest corner, off South Waddi Road on edge of salt lakes. MOORA DISTRICT. -29.91958819 S, 116.1764494 E	01/01/2000	-		120,000	

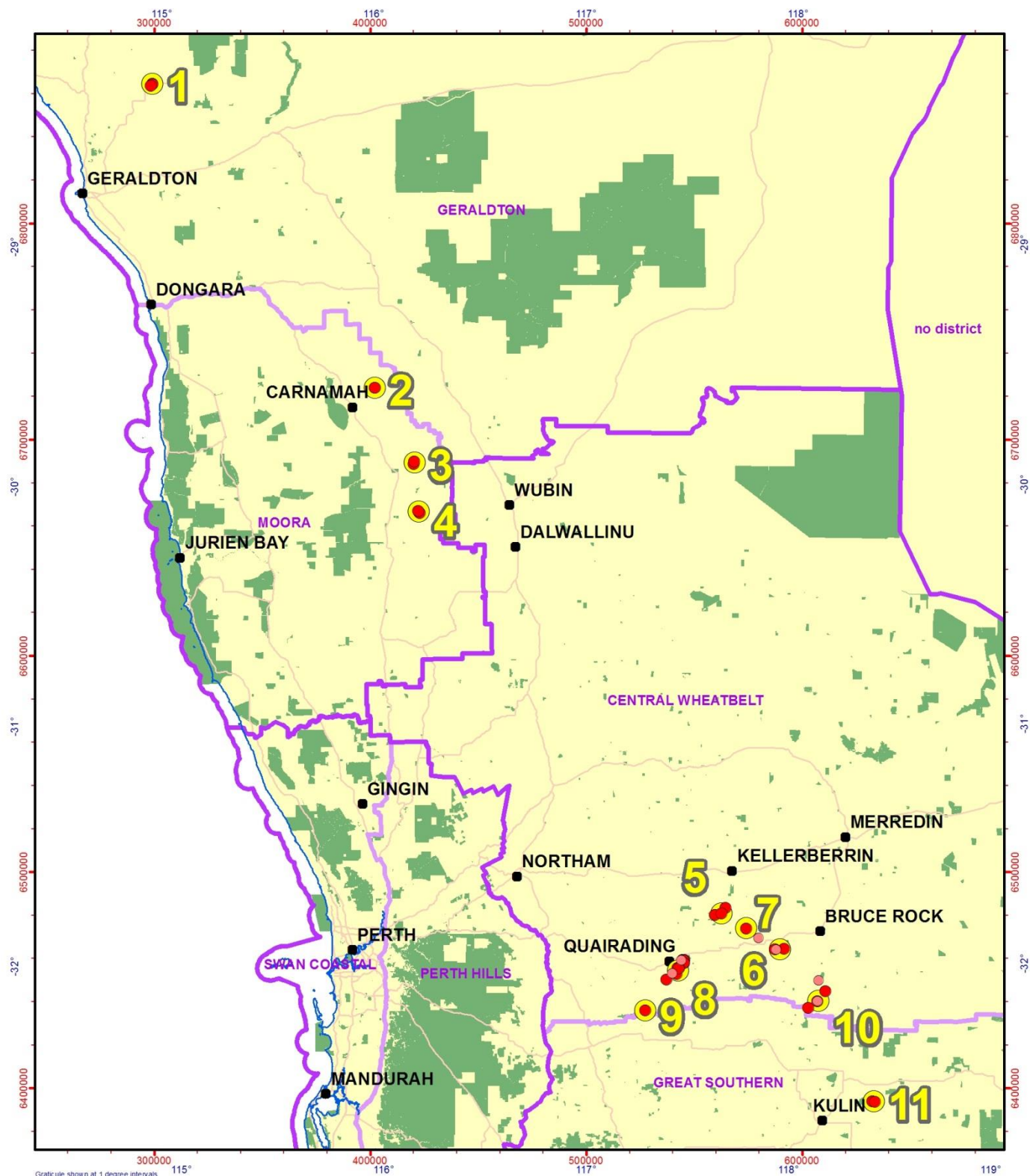
Location	DPAW Subpop#	Tenure	Description and Coordinates	Date of last survey	Mature plant count	Juvenile plant count	Area occupied (m2) *	Condition of population
4	4A	Private Property	Private Property Location No. 4415. 1km southeast on Noble Road from Wubin-Gunyidi Road. MOORA DISTRICT. -30.13138889 S, 116.19888889 E.	27/09/1999	6		70,000	
	4B	Private Property	Private Property Lot 3307. E side of Noble Road. 1km S of Noble Rd and Wubin-Gunyidi Rd intersection. Throughout remnant vegetation found on property. MOORA DISTRICT. -30.13319444 S, 116.19972222 E.	3/12/2009	10,000		N/A (A+B)	Healthy
	12	UCL	UCL (PIN 948130). Wubin-Gunyidi Rd and Noble Rd intersection. NW side of Wubin-Gunyidi Rd. MOORA DISTRICT. -30.12536111 S, 116.19241667 E.	22/09/2009	200		21,000	Healthy
5	8	Crown Lease	Approximately 200m east of Glenluce Nature Reserve (26266). Approximately 4km north of the intersection of Gardner Road and Glenluce Road in the shire of Kellerberrin. Have to cross private property to access the reserve. CENTRAL WHEATBELT DISTRICT. -31.7825066 S, 117.68172451 E.	28/10/2003	270		480,000	
	9	Private Property	Located on islets in the drainage channels of the Salt River south of Mt Caroline. The location is south of Gardner Road, approximately 1.5km west of Glenluce Road, in the shire of Kellerberrin. CENTRAL WHEATBELT DISTRICT. -31.8118964 S, 117.63044736 E.	23/11/2003	100		200,000	
	15	Private Property	Private Property Lot 501 (Plan 300465) Glenluce Rd and Gardiner Rd intersection. Located 200m ENE of junction in NW corner of property. CENTRAL WHEATBELT DISTRICT. -31.80527778 S, 117.66194444 E.	17/12/2011	20	27	25	Moderate
6	10	Nature Reserve	Kwolyin Nature Reserve CR30969. 1km E of Kwolyin East Rd and Stone Rd intersection. Located along the northern branch of the Salt River. CENTRAL WHEATBELT DISTRICT. -31.86734067 S, 117.78448157 E.	14/10/2009	1,000		190,000	Poor
	New pop	Nature Reserve	Shackleton Nature Reserve	/11/2014	487		4,251	Healthy

