Threatened Species Nomination Form

For nominations/assessments under the Common Assessment Method (CAM).

Cover Page *(Office use only for Assessment)*

Species name (scientific and common name)**:**	***Bossiaea* sp. Frankland (E.M. Sandiford EMS 896)**
Nomination for (addition, deletion, change)**:**	**Addition**
Nominated conservation category and criteria:	**Endangered B1ab(iii,v)+2ab(iii,v)**

TSSC 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 ☐ No ☐
A.	Population size reduction	•	
B.	Geographic range	•	
C.	Small population size and decline	•	
D.	Very small or restricted population	•	
E.	Quantitative analysis	•	

Outcome*:*			
TSSC Meeting date:			
TSSC comments:			
Recommendation:			
Ministerial approval:		*Government Gazette/ Legislative effect:*	

Nomination summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	*Bossiaea* sp. Frankland (E.M. Sandiford EMS 896)			
Common name:				
Family name:	Fabaceae	Fauna ☐	Flora ☑	
Nomination for:	Listing ☒	Change of status ☐	Delisting ☐	
Is the species currently on any conservation list, either in WA, Australia or Internationally?		Yes ☑ *If Yes; complete the following table*	No ☐ *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			
State of WA	WC Act	Assessed 5/4/2017	Endangered	B1ab(iii,v)+2ab(iii,v)
	DPaW Priority list	1☑	2 ☐ 3 ☐ 4 ☐ 5 ☐	
Other States or Territories				

Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:	
• 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 ☒ No ☐
Comments:	
• surveys of the species were adequate to inform the assessment;	Yes ☒ No ☐
Comments:	Refer to nomination
• 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 ☒ No ☐
Comments:	

Nominated conservation status: category and criteria (including recommended categories for deleted species)			
Presumed extinct (EX) ☐	Critically endangered (CR) ☐	Endangered (EN) ☑	Vulnerable (VU) ☐
None (least concern) ☐	Data Deficient ☐	Conservation Dependent ☐	
What criteria support the conservation status category above?	**B1ab(iii,v)+2ab(iii,v)**		

Eligibility against the criteria		
*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	• One subpopulation is suspected to have been reduced in size with land clearing for blue-gum plantation. Projected to be reduced in size with proposed sale of property for other agricultural enterprises). • Generation time unknown, and clearing has been over a time period greater than 10 years. • **Insufficient information to assess**
B.	Geographic range	• EOO = 26.5 km^2, AOO 8 km^2 • 2 locations, with main subpopulations in secure habitat. • Quality of habitat for the Frankland subpopulation is degraded and likely to decline further with change of land use. Loss of mature individuals observed and projected to occur in future. • **Meets criteria B1ab(iii,v)+2ab(iii,v) for Endangered**
C.	Small population size and decline	• Unknown number of mature individuals – estimated between 1000 and 3,000. • Observed decline of 20 % in 8 years at the smaller population, which is less than 10 % for the overall population. • Largest subpopulation estimated greater than 1,000 mature individuals. • **Does not meet criteria**
D.	Very small or restricted population	• Number of mature individuals estimated between 1,000 and 3,000. • Only known from 2 locations with AOO < 8 km^2. • Plausible threat from land clearing would not result in the species becoming CR in short time frame under criterion B as whole subpopulation unlikely to be lost. • **Does not meet criteria**
E.	Quantitative analysis	• **Insufficient information to assess**

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

EOO	26.5 km^2 calculated using minimum convex polygon	AOO	8 km^2 estimated using 2 km x 2 km grid method. Mapped area of subpopulations 11.5 ha.	Generation length	Unknown

No. locations	2	Severely fragmented	Yes ☐ No ☑
No. subpopulations	2	No. mature individuals	Estimated 1,000 to 3,000
Percentage global population within Australia		100 %	

Percentage population decline over 10 years or 3 generations	Estimated less than 1 %

