

ATTACHMENT 1 – TECHNICAL MEMORANDUM –
SCP30a THREATENED ECOLOGICAL
COMMUNITY ASSESSMENT – VARIOUS AREAS,
ROTTNEST ISLAND (EMERGE ASSOCIATES,
2024)

TECHNICAL MEMORANDUM

SCP30a Threatened Ecological Community Assessment

Various Areas, Rottnest Island

PROJECT NUMBER	EP23-032(07)	DOC. NUMBER	EP23-032(07)—010 SKP
PROJECT NAME	Rottnest Island SCP30a TEC Assessment	CLIENT	Rottnest Island Authority
AUTHOR	SKP	REVIEWER	RAW
VERSION	1	DATE	27/09/2024

1. INTRODUCTION

Emerge Associates (Emerge) were engaged by the Rottnest Island Authority to undertake a vegetation survey within three areas on Rottnest Island (referred to herein as ‘survey area 1-3’ as shown in **Figure 1**). The survey areas collectively comprise 26.14 ha.

The purpose of the survey was to determine whether the ‘*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain’ threatened ecological community (TEC) (SCP30a) occurs within the survey areas. SCP30a TEC is listed as ‘critically endangered’ under the *Biodiversity Conservation Act 2016* (BC Act) and is synonymous with floristic community type (FCT) 30a, as described by (Gibson *et al.* 1994).

The scope of work was to undertake flora and vegetation survey in order to identify the extent and condition of the SCP30a TEC within the survey areas. Whilst a ‘detailed’ flora and vegetation assessment was not required, this assessment undertook sampling in order to identify the SCP30a TEC to a ‘detailed’ standard in accordance with the Environmental Protection Authority’s (EPA’s) technical guidance (EPA 2016).

As part of this scope of work, the following tasks were undertaken:

- A field survey to undertake quadrat sampling, record vegetation condition and map the extent of the TEC within the survey area.
- Documentation of the desktop assessment, methodology, field surveys and results into a technical memorandum.

2. METHODS

2.1. Field survey

Two botanists from Emerge visited the survey areas on 26 August 2024 to conduct the field survey.

The survey areas were traversed on foot and detailed sampling of the vegetation was undertaken using non-permanent 10 x 10 m quadrats within areas considered likely to represent SCP30a TEC. The quadrats were established using fence droppers bounded by measuring tape. The position¹ of each sample was recorded with a hand-held GPS receiver (±5 m accuracy).

¹ The north-west corner was recorded.

The data recorded within each sample included:

- site details (site name, site number, observers, date, location)
- environmental information (slope, aspect, bare-ground, rock outcropping, soil type and colour, litter layer, topographical position, time since last fire event)
- biological information (species, plant specimens, vegetation structure, vegetation condition, 'foliage projective cover', and disturbance).

Plant specimens were collected where the identity of flora required further confirmation. Photographic images and notes were recorded as required. Flora was classified as native if indigenous to the IBRA region in which the site occurs. Non-native flora is denoted by '**' in text and raw data.

Vegetation condition was mapped on aerial photography based on notes recorded during the field survey to define areas with differing condition and using the EPA (2016) scale (**Table 1**).

Table 1: Vegetation condition scale applied during the field assessment

Category	Definition (EPA 2016)
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks
Very good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely degraded	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 and shrubs.

2.2. Analysis and data preparation

2.2.1. Flora and vegetation

Flora were identified through comparison with named material and through the use of taxonomic keys. Plant specimens collected during the field survey were dried, pressed and named in accordance with requirements of the (Western Australian Herbarium 2024).

The vegetation units within the site were identified from the data collected during the field survey. The vegetation was described according to the dominant species present using the structural formation descriptions of the *National Vegetation Inventory System* (NVIS) (NVIS Technical Working Group 2017). The identified vegetation units were mapped on aerial photography during the field survey and boundaries were interpreted from aerial photography and notes taken in the field.

2.2.2. Floristic community type assignment

The identified vegetation units were compared to the regional ‘floristic community type’ (FCT) dataset *A floristic survey of the southern Swan Coastal Plain* (Gibson *et al.* 1994). Each sample was compared to Gibson *et al.* (1994) separately to limit the influence of spatial correlation when assigning an FCT.

Sample data (presence/absence) was first reconciled with Gibson *et al.* (1994) by standardising the names of taxa with those used in the earlier study. This was necessary due to changes in nomenclature in the intervening period. Taxa that were only identified to genus level were excluded, while some infra-species that have been identified since 1994 were reduced to species level. The combined dataset was then imported into the statistical analysis package PRIMER v6 (Clarke and Gorley 2006).

A resemblance matrix was generated using the Bray-Curtis distance measure which provided the percentage similarity between all pairs of samples. A cluster analysis was then performed using the resemblance matrix and hierarchical agglomerative clustering, to produce a dendrogram.

Where a sample tended to cluster with a grouping of different FCTs, the resemblance matrix was examined. Ultimately a combination of cluster analysis, resemblance matrix and contextual information relating to the soils, landforms and known FCTs within the region was considered in the final determination of an FCT.

2.2.3. Threatened and priority ecological community

Areas of native vegetation potentially representing SCP30a TEC were assessed against key diagnostic characteristics (DPaW 2014; DBCA 2023b, a).

3. RESULTS

3.1. Identification of SCP30a TEC

A total of 36 species (26 native and 10 weed taxa) were recorded across the survey areas. A list of the flora species recorded is provided in **Appendix A** and the raw sample data is provided in **Appendix B**.

