

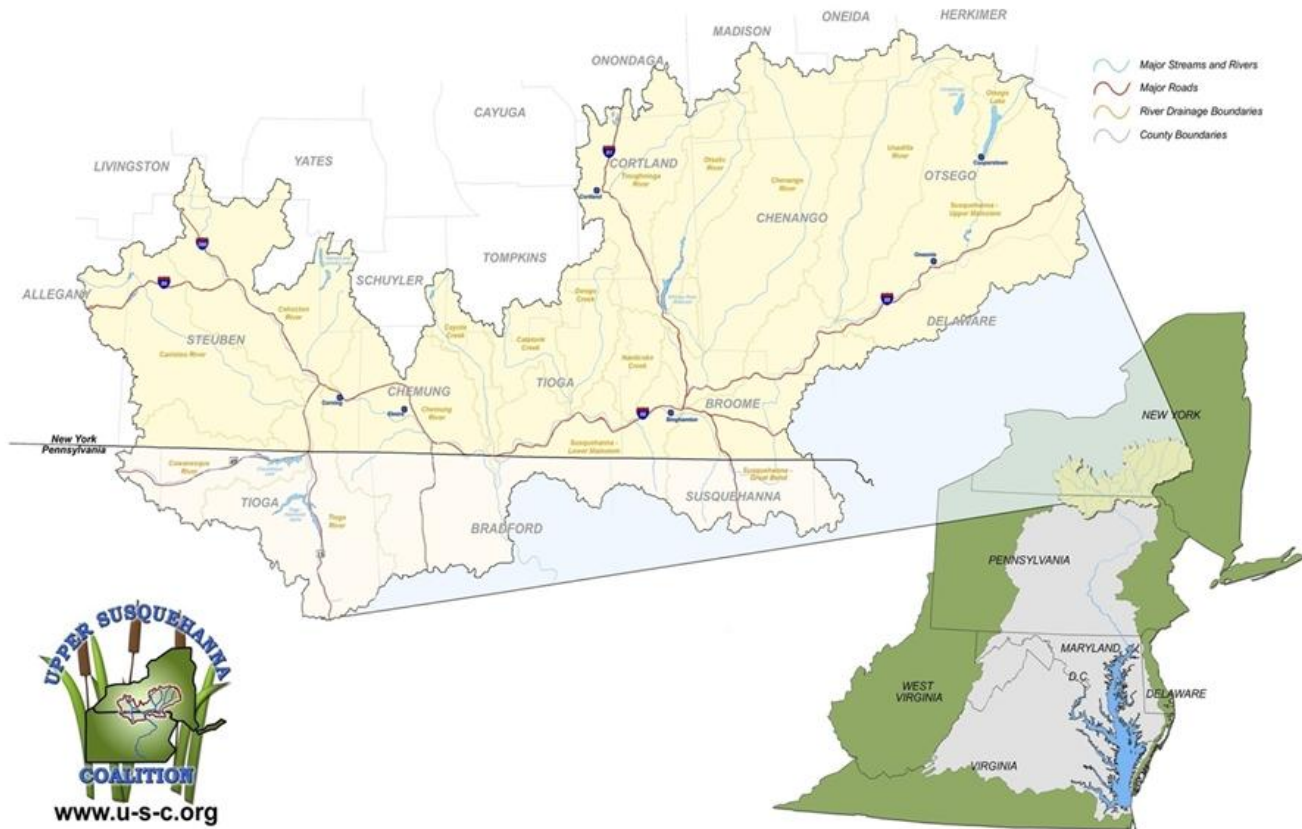
Afforestation Logistics From Lessons Learned in the Field

Woodsmen Field Days
8/22/2026



Upper Susquehanna Coalition Mission

THE UPPER SUSQUEHANNA COALITION HEADWATERS OF THE CHESAPEAKE BAY



THE CHESAPEAKE BAY WATERSHED

- Agriculture is the largest source of nutrient and sediment pollution entering the Bay.
- But agriculture is ESSENTIAL.
- We are in this TOGETHER.



Watershed Agreement Revised in 2025

Goal

Conserve, protect, restore and enhance landscapes of ecological, economic, recreational and cultural value to improve water quality, provide habitat for wildlife and increase resilience.

Healthy Forests & Trees

Conserve, manage and restore forests and tree cover to maximize benefits for water quality, habitat and people throughout the watershed, with a particular focus on riparian areas and communities.

- Conserve tree canopy within communities by reducing the rate of loss of existing canopy and planting and maintaining 45,000 acres of trees by 2040 to achieve a net gain in canopy over the long-term.
- Conserve riparian forest by reducing the rate of loss of existing buffers and planting and maintaining 7,500 acres of buffers annually to achieve no less than 71.5% riparian forest cover by 2040 and 75% riparian forest cover over the long-term.
- Achieve a net gain in forests over the long-term by reducing the rate of forest conversion to other land uses by 33%, permanently protecting a total of 9 million acres of forested land, and planting, maintaining and managing 202,000 acres of new forests by 2040.

STATE REFORESTATION GOALS

Reforestation mitigates climate change by increasing land-based sequestration and storage and can also increase community and ecological resilience to climate impacts

- Net zero emissions goal for 2019 Climate Leadership & Community Protection Act (Climate Act)

Statewide goals to:

- **Plant 25 million trees by 2033**
- **Establish and maintain 1.7 million acres by 2040**

