East Kill Management Unit 7

Town of Jewett – Station 37758 to Route 296 Bridge (Station 26386)

This management unit began at Station 37758, and continued approximately 11,372 ft. to Route 296 Bridge (#1045150) in the Town of Jewett.

Management Unit 7 location
see Figure 4.0.1 for more detailed map

<u>Stream Feature Statistics</u>

10.1% of stream banks experiencing erosion
0.4% of stream banks have been stabilized
0% of stream banks have been bermed
428 feet of clay exposures
26.7 acres of inadequate vegetation
5,544 feet of road within 300ft. of stream

Summary of Recommendations Management Unit 7	
Intervention Level	Assisted Self-Recovery
Stream Morphology	No recommendations at this time
Riparian Vegetation	Prevent the spread of Japanese knotweed where feasible. Increase width of riparian buffer in appropriate locations.
Infrastructure	Interplant rip-rap installations
Aquatic Habitat	Watershed Aquatic Habitat Study
Flood Related Threats	No recommendations at this time
Water Quality	No recommendations at this time
Further Assessment	Continue monitoring of Bank Erosion Monitoring Site (Station 34559). Consider hydraulic analysis of bridge openings

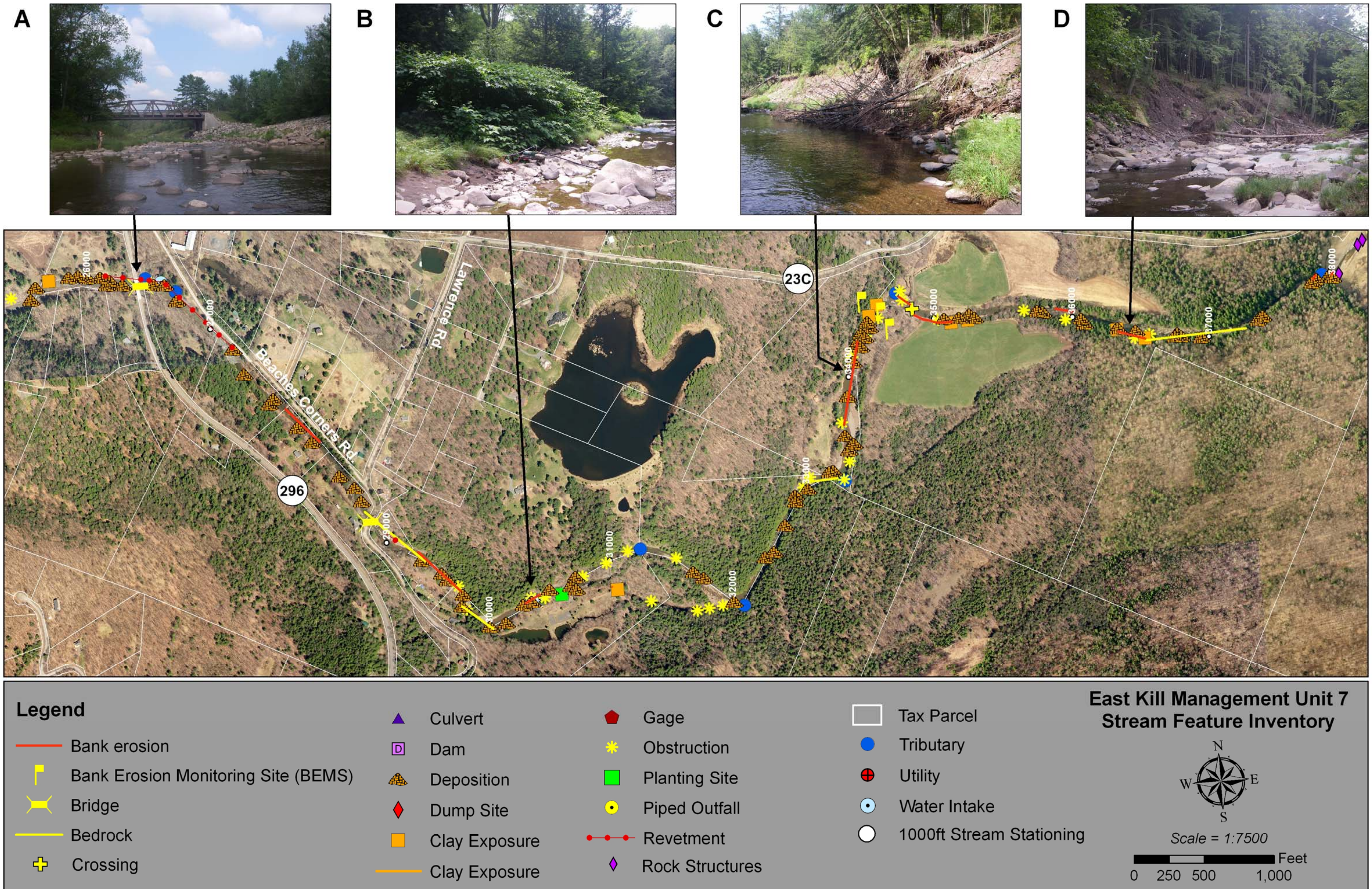


Figure 4.7.1 Management Unit 7 - 2006 aerial photography with stream feature inventory

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 alignment has not changed significantly over the years along this management unit; the channel has remained fairly stable.

As of 2006, according to available NYSDEC records dating back to 1996, there has been one stream disturbance permit issued in this management unit. Following the 1996 flood, a permit was issued for removal of tree and brush debris, the excavation of sand and gravel to restore stream flows to pre-flood conditions near station 31439, and for the installation or repair of rock rip-rap along the stream bank.

