

**Submission  
No 717**

## **INQUIRY INTO ECOSYSTEM DECLINE IN VICTORIA**

**Organisation:** Goulburn Valley Environment Group

**Date Received:** 31 August 2020

*This submission describes a case study in which the decline of 39 threatened plant species in the eastern Northern Plains is recorded and reasons for their decline were investigated.*

Threatened Plants of the eastern Northern Plains, 2020 is a pamphlet that provides an overview of the project and describes the plants and places that were assessed (File attached).

More than twenty years ago, as consultants for Goulburn Valley Environment Group (GVEG), we undertook two major assessments of the conservation status of flora and fauna in the Eastern Northern Plains of Victoria, publishing two reports:

Natural Values of the Public Lands Along the Broken, Boosey and Nine Mile Creeks of Northeast Victoria, 1996

<https://static1.squarespace.com/static/5d3987f9db867f0001b1bb82/t/5d7d776f9a3d416fbae148f3/1568503676495/Natural+Values.pdf>

Priorities for Nature Conservation Reservation and Management in the Eastern Northern Plains of Victoria, 1998

<https://static1.squarespace.com/static/5d3987f9db867f0001b1bb82/t/5d7d7930a0accb2d2c9fcdac/1568504119674/PRIORITIES+FOR+NATURE+CONSERVATION.pdf>

In the years since, many of the recommended changes to conservation status have been achieved, notably the creation of Barmah National Park, Lower Goulburn National Park, Warby-Ovens National Park and Broken-Boosey State Park. As well, many practical conservation actions such as fencing, woody weed control, pest control, planting and signage were undertaken by community groups, ParksVictoria and the Goulburn Broken Catchment Authority on these sites over that time.

In 2017 GVEG received a Victorian Government Biodiversity On-ground Action Grant – Community and Volunteer (BOA2017CA373) to look at how the threatened flora populations identified in those 1990s studies had responded to the changed land tenure and changed management.

The 2017-2019 study focussed on the fate of 157 threatened plant populations at the 22 best quality sites.

Of these,

- **54 populations had disappeared** (32 of these populations were palatable species dependent on seasonal moisture – it is likely that some might re-appear in a wet year, but because of climate change their future is bleak)

- **36** populations were still present but had **declined** in numbers
- **38** had **maintained** their numbers (these were mostly populations of just two species)
- Only **28** populations had **increased** their numbers.

In other words, 57% had disappeared or declined, 24% had stayed the same and only 18% had improved despite many of the sites changing from Crown land reserves grazed under licence to State Park and Nature Conservation Reserve management.

Because we assessed multiple populations of species at different sites, we could compare the consequences of different management actions.

Overall, improvements occurred where:

- **Stock grazing was removed.**
- **Sites were fenced from stock and vehicles.**

Declines happened where:

- **Stock grazing** continued, causing native species to be replaced with pasture species.
- **Vehicles** had access and crushed vegetation.
- **Rubbish** was dumped introducing weeds and providing harbour for pest animals.
- **Earthworks** occurred - the construction of roads, drains, flood levees and mobile phone towers, the installation and maintenance of underground services, track-making and waste soil dumping all led to the permanent replacement of native vegetation with weeds.
- **Changes to hydrology** occurred – swamp drainage, diversion of water from roads and paddocks, unseasonal irrigation flows in creeks and leakage from irrigation channels all encouraged weed invasion.
- **Weed invasion** went unchecked and out-competed native plants.
- **Dense regeneration of eucalypts** occurred after grazing was removed. The natural spacing of Grey Box and River Red Gums in grassy woodlands is about 10 per hectare (DELWP Benchmark for Vegetation Quality Assessment). When dense saplings (often thousands per hectare) are not thinned they eliminate ground layer vegetation with heavy leaf litter and fierce competition for moisture.
- **Kangaroo, deer, hare and rabbit grazing** had high impacts at a few sites, but generally there were fewer kangaroos across the landscape.
- **Camping with horses** occurred and plants were eaten or crushed and weeds and nutrients were introduced in their droppings.

