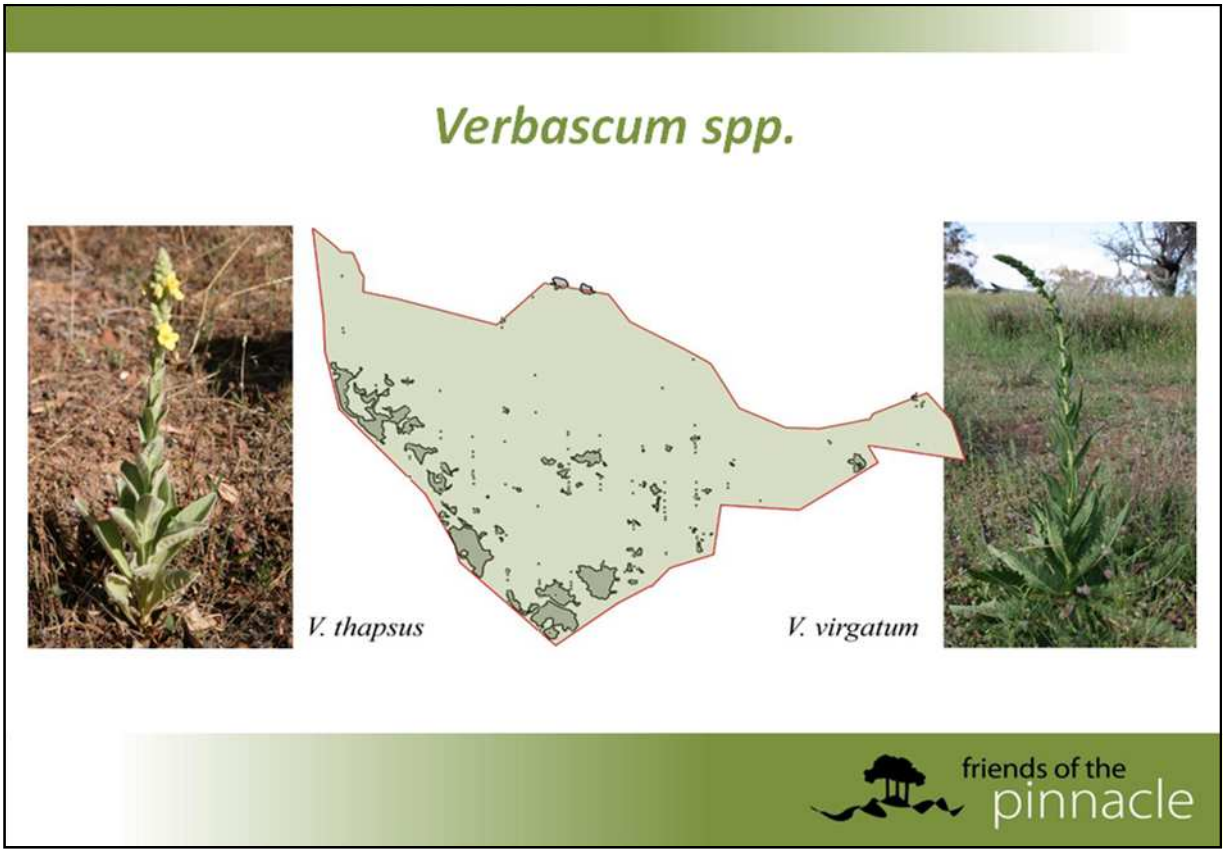
The Friends of the Pinnacle is a parkcare group formed to protect, enhance and promote the ecological values of The Pinnacle Nature Reserve. We have more than 50 members, and an active weed control program.

The Pinnacle Nature Reserve is located to the south of Belconnen, in the upper slopes of the Lower Molonglo Valley. To the east lies Mt Painter, Aranda Bushland and Black Mountain, and to the south Kama Nature Reserve and the Lower Molonglo Valley.

The Pinnacle is some 130ha. Combined with adjacent unleased land – Bottom Pinnacle and North Kama – our area of interest totals 250ha.