Summary of subpopulation information *(detailed information to be provided in the relevant sections of the form)*						
Location *(include coordinates)*	Land tenure	Survey information: Date of survey and No. mature individuals	Area of subpopulations	Site / habitat Condition	Threats *(note if past, present or future)*	Specific management actions
West of Frankland River	Private Property	19/9/2008 Approximately 100 clumps, but number of mature individuals uncertain due to life form	1,343 m^2	Remnant vegetation within blue-gum plantation severely modified	Change of land-use to other agricultural enterprises with future sale of property (pers. comm. Andrew Wise, Senior Forester Western, PF Olsen P/L)	Liaise with land owners Acquisition of private property for conservation
NE of Manjimup	National Park	24/1/2017 Approximately 2,500 plants/clumps, but number of mature individuals uncertain due to life form	114 160 m^2	Habitat is very good	No immediate threats although observed a large amount of diggings, possibly by *Bettongia penicillata* (woylie)	Monitor for decline through herbivore activity and, if necessary, fence

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:	*Bossiaea* sp. Frankland (E.M. Sandiford EMS 896)	
Subspecies name(s) and Author:		
Is the species/subspecies conventionally accepted?	Yes ☑	No ☐
Is there any controversy about the taxonomy?	Yes ☐	No ☑
If not conventionally accepted and/or if there is any controversy; provide details:		
Has the species/subspecies been formally named?	Yes ☐	No ☑
Has the species/subspecies been recently described?	Yes ☐	No ☑
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.	T. D. Macfarlane plans to describe the species in 2017.	
If there are any closely related taxa provide details and include key distinguishing features:	*Bossiaea* sp. Frankland (E.M. Sandiford EMS 896) is possibly closest to *B. ornata* from which it differs in habit, in having smaller, differently shaped and textured leaves and smaller flowers. Terry Macfarlane has studied enough material of *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896) to be confident that it is a distinct species (pers. comm. T. McFarlane).	
1.2 Taxonomic history		
Are there recent synonyms for the species?	Yes ☐	No ☑
If Yes; provide details of synonyms:		
Have there been recent changes in the taxonomy or nomenclature?	Yes ☐	No ☑
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

Insert photograph(s) of species or provide as an attachment:

Photograph from Western Australian Herbarium (1998–).

Species description:	Prostrate subshrub, with thick tap roots, several per plant, spreading rhizomes or branches rooting at nodes, young branchlets terete to oval in section, densely clothed with appressed to slightly spreading hairs. Leaves alternate, unifoliate; lamina elliptic to almost rotund, 2.7-10mm long, 2.5-8mm wide, apex retuse, mucronate, upper surface shiny, sparingly to fairly densely clothed with appressed antrorse hairs up to 0.5mm long, lower surface densely clothed with appressed antrorse hairs, with venation reticulodromous; petiole 1-2mm long, densely clothed with appressed to slightly spreading hairs. Stipules obliquely narrowly ovate, sometimes slightly falcate, 1.5-3.1mm long, conspicuously longitudinally striate, with conspicuous marginal hairs, longer than petiole. Inflorescence solitary, with the pedicel 3.5-4.0mm long, densely clothed with appressed to slightly spreading hairs; bracts scarious, longitudinally striate, glabrous apart from marginal and apical hairs; with outer basal bract ovate, up to 0.6mm long, innermost bract narrow-ovate, 1.0-1.3mm long; bracteoles narrow-ovate, up to 1.8mm long, attached near the middle of the pedicel, scarious, longitudinally striate, persistent, glabrous apart from marginal and apical hairs. Calyx densely clothed with long, apices acute, diverging, 3 lower lobes up to 2mm long, acute, shorter than the tube. Standard 6mm long including a claw 1.6mm long, 8mm wide, broader than long, internally apricot with a basal red horseshoe-shaped flare around the throat; wings 5.4-5.8mm long including a claw 1.1-1.4mm long, 1.6-2mm wide, apparently dark red; keel 6.0-6.2mm long including claw 1.5-1.7mm long, 2.5-2.7mm wide, apparently pinkish-red, glabrous apically in the sinus. Stamen-filaments 3.9-5.2mm long. Ovary up to 4mm long, on a stripe up to 0.7mm long,

	few-ovuled, densely clothed throughout with appressed antrorse hairs. Pods oblong, flattened, 9-15 mm long, 5 mm wide, no stipe exceeding the calyx, surface densely flattened hairy, 2-5 seeded (T. McFarlane pers. comm.; Ross 2006).

