Section 1 – Eligibility for Listing		
1. Name of the ecological community		
Plant assemblages of the Inering System as originally described in Beard (1976)		
2. Listing Category for which the ecological community is nominated		
	Current ranking under WA Minister ESA list in policy	EPBC Act (wholly or as a component)
Current listing category (Please check box)	☐ Critically endangered ☐ Endangered ☒ Vulnerable ☐ Priority 1-4 ☐ Data Deficient ☐ None – not listed	Name: ☐ Critically endangered ☐ Endangered ☐ Vulnerable ☒ None – not listed
Proposed listing category (Please check box)	WA *Biodiversity Conservation Act 2016* ☐ Collapsed ☒ CR: Critically endangered ☐ EN: Endangered ☐ VU: Vulnerable ☐ Priority 1-4	
Select one or more of the following criteria under which the community is to be nominated for BC Act listing. (Please check box). For further details on these criteria please refer to the Attachment to this form. The information you provide in Section 3 should support the criteria you select here.	☐ Criterion A – Reduction in geographic distribution ☒ Criterion B – Restricted geographic distribution ☐ Criterion C – Environmental degradation based on change in an abiotic variable ☐ Criterion D – Disruption of biotic processes or interactions based on change in a biotic variable ☐ Criterion E – Quantitative analysis that estimates the probability of ecosystem collapse	

Section 2 – Description, Condition, Threats & Recovery

Please answer all the questions, providing references where applicable. If no or insufficient information exists to answer a question, you must indicate this instead of leaving the question blank. The answers may be provided within this form or as attachments, ensuring that responses clearly indicate which question number they refer to.

Classification

3. What is the name of the ecological community?

Note any other names that have been used recently, including where different names apply within different jurisdictions. For example, is it known by separate names in different States or regions?

Plant assemblages of the Inering System as originally described in Beard (1976).

4. What authorities/surveys/studies support or use the name?

This ecological community was identified in Beard (1976) in regional vegetation surveys. It was assessed by the Western Australian Threatened Ecological Communities' Scientific Committee on 18 September 2000 as Vulnerable. The ranking was endorsed by the Minister for the Environment on 6 November 2001.

The ecological community is referred to as above by the Department of Biodiversity, Conservation and Attractions, and data collected from the ecological community including the name is saved and stored in the departmental TEC database.

Department of Conservation and Land Management (CALM) (2002) Interim Recovery Plan No. 107; Plant assemblages of the Inering System. CALM, Perth.

5. How does the nominated ecological community relate to other ecological communities that occur nearby or that may be similar to it?

Does it intergrade with any other ecological communities and, if so, what are they and how wide are the intergradation zones?
Describe how you might distinguish the ecological community in areas where there is overlap (also see Description section below).

The community occurs on the Archaean-granite complex of hills as expressed in the range of hills 2.5 km south west of Carnamah northwards to Three Springs (CALM 2002). Similarities and differences between the Inering and the more northern Billeranga system are detailed below.

Beard (1976) notes that like the Billeranga system, the Inering System "covers some small and localised outcrops of resistant rocks. Inering hills is 12 km north of Carnamah and mapped as Archaean-granite complex. The system also includes Woodadying Hill west of Carnamah which is also granitic and some nearby hills to the northwest which are of the Proterozoic Coomberdale Chert. Inering Hill and the associated range stretching over 10km is covered with Casuarina-Melaleuca thicket as in the Billeranga Hills with scattered small trees of *Acacia acuminata* and *Casuarina huegeliana*. On Woondadying Hill there is an open scrub – not a thicket - of *Casuarina campestris* with *Acacia tetragonophylla*, *A. neurophylla*, *Dodonaea inaequifolia*, *Grevillea intricata*, *Melaleuca radula, M. steedmannii*. *M. undulata*. The other hills have not been visited."

Beard (1976) notes that the main part of the Billeranga Hills appears to be more quartzitic, with a yellowish soil…Billeranga Hills, comprising sandstone, acid lavas, chert, silicone, shale and conglomerate" and that the

vegetation for the main part of the Billeranga Hills is "a dense thicket of *Casuarina campestris*, *Baeckea* sp., *Brachysema aphyllum*, *Grevillea stenostachya*, *Hakea* ?*scoparia*, *Hibbertia* sp., *Melaleuca nematophylla*, *M. radula*, *M. steedmannii*."

Description

6. List the main features that distinguish this ecological community from all other ecological communities.

Characteristic (or diagnostic) features can be biological (e.g. taxa or taxonomic groups of plants and animals characteristic to the community; a type of vegetation or other biotic structure), or associated non-biological landscape characteristics (e.g. soil type or substrate, habitat feature, hydrological feature). Please limit your answer to those features that are specific to the ecological community and can be used to distinguish it from other ecological communities.

Characteristic features of this ecological community include *Allocasuarina campestris* scrub over chert and granite; *Allocasuarina campestris* thicket with scattered *Acacia acuminata* and *Allocasuarina huegeliana* over brown sandy loam over stony and lateritic summits and slopes; *Acacia* sp. mixed low woodland on red/brown sandy loam over granite on summits and slopes; *Melaleuca cardiophylla* thicket with scattered *Eucalyptus loxophleba* and *Eucalyptus salmonophloia* over granite on the lower slopes and foothills; and *Eucalyptus loxophleba* woodland over clay loam on the foothills.

7. Give a description of the biological components of the ecological community.

For instance, what species of plants and animals commonly occur in the community; what is the typical vegetation structure (if relevant).

The community occurs in the Inering Hills in the northern Wheatbelt of Western Australia. It comprises: *Allocasuarina campestris* scrub over chert and granite hills; *Allocasuarina campestris* thicket with scattered *Acacia acuminata* and *Allocasuarina huegeliana* over brown sandy loam over stoney and lateritic summits and slopes*; Acacia sp.* mixed low woodland on red brown sandy loam over granite on summits and slopes; *Melaleuca cardiophylla* thicket with scattered *Eucalyptus loxophleba* (York gum) and *Eucalyptus salmonophloia* (salmon gum) over granite on the lower slopes and foothills; and *Eucalyptus loxophleba* woodland over clay loam on the foothills. The community was originally described in Beard J.S. (1976) "The vegetation of the Perenjori area, Western Australia: Map and explanatory memoir" (1:250,000 series, Vegmap Publications, Perth, Western Australia).

Most available survey information is from Woondadying Hill – the southern-most occurrence. Orsini and Lewis (1992) recorded the vegetation of many hills of the Inering hill range that are now highly fragmented, and mapped most of the locations as *Allocasuarina campestris*, *Hakea recurva*, *Grevillea paniculata*, *Acacia acuminata* and *Acacia tetragonophylla* low woodland/scrub. These species are the least palatable to sheep. They did not locate the *Melaleuca filifolia – Allocasuarina campestris* assemblage on Proterozoic Noondine chert as reported by Beard (1976).

8. Give a description of the associated non-biological landscape characteristics or components of the ecological community.

