

Weed control followed by summer wild fire facilitates restoration of seasonal clay-based wetlands in south-west Australia

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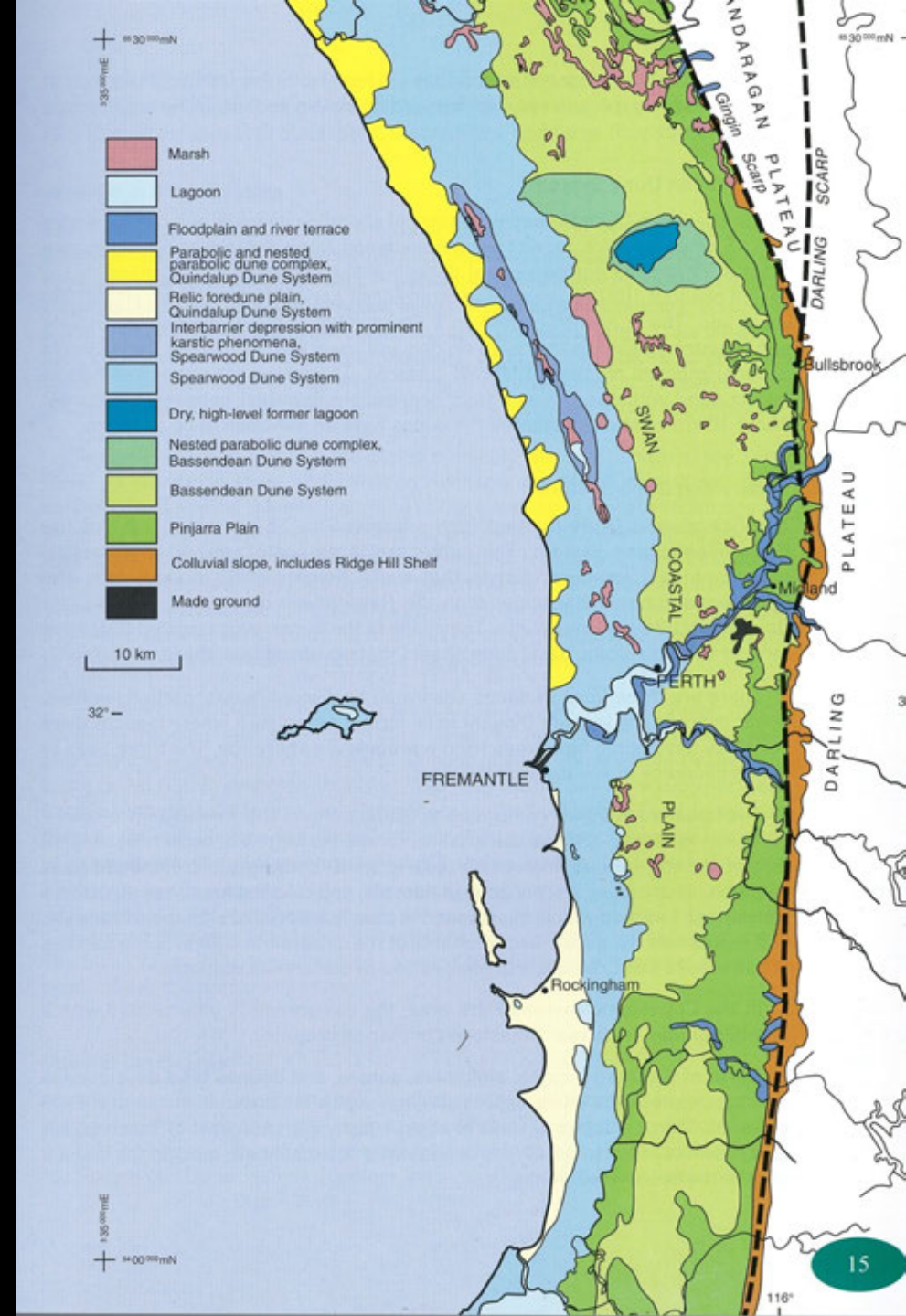


Department of
Environment and Conservation



On the Southern Swan Coastal Plain approximately 240 hectares of clay-based wetlands remain, considerably less than 10% of their original occurrence.