2.2 Biology *(provide details)*

Little known.

Plants collected have a robust root system.

Flowering is sparse with most flowers hidden under foliage.

Pollinators are unknown.

2.3 Ecology *(provide details)*

Plants tend to grow in shady situations such as the base of trees, under shrubs and amongst sedges and grasses.

Plants appear to re-sprout from root stock after grazing.

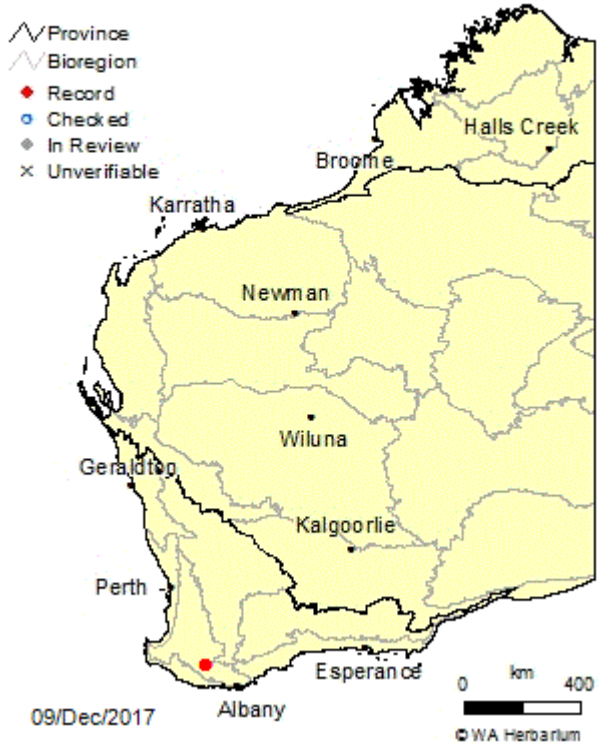
Both populations occur just up-slope from a shallow depression in Jarrah/marri woodland over low shrubs and sedges on sandy loam soils.

Section 3: Geographic range

3.1 Distribution

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

Bossiaea sp. Frankland (E.M. Sandiford EMS 896)



Map from Western Australian Herbarium (1998–).

What is the current distribution of the species within Western Australia?	Known from 2 locations in the SW of Western Australia 30km NE of Manjimup and 70km ESE of Manjimup or 16km W of Frankland.
What percentage of the species	100 %

distribution is within WA?	
What is the current distribution of the species within the other Australian States and Territories?	0 %
Does the species occur outside of Australia?	Yes ☐ No ☑
If Yes, what percentage of the species distribution is within Australia, or what is the significance of the occurrence in Australia?	
What is the current international trend for the species?	
3.2 Migration *(fauna only)*	
Is the species migratory?	Yes ☐ No ☐
Is the migration within WA or within Australia or international?	
3.3 Extent of Occurrence (EOO) within Australia	
What is the current EOO?	26.5 km^2
How has this been calculated?	Minimum convex polygon using ARCgis
What is the historical EOO?	Unknown
What is the current EOO trend?	Decreasing ☐ Increasing ☐ Stable ☑
Provide details on the current trend – quantify if possible	
If there has been a change in EOO when did this change occur?	
Was the change observed, estimated, inferred or projected?	
If the EOO is decreasing / declining, is it continuing?	Yes ☐ No ☑
Is the continuing decline observed, estimated, inferred or projected?	
Is there extreme fluctuation in EOO?	Yes ☐ No ☑
If Yes, provide details:	
3.4 Area of Occupancy (AOO) within Australia	
What is the current AOO?	Estimated as 8 km^2 Mapped area of subpopulations 11.5 ha

