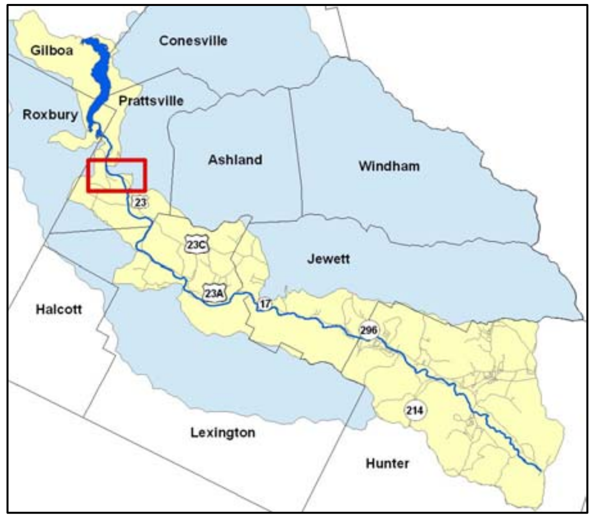
Schoharie Creek Management Unit 17

Town of Prattsville – Station 19376 to NYS Route 23 Bridge (Station 10486)

This management unit began at the confluence with Batavia Kill (Station 19376), and continued approximately 8,890 ft to the NYS Route 23 Bridge (Station 10486) in the Town of Prattsville.

Stream Feature Statistics

10.6% of streambanks experiencing erosion
18.7% of streambanks have been stabilized
0% of streambanks have been bermed
1,056 feet of clay exposures
43 acres of inadequate vegetation
6,757 feet of road within 300 ft of stream
165 structures located in 100-year floodplain



Management Unit 17 location
see Figure 4.0.1 for more detailed map

Summary of Recommendations Management Unit 17	
Intervention Level	Preservation, Passive, Assisted Self-Recovery
Stream Morphology	No recommendations at this time
Riparian Vegetation	Plantings for assisted self-recovery of eroding banks at Stations 19100, 17850 & 14400, and enhancement of riparian buffer at Station 14400, and interplanting of rip-rap at Station 16400 & 12100.
Infrastructure	Support stormwater retrofit of Conine Fields parking areas.
Aquatic Habitat	Watershed Aquatic Habitat Study
Flood Related Threats	No recommendations at this time
Water Quality	Removal of dump sites at Stations 17730, 15750 & 14100.
Further Assessment	Stream feature inventory of Huntersfield Creek tributary to document current conditions and identify sediment sources.

