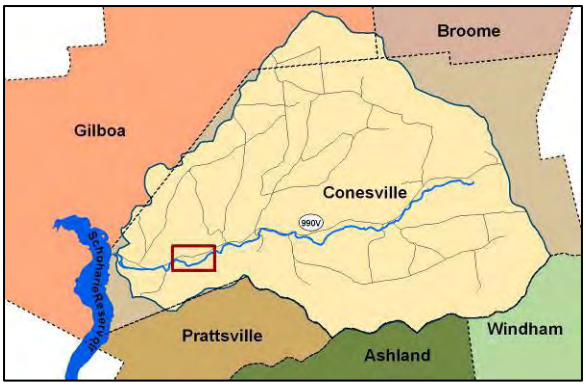
Manor Kill Management Unit 7

Town of Conesville – Station 15492 to Station 9805

This management unit begins at Station 15492, continuing approximately 5,687 ft to Station 9805 in the Town of Conesville.

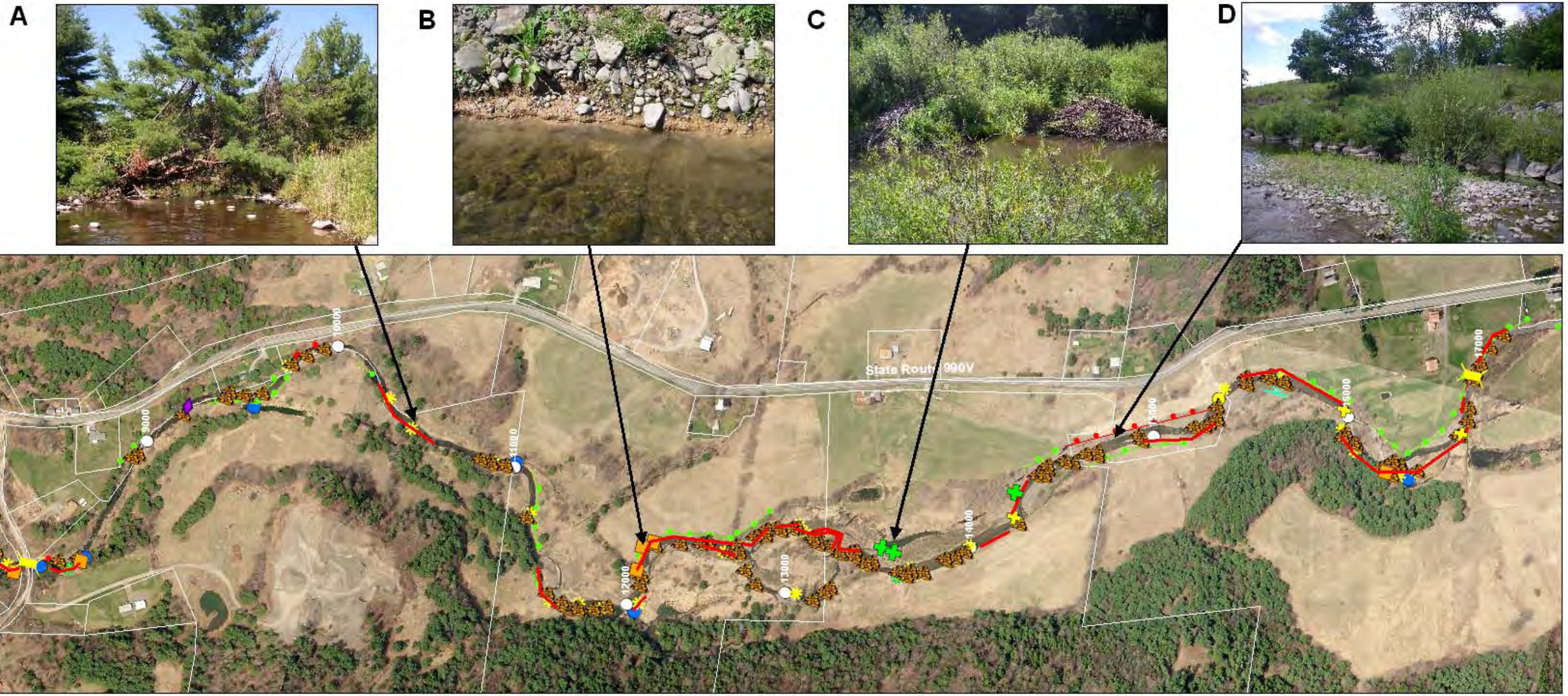
Stream Feature Statistics

24% of streambanks experiencing erosion
6.7% of streambanks have been stabilized
0% of streambanks have been bermed
166.1 feet of clay exposures
41.1 acres of inadequate vegetation
1,369 feet of road within 300ft. of stream
17.23% of streambanks are proposed for planting



Management Unit 7 location
see Figure 4.0.1 for more detailed map

Summary of Recommendations Management Unit 7	
Intervention Level	Assisted Self-Recovery
Stream Morphology	No recommendations at this time.
Riparian Vegetation	Treat, remove and prevent the spread of Japanese knotweed where feasible. Plant a buffer of trees and shrubs along proposed planting sites and increase width of riparian buffer in appropriate locations.
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	Establish Bank Erosion Monitoring Sites at Stations 12637-12169.