Increasing the stresses to threatened plants over that time were also two broad-scale changes:

- **Climate change.** During this period the Millenium Drought occurred and temperatures steadily increased (half of the years reached more than 1 degree above average and last year was more than two) and
- **The change from stock grazing to cropping** on the plains with the consequent loss of trees and introduction of large volumes of chemicals (fertilisers, herbicides, pesticides, fungicides, rodenticides) to the broader landscape. It has also become common across the region for cropping farmers to remove roadside vegetation with herbicide, making the remnant vegetation surviving on public land even more rare.

On the basis of our observations we recommended a number of actions that would be required to secure these populations of threatened plants:

- **Fencing** of sites to prevent timber removal, damage from vehicles, rubbish dumping, stock grazing, horse camping
- Control of **woody and perennial weeds**
- Control of **annual weeds** and excessive eucalypt regeneration **using fire**
- **Noticeboards** to explain the values of the sites.

The managers of these public lands (ParksVictoria, Moira Shire, DELWP) expressed concern at our threatened plant findings and have shown a willingness to take actions to improve conservation outcomes.

#### **Unfortunately they were unable to achieve much.**

I have tried to summarise why I think this is the case.

1. A lack of allocated funding for conservation work – specifically the care that threatened species require.
2. A lack of dedicated trained staff to supervise or undertake conservation work.
3. Some short-term funding from other programs was directed towards improvements at these reserves, but little of what was required was achieved.
4. The nature of most conservation funding - short term, competitive, directed towards the community or overseen by individuals without detailed conservation knowledge - means it cannot be effective. Only long-term work by staff who can get to know the sites they look after, based on research and using adaptive management can achieve the improvements required.
5. Some reserve management categories meant that conservation needs were seen to conflict with recreational needs. For example, DELWP would not allow the fencing of a Streamside Reserve and a Wildlife Reserve to protect Nationally Endangered plant populations from off-road vehicles as it was seen to conflict with recreational user needs.
6. An inability to utilise fire for conservation purposes. Ecologically appropriate fire is an essential tool for restoration in grasslands and grassy woodlands as well as a basic management requirement. Parks Victoria

staff are not permitted to undertake the many small-scale cool burns required to reduce weeds and leaf litter and to promote the germination of native species. Such burns would have the added benefit of reducing volumes of fine fuel and producing more green matter over summer, which could greatly reduce the risk of wildfire on public land.

