

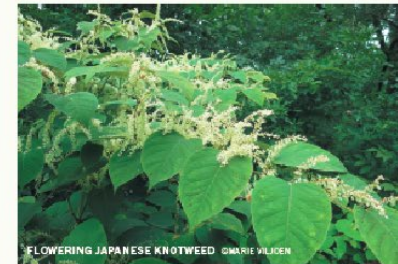
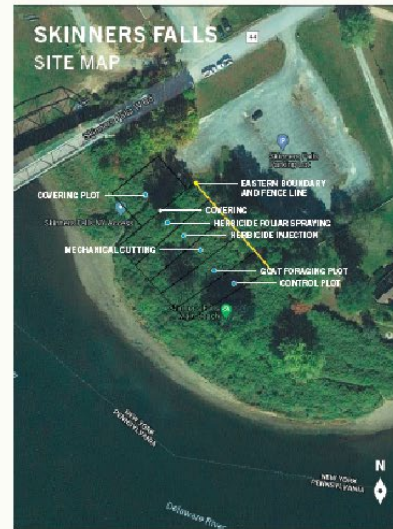
Knotweed Management in the Upper Delaware River Watershed

Research, Demonstration and Outreach Wrap-up

FRIENDS OF THE UPPER DELAWARE RIVER

SKINNERS FALLS

KNOTWEED MANAGEMENT DEMONSTRATION SITE



Knotweed is *everywhere* in the Upper Delaware River watershed.

Here's how you can ID them and recognize the variations:

JAPANESE KNOTWEED 8-10 FEET HIGH LEAVES: HEART-SHAPED, 3-5 VEINS FLOWERS: SMALL, WHITE, IN PANICLES ROOTS: THICK, BROWN, WITH SMALL TUBERESCES	GIANT KNOTWEED 12-15 FEET HIGH LEAVES: LARGE, OVATE, 3-5 VEINS FLOWERS: SMALL, WHITE, IN PANICLES ROOTS: THICK, BROWN, WITH SMALL TUBERESCES	BOHEMIAN KNOTWEED 8-10 FEET HIGH LEAVES: SMALL, OVATE, 3-5 VEINS FLOWERS: SMALL, WHITE, IN PANICLES ROOTS: THICK, BROWN, WITH SMALL TUBERESCES
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This plant spreads rapidly through seeds, rhizomes (roots), and rhizome fragments. It loves to grow in disturbed soils in flood plains, roadsides and construction sites. Where it has established mature stands it may lead to stream bank destabilization, erosion and soil loss because its root structure doesn't retain soils and sediments. It crowds out native riparian plants, like trees and shrubs that cannot grow fast enough to compete with knotweed, reducing plant diversity. The lack of diversity degrades the habitat for pollinators and other insects and animals which depend on diverse native plants for breeding and nourishment throughout the growing season.

This demonstration site highlights different methods you may be able to use to control or eradicate knotweed on your property. The methods have different levels of effort and costs and can lead to different outcomes. Our goal with this project is to provide information to help you set your objectives for managing knotweed on your property.

THANK YOU TO OUR PARTNERS



For more information on these control methods, to get the schedule of live demonstration of these methods or to learn more about this on-going research that is part of this project go to www.fudr.org/knotweed or use this QR code.

FUNDING FOR THE PROJECT COMES IN PART FROM THE NATIONAL FISH AND WILDLIFE FOUNDATION, OWENS CORNING AND EPI. MAP DATA ©2021, IMAGERY ©2021, MAXAR TECHNOLOGIES, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, PA MAPPLUS, KNOTWEED LEAF IDENTIFICATION COURTESY OF JAPANESE KNOTWEED KILLERS.



