Schoharie Creek Management Unit 13

Town of Lexington – Station 48154 to Mosquito Point Bridge (Station 41722)

This management unit began at Station 48154, and continued approximately 6,432 ft to the Mosquito Point Bridge (Station 41722) in the Town of Lexington.

Stream Feature Statistics

6.3% of streambanks experiencing erosion
22.1% of streambanks have been stabilized
0% of streambanks have been bermed
59 feet of clay exposures
24 acres of inadequate vegetation
6,628 feet of road within 300ft of stream
0 structures located in 100-year floodplain

Management Unit 13 location
see Figure 4.0.1 for more detailed map

Summary of Recommendations Management Unit 13	
Intervention Level	Passive, Assisted Self-Recovery
Stream Morphology	No recommendations at this time
Riparian Vegetation	Interplanting of rip-rap at Station 43800 & 42050
Infrastructure	No recommendations at this time
Aquatic Habitat	Watershed Aquatic Habitat Study
Flood Related Threats	No recommendations at this time
Water Quality	No recommendations at this time
Further Assessment	No recommendations at this time

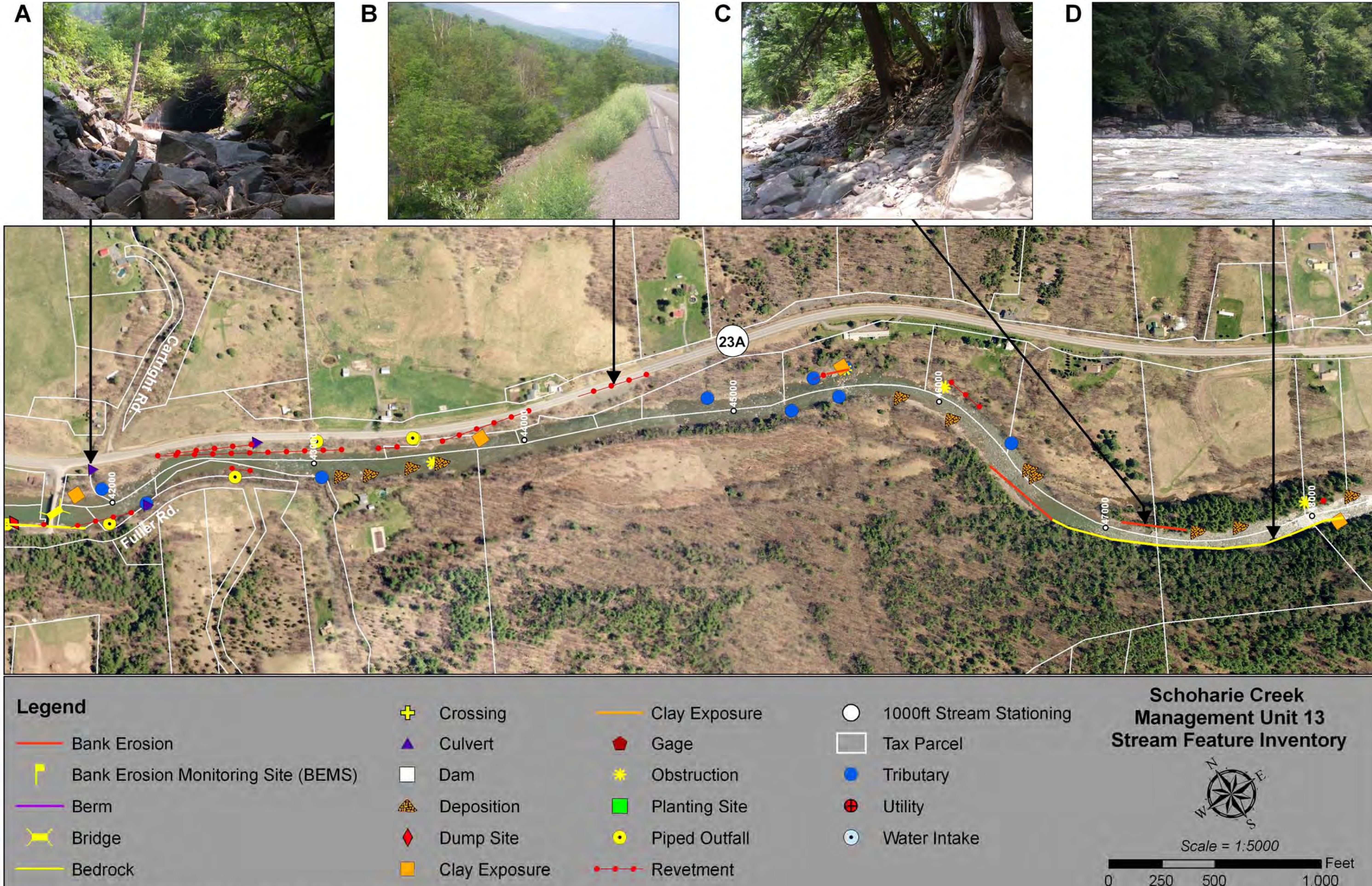
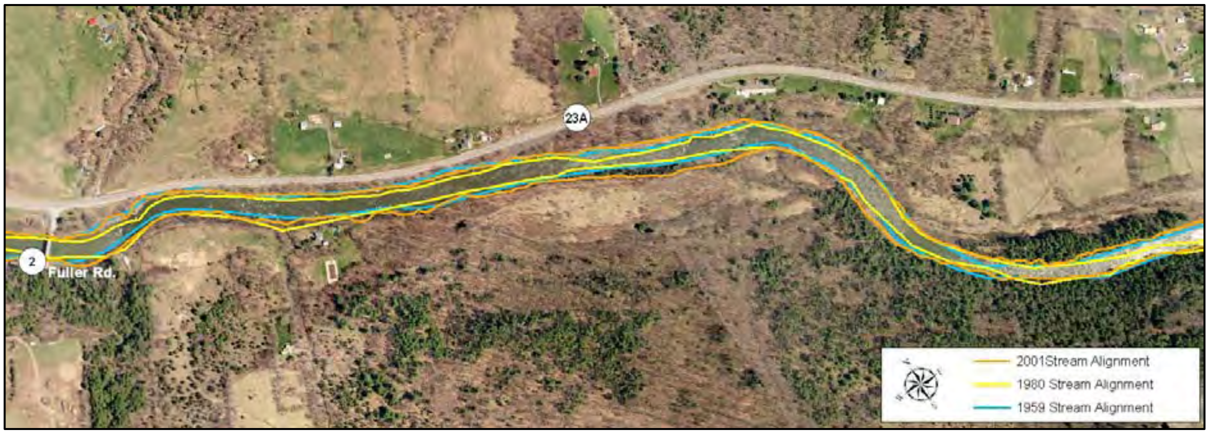


