Tried and True Techniques for Long-term Invasive Plant Management

CT Invasive Plant Symposium

October 7th, 2014

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Case Study
Doctor's Creek, Chilmark, MA

2005

2008

Doctor's Creek
Methods: Low-volume foliar spray

- Low-volume foliar spray in monospecific phragmites stands after tasseling (9/15/06)
- Cut and drip & wiping methods in sensitive areas near plant species of special concern

Doctor's Creek
Methods: Cutting and Hauling

- Cut dead phragmites material and haul to brush piles 6 weeks after herbicide application (10/27/06).

Doctor's Creek
Vegetation Monitoring

- Rate of Phragmites kill (Year 1)= 98.6%± 1.3% (1 SE)

- All patches of plant of special concern were vigorous in 2007

Doctor’s Creek 2013

2013 Doctors Creek, Chilmark, MA

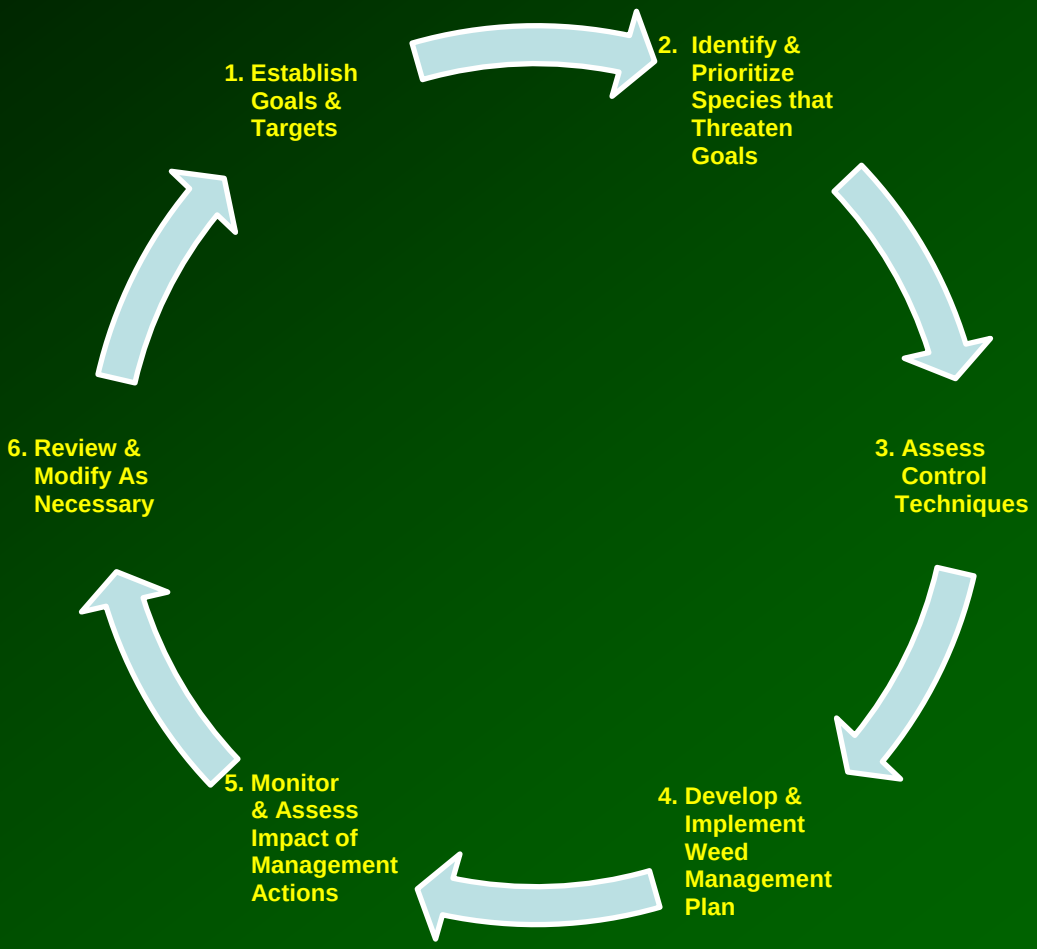
Doctor's Creek
Concerned Landowners & Community Support

