

Off the Beaten Track

This walk was developed by Glenys Bishop, Kay Saunders and Mary Bush as a Themed Rostered Walk, for the public, in June 2021.

The aim of this walk is to take visitors to less commonly visited parts of the Gardens. The walk features examples of work done by Gardens staff to conserve our vulnerable, threatened and endangered native plants, as well as some beautiful plants in flower.

Plant List (Stops 1, 6, 7 do not include specific references to plants)

Stop	Plant	Stop	Plant
2	<i>Banksia menziesii</i> - Menzies' Banksia or Firewood banksia	9	<i>Acacia trinervata</i> - Three Veined Wattle
	<i>Banksia baxteri</i> – Baxter's Banksia		<i>Cyathea australis</i> – Rough Tree Fern
	<i>Banksia coccinea</i> – The Scarlet Banksia		<i>Epacris sparsa</i> – Sparse Heath
	<i>Banksia ashbyi</i> – Ashby's Banksia		<i>Allocasuarina nana</i> – Dwarf Sheoak
	<i>Banksia media</i> –Southern Plains or Golden Stalk Banksia		<i>Xanthorrhoea glauca</i> – Grass Tree
3	<i>Melaleuca ericifolia</i>		
4	<i>Pomaderris delicata</i> and various spp.	10	<i>Hakea scoparia</i> subsp. <i>scoparia</i>
5	<i>Pomaderris reperta</i> – Denman Pomaderris		<i>Grevillea tripartita</i> subsp. <i>macrostylis</i>
8	<i>Zieria baeuerlenii</i> - Bomaderry Zieria		<i>Hakea trifurcata</i> - Two-leaf or two-leaved Hakea, or Kerosene bush
	<i>Asterolasia elegans</i> - Hawkesbury Star Bush		<i>Hakea orthorrhynca</i> var. <i>filiformis</i> - Bird Beak Hakea
	<i>Pimelea venosa</i> - Bolivia Hill		<i>Hakea verrucosa</i> - Warty-fruited hakea
	<i>Boronia deanei</i> - Deane's Boronia	11	<i>Hakea drupacea</i> - Sweet scented hakea
	<i>Grevillea guthrieana</i> - Guthrie's grevillea		<i>Hakea petiolaris</i>
	<i>Prostanthera densa</i> - Villous Mint Bush		<i>Hakea bakeriana</i>
	<i>Grevillea beadleana</i> - Beadle's Grevillea		<i>Hakea constablei</i>
	<i>Prostanthera askania</i> - Tranquility Mintbush		<i>Hakea prostrata</i> - Harsh Hakea
	<i>Leionema westonii</i>		<i>Hakea propinqua</i>
	<i>Epacris purpurascens</i> var. <i>purpurascens</i>		<i>Hakea orthorrhynca</i> var. <i>filiformis</i>
	<i>Phebalium speciosum</i>	12	<i>Melia azedarach</i> (White cedar)



Stop 1 Bollards near Café Bridge (optional to anticipate later parts of the walk)

- **Sentinels** Nine stainless steel bollards stand as sentinels at key entrances to the ANBG. The bollards collectively list over one thousand endangered, vulnerable and extinct native plant species (2003).
See <https://www.anbg.gov.au/gardens/visiting/exploring/public-art/sentinels/index.html>
- Botanic Gardens have a significant role in conserving species. Design plans for a new National Seed Bank were recently released. The National Seed Bank holds short term seed collections to support the living collections and nursery with stock of new and replacement native plant species for display. It also holds long term conservation collections, which are stored to assist in safeguarding Australian native plants.
- The National Seed Bank team conducts research to extend knowledge of how to collect, process, store and germinate native seeds as we increase the number of different plant species held in our bank.
- The National Seed Bank holds significant collections from Australian alpine and Southern NSW tableland grassland communities.
See <https://www.anbg.gov.au/gardens/living/seedbank/index.html>
- During this tour we will see other examples of the ANBG role in conserving species.

Stop 2 Banksia Garden

Continue along the path at the top of the Banksia garden and **stop at the third viewing platform** – good spot for total overview of the garden.

