Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Nomination *(to be completed by nominator)*

Current conservation status					
Name of ecological community:	Shrublands on calcareous silts of the Swan Coastal Plain (floristic community type 18 as originally described in in Gibson *et al*. (1994))				
Other names:	Also referred to as floristic community type 18 (FCT18), 'SCP18' and shrublands on calcareous silts.				
Description:	The community is recorded from between Yalgorup National Park and Bunbury. It is species-rich, consists of open low shrubs with a rich annual flora and is known from calcareous silt flats. A suckering form of *Acacia saligna* (orange wattle), *Melaleuca viminea* (mohan), *Melaleuca teretifolia* (banbar), *Hakea varia* (variable-leaved hakea), *Xanthorrhoea preissii* (balga) and *Leptomeria ellytes* are common in the shrub layer, with sedges including *Lepidosperma longitudinale* (pithy sword-sedge) and *Gahnia trifida* (coast saw-sedge), and a suite of herbs including *Meionectes tenuifolia* a priority 3 flora taxon also common. The community is also known as "floristic community type 18" as originally described in Gibson N., Keighery B.J., Keighery G.J., Burbidge A.H. and Lyons M.N. (1994) "A floristic survey of the southern Swan Coastal Plain" (unpublished report for the Australian Heritage Commission prepared by the Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc.)).				
Nomination for:	Listing ☐		Change of status ☒		Delisting ☐

1. *Is the ecological community currently on any conservation list, either in a State or Territory, Australia or Internationally?* 2. *Is it present in an Australian jurisdiction, but not listed?*	*Provide details of the occurrence and listing status for each jurisdiction in the following table*

Jurisdiction	**List or Act name**	**Date listed or assessed (or N/A)**	**Listing category eg. critically endangered (or none)**	**Listing criteria eg. B1ab(iii)+2ab(iii) (or none)**
National	EPBC Act			
Western Australia	Threatened list; under WA Minister ESA list in policy	6/11/2001	Vulnerable	B)
	Priority list		1 ☐ 2 ☐ 3 ☐ 4 ☐	
Other State/Territory				

Nominated conservation status: category and criteria (include recommended status for deleted ecological communities)			
Critically endangered (CR) ☒	Endangered (EN) ☐	Vulnerable (VU) ☐	Collapsed (CO) ☐

Priority 1 ☐	Priority 2 ☐	Priority 3 ☐	Priority 4 ☐	None ☐
What criteria support the conservation status category for listing as a threatened ecological community or collapsed ecological community? *Refer to Section 32 of the Biodiversity Act 2016 for definition of 'Collapsed', and Appendix 3 table 'IUCN Red List Criteria for ecosystems version 2.2'.*		CR B1a(iii),b; D2b
Eligibility against the criteria		
*Provide justification for the nominated conservation status; is the ecological community eligible or ineligible for listing against the five criteria. For **delisting**, provide details for why the ecological community no longer meets the requirements of the current conservation status.*		
A.	Reduction in geographic distribution *(evidence of decline)*	☐ **A1** ☐ **A2a** ☐ **A2b** ☐ **A3**
	Justification of assessment under Criterion A.	For criteria A and B, the ecosystem was assumed to collapse when the mapped distribution declines to zero. • The community is a specialised habitat type that is likely to have been regionally rare (Gibson *et. al*. 1994). The decline in distribution for the community is unknown. **Inadequate data available to determine if community meets criterion**
B.	Restricted geographic distribution *(EOO and AOO, number of locations and evidence of decline)*	☒ **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) VU**
	Justification of assessment under Criterion B.	• B1: EOO is 43.6km^2 (<2,000km^2). The community's EEO is less that the 2,000km^2 threshold for rank CR. Community meets threshold for rank CR under criterion part B1. • B1a(iii); B2a(iii): Data for weed invasion and reduction in native taxa in the community are indicative of observed and inferred continuing decline through disruption to biotic interactions (see Criterion D and Appendix 1 for details). • B1b): Continuing decline observed from the impacts of weed invasion, grazing by native or introduced fauna, too frequent and intense fire and inferred continued decline associated with hydrological change and drying climate (see Appendix 1 for details of threats). • B1c): Community is considered to occur at 2 threat defined locations, based on the 2 occurrences of the community that may be subject to particular threats such as those that affect a particular bushland location (eg fires). The community meets EN under B1c) as the maximum threshold

