



Wudjari Country (Esperance) Bush Blitz

Flora

27 March – 5 April 2023

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Nomenclature and taxonomy used in this report is consistent with:

The Australian Plant Name Index (APNI)

<http://www.anbg.gov.au/databases/apni-about/index.html>

The Australian Plant Census (APC)

<http://www.anbg.gov.au/chah/apc/about-APC.html>

Florabase

<https://florabase.dpaw.wa.gov.au/>

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Abstract

The Wudjari Country (Esperance) Bush Blitz was held from 27 March to 5 April 2023 on the southern coast, Esperance Plains region of Western Australia. Twelve (12) areas were selected within Cape Le Grand National Park, Cape Arid National Park, and adjacent reserves and natural areas. Habitats included granite outcrops, coastal dune areas and salt marshes, mallee woodland and proteaceous scrubland. During the eight days of survey, 186 botanical voucher collections and five observations were gathered comprising 165 unique vascular plant taxa and two fungal species. Five conservation listed taxa were recorded, along with seven exotic taxa. Most specimens, while not new records for the areas surveyed, filled a collection geographical gap for the region and for the time of year. Several taxa showed atypical flowering for the time of year, which may be indicative of phenological changes due to environmental conditions of the area. Three teachers and one BHP staff member were introduced to flora collecting. As part of the outreach component of the Bush Blitz, the team participated in a successful community day held in Esperance and met with the volunteers from the Esperance Regional Herbarium.

1. Introduction

This Bush Blitz expedition was held in the Esperance Plains region of Western Australia on Wudjari Country.

The specific land units that the expedition included:

- Cape Le Grand National Park, managed by Department of Biodiversity, Conservation and Attractions, Parks and Wildlife.
- Cape Arid National Park, managed by Department of Biodiversity, Conservation and Attractions, Parks and Wildlife.
- and nature reserves and unincorporated lands surrounding the National Parks.

These areas have been reasonably well surveyed for flora (approx. 19,500 vouchered specimens (AVH 2023, Figure 1)), with collections predominantly being made during the months of September to November. Vouchered collections during the months of March and April, however, form less than 7% of all collections for the region, and only 50 collections have been lodged in Australian herbaria from this time of year in the past 10 years.

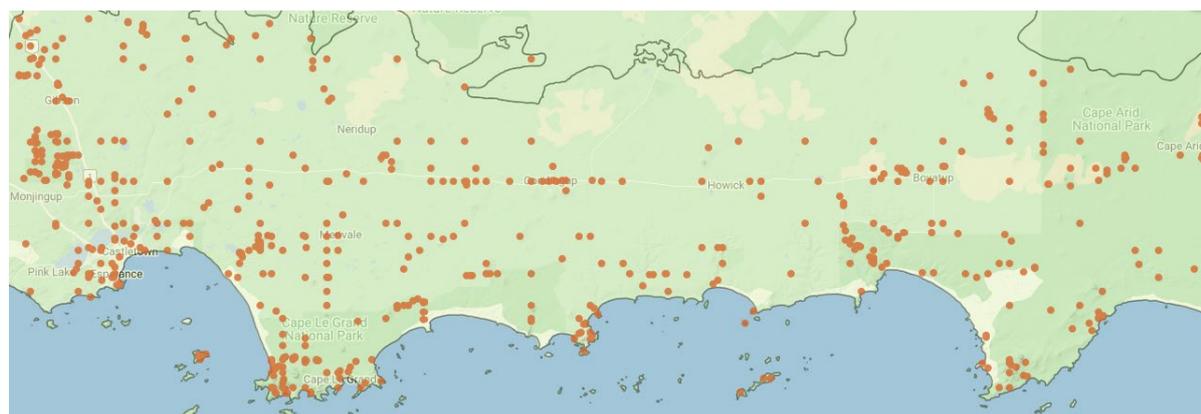


Figure 1: Records of botanical collections gathered from the Bush Blitz region made during the months of March-April. Source: Australasian Virtual Herbarium (AVH 2023).

