

Jonathan Soll

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The Nature Conservancy



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- *And the many other organizations and individuals who have helped at one time or another*

But especially the many dedicated staff of The Nature Conservancy and the AmeriCorps who did all the work, rain or shine.

- Large patches of knotweed are easily suppressed, but very hard to kill.
- Foliar herbicide treatment of suppressed patches is ineffective at killing large rhizomes
- Glyphosate alone is not adequate to eradicate many knotweed patches with the methods we have tried to date
- Stem injection provides a slightly higher control rate than foliar application in field trials



Field Treatment and Experiment Overview

- 2 multi-year, controlled experiments
- Long-term monitoring results from landscape level trials

Control Difficulties

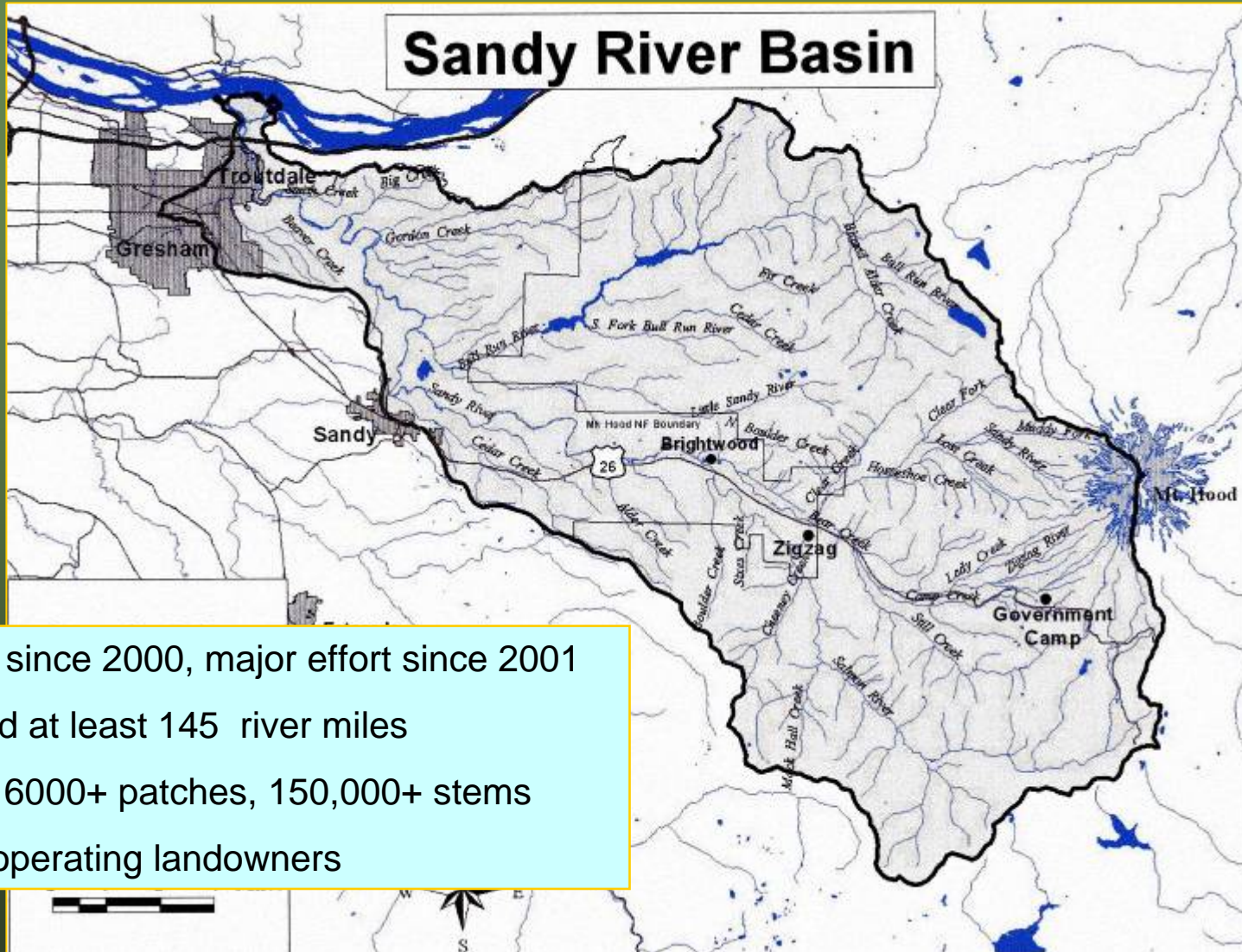
- Difficulty eradicating large patches
- Epinastic/unusual growth hides vigorous roots
- Regeneration of knotweed