Elements of a Successful Project

Planning Framework

- Goals- articulate intention for site
- Planning (Management Plan)
- Site Analysis
- Mapping
- Prioritization
- Initial, Follow-ups, ongoing Stewardship program
- Early Detection Rapid Response
- Success Criteria
- Monitoring
- Management Documentation
- Revegetation & Restoration Considerations (SER)

Adaptive Management Approach Invasive Species



Landowner Goals

Goal	Importance to Me			
	High	**Medium**	**Low**	**Don't Know**
Enhance the Quality/Quantity of Timber Products*				
Generate Immediate Income				
Generate Long Term Income				
Produce Firewood				
Defer or Defray Taxes				
Promote Biological Diversity				
Enhance Habitat for Birds				
Enhance Habitat for Small Animals				
Enhance Habitat for Large Animals				
Improve Access for Walking/Skiing/Recreation				
Maintain or Enhance Privacy				
Improve Hunting or Fishing				
Preserve or Improve Scenic Beauty				
Protect Water Quality				
Protect Unique/Special/ Cultural Areas				
Other:				

In your own words please describe your goals for the property:

Goals

Private Farm, Pawlet, VT

Site Analysis

Invasive Plant Contractors Field Form

Landowner's Name:		Date of Site Visit:
Describe goals of Landowner:		
Landowner's contact info: Address (street, town, zip)	Email:	Phone:
Property Managers (including foresters, NRCS staff):		
Property Location:		Total acreage of property: Total area assessed:
Property details (% or amount forested, % or amount open, previous treatment work):		
Notes on access and permission:		
Notes on boundaries and adjacent lands:		

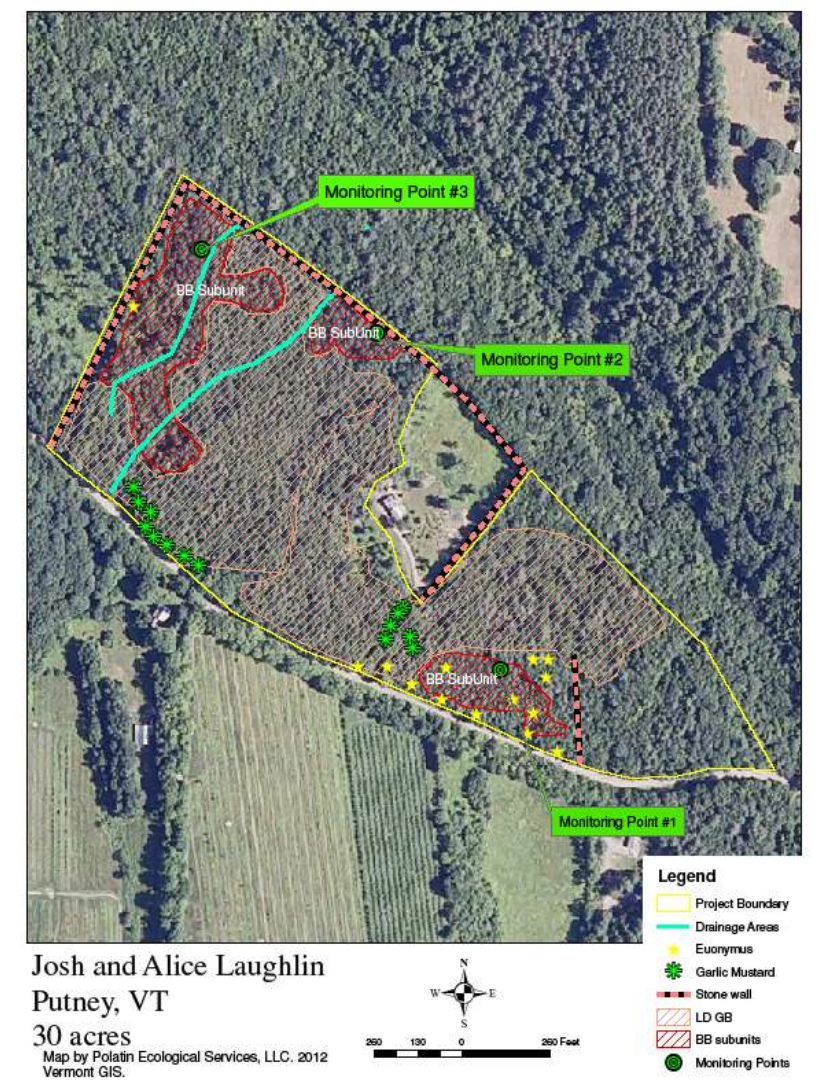
Are any of the treatment areas within 50' of a private well or 200' of a public well? ☐ Yes ☐ No
Are any of the treatment areas near or in certified organic areas: ☐ Yes ☐ No
Are any of the treatment areas adjacent to wetlands, rivers, streams? ☐ Yes ☐ No
Do any of the treatment areas include special features worth noting (RTE)? ☐ Yes ☐ No
Describe details:

Site Analysis

Area # or Description	Species Name	Density (high, medium, low) or (%)	Size (height) and Diameter of stem	Presence of non-target vegetation	Proposed Treatment Method
For Example:					
Area 1, Stand 1, or White Pine Plantation	Common buckthorn	High to moderate or 100 -75%	Seedlings to 3 ft, <1 inch diameter; AND >10 ft, 6 inches diameter	Heavily intermixed with honeysuckle	Foliar spray

General Notes/Comments:

Project Map


Monitoring Point #3
BB SubUnit
BB SubUnit
Monitoring Point #2
BB SubUnit
Monitoring Point #1
Legend
Project Boundary
Drainage Areas
Euonymus
Garlic Mustard
Stone wall
LD GB
BB subunits
Monitoring Points
Josh and Alice Laughlin
Putney, VT
30 acres
Map by Polatin Ecological Services, LLC. 2012
Vermont GIS.
N
W
E
S
260
130
0
260 Feet

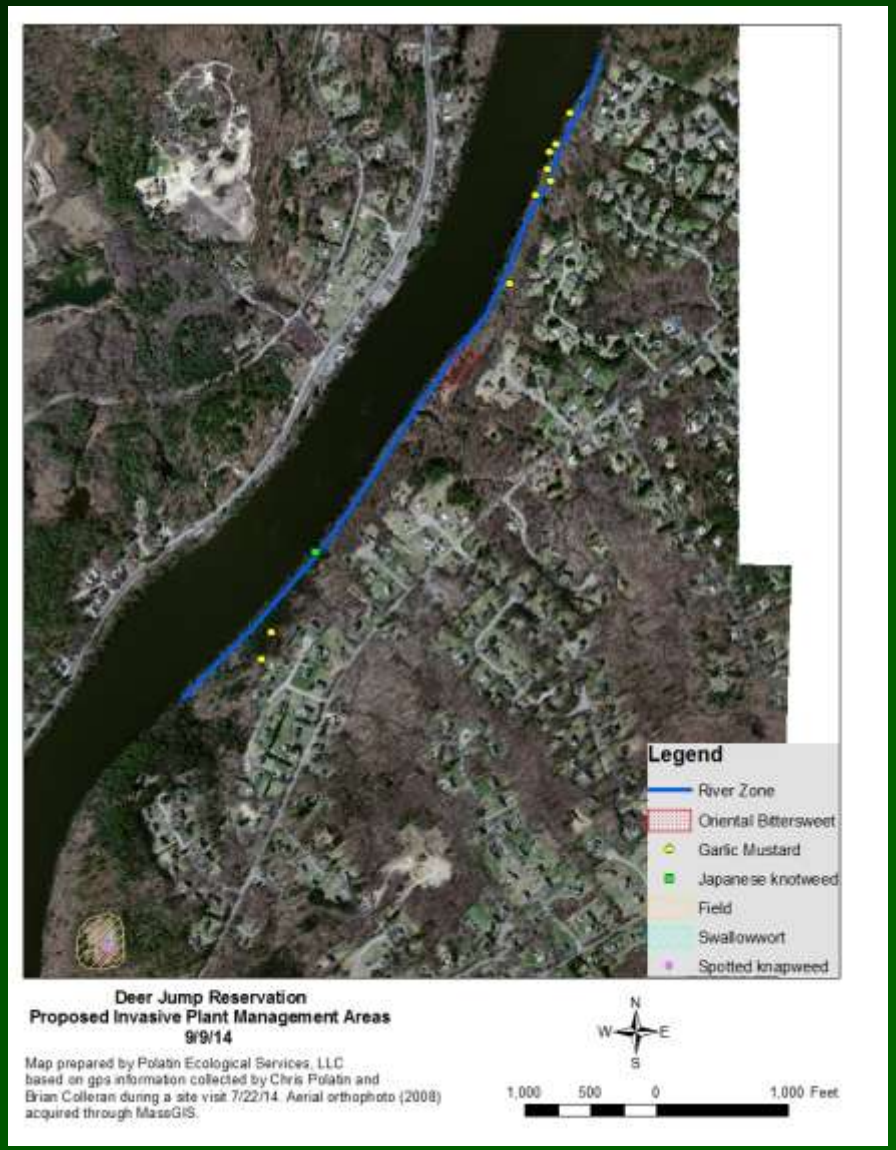
Glossy Buckthorn
Small tree (> 7 ’ tall)

