FLLOWPA Fundamentals

Finger Lakes - Lake Ontario Watershed protection Alliance
From Streams, To Lakes, To Great Lakes
Protecting Our Water Resources Beginning at the Local Level

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FLLOWPA Streambank Stabilization Projects

Fall 2019

Mission

The mission of the Finger Lakes Lake Ontario Watershed Protection Alliance is to facilitate processes that encourage watershed partnerships and implementation of action plans to protect and enhance water quality based on:

- Local needs assessment
- Holistic approach
- Information exchange and public education
- Measurable goals and milestones

Watershed Protection & Stabilization

The Lake Ontario basin contains over 16,200 miles of streams and rivers which support a wide variety of fish, birds and other wildlife; perform valuable hydrological functions; contribute to groundwater recharge; and improve water quality. They also offer numerous recreational and economic benefits for the people, businesses and local governments within the basin. As the frequency and intensity of storm events in the basin increase, stakeholders including landowners, business owners and elected officials have teamed up with members of the Finger Lakes – Lake Ontario Watershed Protection Alliance (FLLOWPA) to protect New York State's valuable freshwater resources through sound watershed management decisions and the implementation of best management practices to preserve and protect the water quality of the basin.

FLLOWPA's streambank stabilization program is designed to:

- Preserve and/or improve water quality;
- Create, preserve and enhance fish, aquatic invertebrate and wildlife habitat;
- Reduce localized erosion while maintaining runoff reduction benefits;
- Increase and/or maintain the waterbody's recreation and aesthetic value; and
- Educate and engage local stakeholders to preserve and protect the basin's freshwater resources.

Although some erosion is part of normal processes in a stream or river system, accelerated bank erosion is occurring throughout the Lake Ontario basin as result of changes in land use, in addition to increases in the frequency and duration of storm events which lead to increased water flow, stream channel erosion, sediment deposition, accelerated nutrient and chemical loading, and a loss of aquatic habitat. Streambank stabilization practices have been implemented by FLLOWPA partners to protect and stabilize banks of streams or constructed channels, and shorelines of lakes, reservoirs, or estuaries to reduce erosion. FLLOWPA partners have used soil bioengineering and structural measures such as rock riprap, gabions, pre-cast concrete wall units and grid pavers, along with critical area seeding and hydroseeding to protect exposed or eroded streambanks and roadbanks from the erosive forces of flowing water and improve the stability of soil slopes that are subject to seepage or have poor soil structure.

Benefits of streambank stabilization include:

- Reducing loss of land and reducing damage to land uses or other facilities adjacent to the banks;
- Maintaining the flow or storage capacity of the channel or impoundment;
- Reducing the downstream effects of sediment resulting from bank erosion;
- Maintaining or restoring channel meanders that enhance stream conditions; and
- Improving or enhancing the stream corridor for fish and wildlife habitat, aesthetics, and recreation.

FLLOWPA funds, from 2000 - 2017, have been providing a measurable impact by improving soil stability:

- **32,666 miles of roadbank have been stabilized**
- **114,335 linear feet of stream bank have been stabilized**
- **46 artificial wetlands have been constructed on 712 acres**
- **2,505 acres identified as critical have been hydroseeded**

Allegany County

Two sites along the Genesee River were mitigated for excessive bank erosion and their imminent threat to major roadways and the railroad. Vertical eroding banks in excess of 30 feet were a significant source of sediment to the Genesee River. FLLOWPA funds of $16,240 were used to support the design, easement securing, engineering, permit application process and the leveraging of FEMA pre-disaster Hazard Mitigation funds for construction. This project also helped the SWCD secure $3,000,000 in State and Federal funding to repair major erosion issues along Genesee River.

Before and after photos of the Genesee River stabilization project.

Photo credit: Allegany County SWCD

Jefferson County

Jefferson County SWCD worked with US Fish and Wildlife to complete a stream bank restoration and stabilization project protecting 4,115 feet of Sandy Creek.

