



## Introduction



There's something about cold, bubbling trout water that can relax almost anyone (see Figure 1). Thus, it is imperative to conserve and restore our precious streams and rivers for future generations to experience and enjoy. With this in mind, the Lakeshore Chapter of Wisconsin Trout Unlimited (LSTU) undertook a project starting in 2019 to repair and enhance existing river restoration improvements and expand improved water into a new section of the Onion River outside of Plymouth, which is located in East Central Wisconsin. The environmentally sensitive site is in a floodplain and wetland forest surrounding a trout stream on State of Wisconsin Department of Natural Resources (WDNR) managed lands.



*Figure 1: Beautiful trout shown before being released (photo courtesy of LSTU).*

## Project Scope



The first stage of the project was designed to include brushing out and stabilizing the banks of the river with brush bundles, bio-logs, tree drops, and bank covering. Upon completion of this work, LSTU would then undertake the installation of fixed structures within the stream itself. These structures were to include bank covers, half logs, and log drops. These efforts were identified to provide habitat for multiple year classes of trout. LSTU would consult with the WDNR during all stages of the project.

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## Unforeseen Challenges



No project of this magnitude goes perfectly without challenges to overcome. Significant challenges arose throughout the process that impaired the team's ability to complete the entire scope, including the impact of the worldwide COVID-19 pandemic, which caused several workdays throughout 2020 and 2021 to be canceled.

Furthermore, a local biologist who played a significant role in designing the original project for LSTU departed, which caused the team to seek out help from other regional and state staff. New members to the project team asked for changes to the original plans, which caused delays in commencement. In addition, the area contained a lot of ash trees, which were unfortunately killed by the emerald ash borer. Some of the dead trees had to be removed (see Figure 2) before they would potentially fall into the river and create damming effects that would be counter-productive to the project's goals. Lastly, delays from equipment and machinery breakdowns also had to be overcome during the project.



*Figure 2: Removing ash tree killed by emerald ash borer before streambank restoration started.*

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## Executing the Plan



While the team was initially negatively impacted by the change in staff, they were fortunate to secure additional help from the WIDNR Trout Habitat team. The WIDNR team allowed the group to complete part of the planned work in the Fall of 2021, which included removal of trees that were growing streamside and destabilizing the bank. The completed work also included repairing several hundred feet of stream bank that included brush bundles, bank reduction, 36 half-log structures on the stream bottom to provide cover and bio-log placement. The team also installed two bank covers stretching over 60 ft (18.3 m) each that provided 120 ft (36.6 m) of habitat improvement for multiple year classes of fish.



Figure 3: Project staff and volunteers constructing lunger structure.



Figure 4: Completion of lunger structure before final backfilling, seeding, and covering. Note black locust post near center of photo that had not been cut off yet.

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## Executing the Plan (Continued)



Boulders were placed into the stream to assist with current flow. Repair of existing lunger structures from the late 1990s and 2000s was also completed.

Construction of the new lunger structures (see Figures 3, 4, and 5) started with the banks being properly shaped with equipment. Next, the newly shaped banks were wrapped in an open weave coir material. Repurposed posts, which were made from black locust trees, were donated from a local YMCA camp. They were pounded into the stream bottom to form the main anchoring support for the lunger structure. Boards of lumber were then fixed to the posts to build the structure itself. Rip rap was placed along the top face of the finished structure, then the final backfilled soil was seeded and covered.



*Figure 5: Completed lunger structure from Figure 4 protected with Curlex NetFree erosion control blanket.*

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## Executing the Plan (Continued)



Curlex® NetFree™ erosion control blanket (ECB), manufactured by American Excelsior Company, was chosen for protecting the environmentally sensitive banks of the trout stream after the improvements were made (see Figure 6).

Curlex NetFree is naturally seed-free, so there was no concern about possibly introducing foreign seeds onto the project like what can happen when using erosion products containing agricultural-based materials such as straw fibers. NetFree does not contain chemical components like hydromulches do, thus there were no concerns of chemical runoff into the sensitive adjacent trout waters. In addition, Curlex NetFree is physically held together, whereas hydromulches rely on chemical bonds that can slump from precipitation and runoff. The project team could not risk material and chemicals washing into the river, and they needed a cover material that would last long enough for native seeds, so hydromulches were quickly eliminated from consideration for this project.



