Annual Report
Annual General Meeting
Threatened Plant Action Group Inc.



Goats on Wilkatana Station; goat browsed *Senecio megaglossus*; contractor Marcus Pickett conducting drone searches for new populations; and TPAG volunteers undertaking census

Over Three Decades of TPAG

February 2025

Acknowledgement of Country

TPAG acknowledges and pays our respects to the Kaurna people, the traditional custodians on whose ancestral lands we meet. We also pay our respect to the other Aboriginal Nations across South Australia on whose traditional lands we work on threatened plants. We acknowledge the deep feelings of attachment and relationship of Aboriginal people to country, flora and fauna, and we respect and value their past, present and ongoing connection to the land and cultural beliefs.

Message from the Chair

In 2024 TPAG, through its various projects and partnerships, worked to conserve **14 threatened flora species** and **2 threatened ecological communities** across South Australia.

Our primary mission - to ensure that South Australia's threatened flora and native habitats are managed and restored - is only possible through the partnerships that we form with other groups and individuals. In 2024 this was more evident than ever, as we teamed up with park rangers, friends of parks groups, private landholders, sporting clubs, special interest groups, university students and bushcare contractors to achieve our goals. This resulted in some great wins for threatened flora and TPAG is proud to share some of these with the reader in this Annual Report.

In 2025, TPAG will be focused on offering an increased number of half day and single day field trips to members. This will contribute to increasing the level of member involvement and engagement in our work. In addition to these shorter field trips, TPAG already has three multi-day field trips confirmed for 2025 as we look to expand the number of species and sites that we care for across the state.

2024 Highlights

Administrative Highlights

TPAG had a full committee for 2024, composed of the following dedicated and caring individuals:

Chairperson	Rhys Morgan
Deputy Chairperson	Rick Davies
Secretary	Sarah Stewart
Treasurer	Doug Bickerton
Grants & Programs Coordinator	Felicia Carli
Public Communication Officer	Karan Coombe-Smith
General Board Members	Ben McCallum, Tim Reynolds and Alex Chu

Approximately **250 volunteer hours** were spent at committee meetings to ensure that TPAG continues to transform and grow into a financially viable, legal and accountable entity with a higher public profile and increased funding levels for threatened flora conservation.

General Meetings and Talks

An Annual General Meeting and two Ordinary General Meetings were held in 2024.

The AGM was held in February 2024 with guest speaker, threatened orchid expert Doug Bickerton, who gave a talk titled ***To Restore or Replant – Two Case Studies of Threatened Plant Recovery*** where he spoke about the benefits and problems of translocation of threatened flora compared with *in situ* recovery of existing populations.



Doug Bickerton's talk on threatened flora recovery at TPAG AGM 2024

The first TPAG Ordinary General Meetings was held in August 2024 and was a joint meeting with the Biology Society of SA (BSSA) and the Friends of Mound Springs (FOMS) titled **THE CONSERVATION & MANAGEMENT OF MOUND SPRINGS AND OTHER ARID FRESHWATER WETLANDS.** All three organisations provided speakers:

1. ***South Australia's Mound Springs: their conservation and management.*** Colin Harris & Simon Lewis (President & Secretary of FoMS)
2. ***Using fire to manage reeds on mound springs, and recover the endemic, endangered Salt Pipewort.*** Dr Rick Davies (Vice Chairperson of TPAG, & vegetation ecologist)
3. ***Climate change impacts on temporary freshwater rock pools in the arid zone***. Kantine Liu (President of BSSA, & PhD student, Adelaide University)





The second was a joint meeting involving TPAG, BSSA and the Native Orchid Society of SA (NOSSA) titled: **THE CONSERVATION OF THREATENED ORCHIDS AND PREVENTING THE SPREAD OF NEW WEEDS.** This was held in November 2024 with the speakers again represented all three organisations:

1. ***Volunteer work with threatened species and other orchid research; the rewards and value to conservation*** by **Leo Davis** (long-time NOSSA member, former Senior High School teacher)
2. ***Working to recover declining native orchids in SA*** by **Tim Reynolds** (foundation member of TPAG, conservation manager, former Research Officer, Biosecurity SA)
3. ***Trade and Regulation of Invasive Plants in Australia*** by **Jacob Maher** (Vice President of BSSA, PhD student, Adelaide University)

4.



Photos: (Clockwise from bottom left) Phil Bridle; Rick Davies, Rick Davies, Leo Davis, Robert Lawrence, Ed Lowrie

Social Media

This year, thanks to many hours spent by members, we made **23 posts** to our social media followers.

Insurance

TPAG continues to be a member of Landcare Australia which is helping with insurance protection for the Board and its members when working on both private and public lands.

Membership

In 2024 TPAG's membership reached 62. We automatically extended all memberships which were purchased after June 30, 2024. These memberships will be valid until the end of 2025. We urge other former members to rejoin if they haven't already done so.

New members are invited to join at any time of the year. Memberships can be paid via Trybooking: https://www.trybooking.com/events/landing/1326113

Current annual membership is $10.

Projects, Grants and Funding

Financial year 2024/25 is the final year of funding for many of TPAG's projects which are funded through National Parks and Wildlife SA's *Friends of Parks Partnership Grant Program.* The other major source of project funding this year were the Landscapes SA *Grassroots Grants.*

Projects with pre-existing funding in 2024:

- Restoring Habitat for the Endangered White Beauty Spider-orchid Caladenia argocalla in partnership with Sevenhill Winery - *Friends of Parks Partnership Grant* (**APPENDIX 1**)
- Restoring habitat of Sandhill Greenhood Orchid in Mowantjie Willauwar CP - *Friends of Parks Partnership Grant* (**APPENDIX 2**)
- Ecological restoration of the Pinery at Grange - *Funded by Grange Golf Club* (**APPENDIX 2**)
- Hood Heartlands - Care of Leafy Greenhoods Coupled with Science Mentoring (Belair NP) - *Friends of Parks Partnership Grant* (**APPENDIX 3**)
- Protecting Adelaide Plains Last Remaining Coastal Bushland at Aldinga Scrub *Friends of Parks Partnership Grant* through Friends of Aldinga Scrub (**APPENDIX 4**)
- Mount Remarkable National Park - protecting threatened and unique vegetation communities in partnership with Friends of Mount Remarkable (critically endangered *Peppermint Box Grassy Woodland) - Friends of Parks Partnership Grant* through Friends of Mount Remarkable (**APPENDIX 5**)

Projects that received new funding in 2024:

- Mountain Daisies *Senecio megaglossus* monitoring and trial cultural and ecological burn planning with Nukunu - Landscapes SA *Grassroots Grant* (**APPENDIX 6**)
- *Improving priority habitat for the nationally endangered Spalding Blown Grass in the Northern and Yorke Region* - Landscapes SA *Grassroots Grant* (**APPENDIX 7**)
- Restoring habitat of Sandhill Greenhood Orchid in Mowantjie Willauwar CP - Landscapes SA *Grassroots Grant* (**APPENDIX 2**)

Unfunded projects undertaken in 2024:

- A survey of Bushy Club-moss *Lycopodium deuterodensum* in Cleland NP (**APPENDIX 8)**
- Saving the critically endangered Beyeria bush pea (*Pultenaea insularis*) from extinction due to weed invasion and macropod browsing (**APPENDIX 9)**

Projects with confirmed funding for 2025:

- Training of Arabana Rangers to monitoring endangered mound springs flora on Finniss Springs Aboriginal Land, including before and after ecological burns - Landscapes SA *Grassroots Grant* through Friends of Mound Springs*
- Ecological restoration of The Pinery at Grange (including recovery work on the Sandhill Greenhood *Pterostylis arenicola)* in partnership with Grange Golf Club - Landscapes SA *Grassroots Grant*
- Weed management planning and restoration of Critically Endangered *Peppermint Box Grassy Woodland*, in Mt Remarkable National Park - *Friends of Parks & Nature Grant* through Friends of Mount Remarkable
- Weeding and monitoring endangered native grassland at Mokota Conservation Park - *Friends of Parks Nature Grant* through Friends of Burra Parks*

**NB Grant applications written by TPAG members Rick Davies and Meg Robertson, respectively.*

Advocacy

Part of TPAG's mission is to lobby for:

- Stronger laws that protect threatened flora
- Better protection and management of wild habitats for threatened plants

In 2024, TPAG's advocacy work focussed on the **South Australian Biodiversity Bill** – which represents a once in a generation opportunity to strengthen conservation and environmental legislation in our state. The bill, currently in draft form, is expected to be introduced to the South Australian Parliament in 2025. TPAG has made multiple submissions with the following key messages:

- Mandatory recovery activities for threatened species such as the development or adoption of funded action plans and the designation of critical habitat
- A genuine commitment to the Mitigation Hierarchy and better administration of Significant Environmental Benefits scheme
- Legislated funding (e.g. for The Conservation Fund) rather than a reliance on funding from compliance activities

Partnerships and Acknowledgments

TPAG wishes to acknowledge new and enduring partnerships with people and organisations. We thank every one of our members, passionate individuals and their partnering groups and organisations for sharing our values and working with us towards the common goal of recovering threatened flora species in their wild habitats.

- The Biology Society of South Australia, who have enthusiastically encouraged tertiary students and graduates to join TPAG and head out into the bush with us.

- An enduring partnership with the Native Orchid Society of South Australia (NOSSA) working to conserve our unique and beautiful native orchids across the State.
- Friends of Parks groups who are so passionate about 'their park' (or area of interest) and who embrace the conservation of threatened plants and are enthusiastic to partner; in particular, Friends of Aldinga Scrub, Friends of Mount Remarkable, Friends of Belair, Friends of Mound Springs and Friend of Burra Parks.
- Sevenhill Winery who have been generous in partnering with us on the conservation of the White Beauty Spider Orchid.
- A long association with The Nature Conservation Society of South Australia, who housed and managed our Project Officer for many years, until the cessation of government funding.
- Bevin Scholz, for his dedication, as a Friend of Belair, to conserving the Leafy Greenhood at Belair, with weekly weeding at orchid sites.
- Ian and Joan Stratford and their team for their dedication over many years, in partnership with SA Water, to conserve a precious native woodland site with many rare plant species at Millbrook Reservoir.
- Rangers at Mt Remarkable National Park and Dutchmans Stern Conservation Park who have found time in their busy schedules to help with monitoring.
- Arabana Rangers who are working with us on Mound Spring monitoring.



TPAG & Friends of Parks volunteers, ranger Niamh Douglas, and native grassland experts Ann Prescott, Anne Brown & Meg Robertson, on Mt Remarkable NP TPAG field trip, September 2023

Treasurer's Report July 2023 – December 2024

It was decided to report on 18 months of activity, so that the final set of figures better reflects the current status of TPAG's finances.

Since June 2023, we have closed two older bank accounts (a Cash Maximiser, and a Business Account), as they were outdated forms of account. We now have a new Savings Account, and two Business Accounts – one for Project funds and transactions, and the other for unfunded or admin activities. The latter is linked to a debit card, to facilitate streamlined minor expenditure, particularly for day and multi-day trips.

TPAG's income, mostly from grants and external finding, increased substantially over the 18 month period, up from approx. $39,000 in 2022-23 to > $112,000. However, expenditure also increased proportionately, consequently the final balance ($70,764.36) is a little less than that at July 2023, but well within the expected fluctuations for a not-for-profit organisation.

As in the previous year, the budget reflects that TPAG overheads are very low, with administration costs < $3,000). Additionally, almost $9,000 was spent on volunteer support.