Natural stream channel design was used to stabilize the stream. Native woody material, called toe wood was installed, while soil lifts wrapped in biodegradable fabric were placed on top of the woody material and then willow stakes were driven into the soil. As the willows grow, they will protect the bank from future erosion. In total, 1,660 feet of toe wood structures were installed on six severely eroding sites.

In stream features were also incorporated into this project including a grade control structure to help create a pool. Two channel blocks were installed with J-hooks to redirect the flow path and 590 feet of rock stabilization was installed. Riparian forest buffers were established along the banks. The trees will provide shade to reduce the water temperature, create habitat for wildlife, filter field runoff and their root systems will help stabilize the banks.

Objectives achieved:

- Stabilizing the stream channel and banks;
- Enhancing the fish and wildlife habitat;
- Providing a more natural landscape;
- Protecting this sensitive area to allow the complete system to function naturally; and
- Reduce annual soil loss by 3,062 tons.

Funding of $70,000 came from a US EPA Great Lakes Restoration Initiative and FLLOWPA funding of $3,000 was used to hydroseed the stabilization area and help with the riparian buffer.

Photo credit: Jefferson County SWCD

Lewis County

FLLOWPA has contributed $223,700 to Lewis County SWCD's hydro seeding program since it was established in 2003

Photo credit: Lewis County SWCD

Madison County

A beaver dam redirected Limestone Creek, a well-known trout stream, resulting in erosion of the toe of a slope causing a massive landslide in Madison County in 2002. The redirected stream course eroded the collapsed hillside depositing significant sediment into the stream. Turbidity in the creek caused visual impacts, reduced water quality and threatened trout survival.

The main goals of the project were to restore Limestone Creek to its natural course, determine the possible causes of the landslide, and stabilize the remaining slope. An additional goal included restoration of its riparian corridor to improve the creek's stability using a natural stream design. Initial project results were extremely positive, and despite some setbacks from high flows in subsequent years, the stream and slope have now reached a state of balance and water quality is vastly improved. The total project cost was approximately $285,000, of which $50,000 came from FLLOWPA.

Photo credit: Madison County Planning Department

Niagara County

Niagara County Parks Department, assisted by Niagara County SWCD hydroseeded shoreline in Krull Park in the Town of Newfane along Lake Ontario in 2016. The lake bank with an elevation change of 35 feet on a 2:1 slope was seeded with native grasses and forbs to re-establish vegetation. The vegetation will reduce the potential for erosion and the native grass and wildflower mix will provide habitat for birds and pollinators. Eliminating the potential source of sediment load to Lake Ontario, this project also provides water quality benefits.

Approximately 485 lineal feet of (0.7 acres) of shoreline area were hydroseeded to prevent erosion and provide wildlife habitat. The total project cost was $2,400 and FLLOWPA contributed $1,000.

Photo credit: Niagara County SWCD

Oneida County

Oneida County SWCD, USFWS and a landowner worked together to install approximately 120 linear feet of stream restoration using Rosgen's toe wood method. Large woody debris was used to stabilize the toe of the eroding bank without damaging habitat. The toe wood is constructed by pre-excavating a trench at the toe of the slope, installing footer logs parallel with the bank and then root wads perpendicular to the flow on top of the footer logs. The root wads were spaced approximately seven feet apart and were submerged below the low water elevation. Willow whips were placed above the root wads along with a thick layer of inert brush to provide a foundation for a soil lift. The soil lift is wrapped in a coconut fiber twine fabric and overlapped and shingled such that the upstream fabric overlies the downstream section. The entire soil lift is seeded with a conservation seed mix both before and after the fabric is wrapped over the top. Wooden stakes were pounded into the seams of the fabric. Live willow stakes were also installed into the top of the soil lift in order to encourage re-vegetation. The project largely withstood storm damage a year later, when nearly 5" of rain fell in 27 hours. Photos show before, during construction, and four days after a storm event one year after construction.

Photo credit: Oneida County SWCD



FLLOWPA Partners Implement Watershed Protection & Stabilization Projects to ...

"Reduce the potential for erosion and provide habitat for birds and pollinators by planting native grasses and wildflower mixes."

"Withstand storm damage when nearly 5" of rain falls in 27 hours."