Figure 4.13.1 Management Unit 13 - 2006 aerial photography with stream feature inventory

Historic Conditions

As seen from the historical stream alignments (below), the *planform* of the channel has remained fairly stable since 1959. As of 2006, according to available NYSDEC records dating back to 1996, there had been no stream disturbance permits issued in this management unit.



Historic stream channel alignments overlayed with 2006 aerial photograph

Stream Channel and Floodplain Current Conditions (2006)

Revetment, Berms and Erosion

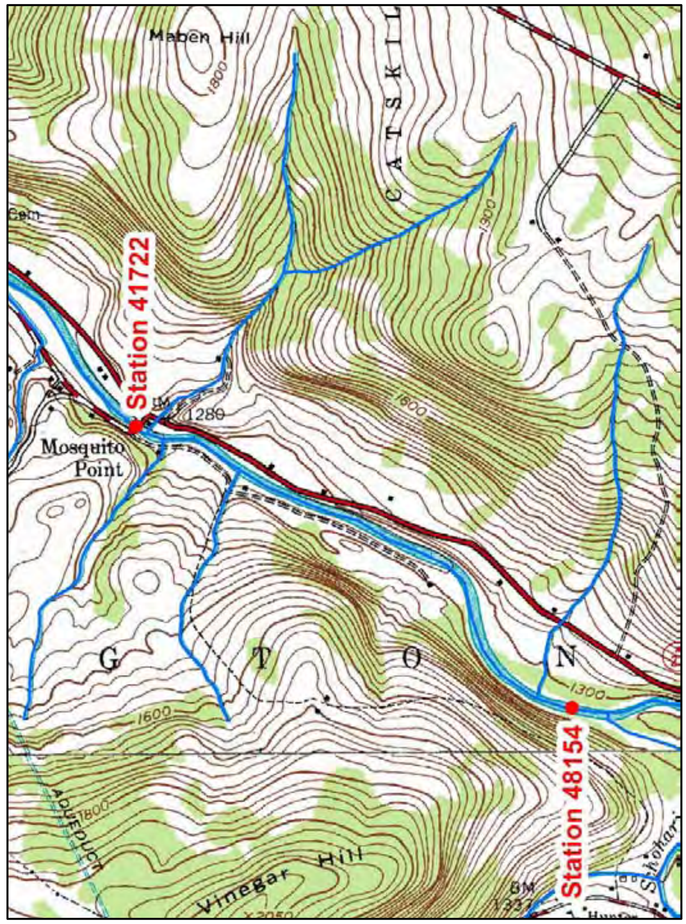
The 2006 stream feature inventory revealed that 6.3% (806 ft) of the streambanks exhibited signs of active erosion along the 12,864 ft of total channel length in the unit (Figure 4.13.1). The total surface area of active erosion totaled approximately 33,005 ft^2. *Revetment* had been installed on 22.1% (2,844 ft) of the streambanks. No *berms* were identified in this management unit at the time of the stream feature inventory.