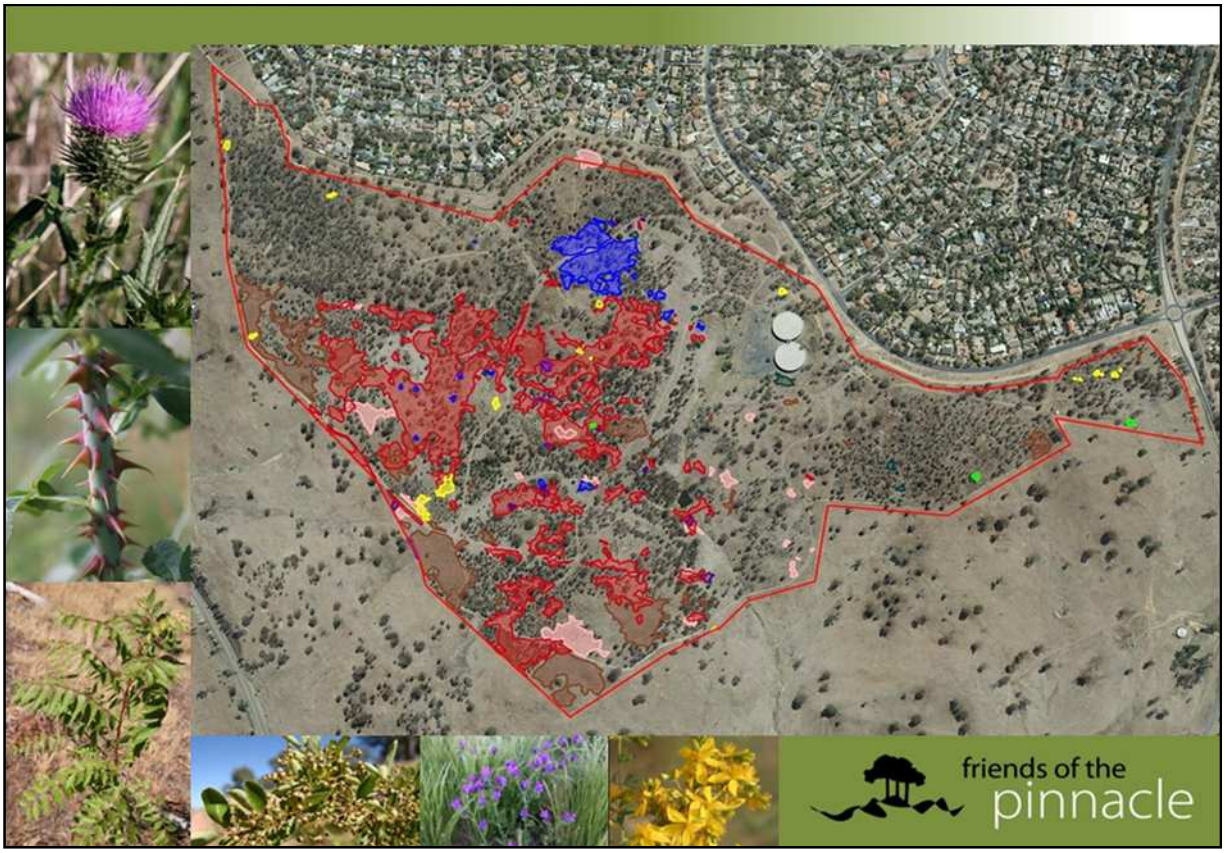
In May 2010 we released a draft Weed Management Plan, and since then have put in a lot of effort implementing it.



The draft plan was backed by a weed survey in spring 2009. We surveyed 14 key weed species, mostly herbs and woody weeds.

Two species are from the genus Verbascum, thapsus and virgatum. The dots show where individual plants were recorded along 20 N/S transects, and the blobs are patches we subsequently mapped using our GPSs.