Stream Channel and Floodplain Current Conditions (2006)

Revetment, Berms and Erosion

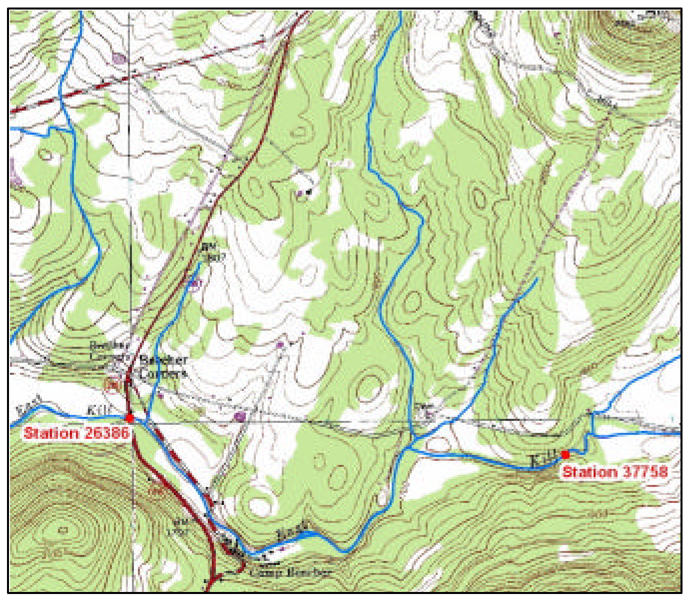
The 2006 stream feature inventory revealed that 10.1% (2,298 ft) of the stream banks exhibited signs of active erosion along the 22,743 ft of total channel length in the unit (Figure 4.7.1). *Revetment* had been installed on 0.4% (85 ft) of the stream banks. No berms were identified in this management 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 4.7.1. Stream stationing presented on this map is measured in feet and begins at the confluence with the Schoharie Creek at Jewett. "Left" and "right" stream bank 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 #7 began at Station 37758. The drainage area ranged from 20.93 mi^2 at the top of the management unit to 25.76 mi^2 at the bottom of the unit. The valley slope was 0.75%.

Valley *morphology* in this management unit was laterally controlled at the top of the unit by a narrow valley floor. Moving downstream, valley morphology was relatively unconfined with a broad glacial and *alluvial* valley flat, until it was influenced by the encroachment of Beaches Corners Road through the downstream portion of this management unit. Generally, stream conditions in this management unit were somewhat unstable. There were ten eroding banks documented, including three mass failures. 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 and revetted stream banks with native trees and shrubs.



