Section 4
Streambank Stabilization and Erosion Control

4.1 Overview

During the development of the SEPP Workplan[1], the Natural Resource Conservation Service (NRCS) and the Army Corps of Engineers recommended feasibility studies as a part of the SEPP streambank stabilization project to study the impacts of erosion and possible controls.

The Merrimack and Piscataquog Rivers in Manchester have high recreation value.

Besides structural repair of current erosion sites, the maintenance of vegetative buffer zones along the riverbank is another important part of long-term erosion control. Programs to increase or protect the riparian buffer in Manchester, clean up the streambanks, or increase public awareness of the importance of rivers and streambanks, were also included in the possible projects to be funded under the streambank project.

4.2 Goals

Listed below are the goals for the streambank project.

- Conduct feasibility studies regarding existing erosion sites along the rivers and streams in Manchester, with particular attention paid to the Merrimack River;
- Increase or protect the riparian buffer in Manchester;
- Coordinate volunteer cleanup days along the streambanks; and
- Conduct other streambank projects, such as public outreach and environmental education.

4.3 Benefits Achieved

Streambank Inventories

Several streambank inventories were conducted under this project. These inventories were intended to identify the erosion, trash dumping, and pipe/outfall locations along the rivers. The first inventory was conducted primarily by volunteers using prepared data sheets.[2] Volunteers from NHDES, USEPA, NRCS, the Merrimack River Paddlers boating club, and the City of Manchester were joined by Amoskeag Fishways staff for the first survey.

A second inventory was conducted to visit the sites identified by the volunteers and ensure that the characterization of the river banks was consistent.[3] Mapping of the river and of identified erosion sites was completed in ArcView with the assistance of the Manchester Planning Department.

[1]. NRCS and Army Corps meetings and field visits listed in Appendix A of the Supplemental Environmental Projects Program Workplan, September 15, 1999.

[2] Merrimack River Streambank Inventory, Manchester New Hampshire. Compiled by Katie Hughes, Hillsborough County Conservation District/Americorps, November 2000. Results of volunteer inventory completed in 2000.

[3] Streambank Inventory of the Merrimack River and Piscataquog River in Manchester, NH. By Katie Hughes, Dave Kellam and the City of Manchester, draft January 2002. Results of re-inventory completed in 2001.

Inventories of the smaller tributaries, such as Millstone Brook, Cohas Brook, Tannery Book, and Black Brook were also conducted, although no formal report was ever completed for this work.

Structural Erosion Control

Design and construction was completed at four locations identified along the Piscataquog River where public access has caused erosion. Four different stair/access options (including one option with floating stairs, and others with concrete footings), paired with four different stabilization techniques (gabion baskets, staked biologs, erosion control fabric, and vegetated riprap), were constructed. The constructed access sites funnel foot traffic to these designated spots, alleviating uncontrolled access to the river which was causing severe erosion along the bank. The sites will serve as demonstration projects for future stabilization work.

In 2006, the sites suffered severe damage due to vandals and floods. The City intends to repair the sites, first giving serious consideration to redesign to minimize future damage.

Vandals removed the stairs from one of the constructed access points on the Piscataquog River. Each of the sites received some damage. (Photo courtesy R. Robinson, EPD)

Streambank Plantings

In addition, native plantings were installed along the Piscataquog River. The plantings were intended to restore sensitive habitat near the Kelly Street Bridge and West Side Arena. The

Bridge over the Piscataquog River, Manchester, NH.

work was conducted by volunteers from St. Anselm's College under the supervision of Dr. Barry Wicklow in Summer 2001.

The SEPP assisted the Intervale Country Club in addressing erosion along the banks of the Merrimack River on their property north of the Amoskeag Dam by purchasing native plantings for the streambank.

Education and Awareness

In conjunction with the Environmental Education task, students and teachers learned about the history and ecology of the Merrimack and Piscataquog Rivers, both in the classroom and during fieldtrips to the rivers.

Thirty residents attended a streambank restoration workshop held at the Amoskeag Fishways on May 26, 2001. Residents attending the workshop received training in bioengineered solutions to erosion, and received a package of plants to aid in streambank stabilization. A second workshop was held at the Fishways in May 2002.

Bass Island

A sum of $100,000 had been set aside to assist with the purchase of a parcel of land on Bass Island, at the junction of the Piscataquog River and the Merrimack River. The parcel consists largely of riparian buffer in danger of development and a historic blacksmith shop. Approximately $2,200 was spent preparing an

environmental assessment of the property prior to purchase.

However, in December 2006, a fire occurred at the blacksmith shop. The advisory committee has therefore recommended, instead of purchasing the property, to set aside the remaining $97,800 in an endowment to support some of the ongoing programs, such as Urban Pond Restoration and Environmental Education.

4.4 Measurable Results and Long Term Benefits

Results taken from the streambank documents include:

- Number of volunteers who received training on streambank issues and participated in the 2000 inventory: 25
- River miles inventoried in 2001: 10 miles
- Number of problem sites identified as a result of the 2001 re-inventory: 47 - Of these sites, 15 were bank erosion, 19 were trash dumping, and 18 were pipes or outfalls (16 of which were combined sewer overfalls), with several sites involving more than one category.
- Number of residents attending streambank restoration workshops: 33
- Number of native plants distributed to workshop attendees for stabilization of streambanks: over 1500 plants
- Demonstration projects installed: 4. Note that future work should include monitoring and assessment of these demonstration projects so that the successful techniques can be utilized at other erosion sites.
- Trust fund seed money to continue projects started under the SEPP: $97,800

Implementation of projects to address identified problems, such as erosion and trash dumping, has not been completed. However, the studies to document such issues will serve as guidance to future streambank work when funding becomes available.

The Merrimack River and Manchester's millyard.

A total of $393,891 was spent on the streambank task, of which $388,092 went towards implementation of completed and in-progress streambank projects (such as the stabilization demonstration projects), $2,200 went towards the environmental assessment of the Bass Island parcel, and $3,598 went towards miscellaneous purchases (such as supplies and equipment for the inventories). This amount does not include the $97,800 endowment.

4.5 Leveraged Funding

Ms. Katie Hughes worked on the streambank project as an AmeriCorps member. AmeriCorps[4] links non-profit organizations with dedicated staff. In exchange, the staff will receive money to be used either for college or to pay back school loans.

Ms. Hughes was engaged through the Natural Resource Conservation Service (NRCS), the Hillsborough County Conservation District, and

[4] www.americorps.org

Amoskeag Fishways to work on the streambank project. She worked from approximately March 2000 to December 2001, at an estimated 70 hours per month. At an estimated $17/hour, her estimated 1,540 hours amounts to $26,180 of leveraged funds.

Trout Unlimited received a $48,000 NHDES 319 grant to conduct a dam removal feasibility study for Black Brook at the outlet of Maxwell Pond. The study, conducted in 2001 with the assistance of the Urban Ponds Restoration Project, NHDES, and USEPA, found removal to be feasible. At that time the Board of Mayor and Aldermen declined to approve removal, but this will likely be revisited as the dam ages and maintenance/repair costs rise.

Mr. David Beauchesne of the Manchester Planning Department assisted with mapping and database development. Although his time was not explicitly covered by SEPP funds, he is a City employee, and therefore his time will not be counted towards leveraged funds.

Total leveraged funds: $74,180