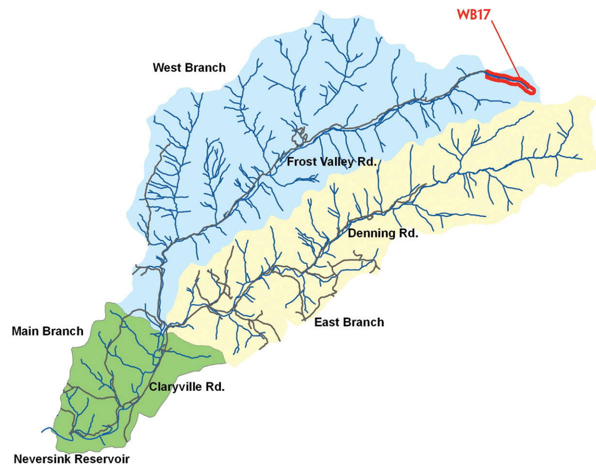
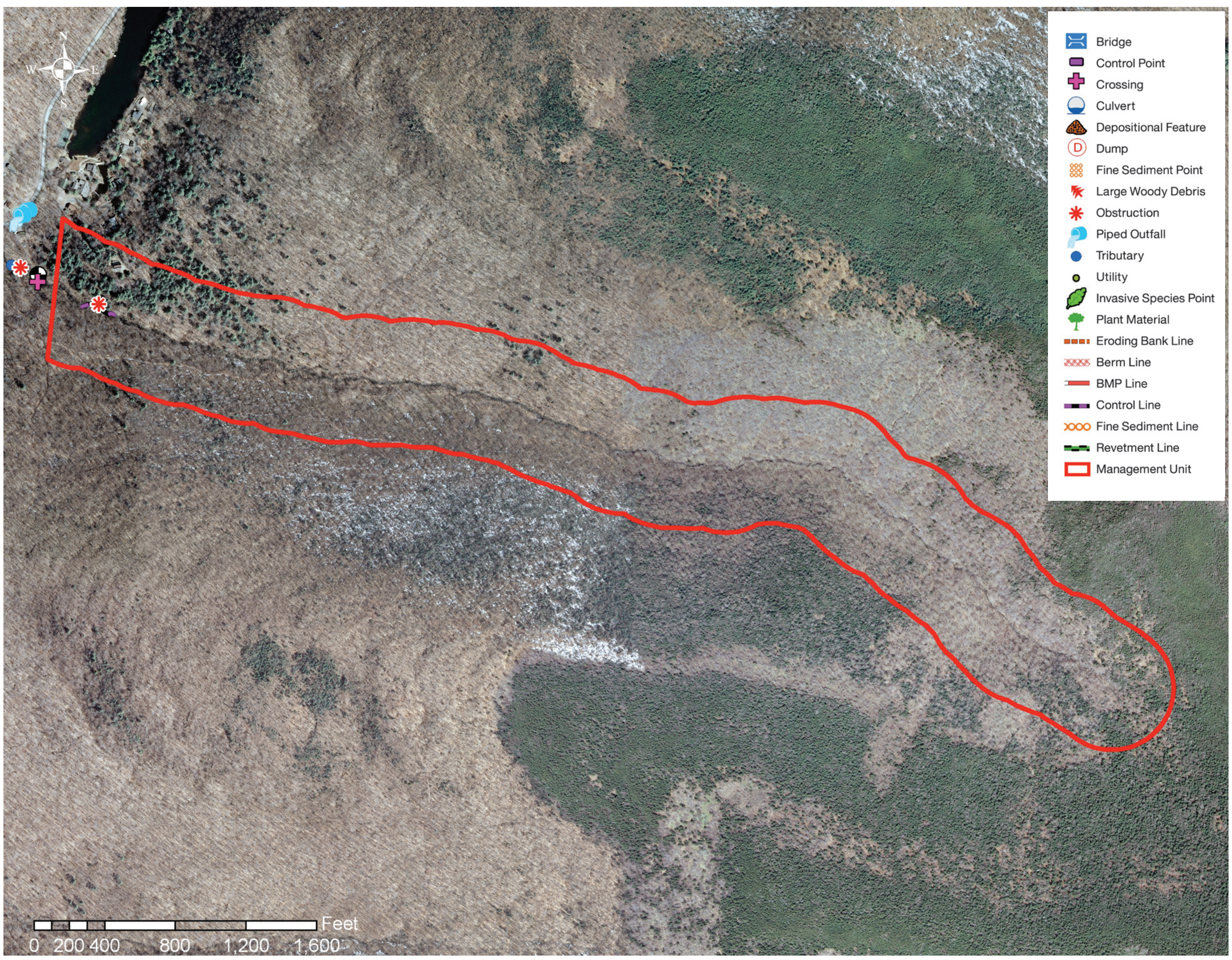
Neversink River West Branch