1980 USGS topographic map – Hunter Quadrangle contour interval 20ft

This management unit began downstream of the Farber Farm Restoration Project at station 37758. At the time of the assessment there was full channel *aggradation*, the process by which streams are raised in elevation by the deposition of material eroded and transported

Bedrock at Stations 37268 - 36553

from other areas, which started in management unit #6 and continued through the beginning of management unit #7. As the stream gently meandered to the right, there was bedrock (Stations 37268 - 36553) along the left stream bank and bed for approximately 715 feet. Along this stretch of the stream sediment size increased with many boulders in the stream and bedrock extending across the channel along the downstream half of the bedrock section. The bedrock provided lateral control by limiting stream bank erosion; it also provided grade control for the channel by preventing *degradation* or *downcutting* of the stream, the process by which streambeds and floodplains are lowered in elevation by eroding downward into the stream bed over time.

Throughout the bedrock controlled stream channel there was excessive deposition, or accumulation of sediment on the channel bed including, full channel aggradation, a center bar, a side bar (Station 36946) along the left, and a *point* bar along the right. A point bar is a depositional feature usually located on the inside of a meander bends, and caused by a decrease in sediment transport capacity. At the downstream end of the bedrock channel there was abundant woody debris along both stream banks (near Station 36550). The woody debris along the right bank appeared to contribute to some minor localized scour upstream and downstream of the debris.

Side bar at Station 36946

Following the bedrock, there was a *mass failure* (Stations 36548 – 36336, (Figure 4.7.1, Inset D), a large slope failure associated with a down-cutting stream channel and undermined support of steep slopes. This mass failure had resulted in an erosion area of approximately 5,311 ft^2, exposing areas of mixed till and compromising mature trees along the left stream bank. During high flows and times of active erosion, a significant amount of clay may enter the stream from this bank due to the lacustrine clay exposure (Stations 36540 – 36334) along the stream bank and the left channel bed. 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. Excessive sediment deposition continued downstream.

Clay exposure at Stations 36540 - 36334

Further downstream, there was a center bar (Station 36067) with a small side channel flowing along the toe of the right stream bank causing erosion (Stations 36016) along approximately 150 feet of the bank. There was a narrow riparian buffer along the bank, beyond which there was an open agricultural field with herbaceous vegetation to the top of the bank. This erosion site may be a good candidate for remediation using vegetative toe and bank protection. Sedge plantings may help to reinforce the toe of the bank. A vigorous buffer with mature trees is important at this site because it may also filter nutrients and pollutants, if any, from the adjacent agricultural fields. Recommendations for this site include the augmentation of the existing buffer with the planting of additional native trees and shrubs along the stream bank 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 functionality. Prior to proceeding with any work, this site would require a more detailed site assessment.

Transverse bar at Stations 35300 - 35182

Continuing downstream, there were woody debris accumulations along both stream banks, and excessive sediment deposition continued. There was a *transverse bar* (Stations 35300 – 35182), or diagonal accumulation of sediment, with a three foot drop into the main stem; there was also full channel aggradation and a side bar along the right stream bank. Along approximately 120 feet of the left bank, there was a clay exposure (Stations 35244 – 35124) at the toe of the undercut bank.

As the stream meandered to the right, there was an erosion area of approximately 2,918 ft^2 along the left bank. Stream bank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows. Mature vegetation had been compromised resulting in a fallen tree across the channel that provided a minor obstruction (Station 35026) at low flows and contributed to localized scour upstream.

Erosion at Stations 35137 - 34845

There was a narrow riparian buffer along the bank, beyond which there was an open agricultural field, with herbaceous vegetation to the top of the bank. Recommendations for this area are similar to those of the previous erosion site that was located along agricultural fields, including riparian plantings of native trees and shrubs to enhance the buffer width to the greatest amount agreeable to the landowner, and to improve buffer functionality.

At the downstream end of this erosion site, there was a stream crossing (Station 34825) that provided access to the agricultural fields along the left side of the stream. Maintenance of this crossing may provide a sediment source for continued aggradational conditions downstream of the crossing. Just downstream of the crossing there was a channel *divergence* (near Station 34800) where a flood chute split off from the main channel. Flood chutes convey flow through a

Stream crossing at Station 34825

secondary channel during periods of high flows; this flood chute converges (Station 33521) with the main channel approximately 976 feet downstream. There was also a historic dam (near Station 34800) that appeared to influence flow through this flood chute.