Research

- Distribution of the three species – volunteer reports and PSU biologists visual survey
- Extent of knotweed colonization in the riparian zone – percentage of the 100 year flood plain covered by knotweed
 - Aerial visible and IR light photographs
 - Processed, ortho-rectified and auto-translated by Shippensburg U
- Soil and sediment migration into waterways due to knotweed
 - Soil tests, core samples, elevations by Stroud
 - Model the amount of soils and sediments that could be transported based on the extent mapping

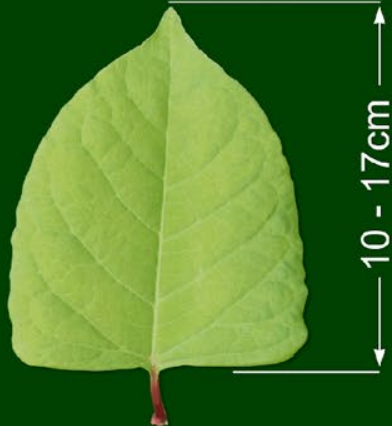
Knotweed Leaf Identification



Giant Knotweed
(*Fallopia sachalinensis*)
Leaf



Bohemian Knotweed
(*Fallopia × bohemica*)
Leaf



Japanese Knotweed
(*Fallopia japonica*)
Leaf



Mapping knotweed using remote sensing techniques: Opportunities and challenges

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Knotweed maps

BEL

-  High probability of Knotweed
-  Knotweed Probable
-  Maybe Knotweed
-  Can be mistaken with Knotweed