For instance, what is the typical landscape in which the community occurs? Note if it is associated with a particular soil type or substrate; what major climatic variables drive the distribution of the ecological community (e.g. rainfall). Note particular altitudes, latitudes or geographic coordinates

The habitat of the plant assemblages of the Inering System comprises the Archaean-granite complex of hills as expressed in the range of hills 2.5 km south west of Carnamah northwards to Three Springs. It encompasses:

- Proterozoic chert and granite hills
- brown sandy loam over stony and lateritic summits and slopes
- red/brown sandy loam over granite on summits and slopes
- granite on lower slopes and foothills
- clay loam on foothills.

9. Provide information on the ecological processes by which the biological and non-biological components interact (where known).

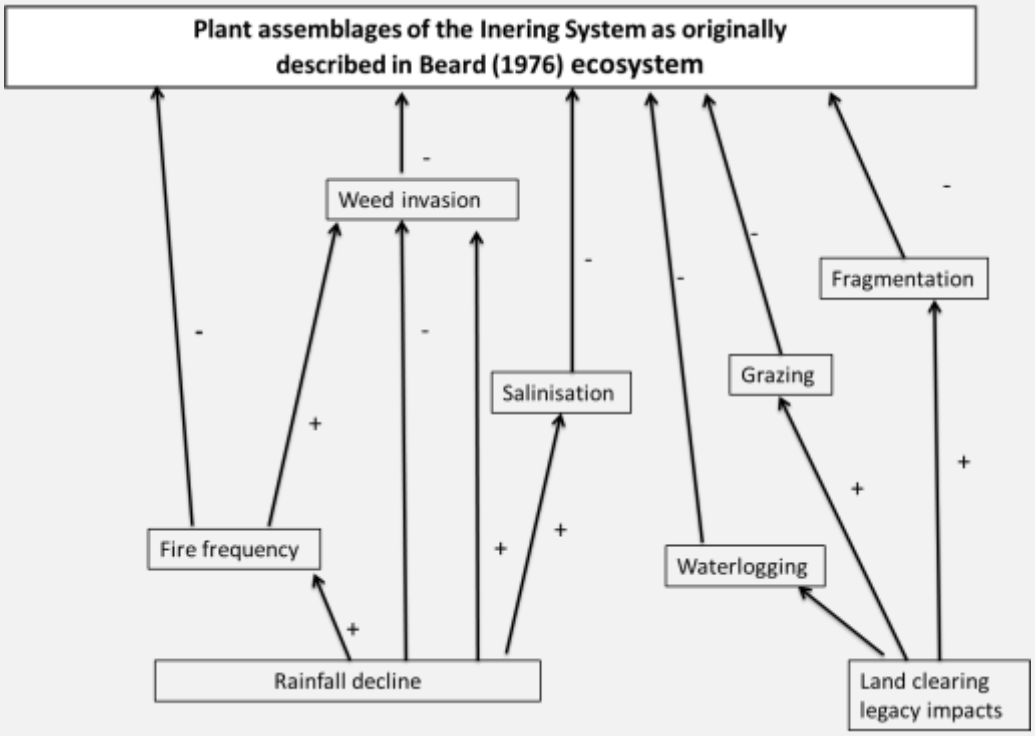

Figure 1: A conceptual model of ecological processes for Plant Assemblages of the Inering System as originally described in Beard (1976). Arrows indicate major relationships that either promote the system at which the arrow is directed (+), or inhibit/reduce its effects (-).

Also see Section 7.

10. Does the ecological community show any consistent regional or other variation across its extent, such as characteristic differences in species composition or structure?

If so, please describe these.

The plant assemblages observed and recorded in this ecological community are associated with the soil types as described in Section 8.

Important factors affecting community composition and structure are aspect, soil/substrate types and depths, fire history and moisture regimes (CALM 2002).

11. Does the ecological community provide habitat for any listed threatened species and/or endemic species?

If so, please note the species and whether the species is listed on State and/or national lists and the nature of their dependence on the ecological community.

The Inering System contains the following priority taxa: *Scholtzia brevistylis* subsp. *prowaka* (P2))", *Epitriche demissus* (P2) and *Acacia nodiflora* (P3) that are very restricted in distribution but not under immediate threat.

12. Identify major studies on the ecological community (authors, dates, title and publishing details where relevant).

Beard, J. S. (1976). *Vegetation Survey of Western Australia. The Vegetation of the Perenjori Area, Western Australia.* 1:250,000 series. Vegmap Publications, Perth.

Department of Conservation and Land Management (2002) Interim Recovery Plan No. 107, Plant assemblages of the Inering System. CALM, Perth.

Hobbs, R. J. and Mooney, H. A. (1993). Restoration ecology and invasions. In *Nature Conservation 3: Reconstruction of Fragmented Ecosystems*. pp 127-133, Saunders, D. A., Hobbs, R. J. and Ehrlich, P. R. (eds). Surrey Beatty and Sons: NSW.

Orsini, J. P. and Lewis, S. (1992). Conservation of Remnant Vegetation in the Inering Creek Catchment. In: V. Read (ed), Inering Save the Bush Project, Bush Management Strategy.

van Dongen, R. (2019). Vegetation cover assessment for "Plant assemblages of the Inering System" using satellite imagery. Unpublished internal report for Department of Biodiversity, Conservation and Attractions, Kensington.

Distribution

13. Describe the distribution across WA and nationally.

State the appropriate bioregions where the ecological community occurs. Attach or provide any maps showing its distribution with details of the source of the maps, or explain how they were created and the datasets used.

(IRP 107) Beard's Inering System originally comprised 4 locations: Inering hills, a 10 km long range approximately 12 km north of Carnamah; Woondadying Hill, 5 km immediately south west of Carnamah; and two other hill ranges (~2-4 km long) just north of Woondadying Hill. All are now fragmented into numerous smaller remnants.

14. What is the area of distribution of the ecological community?

For answers to parts a, b, c & d: please identify whether any values represent extent of occurrence or area of occupancy (as described in the Attachment); provide details of the source(s) for the estimates and explain how they were calculated and the datasets used.

14 a. What is the current known area (in ha)?

14 b. What is the pre-industrialisation extent or its former known extent (in ha)? An ecological community is considered to be naturally restricted if it has a pre-industrialisation area of occupancy that is less than 10 000 ha or a pre-industrialisation extent of occurrence that is less than 100 000 ha (refer to the Attachment A)

14 c. What is the estimated percentage decline of the ecological community?

14 d. What data are there to indicate that future changes in distribution may occur?

The 41 occurrences of this community occur within the Geraldton Sandplains IBRA Bioregion, in the Midwest Region of Western Australia, in the Shires of Carnamah and Three Springs.

The original area of this community is estimated at 4375ha based on interpretation of Beard's (1976) system mapping. The area of the community is 805.8 ha.

The Inering System as described by Beard (1976) originally comprised 4 locations: Inering hills, a 10 km long range approximately 12 km north of Carnamah; Woondadying Hill, 5 km immediately south west of Carnamah; and two other hill ranges (~2-4 km long) just north of Woondadying Hill. All are now fragmented into numerous smaller remnants.