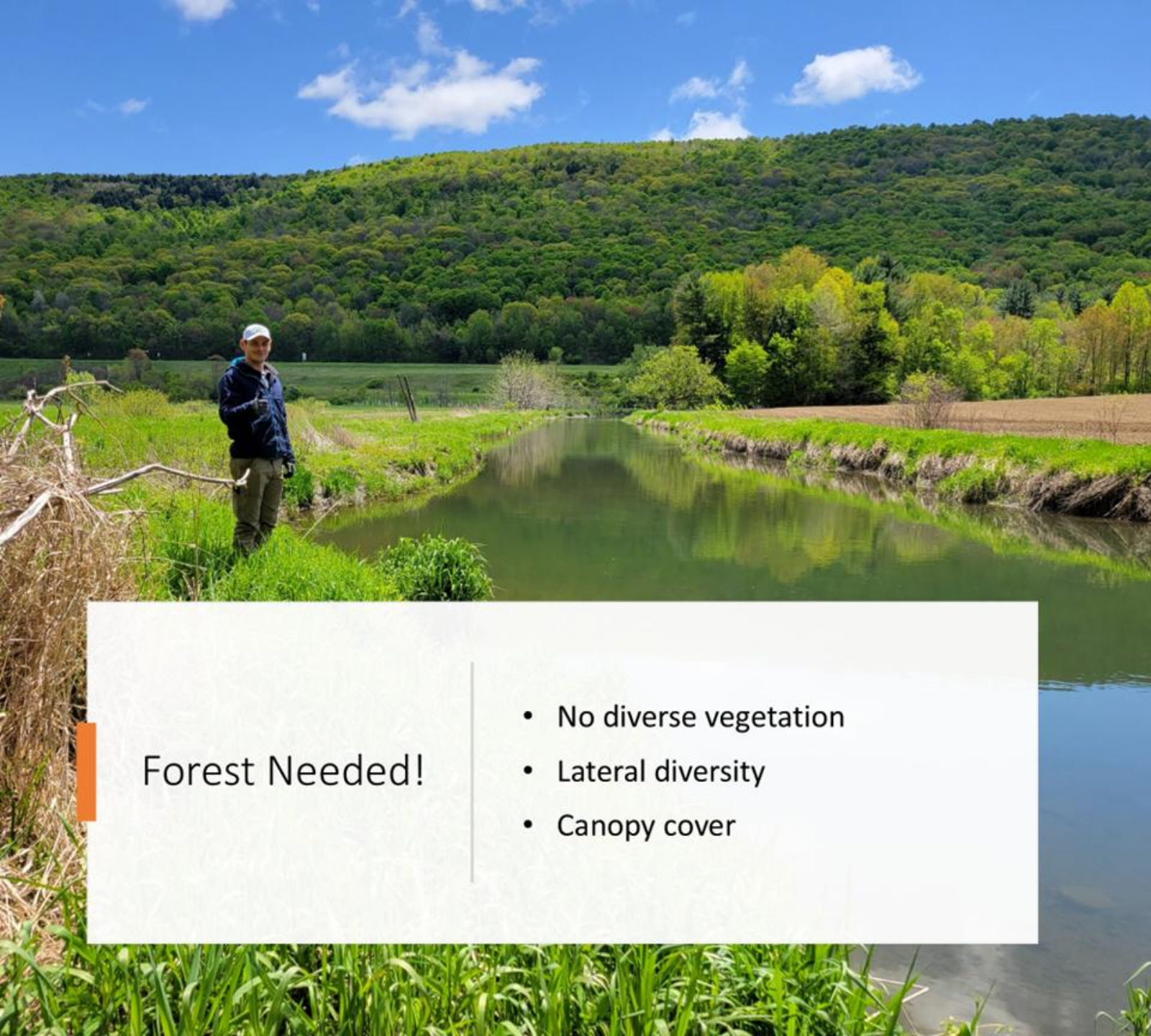
DEC is working on a Statewide Reforestation Plan to serve as a roadmap towards these goals



New York State Reforestation Plan A COLLABORATIVE CALL TO ACTION

Kathy Hochul, Governor | Amanda Lifton, Commissioner





Forest Needed!

- No diverse vegetation
- Lateral diversity
- Canopy cover





Teamwork







Planting Plan Steps



Species selection guidance

What everyone wants

What is available

NHP plant communities

TNC List

Climate change atlas

Oak-Tulip Tree Forest S2S3

Red Maple

Silver Maple

Black Birch

Bitternut Hickory

Pignut Hickory

American Beech

Tulip Poplar

White Oak

Scarlet Oak

Northern Red Oak

Black Oak

Witch Hazel

Spicebush

Lowbush Blueberry

Hillside Blueberry

Maple-leaf Viburnum

(New York State Department of Environmental Conservation, 2020)