MANAGEMENT UNIT 17



STREAM FEATURE STATISTICS

- Stream features were not inventoried in detail in this management unit.
- None of stream is within 50 ft. of the road
- No houses are located within the 100-year floodplain boundary



Stream Feature Inventory 2010 (Figure 1)

Management Unit Description

This management unit begins where at the USGS gaging station "West Branch Neversink River at Winnisook Lake Near Frost Valley, NY" at Station 69700, continuing approximately 2,000 ft. to the headwaters of the West Branch of the Neversink River approximately 6,600 feet upstream. The drainage area ranges from 0.2 mi^2 at the top of the management unit to 0.8 mi^2 at the bottom of the unit. The valley slope is close to 13%. The average valley width is 50 ft.

Summary of Recommendations West Branch Management Unit 17

Intervention Level	Assisted restoration of the bank erosion site between Station 28080 and Station 28020. Passive restoration of the bank erosion between Station 27220 and Station 26680. Preservation elsewhere.
Stream Morphology	Protect and maintain sediment storage capacity and floodplain connectivity. Conduct baseline survey of channel morphology.
Riparian Vegetation	(re-visit with locations for buffer improvement)
Infrastructure	None.
Aquatic Habitat	Fish population and habitat survey.
Flood Related Threats	Flood proofing
Water Quality	Maintain household septic systems.
Further Assessment	Include MU17 in comprehensive Local Flood Hazard Mitigation Analysis of Claryville MUs.