All the remnants of the community are privately owned, most are not fenced and are immediately surrounded by agricultural land or border sealed or unsealed roads. Current or potential threatening processes include fragmentation, grazing, weed invasion and/or inappropriate fire regimes. Threats to the *Eucalyptus loxophleba* woodland assemblage over clay loam on the foothills of locations 1 and 11 also include waterlogging and salinisation.

Patch size

15. What is the typical size (in ha) for a patch of the ecological community (if known)?

Explain how it was calculated and the datasets that are used. Relevant data includes the average patch size, the proportion of patches that are certain sizes, particularly proportions below 10 ha and below 100 ha, (but also below 1 ha and above 100 ha, for example). This could be presented as the range of patch sizes that comprise 90% of the occurrences.

The community is known from 41 locations, with a total area of 805.8ha. Data for this ecological community is sourced from the TEC database which is administered and updated by the Threatened Ecological Communities Program, Department of Biodiversity and Conservation, Kensington.

8 occurrences are less than 1ha in size
12 occurrences are between 1 and 10ha in size
18 occurrences are between 10 and 100ha in size, and
3 occurrences are greater than 100 ha in size.

16. Quantify, if possible, the smallest percentage or area required for a patch of the ecological community to be considered viable.

This refers to the minimum size of a remnant that can remain viable without active management. It may be determined through the requirements for dominant native species, level of species diversity, or the nature of invasive weeds.

Due to the nature of the threats to this ecological community, no minimum size is specified, as future viability will depend on management. Very small areas are able to maintain condition if they are subject to minimal disturbance.

Functionality

17. Is the present distribution of the ecological community severely fragmented?

If so, what are likely causes of fragmentation?
If fragmentation is a natural or positive characteristic of this ecological community, please explain this and state the reason.
Severely fragmented refers to the situation in which increased extinction risk to the ecological community results from most remnants being found in small and relatively isolated patches.

Occurrences of this ecological community are highly fragmented, with these areas higher in the landscape surrounded and separated by rural land cleared for farming/agriculture, infrastructure and roads.

18. Has there been a loss or decline of functionally important species?

This refers to native species that are critically important in the processes that sustain or play a major role in the ecological community and whose removal has the potential to precipitate change in community structure or function sufficient to undermine the overall viability of the community.

Unknown due to lack of appropriate monitoring data.

18 a. If yes, which species are affected?

See Section 18.

18 b. How are the species functionally important and to what extent have they declined?

Unknown due to lack of specific monitoring data.

Reduction in community integrity

19. Please describe any processes that have resulted in a reduction in integrity and the consequences of these processes, e.g. loss of understorey in a woodland. Include any available information on the rate of these changes.

This recognises that an ecological community can be threatened with extinction through on-going modifications that do not necessarily lead to total destruction of all elements of the community. Changes in integrity can be measured by comparison with a benchmark state that reflects as closely as possible the natural condition of the community with respect to the composition and arrangement of its abiotic and biotic elements and the processes that sustain them. Please provide a description of the benchmark state where available. For further information please refer to the Guidelines.

Survey and Monitoring

20. Has the ecological community been reasonably well surveyed?

Provide an overview of surveys to date, including coverage of different land tenure, and the likelihood of the ecological community's current known distribution and/or patch size being a true reflection of its actual distribution (consider area of occupancy and area of extent, including any data on number and size of patches).

The community was originally surveyed and mapped by Beard (1976). Eighteen of the occurrences have been surveyed by the TEC specialist group within the Department, or by consultants acting for the Department, and six have been surveyed by consultancies.

21. Where possible, please indicate areas that haven't been surveyed but may add to the information required in determining the community's overall viability and quality.

Include commentary on issues to do with accessing different land tenures within the area of distribution, including private property, and the likelihood that these areas may include locations.

Seventeen occurrences require survey, and all occurrences are on private land so access is not assured.

22. Is there an ongoing monitoring program? If so, please describe the extent and length of the program.

No strategic monitoring programs are designed or implemented within this community.

Condition Classes and Thresholds

23. Do you think condition classes/thresholds apply to this ecological community? If not, give reasons.

The Committee recognises that ecological communities can exist in various condition states. In reaching its decision the Committee uses condition classes and/or thresholds to determine the patches that are included or excluded from the listed ecological community (see the Guidelines for details of the process of determining condition classes). Relevant here is recognition of different states following disturbance and the natural recovery of the location towards a higher condition class.

The minimum viable condition for this community to be considered viable is Good Condition. This refers to a patch in which "Vegetation structure altered but retains basic vegetation structure or ability to regenerate it. Obvious signs of disturbance, e.g. from partial clearing, dieback, logging, grazing. Presence of very aggressive weeds." (Keighery (1994) Vegetation Condition Scale (Government of WA, 2000)). No minimum patch size is specified, as future viability will depend on management. Very small areas of vegetation are known to be able to maintain their condition if subject to minimal disturbance.

24. If so, how much of the community would you describe as in relatively <u>good condition</u>,

i.e. likely to persist into the long-term with minimal management?

For the purposes of relating condition to IUCN Criteria, good condition related to WA condition categories 'Very Good to Pristine' as below (see ^ below and Table 1 below) are considered to be in good condition, so therefore 404.4ha or 67.55% of locations with known condition are considered to be in good condition, and contain high native plant species diversity, maintain integrity of vegetation structure, and minimal weed/introduced species cover. All locations are in rural areas and are subject to the ongoing pressures/disturbances associated with proposed clearing and agriculture, and all require substantial management to protect from pressures such as spread of introduced species, and grazing impacts.

Table 1: Known vegetation condition of occurrences of the Plant Assemblages of the Inering System

Condition Ranking (Keighery 1994) from Government of Western Australia 2000)	**Hectares**
Excellent	**344.3509**
Very Good	**60.10165**

Good	**194.28045**	
Total	598.733	

25. What features or variables do you consider to be most valuable for identifying a patch of the ecological community in relatively good condition?

Variables for establishing the highest condition class may include: patch size; connectivity; native plant species composition; diversity and cover (for example in overstorey; mid-shrub and/or understorey layers); recognised faunal values; and cover of weeds or other invasive species.

See Section 24 above.

*For the purposes of relating condition to IUCN Criteria, condition categories from (Keighery (1994) Vegetation Condition Scale in Bush Forever (Government of WA 2000)) are defined below:

Good ('Pristine', 'Excellent', 'Very Good' using Bush Forever (2000) scale): This includes vegetation ranging from 'Pristine' - with no obvious signs of disturbance, to 'Excellent' - Vegetation structure intact, with disturbance only affecting individual species, weeds are non-aggressive species and 'Very Good' - Vegetation structure altered, obvious signs of disturbance eg: from repeated fires, dieback, logging, grazing.

26. How much of the community would you describe as in relatively medium condition, i.e. likely to persist into the long-term future with management?

