



What's Working:

Vegetation Establishment & Maintenance

July 2016

Shoreline Projects and Streambank Restoration

2016 Information

- A combination of seeding and planting plugs brings a buffer to life and full of growth quickly. When we first start projects, we concentrate on planting plugs at 12 to 18 inch spacing. As a project evolves, we backed off to planting plugs at either 24 or 36 inch spacing and added seeding the site. This has resulted in better outcomes as well as a more economical approach. (Greg Berg, Minnesota Board of Soil and Water Resources)

2013-2014 Information

- These steps are often used for eroding banks, but in our project, they are used for reinforcing the new channel's meanders:

- 1: Excavate the area
- 2: Install footer logs and rootwad logs
- 3: Fill crib created with heavier woody debris including logs, branches and brush
- 4: Cover with willow brush
- 5: Cover with a soil mat containing brushy vegetation. <http://gilmorecreekrestoration.blogspot.com/> (Crow Wing SWCD Videos)



2008-2012 Information

- Our approach now is to wait for a summer drawdown to plant emergents. We use 1-gallon containers. With this approach, we have not had the need to anchor plants in place or use wave breaks. With the high water that we had last year, we put off a couple of emergent plantings, so that we were not fighting the waves and plants getting dislodged from the substrate. I understand that in some situations, folks do not have this option. But it has been my experience that if we have to consider anchoring 1-gallon containers in place, then we are really fighting conditions that make it tough to establish emergents. The probability of success would likely be lower (Bill Bartodziej, Ramsey-Washington Metro Watershed District).
- I think site prep is key. For some projects we kill the grass and then use fabric as well. Weed control is essential. The



Hennepin Correctional Center has been our main source of plants since they actually harvested seed from Morrison to start their plants and we can truly be using Native Stock from the area. Although very small when they arrive, they seem to thrive. The next most important factor is making sure the landowner adequately waters as necessary. We enlisted the help of a DNR trained riparian plant specialist and she's also a master gardener and she helped in all cases with plant selection.

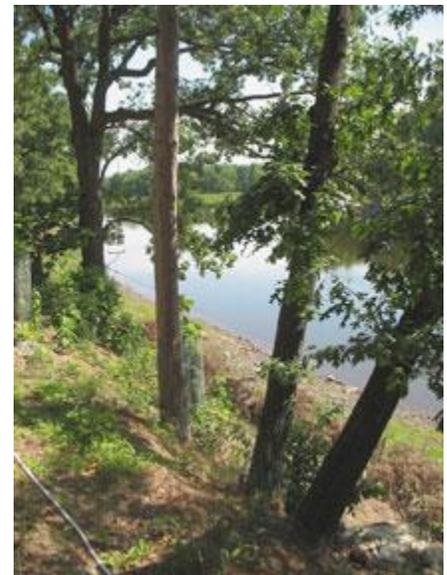
We allowed mulching of non-decorative mulch for weed control. Otherwise, the landowner gets zealous and doesn't know a weed from an introduced plant. Most of the landowners marked the plants with flags to also keep track of good plants (Hellen McLennon, Morrison SWCD).

- We often conduct restoration in systems with large populations of carp, geese and muskrat. We found that poultry wire fencing with a bottom foot (pictured right) is effective at keeping these animal species from accessing newly planted stands of emergent vegetation. We tracked emergent plant cover in plots using different fence types and no fencing. Results are available in Ecological Restoration 26: 184-186 (Ramsey Washington Metro Watershed District).



- A key to the success of lakeshore projects is often related to the strength of partnerships willing to contribute time and energy to a project (Shawn Tracy, Association of Metropolitan Soil and Water Conservation Districts).

- A method that has been effective for stabilizing bare slopes along shorelines involves layering turf reinforcing mat on the exposed soil all the way to the toe of the slope, followed by the application of two inches of soil or compost, followed by seeding with a stabilization mix, and then application of a straw fabric or fabric and geo-jute fabric (CM7000) that can be planted with plugs (pictured below).
-Compost socks can be used at the base to catch erosion and rock can be used to stabilize the toe of the slope. Plugs can then be seeded through the fabric, into the 2-inches of soil or compost (Shawn Tracy, Association of Metropolitan Soil and Water Conservation Districts).



- Erosion control products used when seeding must have sufficient open area to allow seedlings through. Erosion controls used along lake edges must be properly secured. Blankets and nets should be keyed into coir logs and fascines. They must be anchored with high quality rope, and four-foot oak stakes or duckbill anchors with cable ties. Wood stakes have greater holding ability than wedges. Drive stakes until they are snug, cut notch, install rope, drive until it is tight, and cut off the remainder of the stake. Notches are stronger than drilled holes, notch only the corner of the stake and not the side. Cut notches at least four-inches down from expected stake top with a battery powered saw (Steve Henry, East Otter Tail SWCD).