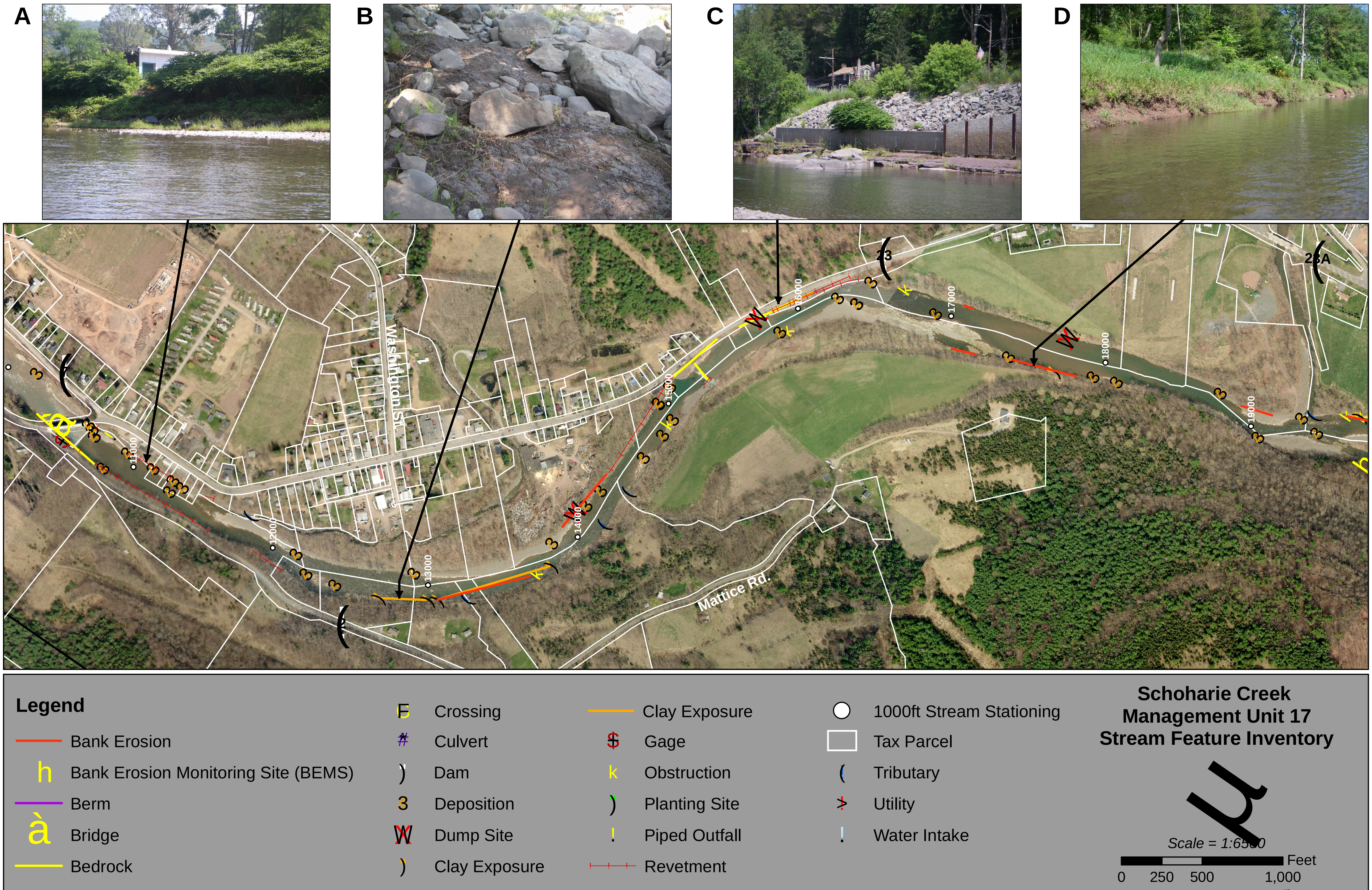
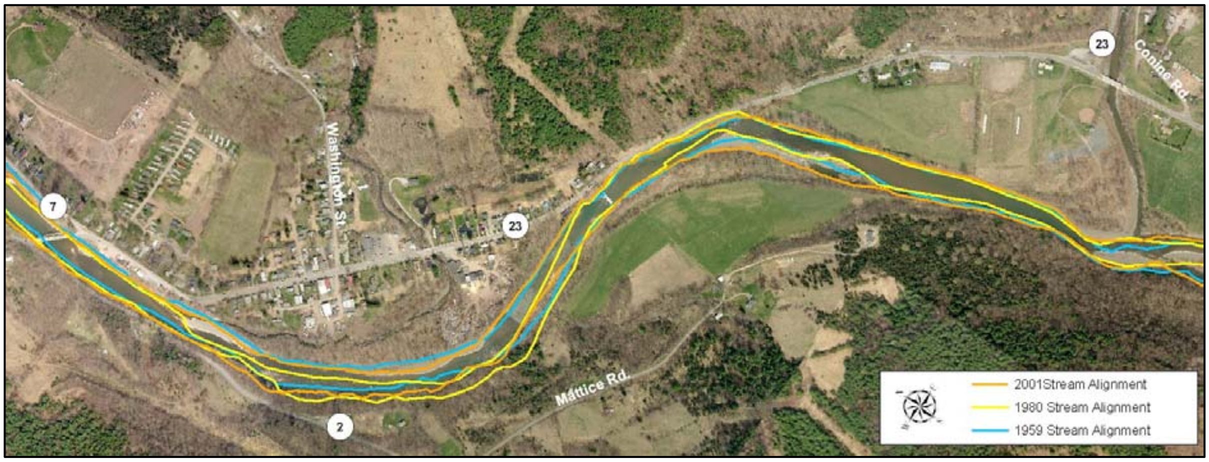