Stream Channel Conditions (2006)

The following description of stream channel conditions references insets in foldout, Figure 4.13.1. Stream stationing presented on this map is measured in feet and begins at the Schoharie Reservoir. “Left” and “right” streambank references are oriented looking downstream, photos are also oriented looking downstream unless otherwise noted. Italicized terms are defined in the glossary. This characterization is the result of an assessment conducted in 2006.

Management unit #13 began at Station 48154. The drainage area ranged from 134.34 mi^2 at the top of the management unit to 137.28 mi^2 at the bottom of the unit. The valley slope was 0.51%.

Valley *morphology* of this management unit was generally confined by valley form and the County Route 23A embankment in the downstream half of the management unit. Generally, stream conditions in this management unit were stable, with the exception of three erosional areas. Management efforts in this unit should focus on addressing improving bank stability and aquatic habitat through riparian zone plantings.



1980 USGS topographic map - Prattsville Quadrangle contour interval 20ft

Wetlands (Stations 48154-41722) approximate wetland boundary delineated by NWI

Five wetlands were located within this management unit. Continued from the previous unit, there was a palustrine wetland with shrub-scrub vegetation along the right streambank at the beginning of the unit (PSS1E, 1.1ac, Station 48154-47600). Just downstream, two palustrine wetlands were located along the right streambank, one was dominated by shrub-scrub vegetation while the other emergent vegetation (PSS1E, 2.6ac, PEM1E, 1.5ac, Station 47000-46500). A fourth palustrine shrub-scrub wetland was located along the left streambank (PSS1E, 4.5ac, Station 45600-44200). The wetland at the downstream end of the unit was classified as riverine lower perennial, signifying it was contained in the natural channel and characterized by a low gradient and slow water velocity (R2UBH, 2.2ac Station 42600-41722). Wetlands are important features in the landscape that provide numerous beneficial functions including protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters, and maintaining surface water flow during dry periods (see Section 2.6 for detailed wetland type descriptions).

As the unit began, the creek had started to scour the toe of the left bank exposing a 76ft^2 area of *lacustrine* clay (Station 48100). Fine sediment inputs, such as these exposures, can be a water quality concern because they increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. Bedrock then started on the left streambank, protecting it from further scour (Inset D, Station 48100).

On the right streambank an unnamed tributary entered the Schoharie Creek (Station 47700). This tributary drained the lower steep slopes of Patterson Ridge, before it reached the flatter topography of the valley floor where it entered the Schoharie Creek. As a result of this stream slope change, the tributary lost its ability to transport sediment gathered from the mountain slopes, and began to deposit sediment at its mouth and into the more gently sloped Schoharie Creek. This is a common feature of confluence areas, which often contain extensive sediment bars, function as important sediment storage areas, and are typically among the most dynamic and changeable areas in the stream system. This tributary was classified C by the NYSDEC (NYSDEC, 1994).

This increase in runoff and sediment load may have contributed to the streambank erosion directly downstream of the tributary confluence (Inset C, Station 47400). An area of approximately 4,654ft^2 along 310ft of the left streambank was eroding. As a result, many mature trees had become undercut had begun to slump down the bank. This type of erosion is common and part of natural stream process. In stable watersheds, the rate of erosion is slow and a natural healing process usually follows.

As the bedrock protecting the left streambank ended, erosion began (Station 46750). Along the outside meander of this bend the *thalweg*, or deepest part of the stream channel, flowed up against the left streambank causing significant bank erosion. Streambank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows. Many mature trees had fallen from the top of the bank and a 24,063ft^2 area of streambank had been left unvegetated. This site may stabilize on its own over time. It appeared a low bench had begun to develop at the toe of the eroding bank which may act to reduce flood water velocities near the bank. As the bank stabilizes native vegetation should reestablish.