Of interest here:

- Variety of leaf formation and foliage across the Banksia species, 17 different patterns
- Variety of flower spikes, eg upright, candlelike, cuplike and pendulous
- Establishment of garden (ie Canberra's climate, soil preparation, grafting of plants)
- 171 species of banksias (see Banksia Garden Handbook pages 5,10 and 11)
https://www.friendsanbg.org.au/guidesweb/couch/uploads/file/the_banksia_garden_handbook_compressed.pdf
- The importance of fire for the stimulation of new growth in some species

Species growing around this viewing platform (all WA species) in order:

***Banksia menziesii* (grafted) - Menzies' Banksia or Firewood banksia**

- Found solely in Western Australia, from the Murchison River in the north, to Pinjarra in the south. Varies greatly in size from shrubs of around 2 m to trees growing commonly to 7 m.
- Grey green serrated foliage and large conspicuous terminal flower spikes from February to October. These iconic flower spikes can grow up to 8 cm across and 12 cm high with a colour form of deep red and pink.
- Was named in honour of Archibald Menzies (1754-1842), a surgeon-naturalist on board the HMS Discovery, on the Vancouver Expedition that discovered and named King George Sound, near Albany, in 1791. Specimens of *menziesii* were not collected on this trip, but in 1827 by Charles Fraser during Captain James Stirling's exploration of the Swan River. Archibald Menzies never got to see the plant that was named in honour of him. <https://www.bgpa.wa.gov.au/about-us/information/our-plants/plants-in-focus/2634-banksia-menziesii>

***Banksia baxteri* – Baxter’s Banksia**

- Occurs naturally along the south coast of Western Australia from the Stirling Range in the west to the Oldfield River in the east. It is a medium to large shrub growing approximately 1.7 to 4 m in height.
- This species is non-lignotuberous, hence not fire tolerant and totally reliant on seed for regeneration. It has very attractive, grey-green, severely triangularly-lobed leaves.
- While most banksia inflorescences appear as cylindrical spikes, Baxter’s Banksia is rather unique with its yellow-green, hemispherical terminal heads to 4 cm long by 8.5 cm wide. These flowers generally appear from December to May.
- The striking, long-stemmed terminal inflorescences make this species very popular with the cut-flower industry and they are often dyed different colours.
- one of the easier banksias to grow, responds well to light pruning after flowering and tolerant of extended dry periods and frost once established
- Named after William Baxter, an English gardener/botanical collector, who collected the type specimen near King George Sound in WA in 1829. <https://www.bgpa.wa.gov.au/about-us/information/our-plants/plants-in-focus/2605-banksia-baxteri>

***Banksia coccinea* – The Scarlet Banksia**

- *Banksia coccinea* is a shrub or small tree found in and around Albany and the Stirling Ranges on the south coast of Western Australia. It usually grows to about 4 metres but can reach up to 8 metres in height.
- The Scarlet Banksia is one of the most attractive banksias with wide, toothed, light to mid-green leaves and large striking flowers of orange-red to bright scarlet that appear between May and January. These flowers are highly prized in the cut flower industry, not just because of their beauty but because of the long, fairly straight, single stems on which they grow.
- This is a great plant for attracting nectar-feeding birds into your garden. <https://www.bgpa.wa.gov.au/about-us/information/our-plants/plants-in-focus/1330-banksia-coccinea>

***Banksia ashbyi* (grafted) – Ashby’s Banksia**

- The northernmost distribution of any Western Australian banksia. In the northern part of its range (Shark Bay north to Exmouth), it is a lignotuberous shrub to 2 m tall (i.e. it has a lignotuber and is therefore fire-tolerant). In its southern range (Shark Bay south to Moora), it is a non-lignotuberous (and therefore not fire-tolerant) shrub or small tree to 8 m tall.
- Produces large bright orange flowers from February to December making it an excellent plant for attracting nectar-feeding birds into your garden, and a great banksia for cut flowers.
- Named after Edwin Ashby (1861-1941) of Blackwood, South Australia, botanist and cultivator of Australian plants. He collected the type specimen used to describe the species, from east of Geraldton. <https://www.bgpa.wa.gov.au/about-us/information/our-plants/plants-in-focus/892-banksia-ashbyi>

***Banksia media* – Southern Plains Banksia or Golden Stalk Banksia**

- Found in shrubland and woodland along the south coast of Western Australia. A shrub to about 4 metres but can grow taller, also a prostrate form from the south coast of Western Australia retains the low habit in cultivation.
- The leaves are broad with toothed margins and the cylindrical flower spikes are conspicuous and bright yellow in colour about 150mm long by 70-90mm diameter at flowering. They are seen in

early winter and may continue through to spring. The seeds are enclosed in follicles attached to a woody cone and are generally retained within the cone until burnt.

- The plant is fire-sensitive in that it does not have lignotuber for vegetative regeneration after bushfires. The species relies on seed for regeneration.
- A particularly attractive feature of the plant is the inflorescences at the bud stage; the contrast of the dark tipped styles with the yellow of the flowers is very striking. <http://anpsa.org.au/b-med.html>

Stop 3 Treehouse and Paperbark Forest

Depending on visitors and time, there are three options here: view the treehouse from the road; walk right into the first level of the treehouse; or walk down the path at end of Banksia garden to see the paperbark forest better and the treehouse, then backtrack or climb the steps on the far side of the treehouse and back onto the road.