		for threat defined locations to meet EN is 5 (1 threat defined location is indicative of CR). • B2: AOO- the community covers 3 grid cells – greater than the maximum 2 grid cell threshold for CR. The community meets EN under criterion part B2 for which the AOO threshold is 20 grid cells (sub-criteria b and c are the same as for B2) • B3: community is considered to consist of 2 threat defined locations, based on 2 occurrences of the community that may be subject to similar threats such as those that affect a particular aquifer, or bushland location. Meets VU under criterion B3, as community occurs at less than 5 threat defined locations and is prone to effects of stochastic events within a very short time period – hydrological change, and too frequent fire, and thus capable of collapse or becoming CR within a short time period. • **Meets criteria for Critically Endangered B1a(iii), b. Meets Endangered under B2a(iii),b. Meets Vulnerable under B3.**
C.	Environmental degradation of abiotic variable *(Evidence of decline over 50-year period)*	☐ **C1** ☐ **C2** ☐ **C3**
	Justification of assessment under Criterion C.	• Hydrological change from a drying climate in the form of rainfall and groundwater decline is an abiotic variable that is a significant threat to the community. • For criterion C, the assessment of decline in abiotic processes focussed on a drying climate using data on the depth of seasonal inundation of the community. The habitat of this community is classified as a dampland, as it experiences seasonal waterlogging. Altered surface flow and/or alteration of the height of the local water table may change the length of the period or the depth of ponding and impact the timing of growth of plant species that are adapted to seasonal waterlogging, and in turn affect the species composition of the community by favouring different plant species. There are inadequate data on surface water levels and seasonaility of inundation linked to vegetation composition in the community to determine a threshold of collapse for the community. Currently, bore data shows relatively stable water levels at occurrence HAY05 however surface water levels and seasonality may not be closely linked to groundwater levels. No current bore data are available for occurrence ELLIS02. **Insufficient evidence to indicate if the community meets criterion C.**
D.	Disruption of biotic processes or interactions	☐ **D1** ☒ **D2** ☐ **D3**

	(Evidence of decline over 50-year period)	
	Justification of assessment under Criterion D.	• Weed invasion is a significant biotic threat to the community. • The severity of weed invasion associated with collapse is uncertain, but it is assumed conservatively that the community reaches a collapsed state when only 10% (plausible range 0–20%) of its plant species are native. • Quadrat data for occurrence ELLIS02 (1) (representative of 97% of the community) indicate an increase in the proportion of exotic species in two of the quadrats between 1993/4 to 2005 with 53% of 'new' taxa being weeds. The main cause of the decline may be poor regeneration after the 1996 bush fire, or changes in hydrology (Smith 2006). It is assumed that the increase in exotic taxa as indicated by 2 quadrats is linear and is representative of weed invasion across the occurrence. Based on these assumptions the community is predicted to reaching the collapse threshold for the proportion of native taxa after approximately 34 years (Appendix 1). • Based on current and future forecasts of the proportion of native plant taxa within the ELLIS02 (1) occurrence of the community, 97% of the extent of the community (>80%) has a quantified severity of 100% (>80%) within a 50-year period. • **Meets criteria for Critically Endangered under D2b**
E.	Quantitative analysis *(statistical probability of ecosystem collapse)*	• No quantitative estimates of the risk of ecosystem collapse have been completed • **Not assessed**

Reasons for change of status

Genuine change ☐ New knowledge ☐ Previous mistake ☐ Review/Other ☒

Provide details: The community was initially ranked as Vulnerable using ranking criteria developed in WA that differ to those in the IUCN Red List Criteria for Ecosystems (version 2.2).

Summary of assessment information *(provide detailed information in the relevant sections of the nomination form)*

EOO	27.3km^2	AOO	300km^2 (3 10x10km grid method).
No. occurrences	2	Severely fragmented (justification below)	Yes ☒ No ☐ Unknown ☐
Justification of whether fragmented	Specialised habitat type. Likely to have been historically regionally rare (Gibson *et al.*, 1994). Historical and recent vegetation clearing between the 2 occurrences has increased their isolation and fragmentation (see Appendix 2).		
Current known area			207.3ha

Pre-industrialisation extent or its former known extent (if known)	Unknown: likely to have been historically regionally rare.
Estimated percentage decline	Decline in distribution unknown.