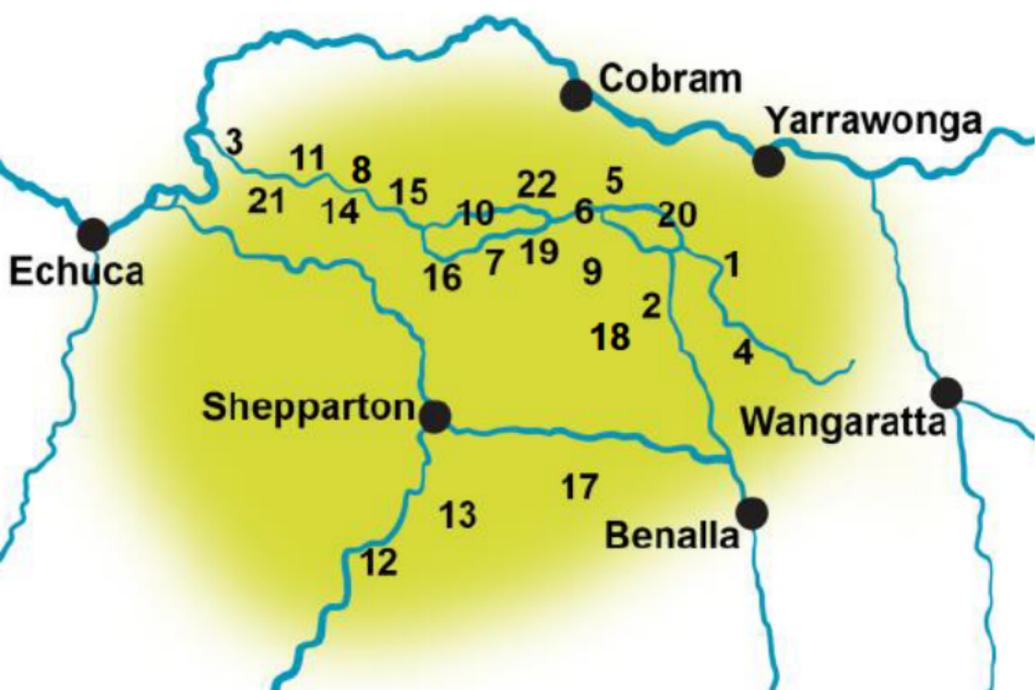
7. Forest Fire Management Victoria (FFMV) are reluctant to allow others such as the CFA or indigenous fire crews to utilise fire on their land.
8. Because FFMV are set up to conduct burns for risk reduction purposes, their burns tend to be too large, too hot and involve the construction of breaks to the permanent detriment of native vegetation. They do not have the resources to conduct the many burns required each season in our many small reserves and tend to focus on locations where the perceived risks of wildfire are greatest, rather on where the conservation needs are greatest.

**Under the current landscape and climate stresses and without active protection and management, I believe there can be no doubt that the current losses of threatened plants will continue and accelerate.**

**An urgent injection of funds and staff and changes to rules to allow ecological burning will be essential if we are to save our rapidly disappearing nature.**

# Threatened Plants

*of the eastern  
Northern Plains*



- |   |   |
|---|---|
| <b>1</b> Three Chain & Kreeck Roads, Tungamah       | <b>12</b> Murchison Golf Course                   |
| <b>2</b> Moodies Swamp Wildlife Reserve             | <b>13</b> Arcadia Nature Conservation Reserve     |
| <b>3</b> James Bridge Streamside Reserve            | <b>14</b> Barwo, Nathalia Natural Features Res    |
| <b>4</b> Rowan Swamp Wildlife Reserve               | <b>15</b> Galts Bridge, Numurkah NFR              |
| <b>5</b> Katamatite, Broken Boosey State Park       | <b>16</b> Wunghnu Common, Broken Boosey SP        |
| <b>6</b> Hester Rd, Broken Boosey State Park        | <b>17</b> Caniambo Nature Conservation Reserve    |
| <b>7</b> Drumanure, Broken Boosey State Park        | <b>18</b> Katamatite Road, Youanmite              |
| <b>8</b> Waaia Common, Numurkah NFR                 | <b>19</b> Harris Bridge, Broken Boosey State Park |
| <b>9</b> Youanmite Nature Conservation Reserve      | <b>20</b> Boosey Boulevard, Broken Boosey SP      |
| <b>10</b> Numurkah Rifle Range, Numurkah NFR        | <b>21</b> Bourkes Bridge, Nathalia NFR            |
| <b>11</b> Picola, Nathalia Natural Features Reserve | <b>22</b> Follets Bridge, Numurkah NFR            |

The eastern Northern Plains of Victoria were once entirely covered with grassy woodlands dominated by Grey Box River Red Gum forests and woodlands grew along the rivers and in the wetlands. There were also treeless grasslands in some areas.

Before invasion, all these grassy types of vegetation were maintained by frequent burning at low intensity by the indigenous people. They manipulated the country with fire for many purposes such as to protect old trees and fire-sensitive vegetation from wildfires, to stimulate the growth of food and medicine plants, to provide forage for meat animals or to prevent the growth of too many trees and shrubs.

Because the eastern Northern Plains are ideal for agriculture 99% of the original vegetation has now been cleared. Most of the remaining 1% is on public land such as conservation reserves, recreation reserves, rail reserves, stream frontages and roadsides.