- The treehouse timbers have been charred using an ancient Japanese technique Shou-Sugi-Ban (burnt cedar wood). The carbonised outer layer provides a weather shield and protection against fire by resisting ignition. It also represents the fact that fire is an essential agent of regeneration in many Australian tree species.
- Most of the building materials are recycled—the tree trunks from the ANBG, the piers, joists and decking from old wharves, the rosewood handrail and ladder rungs are 100-year-old central Qld fence posts used on the film set of *Australia*. The steelworks are by a Chilean sculptor who came on a cultural exchange. They allow native vines to grow through the structure.
- See <https://www.canberratimes.com.au/story/6025471/the-australian-national-botanic-gardens-is-home-to-a-treehouse/> and Fronds December 2017.
- The **swamp** is the bottom of a major drainage area, so all the water from the rock garden drains here, and as the drains are blocked, water now runs across the surface. The existing drainage will not be changed, but a channel has been dug allowing the water to fan out and landscaped with rocks.
- There is a system of waterholes down through CSIRO and ANU into Sullivan's Creek. The Sydney basin, melaleuca swamp and Tasmanian drainage lines feed into this system. [Talk by Phil Hurle at Guides meeting 21/6/2016.]
- The **Paperbark Forest** has evolved over many years to form a large spreading stand of *Melaleuca ericifolia* (originating from Tasmania). This species is a root suckering shrub or tree. It is now a strong landscape feature and forms valuable habitat attracting much fauna. It is an example of a Melaleuca Swamp. These are typically found in damp or wet habitats that dry out seasonally and support biodiversity. [See ANBG Plant App.] In such swamps, Melaleucas are the dominant tree species in poorly drained lowland coastal areas where the water table is near or above ground level for much of the year.
- *Melaleuca ericifolia* (Swamp paperbark) is found from the north coast of New South Wales through Victoria to Tasmania, including King Island, usually in coastal areas. It grows along watercourses and will form dense thickets in wetlands. See <https://resources.austplants.com.au/plant/melaleuca-ericifolia/> and <https://vicflora.rbg.vic.gov.au/flora/taxon/e91dc560-84d5-40c5-94bb-033f16503403>

Continue along road to boundary road and enter the Pomaderris Garden

Stops 4 Pomaderris Garden section 338 near the beginning. As you enter the garden, there is a sign about Pomaderris and three paths to the left, right and straight ahead. Take the path to the right a

short distance, where there are some new plantings of *P. delicata* on the right. Point them out as they can be discussed at stop 5.

- *Pomaderris* plants are characterised by their abundant and often spectacular cream-yellow flowers produced in spring. They are shrubs or small trees with hairy young growth.
- In Australia there are approximately 65 species. The occurrence is mainly in the eastern states with the majority in NSW and Victoria and there are 13 species of *Pomaderris* found in the ACT (Feb 2019 data). They grow in heathland, shrubland, woodland and open forest from near sea-level to about 2200 m altitude.
- Aims of the Pomaderris Garden: focus on what is significant about Pomaderris, as a genus, its rarity and distribution; raise public awareness of the members of this little-known genus; inspire visitors to grow Pomaderris by a display that is representative of home gardens.
- *Pomaderris* provides a good alternative for hedging and screening. Along the boundary round, several species are clipped regularly to form a hedge, illustrating how they could be used to replace cotoneasters as hedging plants in the home garden.
- *Pomaderris* are useful for growing in shaded sites, especially beneath established trees. Plantings are most likely to be successful in home gardens along the coast and mountains of south eastern Australia.
- The garden has several microhabitats created by the landscaping. In the lower part of the garden there are water-harvesting depressions, which fill after rain. From there the water slowly seeps into the very heavy subsoil, thus keeping it damp and overcoming the water repellence of the clay. Species that like moisture can be planted near the depressions and less irrigation will be required.
- See: The Pomaderris Garden Handbook for Guides pages 2-6, 11.
https://www.friendsanbg.org.au/guidesweb/couch/uploads/file/pomaderris_handbook_2019.pdf

Stop 5 Pomaderris Garden section 338 exit at the opposite end from where you entered, walk a few steps to the boundary and turn right. Along the edge of the Pomaderris garden facing the boundary road are in order, several new plantings of *P.cotoneaster*, a big *P. bodalla* bush and then a single *P. reperta* bush. This is smaller than the *P. bodalla* with smooth pale stems and distinctive brown buds. These are three of the seven species investigated in the project described below.

