

Pictures from the field:

Cassytha pubescens R.Br.
(Downy dodder-laurel)

Henry Rutherford



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Acknowledgement of traditional owners:

“The sites described in this presentation are within the Lands of the Kurna Nation, and that this presentation is addressing problems that has arisen from the degradation of Kurna Lands; and I wish to thank you all for listening to my talk today and for taking an interest in the care of these Lands.”

Acknowledge Post Doc Researcher Robert Cirocco, University of Adelaide & his sponsors PIRSA Biosecurity SA, Natural Resources SA Murray-Darling Basin, Natural Resources Adelaide and Mount Lofty Ranges



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What is *Cassytha*?

Genus of the Lauraceae family

History

- No certainty on its evolutionary history, & there is no known fossil evidence (Weber)
- Given that the Lauraceae is accepted as a primitive family, and *Cassytha* displays great morphological deviation from other Lauraceae it can be assumed to be a very old plant (Weber)
- Diversity and distribution of *Cassytha* species are concentrated within Australia and other Gondwana originated continents which leads to the speculation that it evolved in Gondwana (Weber)
- *Cassytha pubescens* represents in its variability a link between most other species in Australia and is still evolving (Weber)



Others *Cassytha* species in
South Australia are:

C. glabella f. *dispar*

C. melantha

C. peninsularis var.
peninsularis

C. peninsularis var. *flindersii*



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Current Niche

Hemiparasite – can photosynthesise as well as draws moisture and nutrients from host

Germinates from seed and grows as highly modified stems with spiralling tendrils.

At maturity it is completely separate from the soil and attached to a host by haustoria



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Has a convergent evolutionary pathway with dodders, where both plants are effectively very similar and both regarded as pests under some situations

Is non selective of its target hosts, though it will appear on some species more than others



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Colouration is thought to be a sign of it's dependence on the host – where a yellow *Cassytha* is not photosynthesising and thus drawing more from the host, and a green *Cassytha* is the opposite, needing to photosynthesise and having a low impact on host



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Cassythia as a biological control

It is a current suggestion that *Cassythia pubescens* is a possible natural and endemic novel biological control.

This is based on observations of *Cassythia pubescens* having a greater impact on exotic woody weed species than on surrounding native vegetation.

An advantage of this is there is no need for quarantine considerations as it is a native endemic plant.

A risk is that under best practice a biological control should be host specific where here we are proposing a justification on a mathematical function of preference.



As a weed professionals there are a few big questions to ask:

- If we propagate and plant en masse will we start a process that has an overall negative impact on native vegetation?
- If we start this process and we have it wrong can we stop it?
- What are the key indicators that it will self-regulate?
- Is the current observed density and distribution of *Cassythia pubescens* that of a balanced state or is it already out of balance due to modern vegetation disturbance?
- If we ignore this idea will we find that *Cassythia pubescens* is one of nature's natural mechanisms for keeping woody weeds in check?



Research

Experimentation is being undertaken by the University of Adelaide conducted by Post Doc Researcher Robert Cirocco, in conjunction with PIRSA Biosecurity SA, Natural Resources SA Murray-Darling Basin, Natural Resources Adelaide and Mount Lofty Ranges, at both the Adelaide and Waite Campuses



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1. Plant growth response on gorse to high / low availability of water / nitrogen, :- CP response to host plant stress

Plant growth response on gorse to large / small host :- CP response to host plant maturity



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2. Field trials onto blackberry, treatments: slashed / unslashed Sites in Belair NP, Horsnell Gully CP, & Cleland CP :-
These *Casslytha* plants have not been germinated from seed but rather naturally infected English broom plants have been transplanted into pots (mother plants), then trained onto gorse plants



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3. Germination trials, treatments: into boiling water then soaked in water 24 hours, Scarified then soaked in water 24 hours, Scarified then soaked in smoked water 24 hours :- under seed germination experimentation thus far, germination is only occurring at approximately 7%



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4. Community
involvement in training
Cassitytha pubescens onto
multiple hosts :- building
community capacity to
implement biological
control