Location	DPAW Subpop#	Tenure	Description and Coordinates	Date of last survey	Mature plant count	Juvenile plant count	Area occupied (m2) *	Condition of population
7	13	Private Property	Private Property Lot 16161. 150m W of Yarding South Rd. Located on S boundary of property, on SW edge of salt lake. Property adjacent to Mokami Nature Reserve to the W and adjacent to Yarding Nature Reserve (and UCL) to the E. CENTRAL WHEATBELT DISTRICT. -31.95080556 S, 117.96872222 E.	21/10/2014	48	27	2,500	Healthy
	22	Nature Reserve	CC- Mokami Nature Reserve, east of Erikin South Road, approximately 6.4km south from Bruce Rock-Quairading Road. CENTRAL WHEATBELT DISTRICT. -31.95361111 S, 117.9239444 E.	26/11/2014	72		130	Healthy
8	14A	Shire Road Reserve	Shire Road Reserve. Solomon South Rd. 1.5-2km S of York Merredin (Quairading-Bruce Rock Road) and Solomon South Rd intersection. East and west of road. CENTRAL WHEATBELT DISTRICT. -32.00016667 S, 117.47197222 E.	13/12/2011	928	2000	19,620	Moderate
	14B	Private Property	Private Property Lot 24362. W side of Solomon South Road. 1 - 1.5km S of York Merredin and Solomon Rd intersection. CENTRAL WHEATBELT DISTRICT. -32.00016667 S, 117.47197222 E.	14/12/2011	(A+B)		N/A (A+B)	Moderate
	14C	Railway Reserve	Railway Reserve (not in service). 700m E of Solomon Rd. Located on N side of rail reserve, on E side of a salt river running N-S through railway reserve. Adjacent Badjaling West Nature Reserve. CENTRAL WHEATBELT DISTRICT. -32.00108333 S, 117.48033333 E.	30/10/2013	388		3,000	Healthy
	14D	Private Property	Private Property Lot 18772. 700m E of Solomon Rd. Located on S boundary of property, on E side of a salt river. Adjacent to a railway reserve and Badjaling West Nature Reserve CENTRAL WHEATBELT DISTRICT. -32.001 S, 117.48033333 E.	21-Oct-13	530		10,000	Healthy
	14E	Nature Reserve	Badjaling West Nature Reserve R28318. 300m E of Solomon South Rd. CENTRAL WHEATBELT DISTRICT. -32.00322222 S, 117.47758333 E.	17/12/2011	13	451	1,600	Moderate

