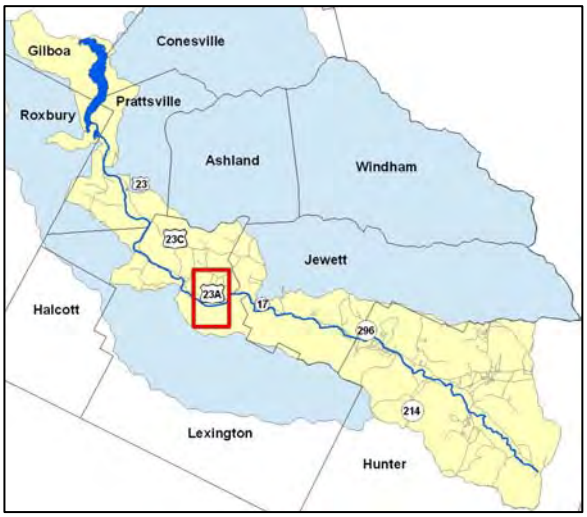
Schoharie Creek Management Unit 11

Town of Lexington – Bush Road Bridge (Station 63446) to County Route 42 Bridge (Station 55350)

This management unit began at Bush Road Bridge (Station 63446), and continued approximately 8,096 ft to the County Route 42 Bridge (Station 55350) in the Town of Lexington.



Management Unit 11 location
see Figure 4.0.1 for more detailed map

Stream Feature Statistics

9.9% of streambanks experiencing erosion
9.9% of streambanks have been stabilized
0% of streambanks have been bermed
1,331 feet of clay exposures
47.5 acres of inadequate vegetation
2,338 feet of road within 300ft of stream
6 structures located in 100-year floodplain

Summary of Recommendations Management Unit 11	
Intervention Level	Preservation, Passive, Assisted Self-Recovery
Stream Morphology	No recommendations at this time
Riparian Vegetation	Enhancement of riparian buffer at Station 57100.
Infrastructure	No recommendations at this time
Aquatic Habitat	Watershed Aquatic Habitat Study
Flood Related Threats	No recommendations at this time
Water Quality	Removal of dump site at Station 56700.
Further Assessment	Installation of bank erosion monitoring site at Station 59100.

A

B

C

D

Legend

- Bank Erosion
- Bank Erosion Monitoring Site (BEMS)
- Berm
- Bridge
- Bedrock
- Crossing
- Culvert
- Dam
- Deposition
- Dump Site
- Clay Exposure
- Clay Exposure
- Gage
- Obstruction
- Planting Site
- Piped Outfall
- Revetment
- 1000ft Stream Stationing
- Tax Parcel
- Tributary
- Utility
- Water Intake

Schoharie Creek
Management Unit 11
Stream Feature Inventory

N W E S

Scale = 1:6000

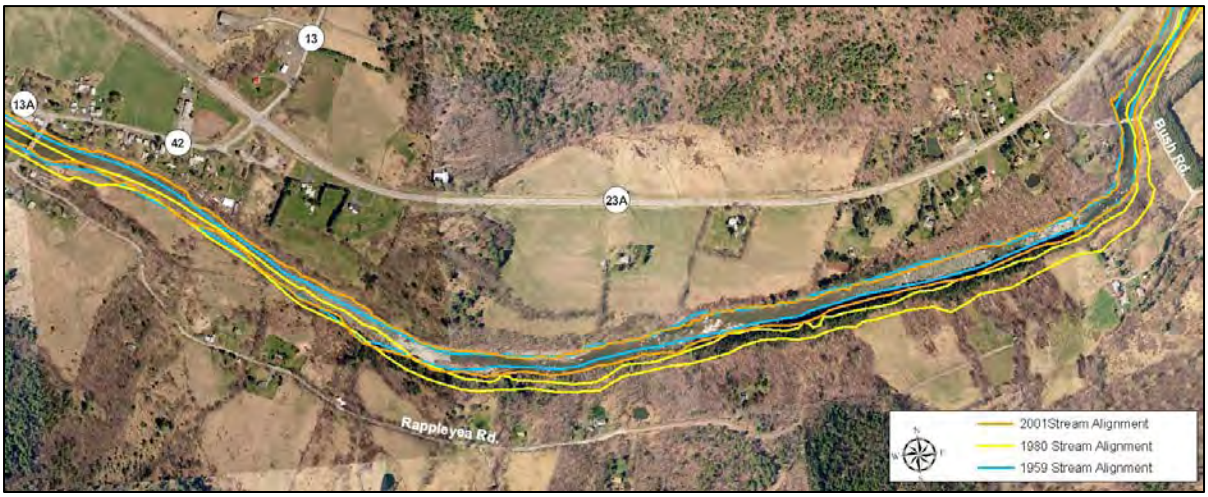
0 250 500 1,000 Feet

Stream flow

Figure 4.11.1 Management Unit 11 - 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 NYS DEC 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