194.3ha or 32.4% of locations with known condition are considered to be in medium condition, and contain medium plant species diversity, reduced of vegetation structure, and a medium level of weed/introduced species cover.

*For the purposes of relating condition to IUCN Criteria, condition categories from (Keighery (1994) Vegetation Condition Scale in Bush Forever (Government of WA 2000)) are defined below:

Medium ('Good' using Bush Forever (2000) scale): This includes vegetation categorised as 'Good' - Vegetation structure altered but retains basic vegetation structure or ability to regenerate it, obvious signs of disturbance are present, from activities including partial clearing, dieback and grazing.

27. Please describe how you would identify areas in medium condition using one or a combination of indicators such as species diversity, structure, remnant size, cover of weeds or other invasive species, etc.

See Section 26 above.

28. How much of the community would you describe as in relatively <u>poor condition</u>, i.e. unlikely to be recoverable with active management?

For the purposes of relating condition to IUCN Criteria, poor condition in this instance relates to WA condition categories 'Degraded' and 'Completely Degraded', (see ^ below and Table 1 above), so 0ha or 0.0% of locations with known condition are considered to be in poor condition.

shrubs.

29. Please describe how you would identify areas in <u>poor condition</u> using one or a combination of indicators such as species diversity, structure, remnant size, cover of weeds or other invasive species, etc.

Poor condition is considered to be vegetation with minimal native flora, presence of aggressive weeds, and evidence of high-level disturbance.

^ This includes vegetation ranging from 'Degraded' Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; grazing to 'Completely Degraded' where the structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Threats

Note: If you plan to identify <u>climate change</u> as a threat to the ecological community, please refer to the Guidelines for information on how this should be addressed.

30. Identify <u>PAST</u> threats to the ecological community indicating whether they are *actual* or *potential*.

Information with regard to past threats to the ecological community has been recorded in IRP 107 as shown in the table below. Since this IRP was drafted in 2002, further fragmentation of locations has occurred. While the known area of extent has increased from a total area of 653.5 ha shown in the table below to a current area of extent of 805.77ha, some of the 27 locations identified in IRP 107 have been subject to further fragmentation, with 41 locations now recorded. Past threats identified in the table below are actual threats. There are no survey data after 2000 to determine current status.

Table 2: Summary of location information, condition and threats

Occ. Site Id	Tenure	Area (ha)	Year of survey: condition	Current and future threats
Inering range 1 (1331 ha)				
1: ANV1	[redacted], Freehold land Prauka Springs,	163.9	2000; Excellent	Grazing, weed invasion, inappropriate fire regimes, salinisation and water logging

	Shire of Carnamah			
2: ANV7	[redacted] Prauka Springs Freehold Private land	16.4	2000: Good	Clearing, grazing, weed invasion and/or altered fire regimes
3: GNV7a	Lot 1 Shire of Carnamah . Private freehold.	25.3	2000: Good	Grazing, weed invasion, altered fire regimes
4: CNV2	Private Freehold Shire of Carnamah	14.3	2000: Good	Grazing, weed invasion
5: GNV9	Private freehold Lot 1, Shire of Carnamah	9.97	2000: Good	Grazing, weed invasion, altered fire regimes
6: GNV10:	Private freehold Lot 1, Shire of Carnamah	16.1	2000: Good	Grazing, weed invasion, altered fire regimes
7: ANV1e	Lot 1 Private Freehold, Shire of Carnamah	2.6	2000: 100% Good (derived from aerial photo)	Fragmentation, grazing, weed invasion
8: Site8	Lot 1 Private freehold. [redacted] Private freehold. Shire of Carnamah	8.2	2000: 80 Good, 20 Excellent (derived from aerial photo)	Grazing, weed invasion, altered fire regimes
9: Site 9	[redacted] Private Freehold land, Shire of Carnamah	18.1	2000: Good 85% Excellent 15% (derived from aerial photo)	Grazing, weed invasion, altered fire regimes
10: Site 10	[redacted] Freehold private land Shire	9	2000: Good 85% Excellent 15% (derived from aerial photo)	Grazing, weed invasion, altered fire regimes

	of Carnamah			
11: Site 11	[redacted] Freehold Private, Lot 1. [redacted] Freehold, Shire of Carnamah	52	2000: 50 Very Good, 50 Excellent	Grazing, weed invasion, altered fire regimes, salinisation and waterlogging
12: CNV3a	Shire of Carnamah Freehold Private	8.4	2000: 100 Good	Grazing, weed invasion, altered fire regimes
13: CNV4	2 properties, bit private Freehold, Shire of Carnamah	51.5	2000: 100 Excellent	Grazing, weed invasion, altered fire regimes
14: FNV4	Private freehold land, Shire of Carnamah	3.3	2000:70 Good, 30 Very Good	Fragmentation, grazing, weed invasion, altered fire regimes
15: ENV6	2 properties, freehold land, Shire of Carnamah	60.7	2000:40 Very Good, 60 Excellent	Grazing, weed invasion, altered fire regimes
16: BNV1	Freehold private property, Shire of Carnamah	16	No condition ranking	Fragmentation
17: INV8	[redacted], Private Freehold land Shire of Carnamah	12.1	No condition ranking	Fragmentation
18: INV5	[redacted] Private Freehold land, Shire of Carnamah	5.2	1991: 100 Excellent (Orsini and Lewis survey)	Fragmentation, grazing, weed invasion

19: INV4a	[redacted] Private Freehold land, Shire of Carnamah	0.8	No condition ranking	Fragmentation
20: INV2	[redacted] Private Freehold land, Shire of Carnamah	5.2	1991: 100 Excellent (Orsini and Lewis survey)	Fragmentation, grazing, weed invasion
21: INV1	[redacted] and Lot 2 Perenjori, Private Freehold, Shire of Carnamah	3.8	No condition ranking	Fragmentation
22: BNV2	[redacted], [redacted], both Private Freehold land, Shire of Carnamah	5.7	1991: 100 Excellent (Orsini and Lewis survey)	Grazing
Inering range 2 (244.7 ha)				
23: NIV	Lot number [redacted] Freehold Private, Shire of Carnamah	4.3	2000: 90 Good, 10 Excellent	Fragmentation, grazing, weed invasion, altered fire regimes
24: NIV/BRO	[redacted] Freehold, Shire of Carnamah	49.7	2000: 90 Good, 10 Excellent	Fragmentation, grazing, weed invasion, altered fire regimes
25: BRO	[redacted], Private Freehold Land, Shire of Carnamah	5.8	No condition ranking	Fragmentation
Inering range 3 (244.7 ha)				
26: UNKN	[redacted],	5.5	No condition ranking	Fragmentation, grazing, weed invasion