Location	DPAW Subpop#	Tenure	Description and Coordinates	Date of last survey	Mature plant count	Juvenile plant count	Area occupied (m2) *	Condition of population
	16A	Private Property	Private Property Lot 13023 Plan 133197 Badjaling, Quairading. 3km S of Bruce Rock-Quairading Rd (York-Merredin Rd) and Solomon South Rd intersection. Population on east side of Solomon South Road and south of Salt River. CENTRAL WHEATBELT DISTRICT. -32.01238889 S, 117.47930556 E.	6/01/2012	766	298	N/A (A+B)	Moderate
	16B	Private Property	Private Property Lot 13023 Plan 133197 Badjaling, Quairading. 3km S of Bruce Rock-Quairading Rd (York-Merredin Rd) and Solomon South Rd intersection. Population on WEST side of Solomon South Road and east of Salt River. Some plants in road reserve. CENTRAL WHEATBELT DISTRICT. -32.01247222 S, 117.47761111 E.	28/02/2012	2,916		150,000	Poor
	17	Private Property	Private Property Lot 17473 Plan 122316. Approximately 7km south on Quairading South Rd (Quairading-Corrigin Rd), Property is on east side of road. Population starts 300m in and runs parallel to road for approx. 1.5km. CENTRAL WHEATBELT DISTRICT. -32.05947222 S, 117.44355556 E.	26/01/2012	2,370	1330	Est 20,000	Poor
	18A	Nature Reserve	CC-vested Crown Reserve R28319. 1.6km E of end of Parker Rd. Population on N side of reserve and river. CENTRAL WHEATBELT DISTRICT. -32.03369444 S, 117.44938889 E.	9/02/2012	5,048		150,000	Poor
	18B	Private Property	Private Property Lot 21573 Plan 122316. 2km E of the end of Parker Rd. Adjacent to CR28319. Population E and N of CR and N of Salt River. CENTRAL WHEATBELT DISTRICT. -32.03327778 S, 117.45525 E.	17/02/2012	12,474		Est 20,000	Poor
	18C	Private Property	Private Property Lot 21573 Plan 122316. 2km E of the end of Parker Rd. Population south of Crown Reserve 28319 and south of Salt River. CENTRAL WHEATBELT DISTRICT. -32.03727778 S, 117.45269444 E.	19/02/2013	5,000	1000	5,000	Healthy
	19	Nature Reserve	CC- Bugin NR 28317, 8km south of Quairading. Population 100m S of Old Beverley West Rd. CENTRAL WHEATBELT DISTRICT. -32.08386111 S, 117.39452778 E.	23/12/2011	120	311	600	Moderate

