

Threatened species walk

Note: material in blue was not included in the full walk (too much repetition), but could be useful if taking the information about one or two plants/plant communities to use in a general walk.

Introduction

I would like to acknowledge the traditional custodians of the land on which we meet today and pay my respects to their Elders past and present.

Themes

- The diversity of threatened plant species and communities on show in the ANBG
- The range of threats faced by these plants and communities
- The critical role the ANBG plays in their conservation

Threatened species - definitions

What is a threatened species?

- A plant that meets certain criteria under threatened species legislation and has been listed under that legislation, either at Commonwealth or State/Territory level
- Commonwealth is the EPBC (Environment Protection and Biodiversity Conservation) Act
- Commonwealth types of threatened species listings are extinct, critically endangered, endangered and vulnerable

Extent of threatened species

What can be listed?

- Plant species – many different plant families and groups, including
 - Trees, shrubs, small plants, lilies
 - Plants from common families as well as more unusual ones
- Ecological communities
 - Alpine to coast plant communities
- Threatening processes: those affecting plants include
 - Land clearance for agriculture, urban development and infrastructure (e.g. roads, power lines)
 - Invasion by garden escapees, and by novel biota, i.e. weed invasion
 - Land degradation by feral animals –rabbits, goats, pigs – includes grazing as well as destruction such as via pig wallows
 - Dieback due to the root-rot fungus *Phytophthora cinnamomic* – also other pathogens
 - Climate change – due to more droughts, increasing temperatures and the inability of threatened plant species to move to more suitable climates

How big is the problem?

- Over 1,300 plant species and almost 80 plant communities listed
- Critically endangered: about 190 plant species and 34 plant communities
- Endangered: about 550 plant species and over 40 plant communities
- Vulnerable: about 580 plant species and 2 plant communities

Why are some plants so much in decline

- Some always had a very restricted distribution
- Others have small populations now as a result of land clearing
- Once in decline, a species or ecological community can be impacted by a much wider range of threats

Other common threats

- Small fragmented populations

- Restricted gene flow between the populations
- Increased chance of a single event destroying a population
- Increased boundary effects relative to the population size, e.g. increased weed invasion
- Grazing by stock or native herbivores such as kangaroos – such grazing can be
 - A threat if over-grazing or some types of preferential grazing occurs
 - Or a useful management tool in some situations
- Inappropriate fire regimes

Other threats that apply to a smaller group of plants/communities – will meet these on the walk

What is being done?

Commonwealth government – Threatened Species Commissioner

- Targeted projects, e.g. Green Army Program, 20 million trees (by 2020) and National Parks recovery projects
- 30 priority plants

NSW government – Saving our Species program

- A state-wide program aiming to secure threatened plants and animals in the wild:
 - Applies expert advice and science to projects
 - Prioritises targeted conservation projects
 - Monitors the effectiveness of projects

Role of the ANBG in conserving threatened species

- Ex situ conservation work
- Research to increase our knowledge of Australian flora
- Developing the living collection to embrace these goals
- At least 300 of the 1,356 threatened species listed under the EPBC Act are in the ANBG
- In 2016 the ANBG established the ANBG Threatened Species Project, which has a particular focus on species from southern NSW and northern Victoria
- Involvement in the Threatened Species Commissioner's work and in Saving our Species projects

We will discuss specific conservation activities of the ANBG as we go on our walk.

Stop 1 – VIC – alpine pipes and opposite pipes

Alpine Sphagnum Bogs and Associated Fens ecological community

Endangered (EPBC)

- i.e. the probability of extinction is at least 20% in the *immediate* future

High country of Tas, Vic, NSW, ACT

Why is it important:

- Rich profusion of flora
- Significant habitat for several threatened fauna species, e.g. Southern Corroboree Frog
- Critical refuge for a number of endemic flora and fauna species at risk of extinction as threats like global warming continue to marginalise their niche habitats
- Provides critical ecosystem services for major inland water resources, e.g. the Murray, Murrumbidgee and Snowy Rivers
- Highly significant from a conservation perspective
 - Contain pollen and charcoal deposits that provide a botanical and climatic timeline dating back millions of years, giving a picture of past climatic conditions and helping us understanding of ongoing climate change

Threats:

- Fire and the ongoing effects of climate change
- Exotic weed invasions, grazing and trampling by non-native hard-hooved animals, e.g. pigs, horses