validation


Validation Hancock

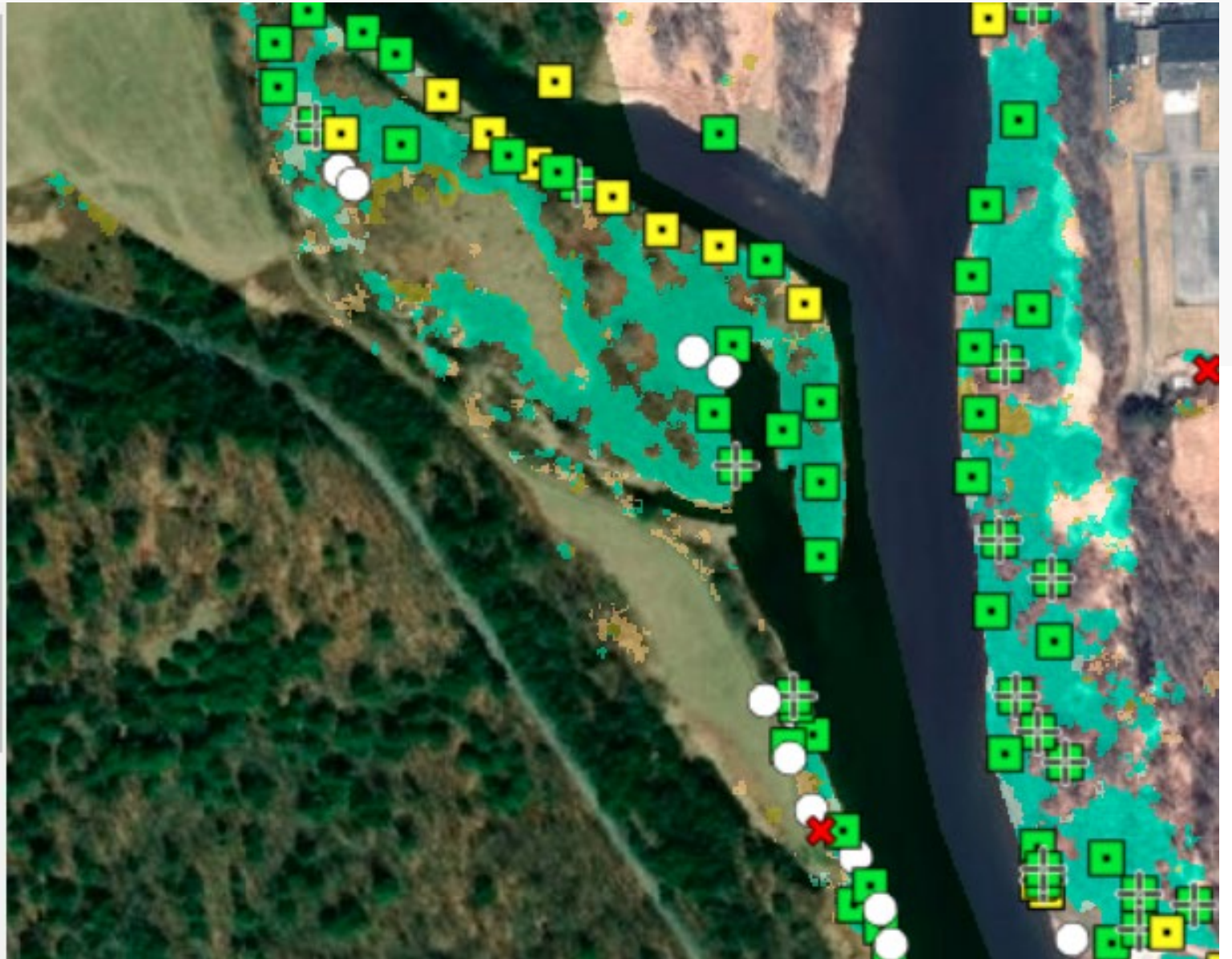
Code

-  Knotweed correct
-  Knotweed under canopy
-  Present
-  False positive
-  Not present

Knotweed

LABEL

-  High probability of Knotweed



Soil Analysis and Sediment Migration Mapping

Melinda Daniels, Stroud Water Research Center



Healthy Riparian Vegetation



Soil erosion



Bare soils where high water has killed off knotweed

Soil erosion

Bare soils where high water has killed off knotweed



Knotweed Management Demonstrations Wrap-up

- Full treatments were only applied at the Skinners Falls and Deposit sites
- Some treatments were more effective at one site versus the other
- All treatments require multiple years

Management Techniques

- Repeated mechanical cutting
- Covering with geotextile membrane
- Herbicide foliar application
- Herbicide injection
- Foraging