All three survey areas contained vegetation described as comprising vegetation unit **MICp** - low open to closed woodland or shrubland of *Melaleuca lanceolata* and *Callitris preissii* over open to closed forbland of *Acanthocarpus preissii*, *Rhagodia baccata* subsp. *dioica*, *Poa poiformis* and *Austrostipa flavescens* on sand, often with underlying and/or outcropping limestone (**Figure 1**). Representative photographs of the **MICp** vegetation in each area are provided in **Plate 1** to **Plate 9**.

The **MICp** vegetation represents SCP30a TEC as it contains key indicator species *Callitris preissii* and/or *Melaleuca lanceolata* and meets the TEC description. The survey areas and surrounding areas occur on calcareous sands of the Quindalup Dunes, as is consistent with the TEC. The surrounding areas also contained similar vegetation dominated by *Melaleuca lanceolata* and *Callitris preissii*.

The central portion of survey area 3 was not mapped as comprising **MICp** as it was dominated by *Acacia rostellifera* shrubs (**Plate 10**). Similarly, one corner of survey area 2 contained planted **Eucalyptus utilis* and was not mapped as **MICp**. Tracks and other cleared areas were also not mapped as comprising **MICp** (**Figure 1**).

The extent of the SCP30a TEC within each survey area is provided in **Table 2**.

Table 2: Areas of SCP30a TEC within each survey area

	Size (ha)			
	Survey area 1	Survey area 2	Survey area 3	TOTAL
SCP30a TEC	2.35	3.76	16.69	22.80
Not SCP30a TEC	0.07	0.26	3.01	3.34
TOTAL	2.42	4.02	19.69	26.14

The floristic analysis identified that all samples either clustered with or showed high similarity to FCT 30a. The most similar Gibson *et al.* (1994) samples and FCTs are shown in **Table 3**.

The relevant portions of the cluster dendrograms are provided in **Appendix C**.

Table 3: Vegetation unit and likely FCT represented within the site for each sample

Vegetation unit	Sample	Most similar (Gibson <i>et al.</i> 1994) site	Similarity (%)	Determined floristic community type (FCT)
MICp	Q1	GARDEN-1 (FCT 30a)	35	FCT 30a – ‘ <i>Callitris preissii</i> (or <i>Melaleuca lanceolata</i>) forests or woodlands’
		GARDEN-3 (FCT 30a)	35	
	Q2	SEAB-1 (FCT 30c)	23	
	Q2^	LESCH-3 (FCT 30b)	30	
		LESCH-4 (FCT 30b)	30	
		GARDEN-3 (FCT 30a)	26	
	Q3^	GARDEN-4 (FCT 30a)	30	
		GARDEN-1 (FCT 30a)	28	
	Q4	GARDEN-1 (FCT 30a)	42	
		GARDEN-3 (FCT 30a)	42	
	Q5	GARDEN-1 (FCT 30a)	36	
		GARDEN-3 (FCT 30a)	36	

^ denotes samples individual similarity to Gibson *et al.* (1994) dataset sites rather than a cluster within the dendrogram



Plate 1: SCP30a TEC vegetation in 'good' condition in survey area 1



Plate 2: SCP 30a TEC vegetation in 'good - very good' condition in survey area 1



Plate 3: SCP30a TEC vegetation in 'degraded' condition in survey area 2



Plate 4: SCP30a TEC vegetation in 'degraded - good' condition in survey area 2



Plate 5: SCP30a TEC vegetation in 'good' condition in survey area 2



Plate 6: SCP30a TEC vegetation in 'degraded - good' condition in survey area 3



Plate 7: SCP30a TEC vegetation in 'good' condition in survey area 3



Plate 8: SCP30a TEC vegetation in 'good to very good' condition in survey area 3



Plate 9: SCP30a TEC vegetation in 'very good' condition in survey area 3



Plate 10: Areas not mapped as the SCP30a TEC vegetation in survey area 3 (*Acacia rostellifera* shrublands)

3.1.1. Vegetation condition

The extent of the SCP30a TEC vegetation by condition category is detailed in **Table 4** and shown in **Figure 1**.

Table 4: Vegetation condition categories within the survey areas

Condition category (EPA 2016)	Size (ha)		
	Survey area 1	Survey area 2	Survey area 3
Pristine	0	0	0
Excellent	0	0	0
Very good	0	0	5.80
Good – very good	0.65	0	4.49
Good	1.70	1.48	4.60
Degraded - good	0	0.47	1.80
Degraded	0	1.81	0
Completely degraded	0	0	0
TOTAL	2.35	3.76	16.69

4. Discussion

4.1. Identification of areas of SCP30a TEC

The DBCA database shows that two occurrences of the '*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands' TEC occur close to the site. Floristic analysis indicated samples Q1 to Q5 all showed high similarity to FCT 30a. Sample Q2 clustered to FCT 30c which is not an appropriate FCT for Rottnest Island and Sample Q3 clustered to a large group of FCTs with low similarity. Both of these samples showed high individual similarity to Gibson *et al.* (1994) assigned to FCT 30a.

Almost all samples contained *Callitris preissii* which is a key indicator for the TEC (DPaW 2014; DBCA 2023a). The codominant canopy species *Melaleuca lanceolata*, understorey species *Acanthocarpus preissii* and *Rhagodia baccata* and weed species **Galium murale* and *Trachyandra divaricata* present in these quadrats are also listed as common and typical species within the TEC (DPaW 2014).