Location	DPAW Subpop#	Tenure	Description and Coordinates	Date of last survey	Mature plant count	Juvenile plant count	Area occupied (m2) *	Condition of population
	New pop	Private Property	Private Property of Rick Ladyman	3/11/2012	751		1,500	Healthy
	New pop	Private Property	Private Property of Neil Richards	21/01/2014	9,359		90,000	
9	7	Nature Reserve	Located on the east side of Yenyening Lakes Nature Reserve, in the Shire of Quairading. CENTRAL WHEATBELT DISTRICT. -32.21166667 S, 117.28944444 E.	13/10/2002	Unknown		Unknown	
10	11	Nature Reserve	Seagroatt Nature Reserve, 20km west of Narembeen, within the Shire of Bruce Rock. CENTRAL WHEATBELT DISTRICT. -32.12655556 S, 118.17366667 E.	4/11/2003	100		Unknown	
	20	Nature Reserve	CC- Red Lake Nature Reserve R16493, 25 Km North East of Corrigin, East of Corrigin-Bruce Rock Road. Population is 300m E of Corrigin-Bruce Rock Rd. Plants located on N edge of lake. CENTRAL WHEATBELT DISTRICT. -32.19755556 S, 118.09188889 E.	18/12/2013	217	444	9,000	Healthy
	23	Nature Reserve	CC- Seagroatt Nature Reserve, 30.3km straight line NE of Corrigin, approx. 3.4km E of intersection Bruce Rock-Corrigin Rd and Babakin South East Rd, Populations approx. 400m north of Babakin South East Road. CENTRAL WHEATBELT DISTRICT. -32.16991667 S, 118.1358333 E.	02/12/2013	240		2,000	
	New pop	Nature Reserve	Wandjagill Nature Reserve	13/10/2012	6670		58,000	
11	3A	Nature Reserve	Kondinin Salt Marsh Nature Reserve R26905. 3.8km W of Fotherinham Rd. Located adjacent to internal track running N-S through reserve, on both sides of track. GREAT SOUTHERN DISTRICT. -32.583817 S, 118.411003 E.	10/11/2010	2,700		100,000	Moderate
	3B	Nature Reserve	Kondinin Salt Marsh Nature Reserve R26692. 2.8km W of Fotherinham Rd. Located on southern boundary track on both N and S sides of roads. Adjacent to NR R26905. GREAT SOUTHERN DISTRICT. -32.584582 S, 118.424694 E.	10/11/2010	186		9,000	Moderate
Totals					64,838	5,888	1,998,926	

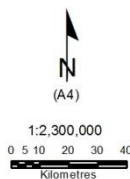
Ptilotus fasciculatus Overview



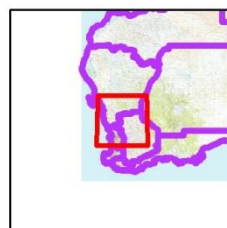
Graticule shown at 1 degree intervals
Grid shown at 100000 metre intervals

Legend

- IUCN Locations
- TPFL Populations
- new populations
- DPAW Regions
- DPAW Districts
- DPAW Reserves