ANBG work:

- Alpine seed and seedling ecology research project
- Collaborating with the ANU, Uni of Qld and Friends of the ANBG
- Assessing alpine germination strategies, variation in seed and seedling traits within species, and the role of maternal environment in seed traits
- Also the potential impact of climate change on the ability of alpine plants to reproduce via seed
- Resolve the germination strategy of species in the endangered Alpine Sphagnum Bogs and Associated Fens ecological community

Other threats:

- [Tourism, increased human infrastructure, and harvesting of sphagnum moss for use in the horticultural industry in some areas.](#)

Acacia aphylla (Leafless rock wattle, Twisted Desert Wattle, Live Wire)

In the corner pipe across from alpine pipes

Vulnerable (EPBC)

- i.e. probability of extinction in the wild is at least 20% in the *medium-term* future

Small populations east of Perth

- Lots of seed during summer which stores well and remains viable for a long time, but few or no seedling often found
- Plants are killed by fire

Threats: little known

Other:

- Seedlings start out growing typical *Acacia* leaves which are soon shed after dry conditions, then the plant continues to grow stems as a totally leafless wattle, hence its name 'aphylla' which means without leaves.

- Thickened blue-green wiry stems, with the ability to photosynthesize like leaves are an evolutionary adaptation that greatly reduces the surface area for water loss through transpiration.

Other threats:

- Main potential threat is vulnerability to extended summer droughts, as it grows in shallow soils
- May also be threatened by dieback and by inappropriate fire regimes

Stop 2 – southern steps, VIC

Allocasuarina protuensis (Nielsen Park Sheoak)

Endangered (EPBC)

Nielsen Park National Park, Sydney Harbour

Generally dioecious, i.e. each plant produces flowers of a different sex

Threats include loss of habitat, fire and inappropriate activity and recreational use

Other:

- Only discovered in 1986 in an area overseen by Europeans since settlement
 - Single population of 10 plants
- Last known wild tree died in April 2003, probably of old age – estimated to be 30 years old
- Translocated to original site, Nielsen Park and other sites nearby with similar soils
- In 2008, 120 plants recorded as surviving
- One of the NSW Saving Our Species plants

Other threats:

- Weeds
- Dominant overstorey

Homoranthus montanus (Mountain Mouse Bush)

Photo

Vulnerable (EPBC)

Near Ballandean in the Granite Belt of Queensland – two areas 20 km apart

As the flowers age they change colour from creamy white to pale shades of red

Threats - land clearing, altered fire regimes, grazing and invasive weeds

Stop 3 – grassy woodland garden

Yellow box – red gum grassy woodland

(White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland)

Critically endangered (EPBC)

- Probability of extinction is at least 50% in the *immediate* future

Endangered (NSW, ACT)

- Note different level of listing in NSW and the ACT versus the Commonwealth

Western slopes and tablelands of the Great Dividing Range from S Qld through NSW to central Vic.

The ACT contains the largest remaining remnants in good condition

Threats - clearing and urbanization + usual

Home to threatened fauna and birds, e.g. superb parrot

Some of the plants within a threatened ecological community are threatened, others can be quite common – for example:

- *Rutidosia leptorhynchoides* (Button wrinklewort) is a little yellow daisy and is endangered
- *Chrysocephalum apiculatum* (Common everlasting, yellow buttons) is another little yellow daisy but occurs in all States and Territories, in a wide range of environments

Description:

- Species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance of White Box, Yellow Box or Blakely's Red Gum trees
- Widely-spaced trees of medium height in which the canopies are clearly separated

Other threats:

- Weeds
- Pest animals
- Dieback
- Inappropriate grazing regimes
- Inappropriate fire regimes
- Climate change

Rutidosia leptorhynchoides (Button wrinklewort)

Endangered (EPBC, NSW, Vic, ACT)

Location:

- Now restricted to 11 tiny sites in south-western Victoria and in Canberra and Queanbeyan
- One of the ACT sites is Stirling Ridge, across the lake near Parliament House

Threats:

- Erosion of genetic diversity and increased inbreeding
- Lack of Genetic Diversity in Small Populations
- Genetic incompatibility

Genetics:

