

Walnut Brook Riparian Restoration

A model approach to restoring stream corridors in urbanizing areas

North Jersey RC&D facilitating the transition to sustainable use and protection of the region's human and natural resources through partnerships, education and innovation



2007 to 2011

In early 2007, North Jersey Resource Conservation and Development (RC&D) Council received funding to continue the streambank stabilization work along the **Walnut Brook** as it flows through Mine Brook Park and the Hunterdon County Land Trust (HLTA) owned Dvoor Farm in Raritan Township, Hunterdon County and to create 2.97 acres of forested wetland. The project is managed by North Jersey RC&D. The streambank stabilization portion of the project is part of a large watershed management grant 'Developing the Neshanic River Watershed Restoration Plan' led by New Jersey Institute of Technology and funded by the Division of Watershed Management of NJ Department of Environmental Protection (DEP). Additional funding for the streambank stabilization and wetland creation portion of the project is provided by the New Jersey Wetland Mitigation Council. RC&D received \$126,000 in funds from the NJDEP and \$566,260 in funds from the New Jersey Wetland Mitigation Council to complete the three phases of the riparian restoration project.

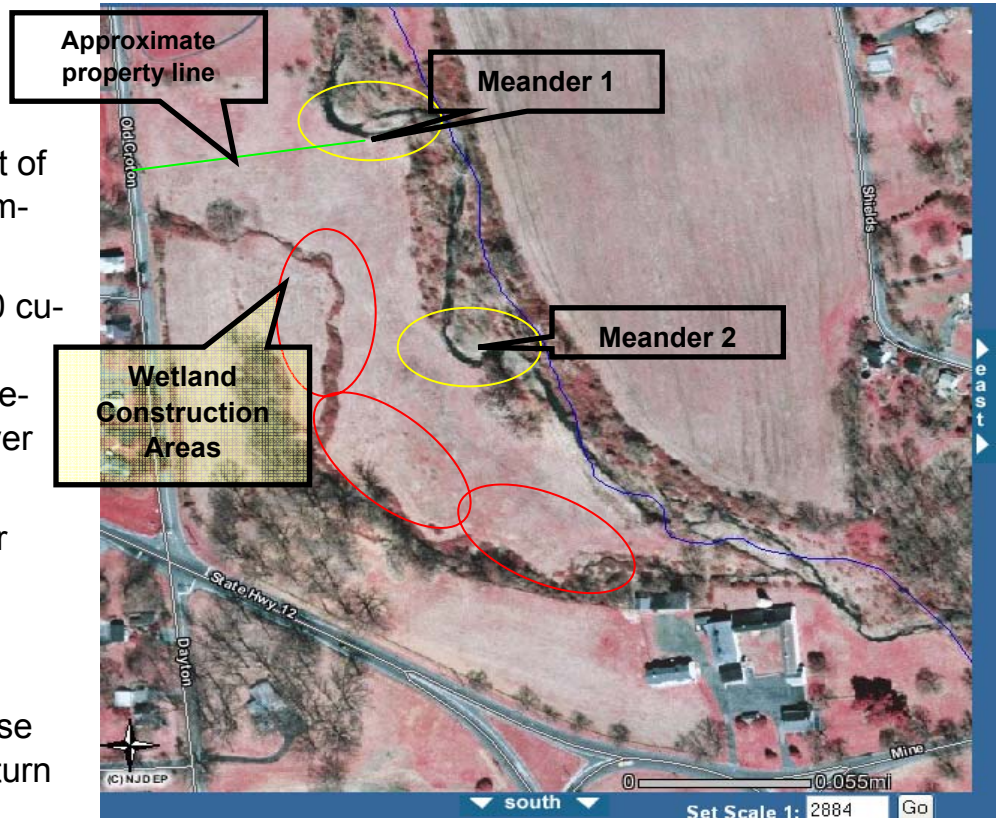
Initial restoration work along the Walnut Brook began in fall 2005 in Mine Brook Park. The project funds received for this work totaled \$21,250 in grant fund and cash towards the project which came from The National Fish & Wildlife Foundation (5-Star Restoration Program), NRCS-Wildlife Habitat Incentives Program, and from two Raritan Township committees, additionally over \$30,000 of in-kind services and material were donated to this initial project.

Mine Brook Park is a 15.8 acre property which is heavily utilized as it supports a playground, soccer and baseball fields plus walking trails. The HLTA Dvoor Farm is a 42 acre preserved farm that abuts Mine Brook Park. Continuous stream-flow monitoring data shows that peak flows in the Walnut Brook have greatly increased since much of the housing development occurred in the watershed in the 1960s – 70's. These increased flows have negatively impacted the stream resulting in serious stream bank erosion, excess sediment, and related impacts to native flora and fauna.