Lessons Learned/New Treatment Protocol



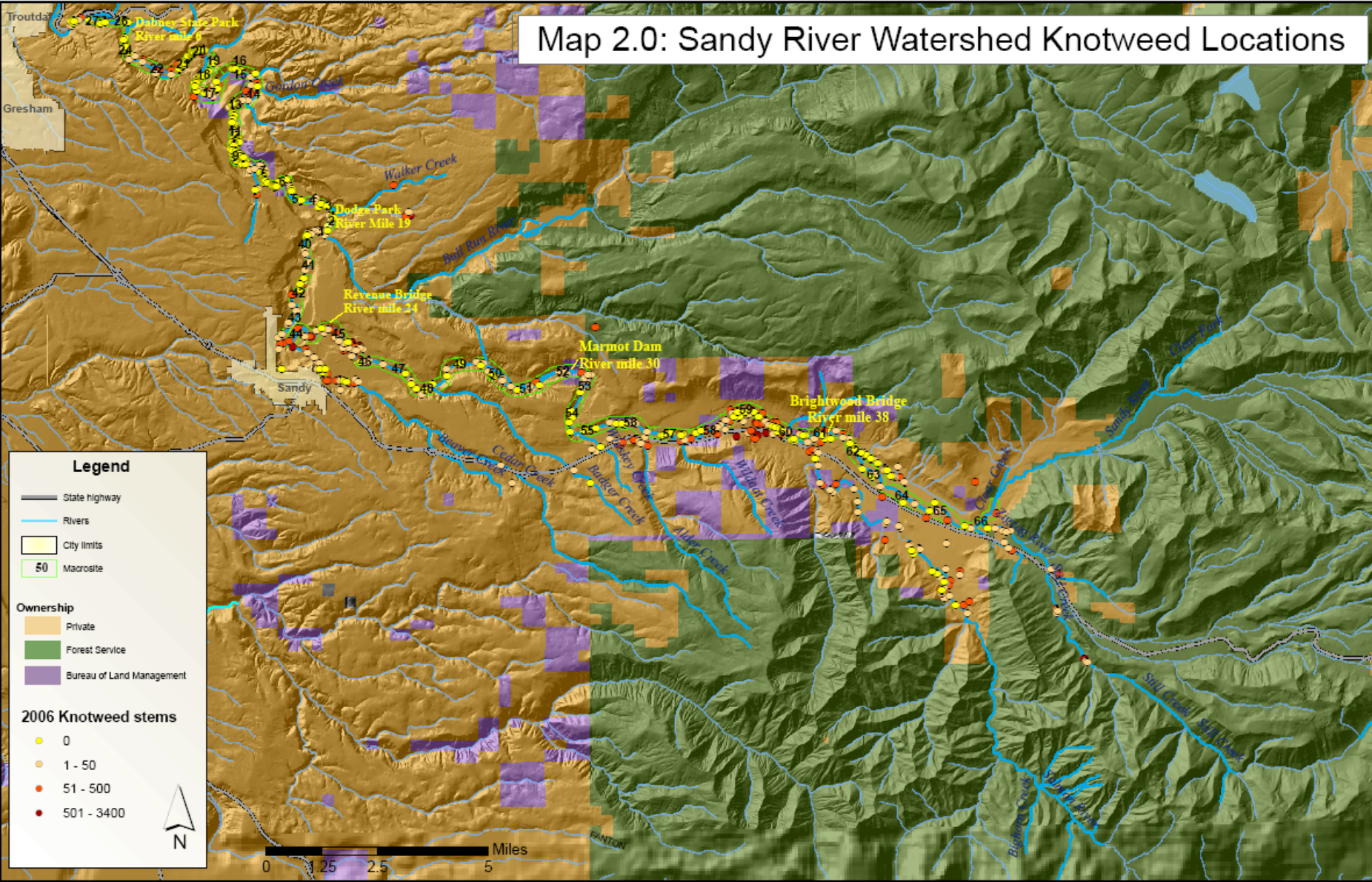
Sandy River Riparian Habitat Projection Project

Landscape overview and project history



- working since 2000, major effort since 2001
- surveyed at least 145 river miles
- treated 6000+ patches, 150,000+ stems
- 450 cooperating landowners