Not surprisingly, these grasslands and woodlands are amongst the most threatened ecosystems in Australia. The Australian government lists

*Grey Box Grassy Woodlands of South-eastern Australia* as **Endangered** & *Natural Grasslands of the Murray Valley Plains* as **Critically Endangered**.

The little that's left has all been degraded by activities such as stock grazing, timber cutting, rubbish dumping, recreational use, the diversion of water to irrigation and the lack of fire. Pests and weeds are now common everywhere and the hotter and drier climate places additional stresses on the lives of native plants and animals. Many of those that depend on these bushland fragments are threatened too.

In 1994 & 1995 GVEG surveyed the largest area of grassy woodland left - the frontages of the Broken, Boosey and Nine-Mile Creeks. We found most of it to be of high conservation value. GVEG asked the Victorian government to change these areas (and other valuable remnants) from grazing lands to nature conservation reserves. GVEG also organised fencing to protect some of the most vulnerable vegetation.

In 2017 & 2018 GVEG re-surveyed the most important sites for threatened plants to see how they had fared over the last two decades.

The results were disturbing. 22 species had declined or disappeared with little prospect of return. 14 species could not be found because they failed to make any growth over two very dry seasons. They might return in a wet year but the threat to them will clearly be heightened by climate change. Only 18 of the 54 threatened species had maintained or increased their numbers and that was mostly due to active interventions such as fencing and weed control. GVEG is now working with land managers to find ways of better protecting our threatened plants so they can survive into the future.

***You can help by sharing this story and by lending a hand at your local site.***

# Changes to threatened plant populations at 22 public land sites in the eastern Northern Plains: 1995 to 2019

Submission 17

**Abbreviations:** **1** = site where population present, **1?** = site where formerly present, **ENP** = eastern Northern Plains, **Vic** = Victoria, **N, S, E, W** = north, south, east, west  
**E** = nationally endangered (EPBC), **L** = Listed (FFG Act 1988), **e, v, r** = endangered, vulnerable or rare in Victoria (DELWP), **k** = insufficiently known (DELWP), **d** = rare or declining in the region (GVEG), **n** = no longer considered threatened (DELWP)