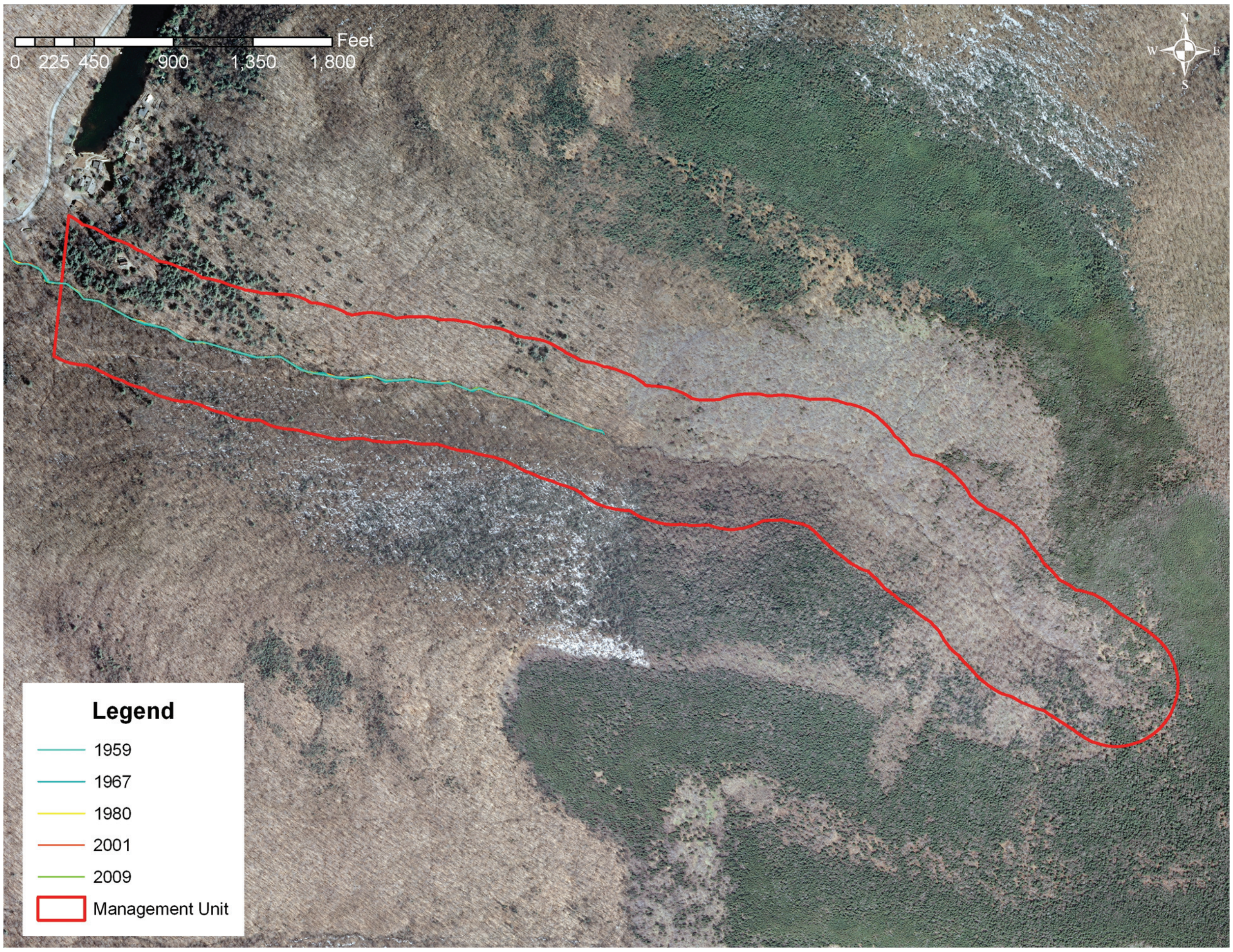
Historic Conditions

As the glaciers retreated about 12,000 years ago, they left their "tracks" in the Catskills. See Section 2.4 *Geology of Upper Neversink River,* for a description of these deposits. These deposits make up the soils in the high banks along the valley walls on the Neversink mainstem and its tributaries. These soils are eroded by moving water, and are then transported downstream by the River. During the periods when the forests of the Neversink watershed were heavily logged for bark, timber, firewood and to make pasture for livestock, the change in cover and the erosion created by timber skidding profoundly affected the Neversink hydrology and drainage patterns.

Excerpt from 1875 Beers Map (Figure 2)

The 1875 Beers Atlas of this area indicates that by that time, the stream had been harnessed for manufacturing, primarily saw mills, woodworking shops and tanneries *(Figure 2)*. Raceways were built in the floodplains to divert water to ponds for use as needed. Floodplains were profoundly altered in the process, as these watercourses also became areas of preferential channelized flow when floodwaters inundated the floodplains. When woody debris jams blocked the primary channels, these raceways sometimes eroded out to become major secondary channels, or even took over the full flow to become a new primary watercourse.

During large runoff events, floodplains adjacent to the confluence of major tributaries receive large slugs of material eroded out of the steep streams draining the valley walls. overwhelmed the Neversink's ability to transport it, creating an alluvial fan. Like changes in the floodplains made by humans, these episodes can result in catastrophic shifts in channel alignment. In the roughly one hundred and twenty centuries since the retreat of the glaciers, the position of Neversink River has moved back and forth across its floodplain numerous times in many locations. A comparison of historical channel alignments *(Figure 3, following page)* and in-stream observations made during a stream feature inventory in 2010 *(Figure 1, page 1)* indicate little lateral channel instability. According to records available from the NYSDEC DART database no NYS Article 15 stream disturbance permits have been issued in this management unit. These permits pertain to activities which have the potential to significantly impact stream function, such as bank stabilization, stream crossings, habitat enhancement, and logging practices. database (**http://www.dec.ny.gov/cfmx/extapps/envapps/**).



Historical channel alignments from five selected years (Figure 3)

Stream Channel and Floodplain Current Conditions

The following description references stationing in the foldout Figure 4. "Left" and "right" references are oriented looking downstream, photos are also oriented looking downstream unless otherwise noted. Stationing references, however, proceed upstream, in feet, from an origin of (Station 0) at the confluence with the Neversink Reservoir. Italicized terms are defined in the glossary. This characterization is the result of surveys conducted in 2010.

WBMU17 begins at the headwaters of the West Branch of the Neversink River which is located on the northwestern slope of Slide Mountain on New York State land in the Catskill Preserve. The first third of this management unit is in "forever wild" status and so is unmanaged; hence, this section of this management unit was not inventoried in detail and no recommendations were made.

One-third of the way downstream WBMU17 the river crossed into land owned by the NYC DEP. Beginning at Station 71750 a property boundary runs roughly along the main channel; the right bank and forested valley wall are private property while the left bank and forested valley wall are owned by the NYC DEP.