"Reduce concentrations of chemicals and other pollutants in runoff entering aquatic ecosystems."

"Provide a more natural landscape."

"Stabilize the stream channel and banks."

"Seed exposed soil on steep slopes to prevent eroded sediment from entering surface water."

"Enhance the fish and wildlife habitat."

"Reduce loss of land and reduce damage to land uses or other facilities adjacent to the banks."

Schuyler County

Catlin Mill Creek is a protected trout stream that is a direct tributary of Catharine Creek, a world renowned trout stream that is a direct tributary of AA drinking water source of Seneca Lake. Severe erosion was threatening stream habitat and health, four homes, and their associated septic systems, the Town of Hector gravel pit and NYS Route 228.

Schuyler County SWCD with assistance from the towns of Catharine and Hector Highway Departments utilized $19,000 in FLLOWPA funds to stabilize over 2,000 feet of significantly eroded streambank along Catlin Mill Creek utilizing rock and willow structures. NYS Water Quality Improvement Program provided over $50,000 to purchase rock. Over $20,000 of in-kind time and equipment was contributed by the municipalities and Schuyler County SWCD.




Critical area seeding has been a major component of the Schuyler County SWCD's FLLOWPA program for the last 20 years. The program originally started with the purchase of hand seeders for all municipal highway departments. Seed was provided to them so they could hand seed areas they disturbed immediately after excavation. The program then grew in participation and acreage and the District was able to obtain a bale mulcher through the FLLOWPA program for all of the District projects, all municipal projects, and many private ponds, diversions, and waterways. From 2008 to today, the Schuyler County SWCD has been utilizing a hydroseeder. This hydroseeder was purchased with member item funding and is used by the District to seed all excavated municipal road ditches, all stream stabilization projects, and many agricultural projects the District implements, along with private ponds, waterways, and diversions.

From 2008 through 2016 over 560 acres were seeded throughout the county by partnering with towns, villages, highway departments, private farms and landowners. Nearly $50,000 of FLLOWPA funding was used to purchase materials. Schuyler County SWCD and its municipalities provided $57,600 in manpower and $96,000 in equipment time. The one-ton truck and hydroseeder were purchased with $75,000 of member item and local funds.

Photo credit: Schuyler County SWCD

Steuben County

Photo credit: Steuben County SWCD

Since 1988, Steuben County SWCD has operated a hydroseeding program dedicated to controlling sediment loading and erosion from critical areas. The District has cost shared with municipalities and the County to revegetate exposed soil from construction projects, in addition to stream banks, road ditches, gravel pits, and urban development.

Approximately 380 acres have been treated with FLLOWPA funds and local contributions, totaling more than $224,155.

Yates County

The Town of Barrington (Yates County) was dealing with an unstable slope adjacent to a town road right of way for many years. This unstable slope was contributing large amounts of sediment to the road ditch that eventually discharged into Keuka Lake approximately six hundred feet away.

In 2006 Yates County SWCD's FLLOWPA program partnered with the Town of Barrington Highway Department to address this water quality issue. FLLOWPA funds provided the technical staff resources to develop a corrective action plan and provide labor and materials to re-establish vegetation to the finished project to protect and stabilize the soils. The Town of Barrington provided the labor and equipment to implement the project which included reshaping the bank to a stabilized slope angle and reshaping and rock armoring the down slope road ditch to prevent erosion. FLLOWPA technical assistance funds ($8,000) were used for design, implementation and materials. The Town Highway Department spent approximately $30,000 in labor and equipment to implement the project.

Photo credit: Yates County SWCD

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Finger Lakes - Lake Ontario Watershed Protection Alliance
Water Resources Board
Kristy LaManche, Program Coordinator
3105 NYS Route 3, Fulton, NY 13069
315-592-9663 | klama3481@gmail.com
www.fllowpa.org | www.facebook.com/fllowpa

FLLOWPA membership includes the following
New York State counties wholly or partially in the Lake Ontario Drainage basin:

Allegany, Cayuga, Chemung, Cortland, Genesee, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Schuyler, Seneca, Steuben, Tompkins, Wayne, Wyoming, Yates

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