Glossy Buckthorn
Shrub (< 7’)

Glossy Buckthorn Seedling (< 2’)

Prioritization

Case Study: Deer Jump Reservation Andover, MA



Invasive Plant Severity/Prevalence Ranking

- (1) ESSENTIALLY ABSENT: none observed or, if any, then extremely sparse; no, or minimal, invasive plant seed bank expected.
- (2) MINOR AND READILY TREATABLE. Minor and readily treatable, and therefore still available for silviculture if treated; possible presence of localized invasive plant seed bank, but widespread invasive plant seed bank not expected.
- (3) MODERATE TO SEVERE. Moderate to severe, and therefore cannot be considered available for silviculture within a 5-10 year period/until 5-10 years after receiving treatment and, under monitoring with follow-up treatment as needed until plants and seedbank are controlled, and being downgraded to (2) or (1).
- (4) SEVERE. Severe infestation with no expectation of silviculture within 10 years, even if treated.
- (5) CANDIDATE FOR RESTORATION: The site is no longer dominated by desirable forest vegetation and/or there is no expectation that the site will be, or will continue to be, dominated by desirable forest vegetation within any foreseeable timeframe without complete intervention/restoration.

Category 5: Restoration

Bittersweet

High Priority: Bittersweet

Priority:
Knotweed & Garlic Mustard

Priority: Field

Warm season grasses

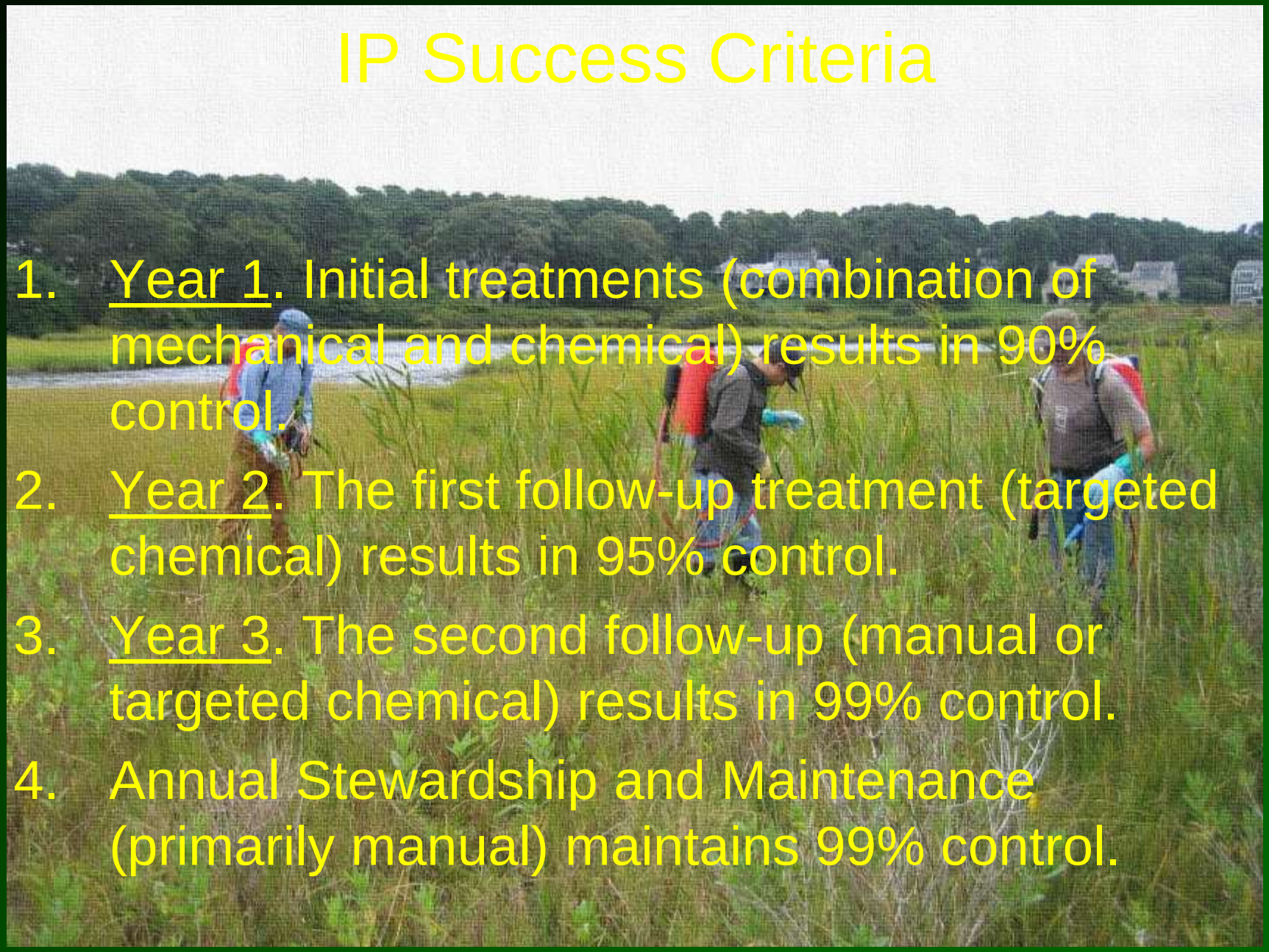
Glossy buckthorn

Spotted knapweed

Swallowwort

Priority:
View of River

IP Success Criteria



1. Year 1. Initial treatments (combination of mechanical and chemical) results in 90% control.
2. Year 2. The first follow-up treatment (targeted chemical) results in 95% control.
3. Year 3. The second follow-up (manual or targeted chemical) results in 99% control.
4. Annual Stewardship and Maintenance (primarily manual) maintains 99% control.