Legend

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

Manor Kill Management Unit 7
Stream Feature Inventory

N W E S

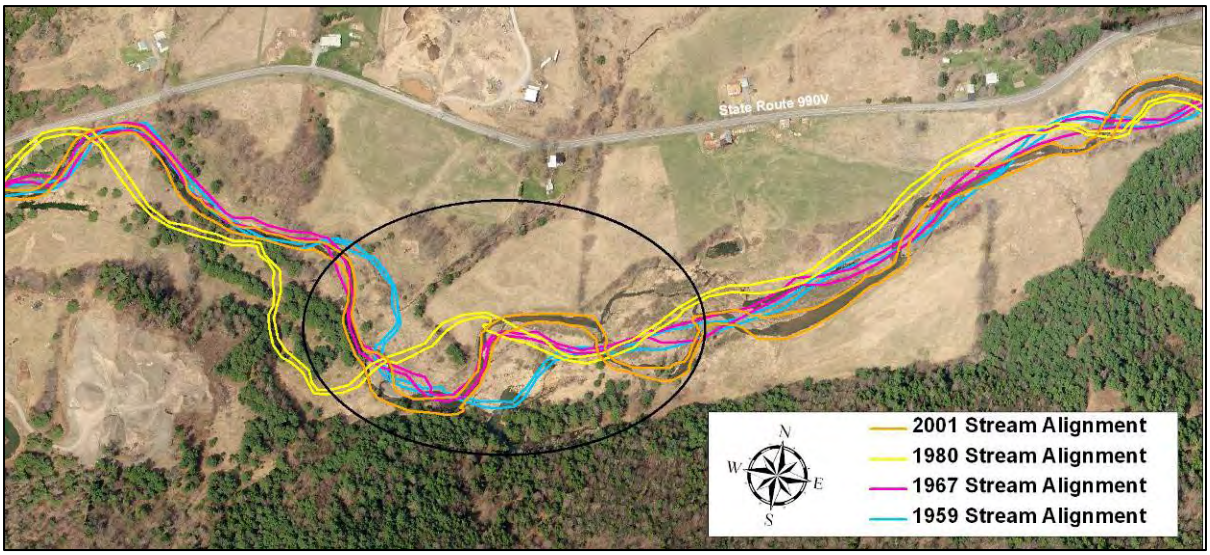
Scale = 1:5,100

0 255 510 1,020 Feet

Stream flow

Figure 4.7.1 Management Unit 7 - 2006 aerial photography with 2008 stream feature inventory.

Historic Conditions



Historic stream channel alignments overlayed with 2006 aerial photograph

As seen from the historical stream channel alignments (above), the *planform* of the channel has changed significantly over time along this management unit. The stream has experienced lateral migration in several locations over the years. Lateral migration is the movement of a channel across its floodplain, which usually results in extensive bank erosion. The outside banks of meander bends tend to move laterally across the valley floor and down the valley.

When *georeferencing* the 1980 aerial imagery, or establishing a relation between the images to map projections or coordinate systems within a *Geographic Information System (GIS)*, we encountered some problems with accuracy. Along the downstream portion of this management unit, map above shows that the alignment and shape of the channel remained similar to previous years, although it is slightly off in location; this is primarily due to problems associated with the georeferencing process.

As of 2008, according to available NYS DEC records dating back to 1998, there have been three stream disturbance permits issued in this management unit. In 1992, a permit was issued to the New York State Department of Transportation for slope stabilization along State Route 990V. In 1993, a permit was issued for the placement of skid logs across the Manor Kill at an already existing stream channel crossing. In 2008, a permit was issued for an in-stream crossing using a temporary access ford in order to skid logs across the stream.