2. Methods

2.1 Site selection

Sites were selected based on intensity of previous surveys (as documented by vouchered collections at the Western Australian Herbarium), availability/accessibility to fresh water, accessibility by car, permission to enter and collect in an area, and observation by Bush Blitz teams visiting locations during the expedition. Twelve areas where Surveys were conducted by traversing regions by car and selecting areas for collecting vouchers based on changes in vegetation type (Figure 2, 3).



Figure 2. Renee Gugiatti documenting a voucher specimen in Cape Arid National Park proteaceous scrub.

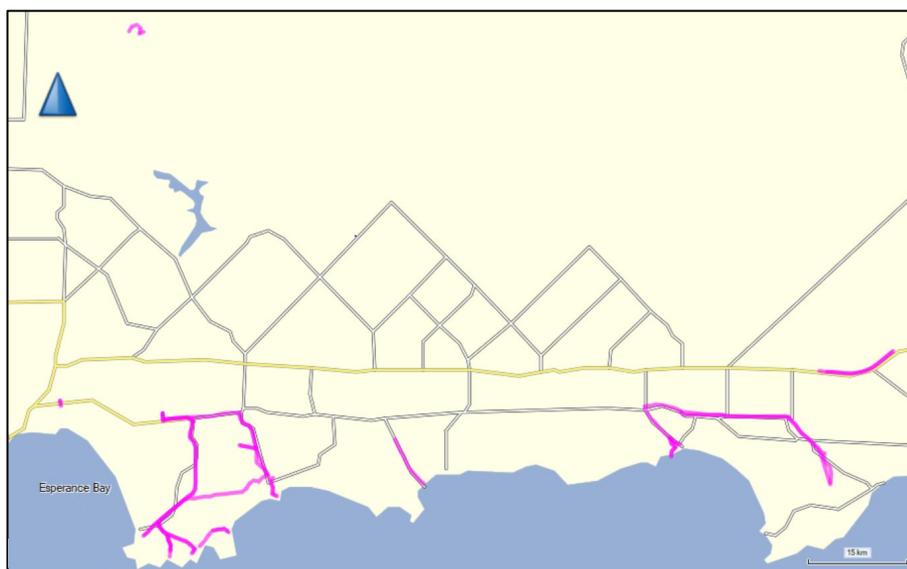


Figure 3. Map of the Bush Blitz region indicating areas surveyed by car and on foot (magenta).

Table 1: Site descriptions for the Wudjari Country (Esperance) Bush Blitz.

Date	Location	Description	Survey type
27 th March 2023	Cape Le Grand National Park; Lucky Bay Road and Rossiter Bay.	Seasonal swamps, coastal dunes.	Hand collection
28 th March 2023	Cape Le Grand National Park; Dunn Rocks Road and maintenance trail near Dunn Rocks.	Mallee woodland; seasonal swamps.	Hand collection
29 th March 2023	Cape Arid National Park; maintenance track parallel with Merivale Road.	Plain, deep sand heathlands, open mallee woodland, proteaceous scrub.	Hand collection/observation
30 th March 2023	Cape Arid National Park; Fisheries Road to Israelite Bay.	Plain, deep sand heathlands, open mallee woodland, proteaceous scrub.	Hand collection/observation
31 st March 2023	Mount Ridley, Wave Rock (SSS1).	Granite outcrop with mallee woodland	Standard Survey methods
1 st April 2023	Cape Le Grand National Park; south end Little Hellfire Bay, along Coastal Walk Trail (SSS2).	Coastal dune adjacent to granite outcrop.	Standard Survey methods
3 rd April 2023	Cape Le Grand National Park; maintenance trail parallel to northern boundary.	Plain, open mallee woodland, proteaceous scrub.	Hand collection/observation
	Cape Le Grand National Park; Thistle Cove, Frenchman Peak.	Granite outcrop with mallee woodland	
4 th April 2023	Cape Arid National Park; Thomas River Road	Plain, deep sand heathlands, open mallee woodland, proteaceous scrub.	Hand collection
	Duke of Orleans Bay; Orleans Bay Road	Coastal dune	
5 th April 2023	Nature Reserve, Merivale Rd-Cape Le Grand Rd	Granite outcrop adjacent to agricultural land	Hand collection
	Mullet Lake Nature Reserve, trail off Hicks Rd-Merivale Rd, 2.2 km S Merivale Rd	Salt marsh and adjacent sand-dune rise.	