Bank erosion at Station 46750

At the next meander bend, a 197 ft stacked rock wall had been built along the right streambank (Station 46100). Walls such as this, while created with the best of intentions, tend to raise flood elevations and increase the erosive power of the stream. It is recommended that this wall be evaluated for its influence on floodplain connectivity and stream entrenchment, and that removal should be considered if there is significant negative impact.

Bank erosion at Station 45560

Downstream, the hillslope on the right streambank was undermined by toe erosion, resulting in the mass wasting of the bank (Station 45560). This erosion had resulted in a loss of vegetation on a 4,287 ft^2 area of streambank. The exposed soil has a high silt and clay content, contributing sediment through *wet ravel* and may yield a significant suspended sediment load during rainfall events. An entrenched tributary flowing over the bank and many seeps have exacerbated this erosion.

As the stream flowed up against the County Route 23A embankment much of the right streambank had been hardened. Rip-rap had been installed along 778 ft of this embankment (Inset B, Station 44640 & Station 44050). While rip-rap and other hard controls may provide temporary relief from erosion, they are expensive to install, degrade habitat, and require ongoing maintenance or may transfer erosion problems to upstream or downstream areas. Alternate stabilization techniques should be explored for streambanks whenever possible. Along this rip-rap, the streambank toe had scoured exposing a 15 ft long section of clay and silt (Station 43800). Native shrub and sedge species should be interplanted through the rip-rap and along the toe of this streambank to help strengthen the revetment and enhance aquatic habitat.

Clay exposure at Station 43800

Downstream 881 ft of rip-rap and 400 ft of concrete T-wall had been installed on the right streambank (Station 43130). On the opposite bank two unnamed tributaries entered the Schoharie Creek (Station 43040 & 42100). These tributaries, which originated on Vinegar Hill, appeared to deliver a considerable amount of sediment into the creek. Both tributaries were classified as C by the NYSDEC (NYSDEC, 1994).

Rip-rap at Station 42050

Approximately 298 ft of rip-rap had been installed along the Fuller Road embankment on the left streambank (Station 42050). High flows have started to scour this bank. Native shrub and sedge species should be interplanted along the toe of this streambank to help strengthen the revetment, while enhancing aquatic habitat. A combination of trees and shrubs should also be planted along the streambank to increase bank stability and protect the road embankment.

On the opposite bank another unnamed tributary entered the Schoharie Creek from the right streambank (Inset A, Station 42000). This tributary drained Maben Hill and Patterson Ridge before crossing under County Route 23A through a large metal culvert which discharged at the top of the road embankment. This tributary was classified C by the NYSDEC (NYSDEC, 1994). Just downstream of this outfall a 20 ft^2 lacustrine clay exposure was documented (Station 41800).

At the downstream end of this management unit the stream passed under the Mosquito Point bridge (Station 41722, BIN 3302930). This bridge may constrict the floodplain at very high flows, but appeared to pass most flows effectively. Flood damage to bridges is typically caused by inadequate hydraulic capacity of the bridge, misaligned piers and/or abutments, or accumulation of debris. As bridges are replaced over time, these issues should be evaluated and adjusted if necessary to lessen the probability of flood damage by providing a more effective conveyance channel that promotes water and sediment flow through the bridge opening.

Mosquito Point bridge at Station 41722

Sediment Transport

Streams move sediment as well as water. Channel and floodplain conditions determine whether the reach aggrades, degrades, or remains in balance over time. If more sediment enters than leaves, the reach aggrades. If more leaves than enters, the stream degrades (See Section 3.1 for more details on Stream Processes).

Evidenced by lack of significant aggradation this unit appeared to be conveying its sediment load effectively. However tributaries within the unit appeared to contribute a significant amount of sediment.

Riparian Vegetation

One of the most cost-effective and self-sustaining methods for landowners to protect streamside property is to maintain or replant a healthy buffer of trees and shrubs along the banks and floodplains, especially within the first 50 to 100 ft of the stream. A dense mat of roots under trees and shrubs binds the soil together, making it much less susceptible to erosion. Mowed lawn (grass) does not provide adequate erosion protection on stream banks because it typically has a very shallow rooting system and cannot reduce erosive forces by slowing water velocity as well as trees and shrubs. One innovative solution is the interplanting of revetment with native trees and shrubs which can significantly increase the working life of existing rock rip-rap, while providing additional benefits to water, habitat, and aesthetic quality. *Riparian*, or streamside, forest can buffer and filter contaminants coming from upland sources, shallow groundwater or overbank flows, and slow the velocity of floodwaters causing sediment to drop out while allowing for *groundwater recharge*. Riparian plantings can include a great variety of flowering trees, shrubs, and sedges native to the Catskills. Native species are adapted to our regional climate and soil conditions and typically require less maintenance following planting and establishment. Three suitable riparian improvement planting sites were documented within this management unit.