C. preissii was historically abundant on Rottnest Island but its extent has been reduced and the remainder is generally found as scattered occurrences amongst *Melaleuca lanceolata* closed woodland. Some of the *Callitris preissii* and *Melaleuca lanceolata* individuals in the survey area have been planted but are still considered to contribute to the TEC as all three survey areas contains a mixture of mature plants likely to comprise natural populations as well as planted individuals.

4.2. Vegetation condition

The majority of the SCP30a TEC vegetation across all three survey areas was mapped as being in 'good', 'good to very good' or 'very good' condition due to the presence of intact vegetation strata (low trees, shrubs and herbs), high native species cover and low to moderate weed cover. FCT 30a has a relatively low mean species richness (21.1 species per quadrat) (Gibson *et al.* 1994). The samples within the survey areas ranged from 12 to 22 species per quadrat.

Vegetation in portions of the western end of survey area 3 and the north-western portion of survey area 2 had higher weed cover and were mapped as being in 'degraded to good' condition.

Vegetation in the western portion of survey area 2 comprised a low closed woodland of *Melaleuca lanceolata* over dense weeds with limited native understorey and was mapped as being in degraded condition (Plate 3).

5. CONCLUSIONS

The '*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands' TEC occurs within all three survey areas, occupying a total of 22.8 ha (87% of the total survey area) and ranging from 'degraded' to 'very good' condition.

6. REFERENCES

6.1. General references

Clarke, K. R. and Gorley, R. N. 2006, *PRIMER v6: User Manual/Tutorial*, PRIMER-E, Plymouth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023a, *Methods for survey and identification of Western Australian threatened ecological communities (draft)*, Perth, Western Australia.

Department of Biodiversity, Conservation and Attractions, (DBCA) 2023b, *Threatened Ecological Community Fact Sheet: Callitris preissii (or Melaleuca lanceolata) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. 1994)*, Perth.

Department of Parks and Wildlife (DPaW) 2014, *Callitris preissii (or Melaleuca lanceolata) forests and woodlands (Swan Coastal Plain community type 30a – Gibson et al. 1994) Interim Recovery Plan No. 340*, Perth.

Environmental Protection Authority (EPA) 2016, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Perth.

Gibson, N., Keighery, B., Keighery, G., Burbidge, A. and Lyons, M. 1994, *A Floristic survey of the southern Swan Coastal Plain*, Department of Conservation and Land Management and the Conservation Council of Western Australia, Perth.

NVIS Technical Working Group 2017, *Australian Vegetation Attribute Manual: National Vegetation Information System*, Department of the Environment and Energy, Canberra.

Western Australian Herbarium 2024, *Florabase*, Department of Biodiversity, Conservation and Attractions (DBCA), <<https://florabase.dbca.wa.gov.au/>>.

6.2. Online references

Western Australian Herbarium (2024). *FloraBase—the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. <<https://florabase.dpaw.wa.gov.au>>