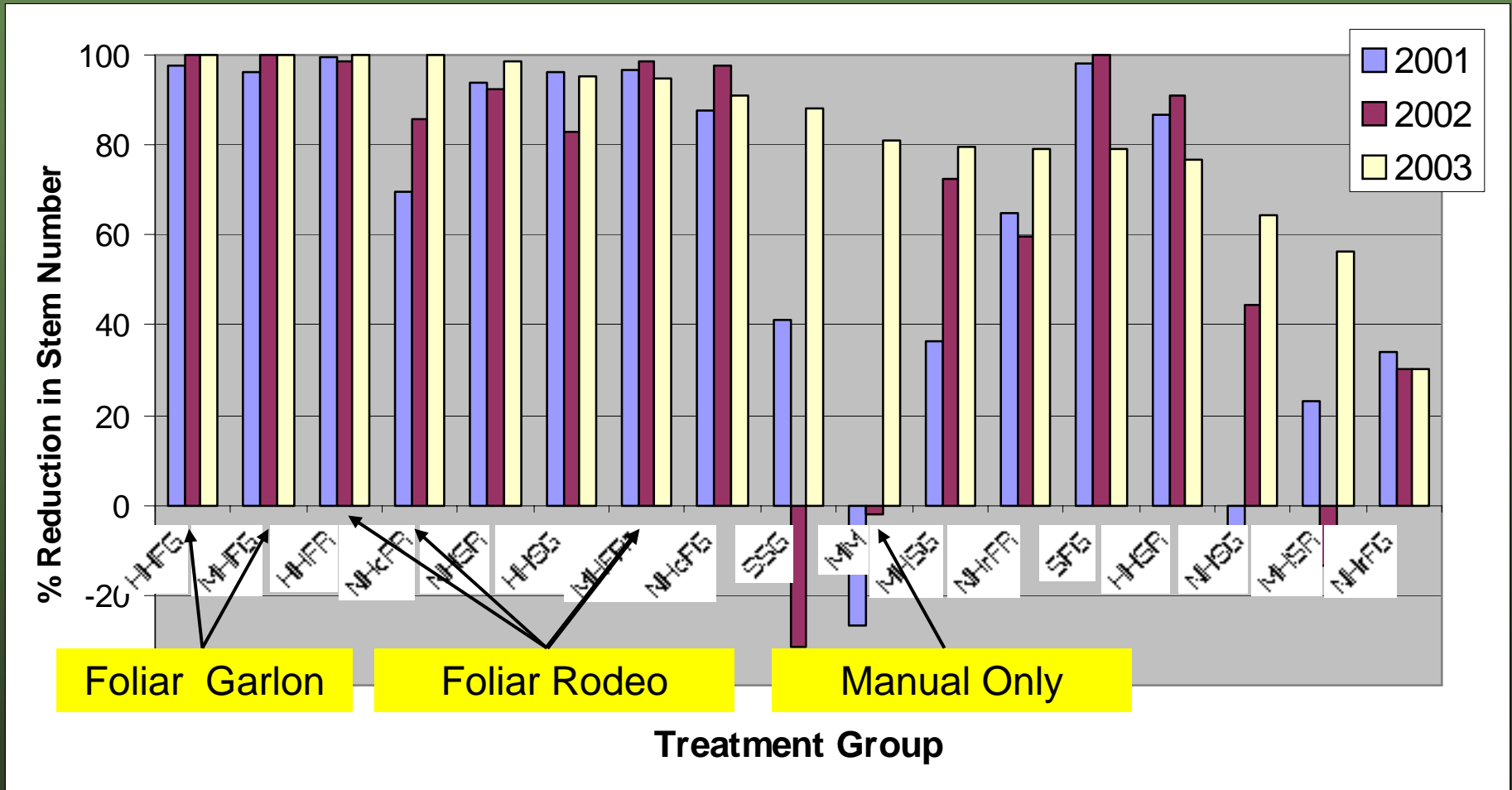
Map 2.0: Sandy River Watershed Knotweed Locations



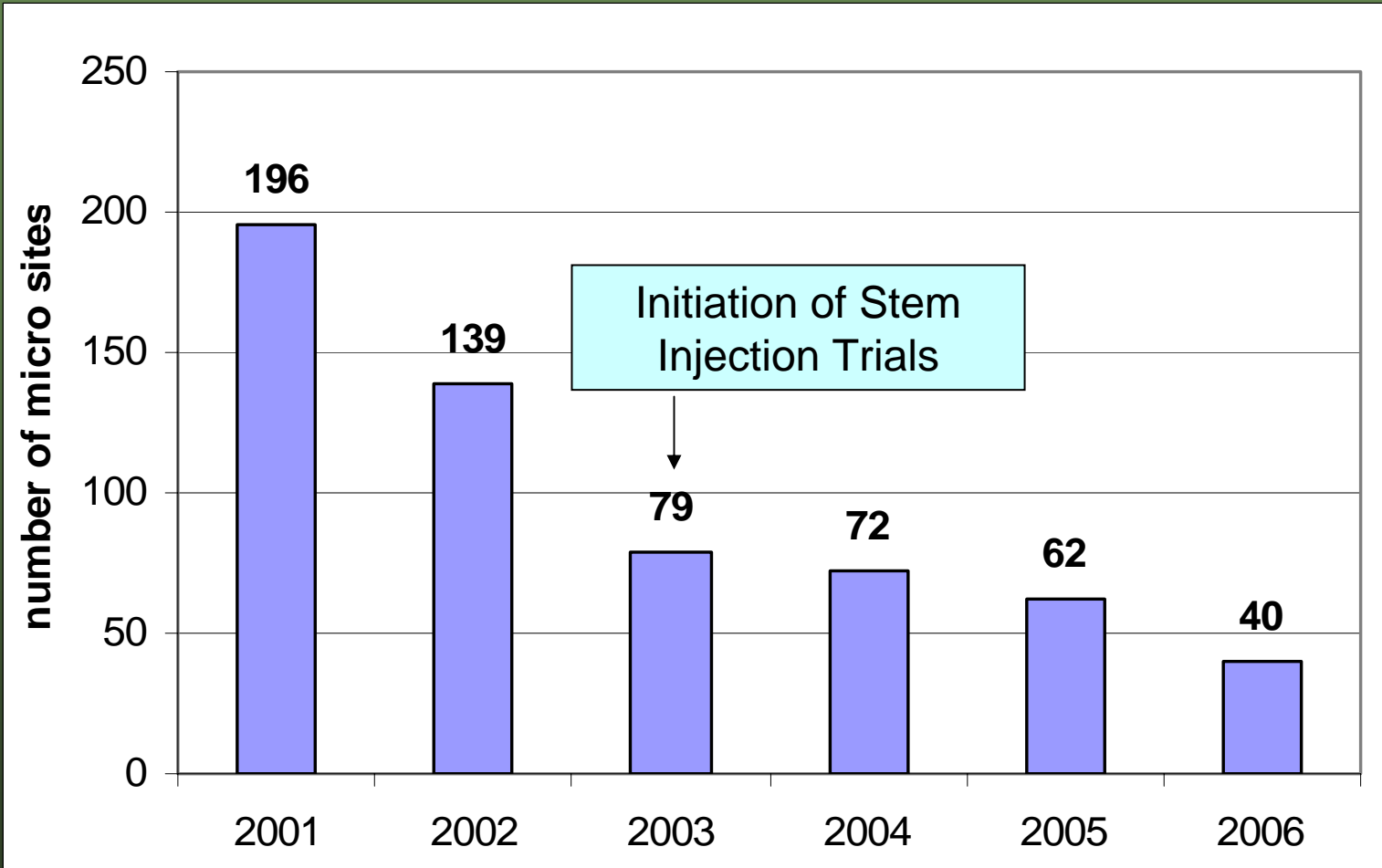
- 2 herbicides
 - glyphosate (Rodeo)
 - triclopyr (Garlon 3a)
- 3 control techniques
 - foliar
 - stem-wick
 - manual cutting
- Varied # and timing of applications
 - Spring, Summer, Fall
 - 1 vs. 2 treatments