2.2 Survey techniques

All flowering or fruiting taxa at each site were collected as a voucher specimen using standard herbarium collecting techniques (see <https://www.dbca.wa.gov.au/media/1106/download>) and lodged in the Western Australian Herbarium (PERTH). Duplicate specimens, where possible, will be lodged at the Australian National Herbarium (CANB). Along with a research-grade herbarium specimen, collection metadata and images of each collection and habitat were captured, and tissue for molecular analysis was gathered where possible (see Section 3.6).

2.2.1 Methods used at standard survey sites

A 20 m x 20 m quadrat was established at each standard survey site in a representative area not impacted by other survey activities. All recorded taxa were collected as vouchers and lodged with the Western Australian Herbarium.

2.3 Identifying the collections

Many identifications were supported by or based on comparisons with existing specimens in the research collection at the Western Australian Herbarium (PERTH) and guided by species distribution data available through The Australasian Virtual Herbarium (<https://avh.chah.org.au>).

In addition, the following references were used:

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3. Results and Discussion

Appendix 1 lists all flora taxa recorded during the Bush Blitz. Collections made during this Bush Blitz will result in 186 specimens being added to public collections and 191 records being added to publicly accessible databases.

3.1 Un-named or not formalised taxa

Four (4) collections were made of un-named or currently undescribed and unpublished taxa (Table 2). These taxa have been collected previously but require further taxonomic research and publication.

Taxon	Comment
<i>Hibbertia racemosa</i> (Endl.) Gilg	Part of a species complex and possible new taxon with smaller stamen numbers, currently being studied.
<i>Leucopogon carinatus</i> R.Br. <i>sens. lat.</i>	A part of a species complex currently being studied.
<i>Leucopogon</i> sp. Coujinup (MA Burgman 1085)	Not formally named, common taxon in the south-west Botanical province
<i>Olearia</i> sp. Eremicola (Diels & Pritzel s.n. PERTH 00449628)	Not formally named.

3.2 Putative new species (new to science)

Only a single putative new species of fungus has been reported for this Bush Blitz (Table 3).

Species	Comment
<i>Gloeoporus</i> sp.	Requires further examination, possibly undescribed taxon

3.3 Exotic and pest species

In general, sites surveyed were free from exotic and pest species with the exception of heavily human impacted-areas (e.g. roadsides). Seven (7) exotic species were recorded (Table 4).

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
<i>Asparagus asparagoides</i> (L.) Druce	Cape Arid National Park, north-west boundary	One seen in area	Monitor and remove populations.
<i>Centaureum tenuiflorum</i> (Hoffmanns. & Link) Fritsch	Cape Le Grand National Park, near Dunn Rocks	Several individuals noted in area.	Widespread annual, noted mostly along road verges.
<i>Erigeron bonariensis</i> L.	Cape Le Grand National Park, western boundary	Common	Widespread annual, noted mostly along road verges.
<i>Euphorbia paralias</i> L.	Cape Le Grand National Park & Duke of Orleans Bay	Common	Observed on coastal dunes.
<i>Pinus</i> sp.	Cape Le Grand National Park, western boundary	Commonly cultivated	Encroaching on park.
<i>Solanum americanum</i> Mill.	Nature Reserve, Merivale Rd-Cape Le Grand Rd	Several individuals seen in area	Adjacent to agricultural property.
<i>Symphotrichum squaumatum</i> (Spreng.) G.L.Nesom	Eastern edge of Cape Le Grand	Locally frequent	Road verge.