The Steering Committee has assisted the Treasurer in developing a Standardised Banking Procedure, intended to inform new Project Managers and Steering Committee members of their financial roles and responsibilities. Each Project Manager uses a Tracking Sheet to manage the transactions for their project, and balance their budgets. The Treasurer manages a Tracking Sheet for each of the Business Accounts. The Procedure can be made available to any members who wish to see it.

FINANCIAL SUMMARY: JULY 2023 – DECEMBER 2024

Account	01-Jul-23	12-Oct-23	17-Apr-24	24-Jul-24	31-Dec-24
Old Cash Maximiser #0029	$45,462.20		$0.00	-	-
Old Business Acc #2130	$29,091.51		$0.00	-	-
New Unfunded Acc #7389	-	-	$0.03	$5,000.03	$5,689.51
New Savings Acc #2655	-	-	$45,936.39		$41,285.84
New Project Acc #1874	-	$6,258.09			$23,789.01
TOTAL	**$74,553.71**				**$70,764.36**
"Loss"	$3,789.35				
Total Income	**$112,264.89**				
Total Expenditure	**$116,054.24**				

INCOME AND EXPENDITURE: JULY 2023 – DECEMBER 2024

	Income	Expenditure
INCOME		
Friends of Parks Partnership Grants 2022-23 (GST)		
• Sevenhill - White Beauty Orchid	**$790.09**	
• Belair - Leafy Greenhood	**$487.55**	
• Mowantjie - Sandhill Greenhood	**$756.68**	
Friends of Parks Partnership Grants 2023-24 (Year 3)		
• Sevenhill White Beauty Orchid	**$8709.00**	
• Leafy Greenhood Belair	**$5926.00**	
• Sandhill Greenhood Mowantjie	**$5533.44**	
Sevenhill Cellars contribution to White Beauty Orchid Project	**$7,000.00**	
Grassroots Grants		
• Grange Golf Club - Sandhill Greenhood	**$36,551.00**	
• Mowantjie – Sandhill Greenhood	**$10,203.00**	
• Dutchmans Stern – Senecio megaglossus	**$10,000.00**	
• Tarlee – Spalding Blown-grass	**$9768.00**	
• *Pultenaea insularis* recovery	**$7969.00**	
Bite Sized Grants		
• Tarlee – Spalding Blown-grass	**$2000.00**	
Friends of Mt Remarkable NP	**$2521.00**	
Landcare SA Admin Grant	**$2,466.75**	
Memberships	**$730.00**	
Interest Cheque and Cash Maximiser	**$853.38**	
Total Income	**$112,264.89**	

EXPENDITURE		
Contractor Payments (specialist weed contractors; project management; reporting)		**$103,552.50**
Administration Expenses (Website; Domain registration; Room hire for AGM; Catering; Insurances; Sandwich board)		**$2994.81**
Volunteer Support (Weed equipment; Fuel; KI Ferry; Accommodation; Food)		**$8728.97**
Sundries Unfunded expenses - committee members – KI trip		**$777.96**
Total Expenditure		**$116,054.24**

The Future

In 2023, TPAG achieved the milestone of 30 years working to conserve threatened plants in their wild habitats across South Australia. TPAG has already identified several priorities to pursue in 2025 and beyond:

- to understand the status of threatened flora previously worked on but currently unfunded, particularly in the South-East and Eyre Peninsula
- seeking funding to establish more recovery projects for priority species in their wild habitats
- broadening the membership demographic and increase volunteers
- increasing our public profile as a key advocate for threatened plant conservation
- continue to seek funding for a Program Coordinator

TPAG will continue to encourage all age groups including students and recent graduates to join TPAG and become involved in project activities. Working alongside experienced botanists and citizen scientists provides the opportunity to share knowledge and to develop innovative approaches. Since 2022 we have been partnering with the Biology Society of SA at Adelaide University, which has provided the opportunity for many tertiary students to undertake field-based monitoring and survey work, and we wish to continue this rewarding partnership.

In 2025, TPAG will work to increase its public profile with its newly developed a website. We also aim to increase our presence on social media platforms, to further develop partnerships and to continue advocating for *in situ* conservation of threatened flora in South Australia.

Since incorporation in 2023, TPAG has been successful in obtaining funding for site-based recovery of eleven nationally threatened plant species and plant communities. However, there remains many other important populations and other species that require focus and new investment. Examples include the recovery of nationally endangered orchids populations of the Mid North, Yorke Peninsula, Southern Finders Ranges and Southern Lofty Ranges; nationally threatened species affected by human-induced hydrological change in the South East, such as *Senecio macrocarpus* in Messent Conservation Park, and *Prasophyllum littorale* in Piccaninnie Ponds Conservation Park.

Some TPAG member have extensive experience in fire and weed ecology research. Thus, TPAG is keen to become involved in ecological burning and weed trials of threatened flora. Two species for which burns are proposed are *Eriocaulon carsonii* on mound springs, and *Senecio megaglossus* in Triodia habitat. Weed trial research is proposed to determine the impact of exotic bulbs on threatened orchids and how it is best managed.

But planning for and implementing each on-ground recovery and research project involves a lot of time and effort. Thus, TPAG's capacity to further expand its program depends on obtaining funding to again employ a Project Officer with a coordination role, as was the case for the 25 years up until 2019 when NRM Boards were superseded by Landscape Boards and funding was withdrawn.



EPBC-listed, endangered Bayonet Spider-orchid (*Caladenia gladiolata*) has its stronghold in Mt Remarkable NP, where its habitat was totally burnt out by the February 2025 bushfire.

APPENDICES - Projects undertaken by TPAG in 2024

APPENDIX 1:

Progress Report to TPAG 2025 AGM:

"Restoring Habitat for the Endangered White Beauty Spider-orchid",

by Doug Bickerton, February 2025

2023-24 Funding: The Friends of Parks Partnership funds for the final third year ($8709 incl. GST) were received in December 2023. Sevenhill Cellars also provided their annual contribution ($7000 incl. GST) in June 2024. A total of $4771.50 remains for contract weeding and reporting before final acquittal in April 2025.

Contract weed control: Contractors Irongrass Environmental Rehabilitation Services and Tim Jury continued with control of Topped Lavender, also Olive, Boneseed, Montpelier Broom, Cape Tulip and *Disa* (Monadenia), using minimal disturbance methods. Most of the effort was following up on the areas covered in the previous year.

Volunteer weed control: On 13th July, 10 volunteers from TPAG, NOSSA and Friends of Spring Gully met for a weed working bee. Topped Lavender seedlings were the target weed. Sevenhill Cellars provided a generous and hearty lunch, enjoyed by all.

Monitoring: Unfortunately, Sevenhill Cellars have not yet opted to continue with their financial contribution to the work being carried out by TPAG at this site. Without the subsequent financial support for volunteers, it was decided not to monitor the population this year.



Caladenia argocalla (photo by Rosalie Lawrence)



Volunteers removing weeds around *Caladenia argocalla*

APPENDIX 2:



Progress Report to 2025 TPAG AGM:

Sandhill Greenhood

by Tim Reynolds & Sarah Stewart

15 February 2025

Pterostylis arenicola – Endemic to SA; Vulnerable (Aus).
A geophytic orchid, arising annually in autumn from
an underground tuber.

1. GRANGE GOLF COURSE

The Grange Golf Course is one of only a few sites remaining in metropolitan Adelaide where pre-European native vegetation still persists today. Several plant species found here survive nowhere else in the region, including the Sandhill Greenhood orchid. The annual census of the orchid colony recorded 2315 plants in September 2024 (Figure 1). This is the highest number of plants since the first count 30 years ago. As recently as 2007 there were less than 60 plants in the colony. Continued efforts to restore the habitat including reduction of key weeds, further orchid marking and protection and increasing awareness by club members have contributed to this recovery.

Despite the increase in number of plants to more than 2300 in 2024 (c.f.1900 in 2023), less than 10% flowered, and pod count later in the season was also very low. We attribute this to the extremely dry winter and spring; many plants withered before they were able to flower, be pollinated, or produce seed pods. A decline in plant numbers over the next two years could be expected given the drier climate outlook.

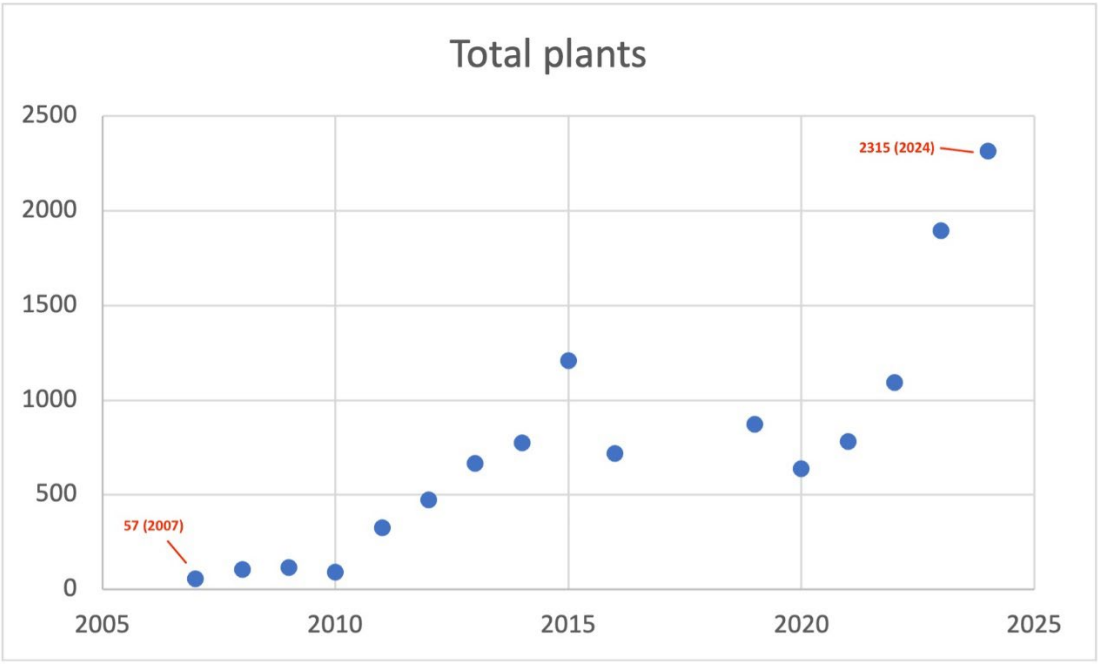


Figure 1: *Pterostylis arenicola* at Grange Golf Course, 2007 to 2024

In September 2024 TPAG committee member Tim Reynolds secured a new three-year Green Adelaide Grassroots grant of $143,000 for the Grange Golf Club to expand the habitat recovery work to eight new remnant vegetation sites in Grange Golf Course. Project delivery was by TPAG (Tim and Lillian Camphausen) and Trees For Life contractors. Works commenced in early October 2024.

A major tournament, LIV Golf, which attracted 94,000 spectators over 3 days from April 26-28 in 2024 (c.f. 77,000 in 2003; 100,000+ in Feb 2005) was considered a potential threat to sensitive sites in Grange Golf Course. Unfortunately, despite efforts to protect all sites, loss of crowd control during the post-match entertainment resulted in crowd invasion and trampling damage to significant remnant vegetation adjacent to the Fan Village entertainment precinct. Full recovery of the vegetation is likely to take a number of years. The setting up and dismantling of visitor and event facilities resulted in other vegetation damage around the course.