Monitoring

2011

2012

2013

2014

Ecological Restoration

- Munro, J.W. *Ecological Restoration and Other Conservation Practices: The Difference.* Ecological Restoration, Vol. 24, No. 3, 2006

- SER Primer

- SER Guidelines for Developing and Managing Ecological Restoration Projects

- Apfelbaum, S.I. and Haney, A. 2010. *Restoring Ecological Health to Your Land.*

Revegetation

Revegetation Methods: Cuttings

Seeding

- Seed collection, processing, and storage
- Direct seeding from commercial seed sources
- Seedbed preparation: good seed to soil contact with light raking, rolling, or stomping

Cover Crop

Case study: Powell Conservation Land, Harvard, MA

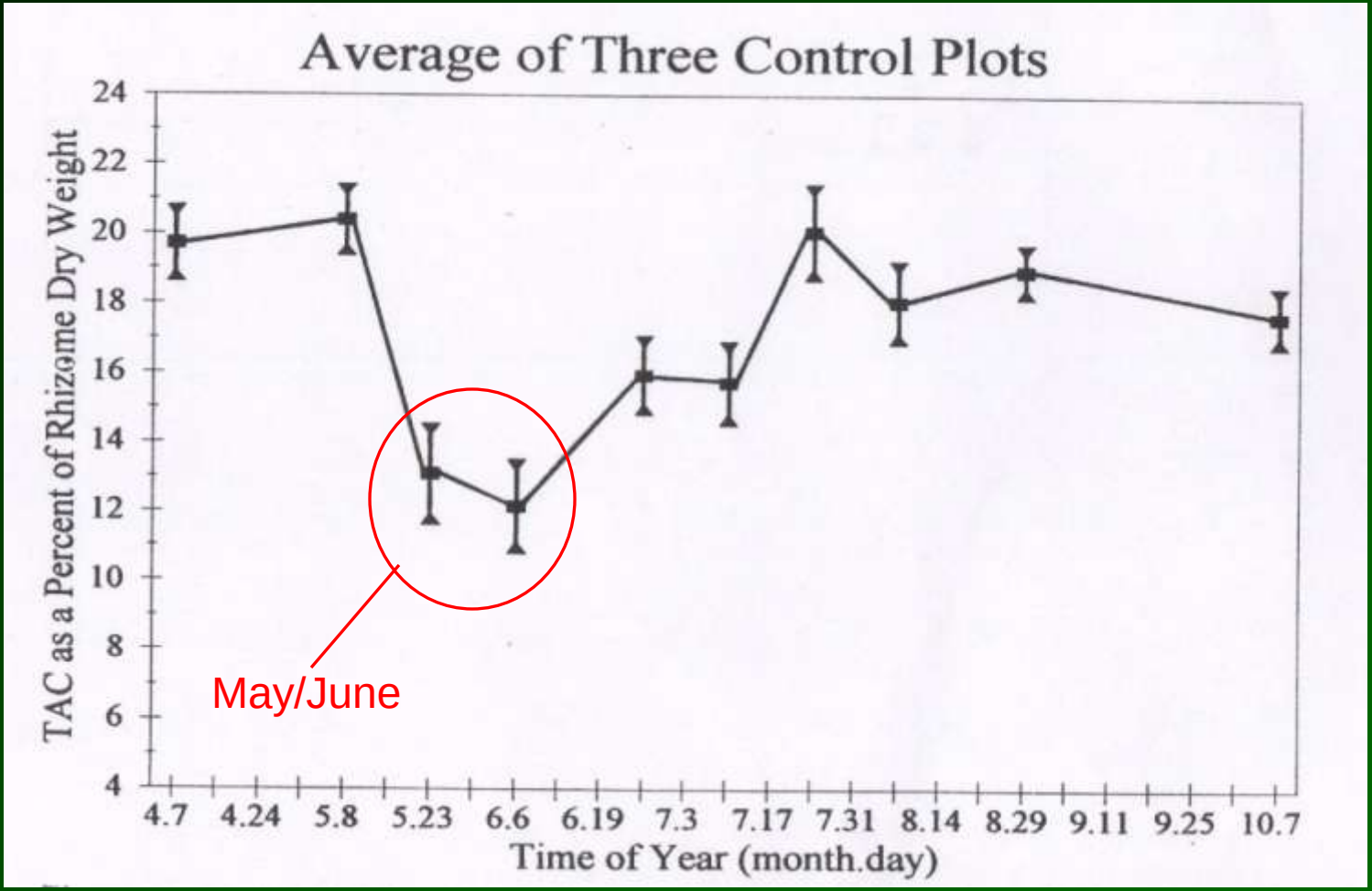
Nurse Crop

Elements of a Successful Project

Management

- Integrated Management (cutting and herbicide)
- Timing
- Tools & Techniques (goats and cover crops
- Multiple management visits
- Persistence & Thoroughness