Downstream of the crossing, there was an erosional area of approximately 692 ft^2 along the right stream bank adjacent to a farm field with maintained herbaceous vegetation. Maintaining a riparian buffer with native deep-rooted woody species may help to improve stream bank stability along these farm fields.

Beaver dam at Station 34670

Just before the stream made a sharp turn to the left, there was a beaver dam (Station 34670) along the right stream bank that contributed to upstream backwater conditions. 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 slowly throughout the year. Just downstream, an unnamed tributary entered along the right (Station 34663). This tributary drains the lower slopes of Cave Mountain and Round Hill before it enters the East 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 were supporting fisheries and other non-contact activities.

Japanese knotweed at Station 34666

Near the beaver dam and tributary, there was also the first observed Japanese knotweed stand (Station 34666), along approximately 100 feet of the right stream bank. 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 width of this knotweed stand was approximately 50 feet, therefore eradication at this location would be difficult. To prevent continued localized spread of this stand, this site should be carefully managed (See Section 2.7 Riparian Vegetation). Due to the amount of knotweed and its proximity to the stream edge, this stand will likely provide a source for continued downstream establishment of knotweed stands from broken stems caused by high flows and beaver activity. Planting hardy native shrubs at the toe of the bank may help to reduce the potential for erosion at this site and provide a buffer to minimize the broken knotweed stems from entering the stream and populating the downstream bed and bank.

Concrete abutment remains at Station 34619

Just downstream there were the remains of an old concrete abutment (Station 34619) along both stream banks. The remains did not appear to have a significant impact on the stream channel at low flows. However, during high flows they may contribute to the aggradational conditions along this stretch of the stream and may provide some localized lateral control.

Mass failure at Stations 34559 - 34461

As the stream continued to meander to the left, there was a mass failure (Stations 34559 – 34461) along the right. Streambank erosion often occurs on the outside of meander bends where the stream velocity is greatest during high flows; along this section of stream, the thalweg flowed up against the toe of the bank undermining the steep slope, exposing mixed till and compromising mature trees along the bank. During high flows and times of active erosion, a significant amount of clay may enter the stream from this bank; this poses a water quality threat due to the turbidity associated with clay exposures. To study erosion along this reach, this bank has been monumented as a Bank Erosion Monitoring Site (BEMS # 06EK2085, Station 34559). A cross-section and long profile survey were conducted to collect baseline data. In the future this cross-section can be resurveyed to calculate the bank's erosion rate. It is recommended that monitoring of this site continue.

Wetland boundary approximately delineated by NWI (Stations 34511 - 34348)

Along the meander bend, there was a 0.5 acre riverine wetland (Stations 34511 - 34348) that was classified as R3USA (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. There was abundant woody debris accumulation and aggradational conditions through this stretch of the stream.

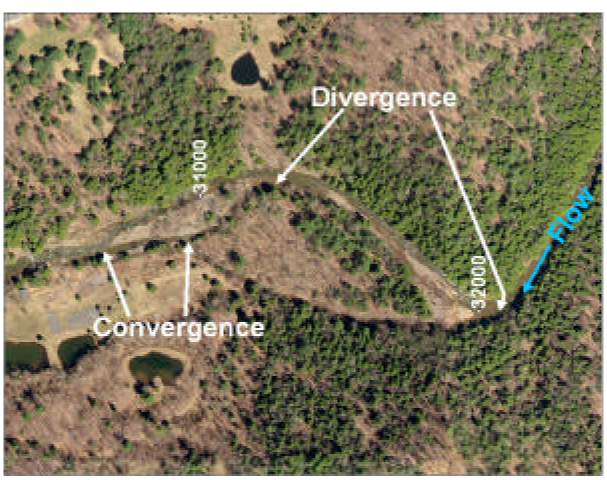
Tributary at Station 33265

Continuing downstream, there was a short stretch of forested bank followed by a high steep bank that was eroding for approximately 613 feet on the right. Along this erosion site (Stations 34258 – 33645, Figure 4.7.1 Inset C) there were several fallen trees and minimal herbaceous vegetation on the face and toe of the bank. Opposite this eroding bank there were three small patches of Japanese knotweed along the left stream bank. Excessive sediment deposition continued along this reach including, side, point, center and transverse bars. As the stream meandered to the right, a small intermittent unnamed tributary (Station 33265) entered along the left stream bank.