Figure 4.17.1 Management Unit 17 - 2006 aerial photography with stream feature inventory

Historic Conditions

As seen from the historical stream alignments (below), the *planform* of the channel has remained fairly stable since 1959.



Historic stream channel alignments overlayed with 2006 aerial photograph

As of 2006, according to available NYSDEC records dating back to 1996, there had been four stream disturbance permits issued in this management unit. All of these permits were issued to private landowners following the 1996 flood. The first permit was issued for debris removal and excavation of 1,000 yd^3 of sand/gravel along 350 ft to restore stream flows to pre-flood channels near the dam at the middle of the management unit. Near the downstream end of the management unit, three permits had been issued to the residents on the right streambank for installation of 316 ft of rip-rap along with excavation of a small amount of sand/gravel.

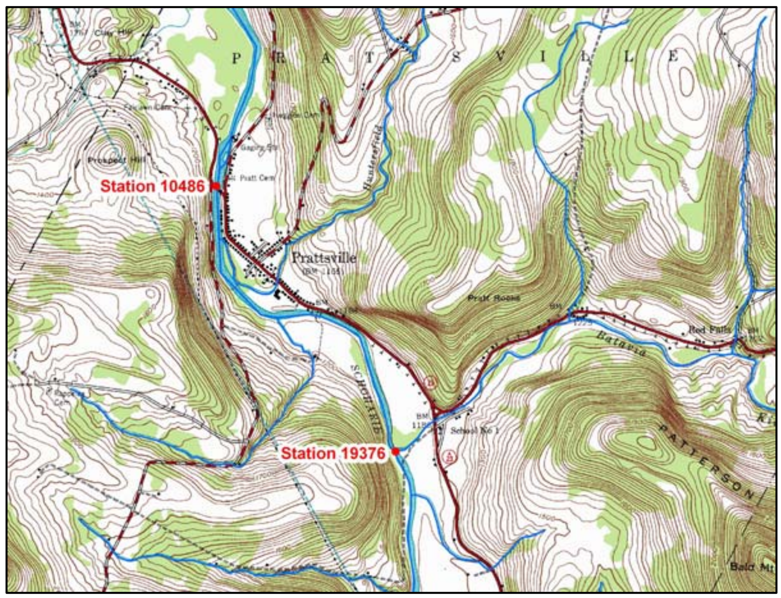
Stream Channel and Floodplain Current Conditions (2006)

Revetment, Berms and Erosion

The 2006 stream feature inventory revealed that 10.6% (1,888 ft) of the streambanks exhibited signs of active erosion along the 17,779 ft of total channel length in the unit (Figure 4.17.1). The total surface area of active erosion totaled approximately 15,754 ft^2. *Revetment* has been installed on 18.7% (3,328 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 4.17.1. 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.



1980 USGS topographic map - Prattsville Quadrangle contour interval 20ft

Management unit #17 began at the Batavia Kill confluence. The drainage area ranged from 153.52 mi^2 at the top of the management unit to 236.48 mi^2 at the bottom of the unit. Drainage area increased significantly at the Batavia Kill confluence near the upstream end of the management unit. The valley slope was 0.24%.