In 2024, the TPAG recovery team (Tim Reynolds and Lillian Camphausen) worked a total of 630 hours, typically one half-day a week throughout the year.

2. MOWANTJIE WILLAUWAR CONSERVATION PARK (NEAR WELLINGTON)

Project Name: Restoring habitats of Sandhill Greenhood Orchid in Mowantjie Willauwar CP (FOPPG020).

Funding sources: Friends of Parks Partnership Grant: $20,807.50 (incl. GST) for three years (2022- 24); Murraylands & Riverlands Landscape Board Grassroots Grants: $20,406.00 (incl. GST) for one year (2024-25).

This large population of the Sandhill Greenhood occurs in weed invaded *Callitris gracilis* Low Woodland. Control of perennial veldt grass and various exotic annual grasses is a high priority to reduce competition for moisture and nutrients and to reduce the fire threat to a fire-sensitive habitat. Eradication of rabbits is also a priority to reduce the spread and growth of weeds.

Two contractors were employed to treat the extensive infestations of weeds particularly Perennial Veldt grass, Bridal Creeper and Soursob, focusing again on priority areas, i.e. large Sandhill Greenhood colonies identified in Year 1, where weed control in the vicinity could have the greatest benefit. A complementary approach based more on local eradication was applied to less common or localised species but known to be highly invasive, including Freesia, Gazania, African Boxthorn, & One O'clock. This involved targeted weed treatment and was not necessarily dependent on proximity to orchid colonies.

Two working bees were conducted on 11th August and 11th September, attended on each occasion by four TPAG volunteers who travelled from Adelaide. In September four TPAG volunteers were joined by MRLB Threatened Flora Officer Victoria Hefford to monitor orchid colonies in the park. Over 2024 a total of 56 volunteer hours were carried out on working bees in the park.

To monitor the orchid population, on 11/9/24 we repeated nested quadrats at three sites - each a large sub-colony - to collect density and phenology data for a total sample of 809 plants. Most plants were so dry that differentiating between similar greenhood species was difficult. To the end of September 2024 – excepting January - monthly rainfall totals for 2024 were substantially below the long term mean rainfall average for nearby Tailem Bend. We noted early senescence of rosettes of *P. arenicola*, and very few flower scapes. Across all sites we recorded:

- average plant density of 30 per m^2;
- 18% of plants in flower or bud and 0.4% of plants with seed pods;
- 4.7% of plants with damage including flower scape.

We have developed valuable partnerships with the following people through this project:

- Joseph Gallasch, Ranger, NPWS
- Bec Gould (District Officer, Murraylands and Riverland Landscape Board)
- Victoria Hefford (Threatened Flora Officer, Landscape SA - MRLB)
- Bushcare contractors, Irongrass Environmental Rehabilitation Services (IERS) and Second Nature Conservancy
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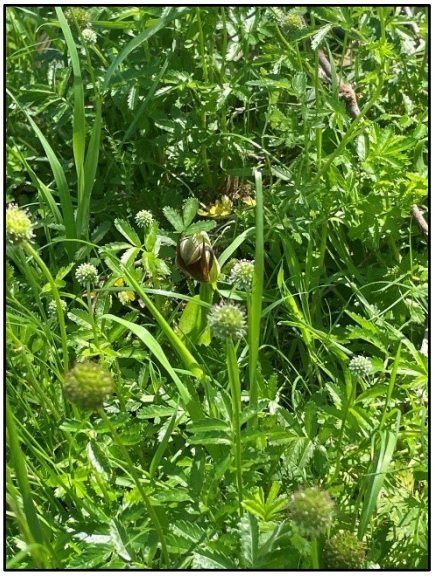
Project Leader Sarah Stewart on site with TPAG volunteers

APPENDIX 3:

Third Year Progress Report to TPAG 2025 AGM:

'Hood Heartlands - Care of Leafy Greenhoods Coupled with Science Mentoring'

by Karan Coombe-Smith, February 2025



Background

Belair National Park ('Belair') is the 'heartland' in South Australia for the Leafy Greenhood Orchid, *Pterostylis cucullata subspecies sylvicola*, which is rated as Nationally Vulnerable (EPBC Act) and Endangered in SA (NPW Act). Being a small understorey species, the greenhood is easily swamped by the multitude of weeds in Belair NP. Interestingly, the National Recovery Plan for this species suggests 'Little is known of the ecology of the Leafy Greenhood' and the interaction between Belair's weeds and orchids is not clearly understood.

Third Year

TPAG employed the same specialist weed contractor across this three-year project, to treat difficult weeds at four steep orchid sites at Belair NP, using herbicides not readily available to volunteers. Weeds treated on steeper slopes included trees and woody weeds - Ash, Pittosporum, Hawthorn, Broom; creepers – ivy and blackberry; and herbaceous weeds - African daisy, forget-me-not, herb Robert, St John's Wort, Cleavers (*Galium aparine*), Scarlet pimpernel, thistles.

A large area of three-cornered garlic *(Allium triquetrum)* has been sprayed at one site, to minimise its spread into new areas, after last year's work appears to have been successful in holding the weed front, with the slope looking a lot better this season. Delicate spraying of garlic closer to greenhoods was also undertaken at this site.

Ivy has been treated at one site over the life of the project with most of the ivy on a large Eucalyptus tree now dead, saving the tree, allowing more water penetration and ground habitat. A combination of pulling and cut and swab closer to leafy greenhoods in this location is recommended for remaining ivy, with repeat spraying for outbreaks elsewhere.



An intensive count was undertaken at one orchid site by TPAG members, highlighting that counting and monitoring both orchid individuals, groups and populations is difficult, particularly because the sites have weed invaded understories and methods are either coarse or very labour-intensive. Innovative, accurate and sensitive monitoring and counting techniques for orchids would be beneficial to understand more about individuals, groups, sites and recruitment without trampling over sites.

Meanwhile, at Upper Sturt a landowner and TPAG member continues to care for a healthy population on private land, estimated at more than 600 orchids.

Conclusions and Recommendations

- After decades of hard work by volunteers (since 1983), significant progress has been made in woody weed control in many parts of Belair as well as orchid sites. However, three-corner garlic and other swamping non-native bulbs remain a difficult-to-manage threat to the whole of Belair, and very challenging to control in sensitive orchid habitat.

- Ongoing weed management is needed at all Belair orchid sites. While volunteers can hand pull it is labour intensive and requires good knowledge of weeds vs native plants as well as slow and careful walking. Unfortunately, many of the weeds emerge when the orchids are up, further complicating site work.

- It has been a challenge to achieve scientific mentoring this year as the Project Officer and Orchid citizen scientist were both unavailable for much of the season. Also, it is difficult to take multiple students and volunteers to a site because a considerable amount of care is needed when traversing and spot spraying around emerging and flowering orchids, and best undertaken by expert weed contractors in small numbers.
- Emerging, contemporary or improved methods for control of weedy bulbs are needed, with accompanying funding to implement.
- It should be noted that any work on the grassy woodland habitat where *Pterostylis cucullata* grows has benefits for other herbaceous ground plants, such as these snapped at orchid sites.



- A Strategic Weed Management Plan for Belair National Park is still needed to identify existing, new and emerging weeds, taking a triage approach to conserve threatened flora species, high value vegetation and significant fauna habitats.

APPENDIX 4:

Progress report to TPAG 2025 AGM for

NPWS Friends of Parks Partners Grant Program project:

"Protecting Adelaide Plains Last Remaining Coastal Bushland at Aldinga Scrub",

by Rhys Morgan and Rick Davies - 6 February 2025



Background

Calochilus cupreus (Copper Beard-orchid) is listed as Critically Endangered under the Federal *EPBC Act 1999* and is confined to Aldinga Conservation Park. Members of the Threatened Plan Action Group (TPAG), Friends of Aldinga Scrub Conservation Park (FOAS), and the Native Orchid Society of SA (NOSSA) have had a long involvement in the recovery of the species and its habitat. In 2014, then TPAG project officer Tim Jury successfully nominated *Calochilus cupreus* as Critically Endangered under the EPBC Act. This nomination listing human & kangaroo tramping and invasion by Perennial Veldt Grass (*Ehrharta calycina*), Bridal Creeper (*Asparagus asparagoides*), Soursob (*Oxalis pes-caprae*), and European Olive (*Olea europaea*) as the main threats.

Consequently, as the then AMLR Threatened Flora Ecologist, Rick Davies obtained funding for weed spraying by expert bushland weed contractor and negotiated the construction of a kangaroo-proof exclosure around the population. This fencing was constructed in 2016 funded by the National Parks and Wildlife Service (NPWS) and AMLR NRM. Tim Jury subsequently coordinated a number of TPAG volunteer weeding days in the exclosure. More recently, FOAS and TPAG volunteers jointly removed two kangaroos from the exclosure and undertook some follow-up weeding. NOSSA & TPAG volunteers have undertaken invaluable monitoring of the orchid for a number of years.

The Project

On cessation of funding of weeding in the exclosure by the Federal *Back from Brink* program in 2020, there was an urgent need for the weeding effort to be continued. Thus in 2021, TPAG helped developed a *NPWS Friends of Parks Partnership Grant Program* grant application with NPWS ranger Amy Anderson and FOAS. This was submitted by FOAS with TPAG as a partner. This project application, titled *Protecting Adelaide Plains Last Remaining Coastal Bushland at Aldinga Scrub*, was successful and had weeding as a major component, viz. $32,380 for weeding over two years, in and around the exclosure.

Progress in 2024

As in 2023, Tim Jury was again employed as expert bushland weed contractor due his past extensive experience in weeding at threatened plant species sites, including at this site. Tim visited the site with orchid expert Thelma Bridle, before spraying, to get up to date on the exact location of each orchid plant and their likely emergence times. Ranger Angus Droogan-Turniski visited the site with Thelma on a separate occasion to discuss management priorities

90 hours of weed management was undertaken by Tim in 2024. The primary target weeds, Bridal Creeper; Soursob and Perennial Veldt Grass, were treated across much of the exclosure. There has been a notable decline in the abundance of all priority weeds in response to control actions.

Coastal Galenia (*Galenia pubescens*), identified in 2023, was controlled again in 2024 with the works appearing to be highly effective - although some new plants continue to emerge, and these will be targeted in subsequent visits.



Tim Jury (left) and orchid expert Thelma Bride (NOSSA & FOAS, right) with previous NPWS Ranger Genki Kondo in 2023

APPENDIX 5:

Progress report to TPAG 2024 AGM for
NPWS Friends of Parks Partners Grant Program project titled:
"Mount Remarkable National Park - protecting threatened and unique vegetation communities", Year 3

by Meg Robertson, Rick Davies, Andrew Allanson, Janet Kuys

19 February 2024

Participating partners: Threatened Plant Action Group, Biology Society of SA, and Friends of Mount Remarkable National Park, National Parks and Wildlife Service of SA, Yorke and Mid North District.

Background

The *Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia* Threatened Ecological Community (TEC) is listed as Critically Endangered under the Federal *EPBC Act 1999.* Peppermint Box Grassy Woodland (PBGW) TEC only occurs in South Australia and contains a unique suite of species. The Willowie Block at the eastern edge of the Mt Remarkable National Park contains one of the largest surviving areas of PBGW.

The National Recovery Plan for the TEC produced by DEW (Turner 2012) identified this area as being of high importance. Despite PBGW being prone to weed invasion due to the relatively fertile soil on which it occurs, around a third of the PBGW in the park is relatively weed free and contains a high diversity of native species in its understorey. It is important that these areas are maintained and protected from further weed invasion to maintain the health and condition of this community.