- Extensive research done on its genetics by Andrew Young and others at CSIRO
- Two chromosomal races
 - diploid populations that are spread across the whole range
 - tetraploids in the south-west of the species range in Victoria
 - reduced fertility if the two races interbreed
- Self-incompatibility systems
 - Are there to prevent inbreeding
 - Work effectively in large, genetically diverse populations
- Button wrinklewort is self-incompatible
 - But most populations are small and fragmented
 - Resulting in a reduction in fertilization within these populations
 - Suggesting that conservation strategies should

- focus on maintaining population sizes above 200 plants, and
- future re-establishment efforts should source seed broadly
- obtain information about the genetic composition of all populations
- also seed collection for translocation projects should be from a selection of plants each located several metres apart to minimise the relatedness of progeny

NSW Saving Our Species plant

Threatened Species Commissioner priority plant

Other threats:

- Decline in its habitat (box gum woodland and natural temperate grasslands, both critically endangered)
- Clearing
- Heavy grazing
- Weed invasion
- Competition with other understorey vegetation
- Shading and competition from eucalypt and shrub regeneration
- Inappropriate fire regimes
- More frequent drought from climate change

Swainsona recta (Small Purple-pea)

Endangered (EPBC, NSW, ACT)

Only small populations, 3 in the ACT, 4 in central eastern NSW, extinct in the wild in Vic

- Over 80% of the southern populations are on railway easements

Conservation measures:

- Been re-introduced to at least ten sites in north east Victoria
- ANBG actions:
 - Discovered how to germinate the seed
 - created a seed orchard of Small Purple Pea to produce seed and bulk up stocks for propagation
 - for later planting out in various areas in the ACT and supplement existing populations
 - including a biodiversity offset block in Williamsdale and the *Wandiyali Swainsona* Project
- *Wandiyali Swainsona* Project (in conjunction with the Threatened Species Commissioner) is
 - Protecting existing populations
 - Management of existing populations involves Greening Australia, Conservation Volunteers Australia, Canberra Nature Map, Queanbeyan Landcare and the Molonglo Catchment Group
 - Translocating 300 seedlings from the ANBG to establish a new self-sustaining population near Queanbeyan

Threatened Species Commissioner priority plant

Threats:

- trampling/grazing by cattle, sheep, goats and feral pigs
- weeds, mainly exotic grasses
- erosion, e.g. of railway embankments where it is growing
- genetic erosion and inbreeding
- small size and fragmentation of remaining populations

Lepidium ginninderrense (Ginninderra peppergrass)

Endangered (EPBC, ACT)

Two populations

- First found was in Belconnen Naval Station – about 1,700 plants
 - Will eventually become part of a reserve when the Commonwealth hands it over to the ACT government

- Second discovered in 2012 in a paddock in Franklin (ACT) containing disturbed grassland and remnant Box-Gum Woodland – about 380 plants across 12 sub-populations
 - an offset block for the Dudley St (Yarralumla) upgrade

Belongs to the cabbage (Brassicaceae) family

The ANBG is collecting, researching and growing the plant's seeds to secure its survival

Threats:

- Clearing and development
- Overgrazing

Stop 4 – northern steps, VIC

Brief pause here

Eucalypt fact:

- Of the over 800 eucalypts in Australia, 61 species (7.6%) are listed as endangered
- Together with another 13 subspecies

Eucalyptus imlayensis

Endangered (EPBC). Critically endangered (NSW)

A single location, at Mt Imlay National Park, near Eden, NSW. Area is less than 4 km²

Threats include increased frequency or severity of drought/climate change

Description:

- Mallee tree to 7 m tall, with smooth bark
- Has a lignotuber (which enables regrowth)
- Establishment from seed is likely to be a rare event - no seedlings or immature plants recorded in the population during studies since Dec. 1998.

Other threats:

- Possibly dieback (*Phytophthora cinnamomi*)
- Possibly insect attack

Eucalyptus langleyi (Green Mallee Ash, Nowra Mallee, Nowra Mallee Ash, Albatross Mallee)

Vulnerable (EPBC). Endangered (NSW)

Small area of scrubland near Nowra

- Initially 32 trees, now only 20
- 3 clumps of trees destroyed during pipeline construction in 2000
- Establishment from seed is likely to be a rare event

Threats include

- highly vulnerable to fire and drought due to small population
- damage to new growth by recreational users in area

A targeted strategy has been developed, which includes

- Design and maintain walking tracks to minimize risk of recreational user damage
- Fire management
- Weed control
- Enrichment planting

