

# Northern Hardwood

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**Project Subject/Title:** Treatment of Pennsylvania sedge in Northern Hardwood  
**County:** Oneida  
**TRS:** T35N R9E, Sec. 29

**Contact Person:** Colleen Matula, 715-216-1378

**Type of Prescription:** Single tree selection harvest with 1 sixty foot gap/acre. Site Preparation within the gap included Rx burn, scalp, herbicide and herbicide/scalp

**Year Initiated:** 2003-04

**Abstract/Prescription:** The native Pennsylvania sedge typically grows in small dense tufts connected by rhizomes which serve as primary means of reproduction. Anecdotal evidence suggest sedge dominated understories on high quality northern hardwood sites lowers species diversity and seedling densities. Several factors may explain the increased abundance of Penn sedge in northern hardwood systems such as past intense harvest and fire, excessive white tailed deer browse, or exotic earthworm invasion altering the soil. This project was set up to set back the dominance of the sedge and try to increase tree regeneration. A single tree selection harvest was conducted. Canopy gaps were placed 1 sixty foot gap per acre. Within each gap a site preparation was utilized such as scalp, herbicide, Rx fire, and scalp/herbicide.

The scalping was conducted by using a dozer blade lightly scarifying the soil and breaking up the sedge mats during the mid summer.

There were various combinations of herbicide used in this project. The herbicide was applied in the late spring. The herbicide brands include Oust, Velpar, Aqua neat, Arsenal, Plateau, Diuron. The herbicide was provided by UAPTImberland.

Before harvest, permanent monitoring plots centered on 60 of these gaps and data collected on overstory composition, structure/density, canopy cover and other site characteristics.

## **Results:**

Discussion/ Recommendations:

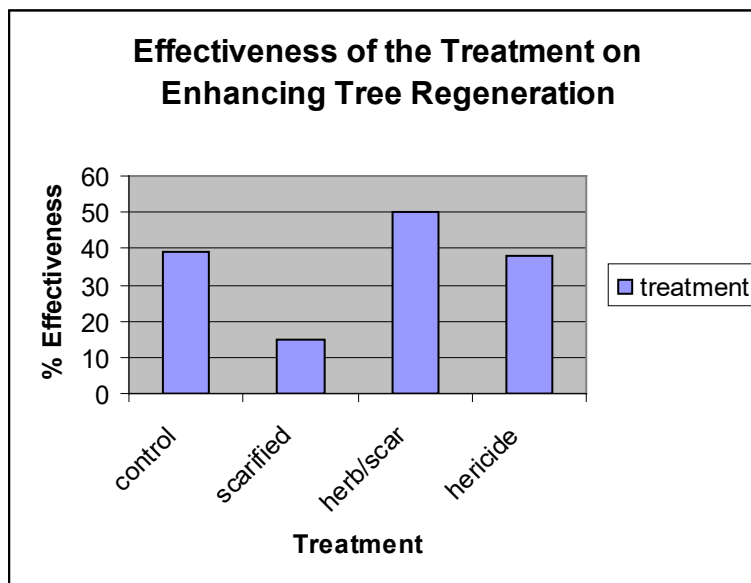
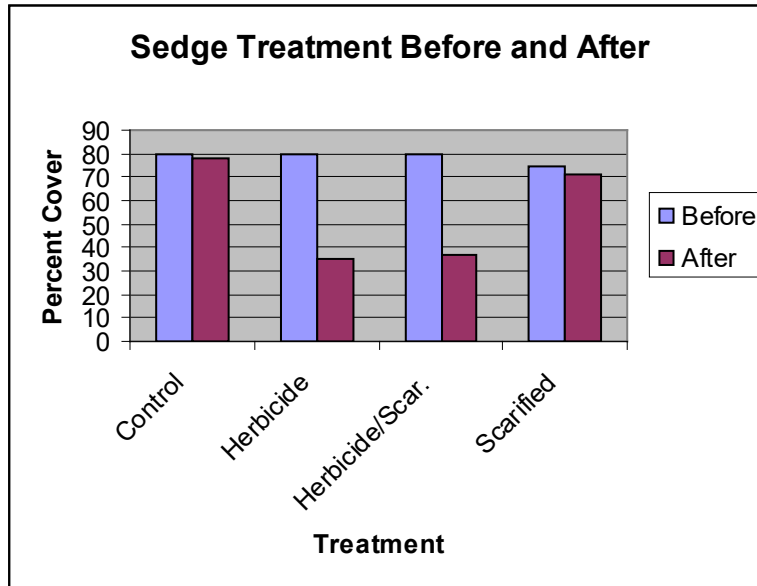
The sedge control treatments were assessed by estimating percent cover as displayed in the chart below. Before treatment, each plot had at least 75% sedge cover. The herbicide and herbicide/scarification treatments were the most successful by reducing the sedge to less than 50% cover, 9 out of 11 plots on herbicide and 6 out of 10 on herbicide/scarification. The herbicide Oust was the most successful. The prescribed burning treatment was not successful since the sedge is somewhat fire resistant. The scarification treatment did not reduce sedge since it was difficult to break up the sedge mat.