Boulder and bedrock control on valley wall and stream bed (B465)

Throughout this management unit the Neversink River is considered a headwater stream as defined by the steep channel slope and confined valley conditions. The main channel is constrained on both banks by boulder and bedrock and the bed grade is controlled by bedrock for the entire extent of river in WBMU17. The dense forest surrounding the stream in this management unit provides a continuous source of large mature trees that can be blown down or washed into the stream during storm events. Several woody debris composed of these downed trees from the steep valley walls were observed forming obstructions in the channel throughout this segment of the river. These woody debris most likely augment the step-pool channel type in this location by providing blockages that lead to pool formation. *(B465, A544)*

Obstructions in channel (A544)

There was finer materials such as coarse gravels observed in some of the pools which are most likely from *colluvium*--sediment transported by gravity from a steep slope—from the steep valley walls and slopes of Slide Mountain. These coarse gravels as well as larger colluvial materials are the sediment supply for the river; they are transported during high flow events and eventually contribute to the alluvial processes in the less confined river valley downstream. *(B456, A547)*

Coarse gravel in bedrock pool (B456)

Colluvium (A457)

For approximately 400 feet upstream of the USGS gauging station remnants of 2 inch diameter steel piping was observed in the main channel. In some locations there were pipe stick ups through the channel bed and in other locations lengths of pipe were exposed. *(A546)* It is possible that this is relict irrigation or water supply piping that once conveyed water from the mainstem to the nearby Winnisook Club residences. As is likely that this section of the river serves as headwater habitat with high conservation value, it is recommended that this piping be removed to prevent any habitat degradation.

Piping in channel bed (A456)

WBMU17 ends slightly upstream of a USGS gauging station on the right bank near Station 69700.

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).

Due to its relatively steep slope and channel confinement, this management unit is largely a sediment transport reach. Transport reaches are in a state of *dynamic equilibrium,* effectively conveying sediment supplied from upstream during each flow event. The densely forested portion of the watershed within this management unit serves as a continuous source of large woody material that is transported downstream and deposited during flood events. This large woody debris often serves as an obstruction to sediment transport, resulting in the aggradation of bed material.

To better understand sediment transport and sediment transport dynamics a baseline survey of channel form and function is recommended for this management unit.

Riparian Vegetation

One of the most cost-effective methods for landowners to protect streamside property is to maintain or replant a healthy buffer of trees and shrubs along the bank, especially within the first 30 to 50 ft. of the stream. A dense mat of roots under trees and shrubs bind the soil together, and makes it much less susceptible to erosion under flood flows. Mowed lawn does not provide adequate erosion protection on stream banks because it typically has a very shallow rooting system. Interplanting with native trees and shrubs can significantly increase the working life of existing rock rip-rap placed on stream banks for erosion protection. Riparian, or streamside, forest can buffer and filter contaminants coming from upland sources or overbank flows. Riparian plantings can include a great variety of flowering trees and shrubs, native to the Catskills, which are adapted to our regional climate and soil conditions and typically require less maintenance following planting and establishment.

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 it's 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 result can include rapid stream bank erosion and increase surface runoff impacts. There were no occurrences of Japanese knotweed documented in this management unit during the 2010 inventory.

An analysis of vegetation was conducted using aerial photography from 2001 and field inventories *(Figure 5)*. In this management unit, the predominant vegetation type within the 100 ft. riparian buffer is deciduous-closed tree canopy (66.49%) followed by mixed-closed tree canopy (30.70%). Impervious area makes up 0.02% of this unit's buffer. There are 2.64 acres of potential buffer improvement area in this management unit *(Figure 7)*.

There are no wetland areas within this management unit mapped in the National Wetland Inventory (see Section 2.5, *Wetlands and Floodplains* for more information on the National Wetland Inventory and wetlands in the Neversink watershed). 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 2.5 for wetland type descriptions and regulations). Formation of wetlands requires relatively flat topography that does not exist in WBMU17; this is typical of steep and confined headwater streams.

Flood Threats

INUNDATION 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 upper Neversink River is scheduled to have its FIRMs updated with current surveys and hydrology and hydraulics analysis in the next few years, and the mapped boundaries of the 100-year floodplain are likely to change. The FIRM maps did not include a 100-year floodplain boundary in WBMU17; flooding is unlikely due to the steep topographic relief and confined flows in this management unit.

BANK EROSION No bank erosion was inventoried in this management unit.

INFRASTRUCTURE None of the stream bank length in this management unit has been treated with revetment and there were no berms documented in this management unit.