Population increased

Population similar

Population declined

Population absent

Population absent but might re-appear if wet

| Name & status  | Current range                           | Likely causes of change                               |
|--|---|---|
| <b>Buloke</b><br><i>Allocasuarina leuhmannii</i> <b>L</b>                                  | Broadscale decline due to cropping      | Surviving where seedlings not grazed                  |
| <b>Plains Joyweed</b><br><i>Alternanthera</i> sp. <b>1 k</b>                               | Poorly known                            | Not apparent - too dry                                |
| <b>Spiny-fruit Saltbush</b><br><i>Atriplex spinibractea</i> <b>e</b>                       | ENP has only populations in Vic         | Removal of stock grazing                              |
| <b>Corkscrew Spear-grass</b><br><i>Austrostipa setacea</i> <b>d</b>                        | Widespread but still "rather rare"      | Not apparent - too dry                                |
| <b>Yellow-tongue Daisy</b><br><i>Brachyscome chrysoglossa</i> <b>v</b>                     | Scattered across Vic but rare           | Surviving where not grazed & without weed competition |
| <b>Lobe-seed Daisy</b><br><i>Brachyscome dentata</i> <b>d</b>                              | Rare in E Vic                           | Surviving where not grazed                            |
| <b>Inland Daisy</b><br><i>Brachyscome trachycarpa</i> <b>v</b>                             | Very rare - only 2 other records in Vic | Weed competition                                      |
| <b>Blue Grass-lily</b><br><i>Caesia calliantha</i> <b>d</b>                                | Only a few populations                  | Weed competition                                      |
| <b>Blue Burr-daisy</b><br><i>Calotis cuneifolia</i> <b>r</b>                               | Scattered across Vic but rare           | Surviving where not grazed or damaged by vehicles     |
| <b>Yellow Burr-daisy</b><br><i>Calotis lappulacea</i> <b>r</b>                             | Scattered across Vic but rare           | Surviving where not grazed or damaged by vehicles     |
| <b>Rough Burr-daisy</b> <b>d</b><br><i>Calotis scabiosifolia</i> var. <i>scabiosifolia</i> | Scattered across W Vic but rare         | Surviving where not grazed or damaged by vehicles     |
| <b>Clustered Everlasting</b><br><i>Chrysocephalum semipapposum</i> <b>d</b>                | Only a few sites in ENP                 | Stock grazing, vehicle damage                         |
| <b>Grey Billy-buttons</b><br><i>Craspedia canens</i> <b>e L</b>                            | Scattered across Vic, very rare         | Weed competition, drought                             |
| <b>Small Scurf-pea</b><br><i>Cullen parvum</i> <b>e L E</b>                                | 11 out of 13 pops in the ENP now absent | Grazing, vehicle damage, tree regeneration            |
| <b>Emu Foot</b><br><i>Cullen tenax</i> <b>e</b>  | Generally rare                          | Vehicle damage, tree regeneration, drought            |
| <b>Small Water-ribbons</b><br><i>Cycnogeton dubium</i> <b>r</b>                            | Rare - ENP is the stronghold            | Not apparent - too dry                                |
| <b>Yelka</b><br><i>Cyperus victoriensis</i> <b>k</b>                                       | Very rare - only 4 other records in Vic | Not apparent - too dry                                |
| <b>Slender Tick-trefoil</b><br><i>Desmodium varians</i> <b>k</b>                           | Poorly known, very rare in ENP          | Herbivore grazing, drought                            |
| <b>Late-flowering Flax-lily</b><br><i>Dianella tarda</i> <b>v</b>                          | Restricted to ENP & central N Vic       | Surviving where not grazed                            |
| <b>Cotton Panic</b><br><i>Digitaria brownii</i> <b>k</b>                                   | Rare in Vic. Only 1 known pop in ENP    | Surviving where not grazed                            |
| <b>Golden Moths</b><br><i>Diuris chryseopsis</i> <b>d</b>                                  | Very rare in ENP                        | Weed competition                                      |
| <b>Pale Spike-rush</b><br><i>Eleocharis pallens</i> <b>k</b>                               | Rare - only in N Vic & near Melb        | Not apparent - too dry                                |
| <b>Southern Cane-grass</b><br><i>Eragrostis infecunda</i>                                  | Now more widespread                     | Reduced stock grazing                                 |
| <b>Amulla</b><br><i>Eremophila debilis</i> <b>e</b>  | Only 1 population in Vic                | Reduced stock grazing                                 |
| <b>Berrigan</b><br><i>Eremophila longifolia</i> <b>d</b>                                   | More common in W Vic, rare in E Vic     | But many populations unhealthy                        |
| <b>Long Eryngium</b><br><i>Eryngium paludosum</i> <b>v</b>                                 | Rare - only N central Vic               | Not apparent - too dry                                |

