

# Neversink River East Branch

## MANAGEMENT UNIT 2

### Summary of Post-Flood Recommendations

<b>Intervention Level</b>	Full Restoration of split channel section impacted by emergency restoration efforts from Station 5700 in EBMU3 through Station 1800.
<b>Stream Morphology</b>	No change.
<b>Riparian Vegetation</b>	No change.
<b>Infrastructure</b>	No change.
<b>Aquatic Habitat</b>	No change.
<b>Flood Related Threats</b>	No change.
<b>Water Quality</b>	None.
<b>Further Assessment</b>	Include MU2 in comprehensive Local Flood Hazard Mitigation Analysis of Claryville MUs.

### Stream Channel and Floodplain Current Conditions

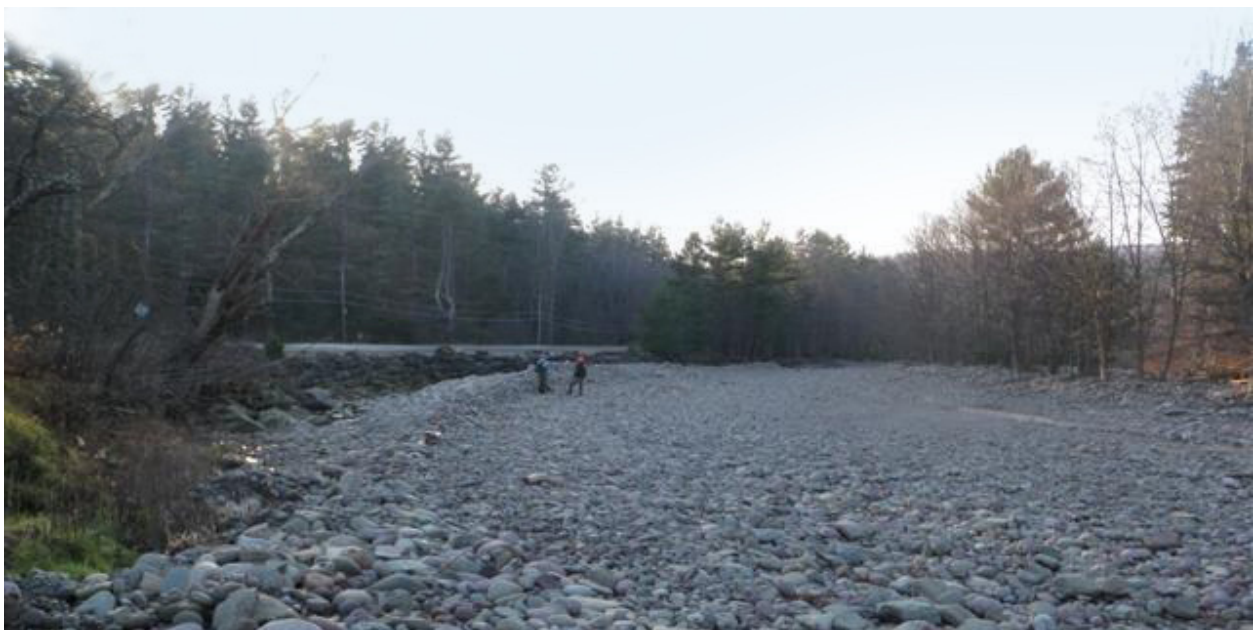
The following description of stream morphology is the result of a survey conducted in December, 2011. “Left” and “right” references are oriented looking downstream, photos are also oriented looking downstream unless otherwise noted. Stationing references, however, proceed upstream, in feet, from an origin (Station 0) at the confluence with the Neversink Reservoir. Italicized terms are defined in the glossary.

EBMU2 begins as the stream flows across the border of Ulster and Sullivan Counties.

Immediately following TS Irene, the majority of the flow in the channel was diverted to the side channel through Station 3200 to facilitate emergency repair work to the rock wall. Repair was completed by Sullivan County DPW during spring 2012. The channel was in the process of being restored when the September 18 flow (~40-yr return probability) occurred, which again eroded the toe of the rock wall and undermined the placement. The wall was repaired in October 2012. While revetment is once again in good structural condition, inappropriate channel dimensions and ineffective sediment transport will continue to present both inundation and flood erosion hazard risk at this location. The installation of flow deflection structures at the rock wall, are recommended for this reach.

*Full restoration* is recommended for most of this management unit, from Station 5700 to near Station 1800. The restoration should include removal of any remaining in-channel berms, and the establishment of a stable channel (curvature, width, depth, and slope). The stream crossing at the bottom of the management unit should be assessed for backwatering effects at higher flows, which may be the ultimate source of the problems in this management unit.

Potential flood risks to infrastructure in the left floodplain are increased by the lack of an adequately vegetated riparian buffer. There is no mature woody vegetation along the left stream bank from Station 5270 to Station 3900. A riparian buffer including woody vegetation can strengthen the stream bank and slow erosive forces of higher flows during flood events. It is recommended that this area be further assessed for the potential of restoring the riparian buffer using various planting techniques.



*Stacked boulder revetment along left bank protecting road. (P1010081)*

Downstream of the stacked rock wall, an eroding bank segment on the right bank extends 430-feet from Station 3150 to Station 2720 (BEMS ID # NEB2\_2700). (See picture A476 on Page 9 for pre-flood condition) An over-widened channel and excessive floodplain connectivity on the left bank create ineffective sediment transport dynamics here, leading to significant deposition and an unstable channel pattern. This in turn is contributing to erosion at the toe of the right bank, which is exposing cobble sized alluvial material. The *full restoration* of the main channel through this stream reach could include use of *bioengineering* techniques to stabilize this slope.



*Eroding bank segment on the right bank on the outside of a meander bend. (P1010090)*

Continuing downstream, the channel again meanders slightly to the right and the resulting hydraulic pressure put on the left bank has caused erosion that was documented in both 2010 and after the flood events in December, 2011. This erosion site begins at Station 2600, continuing approximately 90-feet to Station 2510 (BEMS ID # NEB2\_2500). (See picture B378 on Page 9 for additional detail) *Bioengineering techniques* to stabilize this bank should be incorporated into the restoration planning for this management unit.



*Erosion along left bank. (P1010096)*

Although the sediment depositional patterns have shifted during high flow events since 2010 slightly adjusted pressures on adjacent banks, the recommendations through the remainder of this management unit remain unchanged.

A series of berms and revetments have been installed along the left bank and floodplain to protect a private residence from flood hazards near Station 1800. Because the building structure in the left floodplain is located in such close proximity to the stream, these revetments have been installed in an attempt to provide some relief from large flood

events. Although currently preventing the left bank from eroding along this reach, revetments such as this can only withstand a certain level of shear stress before beginning to fail. Evidence on the property such as woody debris and fine sediment deposition indicate that these revetments were overtopped during the flooding associated with TS Irene.

As a part of the restoration designs for this management unit, it is recommended that the entire MU be included in a comprehensive Local Flood Hazard Mitigation Analysis to investigate hydraulics and sediment transport in the stream corridor, from Station 10500 through the Halls Mills covered bridge on the mainstem of the Neversink River. The purpose of the analysis would be to develop options for reducing flooding threats to this relatively dense population center of the Neversink Valley.

EBMU3 ends at Station 1450 as the stream channel is crossed via bridge by Frost Valley Road.