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



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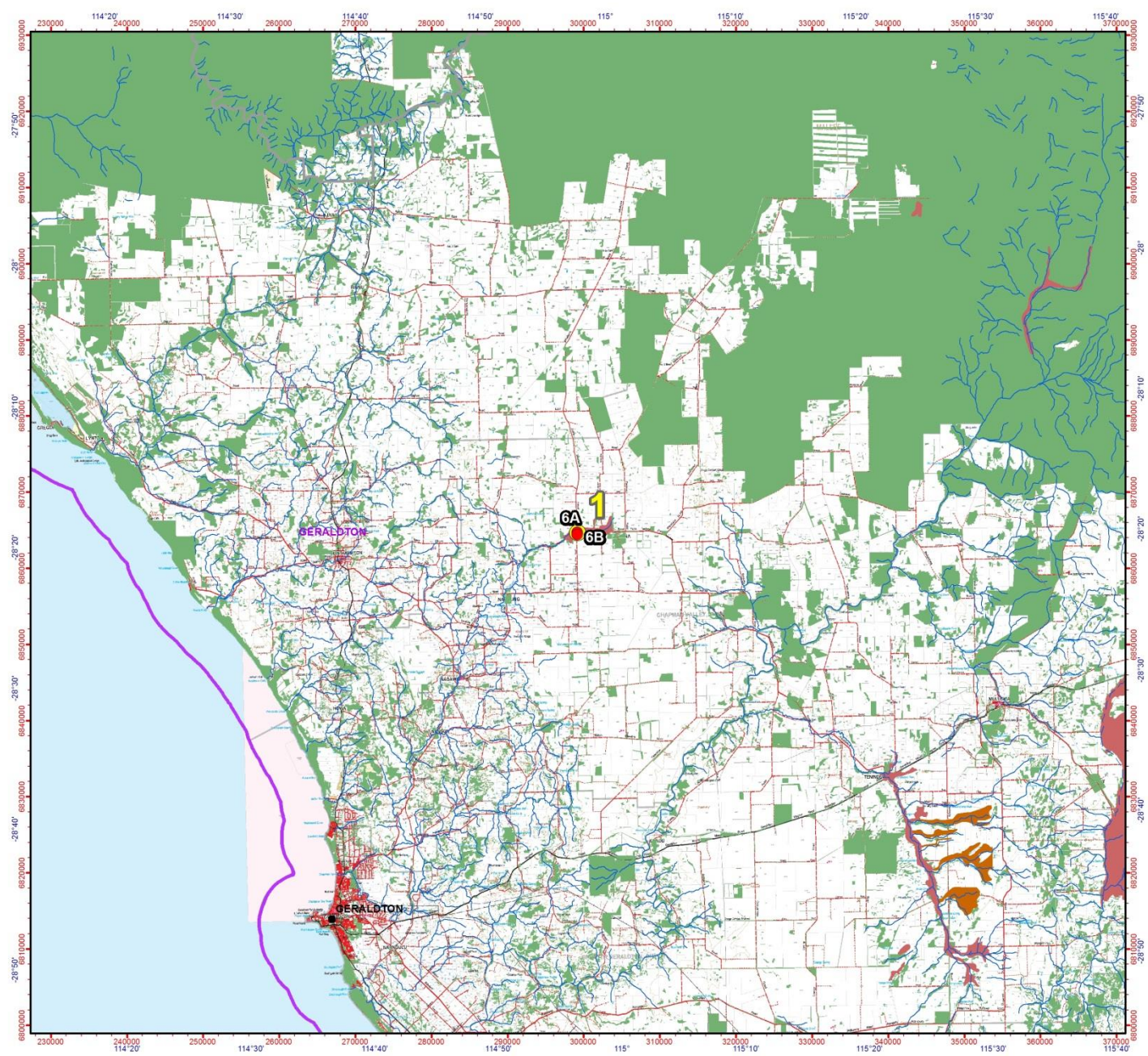


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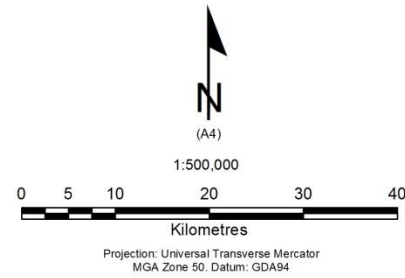
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Habitat

Legend

- WA Townsites selection
- UpdatedTPFLPops
- TSSCNom_2016_Locations
- DPaW Regions
- DPaW Districts
- Land Districts
- Connector
- Watercourse
- State Vegetation (Physiognomic) selection
 - 47: Samphire with thicket/scrub
 - 50: Samphire
 - Midwest Remnant Vegetation



