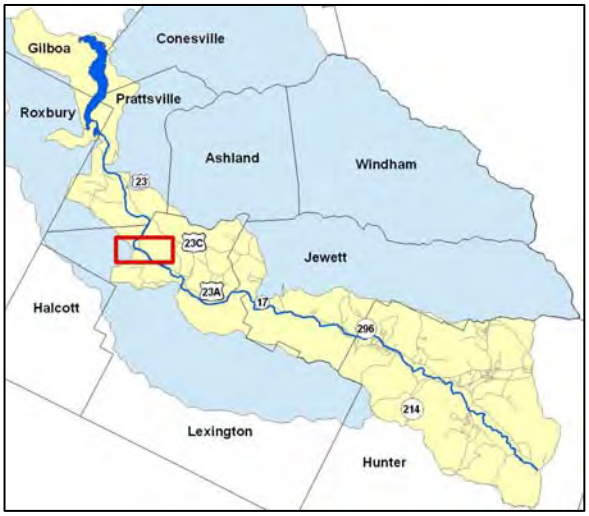
Schoharie Creek Management Unit 14

Town of Lexington – Mosquito Point Bridge (Station 41722) to Station 34336

This management unit began at Station 41722, and continued approximately 7,386 ft to Station 34336 in the Town of Lexington.

Stream Feature Statistics

6.9% of streambanks experiencing erosion
8.8% of streambanks have been stabilized
0% of streambanks have been bermed
30 feet of clay exposures
50 acres of inadequate vegetation
13,587 feet of road within 300ft of stream
3 structures located in 100-year floodplain



Management Unit 14 location
see Figure 4.0.1 for more detailed map

Summary of Recommendations Management Unit 14	
Intervention Level	Assisted Self-Recovery
Stream Morphology	No recommendations at this time
Riparian Vegetation	Plantings for assisted self-recovery of eroding banks at Stations 40300, 39440 & 36500, enhancement of riparian buffer at Station 40300, and interplanting of rip-rap at Stations 41200 & 36900
Infrastructure	No recommendations at this time
Aquatic Habitat	Watershed Aquatic Habitat Study
Flood Related Threats	Elevating and relocating Little West Kill Road to remediate flooding.
Water Quality	Removal of dump site at Station 41530.
Further Assessment	Study feasibility of elevating and relocating Little West Kill Road to remediate flooding. Stream feature inventory of Little West Kill tributary to document current conditions and identify sediment sources.