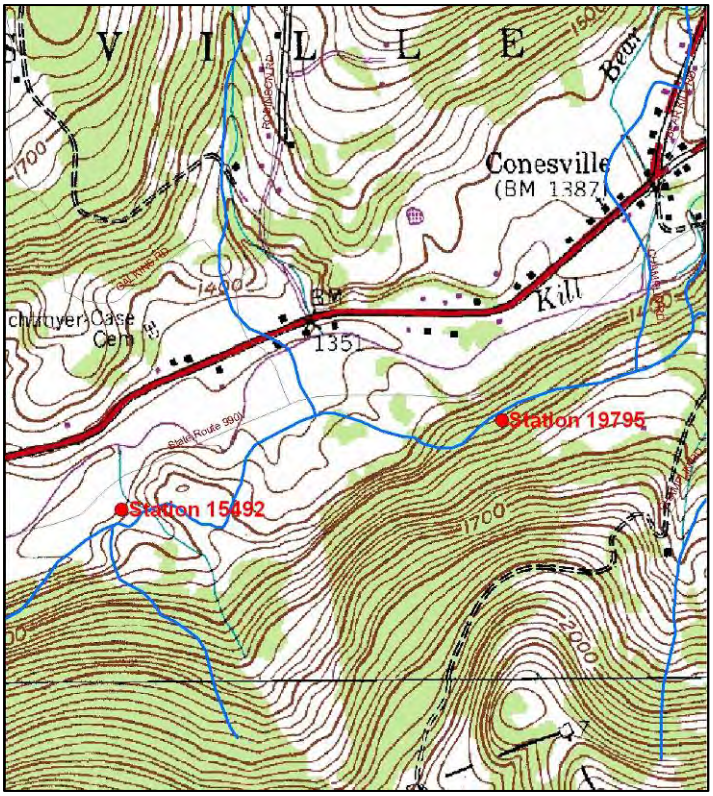
Stream Channel and Floodplain Current Conditions (2008)

Revetment, Berms and Erosion

The 2008 stream feature inventory revealed that 24% (2,714ft) of the streambanks exhibited signs of active erosion along the 11,374 ft. of total streambank length in the unit (Figure 4.7.1). *Revetment* has been installed on 6.7% (767 ft.) of the streambanks. Approximately 0% (0 ft.) of the streambanks have been bermed.

Stream Channel Conditions (2008)

The following description of stream channel conditions references insets in foldout, Figure 4.7.1. Stream stationing presented on this map is measured in feet and begins at the confluence with the Schoharie Reservoir in Conesville. "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 2008.



1980 USGS topographic map – Prattsville Quadrangle contour interval 20ft

Management unit #7 began at Station 15492. The drainage area ranged from 30.25 mi^2 at the top of the management unit to 31.58 mi^2 at the bottom of the unit. The valley slope was 0.44%.

Valley morphology in this management unit was relatively unconfined with a broad glacial and *alluvial* valley flat. Along the middle portion of this management unit, morphology was influenced by the encroachment of State Route 990V. Generally, stream conditions in this management unit were relatively unstable, with deficient sediment

transport ability resulting in aggradational conditions throughout, and approximately 2,714 feet of erosion. There were 12 eroding banks documented in this management unit; no mass failures were observed during the assessment. Management efforts in this unit should focus on preservation of existing wetlands and forested areas and improvements to the riparian buffer by planting *herbaceous* areas with native trees and shrubs.

Wetland boundary approximately delineated by NWI Stations 16055 – 14985

Riparian Planting Site at Stations 15127 - 14683

Management Unit 7 began along the downstream portion of a 1.3 acre palustrine, wetland, followed by a 1.1 acre palustrine wetland; both wetlands started in management unit 6 and continued into management unit 7. These wetlands are classified PEM1E, *palustrine, emergent, persistent, seasonally flooded/saturated*, and PSS1E, *palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated*, respectively (see Section 2.6 for detailed wetland type descriptions). 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.

Along the right streambank, there was a piped outfall (Station 15368) that appeared to receive intermittent flow. This drainage pipe did not have outfall protection. Continuing downstream, there were multiple areas of channel *aggradation*, the process by which streams are raised in elevation by the deposition of material eroded and transported from other areas. These areas included transverse, point and center bars. During low flows, the transverse, or diagonal, bar (Station 15294 – 15262) directs flow toward the left streambank.