Discovered by Laurence Joseph Langley, a foundation member of the ANPS and the founder of the Australian Seed Company

Other threats:

- weed invasion

Stop 5 – Banks walk

In the pipe:

Boronia repanda (Repand Boronia, Border Boronia, Granite Rose)

Endangered (EPBC, NSW, Qld)

Nine populations on the Stanthorpe Plateau (Qld) and one population in NSW

Threats:

- removal of undergrowth for fire reduction purposes
- quarrying
- Inappropriate seed collection

No populations are managed in conservation reserves

Threats:

- [vegetation clearing](#)
- [inappropriate fire regimes](#)

***Prostanthera junonis* (labelled *marvifolia*)** (Somersby mintbush)

Endangered (EPBC, NSW)

Somersby Plateau in the Gosford and Wyong area

Threats:

- Impact from vehicles, people, rubbish dumping

NSW Saving Our species plant

Threats:

- [Habitat loss due to clearing for urban development and roads](#)
- [Weed invasion](#)
- [Inappropriate fire regimes](#)

Eucalyptus morrisbyi (Morrisby's Gum, after the owner of the property where it was found)

Endangered (EPBC, Tas)

South east Tasmania from 4 locations, the two main ones being 21 km apart – in the Government Hills near Risdon, and the fragmented Cremorne subpopulation

Seedlings take about 10 years to produce flowers (a long time for eucalypts)

Threats:

- clearing and fragmentation for road improvement

Conservation:

- The Risdon stand no longer produces seed and can be considered functionally extinct. However some reproduction from lignotubers has occurred
- Seed orchard established in mid 1990s
- Extinction in short term unlikely due to ex situ and ornamental plantings – since 1987, hundreds of seedlings have been planted along roads, on private property near Cremorne and propagated at the Tasmanian Royal Botanic Gardens
- Genetic analyses being undertaken

Threatened Species Commissioner priority plant

Other threats:

- [Relatively susceptible to drought](#)
- [Weeds and competition with other plant species](#)
- [palatable to insect and vertebrate browsing](#)

Banksia vincentia

[photo]

In pipe on other side of *E. morrisbyi*

Critically endangered (EPBC, NSW)

One site at Vincentia, Jervis Bay

Grows in low sedgeland and grassy heath

Threats:

- Extremely small population size
- Weed invasion
- Impact of road maintenance and urban development
- Poor knowledge about the species, including the impact of fire on it
- Soil pathogens

Other:

- Initially discovered in 2008 – 14 plants
- Now down to 4 plants
- NSW Saving Our Species plant
- Threatened Species Commissioner priority plant
- ANBG work includes
 - Cultivating 45 plants
 - Working with other botanic gardens, Parks Australia, Booderee NP and the NSW Office of the Environment and Heritage to establish 800 plants in a new orchard in Booderee NP near Vincentia
 - Studying the genetic diversity of *B. Vincentia*, including
 - Determining the level and impact of hybridisation in *Banksia vincentia* and its potential impact on the fitness of natural as well as translocated populations;
 - Getting an understanding of the genetic health, and genetic diversity in *Banksia vincentia*;
 - Determine kinship of seedlings, and verify identity of cutting material;
 - Determine ideal material to be used in translocation.

Stop 6 – path leading up to café entrance

[photo]

In pipes:

Astelia Australiana (Tall Astelia)

Vulnerable (EPBC, Vic)

Victoria – upland plateaus in central Vic

Description:

- Flowers green (female) and maroon (male) – separate and may be on different plants
- Male flowers have a foetid smell
- Female flowers with rudimentary stamens sometimes produce fruit without fertilization
- Largely reliant of vegetative reproduction – pollination vectors are unknown
- Plants form large colonies on humus-rich waterlogged soils in *Nothofagus* and *Eucalyptus regnans* forests

Threats:

- Wildfires (fire sensitive species)
- Loss of habitat
- Impact of nearby timber harvesting
- Competition from other plants
- Possibility of future damage from visitors or collectors

Other:

- Association with *Nothofagus* reflects its ancient origins in the rainforests of Gondwana
- Good frog habitat

Seed bank

Point out seed bank as we pass it

Stop 7 – gymnosperms

Wollemia nobilis (Wollemi Pine)

Critically endangered (EPBC)

A relict species confined to remote gullies in Wollemi National Park, NSW

Description:

- Extremely long lived
- Male and female cones born on the same tree
- No detectable genetic variation – appears to be clonal