Figures



Figure 1: SCP30a TEC Areas and Condition

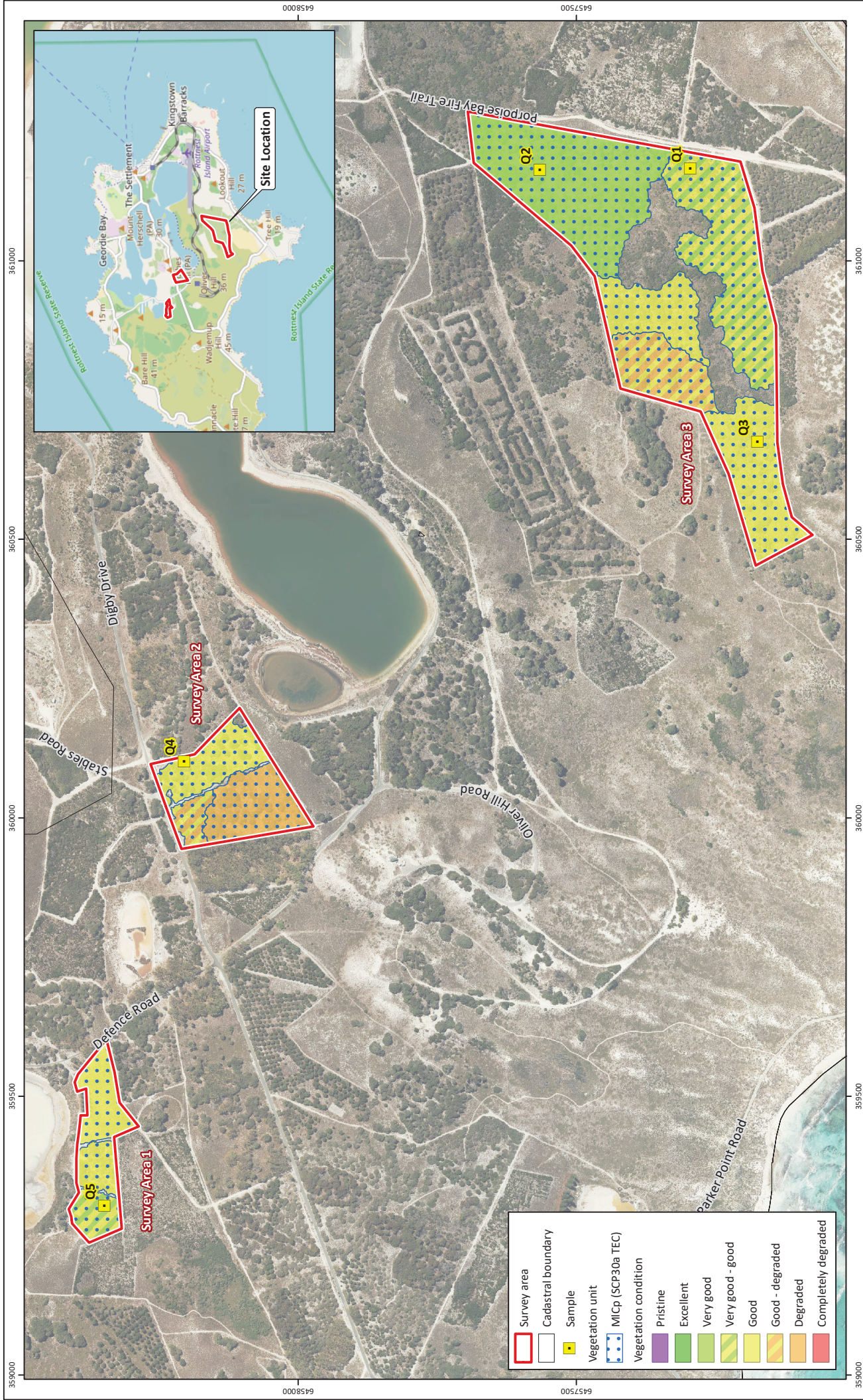


Figure 1: SCP30a TEC Areas and Condition

Plan Number: EP23-032(07)-F25a
Drawn: GAR
Date: 13/09/2024
Checked: SKP
Approved: SKP
Date: 13/09/2024

Project: SCP30a TEC Survey
Client: Rottnest Island Authority

Scale: 1:9,000@A4
GDA 2020 MGA Zone 50

0 90 180 270 Metres

N

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used ©Landgate (2024).

Appendix A

Species List



Family	Status	Species
Araliaceae		<i>Hydrocotyle diantha</i> <i>Hydrocotyle hispidula</i>
Asparagaceae		<i>Acanthocarpus preissii</i>
Asphodelaceae	*	<i>Asphodelus fistulosus</i>
	*	<i>Trachyandra divaricata</i>
Asteraceae	*	<i>Leontodon rhagadioloides</i> <i>Senecio pinnatifolius</i> var. <i>maritimus</i>
Caryophyllaceae	*	<i>Cerastium glomeratum</i>
Centrolepidaceae		<i>Centrolepis polygyna</i>
Chenopodiaceae		<i>Rhagodia baccata</i> subsp. <i>dioica</i>
Colchicaceae		<i>Wurmbea monantha</i>
Crassulaceae		<i>Crassula colorata</i> <i>Crassula decumbens</i>
Cupressaceae		<i>Callitris preissii</i>
Cyperaceae		<i>Carex thecata</i> <i>Lepidosperma ?pubisquameum</i>
Euphorbiaceae	*	<i>Euphorbia peplus</i>
Fabaceae		<i>Acacia rostellifera</i>
Haemodoraceae		<i>Conostylis candicans</i> subsp. <i>calcicola</i>
Juncaginaceae		<i>Triglochin trichophora</i>
Malvaceae		<i>Guichenotia ledifolia</i> <i>Thomasia cognata</i>
Montiaceae		<i>Calandrinia brevipedata</i>
Myrtaceae	PI	<i>Eucalyptus gomphocephala</i>
	*, PI	<i>Eucalyptus utilis</i> <i>Melaleuca lanceolata</i>
Orchidaceae		<i>Caladenia latifolia</i> <i>Cyrtostylis huegelii</i>
Phyllanthaceae		

Poranthera drummondii

Poaceae

*Austrostipa flavescens**Poa poiformis*

* Poaceae sp.

Primulaceae

* *Lysimachia arvensis*

Ranunculaceae

Clematis linearifolia

Rubiaceae

* *Galium murale*

Urticaceae

*Parietaria cardiostegia** *Urtica urens*

*=non-native, Pl=planted

Appendix B

Raw survey data



Sample Name: Q1

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q1: Page 1 of 2

Quadrat and landform details

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 361166.1865

NW corner northing: 6457295.214

Altitude (m): 0

Geographic datum/zone: GDA94/Zone 50

Soil water content: damp

Landform: flat

Time since fire: no evidence

Disturbance: moderate - weeds, plantings

Soil type/texture sand/

Bare ground (%): 15

Rocks (%) and type: No rocks

Soil colour: grey/brown

Litter: 35% (branches,twigs,logs)

Vegetation condition: good-very good



Sample Name: Q1

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q1: Page 2 of 2

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia rostellifera</i>	0.5
	<i>Acanthocarpus preissii</i>	30
	<i>Austrostipa flavescens</i>	2
	<i>Calandrinia brevipedata</i>	3
	<i>Callitris preissii</i>	10
	<i>Conostylis candicans subsp. calcicola</i>	1
	<i>Crassula decumbens</i>	0.5
	<i>Cyrtostylis huegelii</i>	opp
*	<i>Euphorbia peplus</i>	1
*	<i>Galium murale</i>	0.5
	<i>Guichenotia ledifolia</i>	opp
	<i>Hydrocotyle diantha</i>	0.5
	<i>Hydrocotyle hispidula</i>	0.5
*	<i>Leontodon rhagadioloides</i>	0.5
	<i>Melaleuca lanceolata</i>	10
	<i>Parietaria cardiostegia</i>	1
	<i>Poa poiformis</i>	2
	<i>Poranthera drummondii</i>	0.5
	<i>Rhagodia baccata supsp. dioica</i>	0.5
	<i>Senecio pinnatifolius var. maritimus</i>	0.5
*	<i>Trachyandra divaricata</i>	1
	<i>Triglochin trichophora</i>	0.5
*	<i>Urtica nitens</i>	1
	<i>Wurmbea monantha</i>	0.5