Valley *morphology* of this management unit was generally unconfined with a broad glacial and *alluvial* valley flat. However, the downstream end of the unit was confined on the left streambank by infrastructure encroachment and the valley wall. Generally, stream conditions in this management unit were stable, although a high percentage of the streambanks had been hardened. Many of the erosion sites were minor and could be addressed with vegetative treatments. Management efforts in this unit should focus on enhancement of riparian vegetation at recommended sites and preservation of undeveloped lands within the 100-year floodplain.

Eight wetlands were located within this management unit. Three wetlands including the entire stream channel along the upstream half of this unit were classified as riverine lower perennial wetlands, signifying they were contained in the natural channel and characterized by a low gradient and slow water velocity (R2UBH, 11.6ac Station 19376-15200) (R2USC, 0.6ac, Station 19376-19000) (R2USC, 0.4ac, Station 16500-16100). Three wetlands were all classified as palustrine wetlands; one was dominated by forest vegetation (PFO1A, 5.1ac, Station 19376-18600), and two had shrub-scrub vegetation (PSS1C, 0.4ac, Station 17800-17500) (PSS1C, 1.6ac, Station 17400-16300). Two wetlands including the entire stream channel along the downstream half of this unit were classified as lacustrine wetlands (L1UBHh, 18.2ac Station 15200-10486) (L2USAh, 2.8ac, Station 12900-11700). 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 19376-10486)
approximate wetland boundary delineated by NWI

At the upstream end of this management unit the Batavia Kill entered the Schoharie Creek from the right streambank (Station 19300). The Batavia Kill originates in the Big Hollow area of the Town of Windham on the south slopes of Windham High Peak, Burnt Knob and Acra Point Mountains, and flows west 21 miles through the towns of Windham, Ashland and Prattsville to its confluence with the Schoharie Creek, near the hamlet of Prattsville. As the stream winds its way down the valley floor, it drops approximately 2,000 feet in elevation from its origin at around 3,600 feet, to the stream's confluence with the

Schoharie Creek at approximately 1,600 feet. As a result of this topography change, the tributary lost its ability to transport sediment gathered from the Batavia Kill Watershed, and began to deposit sediment at its mouth and into the 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. The Batavia Kill Watershed drains an approximate area of 71 square miles (45,440 acres). The New York State Department of Environmental Conservation classifies streams and rivers based on their "best use" (NYSDEC, 1994). The Batavia Kill mainstem carries classifications ranging from A(ts) to C(t) (Table 4.17.1). The classification A is assigned to waters used as a source of drinking water and classification C is for waters supporting fisheries and suitable for non-contact activities. Streams with a use classification of C or higher may carry a sub-classification of (t) or (ts) to indicate the waters sustain trout populations (t) and those which support trout spawning (ts).

Batavia Kill tributary - looking upstream

Table 4.17.1 NYSDEC Best Water Use Classifications on the Batavia Kill

Stream Reach Description	Waters Classification	Approximate Length
Headwater of the Batavia Kill to 1st tributary above C.D. Lane	C(ts)	3.6 miles
Nauvo Road to 1st tributary above C.D. Lane	A(ts)	5.7 miles
Ski Windham intake to Nauvo Road	A(t)	2.4 miles
Schoharie Creek to below Ski Windham intake	C(t)	10.1 miles

A 356 ft long stand of Japanese knotweed (*Fallopia japonica*) had established along the right streambank downstream from the Batavia Kill confluence. Japanese knotweed is an invasive non-native species which does not provide adequate erosion protection due to its very shallow rooting system, and also its rapid growth rate crowds out more beneficial streamside vegetation. Large Japanese knotweed stands were documented throughout the management unit with Japanese knotweed present on almost half of the streambanks. This significant increase in Japanese knotweed is likely due to the introduction of rhizome fragments from the Batavia Kill, which has a high percentage Japanese knotweed on its banks. Once knotweed has established itself in the riparian area, it is able to spread downstream after disturbances caused by beaver activity or by high flows scouring the streambank. Such disturbances often cause stems and rhizomes to break off and float downstream where fragments may establish themselves on streambanks that were previously unaffected by knotweed. Exposed streamside areas such as sediment deposits or disturbed banks with eroded soils lacking vegetation are particularly vulnerable to invasion by knotweed. While it may prove impossible to eradicate Japanese knotweed from all streambanks, it is important to recognize this issue and take action to prevent further spread (See Section 2.7 Riparian Vegetation).