Threats:

- susceptible to pathogens such as dieback (*Phytophthora cinnamomi*)

Other:

- Discovered by bushwalker David Noble in 1994
 - At that time it was only known from the fossil record
- Its family (Araucariaceae) became extinct in the northern hemisphere by the end of the Cretaceous, and declined with the cooling and drying during the northward movement of Australia
- NSW Department of Environment and Climate Change make available a significant supply of commercially available clonal Wollemi Pine specimens to the public to
 - discourage the threat of illegal collection
 - raise royalties for the conservation of this species and other endangered plants in NSW

Other threats:

- Known from one population only, of fewer than 100 adult trees in several stands and about 200-300 seedlings
- very low diversity
- Crimson Rosellas, rats and marsupials eat some of the seedfall

Pause at *Ziera* just past the Wollemi pine

Note: *Ziera prostrata* is also along Banks walk

Ziera facts:

- All bar one endemic to Australia
- Of the 60 species, 21 (35%) are listed as endangered

Ziera prostrata (Headland *Ziera*)

Endangered (EPBC)

Four headlands near Coffs Harbour – exposed southerly aspects

Description:

- Soil seedbank has a short lifespan and extremely low viability
 - Reproduces vegetatively – seedlings rarely seen

Threats:

- Adult plants killed by fire
- Seed predation

Other:

- Cultivar known as Carpet Star is readily available
 - Its flowers attract bees and beneficial insects
 - Good ground cover

Mention the following

Ziera citriodora (Lemon-scented *Ziera*)

Vulnerable (EPBC)

Two populations in the Kybean Range east of Cooma, NSW and four in north-east Victoria

Threats:

- Browsing by native herbivores and domestic stock
- Disturbance from off-road vehicles

Other:

- Has a pleasant perfume
- ANBG has recently banked a seed collection for it, as part of the Partnership is the 1000 Species Project
- Could potentially be bred in large enough numbers to be released to nurseries, providing money for conservation
- Victorian populations discovered in 1988

Point out as pass it at bottom of first steps into the rock garden

Stop 8 – Rock garden

Pause at top of these steps

Homoranthus facts:

- The family is closely related to *Darwinia*
- All are endemic to Australia
- Of the 31 species, 7 (23%) are listed as threatened-

Homoranthus darwinoides

Vulnerable (EPBC)

Western slopes and central tablelands regions of NSW

Description:

- Flowers throughout the year with graceful yellow and pink flowers
- Found in threatened Box Gum Grassy Woodland Ecological Community

Threats:

- inappropriate fire regimes

Other threats:

- feral animals
- grazing
- habitat loss impacts

Stop just past footbridge overlooking pond

Is everything that is rare /on the decline listed? No

- Some threatened species are already in National Parks
- Needs someone to pull together the data and put in a submission meeting the criteria

Eucalyptus lacrimas (Weeping Snowgum; Adaminaby Snowgum)

Restricted to localized patches on the high plains near Kiandra and Adaminaby

Rare but not listed as threatened – is it a species that will be listed in the future?

Threats:

- Small population

Other:

- Originally a subspecies of *E. pauciflora* and likely to hybridise with it
- Species name means weeping, referring to the pendulous branches
- Profuse flowering of small delicate white flowers spring
- An attractive plant for high altitude gardens

Eucalyptus scoporia (Wallangarra White Gum)

Vulnerable (EPBC). Endangered (NSW)

3 locations in NSW near Tenterfield. 3 locations on the Stanthorpe Plateau in Qld.

Only one Qld population has more than a dozen trees

Small tree to 15 m

- ANBG specimen unusually large, possibly due to a good underground water supply from the nearby pond

Threats:

- clearing for agriculture
- damage to seedlings by walkers off tracks

A good small tree for street and park planting – also as an ornamental for its attractive bark

Other threats:

- lack of knowledge of key threats and distribution

- timber collection
- fire

Stop 9 – Acacia section

Acacia facts:

- Of the 1,350 wattles found in Australia, 70 (5%) are listed as threatened
- And a further 7 subspecies are threatened

On right just before path off to the left (about half way up bitumen path)

Acacia pycnostachya (Bolivia Wattle)

Vulnerable (EPBC, NSW)

Two extensive populations south of Tenterfield

Threats:

- Feral goat populations, through browsing and degradation of the rocky habitat.
- NSW Saving Our Species plant