Transverse Bar at Stations 15294 - 15262

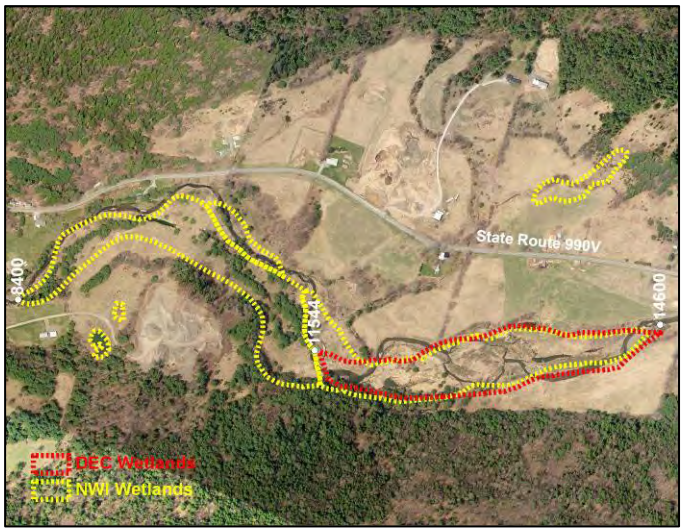
As the stream meandered to the right, there was erosion (Stations 15274 – 14944) along the left streambank for approximately 330 feet. Streambank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows. Along the upstream portion of the erosion, there was a thin line of trees at the top of the bank; along the remainder of the eroding bank, there was a successional old field to the edge of the stream. This area was identified as a proposed riparian planting site (Stations 15127 – 14683). Recommendations for this site include the planting native trees and shrubs along the streambank and the upland area. Enhancing the quality of the buffer with woody vegetation, and increasing the overall buffer width, will help to protect water quality through this reach by slowing stormwater runoff and filtering pollutants associated with nearby land uses. Buffer width should be increased by the greatest amount agreeable to the landowners.

Erosion at Stations 15274 - 14944

Riparian Planting Site at Stations 15127 - 14683

Increasing the buffer width to at least 100 feet will increase the buffer's functionality. The eroding conditions along the upstream portion of the proposed planting site should be given careful consideration when identifying the appropriate species and locations for plantings. Prior to proceeding with any vegetative plantings, a more detailed site assessment may be necessary to determine whether stream bank grading will be required.

Opposite the planting site, the right streambank was reinforced with rock rip rap (Figure 4.7.1, Inset D, Stations 15327 – 14657) for approximately 670 feet. The rip rap was in good structural and functional condition and appeared to provide adequate scour protection. Along substantial portions on the up-and-downstream ends of the revetted streambank there were significant sediment bars with well established herbaceous and



Wetland boundaries approximately delineated by NWI
NYS DEC designated wetland
Stations 14600 - 8400

shrubby vegetation in the right channel bed; through the middle portion of this streambank the channel flowed against the revetment.

Continuing downstream, there was a large Class II New York State designated wetland and a contiguous complex of federal (NWI) wetlands (Stations 14600 – 8400) that occupies the remaining length of this management unit and continues into management unit 8. The Class II NYS wetland began at station 14600, covering approximately 17.5 acres surrounding the stream corridor, and ended at station 11544. The NYS Freshwater Wetlands Act (FWA) classifies wetlands from Class I, wetlands which provide the most benefits, to Class IV, wetlands which provide the fewest benefits. Around every regulated wetland is a regulated adjacent area of 100 feet, which serves as a buffer area for the wetland (NYS DEC, 2003). The first NWI wetland that overlaps the NYS wetland is approximately 15.3 acres and classified PEM1E, *palustrine, emergent, persistent, seasonally flooded/saturated*. This wetland complex continues with two additional palustrine wetlands; one approximately 15.3 acres in size, classified as PEM1/SS1E, *palustrine, emergent, persistent, scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated*, and one approximately 1.7 acres, classified as PEM1C, *palustrine, emergent, persistent, seasonally flooded*.

Erosion at Stations 14431 - 14271

Along the first wetland, there was erosion (Stations 14431 - 14271) on the right streambank for approximately 160 feet. The upstream portion of the erosion had herbaceous vegetation to the edge of the

stream; this vegetation was primarily successional old field with a few willows. Allowing natural succession to proceed along this bank is recommended in order to gain a woody vegetative buffer that may help to improve streambank stability. Also along this eroding bank, there was a compromised tree and a beaver lodge (Station 14366) with abundant woody debris accumulated behind the lodge; this beaver lodge did not appear to be active. Continuing downstream along the erosion, there was a young forest that provided a wooded buffer from the adjacent agricultural fields.

Point Bar at Stations14491 - 14251

Opposite the erosion site, there was a point bar that stretched for approximately 240 feet along the left stream bed. There was an overflow channel along the backside of the point bar. The overflow channel contributed to the excess sediment deposition, particularly along the downstream end of the point bar, which had a steep drop off into a deep pool in the main channel. Just downstream, there was a stream channel crossing or access point (Station 14250) that appeared to be used for recreational purposes, and was only maintained along the right streambank.

Continuing downstream, there was erosion (Stations 14180 – 14043) along the left streambank for approximately 137 feet. There was a successional old field to the top of the streambank; the face of the bank was exposed with herbaceous vegetation becoming established along the toe of the bank. Recommendations for this site include refraining from periodic mowing or maintenance of the field, allowing succession to proceed with natural regeneration of shrub and early successional tree species. Over time this site may self-recover.