Japanese knotweed at Station 19300

Conine Field, the Prattsville Town Park, is located on adjacent land on the right streambank. This park does receive flood waters regularly due to its location within the 100-year floodplain. The town of Prattsville has partnered with Greene County Soil & Water Conservation District and received a $5,000 member item grant from the NYS assembly to develop a preliminary plan for improvements to this park, including stormwater retrofit for the parking areas to protect water quality, establishment of a protective riparian vegetation buffer, and improved fishing access possibly including handicapped accessibility. Riparian vegetation buffer establishment would involve experimenting with various management techniques to remove Japanese knotweed from the park's streambank and replace it with native vegetation.

The right streambank had scoured during high flow events along 211ft (Station 19100). This type of erosion is common and may revegetate on its own with time. To speed up this process and increase bank stability native shrubs and sedges could be planted along the streambank and toe. In stable watersheds, the rate of erosion is slow and a natural healing process usually follows.

Bank erosion at Station 19100

Downstream, similar scour had occurred along 414 ft of the left streambank (Inset D, Station 17850), exposing a 45 ft^2 clay/silt deposit. Fine sediment inputs from eroding banks can be a water quality concern because they increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. On the opposite bank (right) a dump site including an old car and other metal debris was documented (Station 17730). To prevent introduction of this material and any associated pollutants into the stream, the dump should be removed.

Revetment at Station 16400

As the stream flowed directly into the NYS Route 23 road embankment, rip-rap and a concrete wall and been installed along 577 ft of the right streambank (Station 16400). Interplanting of this rip-rap, by inserting native tree and shrub plantings into the soil between the rocks, would strengthen and increase its longevity and also improve the aquatic habitat by providing shade, resulting in cooler water temperatures. Plantings of shrubs and sedges on the lower half bank below the concrete wall would provide additional protection for the streambank toe.

At the downstream end of this revetment, another dump site including an old car and other metal debris was documented along the right streambank (Station 15750). To prevent introduction of this material and any associated pollutants into the stream, the dump should be removed.

Downstream, a concrete dam was located across the stream channel (Station 15280). With the completion of the Schoharie Reservoir and subsequent inundation of Devasego Falls during the 1930's, smallmouth bass had become established upstream of the falls. In 1939, public disdain for the small, slow growing smallmouth bass of upper Schoharie Creek prompted the then NYS Conservation Department to construct a fish barrier dam across the Schoharie Creek to prevent the movement of bass upstream. In a 1981 study bass were generally less abundant than in previous studies, and also less abundant than trout above the barrier dam. The dam may have exerted some control on upstream smallmouth bass populations over time (NYSDEC, 1993). The large pool created downstream by this structure serves as a popular swimming spot for residents. The concrete abutment had caused erosion on the left streambank upstream and downstream from the dam. Rip-rap had been installed along 66 ft of this bank but is unlikely to prevent future erosion at this site (Station 15300).

Dam at Station 15280 - looking upstream

Downstream the adjacent land use changes from agricultural and forested to residential and commercial. Many of the homes and businesses along the right streambank suffer flooding due to their location within the 100-year floodplain, or the area which has a 1% chance of being inundated in any given year. Rip-rap had been installed along 704 ft of the right streambank (Station 15150)

Rip-rap at Station 15150 - looking upstream

On the left streambank an unnamed tributary entered the Schoharie Creek (Station 14400). This small tributary, which originated on the lower slopes of Roundtop Mountain, appeared to deliver a considerable amount of sediment into the creek. This tributary was classified as C by the NYSDEC (NYSDEC, 1994).