Sample Name:

Q2

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q2: Page 1 of 2

Quadrat and landform details

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 361162.6061

NW corner northing: 6457565.378

Altitude (m): 0

Geographic datum/zone: GDA94/Zone 50

Soil water content: damp

Landform: flat

Time since fire: no evidence

Disturbance: moderate - weeds

Soil type/texture sand/

Bare ground (%): 5

Rocks (%) and type: No rocks

Soil colour: grey/brown

Litter: 20% (branches,twigs,)

Vegetation condition: very good



Sample Name: Q2

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q2: Page 2 of 2

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acanthocarpus preissii</i>	20
	<i>Acacia rostellifera</i>	2
	<i>Caladenia latifolia</i>	0.5
	<i>Calandrinia brevipedata</i>	5
	<i>Callitris preissii</i>	opp
	<i>Conostylis candicans subsp. calcicola</i>	5
	<i>Crassula colorata</i>	0.5
	<i>Crassula decumbens</i>	0.5
	<i>Cyrtostylis huegelii</i>	0.5
	<i>Guichenotia ledifolia</i>	10
	<i>Hydrocotyle diantha</i>	10
	<i>Hydrocotyle hispidula</i>	0.5
	<i>Melaleuca lanceolata</i>	10
	<i>Parietaria cardiostegia</i>	1
	<i>Poa poiformis</i>	8
	<i>Poranthera drummondii</i>	1
	<i>Senecio pinnatifolius var. maritimus</i>	0.5
	<i>Triglochin trichophora</i>	1
	<i>Wurmbea monantha</i>	0.5

Sample Name: Q3

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q3: Page 1 of 2

Quadrat and landform details

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 360675.2381

NW corner northing: 6457174.984

Altitude (m): 0

Geographic datum/zone: GDA94/Zone 50

Soil water content: slightly damp

Landform: lower slope

Time since fire: no evidence

Disturbance: moderate - weeds

Soil type/texture sand/

Bare ground (%): 1

Rocks (%) and type: No rocks

Soil colour: brown/

Litter: 5% (branches,,)

Vegetation condition: good-very good



Sample Name: **Q3**

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q3: Page 2 of 2

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acanthocarpus preissii</i>	10
*	<i>Isolepis marginata</i>	0.5
	<i>Clematis linearifolia</i>	0.5
	<i>Crassula decumbens</i>	0.5
	<i>Cyrtostylis huegelii</i>	0.5
	<i>Hydrocotyle diantha</i>	2
*	<i>Leontodon rhagadioloides</i>	0.5
	<i>Melaleuca lanceolata</i>	5
	<i>Parietaria cardiostegia</i>	7
	<i>Poa poiformis</i>	0.5
	<i>Rhagodia baccata supsp. dioica</i>	70
*	<i>Trachyandra divaricata</i>	3

Sample Name: Q4

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q4: Page 1 of 2

Quadrat and landform details

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 360102.1236

NW corner northing: 6458204.867

Altitude (m): 0

Geographic datum/zone: GDA94/Zone 50

Soil water content: slightly damp

Landform: upper slope

Time since fire: no evidence

Disturbance: moderate - weeds

Soil type/texture sand/

Bare ground (%): 2

Rocks (%) and type: 2%, limestone

Soil colour: brown/

Litter: 5% (branches,,)

Vegetation condition: good



Sample Name: Q4

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q4: Page 2 of 2

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acanthocarpus preissii</i>	20
	* <i>Asphodelus fistulosus</i>	0.5
	<i>Callitris preissii</i>	2
	<i>Carex thecata</i>	0.5
	<i>Crassula decumbens</i>	0.5
	<i>Cyrtostylis huegelii</i>	0.5
	<i>Dichondra repens</i>	opp
	* <i>Erodium cicutarium</i>	opp
	* <i>Euphorbia peplus</i>	15
	* <i>Galium murale</i>	8
	<i>Guichenotia ledifolia</i>	30
	<i>Hydrocotyle diantha</i>	0.5
	* <i>Lysimachia arvensis</i>	0.5
	<i>Melaleuca lanceolata</i>	5
	<i>Parietaria cardiostegia</i>	0.5
	<i>Poa poiformis</i>	2
	* <i>Poaceae sp.</i>	1
	<i>Poranthera drummondii</i>	0.5
	* <i>Trachyandra divaricata</i>	1
	<i>Triglochin trichophora</i>	0.5
	*, Pl <i>Eucalyptus utilis</i>	opp

Sample Name:

Q5

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q5: Page 1 of 2

Quadrat and landform details

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 359303.8436

NW corner northing: 6458348.021

Altitude (m): 0

Geographic datum/zone: GDA94/Zone 50

Soil water content: slightly damp

Landform: lower slope

Time since fire: no evidence

Disturbance: moderate - weeds, plantings

Soil type/texture sand/

Bare ground (%): 1

Rocks (%) and type: 1%, limestone

Soil colour: brown/

Litter: 5% (branches,,)