Generalised geomorphology of the Perth region
(from; Gozzard, J.R. 2007)





- 609 taxa recorded from the clay-pans of south-west Australia
 - 16 are endemic to the clay-pans
 - 20 have their distribution centered on the clay-pans
- (Gibson *et al.* 2005)



Amphibromus neesii (Swamp Wallaby Grass)



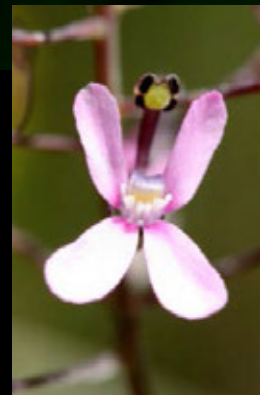
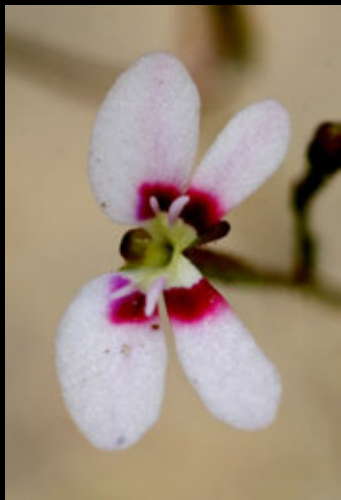
Eryngium pinnatifidum subsp. *palustre* ms





Stylidium obtusatum







Centrolepis aristata





Tribonanthes longipetala





Chorizandra enodis





Meeboldina cana (female)