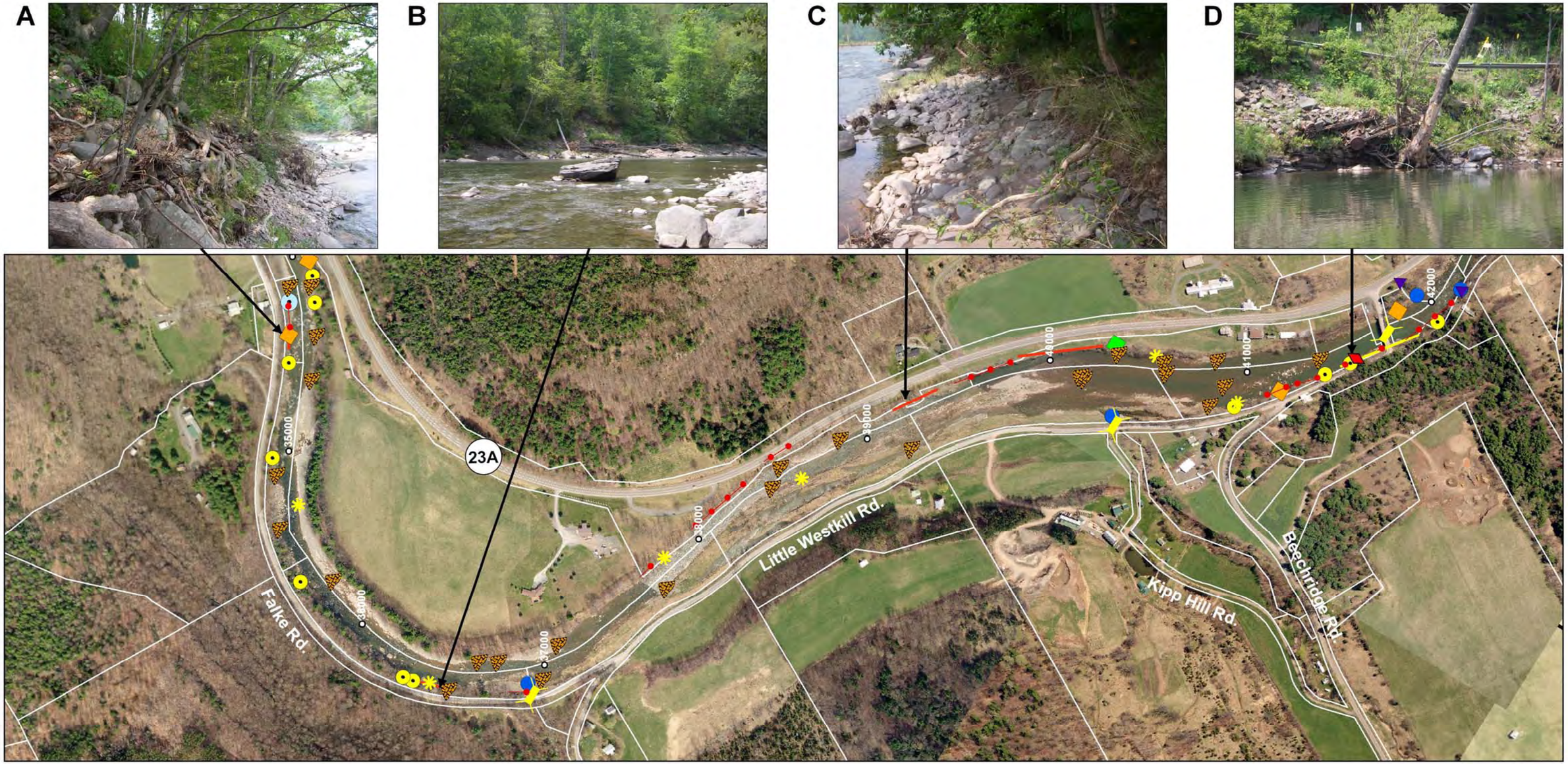


Figure 4.14.1 Management Unit 14 - 2006 aerial photography with stream feature inventory

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 have been no stream disturbance permit 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

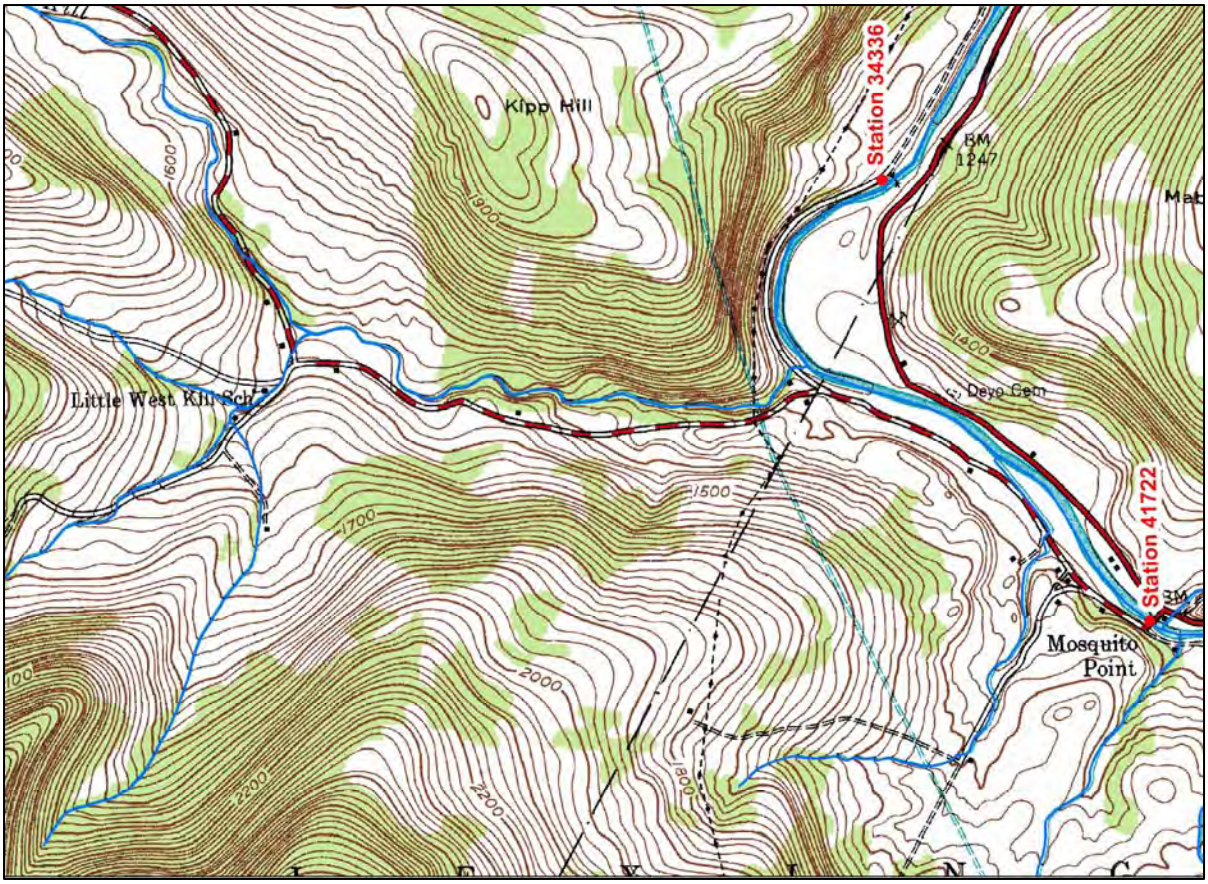
The 2006 stream feature inventory revealed that 6.9% (1,019 ft) of the streambanks exhibited signs of active erosion along the 14,772 ft of total channel length in the unit (Figure 4.14.1). The total surface area of active erosion totaled approximately 15,044 ft^2. *Revetment* had been installed on 8.8% (1,294 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 4.14.1. 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 #14 began at Station 41722. The drainage area ranged from 137.28 mi^2 at the top of the management unit to 147.4 mi^2 at the bottom of the unit. The valley slope was 0.51%.