The Threatened Plant Action Group is concerned that the importance of this area has not been adequately recognised. A network of mountain bike trails has been constructed in the eastern Willowie Block where the PBGW occurs. Construction of the much more extensive Epic Bike trail in the park is underway and will also impact the PBGW. As well as the initial clearance of native understorey for trails, the PBGW is potentially further threatened by erosion and bikers riding off track and importing new weeds in mud on bike wheels.

The project

In 2022, a grant was obtained from the *National Parks and Wildlife Service Friends of Parks 'Partnership Grants' Program* by the *Friends of Mt Remarkable National Park* (FoMRNP) in partnership with the *Threatened Plant Action Group* (TPAG) and the *Biology Society of South Australia* (BSSA). This project, titled *Mount Remarkable National Park - protecting threatened and unique vegetation communities* focused on weed management in the park.

An important component was a survey of Peppermint Box Grassy Woodland in Mt Remarkable NP, followed by *in-situ* conservation works to restore the condition of this TEC. This component was planned, managed, and coordinated by TPAG.



Figure 1. TPAG volunteers on site (bottom), compiling field herbariums (middle) and undertaking monitoring (top).

2024 Survey

1. Background and aims

A field trip involving nine TPAG members undertook work on Peppermint Box Grassy Woodland in the Willowie Section of Mt Remarkable National Park, from September 16th-20th 2024. This team consisted of contract botanist Meg Robertson, three botanist volunteers (Rick Davies, Ann Prescott and Lee Heard), and five other TPAG volunteers (Tessa Carella, Isobel Johnston, Lillian Camphausen, Maxine Gibbs and Tess O'Callaghan), and was assisted by FoMRNP volunteers (Figure 1). This followed weed management by Irongrass Environmental Rehabilitation Services in July 2024.

The goals for this TPAG trip were to follow up previous weeding undertaken by volunteers and contractors in 2022 and 2023, to monitor the condition of Peppermint Box Grassy Woodland, and to measure the rate of spread and impact of soursob on ground stratum native species. This was in accordance with the weed management plan prepared by TPAG contract botanist, Meg Robertson (Robertson 2023).

2. Weeding

Weeding by Contractors

Soursob (*Oxalis pes-caprae*) is one of the most invasive weeds in Peppermint Box Grassy Woodland in Mount Remarkable National Park. This environmental weed spreads rapidly and is able to outcompete most native ground strata species. Extensive spraying of Soursob was undertaken by contractors Andrew Allanson and Janet Kuys of *Irongrass Environmental Rehabilitation Services* (IERS), targeting areas of PBGW prioritised by the weed management plan as having the best quality understoreys.

Importantly, the extremely dry autumn (Figure 2) may have affected the weed spraying work on soursob, as all plants may not have fully emerged. Therefore, follow up in subsequent years is important.

The main priority for IERS was to continue to work on patches of soursob, but to also control any woody weeds or other weeds of concern. A GPS unit was used to record and map each area of soursob treated (Figure 3), as well as areas of horehound, and individuals of exotic Solanum, and African Boxthorn.

Techniques used by IERS included:

- Cutting and swabbing (with herbicide) of woody weeds such as African boxthorn, Solanum sp
- One European olive was "re-drilled and filled" as one branch still had leaves
- Weedspraying using Metsulfuron methyl at 0.10 g per 5 litres (approx. 5 g per ha), and Garlon at 2 ml per litre, targeting
    - Soursob
    - Horehound (some re-shooting from previous spraying)
    - Bridal creeper
    - Galenia (re-shooting following spraying)
    - Onion weed (one only!)

IERS used red vegetable dyemarker in all herbicides used, to ensure that they knew exactly where herbicide was being applied. For areas of soursob, IERS worked around the outer edges to ensure that any soursob which survived the previous year (possibly due to having not emerged yet, or having been previously missed) was terminated, as well as to "push" back (reduce) the infestations. Using this bush regeneration technique enables more of the park area to be treated. Re-visiting these infestations each year will ensure eradication of soursob is achieved.

Exotic Solanum and African Boxthorn were cut as close as possible to ground level and immediately treated with Glyphosate (1:3)

IERS reported that massive previous effort by TPAG and FoMRNP volunteers in controlling horehound was evident and impressive. Most horehound had died, but approximately 20% were re-shooting. IERS applied the same spray mix to re-shooting horehound. IERS stressed that further follow-up will be needed, as seedlings will continue to germinate, whilst other plants may still re-shoot.

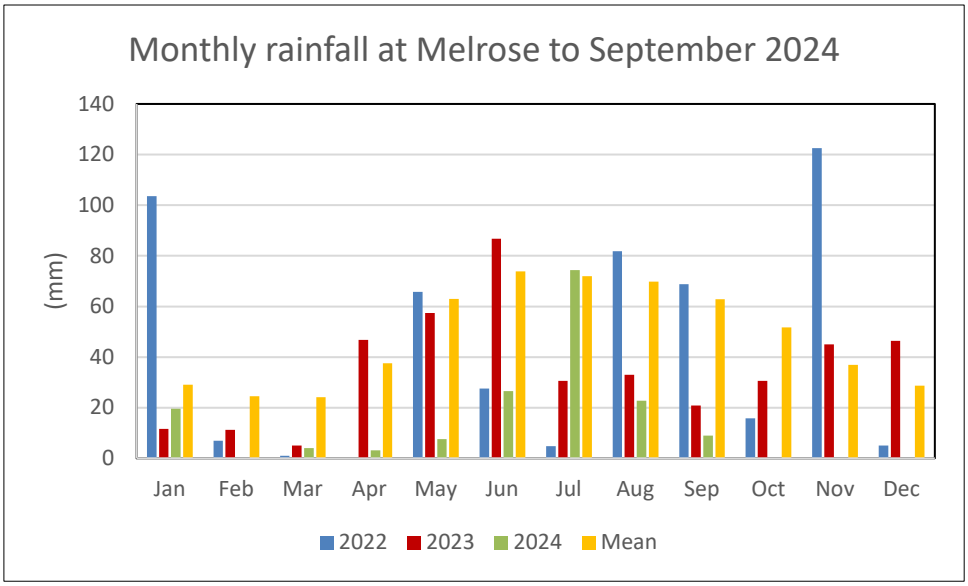
IERS also was able to locate and terminate one small patch of bridal creeper. One other patch was found to have not emerged since treatment the previous year.

Browsing

With such a dry autumn, IERS described the grasses within the park as having been heavily grazed (by kangaroos, euros and rabbits).

Signs of rabbits within the area were observed frequently. Rabbit digs and scats were frequent in many locations and several rabbit warrens were noticed. EIRS observed no grazing of orchids by rabbits, but warned orchid flowers are more likely to be targeted by them. A reduction in grazing pressure would assist in the recovery of grass species as well as herbaceous species.

IERS was of the opinion with techniques and strategies they used, if repeated for 2 – 3 more years, would eradicate soursob from the areas that they have worked on, thereby reducing (along with reducing grazing pressure) the threat to orchids and other herbaceous species. If funds allow, they suggested future soursob work to continue towards the southern boundary.



* **Figure 2: Melrose monthly rainfall from 2022-2024 (NB No data from April 2022)**.

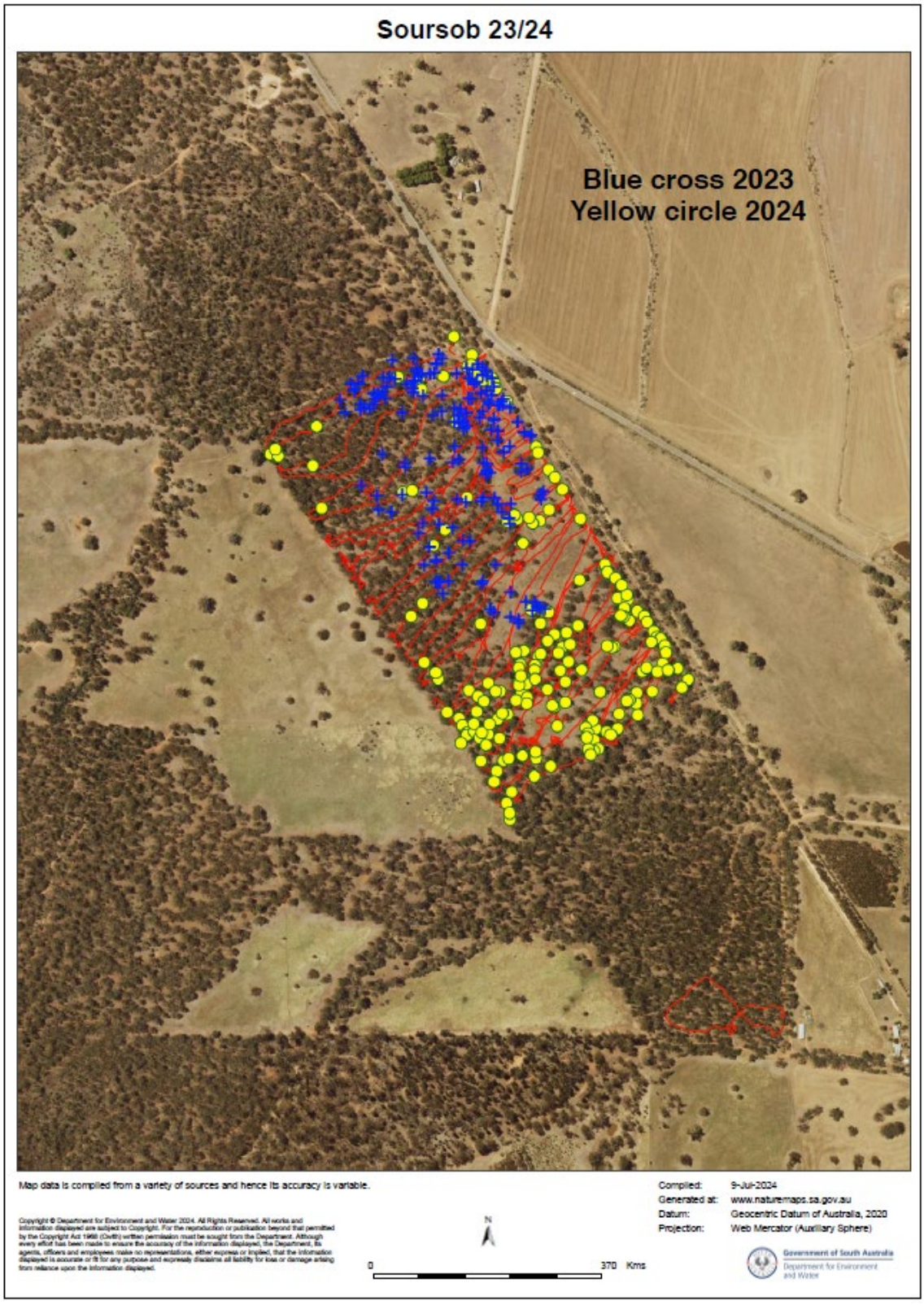


Figure 3: Soursob sprayed by Irongrass Environmental Services 2023 and 2024

Weeding by Volunteers

Volunteer weeding had a narrower focus than in 2023 due to much drier seasonal conditions prior to the trip (Figure 2). Only 167mm of rainfall was recorded at Melrose to the end of September. Annual weed species, particularly Sea Lavender/Statice (*Limonium lobatum*) and annual grasses were much less evident in 2024 due to low rainfall. The focus of the September trip was to remove Horehound and follow up Boxthorn control (Figures 4 & 5). Handpulling and cut and swab were the methods used on both species, depending on plant size. Heads of Horehound were bagged and removed from the site to minimise seed dispersal.