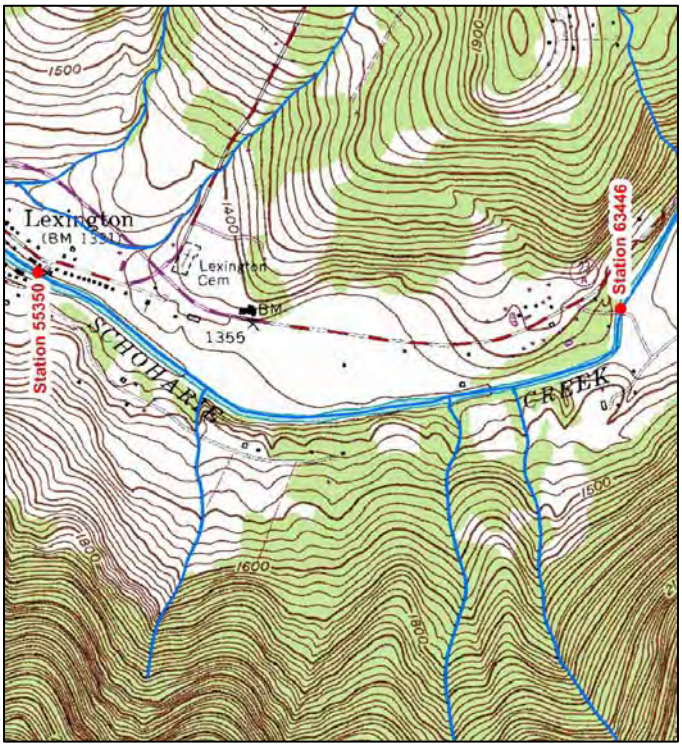
The 2006 stream feature inventory revealed that 9.9% (1,602 ft) of the streambanks exhibited signs of active erosion along the 16,192 ft of total channel length in the unit (Figure 4.11.1). The total surface area of active erosion totaled approximately 77,340 ft^2. *Revetment* had been installed on 9.9% (1,609 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 4.11.1. 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.

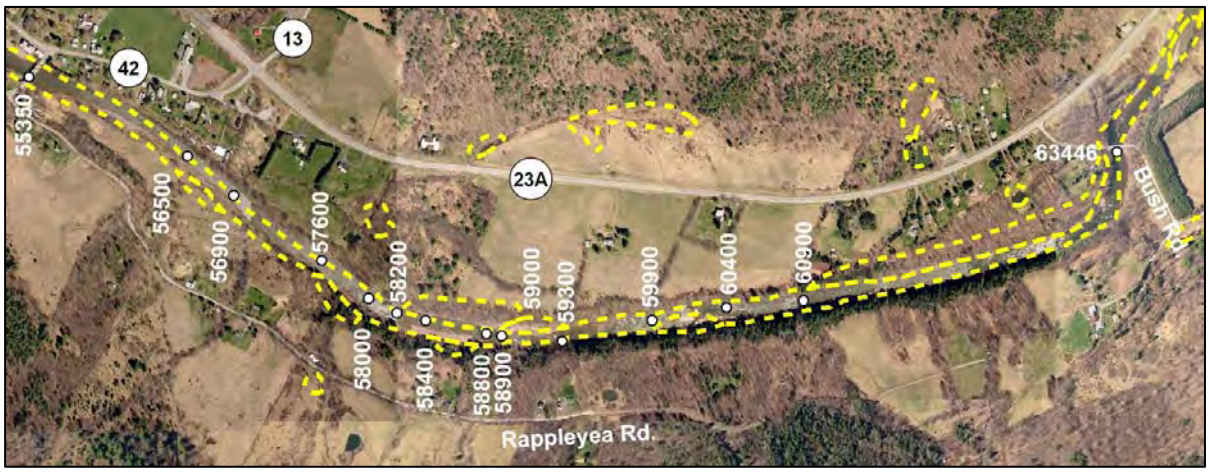
Management unit #11 began at Bush Road. The drainage area ranged from 96.14 mi^2 at the top of the management unit to 99.75 mi^2 at the bottom of the unit. The valley slope was 0.51%.