Bank erosion at Station 14400

On the opposite bank 434 ft (Station 14400) had scoured during high flow events. 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. The stability of this streambank might be improved with plantings of willow *fascines* and sedges. Mature trees lined the top of the bank, however increasing the forested buffer width along the stream corridor by at least 100 feet will increase buffer functionality, such as filtering nutrients and pollutants, if any, from the adjacent commercial property. A high quality riparian buffer is especially important at this site because the adjacent commercial property is located within the 100-year floodplain. A dump site including large metal debris in the streambank was documented along this scour (Station 14100). To prevent introduction of this material, and any associated pollutants, into the stream the dump should be removed.

Bank erosion at Station 13650

Just downstream, along the outside meander bend the left streambank had scoured during high flow events along 599 ft (Station 13650). Streambank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows. Vegetation had been stripped from the lower bank, but regrowth of vegetation had already begun. This erosion had exposed lacustrine clay deposits along 1,040 ft of the streambed and bank (Inset B, Station 13770).

Beginning at Station 12100 downstream to the NYS Route 23 bridge in Prattsville, rip-rap had been installed along 1,035 ft of the County Route 2 road embankment on the left streambank. While some vegetation was established above this rip-rap, additional plantings of native trees and shrubs is recommended at this site. Plantings of shrubs and sedges along the toe of the bank may also provide additional protection against erosion.

Rip-rap at Station 12100

On the right streambank, Huntersfield Creek entered the Schoharie Creek (Station 11800). Huntersfield Creek flows approximately 6.4 miles from its headwaters on Huntersfield Mountain to its confluence with the Schoharie Creek. Beginning at its headwaters, the Huntersfield Creek mainstem was classified as A by NYSDEC for 5.6 miles, indicating that the best uses for this stream were drinking (after disinfection and approved treatment), bathing, and fishing. Downstream the classification is downgraded to C for the last 0.8 miles of stream (NYSDEC, 1994). Approximately 4.2 miles of its tributaries were classified as A(t) by the NYSDEC, signifying they can also support trout populations.

Huntersfield Creek confluence at Station 11800

Huntersfield Creek watershed drains approximately 7.9 mi^2. As evidenced by deposition upstream and downstream of the confluence, Huntersfield Creek delivers a significant amount of sediment to the Schoharie Creek. A stream feature inventory to identify sediment sources from this tributary is recommended.

Downstream rip-rap had been installed along 316 ft of the right streambank in efforts to protect the residential and commercial properties at the top of the streambank (Inset A, Station 11250). A large stand of Japanese knotweed had become established along this rip-rap.

A United States Geologic Survey (USGS) continuously recording stream gage was located on the left streambank approximately 100 ft upstream from the NYS Route 23 bridge in Prattsville (Station 10600). This gage (#01350000) has a drainage area of 237 mi^2 and has been collecting data from November 1902 to the present. All gage information including real time discharge and gage height is available online at the USGS website: http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01350000& (See section 2.4 for more detailed information).

USGS stream gage #01350000 at State Route 23 bridge in Prattsville - Station 10600

At the downstream end of this management unit the stream passed under the NYS Route 23 bridge in Prattsville (Station 10486). Gravel deposits upstream and downstream of the bridges were noted. Deposits such as these are commonly caused by inadequate sizing of the bridge opening. This deposition may also be partly due to the Schoharie Reservoir impoundment downstream. An undersized bridge opening causes water to back up upstream of the bridge, reducing stream velocity, which results in sediment deposition. While bankfull flows may flow freely through this bridge, higher flows backwater, resulting in the upstream aggradation. Flood damage to bridges is typically caused by inadequate hydraulic capacity of the bridge, misaligned piers and/or abutments, or accumulation of

State Route 23 bridge in Prattsville - Station 10486 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.