How has this been calculated?	Estimated AOO using the 2 km x 2 km grid method. Mapped extent of subpopulations with GPS in-situ at both locations and calculated in ARCgis.
What is the historical AOO?	Unknown
What is the current AOO trend?	Decreasing ☑ Increasing ☐ Stable ☐
Provide details on the current trend – quantify if possible	The subpopulation west of the Frankland River was visited with Anthony Wise, who represented the property owner PF Olsen P/L, on 17/1/2017. The area occupied by the species at the site appeared to have declined since the 2008 survey, with fewer clumps of indivisible plants and a reduction in the area occupied by mature individuals of the species observed. It is not known what caused this decline in AOO. An additional loss of clumps of plants was also observed due to the erection of a new boundary fence between two properties.
If there has been a change in AOO when did this change occur?	Unknown but between 2008 and 2017.
Was the change observed, estimated, inferred or projected? Give details.	Observed and estimated.
If the AOO is decreasing / declining, is it continuing?	Yes ☑ No ☐
Is the continuing decline observed, estimated, inferred or projected? Give details.	The private property location has been sold since the 2008 survey and is up for sale again. It is presumed the decline will continue if the land-use enterprise changes to grazing or cropping (pers. comm. Andrew Wise).
Is there extreme fluctuation in AOO?	Yes ☐ No ☐
If Yes, provide details:	Unknown
Does the species have a restricted AOO?	Yes ☑ No ☐
If Yes, provide details:	Both subpopulations occur just up-slope from a shallow depression or drainage line in Jarrah/marri woodland over low shrubs and sedges on sandy loam soils.

3.5 Number of Locations

'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).

At how many locations does the species occur?	2 locations; one in private property and the other in National Park, 47 km apart.
Has there been a change in the number of locations?	Decrease ☐ Increase ☑ No change ☐
If there has been a change, when did this change occur?	New location was confirmed in January 2017.
Was the change observed, estimated, inferred or projected? Give details.	Observed. A 1985 record of a *Bossiaea* species that could have been *Bossiaea* sp.

	Frankland (E.M. Sandiford EMS 896) was located recently at the Bunbury Regional Herbarium by Terry Macfarlane. The record location was verified in the field and photographs sent to Terry who is confident that it is *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896). Vegetative material (no reproductive material found) was posted to Terry 25/1/17 (pers. comm. T. McFarlane).
If the number of locations is decreasing / declining, is it continuing?	Yes ☐ No ☑
Is the continuing decline observed, estimated, inferred or projected? Give details.	
Is there extreme fluctuation in the number of locations?	Yes ☐ No ☑
If Yes, provide details:	
Does this species occur on any off-shore islands?	Yes ☐ No ☑
If Yes, provide details:	
3.6 Fragmentation	
Is the distribution fragmented?	Yes ☑ No ☐
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.	
Is the distribution severely fragmented?	Yes ☐ No ☑
If Yes, provide details:	Subpopulation on private property is restricted to a small area of remnant vegetation surrounded by cleared land/ blue-gums, but the main subpopulation is in a national park.
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 ☑ No ☐
If Yes; provide details:	The largest subpopulation occurs in a national park.
Is the species known to occur on lands that are under threat? i.e. mining tenement, zoned for development	Yes ☑ No ☐
If Yes; provide details:	One subpopulation occurs on private property in remnant vegetation of a blue-gum plantation. The property is up for sale to be used for other agricultural enterprises.
Provide details of other land tenures where the species occurs as this relates to the species conservation status	No other land tenure or records on FloraBase (Western Australian Herbarium 1998–) or Department of Parks and Wildlife corporate database (Threatened and Priority Flora Database).