Knotweed response to 17 Treatments: May 2000 - June 2003



Total survivors for 196 Sandy River Gorge Sites



- How effective is the stem injection treatment method?
- How much glyphosate per stem is needed?
- Is supplemental spray of small stems beneficial?
- Are mid-summer and late summer treatments equally effective?
- Is it necessary to inject every stem?

Stem injection experiments (2003-2005)

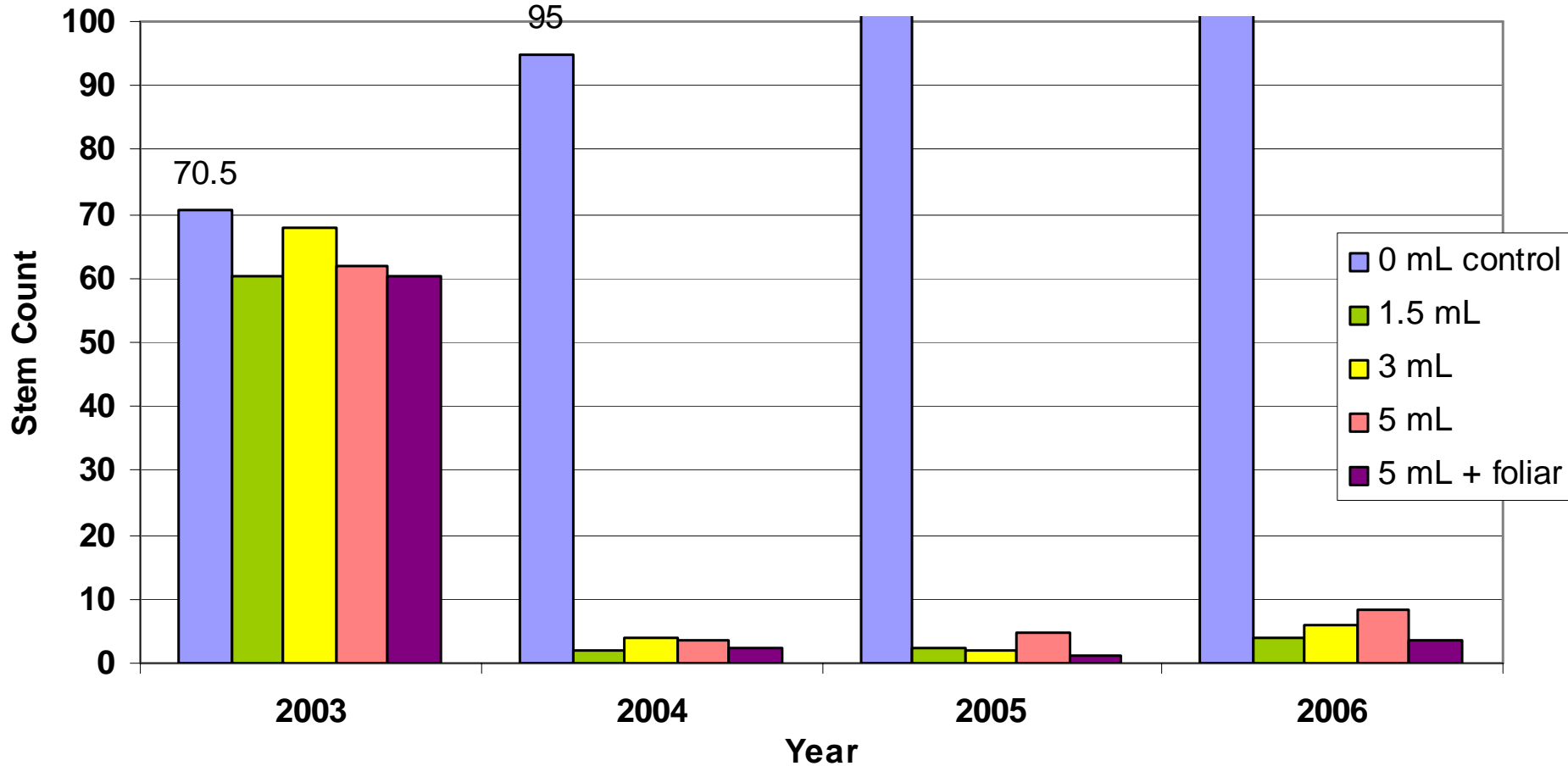
Controlled experiment

- Compared 1.5ml, 3ml, 5ml, 5ml + spray and control
- Compared July & Sept. application dates
- 6 patches per treatment, 30 – 200 stems per patch
- Results monitored for 3 years