Summary assessment against IUCN RLE Criteria

Criterion	Rank indicated	Overall conclusion
A1	-	• Inadequate data available to indicate if community meets criterion
A2a	-	• Inadequate data available to indicate if community meets criterion
A2b	-	• Inadequate data available to indicate if community meets criterion
A3	-	• Inadequate data available to indicate if community meets criterion
B1a	CR	• EOO is <2,000km^2 • Weed data indicative of measure of continuing decline through disruption to biotic interactions. • Meets criterion for CR under B1a(iii)
B1b	CR	• EOO is <2,000km^2 • Continuing decline observed from the impacts of weed invasion, grazing by native or introduced fauna, too frequent and intense fire and inferred continued decline associated with hydrological change and drying climate. • Meets criterion for CR
B1c	EN	• EOO is <2,000km^2 • Ecosystem exists at 2 threat defined locations • Meets criterion for EN
B2a	-	• AOO is 3 grid cells • Weed data are indicative of measure of continuing decline through disruption to biotic interactions. • Meets criterion for EN under B1a(iii)
B2b	EN	• AOO is 3 grid cells • Continuing decline observed from the impacts of weed invasion, grazing by native or introduced fauna, too frequent and intense fire and inferred continued decline associated with hydrological change and drying climate. • Meets criterion for EN
B2c	EN	• AOO is 3 grid cells • Ecosystem exists at 2 threat defined locations • Meets criterion for EN
B3	VU	• Known from 2 threat-defined locations • Prone to the effects of weeds, grazing and too frequent fire; and inferred changes to hydrological regime • Meets criterion for VU
C1	-	• Inadequate evidence to indicate if the community meets the minimum thresholds for proportion of the extent (≥30%) or proportional severity of degradation (≥30%) over the past 50 years to meet VU.
C2	-	• Inadequate evidence to indicate if 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 evidence to indicate if community meets minimum thresholds for proportion of the extent (≥50%) or proportional severity of disruption of abiotic processes (≥50%) since ~1750 to meet VU.
D1	-	• Inadequate evidence to indicate if the community meets the minimum thresholds for proportion of the extent (≥30%) or

		proportional severity of disruption of biotic processes (≥30%) over past 50 years to meet VU.
D2	CR	• Meets the thresholds for proportion of the extent (≥80%) and proportional severity of disruption of biotic processes (≥80%) for weed invasion over a 50-year period. • Meets criterion for CR under D2b
D3	-	• Inadequate evidence to indicate if the community meets minimum thresholds for proportion of the extent (≥50%) or 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 B1a(iii),b; D2b. Meets Endangered under B2a(iii),b. Meets Vulnerable under B3. Plausible range of ranks: VU to CR. *'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; D2b**

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Summary of location (occurrence) information *(provide detailed information in the relevant sections of the nomination form)*						
Occurrence	Land tenure	Survey information: date of survey	Condition	Area of occurrence (ha)	Threats *(note if past, present or future)*	Specific management actions
ELLIS02 (1)	DBCA (Reserve 11710). Yalgorup National Park	1995, 2003, 2005, 2007, 2008, 2012 and 2017	15% good and 85% very good	202	Soil disturbance and track creation, weed invasion, too frequent fire, grazing by native or introduced animals, and hydrological change	Maintenance of fence along Ellis Road, interpretative signage, weed control, appropriate fire regime, hydrological monitoring
HAY05 (2)	City of Bunbury (Crown Reserve 30601) for recreation purposes – soon to be vested with DBCA as part of the yet to be named Bunbury Regional Park	2002, 2003, 2004, 2005, 2008, 2019	100% excellent (2008 survey)	5.3	Weed invasion, rubbish dumping, too frequent fire and hydrological change, track creation	Maintenance of fence, appropriate fire regime, weed control, hydrological monitoring

*For the purposes of relating condition to IUCN Criteria, condition categories from (Keighery (1994) Vegetation Condition Scale (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.

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.

Poor ('Degraded' using Bush Forever (2000) scale): Basic vegetation structure severely impacted by disturbance such as partial clearing, dieback, logging and grazing. Scope for regeneration but not to a state approaching good condition without intensive management.

Beyond recovery ('Completely degraded' using Bush Forever (2000) scale): Vegetation structure 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 shrubs and trees.