3.4 Threatened species

While no threatened species were recorded, five (5) Western Australian Conservation-Listed taxa were reported during the Wudjari Country (Esperance) Bush Blitz (Table 5).

Species	Listing status and level (EBPC, State/Territory)	Location sighted/observed	Indication of abundance
<i>Astartea eobalta</i> Rye	WA – Priority 2	Cape Le Grand National Park, 2.5 km west Rossiter Bay	Small population
<i>Eucalyptus ligulata</i> Brooker subsp. <i>ligulata</i>	WA – Priority 4	Cape Arid National Park, Thomas River region	Small population
<i>Goodenia quadrilocularis</i> R.Br.	WA – Priority 3	SSS2 – Cape Le Grand National Park, Little Hellfire Bay	Small population
<i>Lasiopetalum maxwellii</i> F.Muell.	WA – Priority 2	SSS2 – Cape Le Grand National Park, Little Hellfire Bay	Common in area

<i>Styphelia rotundifolia</i> (R.Br.) Spreng.	WA – Priority 3	Mt Ridley	One individual noted during survey
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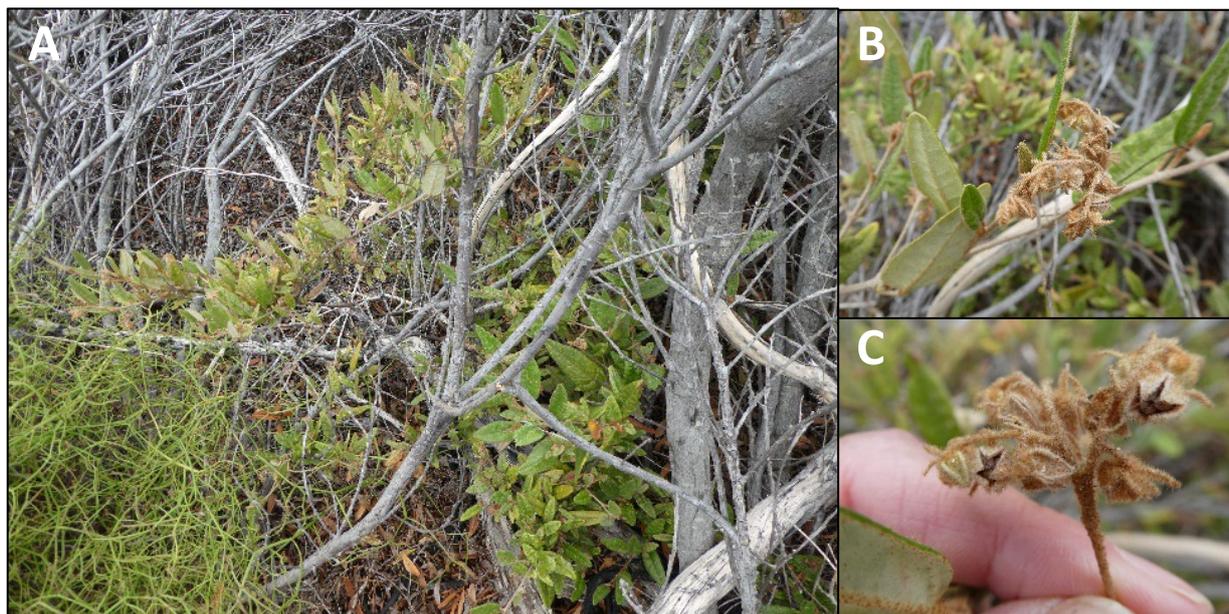


Figure 4: *Lasiopetalum maxwellii* in Standard Survey Site 2 (Cape Le Grand National Park, Little Hellfire Bay). A. Habit, B. Inflorescence, post flowering. C. Developed fruit.