*Figure 6: Vegetation on lunker structure under bank from Figures 4 & 5 that was protected with Curlex NetFree erosion control blanket approximately one season after installation.*

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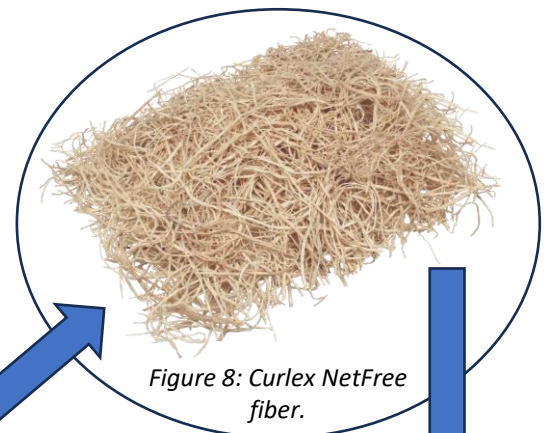
## Executing the Plan (Continued)



In general, hydromulches containing toxic malachite green tracer dyes and/or other potential chemicals of concern are commonly avoided on wildlife friendly and environmentally friendly projects because of their tendency to slump (i.e., fail) and their dependency on additives and chemicals. Curlex NetFree (see Figures 7, 8, and 9) is a completely biodegradable, chemical-free covering designed to hold the seed bed in place until vegetation becomes established. This project applied a native seed mix designed specifically for detention basins at a rate of 10 lb/ac (11.2 kg/ha), with ReGreen cover crop added. Overall, the native seed mix contained 46.37% wildflowers and 53.63% grasses, sedges, and rushes. Please contact the author for exact details on the seed mix, if interested. Curlex NetFree was secured to the soil using biodegradable E-Staple®, by American Excelsior Company.



*Figure 7: Curlex NetFree, a naturally seed-free erosion control blanket, protecting the precious trout stream after rip rap was added to improve flow conditions and before native seed mix germinated.*



*Figure 8: Curlex NetFree fiber.*



*Figure 9: Close-up of curls and barbs on interlocked Curlex fibers.*

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## Results



The project team was able to take on a significant amount of work, with the help of WIDNR, that allowed them to complete over 900 ft (274.3 m) of restoration work on the Onion River in Sheboygan County (see Figure 10). Additional work included the repairs of several existing lunger structures in the project area. Lastly, the team repaired large sections of bank all along the river (see Figure 11). The completed work will have lasting impacts, which will provide improved fish habitat and angling opportunities for the public. Visual observations documented immediate changes to local populations of trout who took residence in the new section of repaired stream. The years of planning and hard work are thankfully showing positive returns already (see Figure 12). The improvements and structures all seem to be holding up as designed, and the site has revegetated nicely.



*Figure 10: "Before" photo of restored bank section before covering was installed.*



*Figure 11: "During" photo of Curlex NetFree protecting restored bank section shown in Figure 10 shortly after installation.*



*Figure 12: "After" photo showing vegetation through the Curlex NetFree protected restored bank section as shown in Figures 10 & 11.*

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Al Wortz, LSTU President, stated, "The project went well overall after overcoming a few curveballs. We significantly improved cold-water habitat for trout and many other species. We were pleased with most of the materials we used, such as the Curlex NetFree product. It was easy to install, is safe for all wildlife and organisms, and it performed at a high level holding the seed and soil in place even during severe events. Overall, the project was a great group effort, and we look forward to accomplishing more in the future."

## Next Steps



The team completed a significant amount in the time they had to work and with the hurdles that had to be overcome. However, more work is needed, so the team is looking forward to working closely with the new local biologist for the area. LSTU will work directly with WIDNR to help secure new permitting and guidance. LSTU has already secured all material related to potential forthcoming structure repairs and intends to continue working on the Onion River in conjunction with their local WIDNR office. The future of the bubbling trout waters is bright thanks to all involved with this awesome project.

LSTU has received the following awards since this project wrapped up:

- 2022 Sheboygan County Conservation Association (SCCA) Water Conservationists of the Year.
- 2022 Wisconsin Wildlife Federation: Land Conservationists of the Year.
- 2022 Wisconsin Conservation Congress: State Conservation Organization of the Year.

*A special thanks goes out to the entire Lakeshore Trout Unlimited Chapter for all their work on this project and other projects that will help ensure future generations have the thrill of bubbling trout water. More specifically, Steve Girardi, Al Wortz, and Herb Twiss directly contributed to this article.*

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