Controlled test of stem injection

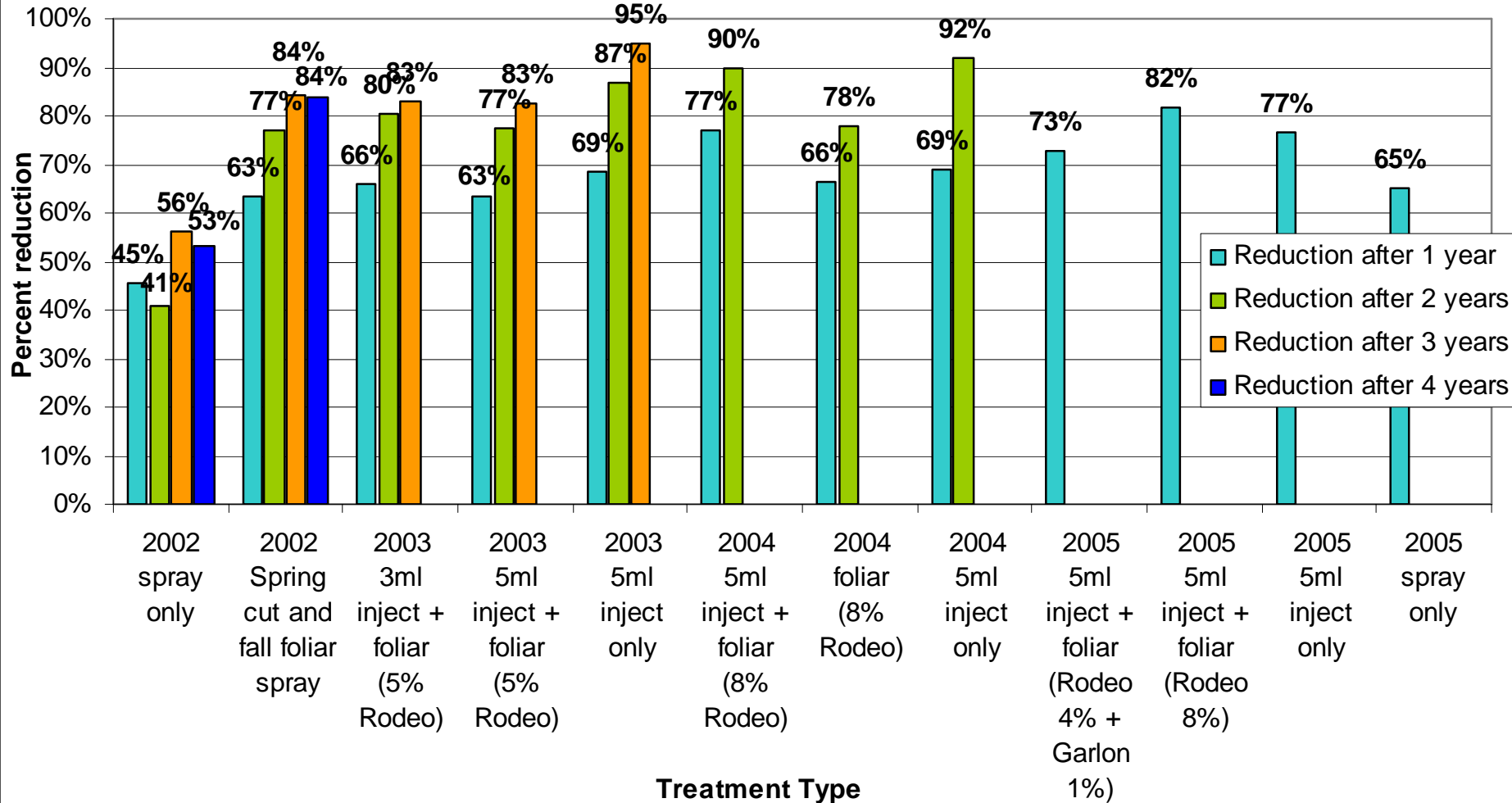
Stem reduction after 1, 2 and 3 years



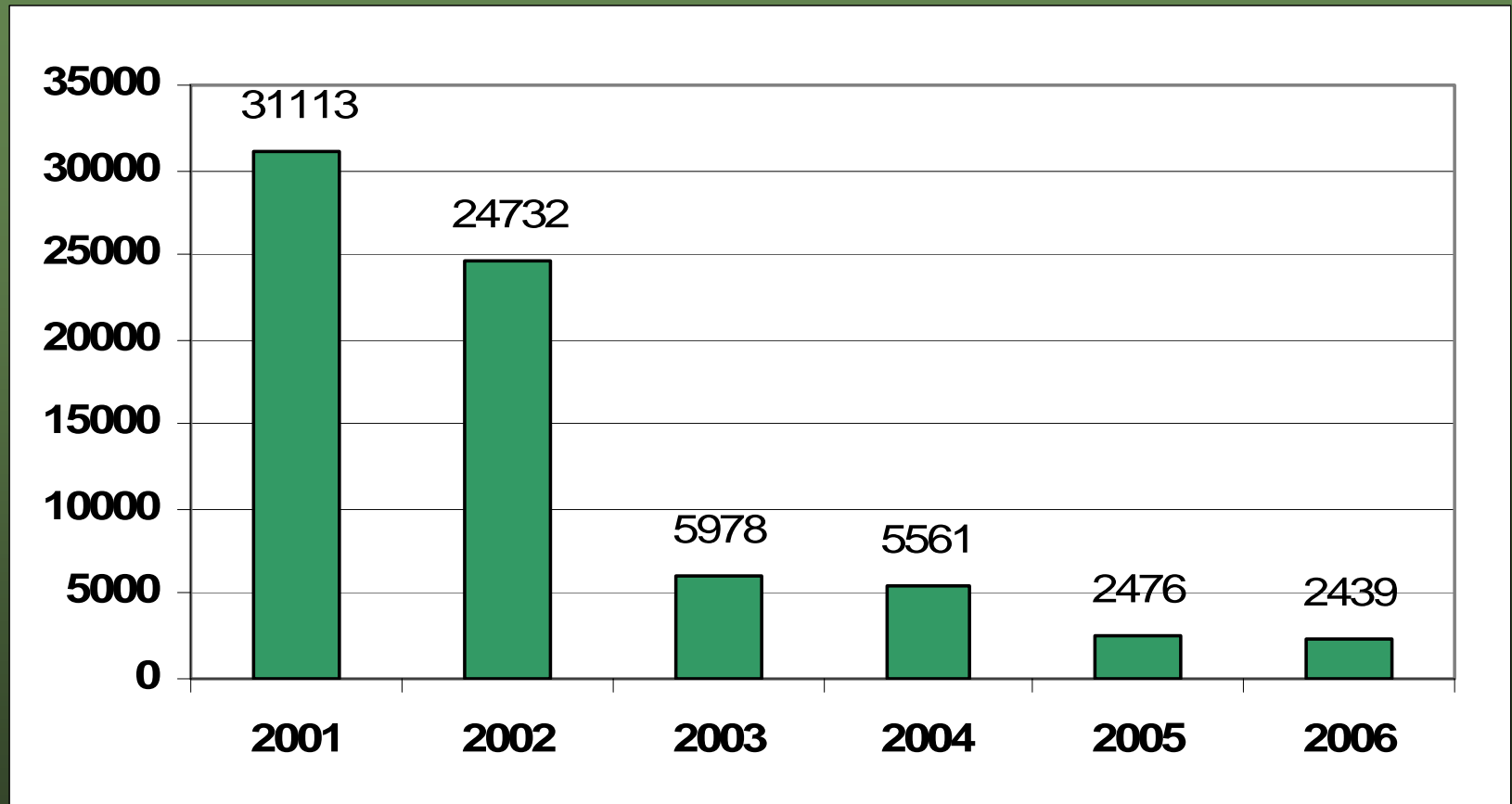
Stem injection is clearly effective but not a magic bullet!