Vegetation condition: good-very good



Sample Name: Q5

Project no.: EP23-032

Date: 26/08/2024

Author: SKP,TAA

Status Non-permanent

Q5: Page 2 of 2

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia rostellifera</i>	3
	<i>Acanthocarpus preissii</i>	20
	<i>Caladenia latifolia</i>	
	<i>Callitris preissii</i>	10
*	<i>Cerastium glomeratum</i>	0.5
	<i>Crassula decumbens</i>	0.5
	<i>Cyrtostylis huegelii</i>	opp
*	<i>Euphorbia peplus</i>	0.5
*	<i>Galium murale</i>	20
	<i>Guichenotia ledifolia</i>	20
	<i>Hydrocotyle diantha</i>	1
	<i>Hydrocotyle hispidula</i>	0.5
	<i>Lepidosperma ?pubisquameum</i>	10
*	<i>Lysimachia arvensis</i>	0.5
	<i>Melaleuca lanceolata</i>	10
	<i>Poa poiformis</i>	10
	<i>Poranthera drummondii</i>	0.5
	<i>Rhagodia baccata supsp. dioica</i>	opp
	<i>Thomasia cognata</i>	0.5
*	<i>Trachyandra divaricata</i>	1
	<i>Triglochin trichophora</i>	opp
*, PI <i>Eucalyptus utilis</i>		opp