River Birch-Sycamore Floodplain Forest S2

Box-elder

Common Red Maple

Silver Maple

River Birch

Bitternut Hickory

Green Ash

Black Walnut

Sycamore

Silky Dogwood

Gray Dogwood

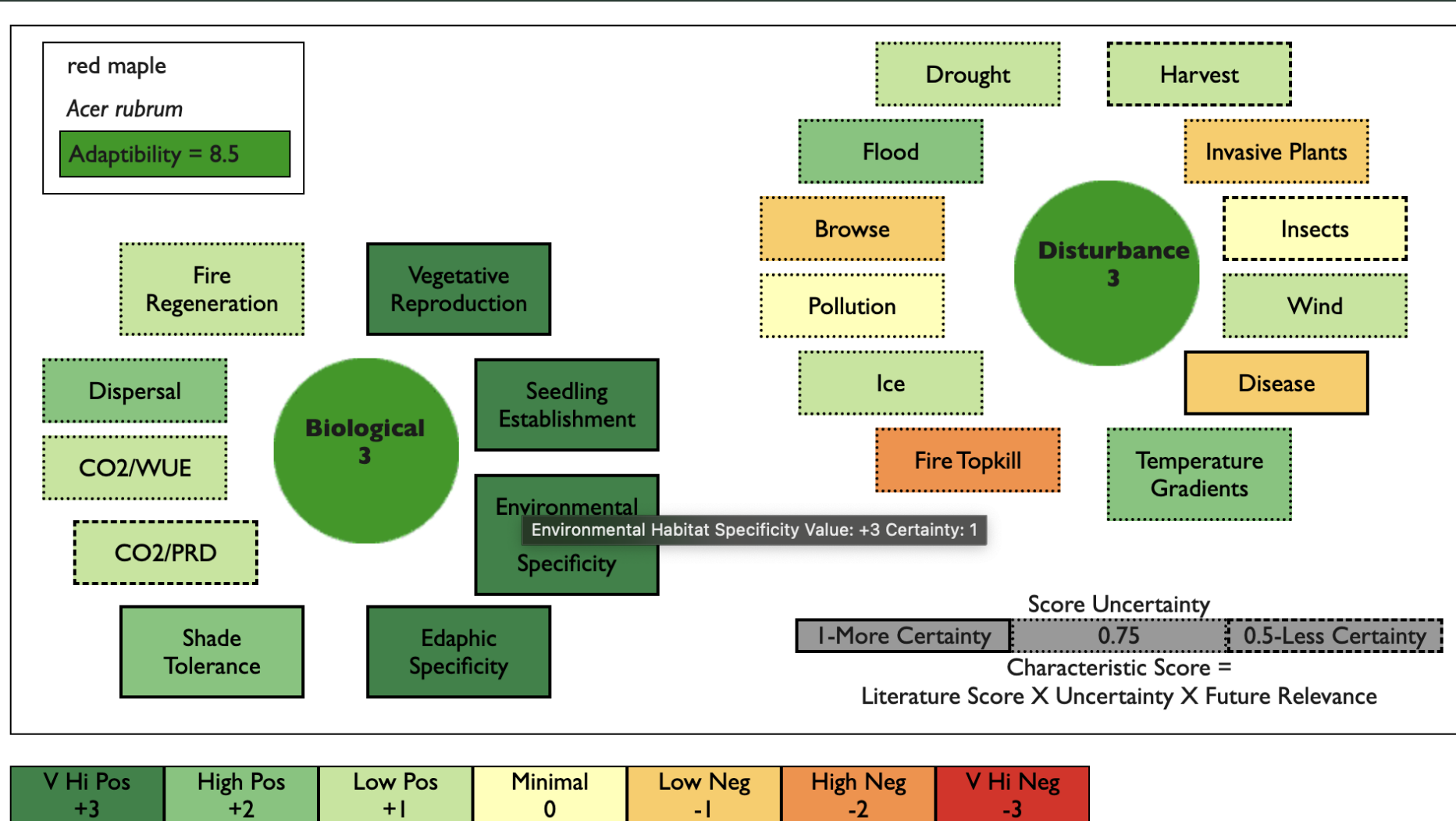
Red-osier Dogwood

Spicebush

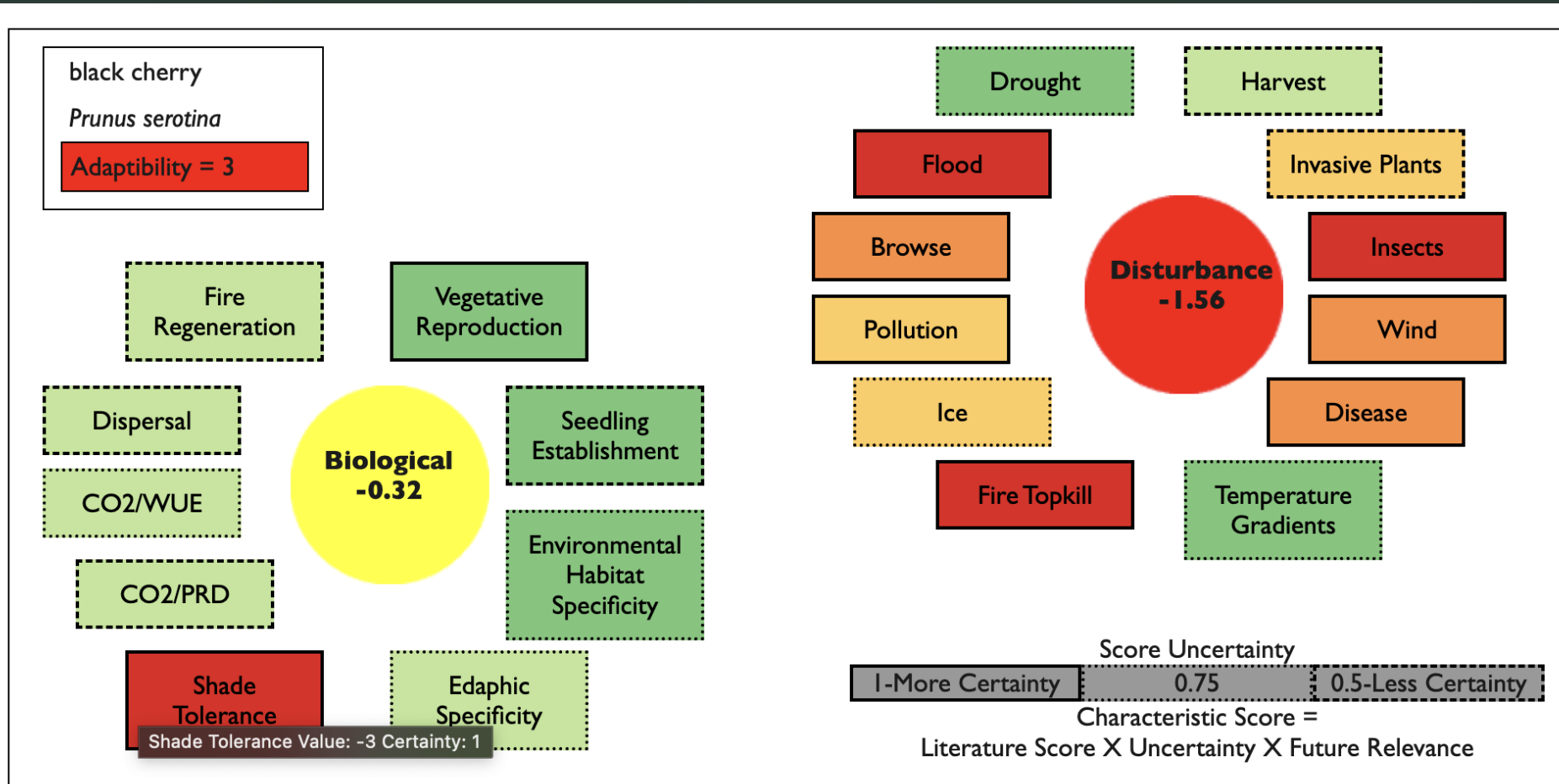
Common blackberry

(New York State Department of Environmental Conservation, 2020)

Spotlight: Red Maple



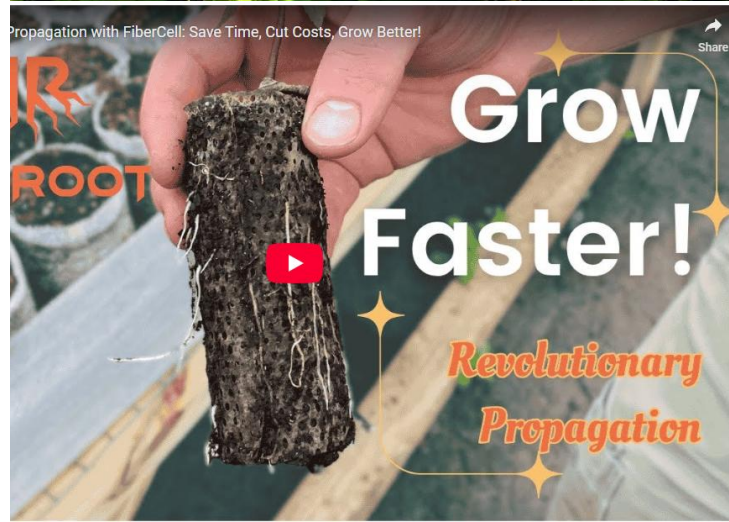
Spotlight: Black Cherry



V Hi Pos +3	High Pos +2	Low Pos +1	Minimal 0	Low Neg -1	High Neg -2	V Hi Neg -3
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\$tock option\$

- How large is the planting?
- Landowner goals.
- Location within the landscape
- Who is planting?
- Seasonality of planting.



Container Size	Gallon Size	Diameter	Height	Cubic Inches	Metric Vol.	US Vol.
Container Seedling / SP5	2 quart	2 7/8" square	9" deep	58.6 cu. in.	0.95 ltrs	0.251 gal
#1 container	#1 gallon	6 1/2"	7"	173 cu. in.	2.84 ltrs	0.734 gal
#2 container	#2 gallon	8 3/4"	8 1/2"	370 cu. in.	6.31 ltrs	1.66 gal
#3 container	#3 gallon	11"	9 5/8"	693 cu. in.	11.35 ltrs	3.00 gal
#5 container	#5 gallon	10 3/4"	11"	887.7 cu. in.	14.55 ltrs	3.843 gal
#7 container	#7 gallon	14"	11 1/2"	1,405.6 cu in	23.03 ltrs	6.085 gal

Plant Height (Shrubs) Information (Average – varies by species, growth habit and growing season)

SHRUBS	<12" height	12-18"	18-24"	2-3'	3-4'	>4'
Cont Sdlg						
#1 container						
#2 container						
#3 container						
#5 container						

Plant Height (Trees) Information (Average – varies by species, growth habit and growing season)

TREES	<12" height	12-18"	18-24"	2-3'	3-4'	4-6'	6-8'
Cont Sdlg							
#2 container							
#3 container							
#5 container							
#7 container							

- C. The trench or hole for planting must be deep and wide enough to permit the roots to be spread out as naturally as possible.
- D. Sufficient soil compaction is needed to assure good root-soil contact and to eliminate air pockets that allow the soil and roots to dry.

