Plants on the Banks of the Salmon Kill

NRCA Student: Grace Herde[1]

Community Partner: Tracy Brown[2]

[1]Housatonic Valley Regional High School; [2]Trout Unlimited

ABSTRACT

The motivation for the project was to improve in-stream and riparian habitat on the Salmon Kill as part of the Trout Unlimited Salmon Kill Enhancement and Restoration Project. Along with improving the stream and riparian habitat came the goal of improving conditions for native brook trout. Brook trout are an important part of the ecosystem because they provide food for larger fish and control the populations of smaller aquatic life in the Salmon Kill. The health of the river was in decline because of the decrease in riparian zones along the banks of the river and the land use surrounding the river, such as plowing.

The questions we had to ask ourselves while doing this project were:

- What fencing would work best for protecting the plants?
- What plants would be the best for creating a stable riparian zone?

Photo monitoring (all 6 sites), construction (3 sites), and planting (3 sites) was made on parts of the Salmon Kill. We found that using 4 foot high hog wire fencing protected the plants better than electric wire. With a new healthy riparian area, the river will be healthier, therefore making more habitat for the brook trout.

Fig 1. A brook Trout (*Salvelinus fontinalis*), similar to the ones you find in parts of the Salmon Kill.

INTRODUCTION

Rivers are extremely important for the environment, and for us. Humans use rivers for multiple different tasks such as transportation, energy, and food and water sources. Freshwater is especially important because it is the water that we drink. It also provides habitat for freshwater aquatic animals.

Accordingly, the specific problem that this project focuses on is the restoration of habitat of eastern brook trout (*Salvelinus fontinalis*; Fig. 1) in the Salmon Kill in northwestern Connecticut. In particular, I focused on the revegetation of the riparian areas (i.e. planting and nurturing of the river corridors and banks) to improve riparian health. Maintenance of "healthy" riparian areas is important for stream habitat because they "...help control nonpoint source pollution by holding and using nutrients and reducing sediment" (NRCS 1)."Trees and grasses in riparian areas stabilize streambanks (NRCS 1). For example, one site along the Salmon Kill had no riparian buffer, and sediment from the steep, eroding banks washed directly into the stream, covering trout spawning habitat. By restoring a riparian buffer at priority locations, the amount of sediment and other pollutants entering the stream will be reduced. Deer, cows and beaver present a threat to the young seedlings, so developing an appropriate planting strategy is essential for the project goals to be achieved.

Objectives

- Revegetation of important waterway to improve habitat;
- Protect plants from known threats - deer, cows and beaver.
- Collect baseline data to compare post-restoration surveys to determine success.

METHODS

This project developed methods to evaluate the effectiveness of riparian planting on the Salmon Kill Project .

Study Area

- A tributary of the Housatonic River, the Salmon Kill in Salisbury, CT (Fig. 2).
- Riparian plantings occurred at 6 sites along 1.33 acres of the Salmon Kill (Fig. 2B-D).
- Photo monitoring occurred at 4 sites (Fig. 2B).

Revegetation & Data Collection

- Photo monitoring using a GPS and compass to identify exact location/positions was conducted before and after restoration at 4 restoration sites to evaluate changes/success (Fig. 1A2, Fig. 3C2).
  - Pre-planting photo monitoring: July 30, 2015 & August 27, 2015
  - Post-planting photo monitoring: July 29, 2015, September 18, 2015 & October 1, 2015.
- With the assistance of students from Hotchkiss School we planted plots after construction activities in September 2015 (Fig. 3B).
- At construction areas, the riparian area was completely unearthed and replanted.
- At the sites where construction did not take place, invasive species were removed in each pod prior to planting.
- Shrubs and trees native to New England came from Earth Tones Native Plant Nursery and Project Native.
- Planting strategy included the installation of 160-400 sq ft planting "pods" ("Pod" design developed by Earth Tones Native Platn Nursery, Woodbury, CT). Each "pod" contained 11-15 plants and were surrounding by 4' hog fence.
- Baseline data was collected (number and species of plant in each "pod") so that later we will be able evaluate plant survival.

