

# Neversink River East Branch

## MANAGEMENT UNIT 5

### Summary of Post-Flood Recommendations

<b>Intervention Level</b>	<p>Passive restoration of the bank erosion site between Station 17700 and Station 17450 (BEMS # NEB5_17400).</p> <p>Passive restoration of the bank erosion site between Station 16760 and Station 16180 (BEMS # NEB5_16100).</p> <p>Assisted Restoration of the side-channel section extending from Station 15300 to Station 14600.</p> <p>Passive restoration of the main channel bank erosion site between Station 14910 and Station 14835.</p>
<b>Stream Morphology</b>	No change.
<b>Riparian Vegetation</b>	No change.
<b>Infrastructure</b>	Evaluate options for mitigation of flooding of Denning Road due to aggradation upstream of Station 15300.
<b>Aquatic Habitat</b>	No change.
<b>Flood Related Threats</b>	Denning Road flooding due to aggradation.
<b>Water Quality</b>	None.
<b>Further Assessment</b>	Evaluate impacts of wooden dam at Station 13730 sediment transport.

### 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.

EBMU5 begins just downstream of where a bridge crosses Denning Road over the stream channel at Station 18700. At Station 18400 relict bridge abutments now serve as control points to high flows on both sides of the stream. The left bank in this area has insufficient riparian vegetation buffering the stream from

the road. A riparian buffer including woody vegetation could restore the forest connectivity and help mitigate flood threats to surrounding infrastructure. It is highly recommended that the right banks from Station 18600 and Station 18000 be assessed for restoration using riparian planting techniques.



*Remnants of wooden dam. (IMGP1686)*

In 2010 an old wooden dam was documented at Station 18100. The dam was destroyed in the flooding since the initial stream survey. In 2011 the only remaining evidence of the dam was the remnants of a cross timber located on the left bank (See Picture B137 on Page 6 for pre-flood condition).

Continuing downstream, the riparian zone becomes well forested on both sides of the stream after Station 18000. The remainder of MU5 is characterized by large woody debris obstructions supplied by this mature forested riparian buffer on both banks. New woody material was released and existing materials were relocated throughout the channel and floodplains during flooding that has occurred since the summer of 2010. For example, the large woody debris jam documented in the left floodplain at Station 17900 and mid-channel at Station 17720 and Station 17410 in 2010 were replaced with a woody obstruction near Station 17700 documented in 2011. A 600-foot cobble side bar documented on the left channel bed beginning at Station 17700, was transported downstream in flooding since 2010 and is no longer present.



*Facing upstream at woody debris jam in main channel. (IMGP1687)*



Erosion of the right bank begins at Station 17700, continuing approximately 250-feet to Station 17450 (BEMS # NEB5\_17400). As noted during the 2010 survey, hydraulic pressure on this bank is exposing cobble sized materials which falling from the bank and collecting at the toe. These cobbles, along with the establishment of sedges at the toe of the bank can assist with the re-stabilization of this erosion site. It also appears that the undercut sod mats are continuing to slump down and cover the exposed portion of the bank, offering additional protection from further erosion. It may be possible for this bank to stabilize without treatment (*passive restoration*); however, it is recommended that this site be monitored for changes in condition.

In 2010 portion of the stream flow was diverging into a side channel into the field in the left floodplain at Station 15290. In an attempt to prevent flow from entering this side channel, the left bank had been stabilized with stacked rock revetment in two separate locations adjacent to the open field. Both of these revetments were overtopped during the flood associated with TS Irene in August, 2011 (see Photo A174 on page 8 for pre-flood condition) resulting in significant incision of the side channel and flooding of the adjacent open field and Denning Road.



*Hydraulic erosion on right bank. (IMPG1689)*

Furthermore, a woody obstruction was documented on the right side of the main channel at Station 15150. This obstruction was diverting a significant portion of the streamflow into the left side channel.



*Looking downstream at recently incised side channel. (IMGP1706)*



*Facing upstream at recently formed side channel along open field. (IMGP1708)*





*Large woody debris jam blocking former main channel. (IMGP1704)*



*Facing upstream at headcuts near convergence. (IMGP1710)*

Part of the flow from the side channel that diverged upstream at Station 15290 rejoins the main channel at Station 14700, while the remaining portion continues through another side channel in the left floodplain. Scour is occurring directly downstream of both channels at this convergence because the water faces an abrupt vertical drop as it flows into a deep pool. This continuous scour is resulting in *headcuts* which are actively migrating upstream, and will continue to do so until they meet substrate that is not erodible.



The woody debris obstruction blocking the main channel at Station 15290 was removed during the summer of 2012, and the material was placed without ballast in the side channel to encourage deposition there and encourage increased flow and improved sediment transport in the main channel. A major flow on September 18, 2012 dislodged the placed material.

*Assisted Restoration* is recommended for this side channel extending from Station 15300 to Station 14600. Options should be investigated for restoring more of the flow to the main channel, improving sediment transport through this stream reach, and to reduce flow moving through the open field adjacent to the side channel toward Denning Road.

The wooden dam at Station 13730 may be impeding sediment transport and contributing to deposition and overbank flooding upstream. Additional investigation is recommended to determine the effects of the structure on effective bedload transport.

EBMU5 ends at Station 13450 where the stream is again crossed by a bridge on Denning Road.



*Denning Road Bridge. (IMG1712)*