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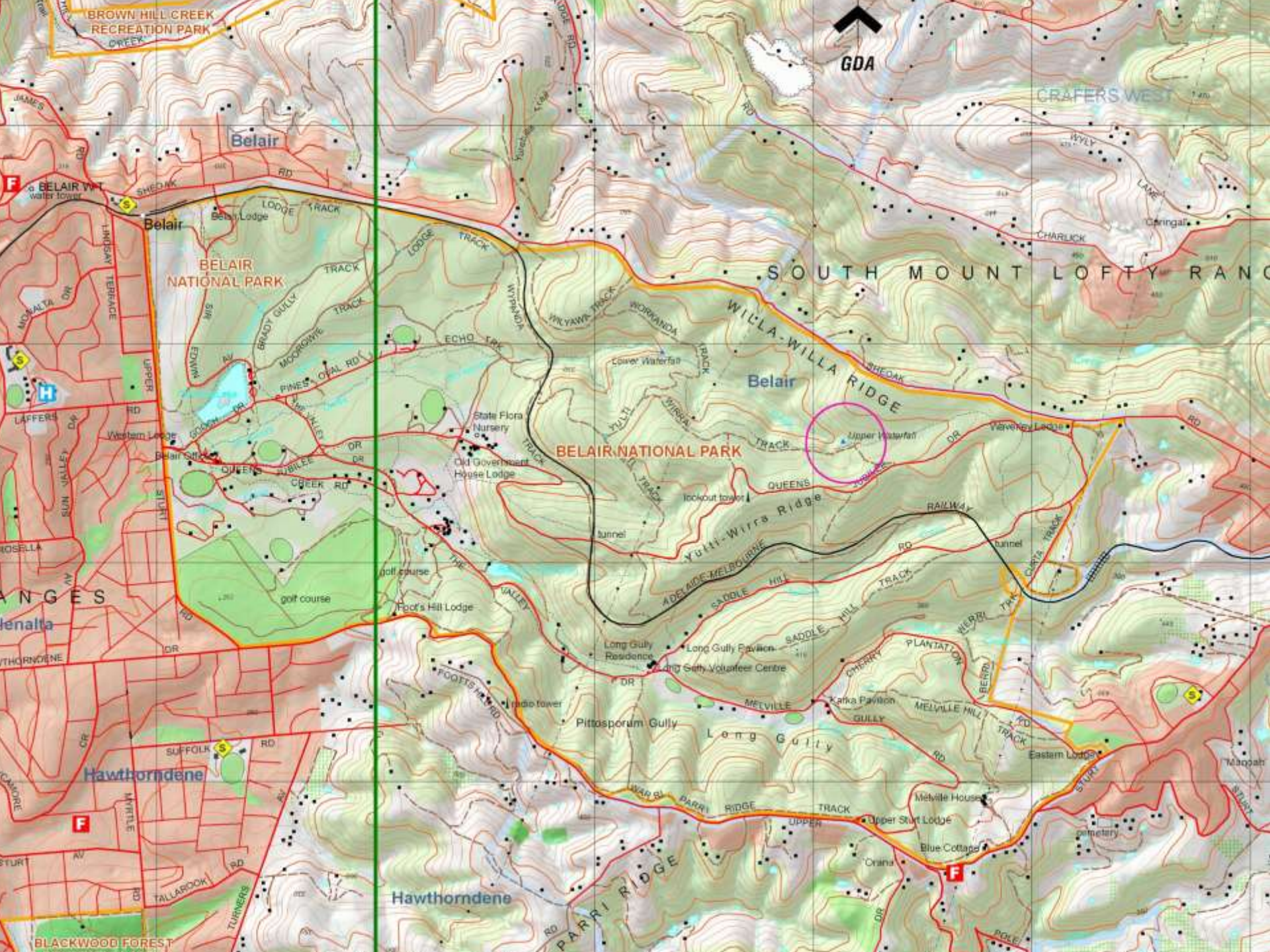
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GDA