	Freehold Private Land			
Woondadying (346.8 ha)				
27: RAYNER	6 Private Freehold land, 3 owners, Shire of Carnamah	85	No condition ranking	Weed invasion
Additional occurrences identified since the IRP (48.02 ha)				
28: INV4b	[redacted] Private Freehold land, Shire of Carnamah	0.7564	No condition ranking	Fragmentation, weed invasion, grazing by native or introduced species
29: GNV7b	12 Private Freehold land, Shire of Carnamah	5.0584	2000: 100% Good Aerial photo and report survey info	Grazing by native or introduced species, weed invasion, altered fire regimes
30: CNV3b	12 Private Freehold land, Shire of Carnamah	5.0584	2000: Good 100%	Grazing by native or introduced species, weed invasion, altered fire regimes
31: Site 12	[redacted] Freehold Private land, Shire of Carnamah	1.9397	2000: Very Good 50%, Excellent 50%	Weed invasion, grazing by native or introduced species, altered fire regimes
32: Site 13	[redacted] Private Freehold Land, Shire of Carnamah	0.986	2000: Very Good 50%, Excellent 50%	Weed invasion, grazing by native or introduced species, altered fire regimes
33: Site 14	[redacted] Private Freehold Land, Shire of Carnamah	0.7749	2000: Very Good 50%, Excellent 50%	Weed invasion, grazing by native or introduced species, altered fire regimes
34: Site 15	[redacted] Private Freehold	0.9167	2000: Very Good 50%, Excellent 50%	Weed invasion, grazing by native or introduced species, altered fire regimes

	land, Shire of Carnamah			
35: Hill02	Lot 1, Private Freehold land, Shire of Carnamah	0.8963	2000: 100% Good (derived from aerial photograph)	Grazing by native or introduced species, weed invasion, fragmentation
36: Hill03	Lot 1, Private Freehold land, Shire of Carnamah	0.3172	2000: Good 100% (derived from aerial photograph)	Grazing by native or introduced species, weed invasion, fragmentation
37: Hill04	Lot 1, Private Freehold land, Shire of Carnamah	0.4809	2000: Good 100% (derived from aerial photograph)	Grazing by native or introduced species, weed invasion, fragmentation
38: ANV1b	Lot 14 and 15, Private Freehold land, Shire of Carnamah	17.7885	2000: Good 50% Excellent 50%	Weed invasion, grazing by native or introduced species, altered fire regimes
39: ANV1c	[redacted] Private Freehold Land, Shire of Carnamah	6.2839	2000: Excellent 50%, Very Good 50 %	Weed invasion, grazing by native or introduced species, altered fire regimes
40: ANV1d	[redacted] Private Freehold Land, Shire of Carnamah	4.1752	2000: Excellent 50%, Very Good 50%	Weed invasion, grazing by native or introduced species, altered fire regimes
41: ANV1e	[redacted] Private Freehold Land, Shire of Carnamah	2.5869	2000: Very Good 50%, Excellent 50%	Weed invasion, grazing by native or introduced species, altered fire regimes

31. Identify <u>CURRENT</u> threats to the ecological community indicating whether they are *actual* or *potential*.

See section 30 above

32. Identify FUTURE threats to the ecological community indicating whether they are *actual* or *potential*.

See section 30 above

For each threat describe:

30 a. How and where the threat impacts on this ecological community.

In 2002 it was estimated that approximately 70% of the Inering System had been cleared (CALM 2002). Threatening processes affecting most locations include grazing, fragmentation, and weed invasion.

Fragmentation

Remnants with large edge to area ratios coupled with high levels of degradation and large distances between remnants are unlikely to remain viable in the future (Odum 1971) as intact representations of the TEC. Some locations are at risk of fragmentation, whereas others are already fragmented.

Grazing

Based on currently available information, only part of location 1 is fenced; and most of the rest are grazed by sheep. Grazing has caused alterations to the species composition by the selective grazing of edible species, the introduction of weeds and nutrients, trampling and general disturbance. Grazing occurs throughout occurrences.

Weed invasion

Weeds can have significant impacts through competition with the native species, prevention of regeneration and alteration of fire regimes (Hobbs and Mooney 1993). Combined disturbances such as fires and grazing can predispose areas to weed invasion if weed propagules are present. All locations of this community are adjacent to agricultural areas that act as weed sources, and are vulnerable to weed invasion following any disturbance.

Altered fire regimes

Fires can cause alterations to the native species composition through promoting weed invasion. In addition, altered fire regimes can prevent native species from completing growth and reproductive cycles.

Salinisation and increased waterlogging

Increase in salinity levels and inundation are a threat to the key elements of the *Eucalyptus loxophleba* woodland over clay loam assemblage that is a component of the community.

33. Identify FUTURE threats to the ecological community indicating whether they are *actual* or *potential*.

See section 30 above.

For <u>each</u> threat describe:

333 a. How the threat has impacted on this ecological community in the past.

See section 32a above.

333 b. What its expected effects are in the future. Include or reference supporting research or information.

There are on-going pressures from clearing, grazing, salinisation, and weed invasion.

333 c. Identify whether the threat only affects certain portions or locations. Give Details.

The threats of fragmentation, grazing and weed invasion affect all locations of this ecological community. Low lying areas of this community are affected by salinisation and waterlogging. Altered fire regimes are likely to affect some occurrences of this community.

34. Identify any natural catastrophic event/s

Explain its likely impact and indicate the likelihood of it occurring (e.g. a drought/fire in the area every 100 years). Catastrophic events are those with a low predictability that are likely to severely affect the ecological community.

35. Additional biological characteristics

Identify and explain any additional biological characteristics particular to the community or species within it that are threatening to its survival (e.g. low genetic diversity). Identify and explain any models addressing survival or particular features.

None

355 a. How does it respond to disturbance?

The response of the ecological community to disturbance such as fire is unknown but fire stimulates weed invasion where weed propagules are present. Clearing has effects that are self-explanatory. Weeds impact on diversity and abundance of native flora as a result of competition for resources. In locations where survey has been undertaken, condition rankings indicate a high proportion of weed species.

355 b. How long does it take to regenerate and/or recover?

It is not known how long it takes for this ecological community to regenerate/recover from the various types of disturbance including grazing and fire.

Threat Abatement and Recovery

36. Identify key management documentation available for the ecological community, e.g. recovery plans, biodiversity management programmes, or site-specific management plans (e.g. for a reserve).

Department of Conservation and Land Management (2002) Interim Recovery Plan No. 107, Plant assemblages of the Inering System. CALM, Perth.

Recommendations for management as listed in the TEC database, and included in CALM (2002) include:

- Fence occurrences
- Rehabilitate and link remnants
- Implement a flora and vegetation monitoring programme
- Control weeds
- Determine and implement appropriate fire regime
- If locations become available, seek to acquire larger locations for the conservation estate

37. Give an overview of how threats are being/potentially abated and other recovery actions underway and/or proposed. Identify who is undertaking these activities and how successful the activities have been to date.

In 2002 funding was provided to fence locations 1 (part), 3-6, 11-15, to reduce grazing.

38. What portion of the current extent of the ecological community is protected in a reserve set aside for conservation purposes, and what proportions are private land, or other tenure? Give details including the name of the reserves, and the extent the ecological community is protected within these reserves.