Boxthorn, Bridal Creeper, Galenia, Horehound, Olives, Onion Weed, Narrawa Burr (*Solanum cinereum*) had previously been targeted south of the Willowie carpark by contractors in winter 2024. To complement the control undertaken by contractors, most effort in September to remove Horehound was concentrated in PBGW north of the carpark.

Other weeds

In 2023 two discrete patches of Onion Weed *Asphodelus fistulosus* were targeted intensively by volunteers. One of these, adjacent to the old well on the edge of the old farm paddock was revisited in 2024 and a small number of plants were observed, but not removed due to hard compacted soil. These weeds require follow up.

In 2023 one patch of Black Flag, *Ferraria crispa* was recorded at the base of a eucalypt on the central management track and flowering stalks were removed. It is possible that this patch was planted deliberately at this location but there is no doubt that the species had become established and was spreading further. The species is a weed in SA, WA and Victoria. Therefore, the goal is to eradicate this infestation which occupied about 2 square metres. In 2024 the single flowering stalk and all other leaves with extant corms were removed, bagged and disposed of. Older, deeper corms may have the ability to regenerate. The site will require follow up in 2025.

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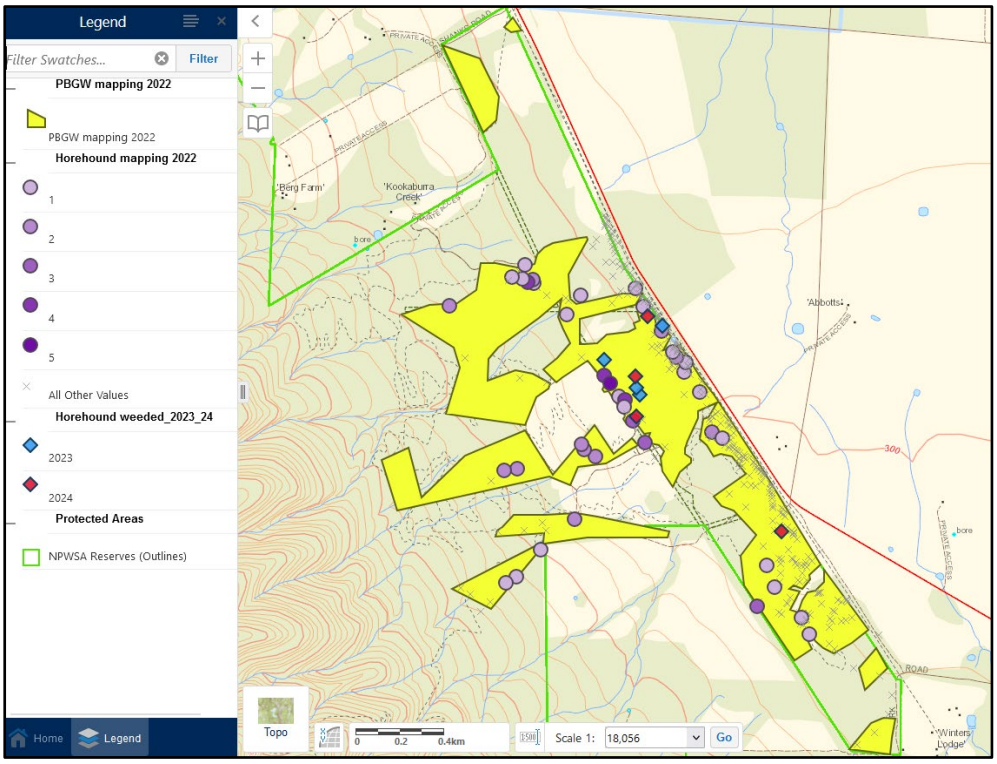


Figure 4. Weeding of Horehound by TPAG volunteers 2023 (blue diamonds) & 2024 (red; additional weeding of Horehound undertaken along the eastern boundary in 2024, not marked on map).

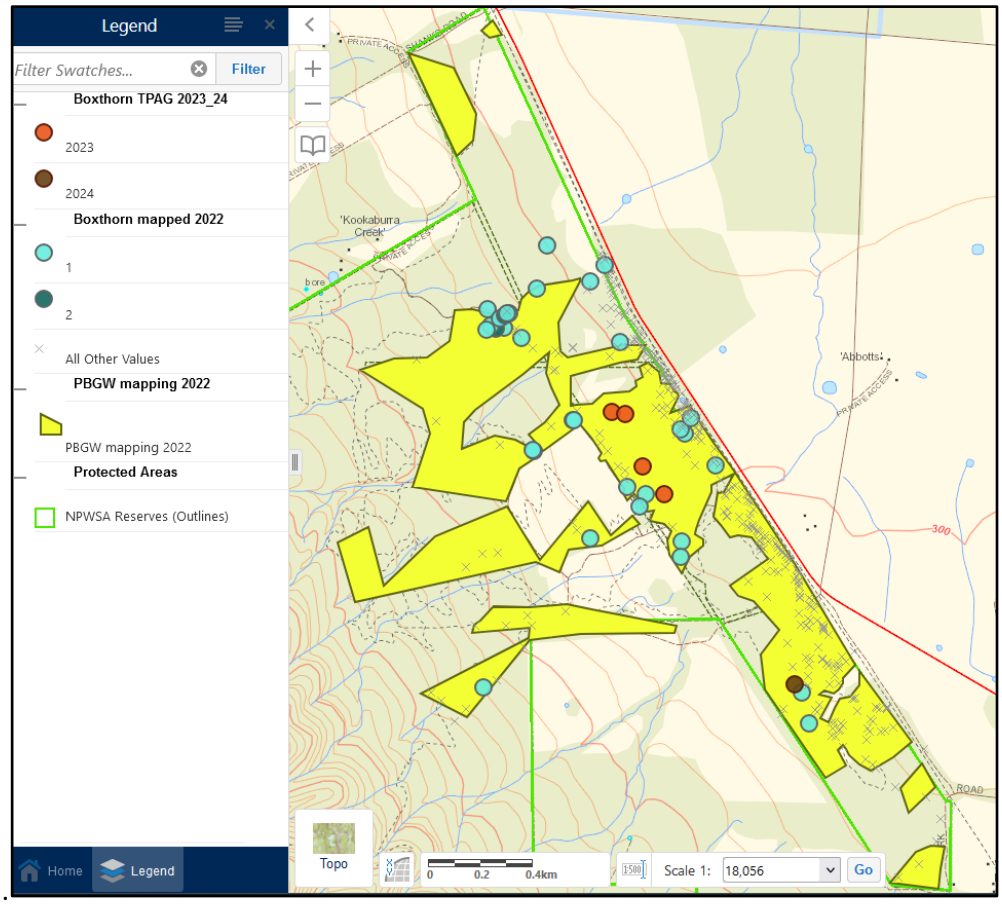


Figure 5. Weeding of African Boxthorn by TPAG volunteers in 2023 (orange dots) and 2024 (brown)

3. Monitoring

Four BDBSA quadrats were recorded in Peppermint Box Grassy Woodland in September and November 2022 and these quadrats were revisited in 2024. Volunteers from the FoMRNP and TPAG were trained in the BDBSA Survey System monitoring methodology.

Four permanent belt transects were set up in 2024, across the boundary front of soursob invasion (described in Appendix 3). Baseline monitoring was undertaken by TPAG volunteers (Figure 1), who were trained in monitoring methodology and in plant species identification, by expert Grassy woodland botanist Rick Davies. Two of these transects started in patches of soursob which had been sprayed and the other two in unsprayed patches. The aim was to quantify the rate of spread of soursop when untreated in comparison with when treated with herbicide, and the impact of this invasion on native ground strata diversity.

4. Field herbarium

Volunteers were trained in compiling a field herbarium consisting of minimal plant samples with field names, ordered in broad taxonomic groupings, for comparison with plants observed in the field and for later taxonomic identification (Figure 1).

References

Davies, R (1997). Weed Management in Temperate Native Grasslands and Box Grassy Woodlands in South Australia. Black Hill Flora Centre, Botanic Gardens of Adelaide, Adelaide. https://www.researchgate.net/publication/279010321_Weed_Management_in_Temperate_Native_Grasslands_and_Box_Grassy_Woodlands_in_South_Australia

Davies, R (2000). Description, Distribution, Conservation Status and Weed Management of Box and Bulloke Grassy Woodlands in South Australia. In: Temperate Eucalypt Woodlands in Australia: Biology, Conservation, Management and Restoration (Eds Hobbs RJ & Yates CJ): 167-89, Surrey Beatty and Sons, Chipping Norton. https://www.researchgate.net/publication/278968680_Description_Distribution_Conservation_Status_and_Weed_Management_of_Box_and_Bulloke_Grassy_Woodlands_in_South_Australia

Robertson M.A. (2023) *Vegetation Management Plan for Peppermint Box Grassy Woodland Mount Remarkable National Park 2023,* Report prepared for Threatened Plant Action Group, Friends of Mt Remarkable National Park, & National Parks and Wildlife Service of SA, Yorke and Mid North District

Turner, J. (2012). *National Recovery Plan for the Peppermint Box* (Eucalyptus odorata) *Grassy Woodland of South Australia ecological community 2012*. Department of Environment, Water and Natural Resources, South Australia. Available from: http://www.environment.gov.au/resource/national-recovery-plan-peppermint-box-eucalyptus-odorata-grassy-woodland-south-australia

APPENDIX 6:

Summary report to TPAG 2024 AGM:

Mountain Daisies *Senecio megaglossus* monitoring and trial cultural and ecological burn planning with Nukunu - Landscapes SA *Grassroots Grant*

by Rick Davies

19 February 2024

Background

Senecio megaglossus (Superb Groundsel) is a perennial shrub which is endemic to South Australia. While it is listed as nationally vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999,* the species is listed in South Australia as endangered under the *National Parks and Wildlife Act 1972* (2019 amendments to Schedule 7).

Senecio megaglossus is endemic to the Southern Flinders Ranges and Mount Lofty Ranges of South Australia. In the Flinders Ranges it has been collected from scattered localities between Buckaringa Gorge in the north, and Spear Creek in the south; while in the Lofty Ranges it has been collected from Marne River Gorge and from an area bounded by White-Yarcowie in the north, Spalding in the west and Robertstown in the south and east (Davies 1986).

Several unsuccessful searches of the last known population in the Southern Lofty Ranges, at Marne River Gorge (R. Davies pers. obs. 2023; D. Duval, pers. com. 2018), suggest that the species is now likely extinct in that region. Heavy invasion of its habitat by soursob, preventing seedling regeneration, is likely to have been an important factor. (R. Davies pers. obs. 2023). However, a population still survives on private land in the Northern Lofty Ranges, south of Orroroo. This population consists of 40 mature individuals (and a few seedlings) occurs on rocky outcrops on steep east facing slopes near the crest of the Narien Range (B. Bianco pers. com. 2024). When surveyed in 2023, there was a high rate of seed predation by insects (A. Chu pers. com. 2024). Except for one plant on the lower slopes, this population was protected from sheep browsing by the steepness of the terrain (B. Bianco pers. com. 2024). Searches at other previous collection sites in the Mid North have been unsuccessful (B. Bianco pers. com. 2024).