GRAFRERS WEST

Belair

BELAIR NATIONAL PARK

BELAIR NATIONAL PARK

SOUTH MOUNT LOFTY RANGE

WILLA-WILLA RIDGE

Belair

ANGES

Belair

Hawthorndene

Hawthorndene

BLACKWOOD FOREST

PARRI RIDGE

UPPER TRACK

Blue Cottage

cemetery

Taqqah

Eastern Lodge

MELVILLE

CHERRY GULLY

Kafka Pavilion

Long Gully

UPPER TRACK

Pittosporum Gully

Long Gully

Long Gully Residence

Long Gully Pavilion

Long Gully Volunteer Centre

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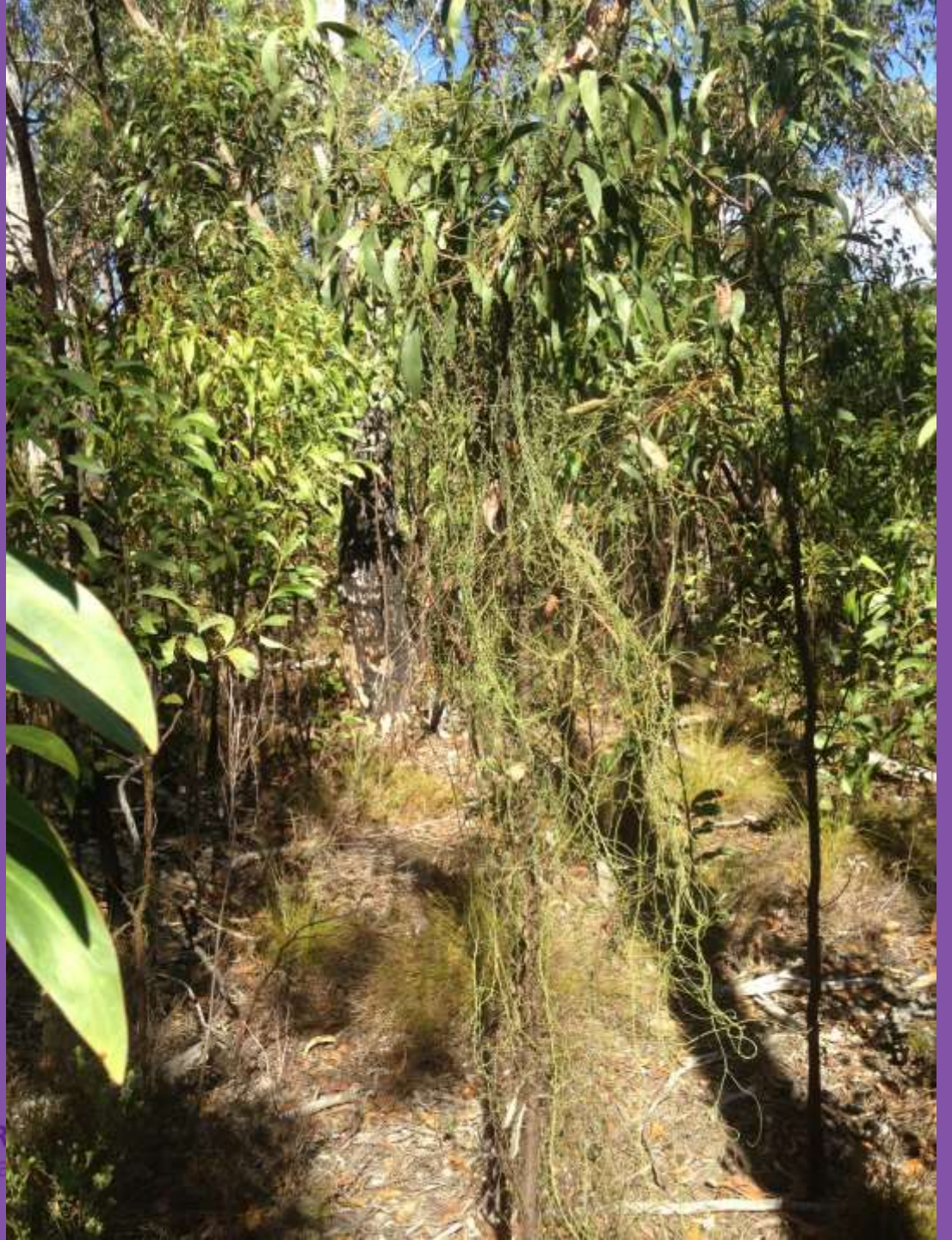
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