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|--|---|--|
| <b>Spreading Eutaxia</b><br><i>Eutaxia microphylla</i> var. <i>diffusa</i>         | More common in W Vic, uncommon in E Vic                 | Reduced stock grazing                          |
| <b>Swamp Star</b><br><i>Hypoxis exilis</i> v                                       | Very rare in Vic & rare in NSW                          | Not apparent - too dry                         |
| <b>Woolly Buttons</b><br><i>Leiocarpa panaetioides</i> d                           | More common in W Vic, rare in E Vic                     | Reduced stock grazing                          |
| <b>Austral Lotus</b><br><i>Lotus australis</i> k                                   | Scattered in Vic, many ENP populations gone             | Herbivore grazing, tree regeneration           |
| <b>Leafless Bluebush</b><br><i>Maireana aphylla</i> r                              | Rare in NW Vic, only 2 plants in ENP                    | But no regeneration has occurred               |
| <b>Hairy Bluebush</b><br><i>Maireana pentagona</i> d                               | Uncommon in NW Vic, rare in ENP                         | Weed competition, stock grazing                |
| <b>Murniong</b><br><i>Microseris walteri</i> d                                     | Widespread in Vic, very rare in ENP                     | Weed competition, herbivore grazing            |
| <b>Smooth Minuria</b><br><i>Minuria integerrima</i> r                              | Uncommon in central N Vic                               | Surviving where not grazed, reduced by drought |
| <b>Minnie Daisy</b><br><i>Minuria leptophylla</i> d                                | Scattered in NW Vic, very rare in ENP                   | Vehicle damage, tree regeneration              |
| <b>Waterbush</b><br><i>Myoporum montanum</i> r                                     | ENP the Vic stronghold. Most populations small          | Increased only where protected from grazing    |
| <b>Slender Water-milfoil</b> e L<br><i>Mirophyllum gracile</i> var. <i>lineare</i> | ENP has only Vic populations                            | Not apparent - too dry                         |
| <b>Native Millet</b><br><i>Panicum decompositum</i> d                              | Uncommon in central Vic, rare in ENP                    | Not apparent - too dry, readily grazed         |
| <b>Hairy Panic</b><br><i>Panicum effusum</i> d                                     | Widespread in Vic but only occasional                   | Not apparent - too dry, readily grazed         |
| <b>Pepper Grass</b><br><i>Panicum laevinode</i> v                                  | Rare in central N Vic                                   | Not apparent - too dry, readily grazed         |
| <b>Coolabah Grass</b><br><i>Panicum queenslandicum</i> e                           | ENP has the only Vic population                         | Not apparent - too dry, readily grazed         |
| <b>Murchison Leek Orchid</b> e<br><i>Prasophyllum</i> sp.aff. <i>hygrophyllum</i>  | Only population anywhere possibly now extinct           | Drought  |
| <b>Hairy Tails</b><br><i>Ptilotus erubescens</i> L d                               | Widespread in W Vic, rare in ENP                        | Earthworks                                     |
| <b>Feather Heads</b><br><i>Ptilotus macrocephalus</i> d                            | Widespread in W Vic, rare in ENP                        | Reduced grazing                                |
| <b>Lambs Tails</b><br><i>Ptilotus semilanatus</i> d                                | Scattered in W Vic, rare in ENP                         | Grazing, weed competition                      |
| <b>Golden Billy-buttons</b><br><i>Pycnosorus chrysanthus</i> d                     | Scattered in W Vic, rare in ENP                         | Weed competition, drought                      |
| <b>Straw Wallaby-grass</b><br><i>Rytidosperma richardsonii</i> v                   | Rare in NE Vic, very rare in ENP                        | Herbicide spraying                             |
| <b>Narrow-leaf Sida</b><br><i>Sida trichopoda</i> d                                | Occasional in NW Vic, rare in ENP                       | Reduced grazing                                |
| <b>Southern Swainson-pea</b><br><i>Swainsona behriana</i> r L                      | Scattered in Vic, possibly the only population in ENP   | But threatened by tree regeneration            |
| <b>Slender Darling-pea</b><br><i>Swainsona murrayana</i> V e L                     | Very rare in N Vic, possibly the only population in ENP | But threatened by weed competition             |
| <b>Silky Swainson-pea</b><br><i>Swainsona sericea</i> v L                          | Rare in N Vic, rare in ENP                              | Weed competition, tree regeneration            |
| <b>Leafy Templetonia</b><br><i>Templetonia stenophylla</i> n                       | Uncommon in W & central Vic                             | Herbivore grazing, vehicle damage              |
| <b>Rye Beetle-grass</b><br><i>Tripogonella loliiformis</i> r                       | Scattered in Vic, rare in ENP                           | Not apparent - too dry                         |
| <b>Broad-leaf Early Nancy</b><br><i>Wurmbea latifolia</i> ssp. <i>vanessae</i> d   | Uncommon in W Vic, rare in ENP                          | Not apparent - too dry                         |

**We pay respects to the traditional owners of these lands & their land management wisdom.**



This project was funded by a Victorian Government Biodiversity On-ground Action Grant BOA2017CA373.