None of the occurrences of this ecological community are protected in reserves. All locations occur on freehold land.

388 a. Which of the reserves are actively managed?
Note which, if any, reserves have management plans and if they are being implemented.

388 b. Give details of any other forms of protection, such as conservation covenants, and whether the protection mechanisms are permanent.

388 c. Indigenous interests
Is the nominated ecological community or parts thereof known to occur on any culturally significant sites? If so comment on any issues with respect to aboriginal interests, in particular with regard to management of the ecological community.

None known.

388 d. Native Title
Do Native Title or Indigenous Protected Areas apply to any parts of the community? If so comment on any issues with respect to exclusive possession and rights to plants and animals, in particular with regard to management of the ecological community.

A Noongar native title claim occurs over the occurrences (Southern Yamatji WAD 19/2019 WC2017/002)

39. Give details of recovery actions that are or could be carried out at the local and regional level, e.g. develop and implement management plan for the control of specific weed species (regional), undertake weeding of known sites (local).

Fencing of all occurrences of this community is recommended, as is weed mapping and control. All occurrences require ongoing management, due to ongoing pressures associated from grazing and weed invasion.

40. Is there an existing support network for the ecological community that facilitates recovery? e.g. an active Landcare group, Conservation Management Network.

Historical records indicate groups such as the Buntine-Marchagee Natural Diversity Recovery Catchment BMNDRC undertook actions including soil conservation earthworks, revegetation, and fencing of remnant vegetation in the Inering Hills System.

41. Describe methods for identifying the ecological community including when to conduct surveys.

For example, season, time of day, weather conditions; length, intensity and pattern of search effort; and limitations and expert acceptance; recommended methods; survey-effort guide. Include references.

Potential locations should be assessed against information held in Beard (1976) to ascertain if vegetation meets the original descriptions. Sampling protocols and timelines best used for identifying and conducting surveys in this community are identified in EPA Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment.

http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf

42. Are there other any aspects relating to the survival of this ecological community that you would like to address?

No.

Section 3 - Justification for this nomination

In order for the nomination to be considered further, one or preferably more of the following criteria need to be fulfilled and substantiated. A clear case for why the ecological community is eligible for listing under the criteria is required, including evidence as to how it meets the requirements for listing under a particular listing category, e.g. 'David *et al*. (1999) finding of 95% decline in geographic distribution suggests it should be listed as critically endangered'. The type of data available will determine which criteria will be used to justify the application of a listing category.
At least one criterion must trigger the thresholds of a listing category as indicated in the Attachment. Criteria may be of different levels of listing category e.g. Criterion 1 = CR and Criterion 3 = VU.

43. Provide data that demonstrates why the ecological community meets at least one of the following criteria for the nominated listing category.

Please use data provided in previous sections to demonstrate how it specifically meets at least one of the following criteria. Advice on how to interpret the listing criteria is in Attachment A. Provide a response for every sub-criterion.

Criterion A: Reduction in geographic distribution.

Criterion A	
☐ CR ☒ EN ☐ VU ☐ not eligible	☐ **A1** ☐ **A2a** ☐ **A2b** ☒ **A3**

Justification for assessment under Criterion A:

For criteria A and B, the ecosystem is assumed to collapse when the mapped distribution declines to zero.

In 2002 a polygon that approximates the boundaries of Beard's (1976) Inering System was developed based on Beard's system association mapping, topography, and current mapping of known remnants of the Inering System. The two polygons (south ~ 1372ha, and north ~3003ha) total ~4375ha (CALM 2002). From digitised GIS mapping of remaining occurrences of this ecological community, the community is calculated to have an extent of 805.8 ha. It is considered naturally rare and restricted. Beard (1976) also notes "within the farming belt most natural vegetation has now been destroyed except in the various small reserves…on public land along roadsides, and in occasional uncleared areas on farms…The proportion of uncleared country is small except in the Nanekine System…". These data are indicative of an estimated loss of ~82% of this community since 1750.

Evidence indicates a decline in a measure of disruption to biotic interactions (loss of vegetation cover) to support ranking under B1a iii.

Community meets subcriterion A3 with ≥70% historical reduction (since approximately 1750), to make it **eligible for listing as Endangered.**

Meets EN under A3.

Criterion B: Restricted geographic distribution.

Criterion B	
☒ CR ☒ EN ☐ VU ☐ not eligible	☒ **B1** (specify at least one of the following) ☐ **a)(i)** ☐ **a)(ii)** ☒ **a)(iii)** ☒ **b)** ☐ **c); CR** ☒ **B2** (specify at least one of the following) ☐ **a)(i)** ☐ **a)(ii)** ☒ **a)(iii)** ☒ **b)** ☐ **c); EN** ☐ **B3** (only for Vulnerable Listing)

Justification for assessment under Criterion B:

B1 Extent of minimum convex polygon EEO (km²) is 46.3km², which is ≤2000km, and an observed or inferred continuing decline in:

(a) Evidence indicates a decline in a measure of disruption to biotic interactions (loss of vegetation cover) to support ranking under B1a iii (see explanation under criterion D below).
(b) Observed or inferred threatening processes that are likely to cause continuing declines in environmental quality or biotic interactions through loss of vegetation cover within the next 20 years. Ongoing grazing and weed invasion are likely to continue to cause continuing declines in environmental quality and biotic interactions.

This community is therefore eligible for listing as **Critically Endangered under subcriterion B1aiii,b).**

B2 Under Subcriterion B2 5 10x10km grid cells are occupied. This falls within the category of ≤20 category and ≥2, making it eligible for listing as **Endangered under subcriterion B2 a,b.**

B3 Threat Defined Locations
Community is considered to occur at 17 threat defined locations (greater than the maximum ≤5 threshold to meet VU).

Community does not meet sub-criterion B3.

M**eets CR B1a,b**

Criterion C: Environmental degradation based on change in an abiotic variable.

Criterion C	
☐ CR ☐ EN ☐ VU ☐ not eligible	☐ **C1** ☐ **C2** ☐ **C3**

Justification for assessment under Criterion C:

Damage to the substrate and soil loss, particularly as a consequence of grazing, represent a change to an abiotic variable that is a significant threat to the community.

Collapse in this context is loss of the surface soils across the extent of the community. The assumption is that complete loss of soil will result in loss of the characteristic vegetation of the assemblage and replacement with weeds or native species that can tolerate rock substrate.

The extent and severity of soil loss has not been measured and requires investigation. Quantitative data that would link loss of substrate with decline of the community are also not available.

There are inadequate quantitative data about disruption of abiotic processes or interactions in relation to soil loss to support assessment of the community against criterion C.

Criterion D: Disruption of biotic processes or interactions based on change in a biotic variable.

Criterion D ☐ CR ☐ EN ☐ VU ☐ not eligible	☐ **D1** ☐ **D2** ☐ **D3**

Justification for assessment under Criterion D:

Loss of vegetation cover as a consequence of grazing in particular, is a significant biotic variable affecting the community.