Section 4: Habitat

4.1 Habitat *(provide details in response to the question below)*			
Described 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).	The species has been found in Jarrah/marri woodland over a limited number of medium to low shrubs, sedges and forbs; up-slope from a shallow depression on sandy loam soils over laterite. The plants tend to grow close to the bases of trees, shrubs and sedges rather than in the open.		
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)*	The plants tend to grow close to the bases of trees, shrubs and sedges rather than the open.		
Is the habitat restricted in extent or number of locations?		Yes ☑	No ☐
If Yes, provide details:	Locally restricted to sites near shallow depressions		
Is this species reliant on a threatened or priority species or ecological community?		Yes ☐	No ☑
If Yes, provide details:			
Are there any other species (sympatric species) that may affect the conservation status of the nominated species?		Yes ☐	No ☑
If Yes, provide details:			
What is the area, extent, abundance of habitat?	Unknown		
What is the quality of habitat?	Remnant vegetation on private property appears to have been severely modified compared to similar forest type in immediate area.		
Is there a decline in habitat area, extent or quality?		Yes ☑	No ☐
If there is a decline, is the decline continuing?		Yes ☑	No ☐
Provide details:	The private property population is expected to continue to decline with change of ownership for agricultural purposes.		
What is the critical habitat or habitat important for the survival of the species?	Unknown but observations from the 2 known locations appears that the habitat where it occurs is critical to the survival of *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896).		

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	Area of subpopulation	Site / habitat Condition
West of Frankland River	Private Property	19/9/2008 Approximately 100 clumps, but number of mature individuals uncertain due to life form	1343 m^2	Remnant vegetation within blue-gum plantation severely modified
NE of Manjimup	National Park	24/1/2017 Approximately 2,500 plants/clumps, but number of mature individuals uncertain due to life form	114 160 m^2	Habitat is very good

5.2 Population size (Australian context) *(include how numbers were determined/calculated)*	
What is the total population size?	Approximately 2,600 clumps counted. Estimated between 1,000-3,000 mature individuals.
What is the number of subpopulations?	2
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?	Estimated between 1,000-3,000 mature individuals.
What is the number of immature individuals?	Unknown
What is the number of senescing/past reproductive individuals?	Unknown
What is the maximum number of mature individuals per subpopulation?	2,500
What is the percentage of mature individuals in the largest subpopulation?	Conservative estimate may be 50 %
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 (mature individuals)?	Decreasing ☑ Increasing ☐ Stable ☐
What is the percentage of the population change and over what time period?	≤ 20 % in 8yrs at one subpopulation only. (Equates to less than 1 % for whole population.)
How has this been calculated?	Estimated through observation comparing locations of plants observed during the 2008 monitoring at the subpopulation on the private property and a recent visit there in January 2017. Places where plants were found close to the north boundary fence in 2008 were not present in 2017.
If the trend is decreasing; are the causes of the reduction understood?	Yes ☐ No ☑
Have the causes of the reduction ceased?	Yes ☐ No ☐
Are the causes of the reduction reversible?	Yes ☐ No ☐
Is the reduction continuing (continuing decline)?	Yes ☐ No ☐
Has the change been observed, estimated, inferred or is it suspected (direct observation, index of abundance appropriate to the species)?	The reduction has been estimated through observations. There may be a number of causes and require researching to determine. It is unknown to what extent the decline will continue.
When was the reduction or is it anticipated to occur?	Past ☑ Present ☐ Future ☐
What is the period of time for the reduction (in years and generations)?	8 years
Has there been a reduction in the number of subpopulations?	Yes ☐ No ☐
If Yes, provide details:	Unknown
Are there extreme fluctuations in population size?	Yes ☐ No ☑
If Yes, provide details:	N/A