[www.gveg-enviro.com](http://www.gveg-enviro.com)

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Submission 717



Sally Mann

**Golden Moths**  
*Diuris chryseopsis*  
1 population 12



Rowhan Marshall

**Murchison Leek Orchid** e  
*Prasophyllum* sp.aff. *argillaceum*  
1 pop, possibly extinct 12?



Macleay Grass Man Flickr

**Coolabah Grass** e  
*Panicum queenslandicum* var.  
*queenslandicum* 1 pop 5



Goldfields Revegetation

**Long Eryngium**  
*Eryngium paludosum* v  
2 populations 1, 11



Sally Mann

**Swamp Star**  
*Hypoxis exilis* v  
3 populations 1, 4, 5



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**Late-flowering Flax-lily**  
*Dianella tarda* v  
At most sites



Neville Walsh ©2020 RBGB CC BY-NC-SA 4.0

**Small Scurf-pea**  
*Cullen parvum* E e L



Jeff Jeanes ©2020 RBGB CC BY-NC-SA 4.0

**Emu-foot**  
*Cullen tenax* e



David Pitts ©2020 CC BY-NC-SA 4.0

**Austral Trefoil**  
*Lotus australis*  
1 population 3



Sally Mann

**Slender Darling-pea**  
*Swainsona murrayana* V e L  
1 population 11



A. Messina ©2020 RBGB CC BY-NC-SA 4.0

**Southern Sulfur-pea**  
*Swainsona behriana* r L  
1 population 15



Glen Johnson ©2020 CC BY-NC-SA 4.0

**Silky Swainson-pea**  
*Swainsona sericea* v L  
1 population 13, 11?



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**Rough Burr-daisy** d  
*Calotis scabiosifolia* var. *scabiosifolia* 1 pop 5, 1?

**Blue Burr-daisy** r  
*Calotis cuneifolia* r 3 populations 2, 5, 20

**Yellow Burr-daisy** r  
*Calotis lappulacea* r 3 populations 2, 3, 5



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**Yellow-tongue Daisy** v  
*Brachyscome chrysoglossa* v 2 populations 8, 19, 10? 13?

**Lobe-seed Daisy** d  
*Brachyscome dentata* d 1 population 1

**Smooth Minuria** r  
*Minuria integerrima* r 15+ pops 7,8,9,11,14,15,19



Harry Rose Flickr



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**Hairy Tails** d L  
*Ptilotis erubescens* d L 1 population 14

**Grey Billy-buttons** e L  
*Craspedia canens* e L 1 population 1

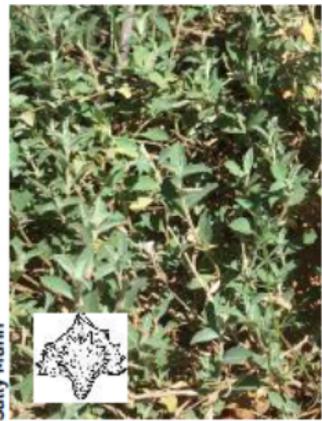
**Golden Billy-buttons** d  
*Pycnosorus chrysanthus* d 2 populations 1, 9



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M.Moir, NHV © 2020 RBGB CC BY-NC-SA 4.0

**Amulla** e  
*Eremophila debilis* e 1 population 20

**Narrow-leaved Sida** d  
*Sida trichopoda* d 1 population 5

**Spiny-fruit Saltbush** e  
*Atriplex spinibractea* e 3 populations 5, 7, 22