The Importance of Timing Management Activities



(Droege, 1996)

Manual Methods

Weed Wrench

Loppers

Honeysuckle Popper

Hand saw

Hand-pulling

Propane Torch

Garlic Mustard

Japanese Barberry

Japanese stiltgrass

Community/Volunteers/Partners/Stakeholders

Case Study:
Fannie Stebbins Memorial Wildlife Refuge
Longmeadow, MA

Fannie Stebbins Refuge

Knotweed Management

Fannie Stebbins Refuge
Knotweed Results

Fannie Stebbins Refuge
Knotweed Results

Fannie Stebbins Refuge
Youth Conservation Corps

Vegetation Reduction
Small-Medium Scale

Vegetation Reduction
Large Scale

Excavator with Brontosaurus Mower

MassAudubon Drumlin Farm
Lincoln, MA (2008)

Vegetation Reduction
Conservation Grazing

Conservation Grazing

Judicious Herbicide Use

- Integrate management activities (cutting, mowing, etc.)
- Use targeted herbicide methods that minimize amount used
- Timing to maximize effectiveness of treatment
- Pay attention to environmental conditions that cause non-target damage/drift (wind speed, high temps, humidity, rain)

Case Study:
Little Sippewissett Marsh, Falmouth, MA

2008

2009

2010

2011

2012

Little Sippewissett Marsh, Falmouth, MA

Case Study: Bittersweet
Greylock Glen, Adams, MA

Case Study: HD Honeysuckle
USACOE Thetford, VT

USACOE Thetford, VT

Planning for Success

Tidmarsh Farms, Manomet, MA

Area	Acreage	Target species
Holding Pond Tributary	0.17	phragmites &knotweed
T-1	0.10	phragmites
Bog 2	0.10	phragmites
	0.12	phragmites
	4.26	willow
Bog 3	0.05	phragmites
Bog 4	0.03	phragmites
	few plants	willow
Beaver Dam west	5.4	phragmites & willow
Beaver Dam east	1.9	phragmites & willow
Road between Bog 6A & Bog 7	0.005	knotweed

Tidmarsh Farms, Manomet, MA

Date	Crew	Weather	Target Species	Treated Area (acres)	Herbicide Mix	Total Applied (gallons)	Method	Field Notes
08/29/13	Chris, Jon, Nick, Al, Jeremy	65F, 93%rh, 3mphN, clouds light drizzle at noon	Phragmites, Japanese knotweed, Rusty Willow	.2	2% Rodeo, .5% Polaris, .5% ChemSurf 90	2	backpack sprayer	Holding Pond: treated small patch of Phragmites and knotweed along both sides of road and down embankment towards stream.
				.7	2% Rodeo, .5% Polaris, .5% ChemSurf 90	4	backpack sprayer	NRCS Easement: treated mapped Phragmites patches in Bogs 2, 3, and 4, and knotweed growing on berm between Bogs 6A and 7. Located, mapped, and treated additional patches of Phrag. Set up monitoring points and took photos.
					8% Rodeo, .5% Polaris, Thinvert RTU	2		
				1.1	8% Rodeo, .5% Polaris, Thinvert RTU	2	glove method	Impoundment: worked through a portion of the new marsh south of the breached impoundment. Used the “glove method” to minimize off-target in this habitat. Also treated Rusty Willow.
					5% Rodeo, .5% Polaris, .5% ChemSurf 90	.5		

Tidmarsh Farms, Manomet, MA