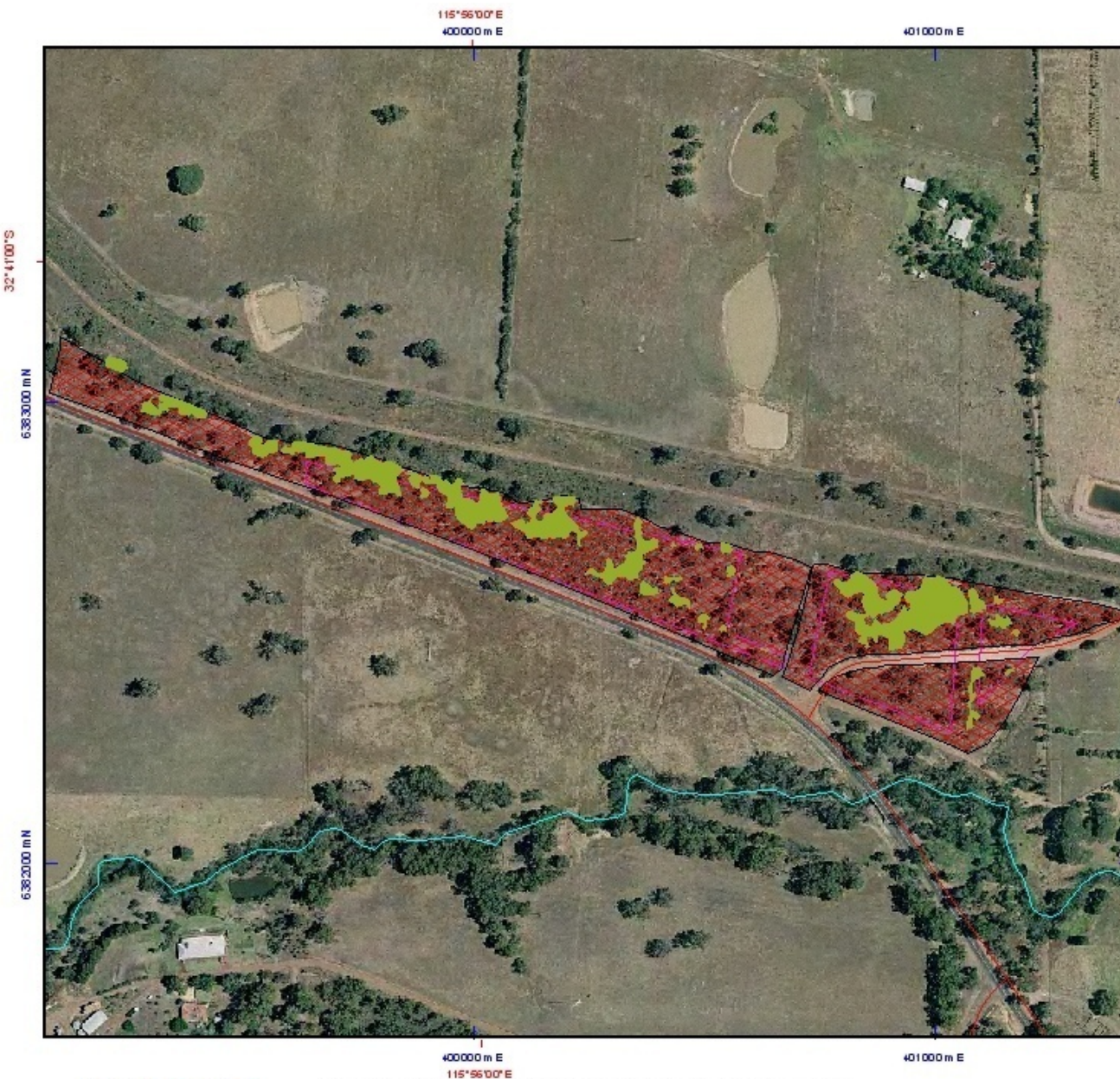


Meeboldina cana (male)

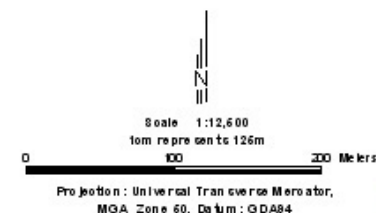


Meelon Nature Reserve





Meelon - Watsoria 2006



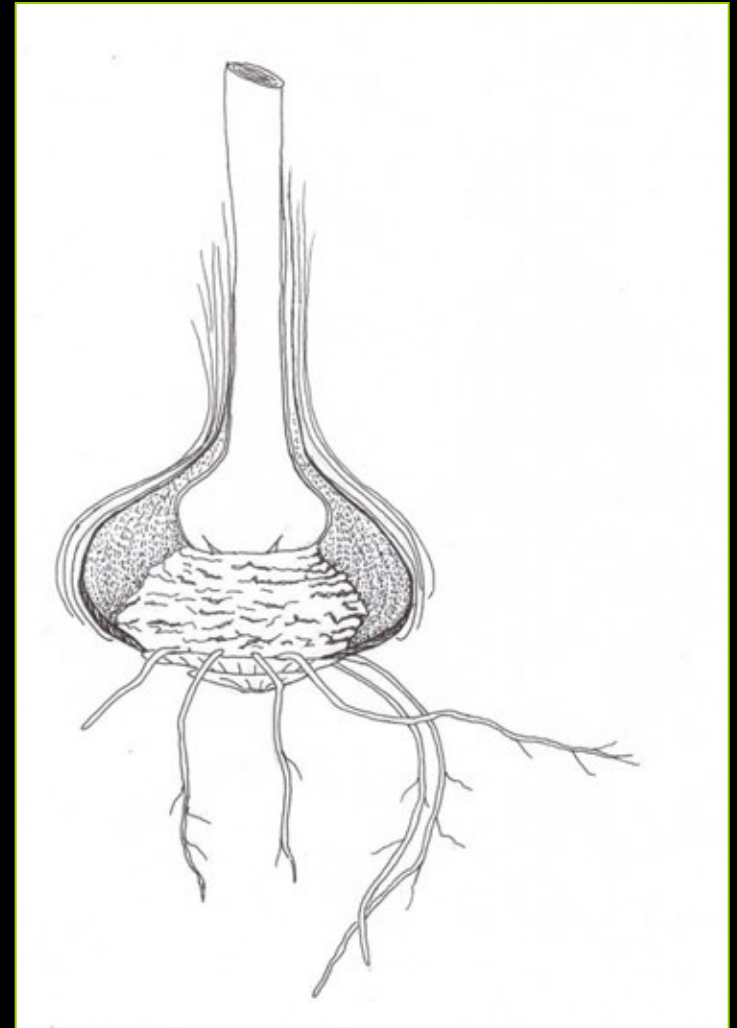
Produced Under the Direction of
Kieran McKinnon Executive Director
Department of Conservation & Land Management.