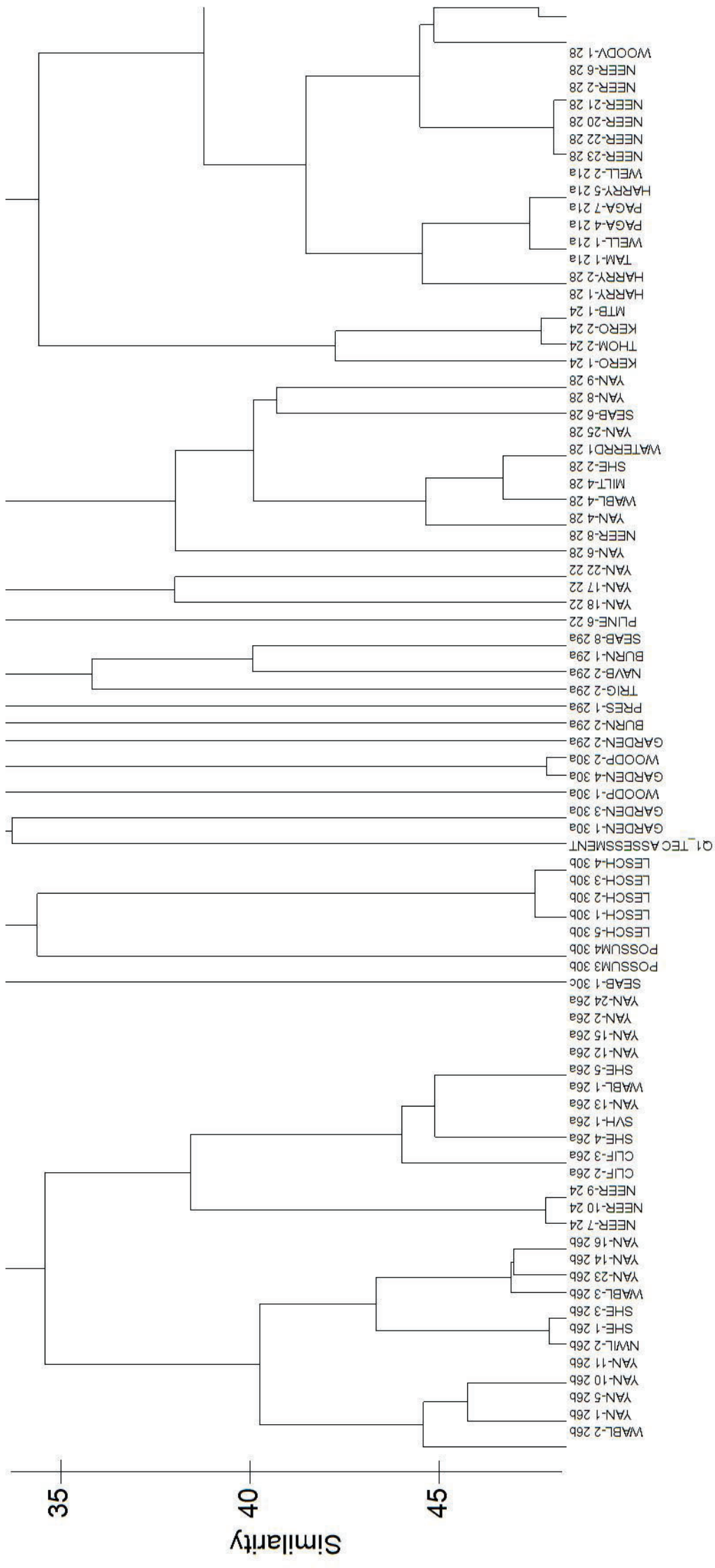
Appendix C

Cluster Dendrograms



Group average

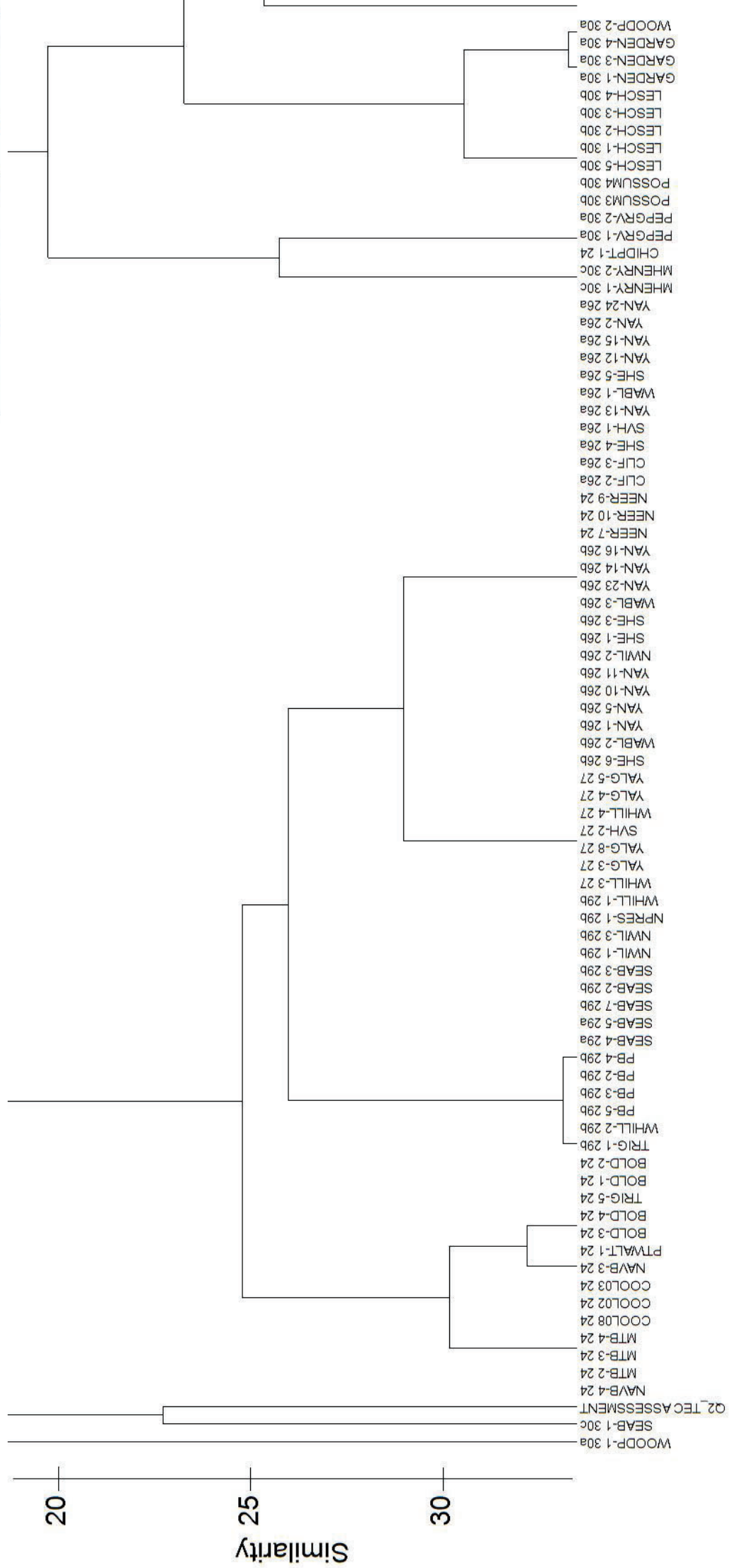
Resemblance: S17 Bray Curtis similarity



Samples

Group average

Resemblance: S17 Bray Curtis similarity



Samples

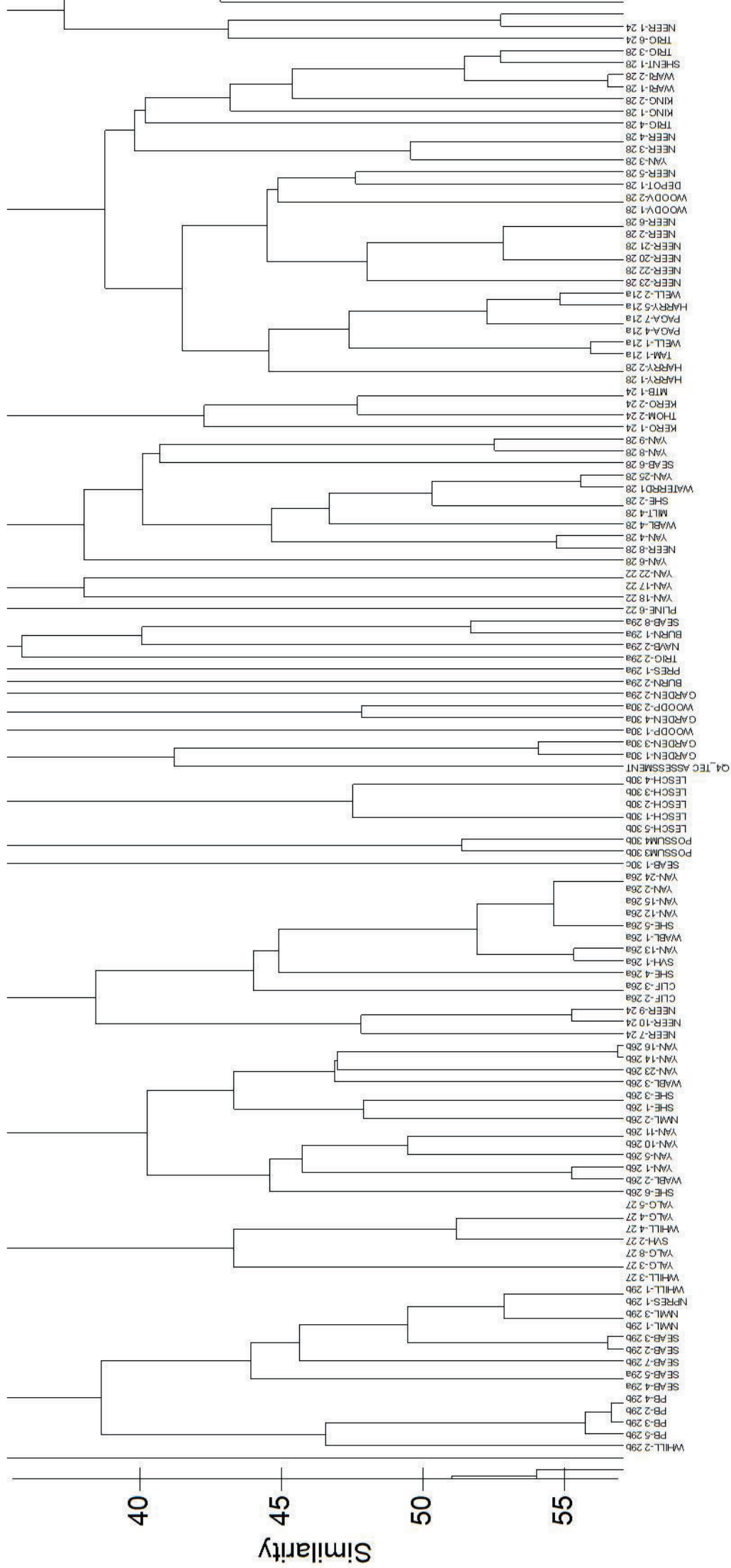