Comparison of Treatments

Landscape Scale Trials



Total stem count for 196 Sandy River sites

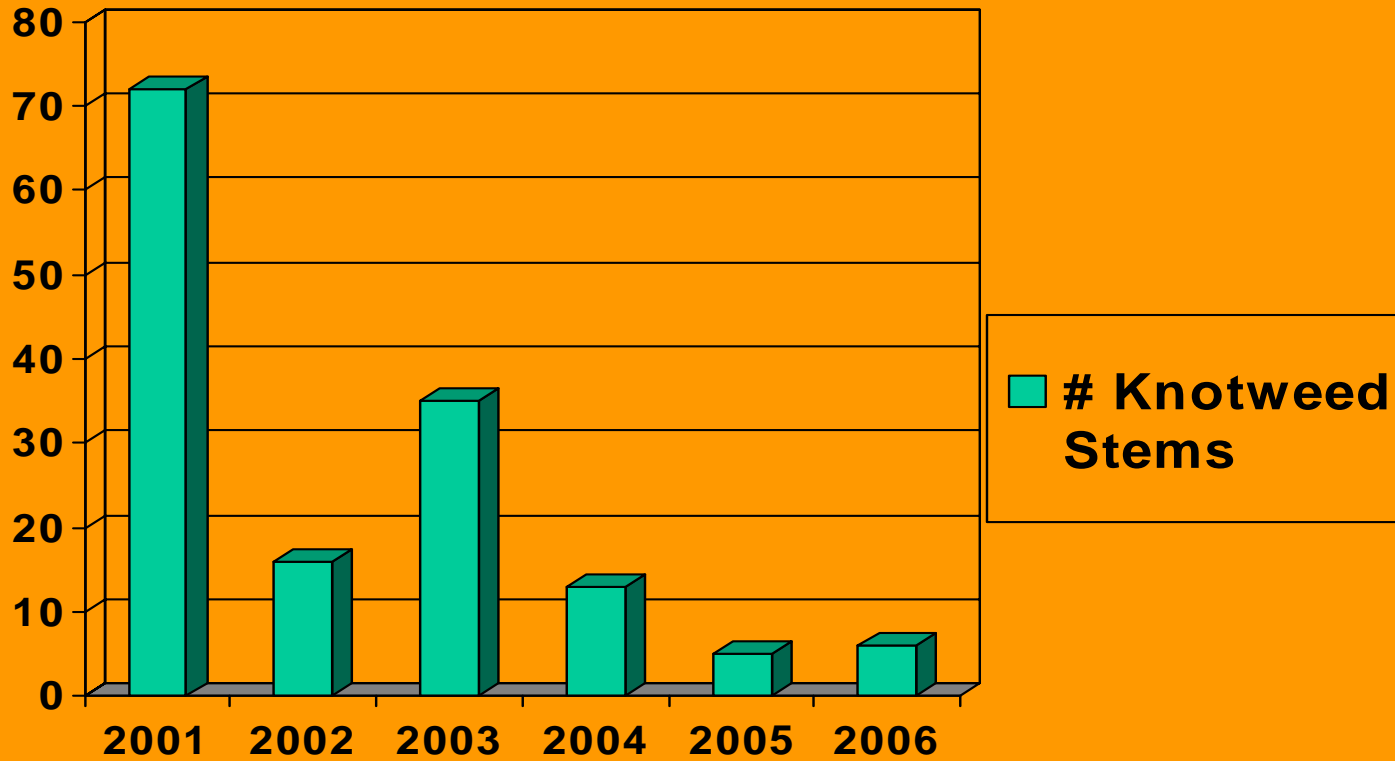


No patch with > 300 stems in 2001 had been eradicated by 2006!

Epinastic Growth



History of Site 18-27 Treated since 2001



Excavation of Knotweed Rhizome at Site 18-27



Healthy Roots, Very Few Shoots

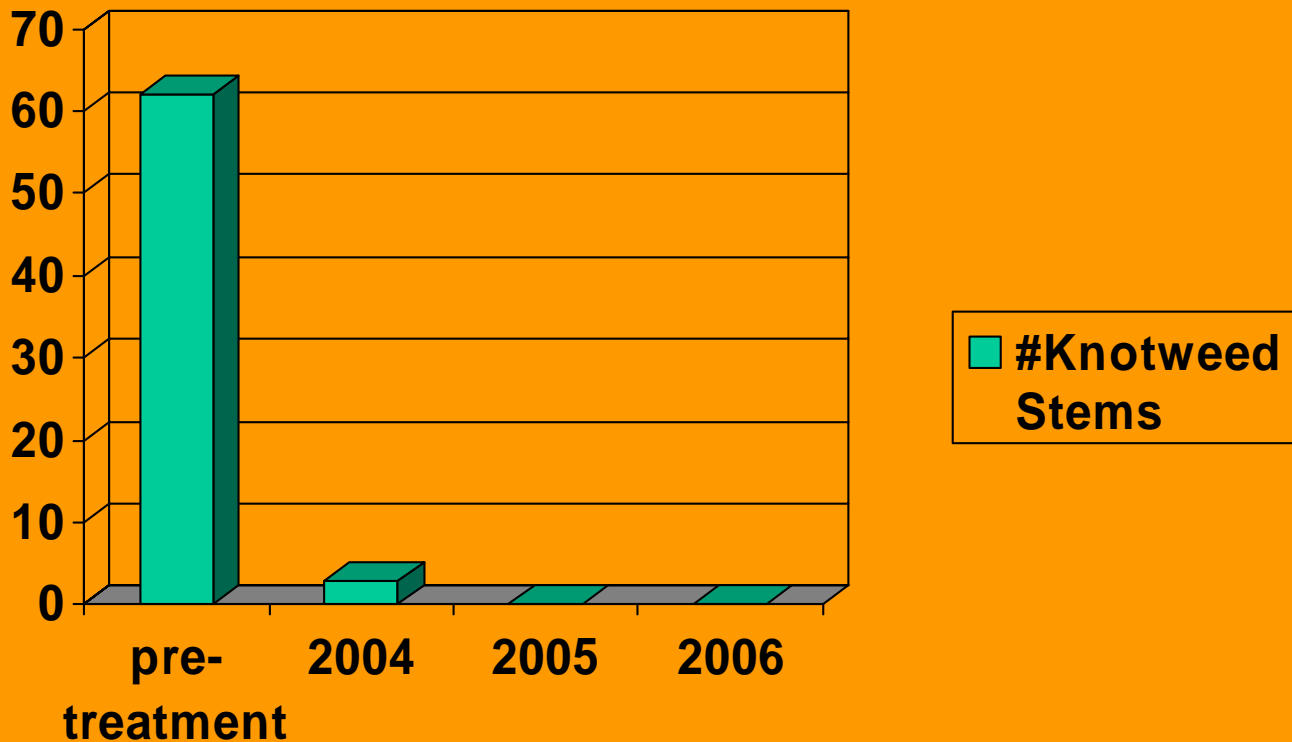








Summary Stem Count For Controlled Injection Experiment Phase 3, Patch 30



Phase 3, Patch 30 Pretreatment



Phase 3, Patch 30 1 year post-treatment



Phase 3, Patch 30 2 years post-treatment



- 0 new above ground stems
- Bulky upper root crown tissue appears dead

Unfortunately...