***Astartea eoblata*. Priority 2.** An erect shrub, restricted to peaty grey sand in seasonally damp areas, this species is known from eleven populations, mostly in the Cape Le Grand and Cape Arid National Parks.

***Eucalyptus ligulata* subsp. *ligulata*. Priority 4.** This is a small open mallee, with most populations restricted to granite outcrops in the Cape Le Grand and Cape Arid National Parks.

***Goodenia quadriocularis*. Priority 2.** This erect robust perennial herb or shrub is commonly restricted to coastal sands and granite outcrops in the Cape Le Grand and Cape Arid National Park. With a total of 27 currently known collections, this is a new population discovered in Cape Le Grand National Park at Little Hellfire Bay (Standard Survey Site 2).

***Lasiopetalum maxwellii*. Priority 2.** This species is a sprawling open shrub, mostly restricted to granite outcrops in the Cape Le Grand National Park, and here documented in Little Hellfire Bay (Standard Survey Site 2) (Figure 4).

***Styphelia rotundifolia*. Priority 3.** Is an erect shrub, distribution ranges from Esperance to Cape Arid, often associated with granite outcrops such as Mt Ridley (Standard Survey Site 1).

3.5 Range extensions

Nineteen (19) taxa were recorded during the Bush Blitz as range extensions (>10km) or new records for the region (Table 6). Exact locality information is documented in Appendix 2.

Table 6. Range extensions or significant infill in distribution records for species			
Species	Location sighted/observed	Distance from nearest known record (km)	Comments
<i>Cassytha micrantha</i> Meisn.	Cape Le Grand National Park; Lucky Bay Road, approx. 2.5 km west of Rossiter Bay	Approx. 7.5 km north-east	Second record for Park.
<i>Centaurium tenuiflorum</i> (Hoffmanns. & Link) Fritsch	Cape Le Grand National Park; Dunn Rocks area.	10 km east	New record for eastern end of Park.
<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> Kunze	Mt Ridley		New record for area.
<i>Chenopodium glaucum</i> L.	Cape Le Grand National Park; Rossiter Bay.		First record for Park.
<i>Daviesia lancifolia</i> Turcz.	Cape Le Grand National Park; Dunn Rocks area.	10 km east	Second record for Park.
<i>Erigeron bonariensis</i> L.	Cape Le Grand National Park; north western-most corner.		Not previously recorded from Park; observed commonly along roadsides.
<i>Eucalyptus occidentalis</i> Endl.	Mt Ridley		New record for area.
<i>Euphorbia paralias</i> L.	Duke of Orleans Bay, adjacent to Cape Le Grand National Park	40 km east	Not previously recorded from area; observed along coast.
<i>Goodenia viscida</i> R.Br.	Cape Arid National Park; maintenance track parallel with Merivale Road	80 km range extension east	Photographic record, insufficient material for vouchering.
<i>Grevillea anethifolia</i> R.Br.	Mount Ridley		New record for area.
<i>Hakea laurina</i> R.Br.	Mount Ridley		New record for area.
<i>Halagoris digyna</i> Labill.	Cape Le Grand National Park; Dunn Rocks area.		First record for Park.
<i>Hibbertia racemosa</i> (Endl.) Gilg	Mt Ridley		New record for area.
<i>Laxmannia ramosa</i> subsp. <i>deflexa</i> Keighery	Nature reserve north and adjacent to Cape Le Grand National Park.		New record for area, not recorded from Park.
<i>Microcorys glabra</i> var. <i>glabra</i> (Bartl.) Benth.	Cape Arid National Park; maintenance track parallel with Merivale Road.	10 km range extension east	
<i>Rhagodia baccata</i> subsp. <i>baccata</i> (Labill.) Moq.	Duke of Orleans Bay	10 km east	Not previously recorded from area, and first collection for eastern end of Park.
<i>Solanum americanum</i> Mill.	Merivale, Nature Reserve, Merivale Rd-Cape Le Grand Rd	135 km north-east, 180 km west	Not previously recorded from area.