Group average

Resemblance: S17 Bray Curtis similarity



Group average

Resemblance: S17 Bray Curtis similarity



Samples

40

Similarity

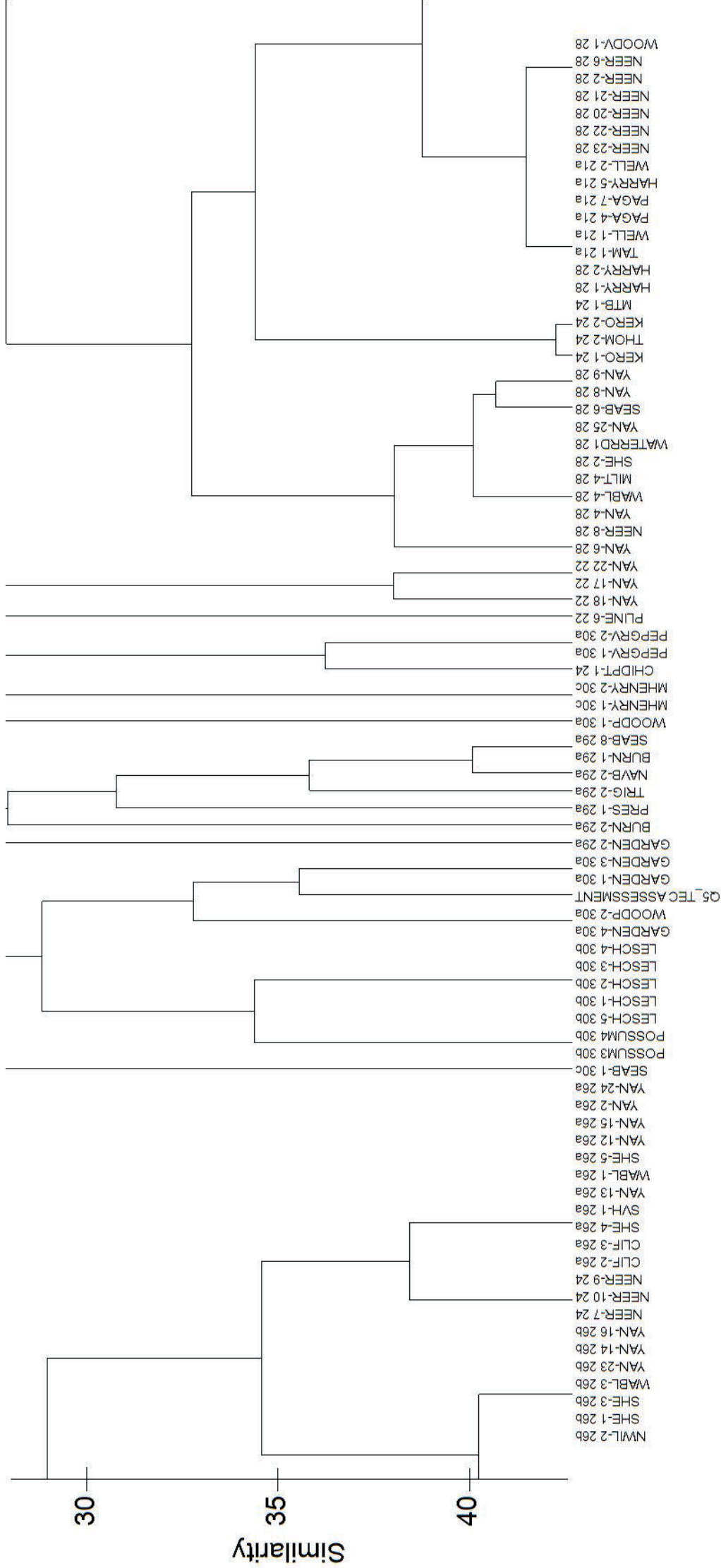
45

50

55

Group average

Resemblance: S17 Bray Curtis similarity



Samples