Erosion at Stations 14180 - 14043

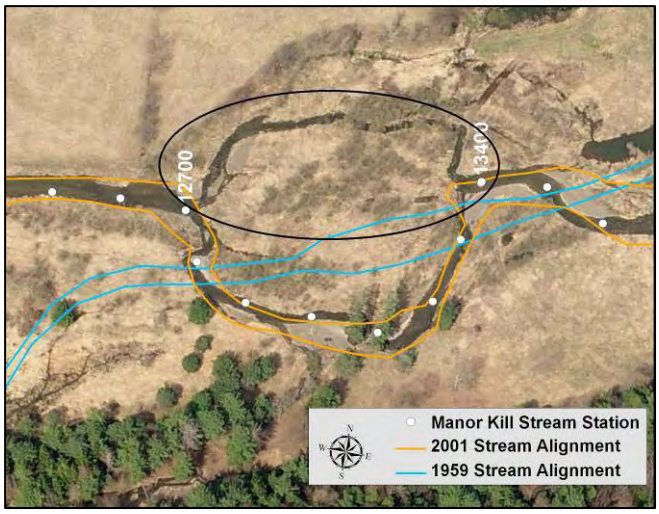
Beaver Dam at Station 14007

Further downstream, there was a beaver dam (Station 14007) that was actively being constructed or maintained, with evidence of fresh beaver damage to the willows upstream and downstream of the dam along the right streambank. This dam contributed to upstream backwater and downstream aggradational conditions, including a center bar followed by a transverse bar. Behind the willow vegetated streambank along the right, there was a backwater channel with relatively deep water and two beaver lodges (Figure 4.7.1, Inset B, Stations 13622 and 13567). Although there was not a channel divergence observed during the assessment, this area may serve as an over flow channel during periods of high flow. In the main channel, there were multiple occurrences of woody debris and large trees (between Stations 13748 and 13674) that contributed to localized scour and aggradational conditions. There appeared to be active construction of a second beaver dam (Station 13519) further downstream; this dam began along the left streambank and only occupied a portion of the channel. Due to the multiple beaver dams and woody debris accumulations there were abundant aggradational features along this stretch of the stream including, multiple center, point, transverse and side bars and areas of full channel aggradation.

Further downstream, there was erosion (Station 13464) along the right streambank that started at the confluence of the back water channel and continued for approximately 293 feet. The erosion along this bank was relatively minor, with exposed roots and a mix of herbaceous and shrubby vegetation to the stream's edge. Along this stretch of stream, there was a channel *divergence* (Station 13393), where a flood chute split off from the

Erosion at Station 13464

main channel. Flood chutes convey flow through a secondary channel during periods of high flows; this flood chute converged (Station 12665) with the main channel approximately 728 feet downstream. Based on a review of the historic and recent aerial photographs, this area has experienced significant lateral migration. Sometime between 1980 and 2001, the relatively straight channel observed in the 1959, 1967 and 1980 aerial imagery, meandered to the left, creating a new more sinuous channel. This new channel appeared to function as the main channel through 2006 (stream stationing based on 2006 aerials), and a less significant channel meandered to the right (see area indicated with black oval). Between 2006 and the 2008 assessment, the existing secondary channel (right (black oval)) became the main channel, while the left channel (previously mentioned, Stations 13393 – 12665) appeared to be cut off from the main channel due to abundant woody debris and aggradation. This channel may function as an overflow channel during very high flood flows.



Lateral Migration between Stations 13400 - 12700

Full Channel Aggradation at Stations 13380-13225, Secondary Channel
Photograph Orientation, Looking Upstream

At the time of the assessment, there was no surface flow along the upstream portion of the secondary channel. There was excess sediment deposition beginning at the channel divergence and continuing for much of the secondary channel. This included full channel aggradation (Stations 13380 – 13225) for approximately 155 feet, followed by multiple point bars. Herbaceous vegetation was becoming well established through the upstream portion of the channel. Continuing downstream along

Woody Debris at Station 13050
Secondary Channel

the secondary channel, it appeared as though much of this excess sediment deposition was caused by a large fallen tree and accumulated woody debris (Station 13050) that posed a significant obstruction to channel flow. Downstream of the fallen tree, there was surface flow, additional woody debris, and the aggradational conditions persisted.

Continuing along the main channel, there was erosion (Station 13344) along the left streambank for approximately 257 feet. There were willows along the top of the streambank and herbaceous vegetation on the face of the bank; some areas had exposed and undercut roots, and there were compromised and fallen shrubs along a portion of the eroding bank. These shrubs posed minor obstructions to flow and appeared to contribute to aggradational conditions along this stretch of stream. There were also two channel convergences (approximate Stations 13070 – 13060) that entered along the right streambank. At the time of the assessment, a divergence point was not observed; these channels may function as overflow channels and may drain from adjacent areas of open water wetland habitats. Downstream of the overflow channels, the right streambank was experiencing minor erosion for approximately 94 feet, and there was a large tree along the right channel bed that appeared to contribute to localized scour of the channel bed and toe of the streambank. An additional convergence was observed downstream of the erosion (approximate Station 12918) after which the erosion continued for an additional 140 feet. Aggradational conditions persisted along this stretch of the stream and including multiple transverse, point, and side bars.