Table 1. Vegetation of the Shrublands on calcareous silts of the Swan Coastal Plain

Condition rank (from Government of Western Australia 2000)	**Hectares**	**IUCN Criteria condition ranking**	**Hectares**
Pristine	0		
Excellent	5.3		
Very Good	171.7		
Good	30.3	**Good**	177
Degraded	0	**Medium**	30.3
Completely degraded	0	**Poor**	0
Total	207.3	**Total**	207.3

APPENDIX 1 THREATS

Land clearing

Occurrence HAY05 (2) has been partially cleared by the creation of a track running through the occurrence. The majority of the grassy weeds occur along this track. Occurrence ELLIS02 (1) has vehicle tracks cleared alongside, as well as a public road that passes through the centre of the occurrence.

Weed invasion

Grazing alters species composition through increased nutrient levels and weed invasion. Other disturbances, such as fire and disturbance of the vegetation can also result in increased weed invasion. Increased nutrient levels favour weed species that are generally adapted to higher levels of nutrients than local species. Tracks through parts of the community are the location of the majority of invasion of grassy weeds and herbaceous weed species. Quadrat data for occurrence ELLIS02 (1) indicate an increase in the proportion of exotic species in two of the quadrats between 1993/4 to 2005 with 53% of 'new' taxa being weeds (Figure 1). The main cause of the decline may be poor regeneration after the 1996 bush fire, or changes in hydrology (Smith 2006). It is assumed conservatively that the community reaches a collapsed state when only 10% (plausible range 0–20%) of its plant species are native. The assumptions are that the rate of increase of weed taxa in this community is linear, and that data for the two quadrats in the occurrence reflect the weed invasion rate for the entire occurrence. Based on these assumptions, at approximately 34 years after the 2005 survey, the proportion of native plant taxa falls below the collapse threshold. A hot bushfire in 2016 heavily impacted the community at Yalgorup National Park. The flora composition of the community has drastically changed and there is a high presence of weeds ([redacted] personal communication 2020[1]). The community is highly susceptible to disturbance from fire due to species possessing lignotubers. These species are fire intolerant as lignotubers sit on the ground surface and are killed by fire. Given the weed invasion trend calculated from 1994 and 2005 (figure 1), it is likely the 2016 fire event has exacerbated weed invasion at this occurrence.