1980 USGS topographic map - Lexington Quadrangle contour interval 20ft

Valley *morphology* of this management unit was highly confined in the upstream half of the management unit however, confinement lessens in the downstream half. Stream channel conditions appeared fairly stable with the exception of two mass failures. Bedrock, abundant in this unit, armored the channel against incision that might otherwise be expected in this type of valley setting. Management strategies should focus on preservation of channel conditions, enhancement of the riparian buffer at the recommended planting site, and further study of bank erosion.

Most of the stream channel within this management unit was designated as a wetland. Six of these wetlands 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, 19.3 Station 63446-55350) (R2USC, 0.8ac, Station 60400-59900) (R2USC, 0.6ac, Station 59300-58900), (R2USC, 0.4ac, Station 58800-58400) (R2USC, 0.8ac, 58000-57600) (R2USA, 0.5ac, 56900-56500). Beginning at the upstream end of the management unit there was a 6.1 acre palustrine forested wetland located along the right streambank (PFO1A, Station 63400-60900). A 2.6 acre palustrine wetland with shrub-scrub vegetation was located on the right streambank in the middle of the management unit (PSS1A, Station



Wetlands (Stations 63446-55350) approximate wetland boundary delineated by NWI

58800-58200). 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).

This management unit began as the stream passed under the bridge at Bush Road (BIN 32012110) (Inset D, Station 63446). This bridge may constrict the floodplain at very high flows, as evidenced by aggradation at the left bridge abutment, 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.

A United State Geologic Survey (USGS) continuously recording stream gage was located on the left streambank approximately 700 ft downstream from the Bush Road bridge (Station 62740). This gage (#01349705) has a drainage area of 96.8mi^2 and has been collecting data from August 1999 to the present. All gage information including real time discharge and gage height

USGS stream gage #01349705 - Station 62740

is available online at the USGS website: http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01349705& (See section 2.4 for more detailed information).

The *thalweg*, or deepest part of the stream channel, flowed up against the left streambank causing the first significant bank erosion in the management unit (Inset D, Station 62100). This *mass failure* had resulted in an erosion area of approximately 11,248 ft^2, exposing areas of mixed till as well as compromising mature trees at the top of the bank. Streambank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows.

Bank erosion at Station 62100

Downstream on the left streambank, two unnamed tr*ibutaries* entered the Schoharie Creek (Inset C, Station 61700 & Station 60900). These tributaries drained the steep slopes of the adjacent mountain, before they reached the flatter topography of the valley floor where they 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. The New York State Department of Environmental Conservation classifies streams and rivers based on their "best use" (NYSDEC, 1994). These tributaries were classified as C, indicating that the best uses for these streams are the support of fisheries and other non-contact activities.

Tributary at Station 60900

At the next downstream meander bend there was another erosion site (Inset B, Station 59100). The hillslope was undermined by toe erosion, resulting in the mass wasting of a 65,306 ft^2 area along 1,363 ft of the bank. This erosion had left the face of the streambank unvegetated. Throughout the bank *lacustrine clay* deposits were exposed. Clay inputs into a stream are a serious water quality concern because they increase *turbidity*, degrade fish habitat, and can act as a carrier for other pollutants and pathogens. This bank may introduce significant amounts of suspended sediment and woody debris during rainfall events. While woody debris is valued as a feature of good fish habitat, in some instances it can present a threat to infrastructure. This site may stabilize on its own over time. It appeared a low bench may have started to develop at the toe of the eroding bank which may act to reduce flood water velocities near the bank. A bank erosion monitoring site (BEMS) could be installed along this bank to study this bank's erosion rate and document its potential recovery. In-depth survey and design would be necessary to effectively restore this erosion site.

Bank erosion at Station 59100

An unnamed tributary entrenched into the eroding hillslope entered the Schoharie Creek along this erosion (Station 57840). This tributary drained the adjacent mountain slopes and appeared to introduce a fair amount of sediment into the creek. This tributary was classified as C by the NYSDEC (NYSDEC, 1994).

Planting site at Station 57100

As the stream gained access to the floodplain on the left streambank the riparian buffer was composed primarily of herbaceous vegetation (Station 57100). A buffer of native trees and shrubs should be planted along the streambank and corridor. Buffer width should be increased by the greatest amount agreeable to the landowner, but increasing the buffer

width by at least 100 feet will increase the buffer functionality, such as slowing the flow of run-off from the floodplain and allowing sediment and its attached pollutants, if any, to settle out before reaching the stream.