Searches in 2023 of two former collection sites in the Southern Flinders Ranges (Old Woolundunga Homestead, Mount Brown (1988); Spear Creek Station, c. 4 km up Spear Creek from Spear Creek and Deep Creek Junction (1994)) by TPAG volunteers were unsuccessful (R. Davies pers. obs. 2023). However, eleven mature *S. megaglossus* plants were located in 2023 near a third former collection site, on Horrocks Creek (M. Robertson pers. obs. 2023). This population was immediately above a low cliff adjacent to the creek, giving it some protection from sheep grazing.

The last known large populations of the species occur in *The Dutchmans Stern Conservation Park* and adjacent Wilkatana Station. While seedling recruitment is occurring in both areas, in most years emerging seedlings do not survive to maturity. This has variously attributed to goat, sheep and kangaroo browsing, reduced fire frequency allowing associated Triodia and shrubs to increasing in cover and thus out compete seedling, and increasingly variable rainfall from year to year.

The largest of these populations *found* in the in the park in 1992 consisted of 465 mostly mature plants with very few seedlings and occurred in areas of predominantly exotic grasses and forbs (Davies 1992). This population decline to only 80 plants by 1999 (Davies 2000) despite the area in the park being fenced against stock, and ongoing goat control program in the park.

However, one population where healthy recruitment was occurring was described in Davies (1995), this consisting of mostly seedlings. This population, of over 100 plants, occurred in an area that had been burnt during the preceding year. A correlation was noticed between the occurrence of these seedlings and the extent of the fire. This indicated that seedling germination is stimulated by fire.

A further population estimated in 1993 to consist of several thousand plants occurred on privately owned Wilkatana Station to the north of the park. Davies (1995) strongly recommended that this area be acquired as a further addition to the parks as the population was threatened at the time by sheep grazing. A brief survey described by Davies (2000) estimated the population had declined to 100 plants by 1999.

A long-term program to monitor *S. megaglossus* in The Dutchmans Stern Conservation Park was set up by Davies (1995) including two fenced quadrats and two associated unfenced quadrats where the health , size and reproductive size of individual plant were monitored. The results of monitoring between 1992 and 1999 are described in Davies (1995, 2000). A subsequent report (Davies 2004) presented the results of further monitoring in 2003, and analysis trends between 1992 and 2003. It also included a 2003 census of the majority of known populations in and adjacent to the park, along with an analysis of age structure, health and fecundity of these populations. A permanent belt transect was subsequently set up on Wilkatana Station in 2003.

The aim of the monitoring program is to determine whether *S*. *megaglossus* numbers and condition is still declining in and adjacent to the park over the longer term. It also aims to determine whether the past observed declines were due to inadequate seed set, lack of seedling recruitment, the inability of seedlings to reach maturity, and/or total grazing pressure. The program similarly examined whether the declines were associated with increased weed invasion, or increased competition from native shrubs and native perennial grasses.

2024 Field Trip

A TPAG field trip to remonitor all the quadrat and the belt transect, and survey as many as possible of all know populations of *S. megaglossus* in Dutchmans Stern CP and adjacent Wilkatana Station (Figure 3), was conducted from 23rd to 28th September 2024. This was led by Rick Davies assisted at various times by botanists/ecologists Rob Brandle, Ben McCallum and Meg Robertson. TPAG volunteers involved in the survey were Rob Ridgewell, Robert (Bert) Heathwood, Phoebe Dickeson, Eira Thorstensson, Tessa Carella, Bruce Marquis, Rose Mason and Karan Coombe-Smith.

To check if there were any further unknown populations on Wilkatana Station, drone pilot and botanist Marcus Pickett was contracted to undertake drone searches of suitable habitat in the centre and northern areas of the station (Figure 3).

A detailed report is being prepared which presents the results of these survey and monitoring and will be made available on ResearchGate.



Figure 1. *Senecio megaglossus* impacted by goat browsing on Wilkatana Station



Figure 2. TPAG volunteers undertaking a census of *Senecio megaglossus* on Wilkatana Station

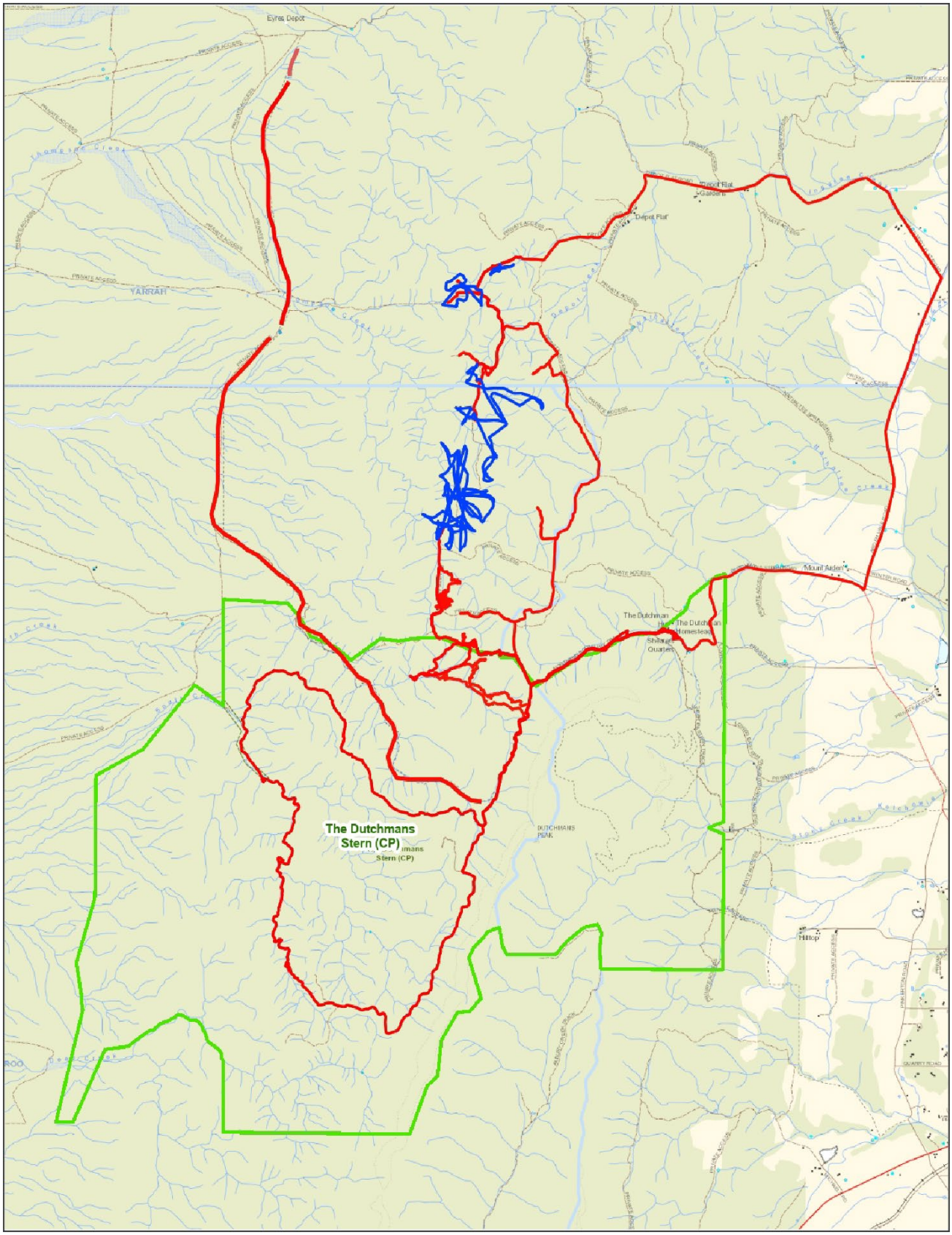


Figure 3. Area searched for *Senecio megaglossus* in 2023 & 2024 (red = on ground, blue = by drone)

APPENDIX 7:

Summary report to TPAG 2024 AGM for project titled:
Urgent recovery actions for the Endangered Spalding Blown-grass.
in the Northern and Yorke Region

by Rick Davies & Tim Jury

6 February 2024

Project description

Spalding Blown-grass (*Lachnagrostis limitanea*), is listed as Nationally Endangered under the Commonwealth Environment Protection and Biodiversity Conservation Act, and listed as Endangered under South Australian legislation. The species is restricted to the Northern and Yorke region of South Australia with only two viable, naturally occurring populations remain, near Tarlee, and near Spalding (at Yakkalo).

These populations of Spalding Blown-grass occur in modified habitats that are dominated by introduced plant species, particularly annual grasses and herbs. The species occurs on remnant native grasslands existing as narrow strips adjacent to agricultural land and transport corridors. These habitats are also threatened by invasion of perennial weeds.

On-ground actions to recover Spalding Blown-grass have been implemented over the past 25 years and have been a collaborative effort between the Threatened Plant Action Group (TPAG), the Department for Environment, Volunteers and other partners. During the Covid pandemic there was an unfortunate hiatus in site management and TPAG is now resuming this important species recovery work.

This project is implementing site management actions recommended in the adopted National Recovery Plan for Spalding Blown-grass. The aim of this project is to coordinate, implement and evaluate recommended on-ground management and monitoring actions at the remaining Spalding Blown-grass sites to assist the recovery of surviving populations by reducing weed competition and enable the regeneration and survival of the species. The project is building upon past management actions to ensure the long-term survival of the remaining populations. We are implementing threat management actions such as weed control at the Tarlee and Yakkalo sites to bolster populations by reducing competition pressure and to assist natural regeneration and population reproduction. Spalding Blown-grass populations are being monitored to assess the efficacy of the implemented management actions.

The project sites also contain important areas of threatened temperate native grassland and other rare flora species such as Barren cane-grass, Tall Blown-grass and Red-legged grass.

Activities in 2024

This project implemented actions to manage threats to remaining populations of Spalding Blown-grass at both the Tarlee and Yackilo sites.

At the Tarlee site, annual and perennial weed grasses (Wild oats, Tall Wheatgrass, Phalaris, Rice Millet) were slashed for approximately 13,000m^2 along western and eastern sides of train line, from post 91 south to culvert/bridge at southern end, plus some areas of adjoining roadside. Spot-spraying was also undertaken of herbaceous weeds, mostly Scabious, but also Salvation Jane, Spiny Starwort, Bristly Ox-tongue, Onion Grass, False Caper, Plantain, Prickly Lettuce, and Statice. Cutting & swabbing or physical removal was used to treat Aleppo Pine, Wild Aster and Stinkweed. Liaison was undertaken with local landholders and adjacent land managers.

A brushcutter with a flail blade had to be used to reduce dense infestations of Scabious (*Scabiosa atropurpurea*). The species has invaded the southern section of the site from the adjoining roadside and has established thick infestations of large woody plants. Weed control treatment was very difficult unless plants were first slashed to enable access for spot-spraying. Tall Wheatgrass (*Thinopyrum elongatum*) is also moving into the site from the north where it dominates the trainline and roadside. Actions were implemented to contain this species and reduce its spread and impact.

At the Yackilo sites, slashing to control weed grasses (Wild Oats, Phalaris) was undertaken over approximately 4,000m^2 from roadside to easternmost waterpipe to southern edge of site near fence and river ford. Herbaceous weeds, mainly Artichoke Thistle, Horehound, Scabious, Bristly Oxtongue, Onion Grass, and Sow Thistle, were spot sprayed. Strategic trimming to reduce competition from native Reeds was also undertaken, as was liaison with local landholder.

Tim Jury was contracted to undertake the work. He spent five days managing weeds at the Tarlee site and three days at the Yakkalo site. The weeding at the former site concentrated on Scabiosa which was the predominant perennial weed. At the latter site, Tim concentrated on the serious environment weeds, Phalaris, Artichoke Thistle, and Horehound. Annual grasses were slashed at both sites to reduce seed set.