- The ANBG led a 3-year project (ended in May 2019) involving several collaborators from SE NSW. The aims were to source, collect and secure seed and living plant material from a number of NSW and ACT species that were threatened or likely to become threatened in the near future; investigate biological traits that might affect the success of species reproduction in cultivation and in the wild; produce plant material ready for planting out in the wild.
- The species included were *P. bodalla*, *P. brunnea*, *P. cotoneaster*, *P.delicata*, *P.pallida*, *P. reperta*, *P. walshii*. [Details about these species on pages 11-15 of Pomaderris handbook. Map and legend on pages 25-26, but new plantings since then.]
- For *P. delicata*, the first species investigated, seeds in the wild were rare and not viable. Cuttings were taken from wild plants and grown together in a caged area (this is a seed orchard). A pilot seed orchard, with no controls on cross-pollination, produced about 200,000 seeds whereas only about 100 seeds were able to be collected from the wild. Some plants grown from these seed orchard seeds were reintroduced to the wild where they grew successfully.

- The ANBG developed a protocol for collecting seeds or cuttings from the wild, including identifying suitable population sources and ensuring that any plants and seeds propagated from them have traceable links to parentage for future research and use in species recovery. [See The Pomaderris Garden Handbook for Guides pages 6-7, p 22-23]
- ***Pomaderris reperta* (Denman Pomaderris)** is a critically endangered shrub that grows 1 to 3 metres tall in a small number of sites along a single ridgeline near Denman, south west of Muswellbrook in the upper Hunter Valley in NSW. It has very hairy young stems and leaves to 35 mm long and 20 mm wide and very distinctive buds. It grows in woodlands in association with *Eucalyptus* species in sandy loam soils on sandstone or conglomerate. Seeds were collected at Myambat in Denman in 2016 from 23 different existing plants and the staff at the gardens germinated approximately 600 new plants using the developed protocols. 450 plants were translocated to the Denman site, and the remainder were planted at the ANBG. Unfortunately, the Black Summer bushfires devastated the Denman population, so the Australian National Botanic Gardens holds the only current living collection. The National Seed Bank has a collection of seeds of the Denman Pomaderris which in conjunction with the horticultural expertise of the gardens staff, could produce a renewable population for the species if the wild population failed to recover. [See [Saving six unique plants in six unique locations | Parks Australia](#)]
- The discussion at stop 5 leads into discussion at stop 7.

Walk up the boundary road.

Stop 6 Gall, or burl, on a eucalypt on LH side next to the speed hump sign

- Massive galls on tree trunks, branches and roots such as on the *Eucalyptus* trunk that you see here are thought to develop as the result of infection by a fungus, virus or bacterium or due to environmental stress or physical trauma. (Crown gall, for example, a disease of a wide range of woody plants around the world, is caused by soil-borne bacteria of the genus *Agrobacterium*.)
- These massive galls are called burls or, in the US and UK, burrs and are prized by woodworkers for their convoluted grain patterns for production of decorative bowls, although these make the wood hard to work.
- Some background information: Plant galls, as abnormal outgrowths of plant tissues, are very common and are most often small and found on leaves or growing tissues such as buds, growing tips or young, green shoots. These are often caused by insects or mites: amongst insects, the most common gall inducing groups in Australia are aphids, midge flies and gall wasps. Each species produces a very specific type of gall, which can sometimes be used to identify the causal insect. These galls develop in response to chemicals or hormones introduced by sap sucking insects in their saliva or through gall wasp ovipositors, rather than by the physical act of feeding.
- See <https://en.wikipedia.org/wiki/Gall>, <https://www.australianwoodwork.com.au/blogs/news/australian-eucalyptus-burls-what-exactly-is-a-burl>, <https://en.wikipedia.org/wiki/Burl>, <https://www.dpi.nsw.gov.au/agriculture/horticulture/pests-diseases-hort/information-for-multiple-crops/crown-gall-of-plants>, <https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/ny15002-gall-producing-insects.pdf>

Turn left up the road on the far side of the Sydney gully to the eastern, lower, end gate of the Conservation and Research Garden