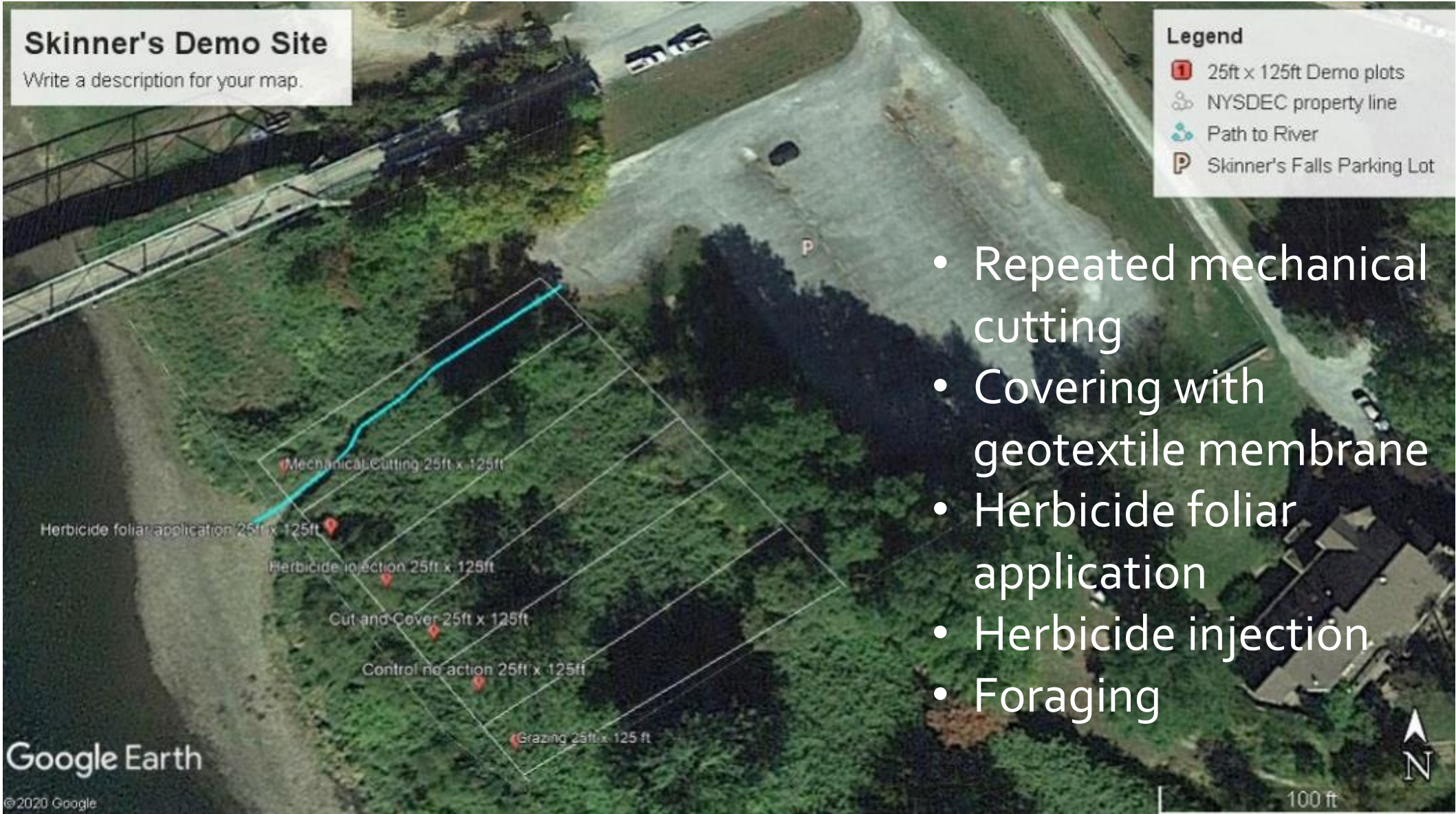
Landowner Objective

Setting Demonstration

Messaging

- Eradication of large patches – difficult and expensive
- Early detection and eradication of isolated plants – relatively easy
- Containment – feasible with repeated attention each year
- Control – Allow other vegetation light and air
- Fostering succession and competition through control and selective plantings of native riparian vegetation

Skinner's Falls Demonstration Site



- Repeated mechanical cutting
- Covering with geotextile membrane
- Herbicide foliar application
- Herbicide injection
- Foraging

SKINNER'S Falls Demonstration Site



Management Demonstration

Outcomes – Part 1

- **Repeated mechanical cutting** – Eliminated flowering and seed production, multiple years required to encourage successful completion by other plants
- **Covering with geotextile membrane** – Completely smothered knotweed, no breaks, tears or punctures. Needs multiple years to kill rhizomes; site owners have agreed to leave membrane in place for at least another year. Requires maintenance of adjoining ground to capture knotweed growing out from beneath the membrane. Will experiment with succession planting with membrane in place at Skinners Falls in 2022

Management Demonstration

Outcomes – Part 2

- **Herbicide foliar application** – Good coverage on all plots, requires survey next growing season to assess impact and need for follow up treatment
- **Herbicide injection** - Good coverage on Deposit plot. Skinners plot too dense to allow full coverage. Follow up spraying covered more of the Skinners knotweed. Requires survey next growing season to assess impact and need for follow up treatment
- **Foraging** – Goats like the leaves, not the young shoots. They effectively managed knotweed by eating leaves and bending down stalks to get to the leaves but left some tall stalks that have a Seussical fringe of knotweed leaves and flowers at the top. May require tighter gang grazing, more goats and some selective cutting plus multiple years of treatment. Will assess impacts next growing season.

Goat Foraging Management Topiary



Knotweed Management Outreach Wrap-up

- Over 50 households attended our 4 in-person knotweed demonstration events at the 3 demonstration sites
- Over 50 people attended our in-person events at the Wayne County Public Library and Upper Delaware Council meetings
- 100s more attended our virtual events sponsored by FUDR and NYLCV
- 10 Newspaper articles or radio shows about the project including one article this week.
- Survey showed that over 75% of respondents learned new information from our demonstrations and outreach about knotweed management

Thanks To:

LightHawk
National Fish and Wildlife Foundation
Shippensburg University-CLUS
Stroud Water Resources Center
Eric Burkhardt, PSU
Mike Roberto, Photographer
NYS DEC
NPS UPDE
Hancock Volunteer Fire Department
Village of Deposit




New York League of Conservation Voters
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Terry and Barb Grant of Grant Farm
Andrew Gross
Owens Corning
Cochecton Mills
Signs, Etc.
Augellos Excavating
Bisbees Lumber Company

Last but not least:



Molly, Sherri, Shell and Jeff at Friends of the Upper Delaware River



Thank You

-  Steven Schwartz
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-  knotweed@fudr.org



 Demonstration Sites
 Delaware River Basin