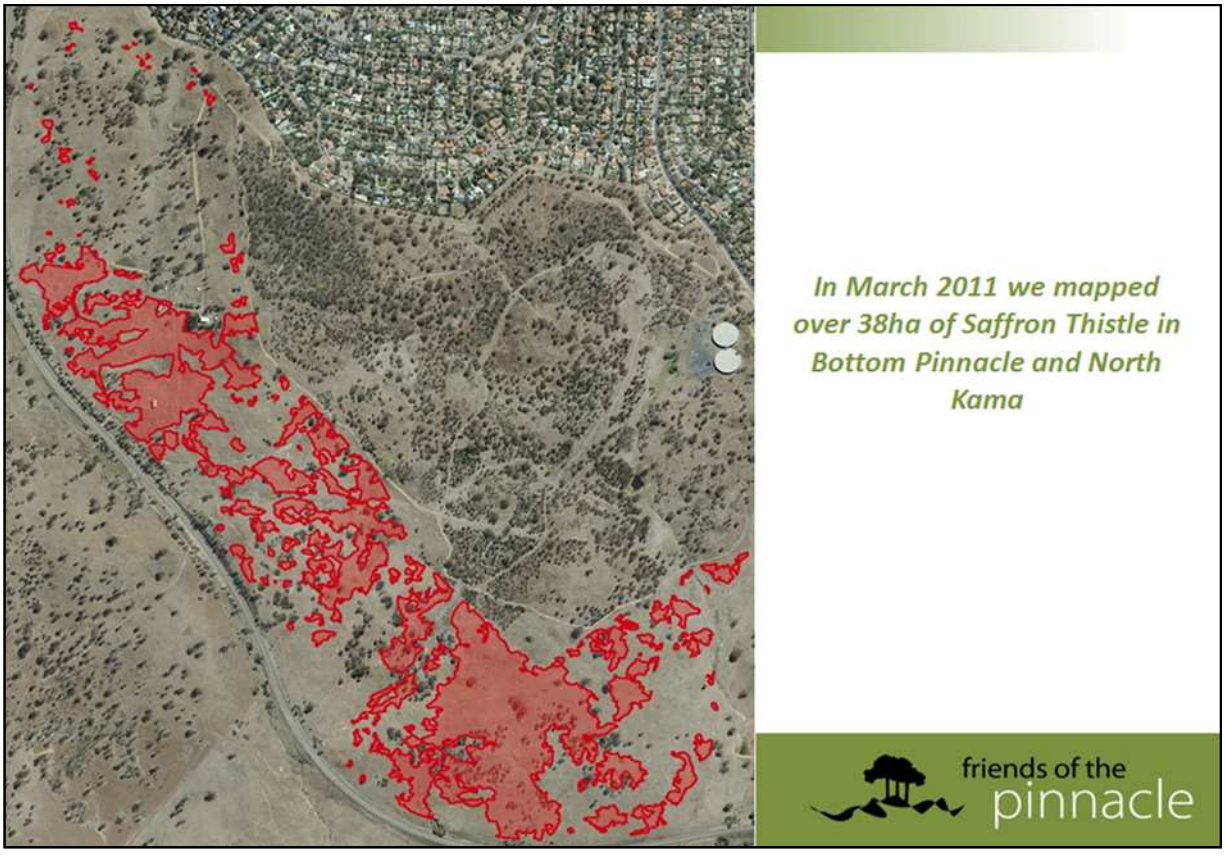
At the time of the survey we estimated approximately 7.5ha of verbascum, and 80,000 individual plants.



These are the weed patches we mapped, where a patch is greater than 5sqr metres.

Horehound patches are blue, saffron thistles red, thapsus brown and virgatum pink …. also yellow st johns wort, and green woody weed patches. Paterson's curse and briar rose were not patch mapped, but presence was recorded.

2009 was a below average rainfall year, with about 450mm at the Airport. Its been much wetter since. We mapped almost 12ha of saffron thistle in 2009, yet we slashed over 50ha of saffrons in 2010.



Indeed, the 2010-11 season was extraordinary for Saffron Thistles. We mapped over 38 ha of this weed across Bottom Pinnacle and North Kama as a benchmark for a very wet year, and a rainfall pattern that certainly favoured this plant.