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 or mass failure of streambanks, this unit appeared to be conveying its sediment load fairly effectively. Tributaries within the unit appeared to contribute the majority of sediment in this unit.

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.

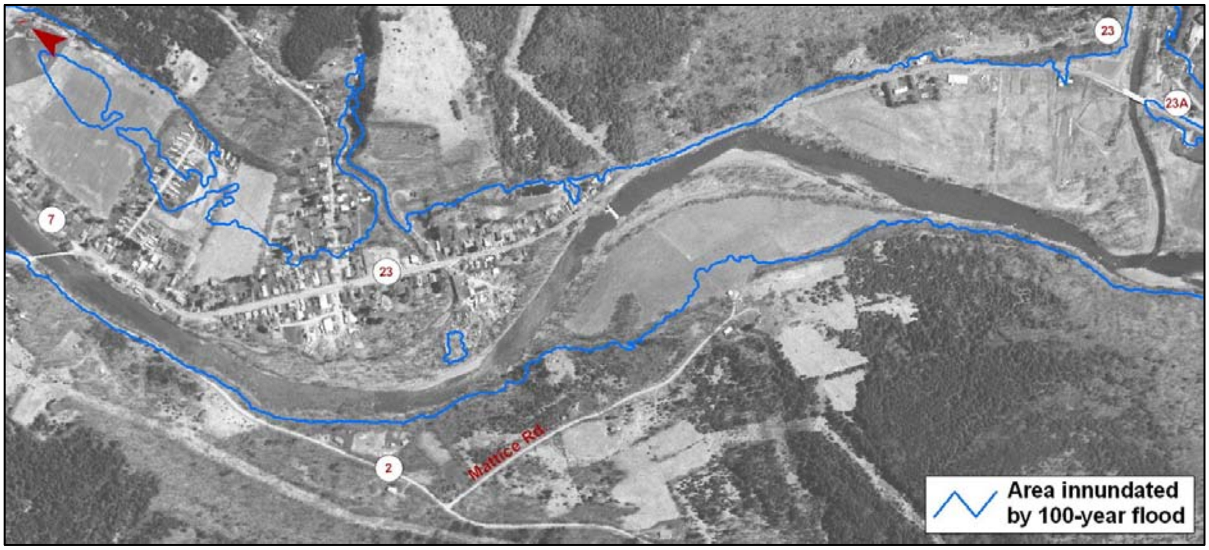
Some plant species that are not native can create difficulties for stream management, particularly if they are invasive. Japanese knotweed (*Fallopia japonica*), for example, has become a widespread problem in recent years. Knotweed shades out other species with its dense canopy structure (many large, 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, 30 Japanese knotweed occurrences along an estimated length of 8,275 ft were documented in this management unit. 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 (49%) followed by herbaceous (25%). 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 (8%) within this unit's buffer was primarily the local roadways, private residences and associated driveways.

<u>Flood Threats</u>

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 NYS DEC 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 (above), one hundred sixty-five 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 are expected to occur once in any 100-year period, on the basis of a statistical analysis of local



100-year floodplain boundary map

flood record. Most communities regulate the type of development that can occur in areas subject to these flood risks.

<u>Aquatic Habitat</u>

Generally, habitat quality appeared to be fair throughout this management unit. Canopy cover was inadequate along some streambanks and could be enhanced with plantings in the riparian zone. 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. The quality and impact of the warm-water fishery should also be evaluated from the dam downstream to the Schoharie Reservoir confluence (e.g. smallmouth bass and walleye).

<u>Water Quality</u>

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 three 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 eight 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, two homeowners within the drainage area of this management unit had made use of these programs to replace or repair a septic system.

References

NYSDEC, 1993. New York State Department of Environmental Conservation. A Management Plan for the Trout Fisheries of Upper Schoharie and Gooseberry Creeks. NYS DEC Region 4 Fisheries Office Stamford, NY: 6p.

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.