Downstream, aggradation or a raising of the streambed due to the deposition of sediment that cannot be moved by the shallower flows at these greater stream widths was noted (Station 57000). This aggradation also steepened the stream channel gradient downstream of the deposition site by raising the elevation of the channel.

Further downstream, an old dumpsite containing an old truck and metal debris was observed on the right streambank (Station 56700). Removal of the trash is recommended to avoid its introduction into the stream.

As residential properties started to line the right streambank, revetment including 833 ft of rip-rap (Station 56600) and 165 ft of stacked rock wall (Station 55600) had been installed. The rip-rap appeared to have been dumped between existing streamside vegetation, which may help to stabilize this bank and enhance aquatic habitat.

Rip-rap at Station 56600

This management unit ended as the stream passed under the bridge at County Route 42 (BIN 1025220) (Inset A, Station 55350). This bridge may constrict the floodplain at very high flows, as evidenced by aggradation at the right bridge abutment, but appeared to pass most flows effectively. Higher flows appeared to backwater, resulting in upstream channel widening and aggradation. A large gravel bar had formed along the right streambank indicating inadequate sizing of the bridge opening. An undersized bridge opening causes water to back up upstream of the bridge, reducing stream velocity, which

Aggradation at County Route 42 bridge Station 55350

results in sediment deposition. 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).

The uppermost reach appeared to be conveying its sediment load effectively; however, aggradation was evident in the downstream half of the unit including backwatering and deposition upstream of the County Route 42 bridge. This management unit was characterized by generally aggrading conditions. Tributaries and eroding banks 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

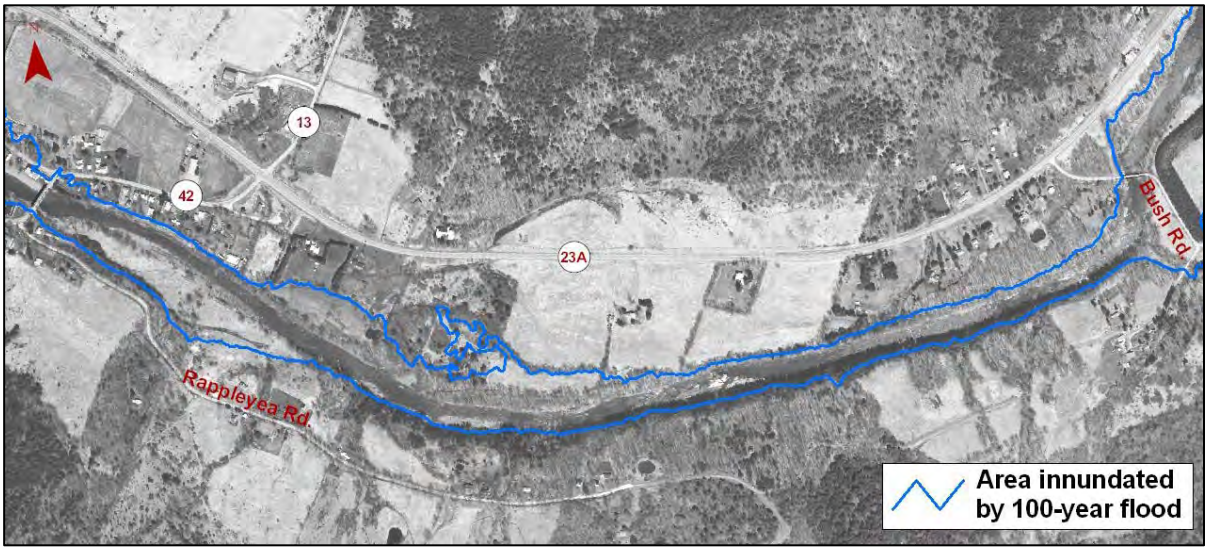
typically require less maintenance following planting and establishment. Three suitable riparian improvement planting sites were documented within this management unit.

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, 20 Japanese knotweed occurrences along an estimated length of 982 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 (53%) followed by herbaceous (36%). 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 (3%) 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 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.



100-year floodplain boundary map

According to the current floodplain maps (above), six 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 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. Canopy cover was adequate along most streambanks but could be enhanced along the left streambank at the downstream end of the management unit 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 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 Schoharie Creek. Fine sediment inputs into a stream increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. There was one clay exposure 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, eight 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.