Weed control priorities

Invasiveness	*Target Weed*	*Potential for effective control*	*Priority for treatment*
Highly invasive weeds that readily form mono-cultures.	African Love Grass St John's Wort	High	Very High
Invasive weeds that readily form monocultures, including in undisturbed areas.	Blackberry, Briar Rose, Woody Weeds Cootamundra Wattle	High	High
Invasive weeds that only form mono-cultures in disturbed areas	*Verbascum spp.*, Thistles (Nodding, Scotch, Saffron) Horehound, Capeweed Paterson's Curse	High	Medium
Weeds that usually only invade degraded or highly disturbed areas	Exotic Grasses and Herbs, Sorrel	Low-Medium	Low-Medium

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In the draft Weed Plan we prioritised weeds for treatment, based on the risk framework in the ACT's Weed Management Strategy.

We prioritised weeds for treatment according to their invasiveness and potential for effective treatment. For example St Johns Wort is highly invasive and with care can be treated. The same for African Love Grass. Whilst Sorel is usually associated with nutrient enriched, highly disturbed sites and the current likelihood of effective control for the vast area it covers is considered low.

Annual effort to control weeds (egs only).

Target weed	Treatment	Recorded	Units	per hr	repeats	hours
St John's Wort	foliar spray	7,172	plants	200	3	108
Cootamundra Wattle	cut/dab	148	plants	20	1	9
Saffron Thistle	grub	702	plants	30	1	24
	spray/slash	119,000	m^2	1,740	1	69
Verbascum spp.	grub	1,215	plants	60	4	83
	foliar spray	79,000	m^2	500	4	645
Paterson's Curse	foliar spray	648	plants	300	1	6
	foliar spray	15,000	m^2	1,740	1	9
TOTAL VOLUNTEER HOURS FOR NON-GRASS SPECIES						**1131**

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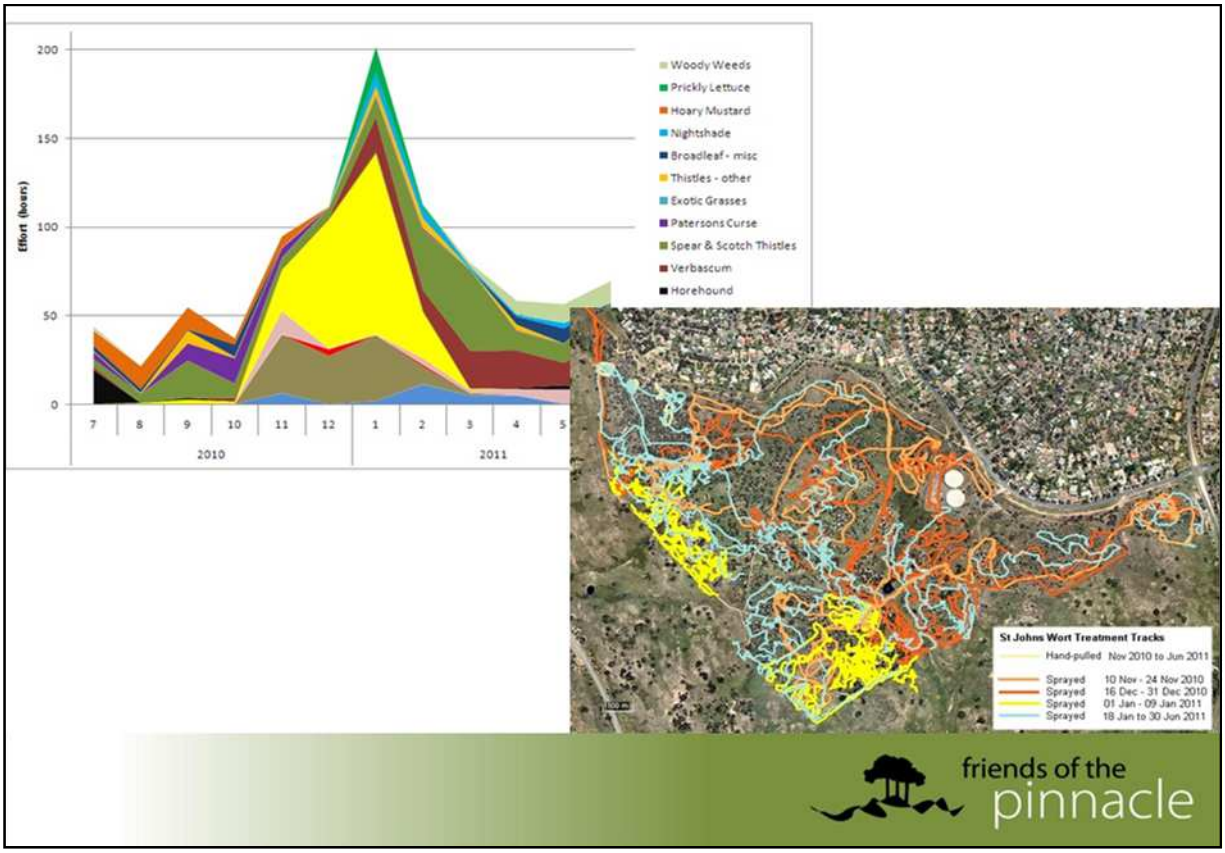
This is an extract from one of the plan's tables, hence the totals column not adding up.