Aquatic Habitat

Aquatic habitat is one aspect of the Neversink River ecosystem. While ecosystem health includes a broad array of conditions and functions, what constitutes "good habitat" is specific to individual species. When we refer to aquatic habitat, we often mean fish habitat, and specifically trout habitat, as the recreational trout fishery in the Catskills is one of its signature attractions for both residents and visitors. Good trout habitat, then, might be considered one aspect of "good human habitat" in the Neversink River valley.

Even characterizing trout habitat is not a simple matter. Habitat characteristics include the physical structure of the stream, water quality, food supply, competition from other species, and the flow regime. The particular kind of habitat needed varies not only from species to species, but between the different ages, or life stages, of a particular species, from eggs just spawned to juveniles to adults.

New York State Department of Environmental Conservation (DEC) classifies the surface waters in New York according to their designated usses in accordance with the Clean Water Act. The following list summarizes those classifications applicable to the Neversink River.

1. The classifications A, AA, A-S and AA-S indicate a best usage for a source of drinking water, swimming and other recreation, and fishing.
2. Classification B indicates a best usage for swimming and other recreation, and fishing.
3. Classification C indicates a best usage for fishing.
4. Classification D indicates a best usage of fishing, but these waters will not support fish propagation.

Waters with classifications AA, A, B and C may be designated as trout waters (T) or suitable for trout spawning (TS). These designations are important in regards to the standards of quality and purity established for all classifications. See the DEC Rules & Regulations and the Water Quality Standards and Classifications page on the NYSDEC web site for information about standards of quality and purity.

In general, trout habitat is of a high quality in the Neversink River. The flow regime above the reservoir is unregulated, the water quality is generally high (with a few exceptions, most notably low pH as a result of acid rain; see Section 3.1, *Water Quality*), the food chain is healthy, and the evidence is that competition between the three trout species is moderated by some *partitioning* of available habitat among the species. The mainstem in WBMU17 has been given a "C(T)" class designation with best use for fishing, and indicating the presence of trout. Trout spawning likely occurs in this management unit, but has not yet been documented in the DEC classification.

Channel and floodplain management can modify the physical structure of the stream in some locations, resulting in the filling of pools, the loss of stream side cover and the homogenization of structure and hydraulics. As physical structure is compromised, inter-species competition is increased. Fish habitat in this management unit appears to be relatively diverse.

It is recommended that a population and habitat study be conducted on the Neversink River, with particular attention paid to temperature, salinity, riffle/pool ratios and quality and in-stream and canopy cover.

Water Quality

The primary potential water quality concerns in the Neversink as a whole are the contaminants contributed by atmospheric deposition (nitrogen, sulfur, mercury), those coming from human uses (nutrients and pathogens from septic systems, chlorides (salt) and petroleum by-products from road runoff, and suspended sediment from bank and bed erosion. Little can be done by stream managers to mitigate atmospheric deposition of contaminants, but good management of streams and floodplains can effectively reduce the potential for water quality impairments from other sources.

Storm water runoff can have a considerable impact on water quality. When it rains, water falls on roadways and flows untreated directly into the Neversink River. The cumulative impact of oil, grease, sediment, salt, litter and other unseen pollutants found in road runoff can significantly degrade water quality. There are no piped outfalls that convey storm water runoff directly into the Neversink River in this management unit.

Sediment from stream bank and channel erosion pose a potential threat to water quality in the Neversink River. Clay and sediment inputs into a stream may increase *turbidity* and act as a carrier for other pollutants and pathogens. There are no documented bank erosion sites in WBMU17.

Nutrient loading from failing septic systems is another potential source of water pollution. Leaking septic systems can contaminate water making it unhealthy for swimming or wading. Homeowners in this upper portion of the Neversink watershed should inspect their septic systems annually to make sure they are functioning properly. Each household should be on a regular septic service schedule to prevent over-accumulation of solids in their system. Servicing frequency varies per household and is determined by the following factors: 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 out more often.

The New York City Watershed Memorandum of Agreement (MOA) allocated 13.6 million dollars for residential septic system repair and replacement in the West-of-Hudson Watershed through 2002, and the program was refunded in 2007. Systems eligible included those that are less than 1,000-gallon capacity serving one-or-two family residences, or home and business combinations, less than 200 feet from a watercourse. Permanent residents are eligible for 100% reimbursement of eligible costs; second homeowners are eligible for 60% reimbursement. For more information, call the Catskill Watershed Corporation at 845–586–1400, or see **http://www.cwconline.org/programs/septic/septic_article_2a.pdf**.