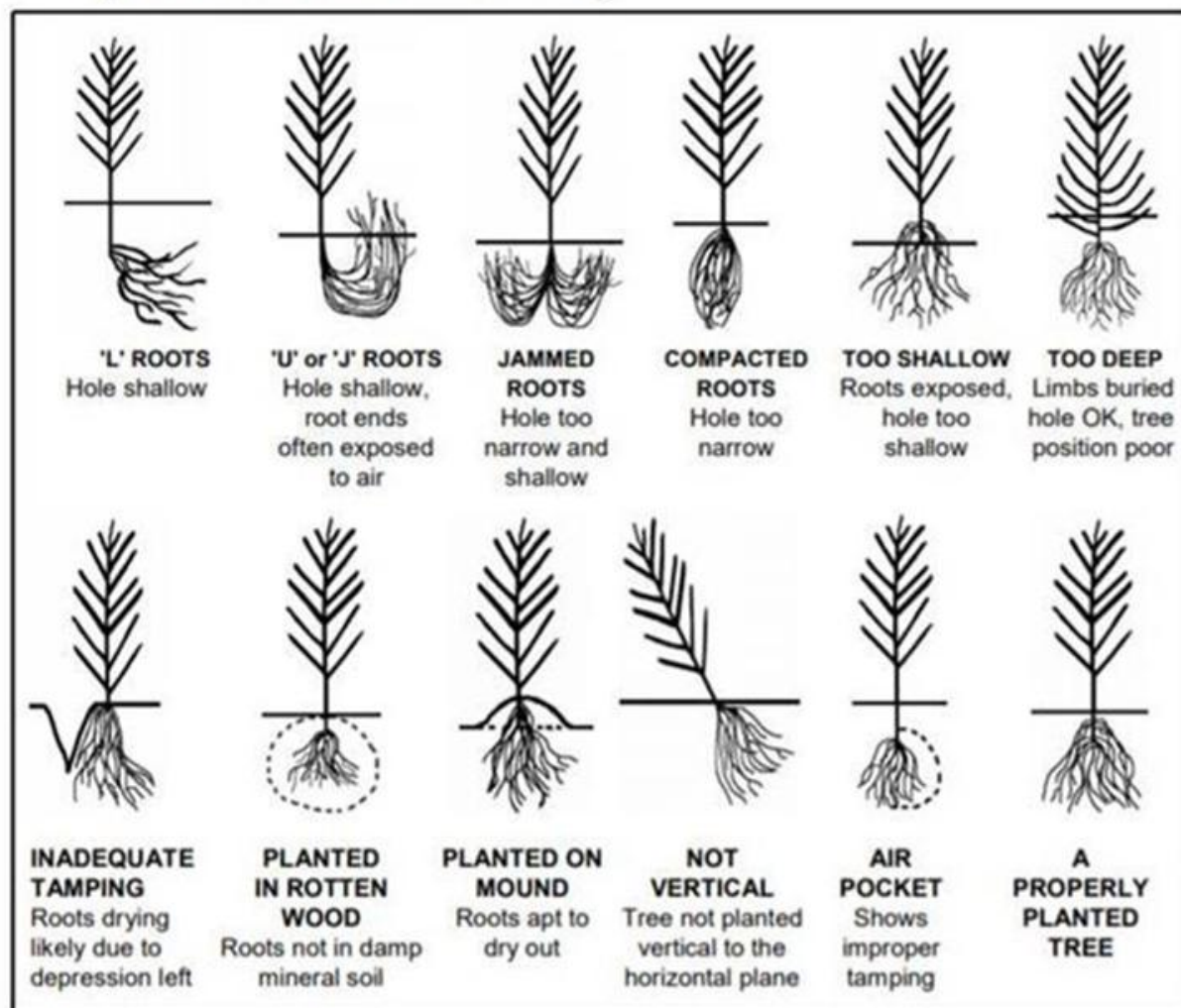


Figure 2. Eleven Ways that Trees should NOT be Planted (illustrated in Drawings 1-11). The Ideal Planting is shown in Drawing 12.

Livestakes

Bioengineering, where soil moisture isn't limiting.

Cornus, Salix, Populus



Design logistics

- Revolves around who will be doing initial and ongoing work
 - Site prep
 - Maintenance
- Deer Protection- Tubes, cages, clusters, fence.





Plant spacing

Spacing by feet	Per acre rate	Common purposes
2 x 2'	10,890	biomass, early successional, living snow fence
3 x 3	4840	biomass, early successional, living snow fence
4 x 4	2723	biomass, early successional, living snow fence
6 x 6	1210	shrub understory, conifers, windbreaks
8 x 8	681	shrub understory, conifers, wildlife overstory, WQ, windbreaks
10 x 10	436	hardwoods, conifers, wildlife overstory, WQ, silvopasture, windbreaks
12 x 12	303	hardwoods, wildlife overstory, WQ, silvopasture
15 x 15	194	wildlife mast-trees, silvopasture



Tree tube options

- Double wall
- Ventilated
- Flare at the top
- Reusable zip ties
- 5'













How are all of these trees getting planted?