With weed species prioritised for treatment we then:

- identified the most effective treatment – should the plant be sprayed or slashed?
- estimated the annual repeats for that treatment, for example wort opportunistically flowers from mid spring through summer. One inspection and spraying effort is not enough;
- estimated the efficiency of that treatment – how long to spray a hectare of horehound?
- estimated the hours of volunteer effort that would be required to apply those treatments, and the time of the year; and
- compared this to volunteer effort levels, to see what was achievable.

Given weeding effort levels current at the time, and known weed infestations, we believed we could treat African Lovegrass, St Johns Wort, Blackberry, Briar Rose, Cootamundra Wattle, Saffron Thistle and Horehound. This assumed no other constraints such as training, equipment and weather.



As we go about weeding we record control treatments:

- whether spraying, slashing, scything, cut and daub or grubbing;

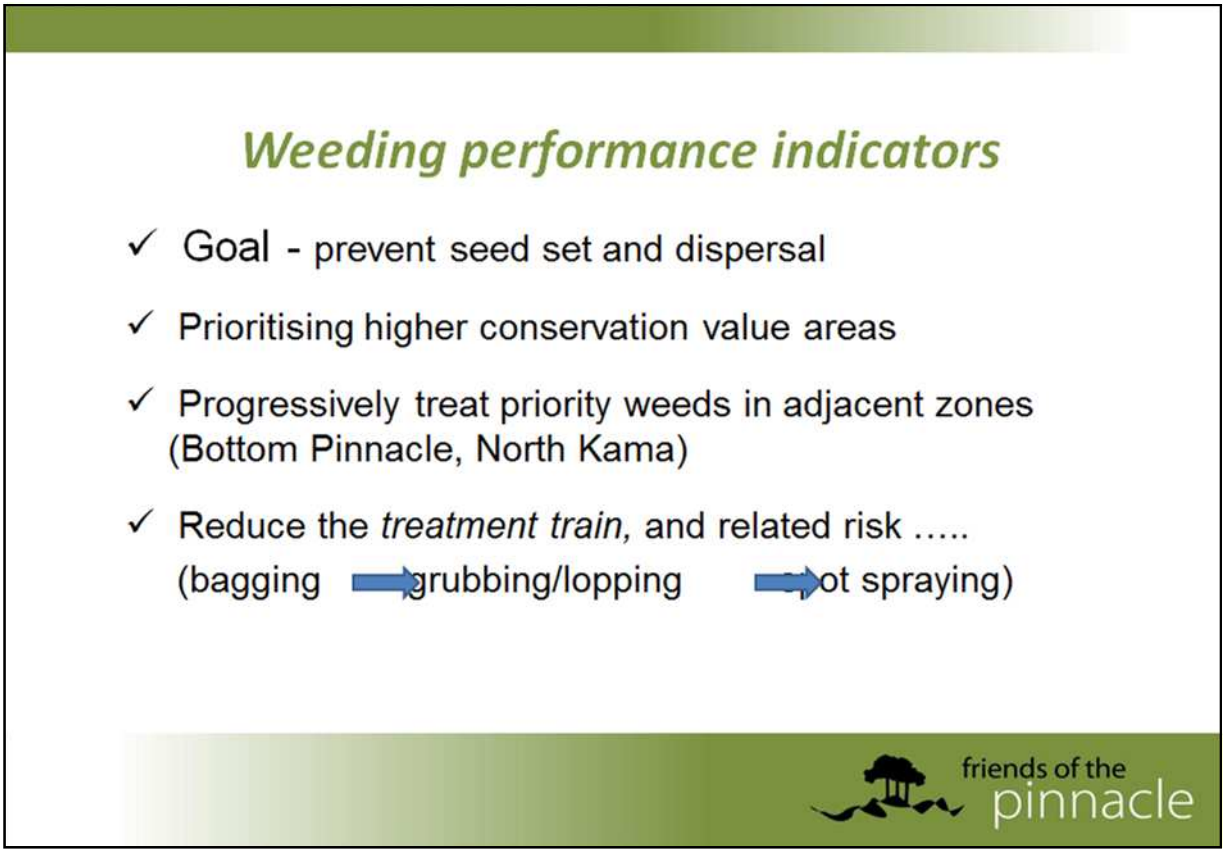
- herbicide usage;