<i>Styphelia rotundifolia</i> (R.Br.) Spreng.	Mount Ridley	20 km range extension north	WA - Priority 3 listed taxon
<i>Thomasia angustifolia</i> Steud.	Mount Ridley		New record for area.

3.6 Genetic information

Samples of leaf tissues were taken from all vouchered collections. Fresh tissue (30–100 mg) was placed in an acid-free tea bag within silica gel for dehydration. Tissues have been lodged with the Western Australian Herbarium, linked to voucher specimens, and available for analysis upon request.

4. Information on species lists

A complete flora species list, consisting of the 165 vascular plant taxa, comprising 42 families, recorded during the Wudjari Country (Esperance) Bush Blitz is provided in Appendix 1. A further two species of fungi were documented. Due to the timing of the survey (prior to the typical flowering season September to November), many taxa were lacking good reproductive material, and annual taxa were not present at the sites. The timing of the expedition also resulted in limited collections of fungi.

5. Information for land managers

The incursion of cultivated pines along the eastern boundary of Cape Le Grand National Park is of concern, along with the observation and documentation of *Erigeron* along roadways but not yet invading into intact bushland, should be of concern to land managers, particularly with the potential for disturbance (e.g., road management, fire). Management of roads and road verges for weeds is highly recommended to avoid incursion of exotic species into the National Parks.

The proliferation of exotic *Euphorbia paralias* along the coastline of the National Parks and surrounding areas is of concern. The widespread naturalisation of this species originally from southern Europe, north Africa and western Asia makes it a weed of potential national significance. Spread by both short (exploding mature fruit) and long (buoyant seeds) distance dispersal, it impacts coastal dune ecosystems, but can be managed by physical means and foliar herbicides (Heyligers 2002).

Bridal Creeper (*Asparagus asparagoides*) is a declared pest in Western Australia (WAOL 2023) and should be monitored and removed given documented presence in Cape Arid National Park.

Phytophthora dieback is well documented in region, and while already managed through road closures and education is noticeable and clearly affecting biodiversity within the parks.

6. Other significant findings

One specimen of what is believed to be *Halgania lavandulacea* with galls was collected from Cape Arid National Park, and similar morphology was observed in other areas of the park. This finding may be of interest to an entomologist!

7. Conclusions

The Wudjari Country (Esperance) Bush Blitz expedition has significantly added to botanical collections from the region at a time not typically collected and resulted in multiple range extensions, as well as new records for conservation listed taxa and weeds. The majority of collections have provided records to fill gaps within the already existing range of taxa.

Several taxa were noted to be atypically flowering at the time of the survey, including *Callitris preissii*, *Clematis pubescens*, *Gahnia ancistrophylla*, *Hibbertia andrewsiana*, *Isopogon polycephalus*, *Senecio pinnatifolius* var. *maritimus*, and *Thysanotus dichotomus*. We would recommend that further surveys and collections be made in the area at times to better assess the effects of climate and environmental impacts on the floral phenology of the region.

As part of the outreach component of the Bush Blitz, the team provided three Western Australian teachers and one BHP staff member with an introduction to research-quality flora collecting and participated in a successful community day held in Esperance (Figure 5). The team also met with the volunteers from the Esperance Regional Herbarium.



Figure 5. Sharing botanical knowledge with the Esperance community.

Acknowledgements

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Appendices

Appendix 1. List of flora recorded during the Wudjari Country (Esperance) Bush Blitz

See attached Excel spreadsheet (Appendix 1 Bush Blitz Species List ESP Flora.xls).

Appendix 2. List of specimens and observations recorded during the Wudjari Country (Esperance) Bush Blitz

See attached Excel spreadsheet (Appendix 2 Bush Blitz Point Data ESP Flora.xls).