1980 USGS topographic map - Prattsville Quadrangle contour interval 20ft

Valley *morphology* of this management unit was generally confined by valley form, infrastructure and encroachment. Little West Kill Road, which runs along the left streambank, has suffered repetitive flood damage due to its location within the 100-year floodplain (Station 41722-36900). Generally, stream conditions in this management unit were stable, with the exception of four erosional areas which could be addressed with vegetative treatments and bioengineered bank stabilization. Management efforts in this unit

should focus on addressing Little West Kill Road flooding issues and enhancement of riparian vegetation at recommended sites.

Ten wetlands were located within this management unit. Three wetlands, along the stream channel were classified as riverine lower perennial, signifying they were contained in the natural channel and characterized by a low gradient and slow water velocity (R2UBH, 18.5ac Station 41722-34336) (R2USC, 1.1ac Station 40200-39500) (R2USA, 0.2ac Station 39000-38700). The remaining wetlands were classified as palustrine; five had emergent vegetation (PEM1E, 0.5ac, Station 41200-40850) (PEM1C, 3.9ac, Station 40400-39000) (PEM1E, 3.3ac, Station 37200-35600) (PEM1E, 0.3ac, Station 34900-34700) (PEM1E, 0.3ac, Station 34450-34336), one along the left streambank at the upstream end of the unit was dominated by shrub-scrub vegetation (PSS1C, 1.7ac, Station 40850-40400), and one along the left streambank in the middle of the unit was forested (PFO1A, 1.7ac, Station 39000-38100). 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).

Wetlands (Station 41722-34336)
approximate wetland boundary delineated by NWI

This management unit began as the stream passed under the Mosquito Point bridge (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.

Starting at the Mosquito Point bridge, Little West Kill road runs parallel to the stream along the left streambank for approximately 4,822 ft (Station 41722-36900). This embankment has suffered repetitive flood damage due to its location within the 100-year floodplain. Elevating and relocating portions of this roadway is recommended to address flooding issues.

Little West Kill Road embankment

An old dumpsite was observed on the left streambank, containing metal debris and old farm machinery (Inset D, Station 41530). Removal of the debris is recommended to avoid its introduction into the stream.