Stop 7 Conservation and Research Garden Section 189b

- The C&R Garden was opened three years ago by Costa Georgiadis (Gardening Australia) who did a wonderful job helping several small children plant out a few of the plants.
- The plants in this garden are all shrubs endemic to areas of NSW or relatively local. All of them are classified as threatened under the Environment Protection and Biodiversity Act 1999. There are three categories of threat: Critically endangered, endangered, vulnerable. The category assigned to a species depends on the severity of reduction in population size, restricted geographical distribution and low numbers of mature individuals and predicted outcome without attention. The threats to continued survival can be fire, flood, grazing by stock or feral animals, weed invasion, loss of habitat, effects of climate change etc.
- While the ANBG has always been involved in conservation and research, in cooperation with other organisations, this dedicated garden was established in part to enhance awareness for the public but also to be able to grow numerous plants of each species in the one place to aid research and conservation efforts. Research can involve such areas as genetic diversity, seed production and germination requirements. It may be carried out by the ANBG or by others, e.g. CSIRO or ANU. The plants themselves form part of an insurance population and can be used to produce seeds or cuttings to be grown on in the nursery for re-introduction into the wild.
- This site was selected as it is readily accessible to the public, next to an older fenced area used for research, has some areas in full sun but most of the site has light shade and some frost protection from existing gum trees (*E. mannifera*). Also, draughts of air flow down through the site, further reducing the danger of frost.
- Mounds and low areas were formed to help retain surface runoff and provide a variety of moisture and drainage conditions to suit the various species.
- There are further plants of these species elsewhere in the ANBG.
- See The Conservation and Research Garden Handbook in the GuidesWeb under Themes and topics.

Enter through the gate. The fence is there to protect plants from wallabies etc

Stop 8 Plants of the Conservation and Research Garden Section 189b

- Notes from the handbook are used here for species planted by January 2020. Later entries are provided with web references.
- Pick out two or three species for discussion. Notice that there are several *Pomaderris* species in this garden, doubling up with the Pomaderris garden.
- On left, ***Zieria baeuerlenii***, Bomaderry Zieria, Rutaceae, Endangered. A small, spreading, shrub. Some tiny flowers visible.
Distribution and habitat: One location only, north west of Nowra near Bomaderry Creek. Shrubby open forest, woodland or closed scrub. No evidence of seed production. Plant resprouts after fire.
See <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10850>
- On left after first left hand side (LHS) path: ***Asterolasia elegans***, Hawkesbury Star Bush, Rutaceae, Endangered. Shrub to 3 m with white flowers.
Distribution and habitat: Just to the north of Sydney. Grows on Hawkesbury sandstone in wet sclerophyll forests on moist hillsides.
Threats: Vulnerable to various human activities on the outskirts of Sydney and together with such small, fragmented populations the species is threatened by climate change

- On right, before and near third RHS path: ***Pimelea venosa***, Bolivia Hill Pimelea, Thymelaeaceae. On verge of extinction in the wild. A lovely soft shrub with densely hairy leaves and clusters of small white flowers in late spring.
Distribution and habitat: Bolivia Hill area south of Tenterfield NSW (if there are any left).
Recorded between granite boulders in open woodland.
Threats: Any plants in the wild could easily be lost due to fire, clearing, grazing by animals etc
- Below third LHS path: ***Boronia deanei***, Deane's Boronia, Rutaceae, Vulnerable.
Distribution and habitat: From Lithgow, NSW to near the Victorian border. The margins of high altitude swamps, in wet heath and in drier open forest.
Threats: Feral pigs, coal and coal seam gas exploration and extraction, drought, fire, climate change
- Again on left after third LHS path: ***Grevillea guthrieana***, Guthrie's grevillea, Proteaceae, Endangered. A medium to large shrub.
Distribution and habitat: Restricted areas of NSW north coast and northern tablelands. Moist eucalypt forest but collected from near the edge of escarpments in dappled open woodland in the Oxley Wild Rivers National Park.
Threats: Fire, *Phytophthora cinnamomi*, infestation by privet, changes in land use etc.
Plants were grown from the many cuttings that were collected on a Bush Blitz trip to this NP along with cuttings of three other species growing in the C&R garden: *Grevillea beadleana*, *Leionema westonii* and *aff. Prostanthera. howelliae*.
See Fronds No.83, August 2016
- Just below fourth LHS path: ***Prostanthera densa***, Villous Mint Bush, Lamiaceae. Vulnerable. A few little plants with mint-scented hairy leaves, in flower.
Distribution and habitat: Port Stephens area to Jervis Bay, in sclerophyll forest and shrubland on coastal headlands and near coastal ranges.
The Mount Annan botanic gardens in collaboration with the NSW National Parks and Wildlife Service have propagated them and are now selling *Prostanthera* 'Mint Velvet' at Mt Annan and some nurseries.
<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/saving-our-species-factsheet-villous-mint-bush-200036.pdf>
- At end of fourth LHS path: flourishing examples of ***Grevillea beadleana***, Beadle's Grevillea, Proteaceae. Endangered, like *G. guthrieana* and, like it, collected on the Bush Blitz trip.
- On right, past fourth RHS path: ***Prostanthera askania***, Tranquility Mintbush, Lamiaceae, Endangered. Scented leaves.
Distribution and habitat: The Gosford and Woy Woy areas of NSW Central Coast, in moist sclerophyll forest and warm temperate rainforest communities.
Threats: Multiple threats from urban development, weeds, fire, the effects of climate change and dieback resulting from *Phytophthora cinnamomi*
- Just past *P. askania*, two shrubs of ***Pomaderris walshii***, Rhamnaceae, Critically endangered, which were planted with Costa Georgiadis' supervision at the opening in 2018. That wasn't his first contact with this species – he had been on the early 2017 collecting trip to the Budderoo National Park where they took cuttings and collected seeds.
Distribution and habitat: Upper Kangaroo River and its tributaries, above Carrington Falls, south-east of Robertson, NSW. Found in riparian shrubland and open grassy forest.