As the stream meandered to the left, there was bedrock (Station 33242 - 33051) along the left channel bed with some along the bank, gradually covering the full bed of the stream channel, for approximately 191 feet. The upstream portion of the bedrock provided some lateral control by limiting stream bank erosion; it also provided grade control for the channel by preventing downcutting of the stream. Aggradational conditions persisted downstream of the bedrock including side and transverse bars.

At the downstream end of the bedrock there was significant woody debris (Stations 33069 – 33009) accumulated along approximately 60 feet of the right stream bank. At the time of the assessment, it appeared to contribute to the excessive sediment deposition upstream of the debris and localized scour along the right bank. There was a small patch of knotweed just downstream.

Woody debris at Stations 33069 - 33009



Split channel between Stations 32020 – 30665
Flood chute between Stations 31276 – 30900

As the stream meandered to the right, there was a small intermittent unnamed tributary (Station 32061) entering along the steep forested bank on the left. Just downstream of the tributary there was a channel divergence (Station 32020) forming a split channel around a well established vegetated center bar. The main channel flowed along the right of the center bar; at the time of the assessment there was a considerable amount of flow in the left channel. At the start of the center bar, there was newly deposited sediment and herbaceous vegetation, including grasses and sedges, followed by forest throughout much of the center bar with herbaceous areas interspersed and at the downstream end of the bar where the two channels converge (Station 30665). There was abundant woody debris accumulated along the center bar. Along the downstream portion of the center bar, there was a second channel divergence (Station 31276) on the right, forming a *flood chute* that had carved a channel through the forested center bar and converged (Station 30900) with the secondary channel on the left. During the field inventory and assessment, both the main channel and the secondary channel were assessed.

Wetland boundaris approximately delineated by NWI (between Stations 31962 - 30100)

Downstream of the first channel divergence, there were multiple wetlands along the left. The first wetland (Stations 31962 – 31535) was a 0.9 acre palustrine wetland that was classified as PEM1A, followed by a 1.2 acre palustrine wetland (Station 31168 – 30562) that was classified PFO1A (see Section 2.6 for detailed wetland type descriptions). Set further back from the stream, there were two open water palustrine wetlands classified as PUBHh, the first (near Station 30450) was 0.1 acre in size and the second (near Station 30200) was 0.3 acre in size.

Along the main channel, downstream of the first divergence, there were multiple woody debris accumulations and excessive sediment deposition along both stream banks. Along this meander bend a stream disturbance permit (near Station 31438) was issued following the flood in 1996. The permit was issue for debris removal, stream bank

Clay exposure along secondary channel

stabilization measures and excavation of sand and gravel to restore stream flows to pre-flood conditions. There was also a stand of Japanese knotweed along approximately 46 feet of the left stream bank.

Along the downstream end of the secondary channel, there were multiple accumulations of woody debris along both stream banks. There was also an erosion site along approximately 11 feet of the stream bank that had exposed lacustrine clay along the bed and bank. Aggradational conditions persisted downstream.

Riparian planting site at Station 30576

Just downstream of the split channel convergence, a potential riparian planting site was identified along the left stream bank (Station 30576). Recommendations for this site include augmentation of the existing buffer with the planting of additional 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 functionality and protect the stream from nearby land uses. Adding vegetation is particularly critical since there is relatively little land separating the pond from the stream. During high flows the area between the pond and stream may be at risk of becoming saturated and washing downstream.


Erosion at Stations 30442 - 30309

Continuing downstream, there was a mass failure (Stations 30442 – 30309) along the right stream bank. This mass failure had resulted in an erosion area of approximately 5,322 ft^2, compromising mature trees along the bank. Although this bank was a significant erosion site, it appeared to be slowly recovering, with herbaceous vegetation becoming established on the face of the bank. However, without deep-rooted shrub and tree species, this bank may continue to erode during future high flows. This erosion site may self recover with time; however, it may also be a good candidate for remediation using vegetative toe and bank protection. Prior to proceeding with any work, this site would require a more detailed site assessment. Opposite the eroding bank there was a water intake pipe (Station 30370) through a stand of Japanese knotweed (Stations 30370 - 30047, Figure 4.7.1 Inset B) along approximately 323 feet of the left stream bank. Aggradational conditions persisted through this stretch of the stream.