Threats:

- [Inappropriate fire regime](#)
- [Clearing for agriculture or for roads, powerlines, etc.](#)

Point out down side path

Acacia terminalis subsp terminalis (Sunshine Wattle)

Endangered (EPBC, NSW)

Very limited range, mainly in near-coastal areas from the northern shores of Sydney Harbour south to Botany Bay

Threats:

- urban development
- impact of recreational use of areas
- rubbish dumping

NSW Saving Our Species plant

Other threats:

- [fire](#)
- [weed invasion](#)

When reach Eucalypt lawn, head across to right just missing the rock jutting out from the garden to the right – aim for the saplings on the edge of the Eucalypt lawn to pick up the path across the Sydney region gully

Stop 10 – Conservation and Research garden

Purpose of this garden

- Have open to the public an area dedicated to threatened species that would be educational and promote interest in conservation
- Contributes to the conservation of many species that are not easily stored as seed.
- The plants will be used to grow new plants for reintroduction into their natural home
 - Detailed information that links each plant growing here to its parent plant in the wild is kept
 - Which gives knowledge about the genetic diversity within our collection

Content of the Conservation and Research Garden

- Initially, threatened plants that are endemic to areas of NSW or which are relatively local
- Also plants where seeds are not at all or not often produced in the wild or are unsuitable for seed banking
 - e.g. fleshy seeds unable to survive the drying and freezing process used
- More species will be added to the garden from time to time and some may be withdrawn
- Many of the species were collected by taking cuttings by necessity
 - But a benefit is that the resultant plants reach flowering much sooner compared with plants grown from seed
- Cuttings were taken from plants in as wide a range as possible of populations in the wild to provide the basis for a living conservation bank

Fenced area at the back

- Used to grow some of these plants for insurance backup (particularly when seeds can't be stored in the National Seed Bank) and for seed collection

Conservation uses

- Once the new plants reach maturity, their seeds can be replanted in the wild
- Or cuttings taken from the ANBG ones can be grown on for reintroduction to the wild.
- The ANBG keeps track of individual clones to allow return to the wild at an appropriate spot
 - In consultation with the other responsible bodies for each species
- Horticultural research
 - Investigation of germination
 - Plant requirements
- Scientific research
 - Genetics
 - Plants available for accurate identification

Prostanthera askania (Tranquility mintbush)

Second plant past big sign

Endangered (EPBC, NSW)

Limited range in the Wyong and Gosford area

Likely to become extinct in the wild due to low plant numbers and urban spread

Threats:

- Dumping of rubbish
- Trampling by people, rock removal, damage from trail bikes
- Usual - urban development, weeds, inappropriate fire regime, dieback, climate change

Grevillea beadleana (Beadle's Grevillea)

On left near gum tree

Endangered (EPBC, NSW)

Four separate areas in NSW, e.g. National Parks in the Tenterfield, Grafton and Armidale areas

Threats:

- Illegal collection of flowers

Excellent ornamental, and quickly made its way into nurseries
Has grown so well in the nursery that it has been translocated to Oxley Wild Rivers NP

Other threats:

- small population size
- Inappropriate fire regimes
- Clearing for development
- Browsing and trampling by stock and feral goats, and trampling by humans

Grevillea guthrieana (Guthrie's grevillea)

On right opposite and a bit down from *Grevillea beadleana*

Endangered (EPBC, NSW)

In the Bulahdelah, Kempsey and Armidale areas

Threats:

- Encroachment by privet
- Changes in land use and clearing

Specimens collected as part of a Bush Blitz trip, where the ANBG collaborated with NSW Parks and Wildlife and others

Other threats:

- Inappropriate fire regime
- Root rot fungus
- Stock damage

Pimela venosa (Bolivia Hill Pimelea)

Further down on left, past the tree

Endangered (EPBC, NSW)

Only the Bolivia Hill area south of Tenterfield.