Threats: Floods, changed rainfall patterns with climate change, fire, genetic problems due to tiny population size, grazing.

On the left and as you turn left towards the side gate:

- ***Leionema westonii***, Rutaceae, Critically endangered. In flower
Distribution and habitat: One known small population of fewer than 50 plants, in woodland near the rim of a gorge in the Macleay Gorges area of Oxley Wild Rivers National Park on the NSW Northern Tablelands.
Threats: Due to tiny distribution, vulnerable to fire and grazing by goats.
This species was discovered in 2004 and named in 2018. A much-branched rhizomatous shrub to 70 cm tall with star-like white flowers with pink anthers. No fruits have been seen.

To the right of this major path and in pot near gate:

- ***Epacris purpurascens var. purpurascens***, Ericaceae (Subfamily Epacridoideae). Vulnerable. A small shrub.

Distribution and habitat: Sydney region from Gosford south to Avon Dam area. A range of habitat types.

Threats arise through being close to urban areas such as habitat loss or modification, urban runoff, vehicles, walkers, weeds, fire, slashing, rubbish dumping.

<https://www.environment.nsw.gov.au/ThreatenedSpeciesApp/profile.aspx?id=10273>

- **In pot at gate: *Phebalium speciosum***, Rutaceae, Critically endangered. Pink flowers
Distribution and habitat: A highly restricted distribution on the far north coast of NSW in open forest or heath around volcanic outcrops and on clifftops. Multiple threats.

https://en.wikipedia.org/wiki/Phebalium_speciosum and

<https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20320>

Exit through the side gate, cross the bitumen road and walk through the Sydney Gully

Stop 9 Sydney Region Gully

The Sydney Region Gully has been developed to represent the huge diversity of flora across the Sydney sandstone region and the Blue Mountains with over 600 plants represented in this section of the gardens.

Of interest along this path in order of sighting; (Guides to select plants to highlight)

1. ***Acacia trinervata* - Three Veined Wattle** on left at first cross path (section 191f)
Occurs from western Sydney to lower Blue Mountains and is an erect or spreading shrub of 1.5–3 m high.
Single flower balls, each consisting of 20 to 30 flowers, occurring throughout the year.
Grows in eucalypt open forest and woodland, on sandstone and shale.
https://apps.lucidcentral.org/wattle/text/entities/acacia_trinervata.htm
2. ***Cyathea australis* – Rough Tree Fern** – on both sides of path in the gully
Found along much of the east coast of Australia, extending right down into Tasmania. It prefers moist mountain areas and can grow on dryer slopes than most other tree ferns.
The term "rough tree fern" refers to rough protuberances on the stipes (the stalk of the fronds) - this is one feature that distinguishes *C.australis* from another common tree fern, *Dicksonia antarctica* (smooth tree fern)
The 'trunk' like structure on a tree-fern is actually a greatly enlarged rhizome! The horticultural appeal of *C. australis* is not only due to its beautiful looks but also because it is an extremely hardy species, even capable of tolerating direct sun when the roots are wet. It is also a robust

tub plant and is unusual in that it is tolerant of salty winds. *C. australis* is thus a popular, cold-hardy tree-fern, adaptable to a variety of climates and soils. <http://anpsa.org.au/c-aus.html>