As the stream meandered to the right, the left stream bank and bed was laterally controlled by approximately 276 feet of bedrock (Stations 30035 - 29759). Along the left, there was a large tree (Station 29794) in the stream channel that provided a minor obstruction to flow and appeared to contribute to localized aggradational conditions.

Mass failure at Stations 29657 - 29235

As the stream gently meandered to the left the *thalweg*, or deepest part of the stream channel, flowed up against the right stream bank causing a mass failure (Stations 29657 – 29235). Along this erosion site, the steep forested bank was undermined resulting in an erosion area of approximately 12,667 ft^2 and compromising mature trees along the bank. Opposite the eroding bank, there was a stand of Japanese knotweed (Stations 29367 – 29168) that had colonized a side bar along the left bank.

Bedrock at Stations 29312 – 28756
photo orientation – looking upstream

Continuing downstream, there was bedrock (Stations 29312 – 28756) across the full channel for approximately 556 feet. The bedrock provided grade control for the stream by preventing degradation or downcutting of

Bridge at Station 28817

the channel bed. Along the bedrock channel there was a stacked rock wall (Stations 29042 – 28957) reinforcing approximately 85 feet of the right stream bank. The rock wall was in poor functional condition and had begun to fail structurally. The stream bank was forested and there was herbaceous and shrubby vegetation interspersed through the rock wall. The stream bank appeared to be stable despite the conditions of the revetment.

The bedrock channel continued through the Beaches Corners Road Bridge (Station 28817, Bridge # 3201150). This bridge may constrict stream flow during periods of very high water, but it appeared to have an adequate span that would pass most flows effectively. At the time of the assessment, aggradational conditions were noted downstream of the bridge. If this bridge is replaced in the future, it is recommended that a hydraulic analysis be conducted in order to determine the appropriate bridge width that will provide the capacity to convey flood flows through the opening. Downstream of the bridge, there were multiple stands of Japanese knotweed along the left stream bank.

After the stream flowed under the bridge, it was laterally confined along the right due to the encroachment of Beaches Corners Road. The stability of the road embankment was compromised due to the erosion (Stations 28151 – 27800) along approximately 351 feet of the right stream bank. At the start of the erosion the bank was beginning to fail, moving downstream, the erosion worsened with fallen trees, exposed soil and minimal herbaceous vegetation. There was a narrow forested riparian buffer between the stream and Beaches Corners Road along the upstream portion of the erosion site. The

Erosion at Stations 28151 – 27800
photo orientation – looking upstream

Rip-rap at Stations 27224 – 26386
photo orientation – looking upstream

buffer had fewer mature trees along the downstream portion of the erosion. Recommendations for this site include the augmentation of the existing buffer with the planting of additional native trees and shrubs along the streambank and the upland area. Prior to proceeding with any work, this site would require a more detailed site assessment.

Continuing downstream, aggradational conditions persisted including point and side bars, and there were multiple patches of Japanese knotweed. The stream continued to flow close to Beaches Corners Road and the right embankment was reinforced with approximately 838 feet of rip-rap (Stations 27224 – 26386). The rip-rap appeared to be in good functional condition; the toe of the bank was stabilized with large rock, while the top of the bank had smaller rock that appeared to be in fair structural condition. The type of rock varied moving downstream as well. There was a small amount of herbaceous vegetation that had established itself along the rip-rap, and some Japanese knotweed interspersed along the revetted bank. Removal of this Japanese knotweed is recommended to prevent the spread of this invasive specie (See Section 2.7 Riparian Vegetation), and native shrub and sedge species should be interplanted through this rip-rap to help strengthen the revetment, while enhancing aquatic habitat. The riparian buffer beyond the rip-rap installation was sparse along the upstream portion of the revetted bank, with some shrubs and mown grass to the edge of the bank. The risk to bank stability can be minimized by maintaining mature trees along the top of this bank.