Threats:

- Population size
- Grazing, clearing or fire could easily wipe out the remaining population

Other:

- On verge of extinction in the wild
 - Surveys at known sites in 1999 and wildfire sites surveyed in 2012 found no plants
 - One new population found in 2012
- Nine plants were germinated from the last remaining known population in the wild
 - These were cloned and distributed to the Royal Botanic Gardens Sydney and the ANBG
 - To be tested genetically to determine the degree of genetic variation amongst them
 - Hopefully, eventually a genetically diverse population can be successfully re-established in the wild

Other threats:

- Stems attacked by caterpillars

Asterolasia elegans

Further down on the right past a tall sprinkler

Endangered (EPBC, NSW)

Just to the north of Sydney

Threats:

- Pollution and runoff from sewage treatment plants and stormwater
- Plus the usual

Other threats:

- Inappropriate fire regime
- Clearing for urban and rural development

- Rubbish dumping
- Weeds
- Trampling and bush rock removal
- Grazing

Stop 11 – main path (Proteacea, section 27)

At corner on road

Grevillea flexulosa(Zigzag Grevillea; Tangled Grevillea)

Vulnerable (EPBC). Rare (WA)

Within a small area east of Perth, , in the Jarrah Forest biographic region

- presumed extinct until rediscovered

Lemon or creamy white flowers are perfumed and attract butterflies, insects and nectar-feeding birds

Threats:

- Dieback from *Phytophthora cinnamomi*
- loss of habitat

A few feet further along in the newly planted part of the *Banksia* section (opposite the stringybark)

Banksia facts:

- Of the 173 *Banksias*, 14 (8%) are listed as threatened
- And another 5 subspecies are also threatened

Banksia brownie(Feather-leaved Banksia)

Endangered (EPBC). Rare (WA)

Esperance Plains and jarrah forest, south-west WA. In 2 populations between Albany and the Stirling Range

Only one seed per follicle (most Banksias have more)

Threats:

- *Phytophthora* and *Armillaria* infections, spread mainly by human activity

Other:

- very good provider of nectar for birds, mammals and insects
- 4 threatened bird species live in the same habitat: Western Ground Parrot, Western Bristlebird, Western Whipbird and Noisy Scrub-bird
- In cultivation at the ANBG and at Kings Park and Botanic Garden in Perth
- Being grown commercially for its attractive foliage

Other threats:

- loss of habitat due to land clearing, commercial exploitation
- changes to fire regime
- *Phytophthora* infection in 2 populations and *Armillaria* infection in one. Pathogens spread mainly by human activity

Stop 12 – Pomaderris garden

Stop is along outside path when reach Pomaderris Bodalla label (not far along)

[photo]

Pomaderris facts:

- About 70 species of *Pomaderris*, 65 in Australia and 10 in New Zealand (some overlap)
- Of the 65 species in Australia, 11 (17%) are listed as endangered
- Plants are characterised by their abundant and often spectacular cream-yellow flowers produced in spring.
- Shrubs or small trees with hairy young growth
- Genetics
 - Many species of *Pomaderris* have three or more sets of chromosomes (polyploidy), which
 - ensures that plants remain ideally suited for present conditions, but
 - may make them vulnerable as conditions change, because they lack the diversity to adapt.

Aims of the *Pomaderris* Garden

- To focus on what is significant about Pomaderris, as a genus, its rarity and distribution
- To raise public awareness of this little-known genus and to inspire gardeners to grow them, showcasing a number of frost-tolerant species from south-eastern Australia including several that are rare and endangered
- to inspire visitors to grow Pomaderris by a display that is representative of home gardens, e.g. as a hedging and screening plant

Establishing the garden

- Collecting cuttings from the wild (wild seeds are rare and not viable)
- Establishing a seed orchard for these species in the ANBG
- A trial seed orchard established near Nerriga
- Over 500 shrubs planted near Tarago and Goulburn to improve the viability of local populations
- Bee pollination in screen-meshed tents to prevent cross-pollination and hybridisation

First one on right

Pomaderris Bodalla (Bodalla Pomaderris)

Vulnerable (NSW)

Between Bodalla and Merimbula, and near Muswellbrook

Threats:

- disturbance from logging operations
- plus usual

Other threats:

- from road maintenance and residential development
- inappropriate fire regimes
- livestock trampling and grazing
- Small population

Down a bit further, small

Pomaderris pallida (Pale Pomaderris)

Vulnerable (EPBC, Vic)

In and around the ACT, found recently in eastern Vic

Threats:

- rural residential development
- Feral browsers: deer, goats and horses

- Flood damage (riparian species along Murrumbidgee, Queanbeyan, Shoalhaven and other rivers)

Other threats:

- [weed invasion](#)
- [Inappropriate fire regimes](#)
- [Flood damage](#)