Erosion at approximate Stations 13050-12960

Continuing along the stream, two proposed planting sites (Stations 12927-12652

Proposed Planting Site Stations 12627-12201

and 12627-12201) were identified along the right bank. These planting sites were separated by a thin row of trees that ran perpendicular to the stream. Recommendations for these sites include planting native trees and shrubs along the streambank and the upland area. Buffer width should be increased by the greatest amount agreeable to the landowners. Increasing the buffer width to at least 100 feet will increase the buffer's functionality. Portions of both proposed planting sites are experiencing erosion; therefore, prior to proceeding with any vegetative plantings careful consideration should be given to identifying the appropriate species and locations for plantings. A more detailed site assessment may be necessary to determine whether stream bank grading will be required.

During the field assessment, the right bank along the second planting site was identified as a proposed Bank Erosion Monitoring Site (BEMS) to study erosion along this reach. To monitor BEMS, a cross-section and long profile may be conducted to collect baseline data. Once the baseline data has been collected, this cross-section can be resurveyed in the future to calculate the bank's erosion rate. Improving the riparian buffer along this site is important however, other stream bank stabilization techniques may be required to reinforce the bank and to minimize any loss of planted vegetation. Toward the end of this erosion site, clay was exposed (Figure 4.7.1, Inset B, Stations 12300-12172) along the streambank and channel bed for approximately 166 feet. 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.

BEMS at Stations 12637-12169

As the stream meandered downstream, a tributary (Station 12034) entered from the left streambank. This tributary appeared to receive its flow from a wetland complex. Beavers were active in this section as evident by felled trees and shrubs. Continuing downstream a beaver dam (Station 11769) had been constructed across the stream channel. The dam appeared to be actively maintained and contributed to backwater and downstream aggradational conditions as well as scour along both banks downstream of the dam. While beaver impoundments can sometimes be a nuisance, beavers have historically played a beneficial and ecologically important role in the stream system. Beaver activity adds organic debris (trees, leaves, etc. which provide the base of the food chain), reduces water velocities and flood-related hazards downstream, and creates wetland areas that filter sediment and release water to the stream and groundwater slowly throughout the year. Excess deposition persisted throughout this stretch of stream including multiple point, center and transverse bars. Along the left streambank a convergence (Station 11725) of a secondary channel was observed. This convergence appeared to contribute to localized downstream aggradational conditions. Opposite of the convergence, a divergence (Station 11713) was observed along the right bank. This divergence rejoined the main channel approximately 250 feet downstream. Along the left streambank, hydraulic erosion (Stations 11688-11500) was observed for 208 feet where herbaceous vegetation had been maintained to the edge of the bank. A large tree had fallen from the upstream end across the stream channel contributing to upstream and downstream aggradational conditions, as well as localized scour of the channel and left bank. Along the downstream end of the erosion, two large pines also appeared to be compromised as the bank continued to erode.

Beaver Dam at Station 11769

Obstruction a t Station 11653

Proposed Planting Sites at Stations 11694-11515 and 11437-11061

This erosion was along a proposed riparian planting site (Stations 11694-11515). Recommendations for this site include discontinued mowing to the stream's edge to allow succession to proceed with natural regeneration of shrub and early successional tree species. Buffer width should be increased by the greatest amount agreeable to the landowners; however erosion along this site may need to be addressed prior to proceeding with any riparian plantings of native sedge, shrub and tree species. A more detailed site assessment may be necessary to determine whether stream bank grading will be required. Downstream along the right streambank an additional proposed riparian planting site was identified (Stations 11437-11061). This site included a successional old field with few shrubs and trees. Recommendations include continuing to allow succession to proceed by not mowing, and planting native trees and shrubs along the streambank and the upland area, increasing the buffer width to at least 100 feet.

As the stream meandered to the left, a tributary (Station 11029) entered from the right streambank. This tributary drains the slopes of Bull Hill Mountain before it reaches the flatter topography of the valley floor where it enters the Manor Kill. The New York State Department of Environmental Conservation classifies streams and rivers based on their "best use" (NYSDEC, 1994). This tributary was classified C by the NYS DEC, indicating that the best uses for this stream are supporting fisheries and other recreational activities. Downstream of the tributary were multiple depositional features including transverse and point bars. Excess deposition is a common feature of confluence areas, which often contain

Transverse Bar at Stations 10914-10854

extensive sediment bars, function as important sediment storage areas, and are typically among the most dynamic and changeable areas in the stream system.