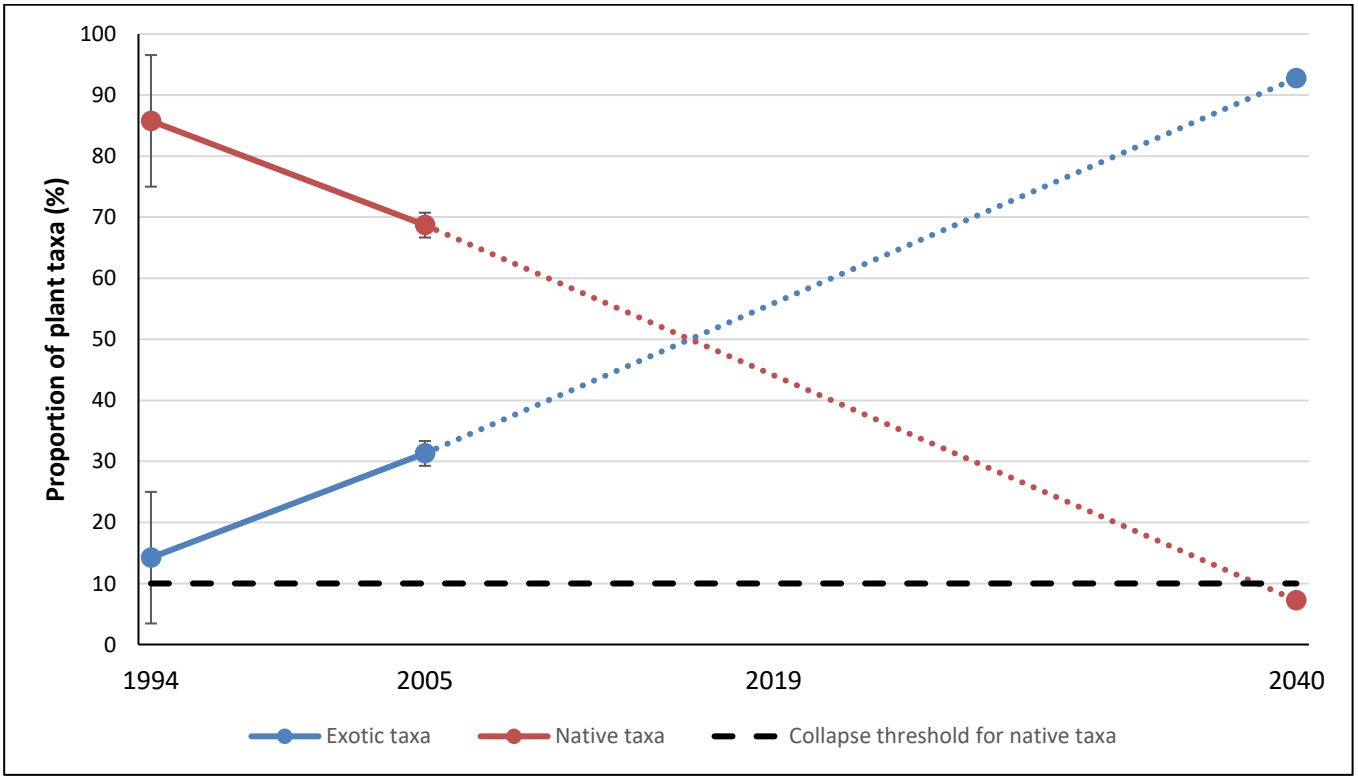

Figure 1. Trend in the proportion of native and exotic plant species in 'Shrublands on calcareous silts of the Swan Coastal Plain', based on the mean of two sampled quadrats (*n* = 2), between 1994 and 2005. An additional 35-year

[1] [redacted]: Previous Senior Principal Research Scientist, DBCA Kensington

forecast was calculated using the linear trendline between 1994 and 2005, of the proportion of exotic taxa (y=1.7707x + 12.516) and the proportion of native taxa (y=-1.7707 + 87.484)(Smith 2006).

Grazing by native and introduces species

Grazing of vegetation in the past is likely to have caused alterations to species composition, by selective grazing of edible species, with the introduction of weeds and nutrients, trampling, and general disturbance. Historical grazing by cattle occurred within occurrence ELLIS02 (1) in Yalgorup NP and led to some general disturbance. Large numbers of rabbits have been recently observed at Yalgorup National Park ([redacted] personal communication 2020).

Hydrological change

Occurrence ELLIS02 (1) is on an old saline lake-bed (basin) of calcareous silts, classified as a dampland (Geomorphic Wetlands Swan Coastal Plain). It is surrounded by Tuart woodland on higher ground. Seasonal waterlogging with saline waters occurs at this site due to an impervious clay layer. Occurrence HAY05 (2) is on low lying wet flat/ seasonal wetlands of calcareous silt with poor drainage which becomes inundated in places. Seasonal waterlogging with the fresh water occurs at this site. Altered surface flow and/or alteration of the level of the local water table may change the length of the period or the depth of ponding and may impact the timing of growth of plant species that are adapted to seasonal waterlogging, and in turn affect the species composition of the community by favouring different plant species.

Figure 2 shows groundwater levels within the vicinity of occurrence HAY05 (2) in Crown Reserve 30601, were relatively stable between 2009 and 2017. Clearing is likely to have increased surface runoff and recharge of the groundwater in the local area, whilst drainage infrastructure has probably offset this with an overall lowering of the water table. Hydrological change has likely occurred within Yalgorup National Park where occurrence ELLIS02 (1) is located, however, there is currently no systematic monitoring to support this inference or the impacts it may be having on the community.