- the timing and location of the treatment, by species and by paddock – these are our management zones; and

- we georeference all treatments, mostly using GPSs. Indeed, you can download the gpx files from our website and know exactly where we where and at what time.

This slide shows where we sprayed St Johns Wort in the 2010-11 season. The squiggly lines are GPS tracklogs, color-coded by month. Though unintended, the map also shows the relative intensity of wort infestations across the reserve.

The upper left hand plot shows monthly effort levels for all treated species during 2010-11. The yellow blob in the middle is the effort applied to slashing saffron thistles with scythes and brushcutters. In the order of 100hrs effort was put into slashing saffrons in January last year, over some 50ha.



Our goal is to reduce the presence of target weed species to isolated individuals, by preventing seed set and dispersal.

And there are spatial priorities to weed control, ensuring higher conservation value “paddocks” are treated first or more thoroughly.

We hope to track improvements in our efficiency and effectiveness by monitoring reductions on total effort, and perhaps in the interim shifts away from bagging seeds, and grubbing or slashing or lopping, to relying entirely on spot spraying. This is especially relevant to verbascum and spear thistles as there are treatments for different growth stages.

Bagging seeds is inefficient and relying on this treatment has attendant risks of not preventing dispersal. We might not get back there in time.

Grubbing disturbs the soil – of particular concern in higher conservation value areas or where cultivation seems to engender more seedlings. Depending on the species and the season, slashing may not kill the plant and retreatment may be necessary. So, the ideal is to work towards successfully treating all weeds by spot spraying, and then less spraying.

The great majority of weeds, which are not targeted through the Weed Plan, are addressed through the Native Grass Restoration Project.

This project tests the potential for a range of treatments to reduce soil nutrient loads, and treat exotic species, to shift the balance from an exotic to native species dominated groundlayer. Those treatments include slashing, burning, cropping and adding soluble carbon (sugar).

The project is supported by both levels of Government, the Canberra Labor Club and Bunnings, and for that support we are grateful. Several hundred hours effort was put into this project in 2010-11.

For more info please go to our website.

We're volunteers!

- volunteer capacity
- communication
- keeping to priorities
- staying with it
- succession

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We face challenges that might be common to volunteer groups.

The capacity of members to commit to regular weeding, to apply the most efficient treatments, and to be available at the right time – are all challenges.

Whilst spraying is the most efficient method, only 4 of 54 members are currently available to spray for 3-4hrs once a week. Other reliable weeders can't carry a loaded knapsack, and others are wary of herbicides.