Erosion at Stations 10630-10266

Continuing downstream there was erosion (Stations 10630-10266) along the left streambank for 365 feet. Along this erosion, vegetation was a mix of grasses, shrubs and trees. The woody vegetation had been compromised along the undercut banks, with exposed roots and one tree that had fallen along the downstream portion of the erosion site (Figure 4.7.1 Inset A, Station 10505). Following the erosion, a proposed planting site (Stations 10226-10146) was identified along the left streambank. This site contained successional old field with sedges at the toe of bank. Upstream and downstream of this site was forested. Recommendations include continuing to allow succession by not mowing, and planting native trees and shrubs along the streambank and the upland area to connect with adjacent forested areas.

As the stream meandered to the left, Japanese knotweed (Station 10056) was observed on the left bank. This was the first and only observation of knotweed in this management unit. Japanese knotweed is an invasive non-native species which does not provide adequate erosion protection due to its very shallow rooting system, and also grows rapidly to crowd out more beneficial streamside vegetation. The best means for controlling knotweed is prevention of its spread. Therefore, effort should be made to ensure that existing stands are not fragmented via unnatural processes (i.e. mowing without removal of all mowed material) and transported into downstream areas. Small stands should be eradicated immediately to avoid further spread within this unit and to

Japanese Knotweed at Station 10056

downstream management units. There are removal methods that may be used for larger stands (see Section 2.7), these methods should be used with caution, and carefully executed to avoid further spread of Japanese knotweed.

Revetment at Stations 9900-9779

As the stream meandered toward State Route 990V, the right streambank had been reinforced with rock rip-rap (Stations 9900-9779) along the toe of the bank for approximately 90 feet in Management Unit 7 and continued into Management Unit 8 for an additional 40 feet. The rip-rap appeared to be old and consisted of natural large boulders, was in fair functional condition and poor structural condition; however it appeared to provide adequate scour protection. Vegetation along the revetment was a mixture of grasses, shrubs and trees. Management Unit 7 ended at Station 9805.

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 3.2 for more details on Stream Processes).

Sediment transport in this unit is influenced by valley morphology and multiple beaver dams and woody debris obstructions. The unconfined valley form and topography suggest that this unit is a sediment storage zone, supplied by tributaries and active erosion. This unit suffers from wide-spread sediment transport deficiencies. Bed load transported through this unit exceeds the transport capacity of this management unit, resulting in channel aggradation and some areas of lateral migration. In general, sediment storage areas benefit the general health of the stream system by limiting bedload delivered to downstream reaches during large storm events. However, mature riparian vegetation will be important in such settings to limit the extent of lateral channel migration and continued bank erosion.

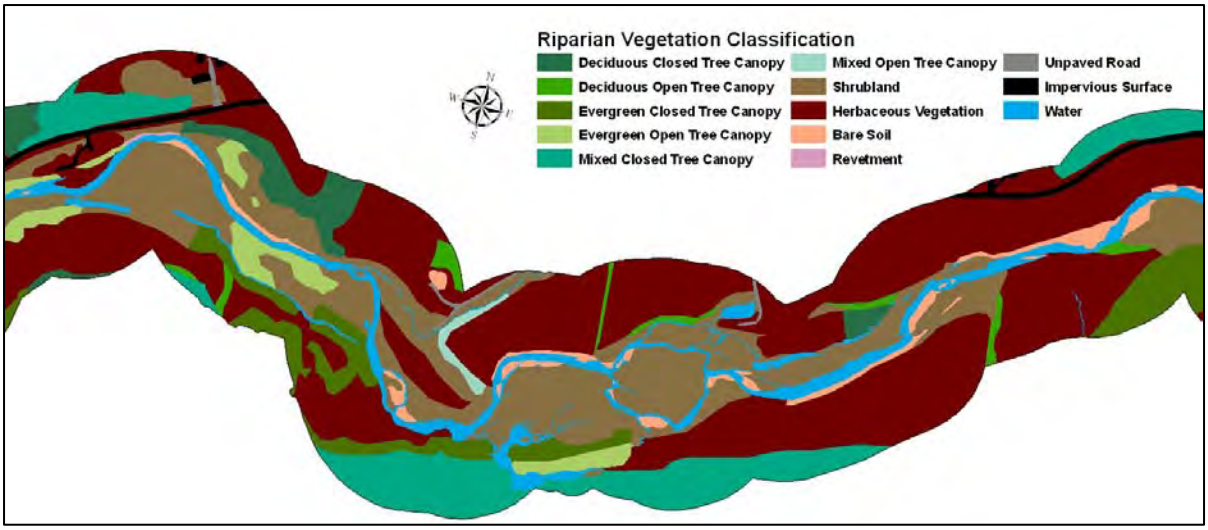
Riparian Vegetation

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. There were seven riparian improvement planting sites documented within this management unit; proposed planting sites cover approximately 17.2 percent of the streambanks in this unit.