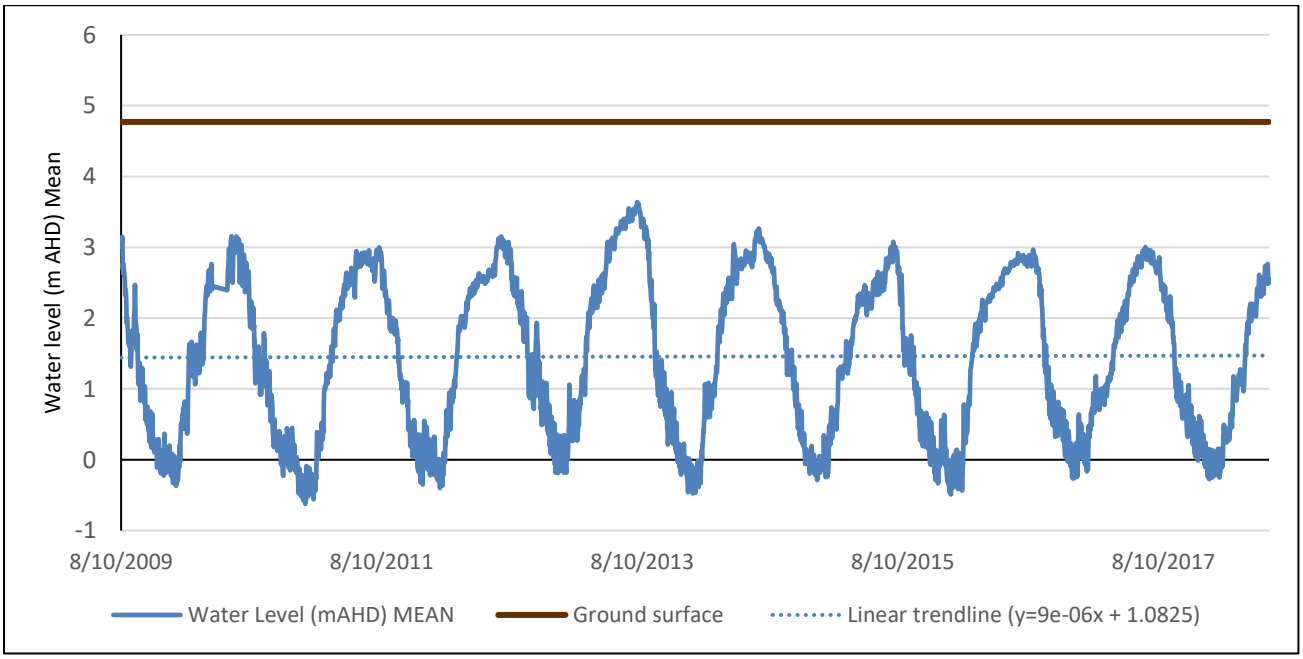

Figure 2. Hydrograph of monitoring bore located 270m northwest of occurrence HAY05 (2) (site ref: 61111467) within Crown Reserve 30601, sampling the superficial swan aquifer (DoW 2019).

Altered fire regimes

Too frequent fire can increase the risk of invasive weeds establishing within small bushland remnants (Abbot and Burrows 2003). A bushfire occurred within occurrence 1 (Ellis01) in 1996, and a severe fire impacted the occurrence in January 2016. The vegetation across the central portion of this occurrence appears to be recovering post-fire ([redacted] personal communication 2017[2]), however, as mentioned above, the vegetation composition of the community has drastically changed and there is a high presence of weeds ([redacted] personal communication 2020). A fire occurred within occurrence 2 (Hay05) in 2002 and 2008. The portion of the community north of the east-west track across the reserve was burnt in a January 2018 wildfire.

Climate drying

Reduced rainfall and the associated impacts on hydrology may have a detrimental effect on the community.

Decreases in winter and spring and annual rainfall are projected with high confidence for the areas in which the community occurs. There is strong model agreement and good understanding of the contributing underlying physical mechanisms driving this change (southward shift of winter and spring storm systems).

According to CSIRO data, early in the century (2030) and under all emission scenarios, winter rainfall is projected to decrease by up to 15 per cent. Late in the century, intermediate emissions (RCP4.5) lead to a projected decrease in winter rainfall of up to around 30%, and under high emissions (RCP8.5) winter rainfall decline is projected to decrease by up to 45%. Changes in autumn and summer are less clear, although downscaling results suggest a continuation of the observed autumn declines. (https://www.climatechangeinaustralia.gov.au/en/climate-projections/future-climate/regional-climate-change-explorer/sub-clusters/?current=SSWSW&tooltip=true&popup=true; accessed October 2019)

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Abbott, I. and Burrows, N. (eds) (2003). *Fire in ecosystems of south-west Western Australia: impacts and management.* Bachhuys Publishers, Leiden, Netherlands.

DoW (2019) Water INformation (WIN) database – discrete sample data Available from URL: http://wir.water.wa.gov.au/SitePages/SiteExplorer.aspx

Gibson, N., Keighery, B., Keighery, G., Burbidge, A and Lyons, M. (1994) A floristic survey of the southern Swan Coastal Plain. Unpublished report for the Australian Heritage Commission prepared by the Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc.).