5.5 Translocations and captive/enclosed subpopulations

Have there been translocations (introduction or re-introduction)?	Yes ☐ No ☑

Are there proposed translocations (introduction or re-introduction)?	Yes ☐ No ☑
Are there captive/enclosed/cultivated subpopulations?	Yes ☐ No ☑
Are there proposed captive/enclosed/cultivated subpopulations?	Yes ☐ No ☑
Are there self-sustaining translocated subpopulations?	Yes ☐ No ☑
If Yes, provide details:	
Are there translocated subpopulations that are not self-sustaining?	Yes ☐ No ☑
If Yes, provide details:	
Are there self-sustaining captive/enclosed subpopulations?	Yes ☐ No ☑
If Yes, provide details:	
Are there captive/enclosed subpopulations that are not self-sustaining?	Yes ☐ No ☑
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?	Opportunistic survey Planned surveys in targeted suitable habitat.
Are there preferred or recommended survey methods that yield better results for the species?	Planned surveys' using a number of people using transects.
Are there special requirements, techniques, expertise or other considerations that are necessary when surveying for this species?	Understanding of species habitat, knowledge of what the species looks like and good observation skills.
Are there reasons why the species may not be detected during surveys?	Plants can be very small and tend to grow under other vegetation.
Can the species be identified in the field?	Yes ☑ No ☐
Provide details:	In flowering season is better than when the plants are not in flower.

Can the species be easily confused within similar species in the field?		Yes ☐ No ☑
Provide details:		
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☑ No ☐
Have targeted surveys been conducted for the species?		Yes ☑ No ☐
Provide details of the successful and unsuccessful surveys undertaken for the species:	Between 2008 and 2012 Targeted survey in suitable habitat by participants of the Parks and Wildlife Flora Course near Frankland River. 0.5 day – No plants found. Targeted survey by J. Smith in suitable habitat further north – 0.5 day – No plants found. Targeted survey by B. Whittred west of seasonally wet depression 0.5 day – No plants found. Targeted survey by B. Whittred in suitable habitat during a Rare flora search for Donnelly District burn boundary upgrade operation. 1 day – No plants found. Between 2012 and 2016 Photographs and diagnostic information for *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896) given to threatened flora volunteer Ted Middleton, who has excellent botanical knowledge to undertake opportunistic surveys in the Frankland and Walpole areas (Parks and Wildlife, Frankland District) – He has reported no plants found so far. January 2017 Targeted survey by J. Smith to relocate 1985 record of a *Bossiaea* that resembles *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896) at location description – 2 x 0.5 day – Plants found. February 2017 Targeted survey in area of subpopulation in a NP – 1 x 1 day plus 2 x 1 day. Extension to subpopulation found.	
6.3 Research *(Provide details)*		
Has the species been well researched?		Yes ☐ No ☐ Partially ☑
What research has been or is being conducted?	Macfarlane **-** Taxonomic work: J.H. Ross, Melbourne (retired), in 2006 provided a description, illustration and means of identification in a key to WA *Bossiaea* species, but considered there was insufficient material and information to formally describe it as a new species. Subsequently more material was collected by T. Macfarlane, R. Hearn and I. Wheeler in 2007 to better understand the plant and the (then) one known population, and to provide more material and photos for taxonomic work and knowledge for conservation. Another collection record was also identified, now confirmed in situ by J. Smith. It has been concluded that the species is distinct and new, and it will be described during 2017. Seeds have not so far been collected.	
What are the knowledge gaps for the species?	Macfarlane **-** Total distribution is unknown, but it is likely to be restricted because of the extent of vegetation survey that has been done in the region. Population structure is unknown. The plants seem to seed readily, but they	

	are rhizomatous and establish new taproots along the rhizomes. To what extent the plants are clonal, and hence the genetic diversity of subpopulations, is unknown.
Research recommendations:	Macfarlane **-** Physical examination of populations to determine extent of possible clonality. Genetics to determine diversity within and between populations. Further searching for additional populations. Seed collection. Completion of taxonomic description.
6.4 Monitoring *(Provide details)*	
Is the species being monitored, either directly (targeted) or indirectly (general monitoring)?	The subpopulation located on private property was being monitored up to 2009. But in recent times limited resources within the Department of Parks and Wildlife (previously Environment and Conservation) and change of ownership since 2008 has made permission to access the property and regular monitoring difficult.
What methods are used for monitoring?	Threatened and Priority Flora forms and site visits.
Monitoring recommendations:	To monitor using the Department of Parks and Wildlife Threatened and Priority Flora Monitoring Form as a minimum on an annual basis during flowering season at both locations to determine increase/decrease in population size and identify threats.