Tributary at Station 26428

Two small unnamed tributaries entered through the rip-rap on the right. The first tributary (Station 26635) had minimal flow under the rip-rap and there was no culvert

Transverse bar at Stations 26555 - 26483
photo orientation – looking upstream

identified at the time of the assessment. This tributary was classified C by the NYS DEC, indicating that the best uses for this stream were supporting fisheries and other non-contact activities. Herbaceous vegetation had grown along the channel of the second tributary (Station 26428) that flowed through the rip-rap. There was also a water intake pipe (Station 26529) along the revetment.

This management unit ended at the Route 296 Bridge (Station 26386, Bridge # 1045150, Figure 4.7.1 Inset A). There was a transverse bar (Stations 26555 – 26483) upstream of the bridge. Aggradational conditions such as this are commonly caused by inadequate sizing of the bridge opening. 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 may backwater, resulting in the upstream aggradation. If this bridge is replaced in the future, it is recommended that a hydraulic analysis be conducted in order to determine the appropriate bridge width that will provide the capacity to convey flood flows.

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).

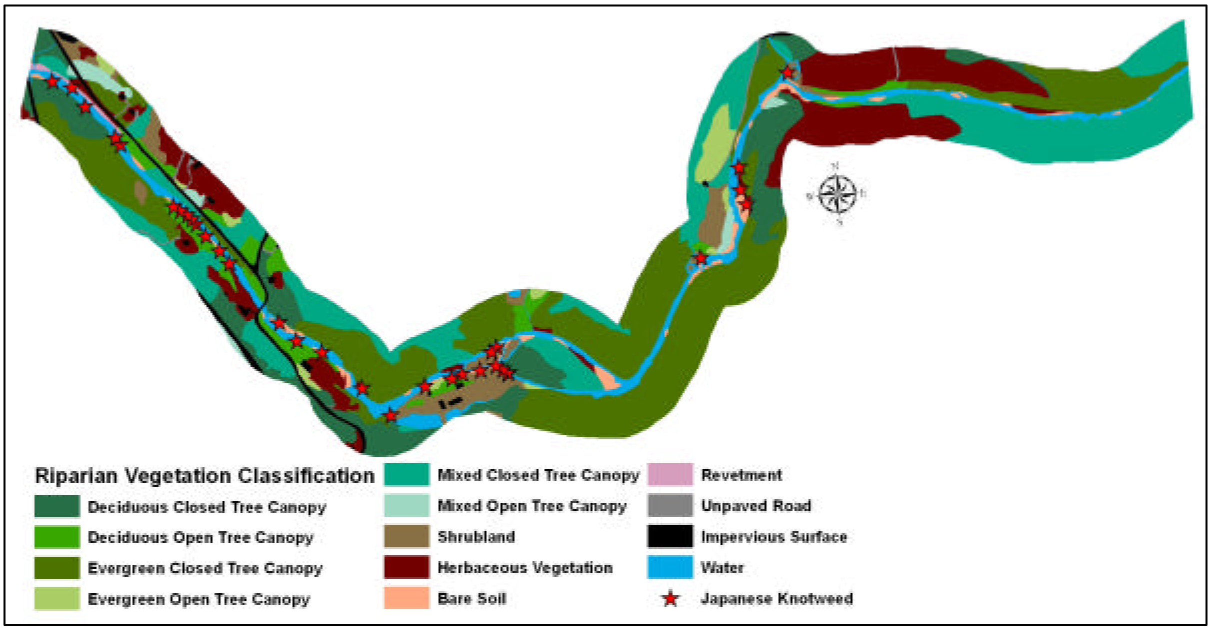
Sediment transport in this unit was influenced by valley morphology. The relatively unconfined valley form and topography suggest that this unit was a sediment storage zone. This unit has experienced wide-spread sediment transport deficiencies. Bed load transported by the stream channel exceeded the transport capacity of management unit #7, resulting in channel aggradation. Sediment storage areas can benefit the general health of the stream system by limiting bed load delivered to downstream reaches during large storm events. Sediment sinks such as this throughout the watershed should be preserved where adjacent land uses permit. Mature riparian vegetation will be important in such settings to limit the extent of lateral channel migration and bank erosion. The ability of the channel to convey sediment was also affected by a bridge that appeared to be contributing to backwater conditions and upstream channel aggradation.