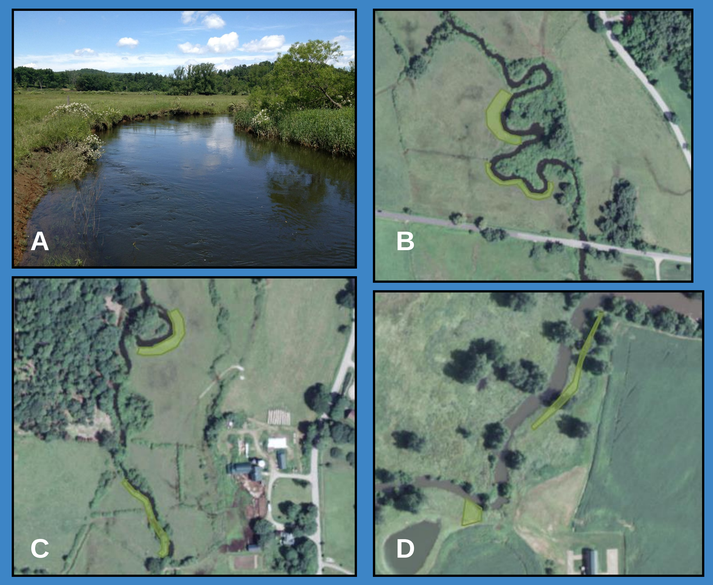

Fig 2. (A) A site along Salmon Kill River, a tributary of the Housatonic River. (B) Site 7 plantings in a field located at Whippoorwill Farm, Salisbury, CT. (C) Site 2 and Site 3 plantings also located at Whippoorwill Farm, and four photo monitoring sites were set at these location. (D) Site 24 and Site 24 plantings located at White Hollow Farm just across the river from Housatonic Valley Regional High School, and five photo monitoring sites were set at these location.

RESULTS

Types of Plants

Common Name	Latin Name
Red maple	*Acer rubrum*
Silver maple	*Acer saccharinum*
Speckled alder	*Alnus incana*
Serviceberry	*Amelanchier canadensis/ arborea*
River birch	*Betula nigra*
American Hornbeam	*Carpinus caroliniana*
Red-osier dogwood	*Cornu sericea*
Silky dogwood	*Cornus amomum*
Gray dogwood	*Cornus racemosa*
Tulip tree	*Liriodendron tulipifera*
American sycamore	*Platanus occidentalis*
Eastern cottonwood	*Populus deltoides*
Quaking aspen	*Populus tremuloides*
Black chokecherry	*Prunus virginiana*
Swamp white oak	*Quercus bicolor*
Swamp rose	*Rosa palustris*
Bebb willow	*Salix bebbiana*
American Hazelnut	*Salix discolor*
Pussy willow	*Salix discolor*
Coyote willow	*Salix exigua*
Black willow	*Salix nigra*
Blue elderberry	*Sambucas canadensis*
Basswood	*Tilia americana*
American elm	*Ulmus americana*

All together, sites 2, 7, and 24 used 285 plants. Plot 1 used 142 plants and plots 2 and 3 used 335 plants together. In total, 762 plants were used and cost $11,500.80. The fencing cost a total of $21,593.00. Although we do not have final results, this baseline data will be vital to understanding whether our methods worked and the Salmon Kill and brook trout will indeed benefit from this project.

Fig 3. Site 2 (A) before construction and planting, (B) during planting and (C) after construction and planting.

CONCLUSIONS

An important component of stream restoration projects is the reconstruction of the riparian zone. This is important because riparian areas "...help control nonpoint source pollution by holding and using nutrients and reducing sediment" (NRCS 1). If there is no barrier, the stream experiences an influx of sediments, causing less wildlife due to loss of habitat and an unhealthy stream. The goal of this project was to establish baseline data in order to monitor the planting sites to see if our current method of choice, fencing in the plants, is an effective approach therefore increasing the likelihood of restoration success and promotion of a healthy riparian barrier along the stream. If our method proves to be ineffective, another method should be explored.

ACKNOWLEDGEMENTS

I would like to give a huge thank you to Tracy Brown, my mentor, and Laura Cisneros for being the wonderful people that they are and giving guidance and help when needed. I would also like to thank everyone involved in NRCA, counselors, professors, and other students who have made this experience one of the best I have ever had.

REFERENCES

"Natural Resources Conservation Service." *Riparian Areas Environmental Uniqueness, Functions, and Values*. N.p., 11 Apr. 1996. Web. 05 Mar. 2016.

A Wild Brook Trout. Digital image. *Nutmeg Trout Unlimited*. N.p., n.d. Web.