Tim also undertook a census of Spalding Blown-grass numbers at both sites in 2023. Seven hundred and thirty plants were counted at the Tarlee site, while 1440 plants survive at the Yakkalo site. This is a threefold increase at the latter site, up from 524 plants in 1994 and 380 in 1995 (Davies 1995).

References:

Davies, R (1995). The Management of Threatened Plant Species in National Parks and Wildlife Service Reserves in South Australia. Black Hill Flora Centre, Botanic Gardens of Adelaide, Adelaide.



Spalding Blown-grass (*Lachnagrostis limitanea*)

APPENDIX 8:

Summary report to TPAG 2025 AGM for
***Lycopodium deuterodensum* in Cleland National Park**

by Felicia Carli

8 February 2024

Survey details

- Only Site 1 surveyed
- Accessed from Eurilla track, entering from Mt Lofty Summit Rd, just after the entrance gate to summit car park.
- Survey of Site 1 completed on 08/06/2024 by Felicia Carli, Rhys Morgan and Ranger Flynn (Cleland NP).

Survey observation

- Dry conditions for winter. Some rain had fallen in the last week, but not much. Soil on site was moist, but many of the midstratum bracken plants were showing signs of drought stress. The bracken on the northeast facing slopes was entirely "burnt" and brown.
- *Lycopodium deuterodensum* plants appeared dry and stressed, with approximately 50% of shoots showing signs of drying, or were dead. Many were drooped over and laying along the ground (Figure 3). However, small juvenile shoots were observed emerging (Figure 1).
- Approximately 50% of *L. deuterodensum* juveniles had been browsed (Figure 2).
- It appeared that *L. deuterodensum* is able to persist as underground rhizomes, with new shoot observed sprouting from the base of dead mature shoots. Further research is needed to confirm this.
- The Lycopodium population had spread outside the original transect markers
- Soil was sandy.

Associated Weeds

- An infestation of blackberries occurred near and above one of the transect markers
- Many Erica seedlings occurred throughout the site.

Survey methods

- Belt transect 15m long, 1m wide.
- Measured out between original transect marker (between tree stumps, down to large single *E. obliqua* and just north of forked tree). Bottom left transect dropper in line with, and about 3m north of, single large *Eucalyptus obliqua*.
- *Lycopodium deuterodensum* shoots were counted in each 1m x 1m quadrat then totaled at the end of each transect.
- Only erect stems were counted. Dead shoots were excluded from the count.

Results

Quadrat #	# living shoots per quadrat
1	119
2	55
3	63
4	89
5	157
6	134
7	163
8	132
9	134
10	119
11	81
12	43
TOTAL	**1289**

Table 1: Numbers of *Lycopodium deuterodensum* shoots in each 1mx1m quadrat, on 8th June 2024.





Figures 1-3: Juvenile *L. deuterodensum* shoots (left), browsed juveniles (centre), & stressed/dead shoots (right)

APPENDIX 9:

Summary report to TPAG AGM for project titled:
Saving the critically endangered Beyeria bush pea (*Pultenaea insularis*)
from extinction due to weed invasion and macropod browsing

by Richard Davies and Felicia Carli

2025

Background:

Pultenaea insularis (Beyeria bush pea) is endemic to Kangaroo Island and is listed as endangered under the South Australian National Parks and Wildlife Act 1972. In April 2023, Dr Richard Davies and Doug Bickerton from TPAG made an application with the Department of Environment and Water to have *P. insularis* listed as 'Critically endangered" under the EPBC Act 1999. Assessment of this application is presently being undertaken.

Only two non-roadside populations of *P. insularis* are known, both which were surveyed in 2022. In Beyeria Conservation Park, 321 plants were counted, down from approximately 600 plants recorded in Beyeria CP in 1995 (Davies 1996, Davies 2023). The biggest threat to this population is browsing by macropods (Western Grey Kangaroos and/or Tamar Wallabies), almost 90% of plants being heavily browsed. Fifteen plants were counted at Kingscote Airport where the greatest threat was firebreak slashing. Invasion by Bridal Creeper and Bridal Veil was also a threat (Davies 2023).

Five population of *P. insularis* were found still surviving on roadsides in 2022, mostly on both sides of Elsegood Road but also a few on Moores Road (ten plants) and Lovering Road (eight plants) (Figure 1). Ten plants recorded in 1996 from Halls Rd, and one on Wheatons Road, had apparently gone extinct (Figure 1). By far the largest surviving roadside population (132 plants) occurs on both sides of Elsegood Road commencing at the intersection with Moores Road, continuing south for 2.3 km. This population had declined by 40% since 1996 when 218 plants were counted (Davies 1996, Davies 2023).

Over all roadside populations, 166 plants were counted in 2022, down from over 307 in 1996. The most serious weed smothering *P. insularis* on roadside is Bridal Veil (*Asparagus declinatus*). In the largest Elsegood Road population, all but one *P. insularis* plant had Bridal Veil growing within a metre of them. Other highly competitive and invasive weeds observed in the vicinity of roadside populations of *P. insularis* were Perennial Veldt Grass (*Ehrharta calycina*), Phalaris (*Phalaris aquatica*), Tall Wheatgrass (*Thinopyrum ponticum*) and Olive (*Olea europea*), but occurrences were much less frequent (Davies 1996, Davies 2023).

The main other threat to roadside populations of *P. insularis* is bulldozing during road maintenance activities. This was particularly an issue for populations along Elsegood Road, where water build-up on the road surface during heavy rains is a problem (Davies 2023).

2023 Weed control and fencing

In 2023, the Kangaroo Island Landscape Board funded the Threatened Plant Action Group Inc (TPAG) to undertake weed management, trial exclusion fencing construction and associated monitoring around populations of *P. insularis* along Elsegood Rd and in Beyeria Conservation Park. This was undertaken as following:

- Bridal Veil and Bridal Creeper was removed from under and immediately around individual patches of *P. insularis* along Elsegood Rd by
    - Physical removal of underground roots and rhizomes
    - Spot spraying with herbicide
- Fenced exclosures and unfenced control sites around populations of *P. insularis* within Beyeria Conservation Park to determine the impact of browsing by macropods

Weed control and fencing were conducted from 25th-29th September 2023. The project was led by TPAG Committee member Felicia Carli with assistance from Tom Hibburt (Assistant Botanist), Tim Jury (Senior Botanist) and Kym Lashmar (KI Landscape Board Botanist). Further assistance was provided by TPAG members and student volunteers Madeline Whipps, Emma Seeliger and Minh Quang Vu.

2023 & 2024 monitoring

Methods

Elsegood Road

P. insularis was hand-weeded and sprayed in 2023 along the east and west side of a two kilometre stretch of Elsegood Road, Kangaroo Island starting from Moores Rd heading south towards The Honey Farm (see Figure 1.).

One hundred and twelve *P. insularis "*plants" had weed treatments applied to them. Given that P. insularis forms prostrate mats and puts down adventitious roots where stems touch the ground, it is difficult to accurately determine how many individuals occur in one patch, without destructive sampling. For this reason, each patch of *P. insularis* containing contiguous foliage was defined as a "plant".

The exotic weed species which was targeted was Bridal Veil (*A. declinatus*), this being the greatest threat to *P. insularis*. Areas in the immediate vicinity of 36 *P. insularis* "plants" were spot sprayed, with hand-removal around 63 *P. insularis* plants, and both hand weeding and spraying around 13 plants. Hand removal included digging up Bridal Veil roots and rhizomes. Even though the species is unable to reproduce from tubers alone, most of the tubers were also removed to ensure that that all rhizomes had been removed.

For each of the treated *P. insularis* plants, the maximum diameter (MD) and perpendicular diameter (PD) of the living foliage was measured, and the approximate foliage area estimated using the formula: $\pi((MD \times PD)/4)^2$. Percentage foliage dieback, and percent cover of Bridal Veil and Bridal Creeper, were also estimated. Each plant was marked with a permanent numbered metal disk in 2024, to facilitate future monitoring.

Two permanently- marked-out belt transect sites were also set up– one that had no treatment applied, and the other subject to both hand weeded and spot sprayed. Monitoring was undertaken

using the Point Intercept Methods to estimate cover of *P. insularis,* Bridal Veil and Bridal Creeper, with results recorded in spreadsheets and all entered to facilitate future monitoring. A 1m x 1m square of reinforcing mesh, divided into a hundred 10cm x 10cm subquadrats, was used, with a pin being pushed into the same corner each subquadrat, the number of strikes providing an objective estimate of cover.

Initial results of a preliminary survey conducted by Kym Lashmar from the KI Landscape Board showed that there is dieback on approximately 30% of all *P. insularis* plants that had treatment applied. A total of six plants had experienced significant dieback of approximately 60-80%. There also appeared to be a natural dieback rate of approximately 2-5% on all plants.

Given some concern about this dieback, hand weeding treatment or spot spraying was halted for this population of *P. insularis* on Elsegood Rd in 2024*,* pending further monitoring by TPAG to determine the best weed management methods to minimise off-target damage to *P. insularis.*

Baseline monitoring was undertaken from 25th to -29th September 2023, with repeat monitoring done from 11th to 13th July 2024. Annual rainfall in 2024 was well below average, viz 289mm compared with an average of 444mm, in nearby Kingscote.

Given that the belt transects set up in 2023 were not replicated, a further eleven permanently marked out 1m x 1m quadrats around P. insularis plant were set up in 2024, at six locations along Elsegood Rd and adjacent Moores Road. All locations were heavily infested with Bridal Veil, but three of the locations had been treated with hand removal and spraying to remove the weed, while the other three were left untreated. The aim of this monitoring is to quantify relative changes in both Bridal Veil and *P. insularis* percentage cover over time, where Bridal Veil is left untreated compared with where it is treated.

Baseline monitoring for these 2024 quadrats as undertaken on 10th July 2024 again using a 1m x 1m square of reinforcing mesh, divided into a hundred 10cm x 10cm subquadrats. However, instead of using the Point Intercept Method, percentage cover was estimated and recorded for each of the hundred 10cm x 10cm subquadrats.

Beyeria Conservation Park

Four 1m x1m macropod-proof exclosures were erected in 2023 within Beyeria Conservation Park surrounding a total of 101 *P. insularis "*plants". Adjacent to exclosures, four 1x1 metre unfenced 'control' quadrats were marked out (see Figure 2). The control quadrats encapsulated 87 "plants". The Point Intercept method was used in both 2023 & 2024 to estimate cover of *P. insularis.*

Results

Elsegood Road

Individual plants

In September 2023, *P. insularis* "plant" dieback averaged 13.3% where hand removal of Bridal Veil had been undertaken, but this halved to 6.6% by July 2024. This was at least partially due to growth of new foliage, average heathy foliage area increasing from 3.2m^2 to 4.8 m^2 during that period. While three plants had over 50% dieback in 2023, all three had greatly decreased dieback by July 2024 and/or had increased in area of healthy foliage. In contrast, half of plants had levels of dieback of five percent or less in both years, and the remainder all had decreasing levels of dieback and mostly increasing areas of healthy foliage.

Where spot spraying alone was used, average dieback was lower at 6.7% in 2023, decreasing to 2.4% when surveyed in 2024. As with hand removal, average area of healthy foliage for all plant subject to spot-spraying increased between 2023 and 2024, from 2.6m^2 to 4.7m^2. Of the 36 plants where spot-spraying was used, only one plant had over 50% dieback in 2023, while 32 plants had 5% or less die back.