- Lower crown and rhizomes have ample living tissue

Knotweed Before Treatment

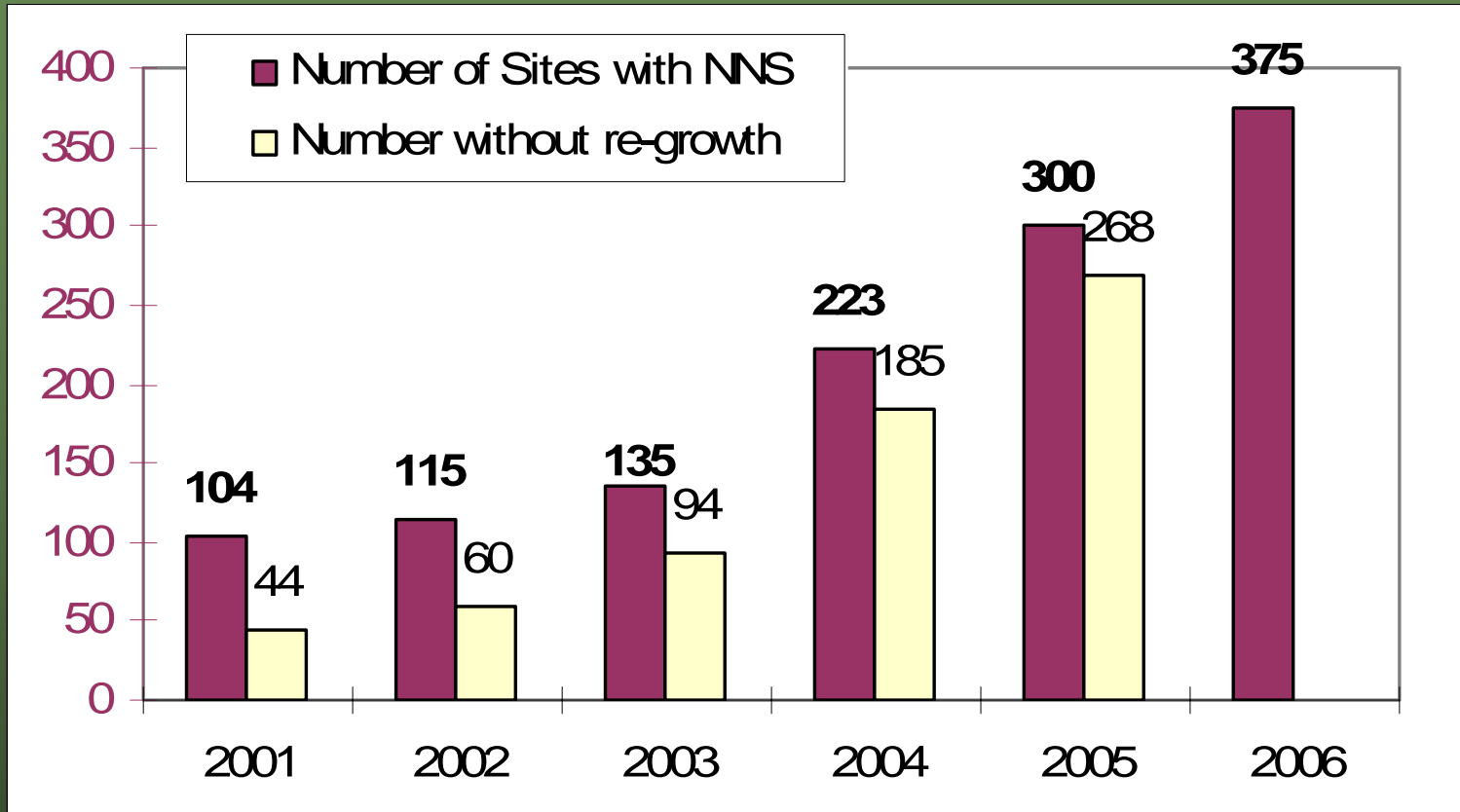


Knotweed After Treatment

**Note large root
area and small
shoot surface!**



Evidence of Knotweed Regeneration



71% of “No New Stems” sites never re-grow

- **Inject all stems of sufficient size** with 3 ml glyphosate (unless legal limitations apply)
- **Spray all healthy stems** too small to inject with either 1% imazapyr or 2% triclopyr
- **No herbicide treatment for any patches with stunted / epinastic stems**, measure infested area and count stems only
- **Remove root crown and upper rhizomes of select patches** with substantial epinastic growth or no above ground shoots

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Includes our full annual report and best management practices document