Tree regeneration surveys were conducted to assess the adequacy and type of regeneration. The herbicide and herbicide/scarification treatment had over half of the plots with good to very good regeneration (2,000 or more stems per acre). More white ash stems established on the control plot and more maple on the herbicide plots. Since it

is only two years after treatment, adequate regeneration surveys will be conducted on the 5th year of the study (2010).

## Deer exclosures

The four deer exclosures were set up mainly to observe the amount of regeneration and species and the growth response to no browse. The tree stems measured inside the fenced closure were at least 3 times taller than the stems outside the plots (that evidently were browsed). There was an abundance of regeneration of varying species within these plots as well as good growth. The stems per acre were well over 2,000 per acre.



Site conditions:

Habitat Type: ATD

## **Covertypes: Northern Hardwood sawtimber 11-15**

### **Conclusion:**

Our results suggest an interaction between deer herbivory contributing to the Pennsylvania sedge dominance in northern hardwood forests. Although earthworm activity was not the focus of the study, it may have additional interacting effects. With deer exclosures installed and monitored, it was obvious that within two years after harvest tree regeneration in the exclosures was abundant and successfully grew through the sedge (as observed in the exclosure control plot). With this observation, it clearly suggests that deer browse is a significant factor in reducing tree regeneration.

Though there are more years of observation, our results suggest that the herbicide treatment was effective at reducing sedge while allowing the establishment of tree regeneration. One suggestion would be to apply a fall herbicide application just after leaf-off to minimize mortality of other understory plants and optimize plant diversity at the site. Sedges and grasses are still photosynthetically active and would still be impacted by the herbicide treatment. Wide scale application of herbicide at a stand level might be logistically and economically difficult, however, even if patches of sedge were treated might enhance the advancement of regeneration.

Ensuring adequate levels of regeneration in northern hardwood forest may require the development of strategies that address complex interacting factors. Adopting silviculture systems that consider thorough site assessments, structural considerations, limiting deer densities or use of deer repellents and reducing Pennsylvania sedge may all be necessary to meet management objectives. Site preparation techniques that combine herbicides application can reduce Pennsylvania sedge cover; however, deer densities or deer herbivory effects will need to be addressed as well.

### **Follow up --Summary of 2015 Regen Inventory – Oneida County Sedge Project**

This is a summary of tree regeneration status ten years after treatments were implemented. In July of 2015, milacre plots were conducted within the gap treatments (and some in “no treatment” areas within the forest matrix). Species count, height class, origin (seed or stump) were measured.

#### Control – plots with gaps but no treatment within gap

- Average 5,000 stems/acre; Range 1,000-10,000 stems/acre
- Lots of MH and AW
- Regen height averages > 4 feet

#### Herbicide – plots with gaps and variety of herbicide treatment in gap

- Average 4,400 stems/acre; Range 2,000-8,000 stems per acre
- Lots of AW and Ironwood
- Regen height averages > 4 feet

#### Herbicide/Scarify – plots with gaps and herbicide/scarify in gap

- Average 4,100 stems/acre; Range 1,000 -7,000 stems/acre

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- Lots of mixed spp – AW, BW, BY, OR, MH
- Regen Height average 1-4 feet

### Scarify – plots with gaps and scarify within gap

-Average 3,400 stems/acre; range 0-11,000

- Lots of mixed spp – AW, BW, BY, OR, MH
- Regen height averages 1-4 feet

### No gap/No Treatment – plots within stand with no treatment

-Average 4,400 stems/acre; Range 1,000-16,000 stems/acre

-Ironwood, AW, some MH – more ironwood

- Regen height average 1 foot

Average Stand Basal Area = 104-120 sq ft/acre

All Deer exclosures had abundant regeneration and diversity in composition – averaging 20 feet or more in height.