Rip-rap at Station 41200

Due to damage from high flow events and stormwater runoff, rip-rap had been installed along 114 ft of the left stream embankment (Station 41200). 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. Interplanting of this rip-rap, by

inserting native tree and shrub plantings into the soil between the rocks, would strengthen and increase its longevity. These plantings would also improve the aquatic habitat by providing shade, resulting in cooler water temperatures. A 60 ft^2 *lacustrine* clay exposure was documented at the toe of this revetment (Station 41150). Fine sediment inputs into a stream increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. To provide protection against toe erosion, sedges or willows could be planted along the toe of the streambank.

Downstream the stream channel became overwide and shallow causing a significant amount of *aggradation* (Station 40900-37700). Deposition of bed materials is common in overwide channels because flow velocities are slower and they lose their ability to transport the stream's *bedload*. Resulting gravel bars may help maintain channel stability during flood events. In stable streams, the bars will erode away while the channel is in flood stage. The bars are then rebuilt as flow decreases, helping the stream maintain its stability by reestablishing its pools and riffles. If gravel bars are removed, these processes do not occur and instead, the flood water often dissipates its energy by eroding banks and scouring the stream bed. Dredging of gravel alters the shape and slope of the channel and may disconnect the stream from its floodplain, destroying the features that naturally dissipated the stream's energy. This frequently results in erosion problems and additional buildup of eroded sediment within the channel. Approximately 5,000 yd^3 of gravel was removed from this reach after the 1996 flood event.

Aggrading stream reach (Station 40900-37700)

An unnamed tributary entered the Schoharie Creek from the left streambank (Station 40300). This tributary drained the steep slopes of Vly Mountain, 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).

Tributary at Station 40300 - looking upstream

On the opposite bank, 433 ft of the County Route 23A embankment had suffered minor erosion during high flow events (Station 40300). The terrace at the top of the embankment had herbaceous vegetation in the riparian zone. Mown lawn or pasture does not provide as much resistance to streambank erosion as the deep and dense root structure found in streamside forest. The complex root systems of trees may also act to filter nutrients and pollutants, if any, from stormwater runoff. Areas where the riparian zone has been maintained in pasture or lawn present opportunities to improve the streamside buffer with tree plantings in order to promote a more mature vegetative community along the streambank and in the floodplain. The stability of this streambank could be improved with plantings of willow *fascines* and sedges along the toe of the bank coupled with trees and shrubs along the bank and upland area.

Bank erosion and planting site at Station 40300

Immediately downstream, 303 ft of rip-rap had been installed along the right streambank (Station 39800). This rip-rap was in fair condition with some mature trees at the top of the bank. As this rip-rap ended, the toe of the streambank had begun to scour (Inset C,

Station 39440). Vegetative protection of the toe with plantings of native shrubs and sedges is recommended.

Rip-rap had been installed on 151 ft of the County Route 23A embankment (Station 39440). Mature vegetation had established throughout this revetment providing increased stability. Downstream, on the right streambank there was a NYSDEC public fishing access with a parking area at the top of the bank (Station 38350). These access points allow the public to wade and walk along the streambed and banks for the purpose of fishing. An old stacked rock wall had been installed along 347 ft of this embankment.

Little West Kill tributary at Station 36900

Proceeding downstream, the stream channel began to narrow. The Little West Kill entered the Schoharie Creek from the left streambank (Station 36900). The Little West Kill mainstem flows approximately 3 miles from its headwaters on Roundtop Mountain, roughly following Little West Kill Road, to its confluence with the Schoharie Creek. The Little Westkill mainstem is classified as C(ts) by NYSDEC, indicating that the best uses for this stream are the support of fisheries, including trout spawning and other non-contact activities (NYSDEC, 1994). Approximately 1.8 miles of its tributaries are classified as C(t), and 6.5 miles were classified as C by the NYSDEC.

The Little West Kill watershed drains approximately 8.2mi^2 and is closely surrounded by Roundtop, Bearpen, and Vly Mountains. As evidenced by the large amount of deposition upstream and downstream of the confluence, the Little West Kill delivers a significant amount of sediment to the Schoharie Creek. A stream feature inventory to identify sediment sources from this tributary is recommended. At the confluence, rip-rap had been installed on 97 ft of the left streambank (Station 36900). Interplanting of this rip-rap, by inserting native tree and shrub plantings into the soil between the rocks, would strengthen and increase its longevity.