Smith, R. (2006). Vegetation composition change at Ellis Road threatened ecological community (SCP18).

[2] [redacted]: Senior Ecologist, DBCA Kensington

APPENDIX 2: Distribution of the Shrublands on calcareous silts of the Swan Coastal Plain community (red)

The map above was created using ArcGIS version 10.6.1 and shows the extent of distribution of the community. It has a range of over 50km, with the southernmost occurrence located in Crown Reserve managed by the City of Bunbury and the northernmost located in Yalgorup National Park. The figure indicates that occurrences of the community are highly fragmented.

The map was created from known mapped occurrences of the community in the Western Australian Threatened Ecological Community Database (TECDB), administered by the Department of Biodiversity and Conservation (DBCA).

APPENDIX 3 IUCN Red List Criteria for ecosystems (version 2.2) (IUCN 2017)

A. Reduction in geographic distribution over ANY of the following time periods:

		CR	EN	VU
A1	Present (over the past 50 years).	≥ 80%	≥ 50%	≥ 30%
A2a	Future (over the next 50 years).	≥ 80%	≥ 50%	≥ 30%
A2b	Future (over any 50 year period including the present and future).	≥ 80%	≥ 50%	≥ 30%
A3	Historic (since 1750).	≥ 90%	≥ 70%	≥ 50%

B. Restricted geographic distribution indicated by EITHER B1, B2 or B3:

		CR	EN	VU
B1	Extent of a minimum convex polygon enclosing all occurrences (Extent of Occurrence)	≤ 2,000 km^2	≤ 20,000 km^2	≤ 50,000 km^2
	AND at least one of the following (a-c):			
	(a) An observed or inferred continuing decline in **EITHER**:			
	i. a measure of spatial extent appropriate to the ecosystem; **OR**			
	ii. a measure of environmental quality appropriate to characteristic biota of the ecosystem; **OR**			
	iii. a measure of disruption to biotic interactions appropriate to the characteristic biota of the ecosystem.			
	(b) Observed or inferred threatening processes that are likely to cause continuing declines in geographic distribution, environmental quality or biotic interactions within the next 20 years.			
	(c) Ecosystem exists at …	1 location	≤ 5 locations	≤ 10 locations
B2	The number of 10 × 10 km grid cells occupied (Area of Occupancy)	≤ 2	≤ 20	≤ 50
	AND at least one of a-c above (same sub-criteria as for B1).			
B3	A very small number of locations (generally fewer than 5) **AND** prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and thus capable of collapse or becoming Critically Endangered within a very short time period (B3 can only lead to a listing as VU).			VU

C. Environmental degradation over ANY of the following time periods:

C1 The past 50 years based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:

Extent (%)	Relative severity (%) ≥ 80	≥ 50	≥ 30
≥ 80	CR	EN	VU
≥ 50	EN	VU	
≥ 30	VU		

C2 The next 50 years, or any 50-year period including the present and future, based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:

Extent (%)	≥ 80	≥ 50	≥ 30
≥ 80	CR	EN	VU
≥ 50	EN	VU	
≥ 30	VU		

C3 Since 1750 based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:

Extent (%)	≥ 90	≥ 70	≥ 50
≥ 90	CR	EN	VU
≥ 70	EN	VU	
≥ 50	VU		

D. Disruption of biotic processes or interactions over ANY of the following time periods:

D1 The past 50 years based on change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:

Extent (%)	Relative severity (%) ≥ 80	≥ 50	≥ 30
≥ 80	CR	EN	VU
≥ 50	EN	VU	
≥ 30	VU		

D2	(D2a) The next 50 years, or (D2b) any 50-year period including the present and future, based on change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table: OR		≥ 80	≥ 50	≥ 30
		≥ 80	CR	EN	VU
		≥ 50	EN	VU	
		≥ 30	VU		
D3	Since 1750, based on a change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:		≥ 90	≥ 70	≥ 50
		≥ 90	CR	EN	VU
		≥ 70	EN	VU	
		≥ 50	VU		
E. Quantitative analysis					
			CR	EN	VU
… that estimates the probability of ecosystem collapse to be:			≥ 50% within 50 years	≥ 20% within 50 years	≥ 10% within 100 years