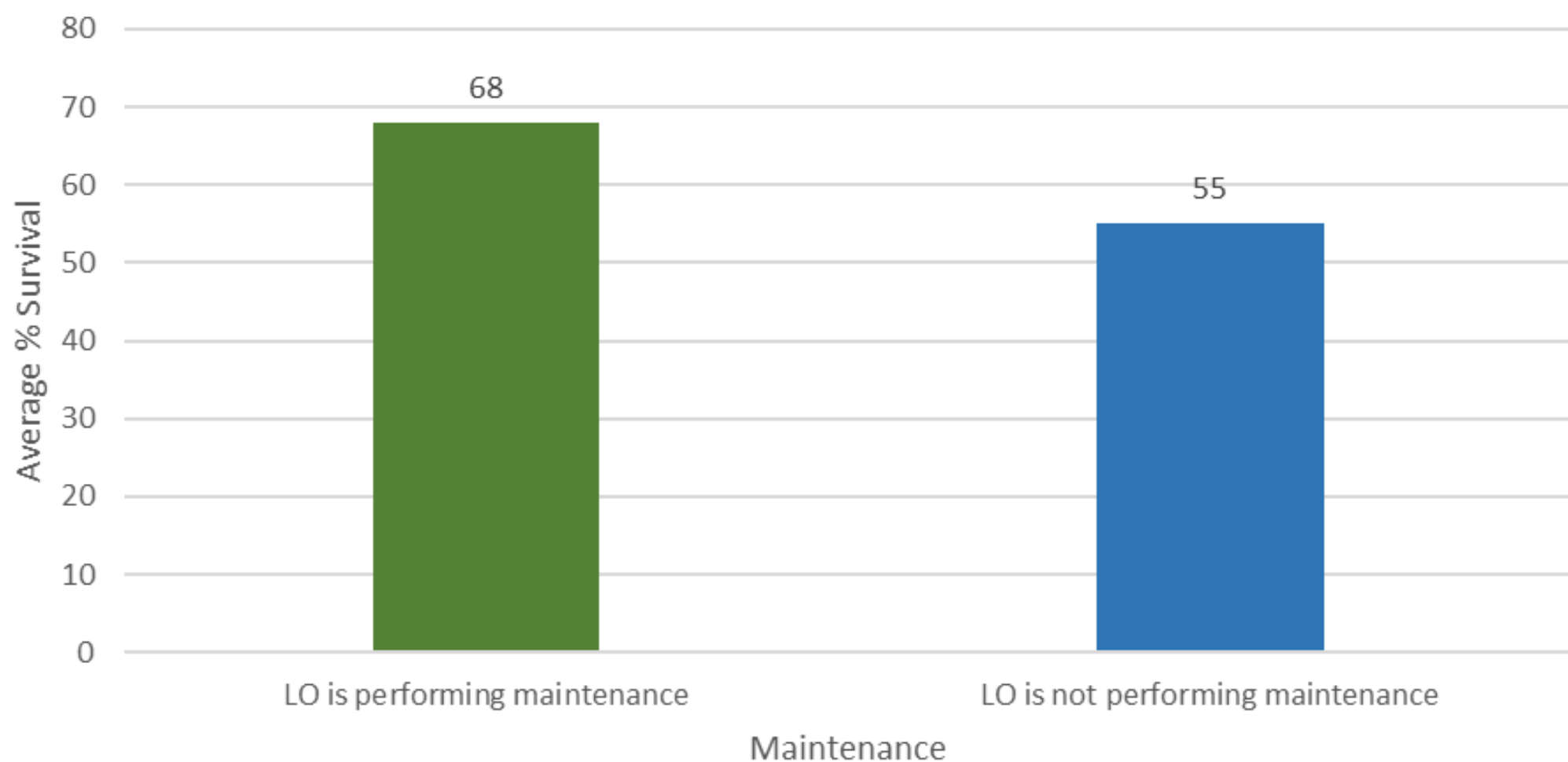




Why Stewardship?



Comparative Survival of Sites With and Without Maintenance



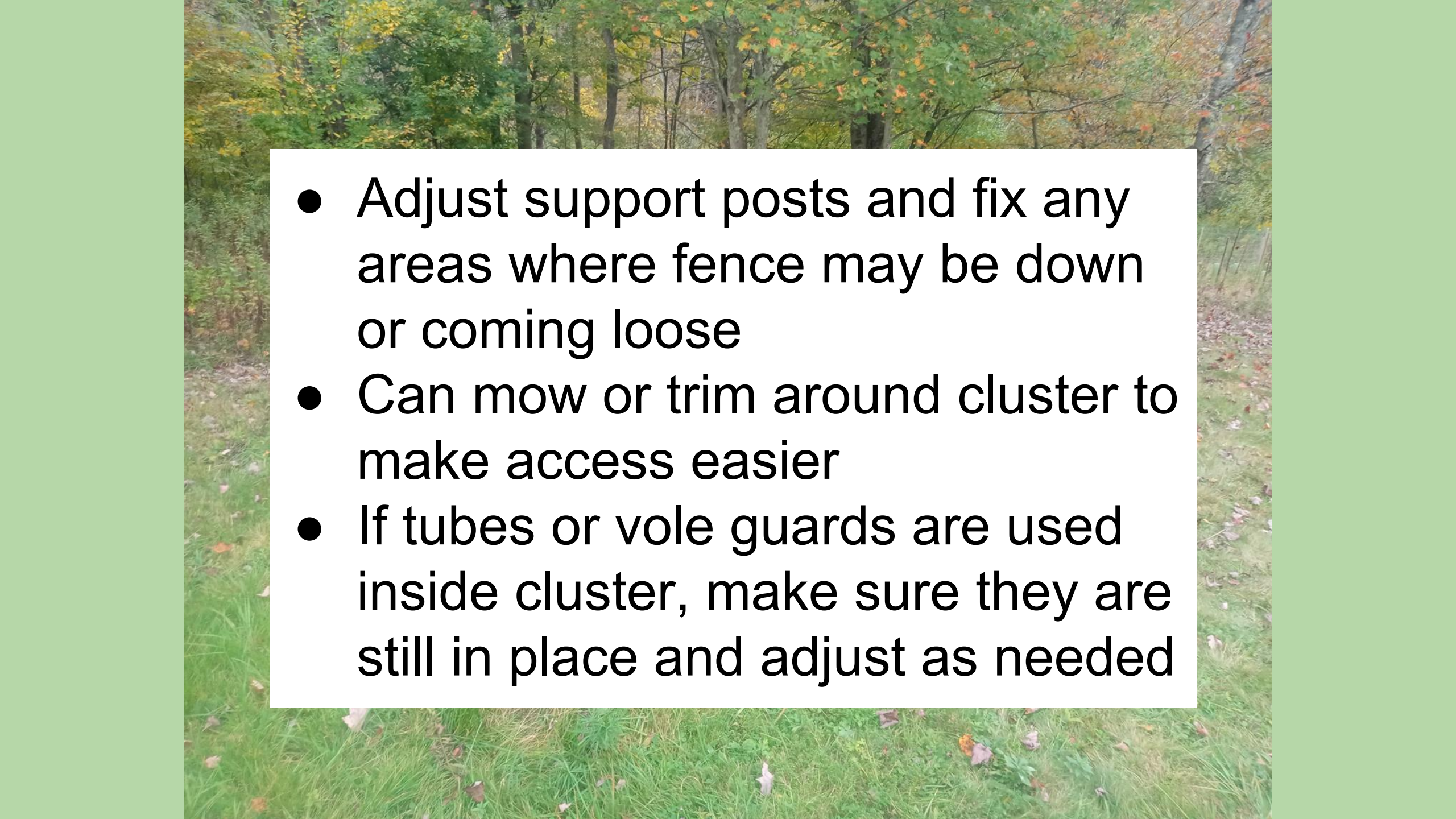
**What kind of
maintenance to plan
for, when to do it, and
who is responsible?**



Cultivating Riparian Forests

A Guide to Establishing Your
Trees & Shrubs



- 
- A photograph of a forest with green and yellowing trees, overlaid with a white text box containing a bulleted list.
- Adjust support posts and fix any areas where fence may be down or coming loose
 - Can mow or trim around cluster to make access easier
 - If tubes or vole guards are used inside cluster, make sure they are still in place and adjust as needed