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- Lakeshore projects need proactive control of reed canary grass. At least 1.5 years of control is generally needed – more time spent on control efforts will increase the success rates of projects. Treatment is generally started in mid to late fall and continues the following spring, and into the next growing season as needed (Shawn Tracy, Association of Metropolitan Soil and Water Conservation Districts).
 - Don't use biologs as wave breaks. I've done this in the past and have seen it done by others, and they don't work. A project on a lake in Wright County used coir logs for wavebreaks which performed well until the early spring when a large wind storm broke many stakes off at the base. These stakes were sturdy, 5-footers that were driven into the sediment at least 3 feet. Another time on a different project in North Oaks, the woven netting got cut, from wave action that moved the log up and down (even though the logs had been very tightly roped to stakes), resulting in the "stuffing" coming out of the logs. The best use of biologs is by stuffing them into the recesses of an undercut bank, which is quite valuable (Joe Walton, Refugia LLC).
 - Do use brush bundles as wavebreaks. We used them on a project at Pleasant Lake in North Oaks (Ramsey County) and they worked great. We made them from buckthorn that we cut from the shoreline and surrounding uplands--an actual beneficial use of buckthorn--which made quite nice wavebreaks (beware the thorns--use sturdy gloves!). Make sure you build the wavebreaks big enough to account for the bounce in the lake and the fetch distance so that waves won't overtop the breaks. You can either build one large brush bundle per section, or you can build a few smaller ones and stack them, depending on your situation. We used 1/4" diameter rope (not coconut fiber, which breaks), to tie the bundles, since thicker rope is too hard to handle. Pull the rope as tight as you can, so that the bundles are dense and well-packed. These wavebreaks performed great, functioning as intended, by protecting the newly planted emergent vegetation from waves. They also collect sediment, over time, and help rebuild the toe of the bank naturally (Joe Walton, Refugia LLC).
 - Using a few well-placed boulders helped protect a channel bank. We placed just a couple of boulders in the bank of a channel (Ramsey County) that feeds into a lake to protect the toe from the erosive current at the mouth of the channel. We keyed a few boulders into the bank, and extended a few more out into the stream (upstream direction) like a mini bend-way-weir (or sometimes called a "rock vein"). This deflected the current from eroding the bank by re-directing it out into the middle of the channel. We used large, round boulders--not angular, to minimize turbulence. Amazingly, by using rock in this way, we were able to protect the bank as well and probably better than by lining the entire toe of the channel with rocks (which had been done in a previous project--not by us)! Also, calm pools formed behind some of the boulders, allowing us to establish emergent vegetation quite well in these calm areas, and good fingerling fish habitat too (Joe Walton, Refugia LLC).
 - We focus on developing detailed plans and conducting construction oversight. We plug everything, I have seen 2 seedings in 3.5 years. We do follow up for our cost share projects each year for 5 years, and 15 for the BWSR money. During the site visit, we make a point to try and schedule it with the owner to answer questions about plants, erosion etc. We went from a very low rate of sites being maintained with our cost share in the beginning of 2006, to 94% maintained in the fall of 2006 (Ramsey SWCD).
 - When planting in water, green wire fencing or snow fencing is important to deter geese.

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- A summary of alternative armoring techniques has been developed by Todd SWCD: <http://toddsxcd.org/Stormwater/Protecting%20Our%20Waters.pdf>
 - On Keller Lake, we are in the process of using an ecological restoration approach to treat shore that has been previously lined with gabion baskets (pictured right). As far as we know, this is the first large-scale attempt at revegetating a lakeshore lined with gabions in the metro area. This fall, we jetted soil into the rock crevasses, and then put a soil cap on top of the rock. The shore was seeded this fall, and will be planted next spring (Bill Bartodziej, Ramsey-Washington Metro Watershed District).
 - Providing curvilinear edging, and clustered, twenty-four inch height native plantings at the upland edge of shoreline plantings help make them look more orderly and approachable to residents (Mike Isensee, Dakota SWCD).
 - Stringing flagging tape between a network of fence posts is effective to keep geese out of new wetland plantings. Using chicken wire enclosures with a bottom foot to prevent tunneling to prevent grazing of emergent species by muskrat. Giant bur-reed seems to be less desirable to muskrat than other species (Ramsey-Washington Metro Watershed District).