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. One suitable riparian improvement planting site was documented within this management unit. There were also multiple locations within this unit that would benefit from interplanting of revetted embankments and enhancing riparian buffer width.

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 stream banks. The results can include rapid stream bank 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 2006 (Riparian Vegetation Mapping, Appendix B). The first appearance of Japanese knotweed on the East Kill occurred in this management unit. In total, 24 Japanese knotweed occurrences along an estimated length of 1,312 ft were documented in this management unit during the stream feature inventory.

The best means for controlling knotweed is prevention of its spread, therefore, efforts 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 downstream management units.

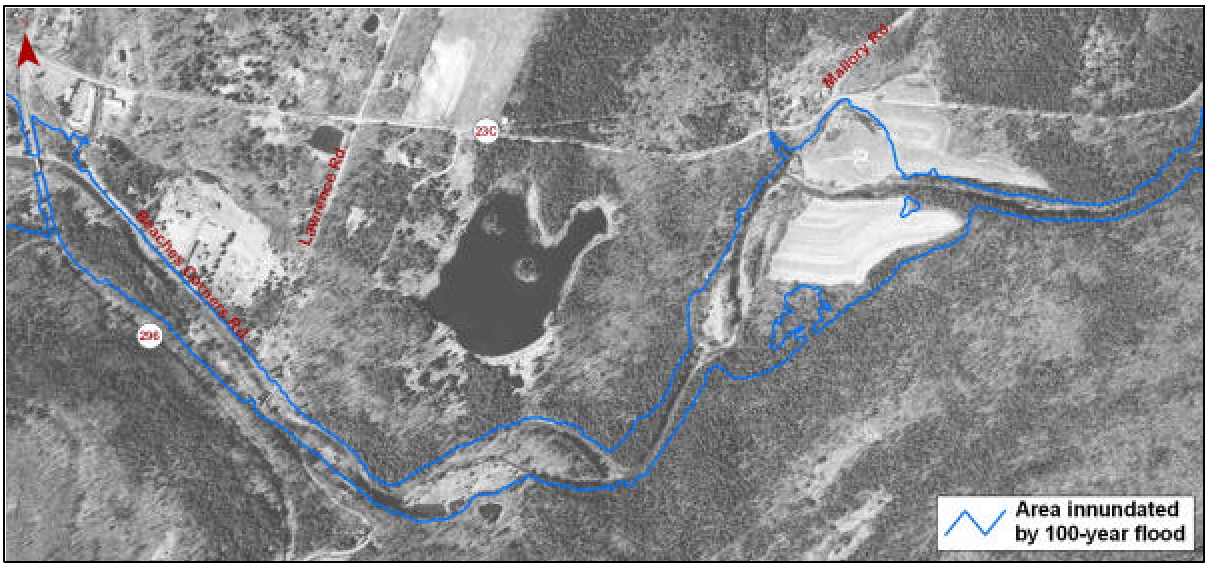


Riparian vegetation classification map based on aerial photography from 2001

An analysis of vegetation was conducted using aerial photography from 2001 and field inventories (see above map and Riparian Vegetation Mapping, Appendix B). In this management unit, the predominant vegetation type within the 300 ft. riparian buffer was forested (75%) followed by herbaceous (14%). *Impervious* area (2.5 %) within this unit's buffer was primarily the local and private roadways, and residential structures. 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 stream bank 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 the East Kill on the basis of recent surveys. The new FIRM hardcopy maps are available for viewing at the Greene County Soil & Water Conservation District Office and the Jewett Municipal Building. 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), three 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 good throughout this management unit. Canopy cover was adequate along much of both stream banks. Woody debris within the stream channel was observed throughout the unit. This woody debris was providing critical habitat for fish and insects, and adding essential organic matter that will benefit organisms downstream.

It is recommended that an aquatic habitat study be conducted on the East 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 East Kill. Fine sediment inputs into a stream increase *turbidity* and can act as a transport mechanism for other pollutants and pathogens. There were four significant 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 the East Kill. The cumulative impact of oil, grease, sediment, salt, litter and other unseen pollutants found in road runoff can significantly degrade water quality. There were no stormwater culverts observed in this management unit during the 2006 stream assessment and inventory.

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 a few buildings located in close proximity to the stream channel in this management unit. These 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 2005, three 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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