Vegetation Control

Mechanical



Physical



Chemical



Vegetation Control

- **Mowing or trimming is recommended 2x per year- once in spring before June, once in fall before October**
- **Permanent mulch (stone mulch) only needs to be applied once; bark mulch may need to be applied multiple times**
- **Herbicide is typically applied once or twice a year by contractor with applicator license**



Results - Stone Mulch Study

- Overall survival of trees & shrubs with mulch treatment: **89.25%**
- Overall survival of trees & shrubs without mulch treatment: **87.88%**

Survival difference of only 1.37%. P-value (0.2984) is greater than 0.05, so this **difference in survival is not significant.**



Bio Mulch

- Bark mulch- compared to stone mulch, bark mulch has an additional benefit of providing a **soil amendment** as well as weed barrier
- Not flood resistant, needs re-application



Checking for damage- pest, herbivore, disease



Contractor maintenance

- May be hired for contracted mowing or herbicide
- Mowing- cheap, easy, effective
- Chemical may be desired for invasive treatment



Assessing survival and project success





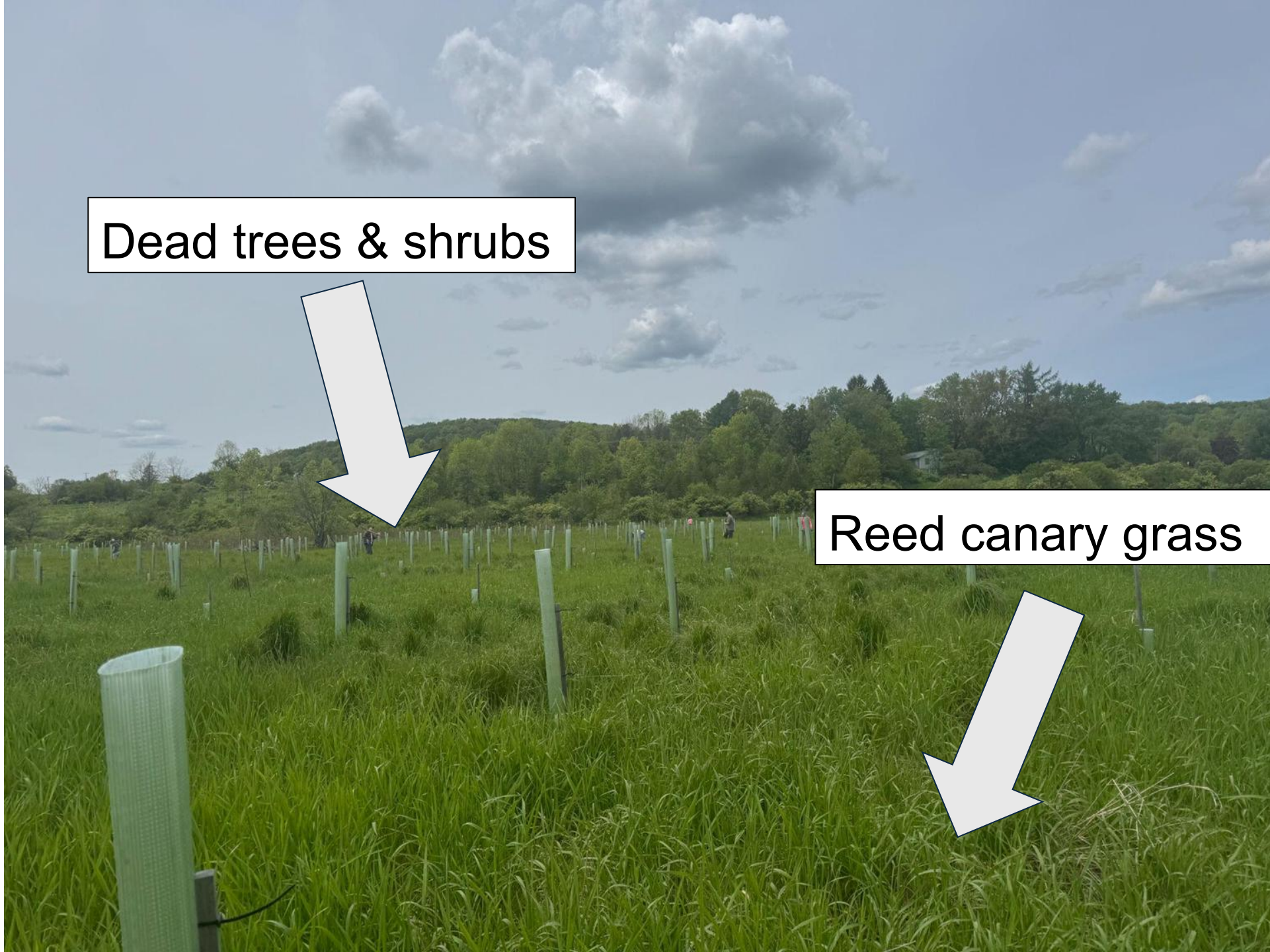
Things
happen

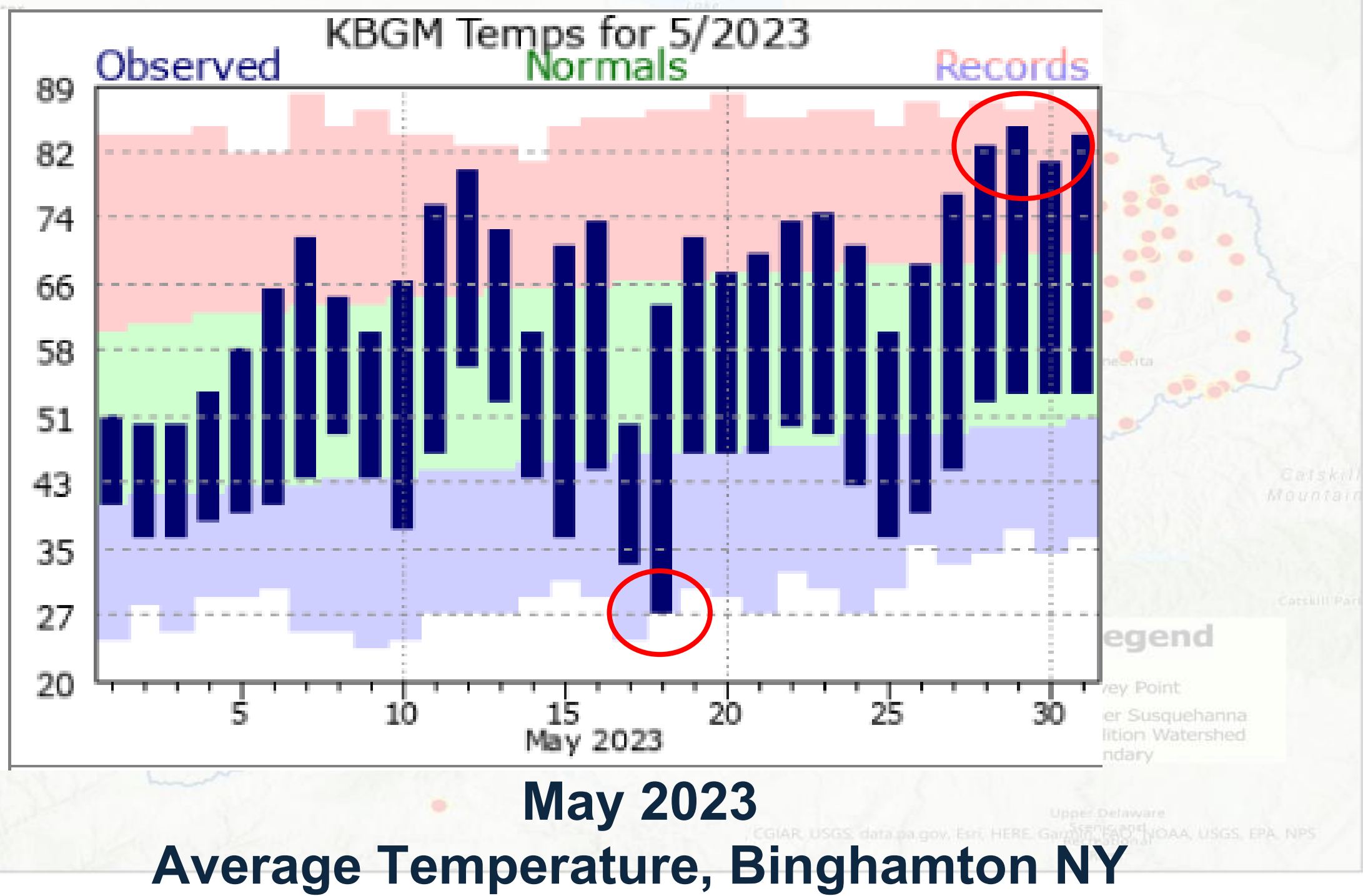


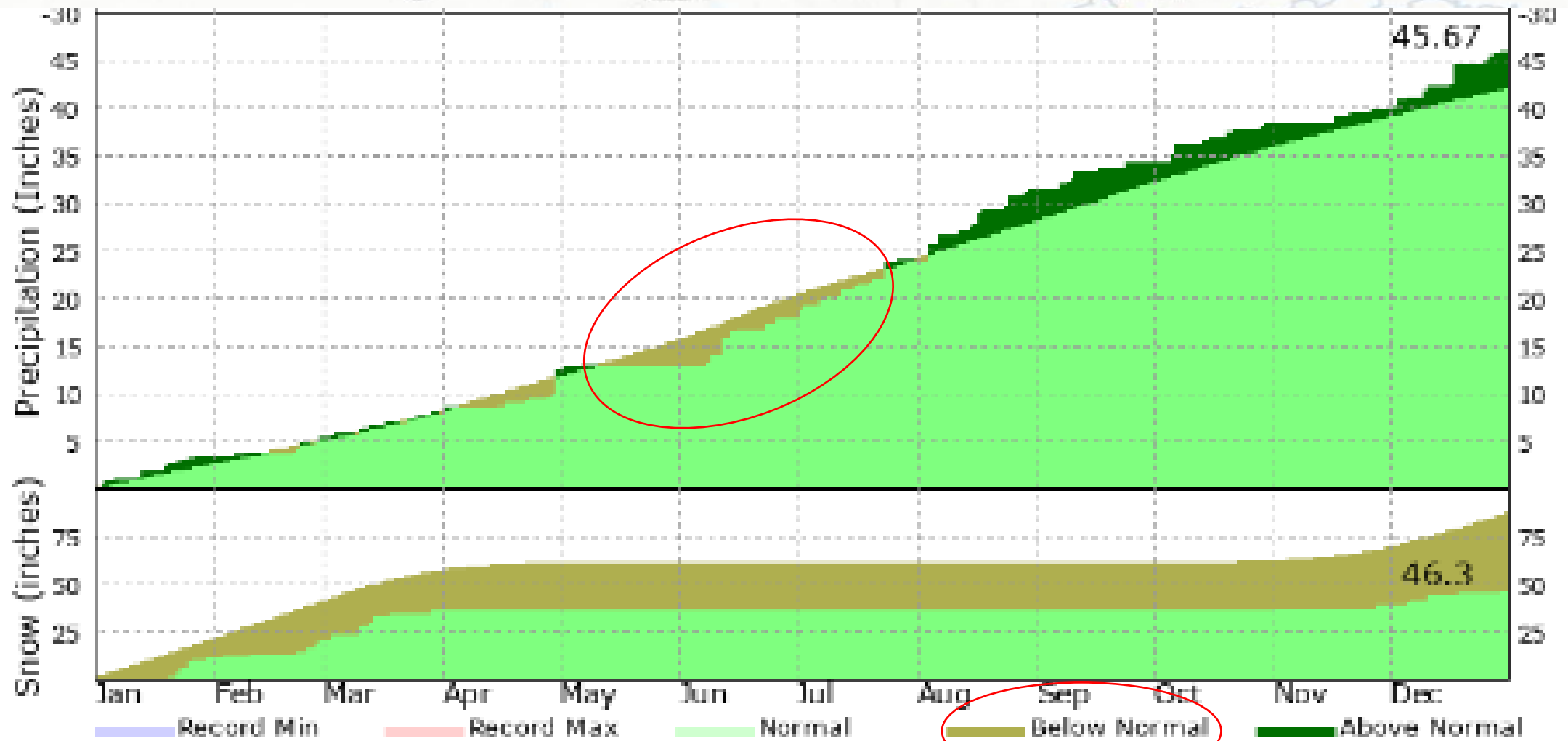
Dead trees & shrubs



Reed canary grass

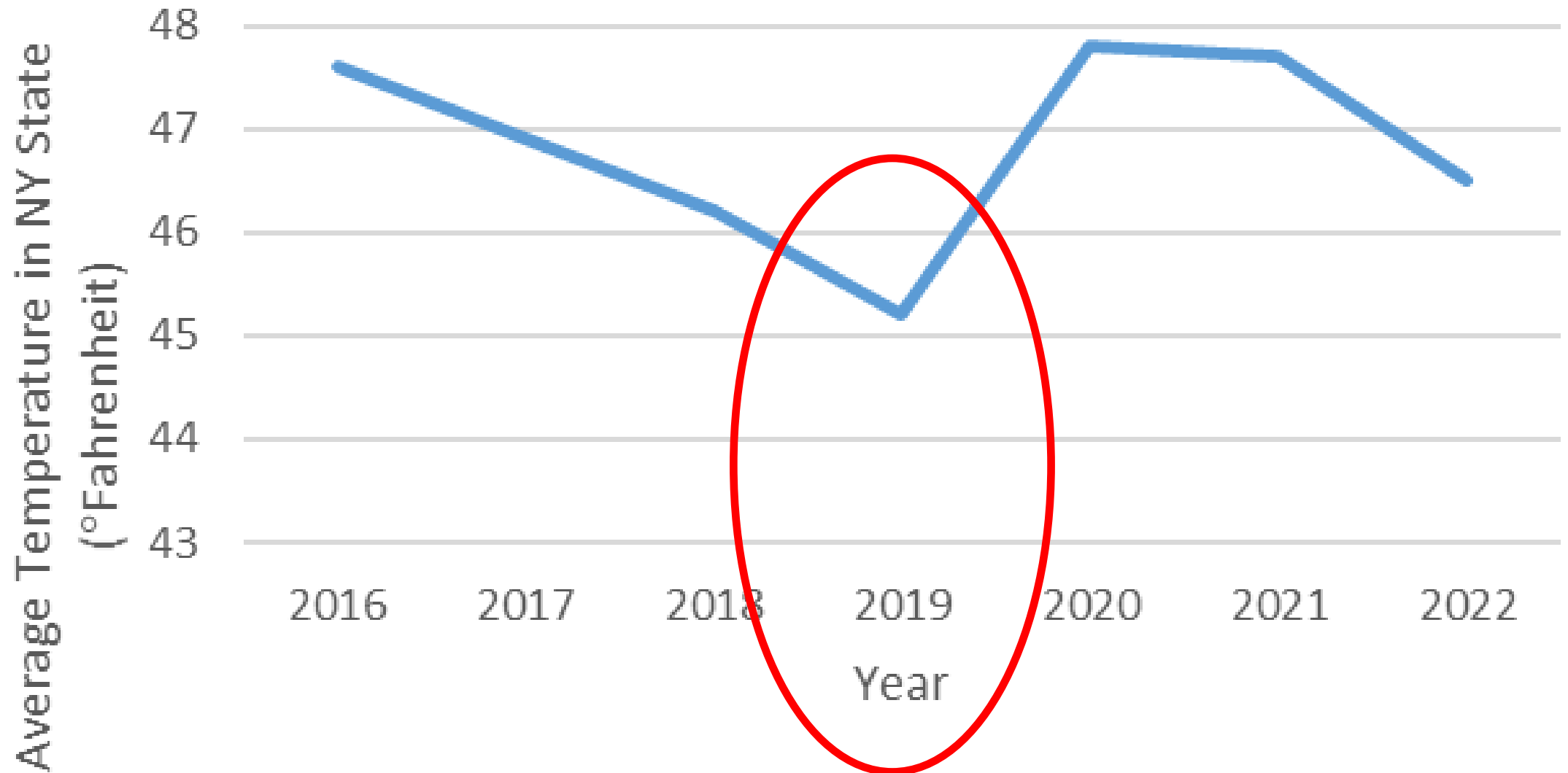




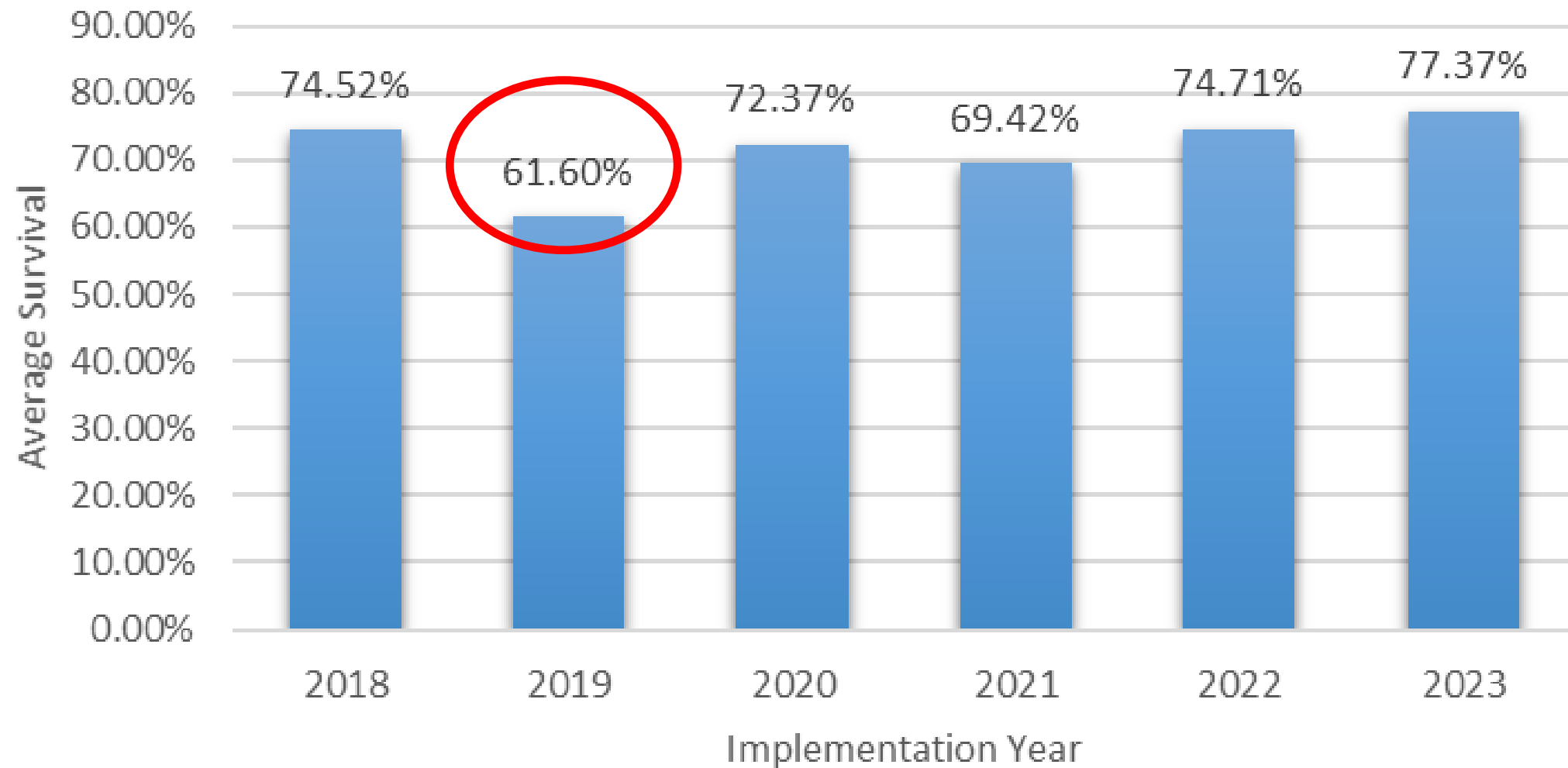


Binghamton NY Average Precipitation 2023

Average Temperature for NY State 2016-2022



Average Survival by Year Planted



Questions?



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