Some plant species that are not native can create difficulties for stream management, particularly if they are invasive. Japanese knotweed (*Fallopia japonica*), for example, has become a widespread problem in recent years. Knotweed shades out other species with its dense canopy structure (many large, overlapping leaves), but stands are sparse at ground level, with much bare space between narrow stems, and without adequate root structure to hold the soil of streambanks. The results can include rapid streambank erosion and increased surface runoff leading to a loss of valuable topsoil. In total, 15 Japanese knotweed occurrences along an estimated length of 58ft were documented in this management unit during the stream feature inventory. Japanese knotweed locations were documented as part of the stream feature inventory conducted during the summer of 2006 (Riparian Vegetation Mapping, Appendix B).

An analysis of vegetation was conducted using aerial photography from 2001 and field inventories (Riparian Vegetation Mapping, Appendix B). In this management unit, the predominant vegetation type within the 300 ft riparian buffer was forested (56%), followed by herbaceous (23%). Areas of herbaceous (non-woody) cover may present opportunities to improve the riparian buffer with tree plantings in order to promote a more mature vegetative community along the streambank and in the floodplain. *Impervious* area (6%) within this unit's buffer was primarily the local roadways, private residences and associated driveways.

Flood Threats

As part of its National Flood Insurance Program (NFIP), the Federal Emergency Management Agency (FEMA) performs hydrologic and hydraulic studies to produce Flood Insurance Rate Maps (FIRM), which identify areas prone to flooding. The NYSDEC Bureau of Program Resources and Flood Protection has developed new floodplain maps for the Schoharie Creek on the basis of recent surveys. The new FIRM hardcopy maps are available for viewing at County Soil & Water Conservation District Offices and most town halls. The FIRM maps shown in this plan are in draft form and currently under review. Finalization and adoption is expected by the end of 2007.

100-year floodplain boundary map

According to the current floodplain maps (above), no existing structures in this unit appeared to be situated within the estimated 100-year floodplain. The 100-year floodplain is that area predicted to be inundated by floods of a magnitude that is expected to occur once in any 100-year period, on the basis of a statistical analysis of local flood records. Most communities regulate the type of development that can occur in areas subject to these flood risks.

Aquatic Habitat

Generally, habitat quality appeared to be fair throughout this management unit. Canopy cover was adequate along most streambanks and could be enhanced with plantings along revetment. Woody debris observed within the stream channel was minimal throughout the unit. Woody debris provides critical habitat for fish and insects, and added essential organic matter that will benefit organisms downstream.

It is recommended that an aquatic habitat study be conducted on the Schoharie Creek with particular attention paid to springs, tributaries and other potential thermal refuge for cold water fish, particularly trout. Once identified, efforts should be made to protect these thermal refugia locations in order to sustain a cold water fishery throughout the summer.

Water Quality

Clay/silt exposures and sediment from stream bank and channel erosion pose a potential threat to water quality in the Schoharie Creek. Fine sediment inputs into a stream increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. There were four clay exposures in this management unit.

Stormwater runoff can also have a considerable impact on water quality. When it rains, water falls on roadways and parking areas before flowing untreated directly into Schoharie Creek. The cumulative impact of oil, grease, sediment, salt, litter and other unseen pollutants found in road runoff can significantly degrade water quality. There were seven stormwater culverts in this management unit in 2006.

Nutrient loading from failing septic systems is another potential source of water pollution. Leaking septic systems can contaminate water with nutrients and pathogens making it unhealthy for drinking, swimming, or wading. Homeowners with septic systems should inspect their systems annually to make sure they are functioning properly. Servicing frequency varies per household and is determined by household size, tank size, and presence of a garbage disposal. Pumping the septic system out every three to five years is recommended for a three-bedroom house with a 1,000-gallon tank; smaller tanks should be pumped more often. To assist watershed landowners with septic system issues, technical and financial assistance is available through two Catskill Watershed Corporation (CWC) programs, the Septic Rehab and Replacement program and the Septic Maintenance program (See Section 2.12). Through December 2005, three homeowners within the drainage area of this management unit had made use of these programs to replace or repair a septic system.

References

NYSDEC, 1994. New York State Department of Environmental Conservation. Water Quality Regulations: Surface Water and Groundwater Classifications and Standards, NYS Codes, rules and regulations, Title 6, Chapter 10, Parts 700-705.