Grid shown at 1 minute intervals.
Grid shown at 1000 metre intervals.

The Dept. of Conservation and Land Management does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequences which may arise from relying on any information depicted.

Produced at 10:58 on September 21, 2006

In September/October each year, just before flowering, on corm exhaustion Watsonia was spot sprayed with the herbicide Dalapon (2.2DPA) at 10g/L + the penetrant pulse.



- Does the native flora of these wetlands have the capacity to regenerate following control and removal of an invasive geophyte?
- Is there a role for fire in that restoration process?





September
2005

(before
treatment)

- 5 transects,
30 1x1m
quadrats

- Recorded
cover of native
and introduced
taxa in each
quadrat

Following
wildfire in
February 2007





September 2005 before treatment
with 10g/L 2-2 DPA (Dalapon)



September 2006



February 2007



September 2007



September 2011

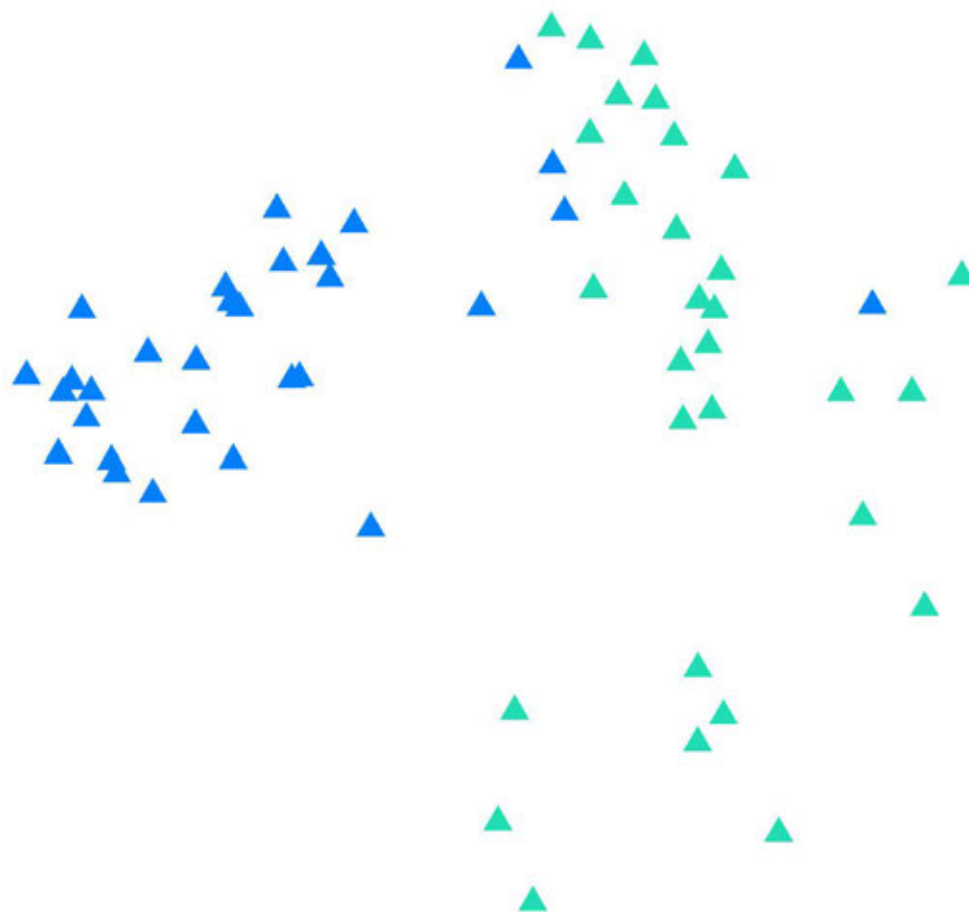
Meelon Nature Reserve

year_Transsect_QuadratNameMid point CC

Resemblance: S17 Bray Curtis similarity

2D Stress: 0.2

year
▲ 2011
▲ 2005



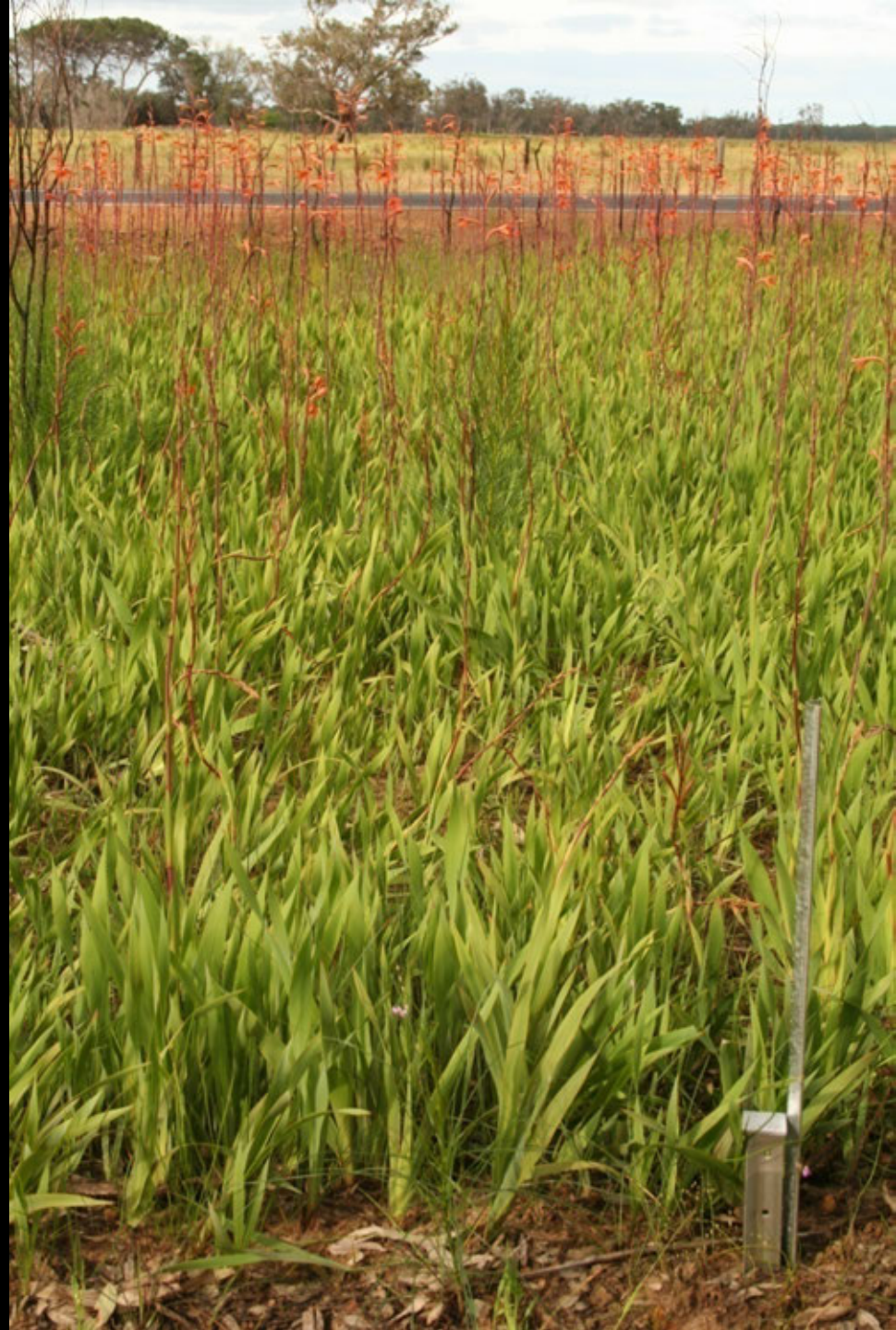
Species	2005 Average abundance	2011 Average abundance
<i>*Watsonia meriana var. bulbillifera</i>	62.4	0.2
<i>Cyathochaeta avenacea</i>	10.0	23.5
<i>Chorizandra enodis</i>	2.3	15.7
<i>Viminaria juncea</i>	2.1	15.4
<i>Caesia micrantha</i>	2.6	2.7
<i>*Briza spp</i>	3.2	2.9
<i>Eucalyptus wandoo</i>	0.0	3.0
<i>Austrodanthonia acerosa</i>	0.4	1.8
<i>Hypoxis occidentalis</i>	0.0	1.9
<i>Lepidosperma sp. WT2Q5</i>	0.1	1.3
<i>Meeboldina sp.</i>	0.2	1.4
<i>Dichopogon preissii</i>	0.0	1.3
<i>Drosera rostulata</i>	1.5	0.2