Section 7: Threats

7.1 Threats *(detail how the species is being impacted, i.e. how severe, the extent, evidence of the impact)*				
Threat *(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)*	Extent *(give details of impact on whole species or specific subpopulations)*	Impact *(what is the level of threat to the conservation of the species)*	Evidence	Time period *(past, present, future)*
Land clearing for plantation, cropping or grazing	Subpopulation 1 comprising approx. 5 % of total number of plants	Potential subpopulation loss will decrease to one known population and decrease in genetic diversity	Private property location has been historically impacted through the establishment of blue-gum plantation. Property is for sale. New owners may change to an agricultural enterprise such as grazing or cropping (pers. comm. Andrew Wise).	Past and Future (within 1-5 yrs)
Fire	Whole species	Low	Species has a thick taproot and appears to resprout after grazing. It is assumed that it is able to resprout after fire and hence little direct impact expected.	Future
Weeds	Subpopulation 1	Low	The degraded area of habitat will have an increased weed risk which may directly compete with the species or increase fire frequency. The biology of the species appears resilient to these potential effects.	Future
Road maintenance	Subpopulation 2	Low	Subpopulation 2 may extend to the edge of the road.	Future
Grazing	Subpopulation 1	Low	Grazing by stock or native animals may occur at subpopulation 1 (private property). The species regenerates after grazing, but excessive grazing will deplete the plant's resources.	Past, present and future

Section 8: Management

8.1 Current management			
Is the species managed?	Yes, directly ☐	Yes, indirectly ☐	No ☑
If Yes; provide details of current or past management actions:			
Does the species benefit from the management of another species or ecological community?	Yes ☐	No ☑	
If Yes; provide details:			

8.2 Recovery planning		
Is there an approved Recovery Plan (RP) or Interim Recovery Plan (IRP) for the species?	Yes ☐	No ☑
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)		
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)		

8.3 Management recommendations

Management

- Undertake surveys of suitable habitat for additional subpopulations.
- Monitor subpopulations to determine changes in plant numbers and potential threats.
- Map habitat critical to the survival of the subspecies to facilitate its protection and appropriate management.
- Protect populations on private property from clearing or accidental damage.
- Fence subpopulation on private property if at risk from stock.
- Monitor weeds at occurrences and manage weed infestations.
- Monitor rabbit activity and manage if necessary.
- Manage fire to reduce risk to plants and the habitat.
- Mark subpopulation if it extends into the road reserve to reduce the risk of accidental damage during road maintenance.
- Collect seed and store at the Threatened Flora Seed Centre.
- Liaise with land managers to ensure awareness of the subpopulations.

Research

- Research biology and ecology of the species, with a focus on reproductive biology including pollination effectiveness, seed viability, and conditions required for natural germination.
- Investigate response to threats and disturbances.
- Determine generation length.

Section 9: Nominator details

Nominator name(s):	
Contact details:	
Date submitted:	27/01/2017
If the nomination has been refereed or reviewed by experts, please provide their names and contact details:	
Terry Macfarlane, Senior Research Scientist, Department of Parks and Wildlife, Kensington WA.	

Section 10: References

9.1 References

Ross, J.H. (2006) Conspectus of Western Australian Bossiaea species. *Muelleria* 23: 15–143.

Western Australian Herbarium (1998–) *FloraBase – The Western Australian Flora.* Department of Environment and Conservation. http://florabase.calm.wa.gov.au/.

Department of Parks and Wildlife Corporate Database; Threatened and Priority Flora.

Personal Communication:

Terry Macfarlane, Senior Research Scientist, Department of Parks and Wildlife, Kensington WA

Andrew Wise, Senior Forester Western, PF Olsen P/L.