For plants subject to both spot-spraying and hand removal, average dieback rates were similar to where hand-removal was alone used: 12.3% in 2023, dropping to 4.9% in 2024. Of the eight plants such treated, one had 70% dieback in 2023, two 10% dieback, and the remainder two or less percentage dieback. On average healthy foliage increased from 2.6 m^2 to 3.3 m^2.

While these results suggest that spot-spraying produced the least off-target impact, these results need to be tempered by the effectiveness of each treatment in reducing Bridal Veil cover. On average, spot spraying reduced Bridal Veil cover to 11.5% in 2024. In contrast, hand-removal alone, and spot spraying together with hand-removal reduced Bridal Veil cover to 7.9%.and 7.4%, respectively.

These results indicate that both methods used together are acceptable, if 1) herbicide spray is not used immediately adjacent *P. insularis* plants, and 2) hand-removal is done in a manner which does not disturb any *P. insularis* adventitious roots. While it is important to remove all Bridal Veil rhizomes and roots, tubers alone are unable to reproduce and only need to be removed to the extent that all rhizomes are exposed and removed.

It should be noted that no *P. insularis* plants subject to any of the three treatments had died as of July 2024, despite the well below average rainfall conditions. And most plants had increased in foliage area between 2023 and 2024 following treatments.

Belt transects

For the seven belt-transect quadrats containing *P. insularis* which had Bridal Veil removed by spot spraying and hand-removal, percentage cover of *P. insularis* only declined slightly from 32% in 2023, to 30% in 2024, a 6% decline. Bridal Veil cover declined sharply from 48% to 11% due to the treatments.

In contrast, for the seven untreated plots, Bridal Veil cover decline was less pronounced, from 63% to 44%., this decline likely attributable to the impact that the dry season was having on the emergence of this weed. Percentage cover decline of *P. insularis* declined more markedly than for the treated quadrats from 8% in 2023, to 5% in 2024, a 38% decline, indicating possible competition effects of Bridal Veil.

Beyeria Conservation Park

Comparison of exclosure quadrats with unfenced control quadrats indicated the effect of macropod browsing on *P. insularis*. For the four exclosures, average *P. insularis* cover decreased from 25% to 19%, a 24% decline, likely attributable to the very dry conditions. In contrast, for the unfenced quadrats average *P. insularis* cover decreased by 67%, from 22% to 6%. This over 40% greater decline is likely due to increased impact of macropod browsing.

Conclusions

It is recommended that both herbicide spraying and hand removal be used to control Bridal Veil threatening *Pultenaea insularis* on roadside **as a matter of urgency**. Our results indicate that both methods used together are acceptable, if 1) herbicide spray is not used immediately adjacent *P. insularis* plants, and 2) hand-removal is done in a manner which does not disturb any *P. insularis* adventitious roots. While it is important to remove all Bridal Veil rhizomes and roots, tubers alone are unable to reproduce and only need to be removed to the extent that all rhizomes are exposed and removed.

It is also recommended that either 1) macropod numbers be reduced in Beyeria Conservation Park by culling or 2) that the whole area containing *Pultenaea insularis* be fenced with macropod-proof fencing.

References

Davies, R. (1996) Threatened Plant Species on Roadsides: Kangaroo Island, South Australia. Resource Management Branch, Department of Environment and Natural Resources, Adelaide.

Davies. R.J.-P. (2023). Survey results and management guidelines for two of Kangaroo Island's most threatened endemic plant species: *Pultenaea insularis* and *Leionema equestre.* Report for the Kangaroo Island Landscape Board. Threatened Plant Action Group, Adelaide.

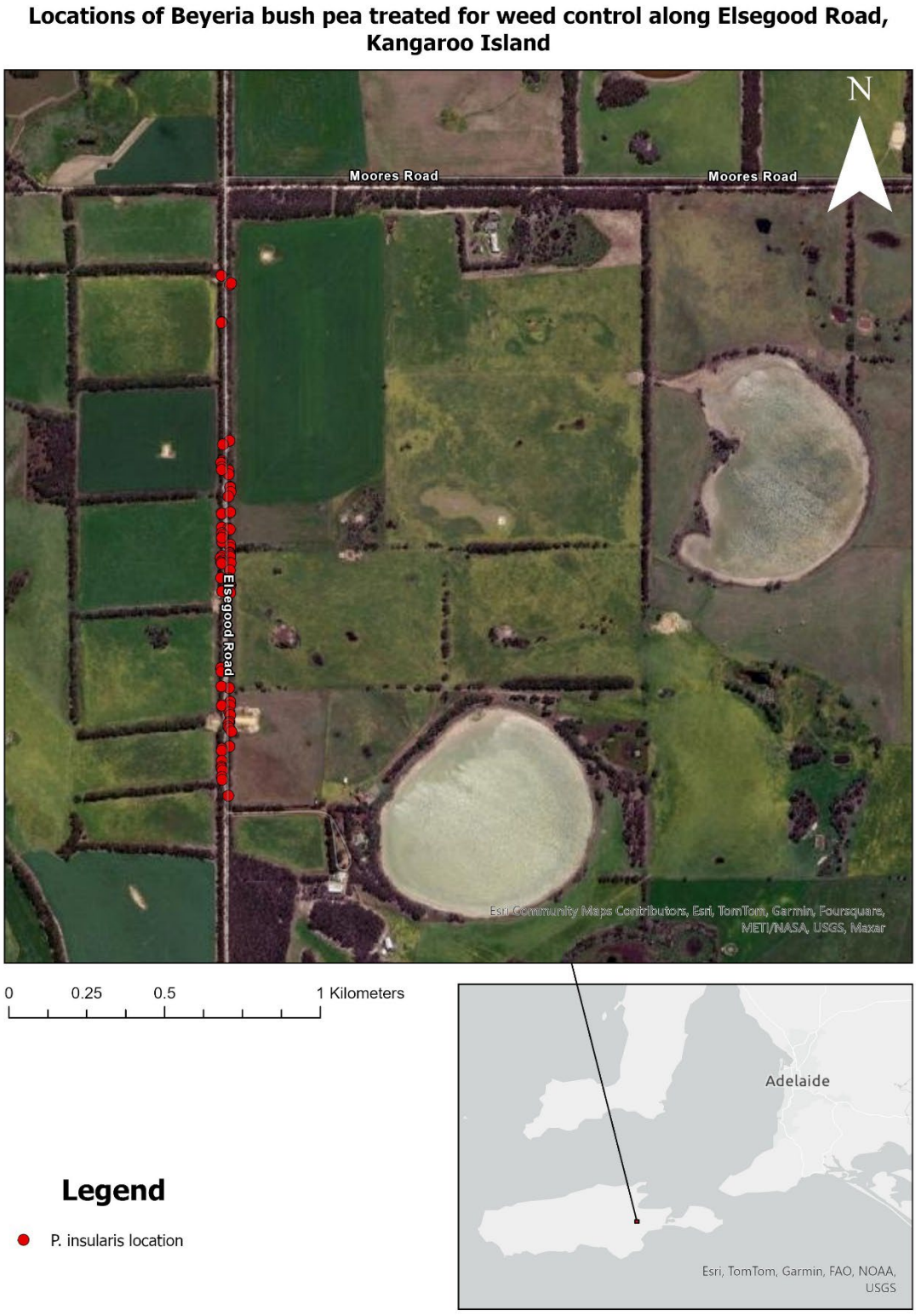


Figure 1: Map showing all *P. insularis* plants treated by hand weeding and/or spot spraying along Elsegood Road, Kangaroo Island in September 2023.

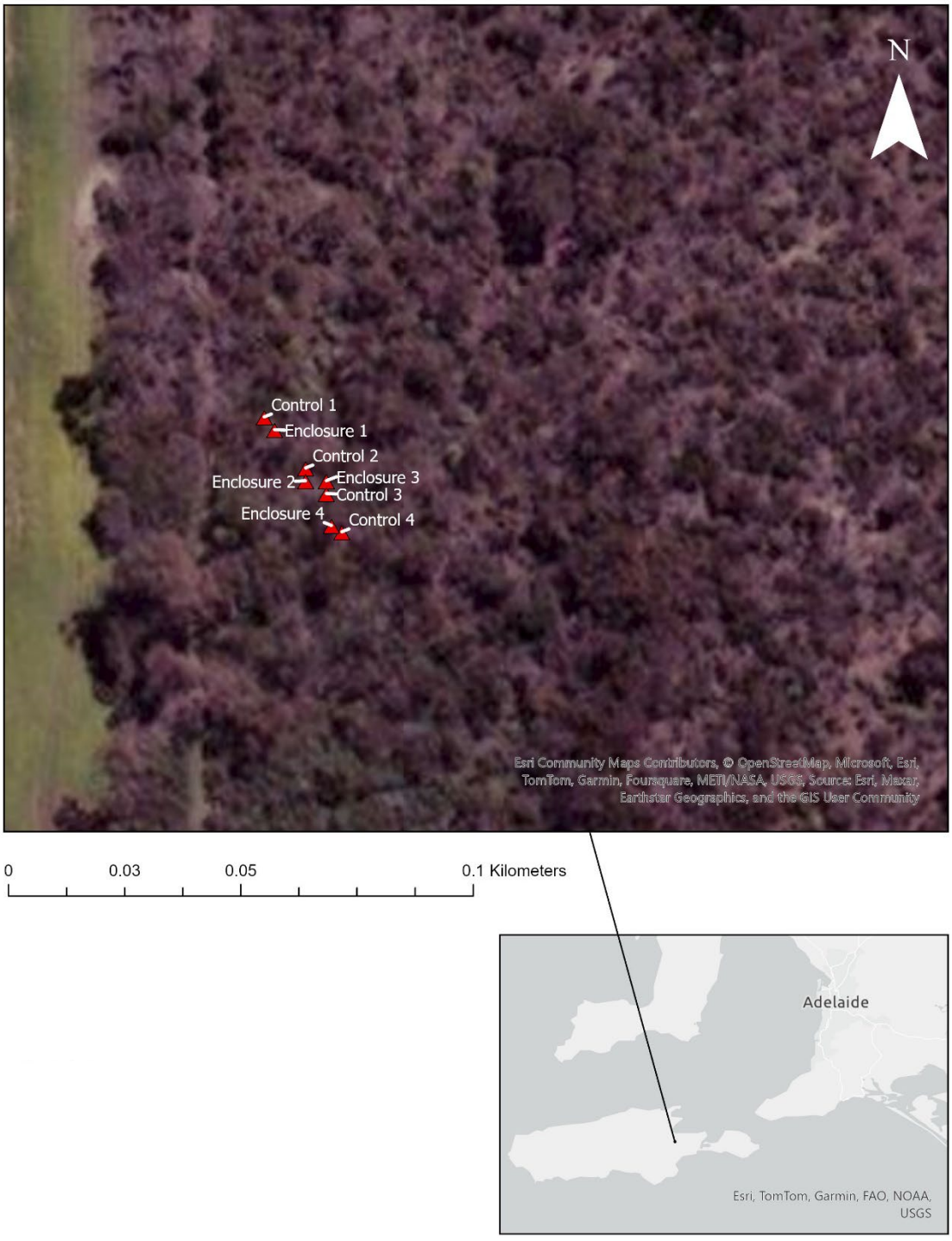


Figure 2: Map showing section of Beyeria Conservation Park where macropod exclosures have been erected. All four fenced exclosures and the four associated unfenced control quadrats are shown.