Anosim comparing 2005 & 2011 (Global R): 0.6, $P < 0.001$

Watsonia meriana var.
bulbillifera flowering
September 2007 in Meelon
Nature Reserve following
summer wildfire

Prolific flowering and seed
set facilitates invasion of
Watsonia into bushland
following fire.



Species	2008 Average abundance	2011 Average abundance
* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	33.9	46.1
<i>Viminaria juncea</i>	17.0	9.7
<i>Cyathochaeta avenacea</i>	19.4	14.7
<i>Dichopogon capillipes</i>	7.6	10.8
<i>Hakea lissocarpa</i>	5.3	5.6
<i>Lepidosperma</i> sp. WT2Q5	4.3	1.6
<i>Chorizandra enodis</i>	5.1	2.0
<i>Xanthorrhoea</i> sp. WC1	1.8	3.5
<i>Hypoxis occidentalis</i>	1.3	2.9
* <i>Romulea rosea</i>	2.0	1.6
<i>Microlaena stipoides</i>	2.3	0.5
* <i>Avena barbata</i>	2.0	0.8



Cyathochaeta avenacea



Dichopogon preissii



Chorizandra enodis



Hypoxis occidentalis



Viminaria juncea



Meeboldina cana

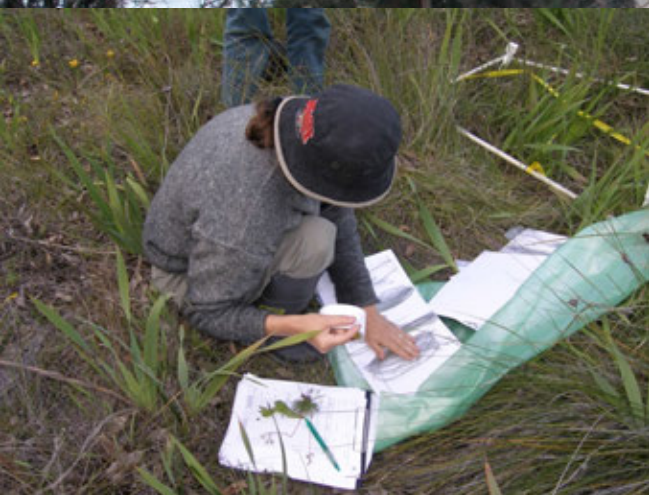


Drosera rostrulata

Summary

- The communities of these wetlands do have the capacity to regenerate once *Watsonia meriana* var. *bulbillifera* has been controlled
- Summer fire can play a role in the restoration process
- Fire also plays a significant role in the invasion of *Watsonia meriana* var. *bulbillifera* into these plant communities in the first place





Thanks