3. ***Epacris sparsa* – Sparse Heath** - on corner with main path [60] (section 191e)
Found in rainforest, wet forest, and shrubland, at the bases of cliffs or rock faces, on rock ledges in the Blue Mountains and the western parts of the Sydney area.
Small shrub to 0.9 m high with flowers cream to greenish-white near the ends of the branches, hanging down. Flowers occurring April-June.
Vulnerable in plant in NSW.
https://apps.lucidcentral.org/plants_se_nsw/text/entities/epacris_sparsa.htm
4. ***Allocasuarina nana* – Dwarf Sheoak** - next to path on left (section 191g) good example of male flowers
The male flowers are carried in spikes on the ends of branches. When the flowers mature, pollen is released and spread by the wind.
A small, dense shrub that will reach a height of less than 1.5 metres. The Dwarf Sheoak could also be used as a low, informal hedge in the larger garden.
Allocasuarina nana occurs in New South Wales and usually grows in sandstone areas in the Blue Mountains of New South Wales and in Deua National Park in southern New South Wales.
<https://austplants.com.au/Allocasuarina-nana-Stunted-Sheoak>
5. ***Xanthorrhoea glauca* – Grass Tree** - just on left before the bitumen road.
Widespread in eastern Australia. The trunk can grow in excess of 5 metres tall, and may be many branched. It is occasionally seen in large communities in nutrient rich soils. The leaves are a grey or bluish glaucous green.
The flower spike soaked in water makes a sweet drink. The growing part of the leaf stem and the white leaf bases can be eaten. The resin from the base of the leaves is a glue used when making weapons and axes.
6. Just before you turn left at the bitumen road, on the right there is a good example of scribbles on a Scribbly Gum - *E.Rossi*.

At the bitumen road that borders the Eucalypt Lawn, turn left and walk down. Can point out the postage stamp view here. Cross a bitumen road and take the next, broad, gravel path on the right between sections 21 and 24.

Stop 10 Hakeas and Grevilleas

General Information

- Walk along this path, on the left of which are some grevilleas and on the right, mostly, *Hakea* species. Like banksias, hakeas belong to the family Proteaceae. The approximately 150 species of *Hakea* are all endemic to Australia and are found in all states, while three species are listed for the ACT in Flora of the ACT, Burbidge and Gray, 1979. The majority of species occur in the south-west of WA.
- Their flowers and inflorescences are similar to those of grevilleas, but hakeas produce woody fruits which are retained on the plant whereas grevillea fruits are non-woody, release seeds as they mature and disappear quickly. Also, *Hakea* inflorescences tend to be borne lower down on stems than those of *Grevillea*.
- See http://www.flora.sa.gov.au/lucid_keys/Hakea/index.shtml and <https://en.wikipedia.org/wiki/Hakea#:~:text=Hakea%20is%20a%20genus%20of,case%20they%20are%20sometimes%20divided.>

Select some of the following:

- ***Hakea scoparia subsp. scoparia***, at the corner as you turn onto this path
Distribution: South-west WA, inland, roughly in a line from Geraldton to near Esperance
Flowers vary from white through cream and pink to orange.
See <https://florabase.dpaw.wa.gov.au/browse/profile/19131>
- Along a little on the right is a grevillea, ***Grevillea tripartita subsp. macrostylis***,
Distribution and habitat: South west WA on southern coast, in mallee shrub communities and coastal heath.
Flowers red to orange, August to December or January-February. Quite a good one to talk about pollination.
See <https://florabase.dpaw.wa.gov.au/browse/profile/19490> and <http://www.anbg.gov.au/abrs/online-resources/flora/stddisplay.xsql?pnid=45447>
- Just after that, at corner of a small track on the right, ***Hakea trifurcata***, Two-leaf or two-leaved Hakea, or Kerosene bush. Not in flower but the foliage is interesting. Flowers of *H. trifurcata* possess a strong smell, sometimes described as fetid, and bees and blowflies have been seen visiting them. [Several other species have a common name of kerosene bush, including a *Banksia* and two *Ozothamnus* species.]
Distribution and habitat: South west WA, from north of Geraldton to east of Esperance. In mallee or low heathland.
A smallish shrub with two entirely different leaf forms. Therein lies a fascinating story. It seems the broader leaves only develop on a plant at sexual maturity. The fruit, unlike those of most hakeas, are green and non-woody, resembling the broad leaves. Thus camouflaged, the seeds are protected to some extent from predation by cockatoos. The plants being killed by bushfires, there needs to be a good stock of seeds in the soil for regeneration.
http://www.flora.sa.gov.au/efsa/lucid/Hakea/key/Australian%20Hakea%20species/Media/Html/Hakea_trifurcata.htm, <https://florabase.dpaw.wa.gov.au/browse/profile/2214> and https://en.wikipedia.org/wiki/Hakea_trifurcata
- ***Hakea orthorrhynca var. filiformis***, Bird Beak Hakea, on right. A better specimen after the Bee hotel (stop 11)
Distribution: SW WA, to north and south of Geraldton.
Small to medium spreading shrub, flowers red, May to Sept. The fruits have a distinct beak.
See <http://anpsa.org.au/h-ort.html> and <https://florabase.dpaw.wa.gov.au/browse/profile/2192>
- Further on, ***Hakea verrucosa***, Warty-fruited hakea. Covered in pink flowers.
Distribution and habitat: SW WA, between Albany and Esperance, growing in heath and low woodland.
See <https://florabase.dpaw.wa.gov.au/browse/profile/2217>
- On the left at the corner of a path, just before you take the path to the right, ***Grevillea corrugata***, a small to medium shrub found a little to the north-east of Perth. Rare and vulnerable. See <https://florabase.dpaw.wa.gov.au/browse/profile/14319>

