

to widen and become shallow. The problem has been with us for a long time, and older residents recall that waterways, such as Grass River, were dredged with the spoils deposited on adjacent shores in what were often wetlands. It is now recognized that dredging can be harmful, as it can promote river bank erosion and releases of excessive amounts of nutrients into the water. It is also expensive and subject to stringent regulatory controls to guard against environmental damage.

While Grass River is not the worst problem area—some connecting waterways in the Upper Chain are much more problematic—Grass River is the best place to do a demonstration project. First, the river's sediment accumulation is well-documented and representative of the whole Chain of Lakes. Second, the necessary technical expertise to assess the project is already focused on Grass River through the organizational involvement of Three Lakes Association and Grass River Natural Area. And third, the idea of a demonstration project on Grass River has stirred the interest of a group of civic-minded donors—especially since they know that, at the least, this pilot project is expected to improve aquatic habitat.

How will the project be organized?

The Antrim County Board of Commissioners has authorized the Operator of Dams to manage the project. Antrim County has applied to the Department of Environmental Quality for a permit to install the structures, with the involvement of the Department of Natural Resources Fisheries Division. The County has secured the services of Mr. Ken Reed, who has installed hundreds of these structures in northern Michigan waters.

A work group made up entirely of volunteers has been formed to manage the project. The work group includes members and staff of Grass River Natural Area, Three Lakes Association, Elk Skegemog Lake Association, and the Antrim Conservation District, in addition to several local residents.

How much will this pilot project cost?

The original goal was to spend \$3500 on the project. Antrim County pledged \$1500, several local businesses have pledged an additional \$2500, and the Three Lakes Association has pledged \$500. The current donations now total \$4500 and will cover the installation of several structures.

How can I get involved?

We will have many volunteer opportunities available. Please provide your email address and contact information to us and we will update you on developments.

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WATERWAYS WORK GROUP OF ANTRIM COUNTY

Large Woody Debris Demonstration Project

An introduction to Large Woody Debris (LWD), how it can improve the aquatic habitat of the Grass River, and responses to Frequently Asked Questions.

Project Partners include:

Antrim Conservation District
Antrim County Board of Commissioners
Antrim County Drain Commissioner
Clam Lake Businesses
Elk-Skegemog Lakes Association
Friends of Clam Lake
Grass River Natural Area
The Watershed Center Grand Traverse Bay
Three Lakes Association
Tip of the Mitt Watershed Council



Introduction

A Waterways Work Group in Antrim County is coordinating the efforts of several organizations, including Grass River Natural Area, the Three Lakes Association, Elk-Skegemog Lakes Association, and Antrim Conservation District, to install a pilot project of several log structures (Large Woody Debris) along the banks of the Grass River between Lake Bellaire and Clam Lake on the Elk River Chain of Lakes. This is a small-scale demonstration project designed to do two things:

- First, to determine if log structures can improve the aquatic habitat of a river laden with a heavy load of sediment.
- Second, to determine if log structures along the banks of Grass River could be a useful technique to improve the navigability of a connecting river by deepening portions of the channel that have become shallow, due to the buildup of sediment.

If successful, the log-structures technique could be applied at a number of sites on the connecting channels throughout the Chain of Lakes.

Importantly, this pilot project is compatible with the current Watershed Management Plan created specifically for Grand Traverse Bay and the Chain of Lakes. Recommended plan steps endorse Best Management Practices that help constrain unnaturally wide channels and concentrate flow into deeper, narrower channels. The Watershed Plan also recommends habitat improvements, as well as the control of sedimentation. As such, the Elk River Chain of Lakes Watershed Plan Implementation Team (ERCOL-WPIT) fully supports this pilot project.

What is Large Woody Debris (LWD)?

For years, fisheries biologists and anglers have been installing natural wooden structures along the banks of creeks and rivers to improve aquatic habitat. The methods vary, but it usually involves simply placing trees into a river. The trees then provide many types of aquatic habitat, just as they would if they had fallen into the river naturally. The raw material are whole trees or logs that are usually harvested close to the site where they will be installed, placed in the river, and anchored with some simple hardware. After just one year, it's usually difficult to identify these structures as man-made—they appear to simply be logjams that naturally accumulated in the river. Thus the term, “large woody debris.”



The benefit to aquatic life has been well documented. In a creek or river with heavy deposits of sediment (often the result of erosion due to human activities), the technique can greatly improve the habitat for fish and their food sources. LWD can convert a river from a relative desert to a lively fishery. This is the main reason that the organization Trout Unlimited has dedicated funding to LWD projects all over North America.

How would LWD help navigation on Grass River?

After they are placed in the river, these log structures reflect some of the flowing water and cause subtle shifts in current direction and velocity. As a result, when LWD is installed in areas where sediment has accumulated, deeper pockets and channels form as sediment is scoured from the riverbed around the structure. This will often expose gravel beds, which also improves habitat.

The placement locations of the structures in Grass River are chosen to utilize this natural dynamic and move sediment out of shallow areas, which are building up and impeding navigation. The LWD may reduce the sediment build-up and it may not. Either way, we will have installed some excellent fish and fish food habitat in the process.

How will we know if it works?

The project includes an important assessment process. We will be documenting the stream conditions before, during, and after installing the structures. By the spring of 2014, we should have a good idea of the effect of the LWD on the river. At that time, we will determine next steps, if any.

If the LWD deepens the Grass River channel, where will the sediment go?

The river constantly moves sediment downstream. If the LWD successfully deepens the channel, as expected, then the displaced sediment will continue moving downstream. The LWD are being placed upstream from areas where there are relatively strong currents. For this pilot project, we expect there will not be a noticeable amount of newly accumulated sediment in the river. One of the technical objectives of this pilot project is to measure the “before” and “after” cross-sectional profile of the channel, at the location of the log structures and also downstream from the log structures.

Are there parallel activities to reduce the amount of new sediment entering Grass River?

Yes, the research findings that prompted this proposed pilot project identified several opportunities to reduce the amount of new sediment entering Grass River each year. These opportunities include:

- installing rain gardens in stormwater runoff areas to reduce the amount of stormwater erosion that generates new sediment loading in Grass River;
- replacing under-sized & perched culvert road-stream crossings, and installing road-runoff diversion basins; and
- removing accumulated sediment from upstream installed sand traps.

These and other Best Management Practices for stormwater control have some costs associated with them, and require collaboration from property owners. The good news is that grant funding is available in many cases, and creative public-private partnerships can be formed to address costs. People interested in helping with these initiatives are encouraged to express their willingness to help.

Why do the project now? Is there really a problem?

There is not a significant navigation “crisis” in Grass River at this time. Nevertheless, concerns about the navigability of the connecting waterways in the Elk River Chain of Lakes have increased in recent years. The issue is the second most common complaint raised by the public to the Operator of Dams and the Drain Commissioner. (Questions concerning water levels are the most common complaint. These two issues are related, as people often believe the shallow waterways are due to low lake levels.) Navigability of the waterways is also an issue of great importance to the businesses and communities that rely on boating recreation on the Chain of Lakes.

The root cause of shallow waterways is the accumulation of sediments. The sediments originate from a number of sources and build up in the channels, causing the waterways