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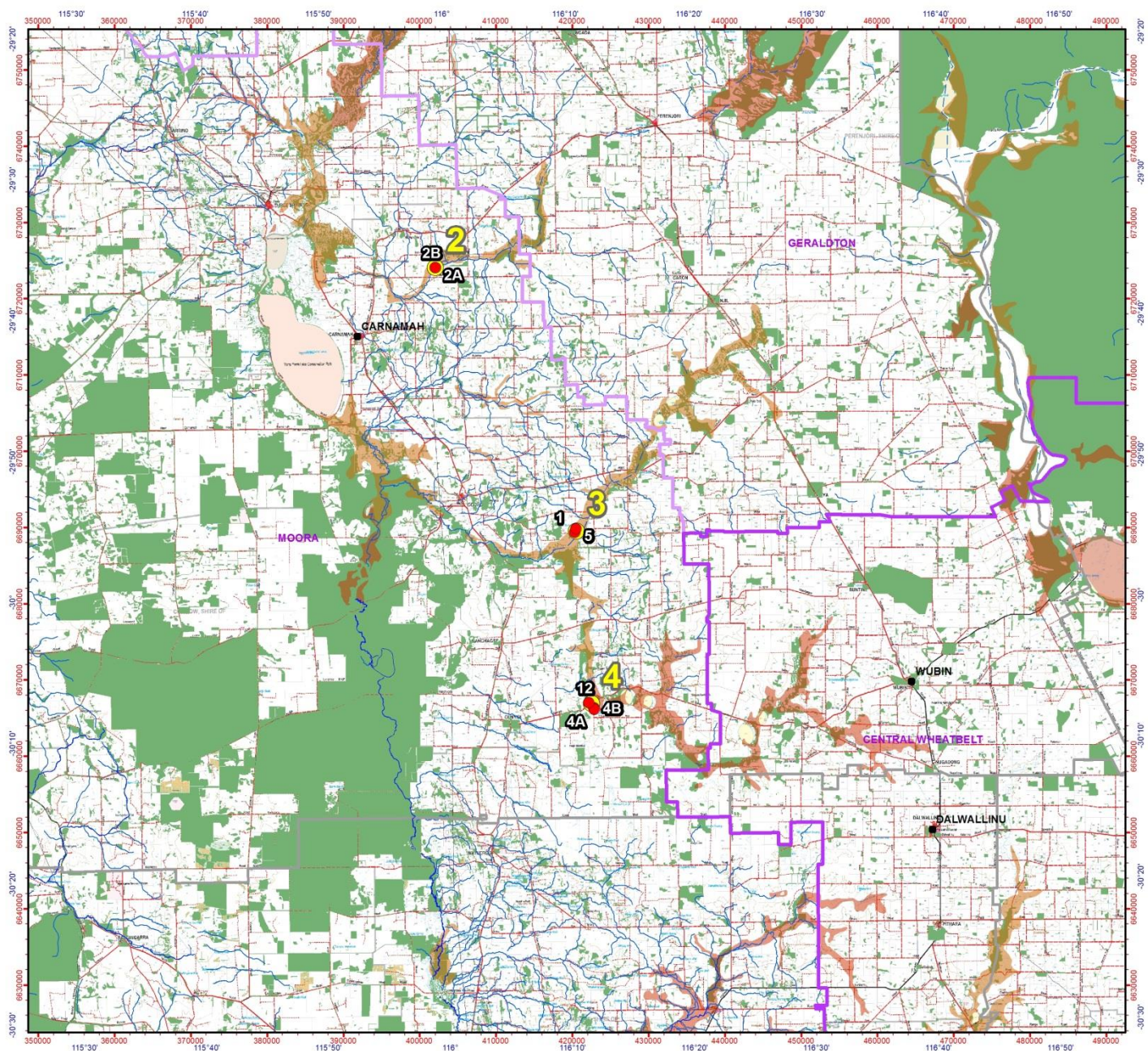


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Produced at 5:14pm, on Jan 15, 2016

Grid shown at 10 minutes intervals.
Grid shown at 10000 metre intervals.
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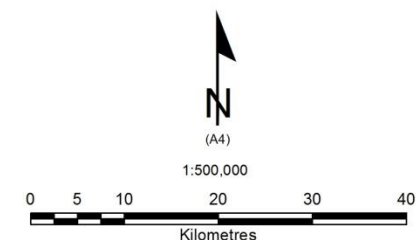
Habitat

Legend

- WA Townsites selection
- UpdatedTPFLPops
- TSSCNom_2016_Locations
- Midwest Major Hydrography
- DPaW Regions
- DPaW Districts
- Land Districts
- Canal
- Connector
- Watercourse

State Vegetation (Physiognomic) selection

- 42: Samphire with thicket and scattered trees
- 47: Samphire with thicket/scrub
- 50: Samphire
- Midwest Remnant Vegetation
- Wheatbelt Remnant Vegetation