At the cross roads of paths, there is a large Eucalyptus. Turn right taking the path through the hakeas towards the Bee Hotel.

Stop 11 More Hakeas. Again, choose which plants to examine.

- To the right see spreading shrub/tree, ***Hakea drupacea***, Sweet scented hakea, with abundant inflorescences of whitish flowers.

Distribution and habitat: Coastal areas of South west WA in open heath or low shrublands. Also naturalised in Victoria, South Africa and NZ.

https://en.wikipedia.org/wiki/Hakea_drupacea

- To the left of *H. drupacea* and further back, a slender tree of ***Hakea petiolaris***, Sea urchin hakea, showing inflorescences right down on the bare trunk and lower branches as well as in the canopy. Found in south-western WA on granite outcrops and hills. See <http://anpsa.org.au/h-pet.html>
- ***Hakea bakeriana***, to left of path
Distribution and habitat: NSW coast and ranges from Newcastle to near Hawkesbury River in dry sclerophyll forest.
Small multi-stemmed shrub with leaves unusually soft for hakeas. Flowers pink, late autumn to winter, the fruits very large, rough and wrinkled (and ugly in comparison with the delicate flowers!). Where the follicles are open one can see where there have been the two winged seeds, typical of all hakeas.
See https://en.wikipedia.org/wiki/Hakea_bakeriana and <https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Hakea~bakeriana>
- As you walk along towards the Bee Hotel, take in the various types of follicles evident.
- The first of these, on your right, is ***Hakea constablei***, a rare hakea from the Blue Mountains and the Wollondilly catchment, on rocky sandstone outcrops in dry sclerophyll forest. There are numerous, green, immature fruit present as well as mature, woody ones. See http://www.flora.sa.gov.au/efsa/lucid/Hakea/key/Australian%20Hakea%20species/Media/Html/Hakea_constablei.htm
- Also of interest are, towards the road above, large shrubs with broad, bright green, quite prickly leaves. These are specimens of ***Hakea prostrata***, Harsh Hakea. They don't look at all prostrate: apparently the species was described from a low growing coastal form.
Distribution: SW WA.
<https://florabase.dpaw.wa.gov.au/browse/profile/2197>
https://en.wikipedia.org/wiki/Hakea_prostrata
- ***Hakea propinqua*** on left just before bee hotel
Distribution: NSW central coast plateaus from Woy Woy to Royal N.P. and in the Blue Mountains.
Shrub to 2 m high. Flowers white, fruit large and warty. One of the "needle bush" hakeas with sharply pointed cylindrical leaves.
<https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Hakea~propinqua>
<https://www.anbg.gov.au/gnp/gnp5/hak-prop.html>

Turn left at bee hotel

- ***Hakea orthorrhynca var. filiformis***, shrub falling over, on left just down from bee hotel
Notes as in stop 10.

Stop 12 *Melia azedarach* (White cedar) not in flower

Distribution and habitat:

- White Cedar is native to Australia and SE Asia and has an average lifespan of around 20 years. In Australia, its natural distribution is from Cooktown in Qld down to the south coast of NSW.

- It is a deciduous shade tree with a rounded crown. The tree reaches 12m at maturity (sometimes up to 30m in favourable natural environments) and a width of 6–8m. White Cedar is often planted as a shade tree in parks, public gardens, stream banks and along footpaths or roadsides because of its dense canopy. The fragrant lilac flowers and yellow fruits of White Cedar make it an appealing ornamental tree.
- The fruit is round, diam 1.5cm, fleshy, and yellow when mature. Fruits are poisonous to humans and some other mammals but birds are able to eat the fruits and thus disperse the seed through their droppings.
- This tree produces a prolific amount of seed and can be a weed. The hard seeds of the plant can also be used in art and crafts, including making beads for rosaries.

Walk below Asteraceae Garden to bitumen road. End of walk.