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 result can include rapid streambank erosion and increased surface runoff leading to a loss of valuable topsoil. Japanese knotweed locations were documented as part of the stream feature inventory conducted during the summer of

Japanese knotweed at Station 42469

2008 (Riparian Vegetation Mapping, Section 2.7). In total, one 10-foot long patch of Japanese knotweed was documented during the stream feature inventory. The best means for controlling knotweed is prevention of its spread, therefore, effort should be made to ensure that all fill brought into the area is clean and does not have fragments of knotweed or other invasive plants. If Japanese knotweed sprouts, or small stands are observed, they should be eradicated immediately to avoid further spread within this unit and to downstream management units.



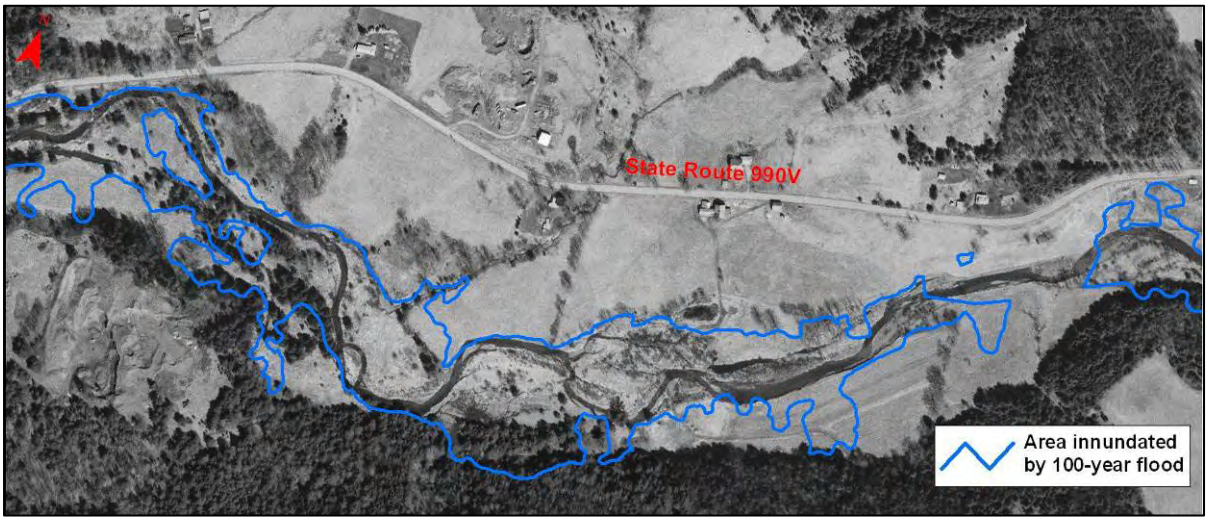
Riparian vegetation classification map based on aerial photography from 2006

An analysis of vegetation was conducted using aerial photography from 2006 and field inventories (see above map and Riparian Vegetation Mapping, Section 2.7). In this management unit, the predominant vegetation type within the 300 ft. riparian buffer was herbaceous (43.2%) followed by shrubland (23.06%). Impervious area (1.05 %) within this unit's buffer was primarily the local and private roadways. 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.

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



100-year floodplain boundary map

the Manor Kill on the basis of recent surveys. The new FIRM hardcopy maps are available for viewing at the Schoharie County Soil & Water Conservation District Office.

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 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 poor throughout this management unit. Canopy cover was inadequate along a significant portion of both streambanks and aggredational conditions persisted throughout the unit. However, there were some areas of woody debris accumulation observed in the unit. Woody debris provides critical habitat for fish and insects, and added essential organic matter that will benefit organisms downstream.

In 2008, researchers from SUNY Cobleskill conducted macroinvertebrate and fish surveys along the Manor Kill. There were two sampling sites within Management Unit 7.

See the macroinvertebrate and fish reports (Appendix F) for more detailed information regarding the surveys and their findings.

It is recommended that an aquatic habitat study be conducted on the Manor Kill 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 Manor Kill. Fine sediment inputs into a stream increase turbidity and can act as a transport mechanism for other pollutants and pathogens. There was one significant 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 the Manor Kill. The cumulative impact of oil, grease, sediment, salt, litter and other unseen pollutants found in road runoff can significantly degrade water quality. There was one stormwater culvert observed in this management unit in 2008.

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. There were no buildings located in close proximity to the stream channel in this management unit. However, building owners should inspect their septic 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 2007, no homeowners within the drainage area of this management unit had made use of these programs to replace or repair a septic system.

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