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



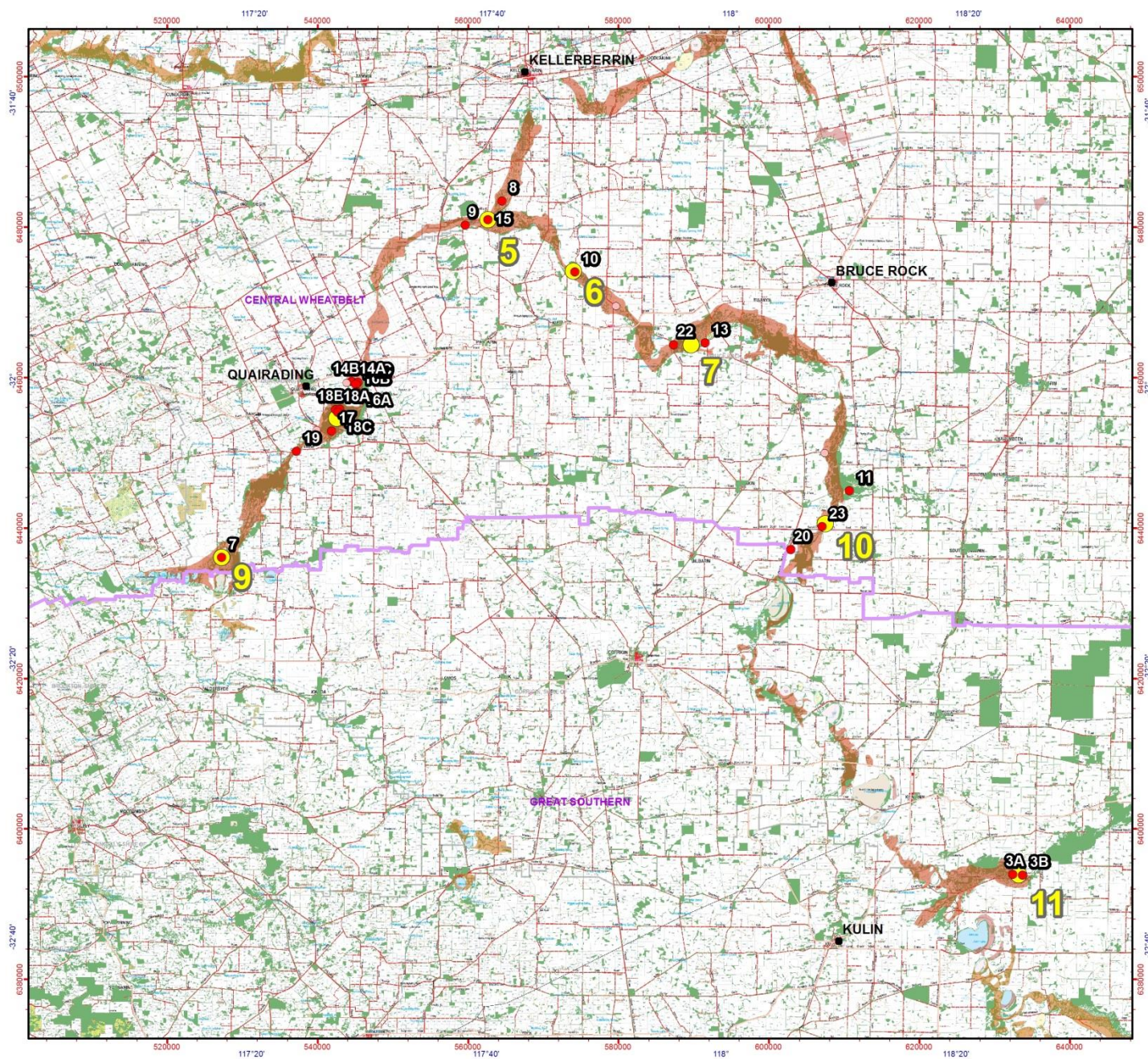
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Grid shown at 10000 metre intervals

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Habitat

Legend

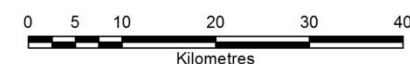
- New populations
- TPFL Populations
- IUCN Locations
- WA Townsites
- DPaW Regions
- DPaW Districts
- State Road

State Vegetation (Physiognomic) selection

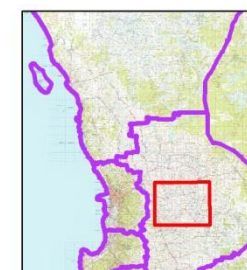
- 42: Samphire with thicket and scattered trees
- 47: Samphire with thicket/scrub
- 50: Samphire
- Wheatbelt Remnant Vegetation



1:510,012



Projection: Universal Transverse Mercator
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