Just past CSIRO gate sign

Pomaderris brunnea (Brown Pomaderris)

Endangered (NSW), vulnerable (Vic)

Limited areas near the Colo, Hawkesbury and Nepean rivers, near Walcha on the New England tablelands and in far eastern Gippsland, Vic

Threats:

- Usual – urban development, inappropriate fire regimes, trampling by people, forestry activities, weed invasion, grazing by deer, cattle and macropods

Next one along

Pomaderris walshii (Carrington Falls Pomaderris)

Critically endangered (NSW)

Upper catchment of Kangaroo River, Budderoo NP

Threats:

- Flooding (natural)
- Small population

Collaboration of several botanic gardens sharing propagated material, to minimize the risk of disaster – ANBG Canberra, Budderoo, Mt Annan, Wollongong

Other threats:

- [Inappropriate fire regimes](#)
- [grazing by sheep and cattle](#)

Just before the road sign (facing the other way)

Pomaderris cotoneaster (Cotoneaster Pomaderris)

Endangered (NSW), threatened (Vic)

NSW, western slopes and near the coast in south eastern NSW. Limited distribution in Gippsland

Threats:

- Damage along walking tracks due to public use
- Browsing by goats

Other threats:

- [Weed invasion](#)
- [Inappropriate fire regimes](#)

Stop 13 – paperbark treehouse

Stop where the *Melaleuca* stand starts (at the tall sprinkler)

Melaleuca ericifolia swamp forest

Threatened (Tas)

Occurs in a narrow strip at the fringe of saltmarsh, lagoons and rivers, in sites poorly-drained or intermittently waterlogged.

Description: pure or almost pure stands of *Melaleuca ericifolia* (coast paperbark) with trees forming a dense (generally even-aged) canopy over a simple, sedgely understorey

Threats:

- clearance
- unplanned frequent fire
- extreme stock disturbance
- logging

Other:

- This ecosystem is not listed nationally or in other States
- However, other similar coastal communities are threatened
 - E.g. Coastal Swamp Oak (*Casuarina glauca*) Forest of NSW and SE Qld ecological community, which contains *Melaleuca ericifolia* (and other *Melaleuca* species)

End of walk

Lawn outside the café

On this walk we have only seen a few of the 300 threatened plants growing within the ANBG. I hope that I have

- Given you an appreciation of these threatened plants and a couple of threatened plant communities
- Increased your understanding of the range of threats to the ongoing survival of these plants and plant communities
- Shown you some of the ways the ANBG is contributing to the conservation of them
 - If you are a Friend I hope this walk has fleshed out some of the articles you've seen in Fronds about this work

Leave out

Stop 14 – main path (Myrtaceae, section 11)

Melaleuca formosus (previously *Callistemon formosus*) (Kingaroy Bottlebrush, Cliff Bottlebrush)

On right a bit up along main path

Near threatened (Qld)

Near coastal districts in south-eastern Queensland, in rocky places in or near rainforests. Also in north-eastern NSW.

Threats:

- Very small distribution. However it is easily propagated from seed or cuttings

Other:

- Grown as a street tree in Kingaroy – recommended as a shrub to be grown beneath power lines
- Formosa means ‘beautifully formed’ or ‘handsome’

Kunzea rupestris

Opposite clump of 3 pipes, on right. Check that it is still alive

Vulnerable (EPBC, NSW)

Twenty populations between Lower Portland and Kuring-gai Chase N.P

Threats:

- Damage to plants for the cut flower industry.
- Hybridisation with *Kunzea capitata*.

NSW Saving Our Species plant

Other threats:

- Track maintenance.
- Fire suppression activities.
- Sedimentation and subsequent competition.
- Weed encroachment.
- Destruction of habitat by soil and sand extraction.
- Local extinction from stochastic events such as drought
- Recreational users accessing trails and creating new trails, damaging habitat.
- Removal of bushrock removal which provides habitat to the species
- Threat of land clearing for rural residential

Homoranthus proxilus (Granite Homoranthus)

On left just past clump of 3 pipes

Vulnerable (EPBC)

Six populations between Inverell and Bendemeer in northern NSW

Threats:

- Trampling by bushwalkers
- Plus usual

Other threats:

- clearing and fragmentation of habitat
- browsing and trampling by feral goats and pigs
- road construction and maintenance
- frequent fires
- weed invasion
- localized extinction due to small populations with scattered distribution

Walk route