The severity of vegetation loss associated with collapse is uncertain, but it is assumed conservatively that the community reaches a collapsed state when there is a total loss of vegetation cover.

Landsat satellite imagery was utilised to assess the change in vegetation cover between 1989 and 2019. Images used in the analysis to map cover change were captured 13/2/1989 and 21/4/2019. Regression of the i35 index from Landsat imagery and canopy cover from aerial photography (r.squared = 0.853, n = 29) was used to map cover change for this assessment (See van Dongen, R. (2019));

Coefficients from the regression were applied to imagery from 13/02/1989 and 21/04/2019, a period of 30 years. This produced two vegetation cover images. The percentage difference of cover values between these two images can then be calculated. A vegetation cover change image within the “Plant assemblages of the Inering System” TEC is shown in Figure 2 and an area summary is provided in Table 3. For further interrogation the change image can be acquired and viewed in standard GIS software.

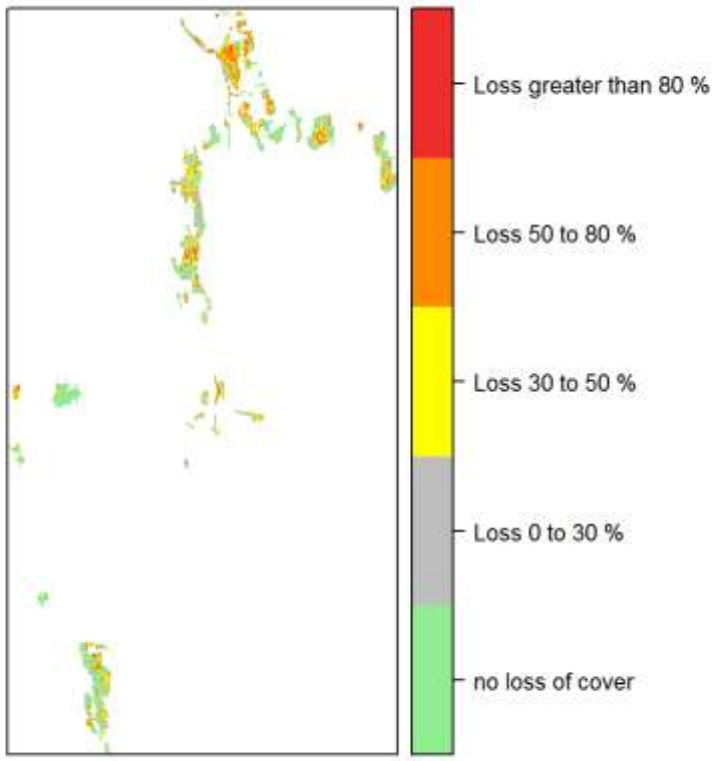

Figure 2. Vegetation cover change within the Plant assemblages of the Inering System TEC (1989 to 2019) (van Dongen, R. (2019))

Table 3: Proportion of vegetation in the community within each loss class (1989 to 2019).

Description	Percent of TEC
Loss less than 30 %	66.36
Loss greater than 30 %	33.63
Loss greater than 50 %	18.61
Loss greater than 80 %	1.53

Table 3 indicates that in the last 30 years, loss of vegetation cover of ≥80% occurs over 1.53% of the extent of the community. This is less than the threshold of ≥30% of the extent to meet CR under D1 and D2. Assuming a linear relationship, it can be extrapolated that a 2.448% loss of vegetation cover would occur for ≥80% of the extent of the community after 50 years.

A threshold of is ≥50% of the extent of the community is required to be subject to ≥50% severity of disruption of biotic processes in any 50 year period to meet EN under D1 and D2. Table 3 indicates that 20.14% (ie 18.61+1.53%) of the community has been subject to ≥50% vegetation decline in 30 years (does not meet EN D1 or D2).

In any 50 year period, a threshold of ≥80% of the extent of the community must be subject to relative severity of ≥30% to meet VU under D1 and D2. Table 3 indicates that 53.77% of the extent of the community has been subject to ≥30% severity of vegetation loss (ie 33.63+18.61+1.53%).

To meet CR under D3, a threshold of ≥50% of the extent of the community must be subject to relative severity of ≥50%. Table 3 indicates that 1.53% of the extent of the community has been subject to ≥80% vegetation decline (does not meet CR D1 or D2). Data for >90% vegetation decline are not available.

Available data do not indicate the community meets criterion D.

Criterion E: Quantitative analysis that estimates the probability of ecosystem collapse.

Criterion E	
☐ CR ☐ EN ☐ VU ☒ not eligible	

Justification for assessment under Criterion E:

No quantitative analysis of probability of ecosystem collapse has been completed.

Table 4: Summary assessment against IUCN RLE Criteria

Criterion	Rank indicated	Overall conclusion
A1	-	• Available data do not indicate community meets criterion
A2a	-	• Available data do not indicate community meets criterion
A2b	-	• Available data do not indicate community meets criterion
A3	EN	• The estimate of ~82% decline, indicates the community meets A3 • Meets criterion for EN
B1a	CR	• EOO is ≤2,000km^2 • Evidence indicates a decline in a measure of disruption to biotic interactions (loss of vegetation cover) to support ranking under B1aiii. • Meets criterion for CR
B1b	CR	• EOO is ≤2,000km^2 • Weed invasion is inferred to be ongoing due to ongoing grazing. • Observed or inferred threatening processes that are likely to cause continuing declines in environmental quality or biotic interactions within the next 20 years. Ongoing grazing and weed invasion are likely to continue to cause continuing declines in environmental quality and biotic interactions • Meets criterion for CR
B1c	-	• EOO is ≤2,000km^2 • Based on 17 clusters of occurrences that may be subject to similar threats such as similar levels of grazing on a particular Lot, the community is considered to exist at 17 threat-defined locations (greater than threshold to meet VU of ≤10) • Does not meet criterion
B2a	EN	• AOO is five grid cells • Decline in a measure of disruption to biotic interactions (loss of vegetation cover) to support ranking under B2aiii. • Observed or inferred threatening processes that are likely to cause continuing declines in environmental quality or biotic interactions within the next 20 years. Ongoing grazing and weed invasion are likely to continue to cause continuing declines in environmental quality and biotic interactions. • Meets criterion for EN under B2ai and B2aiii
B2b	EN	• AOO is five grid cells • Observed or inferred threatening processes (grazing, weed invasion, vegetation loss) that are likely to cause continuing declines in environmental quality or biotic interactions within the next 20 years. • Meets criterion for EN
B2c	-	• AOO is five grid cells • Ecosystem exists at 17 threat-defined locations ≥10 • Does not meet criterion
B3	-	• Ecosystem exists at 17 threat-defined locations ≥10 • Does not meet criterion
C1	-	• Inadequate quantitative data to indicate the community meets the minimum thresholds for proportion of the extent