When slashing Saffron Thistles in 2010-11, the scale of the task and treatment window meant that whilst beneficial, the timing of slashing wasn't always optimal.

Our group has several weekly weeding teams and team leaders, and individuals weeding. This makes it important we communicate priorities, what has been completed and what is planned, and for teams to report what they see to others for follow-up. We're getting better at this, but with new people joining us communication is a continuing demand on key people's time. We use our website as a communication tool – its fotpin's intranet - keeping mostly up to date records of weeding activities – the what, where and when - and notes for each other on observations of what needs doing.

Maintaining effort that leads to lasting benefits is a big ask. Staying with a task – spraying verbascum or African Lovegrass over the years - means a strong value proposition must be there to stay motivated. Testing the hypothesis that good outcomes may be achievable if we stay with priorities was the motivation behind the weed plan, but the message has to be repeated – through the science, highlighting markers of success, and keeping members enthused and focused and working as a team.

And of course succession planning, and spreading the load, seem critical to a group's longevity and to maintaining and focusing effort.

Key external challenges

- communication
- weed control on adjacent land
- wet weather!

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Some challenges come from needing to, or wanting to, work with others, or are transboundary in nature.

We have a good working relationship with ACT Parks. Parks allows us to drive nominated vehicles into the reserve, and they supply us with chemicals, equipment, training and a chainsaw operator. We are party to the preparation of an Operational Plan for the reserve that coordinates our collective efforts.

But sometimes lines of communication fail and we give the other a surprise. We hired a petrol engined augur and drilled 200+ holes in preparation for a planting day – not knowing this was contrary to Parks OH&S requirements. It caused ranger meltdown. It was in the project plan we submitted, but perhaps we should have done more, and closer to the time. And recently a fotpin put in 4hrs spraying lovegrass along a boundary track to learn the next day that Parks would be grading that track the following week.

And there is the issue of weed control on adjacent lands. Weeds arrive by wind, birds, people, machinery, on animals, and by water. Preventing and controlling new or renewed incursions of some species will mean implementing controls elsewhere. To be effective, briar rose control for example might need a landscape scale approach.

And then there is the weather, the wet weather. Wet weather stops weeding in its tracks, especially spraying. The narrower or less frequent are those windows of opportunity for effective weeding the peakier our effort needs to be and more challenging effective control is for volunteers.

Opportunities?

- collaborate
- the right policy settings
- aim higher, manage risk

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And there are opportunities yet to be fully exploited.

As I said we have a good working relationship with ACT Parks. Just this season fotpin and Parks joined forces on wort control. We directed Parks and their contractors to heavily infested paddocks, whilst we spot sprayed less infested, higher conservation value paddocks. The job was thoroughly done, and Parks budget stretched to allow spraying in North Kama and Bottom Pinnacle – and where we would not have otherwise sprayed. We shared the task, applying our knowledge and respective strengths.

Identifying and addressing policy barriers to effective weed control is an important starting point. Over the last 18 months or so Parks has adjusted its policy so chemcerted volunteers may spray Agritone and Brushoff – both now central to fotpin's spraying campaign - and we have been trained and approved to use brushcutters and scythes. By adjusting its policy settings Parks has greatly facilitated efficient weed control by volunteers. And there may be more opportunities through further policy reform and training.

And the other issue relates to scale and capacity. Fotpins are weeding across an area of some 250ha. Perhaps in the longer term we'll be active in Kama Nature Reserve – just the other side of William Hovell Drive - and that would total 420ha. And there could be a parkcare presence in the Lower Molonglo Nature Reserve one day that we'll need to partner with. Operating over a larger area, with our weeders generally in their 50s and 60s, means we may need to kit up and operate like the professionals. Knapsack spraying is very targeted, low impact and low risk compared to contractors with quickspray units, but maybe we need the AWD Agbike with spray and towable slashing units and a shed to store and maintain equipment, and to manage attendant risks, with Parks, as partners.

Thank you!