Stormwater outfall at Station 36350

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 (Inset B, Station 36500). Streambank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows. This erosion had resulted in an exposed area of approximately 10,554ft^2, as well as compromising mature trees at the top of the bank and threatening Falke Road. Two stormwater culverts outfall onto this bank exacerbating erosion during runoff events (Station 36350 & 36300). This erosion site may be a good candidate for remediation using vegetative bank protection using *bioengineering* techniques. Prior to proceeding with any work, this site would require a more detailed site assessment.

At the end of the management unit, 264 ft along the left streambank had scoured during high flow events exposing a small 10 ft^2 area of *lacustrine* clay (Inset A, Station 34470). This erosion was minor and did not immediately threaten the road embankment.

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).

The upstream half of this management unit was characterized by an overwide and shallow stream channel with generally aggrading conditions. However, as the stream channel narrowed in the downstream half of this unit, the stream appeared to be conveying its sediment load effectively. Tributaries within the unit appeared to input 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 435 ft 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).

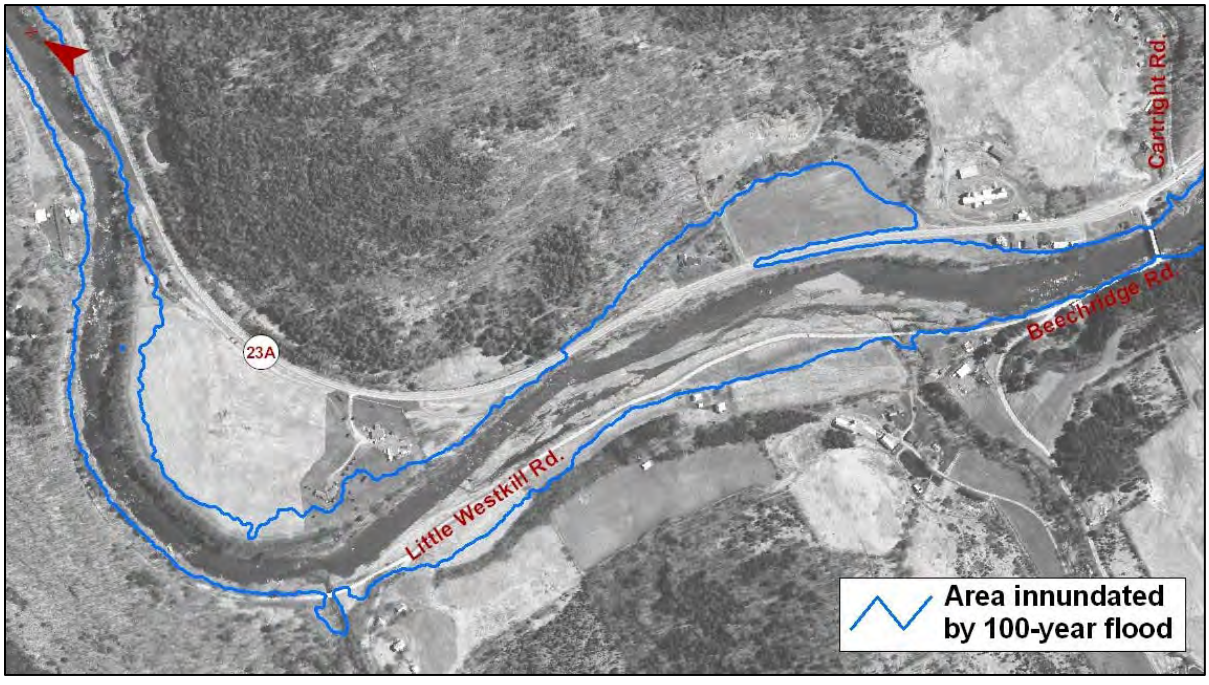
An analysis of vegetation was conducted using aerial photography from 2001 and field inventories (Riparian Vegetation Mapping, Appendix B). In this management unit, the

predominant vegetation type within the 300 ft riparian buffer was forested (38%) followed by herbaceous (37%). 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 (10%) 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.

According to the current floodplain maps (below), three existing structures in this unit appeared to be situated within the estimated 100-year floodplain. The 100-year floodplain is



100-year floodplain boundary map

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 record. 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. Overwide, aggradational conditions in the upstream half of the unit could lead to potential thermal impairment and the filling of pools. Woody debris observed within the stream channel was minimal throughout the unit. Woody debris provides critical habitat for fish and insects, and adds 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 Schoharie Creek. Fine sediment inputs into a stream increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. There were two 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, no 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.