Project Goals:

For the Brook...

- Stabilization of **670 feet** of severely eroding stream-bank
- Decrease in up to 5800 cubic yards of soil input into the Brook and corresponding Neshanic River
- Increase public knowledge and know-how for innovative stabilization techniques
- Increased shading on Brook (helps to decrease water temperatures in turn better fish habitat)
- Planting over 1495 trees and shrubs



For the Dvoor Farm...

- Creation of **2.97 acres** of wetland
- Increase in Ecological Diversity
- Passive Recreation (increased birding habitat and viewing areas)
- Increase plant diversity
- Potential flood storage, nutrient & Sediment retention
- Groundwater recharge

Project Partners:

The streambank stabilization work was managed and overseen with guidance from Dave Derrick (US Army Corps of Engineers Research Hydraulic Engineer *Water Operations Technical Support Program (WOTS)*.), the Natural Resources Conservation Service and Princeton Hydro LLC. Willever Excavating and Petersen Excavating were the contractors.

Additional project partners include: Hunterdon Land Trust Alliance, Raritan Township, Hunterdon County Freeholders, Hunterdon County Soil Conservation District, Hunterdon County Roads, Bridges & Engineering Department, New Jersey Water Supply Authority, South Branch Watershed Association, NJDEP Fish & Wildlife, Trout Unlimited, and Beazer Homes USA.



Project Update

After many months of planning, discussing, designing and permitting the project site, finally began in early April 2009. North Jersey RC&D was able to start to implement Phase 1 and Phase 2 of the project. Phase 1 of the project included the removal of 1.16 acres of multi-flora rose (invasive plant) and the planting, mulching and sheltering of 660 native shrubs and trees along the Walnut Brook on the Dvoor Farm field just off Shield’s Avenue.



Buffer Planting April 2009– before



In April 2009 Partners for Parks volunteers from Ethicon assist with planting



Buffer Planting May 2009– after

Phase 2 of the project included the stabilization of the severely eroding streambanks of the Walnut Brook as it flows through Mine Brook Park onto the Dvoor Farm. For this phase of the project, North Jersey RC&D was able to work with engineers from the U.S. Army Corps of Engineers, from the Natural Resources Conservation Service and from Princeton Hydro LLC. Many obstacles were faced in initially designing the stabilization practices due to the severity of eroded banks and the volume of water that travels this stream corridor during high flow, storm, events. Once June finally rolled around additional challenges had to be met in adjusting the designs proposed for the Brook. Since summer 2007 the Walnut Brook streambanks had eroded an additional **8 to 12 feet!**

To stabilize the eroding streambanks along the Brook various bio-engineering, re-directive and resistive engineering practices were installed with the use of various size rock, natural vegetation including live cuttings of willow and sycamore branches and large tree logs and the planting of shrubs and trees. Once completed 980 tons of rock was used, 1,500 willow and sycamore cuttings and 100 trees and shrubs were utilized during this project.

MEANDER #1



Looking Upstream May 2004 (before)



Looking Downstream June 2009 (during)



Looking Downstream July 2009 (after)

MEANDER #2



Looking Upstream May 2007 (before)

Looking Upstream June 2009 (during)

Looking Upstream July 2009 (after)

Project Budget and Funds Spent for Streambank Stabilization:

Riparian Buffer Restoration (Phase 1 & plants in Phase 2)	\$15,388.00
Streambank Stabilization (Phase 2) Duration 30 days to construct	\$80,000.00
Wetland Creation (Phase 3)	\$307,000.01
Riparian Buffer Restoration (Remaining Phases fall 2009 into spring 2010)	\$69,854.38
In-Kind Donations as of August 2009 (from Project Partner organizations, donated material & services)	\$86,731.28
Volunteer In-Kind Donated Hours & Time Spent Value Donated Hours: 536 from 40 people	\$10,381.72

Phase 3 of the project included the creation of **2.97 acres of wetland**. This phase began in early September 2009. This phase will included earthmoving activities consisting of the removal of fill from the floodplain in order to re-establish the natural floodplain topography as it existed prior to the conversion to agriculture. These areas were planted with native riverine wetland herbaceous and woody vegetation. Approximately 9,500 cubic yards of material was excavated and 11,169 native wetland herbaceous, shrubs and trees were planted.



The remaining phases of the project include additional native tree and shrub riparian buffer planting and restoration on 8 acres of property. These buffer planting phases will commence in fall 2009 and spring 2010. Approximately 1,095 native shrubs and trees will be planted with assistance from community volunteers and organizations.

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