		(≥30%) or proportional severity of degradation (≥30%) over any 50 year period to meet VU.
C2	-	• Inadequate quantitative data to indicate the community meets the minimum thresholds for proportion of the extent (≥30%) or proportional severity of degradation (≥30%) over any 50 year period to meet VU.
C3	-	• Inadequate quantitative data exist to indicate the community meets the minimum thresholds for proportion of the extent (≥50%) or proportional severity of disruption of abiotic processes (≥50%) since ~1750 to meet VU.
D1	-	• Available evidence indicates the community does not meet the minimum thresholds for proportion of the extent (≥30%) and proportional severity of degradation (≥30%) over any 50-year period to meet VU.
D2	-	• Available evidence indicates the community does not meet the minimum thresholds for proportion of the extent (≥30%) and proportional severity of degradation (≥30%) over any 50-year period to meet VU.
D3	-	• Available evidence exists to indicate the community does not meet the minimum thresholds for proportion of the extent (≥50%) and proportional severity of disruption of biotic processes (≥50%) since ~1750 to meet VU.
E	NA	• No quantitative estimates of the risk of ecosystem collapse.
		Meets CR under B1aiii,b. Meets EN under A3, B2a,b. *'The highest risk category obtained by any of the assessed criteria will be the overall risk status of the ecosystem'* (IUCN RLE Guidelines V1.1 page 42). **Meets CR B1a(iii),b.**

Table 5: Known condition of occurrences of 'Plant Assemblages of Inering Hills ecological community'

Condition Ranking (Keighery 1994) from Government of Western Australia 2000)	**Hectares**	**IUCN Criteria condition ranking**	**Hectares**
Excellent	**344.3509**	Good	404.45255
Very Good	**60.10165**		
Good	**194.28045**	**Medium**	**194.28045**
Degraded	0.0	**Poor**	0.0
Completely degraded	0.0	**Beyond recovery**	0.0
Total	598.733	**Total**	598.733

Section 4 – References/Standard of Scientific Evidence/Critical habitat

Note: The opinion of appropriate scientific experts may be cited (with their approval) in support of a nomination. If this is done the names of the experts, their qualifications and full contact details must also be provided in the reference list below. Harvard style of referencing is preferred.

44. Please provide copies of key documentation/references used in the nomination.

Beard, J. S. (1976). *Vegetation Survey of Western Australia. The Vegetation of the Perenjori Area, Western Australia.* 1:250,000 series. Vegmap Publications, Perth.

Department of Conservation and Land Management (2002) Interim Recovery Plan No. 107; Plant assemblages of the Inering System. Unpublished report for the Western Australian Threatened Species and Communities Unit.

Hobbs, R. J. and Mooney, H. A. (1993). Restoration ecology and invasions. In *Nature Conservation 3: Reconstruction of Fragmented Ecosystems*. pp 127-133, Saunders, D. A., Hobbs, R. J. and Ehrlich, P. R. (eds). Surrey Beatty and Sons: NSW.

Hope, P. et al. 2015, Southern and South-Western Flatlands Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, eds. Ekström, M. et al., CSIRO and Bureau of Meteorology, Australia.Orsini, J. P. and Lewis, S. (1992). Conservation of Remnant Vegetation in the Inering Creek Catchment. In: V. Read (ed), Inering Save the Bush Project, Bush Management Strategy.

van Dongen, R. (2019). Vegetation cover assessment for "Plant assemblages of the Inering System" using satellite imagery. Unpublished internal report for Department of Biodiversity, Conservation and Attractions, Kensington.

45. Statement on the Standard of Scientific Evidence

Digitised GIS mapping of remaining occurrences of this ecological community, indicates the community has an extent of 805.8 ha. This is considered to have an error of ~20% ie 805+/- 161ha. The polygon that approximates the original extent of boundaries of Beard's (1976) Inering System was developed based on Beard's system association mapping, topography, and current mapping of known remnants of the vegetation of the Inering System. There are likely to be quite large errors, in the order of +/- 50% associated with that estimation ie the two polygons total ~4375ha +/- 2187ha. These figures are utilised in criterion A.

The following caveats and estimations apply to data utilised in criterion D. The data were derived from remote sensing, and have not been ground truthed.

- Fire history data was assessed for the Inering hills area, using available data. Historical fire data can at time be unreliable/not recorded. In this instance, there were no intersects between fire history and polygons reflecting significant change (in areas greater than 2ha). Fire history polygons were visible in the vicinity of the TEC (from 1978), however they didn't intersect with the TEC, but do show that fire has been recorded in the area, so there is a moderate level of confidence in that GIS data indicating that there were no fire recorded within the TEC boundary.

- With regard to assessing likely changes in vegetation, a temporal series of images of polygons in areas of significant change were generated, and visually inspected by the GIS team.
- The regression model chosen for this data has a r-squared of 0.853, so of higher confidence than other methodology.

The locations have not been subject to strategic monitoring or survey since 2002, therefore data used for this nomination are not very current. However, most known occurrences have been visited to determine if the vegetation present aligns with the Beard (1976) description of the Inering System.

46. Has this document been reviewed and/or have relevant experts been consulted?
If so, indicate by whom and provide their contact details.

Reviewed by regional staff within the department.

47. Do you wish to propose any areas of habitat for consideration as Critical Habitat for the nominated community?
If so, refer to Ministerial Guideline No 5 and attached a separate nomination proposal addressing the matters required under that guideline. Indicate location/s including a map, and attached shapefiles.

No

Section 5 - Nominator Details & Declaration

48. Contact Details

Note: Nominator details are subject to the provision of the *Privacy Act 1988*

Title/Full Name	[redacted]
Organisation or Company name	DBCA
Postal address	DBCA Kensington
Email	[redacted]
Phone	[redacted]
Fax	

49. Declaration

Signature (Or insert electronic signature)	***I declare that the information in this nomination form and any attachments is true and correct to the best of my knowledge.***
Date signed	

Section 6 – Completed nomination form checklist

Please check all items on this list have been completed or are included with your nomination.

- ☐ I have read and applied the further information and guidelines for completing this nomination form in Attachment A
- ☐ Nominator details including name, address contact phone number included
- ☐ Name of the EC
- ☐ Any other names it is known by
- ☐ Map included or attached
- ☐ References cited
- ☐ If questions are left unanswered, a statement indicating that insufficient information is available

A description of:

- ☐ Biological components of the ecological community
- ☐ Non biological components of the ecological community
- ☐ Key interactions and functional processes
- ☐ Characters distinguishing it from other ecological communities
- ☐ Key species (dominant, characteristic or diagnostic, threatened etc)
- ☐ Known or estimated current extent of the ecological community
- ☐ Past/current/future threats including actual/potential, how/ where, how being/how could be abated
- ☐ Which listing category/categories it should be listed under and why

How to lodge your nomination

Completed nominations may be lodged either:

1. by email to: **communities.data@dbca.wa.gov.au**

If submitting by email, please also mail hard copies of attachments that cannot be emailed.

OR

2. by mail to: Species and Communities Branch
Department of Biodiversity, Conservation and Attractions, WA Government
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983

If submitting by mail, please include an electronic copy on memory stick or CD.