

Reach 1a (Source to Maplecrest Gage Station)

Reach 1a begins at the first section of a perennial stream located along the main stem of the Batavia Kill, and continues downstream to the USGS stream gage station near the NYSDEC trail. There are approximately 1.5 miles (7783 feet) of stream length located in this reach. This reach is located primarily within the confines of NYS Forest Preserve, which has resulted in minimal anthropogenic impacts to the stream corridor. The drainage area at the bottom of the reach is 2.03 square miles, with several small intermittent tributaries contributing to the reach. Reach 1a encompasses valley zone 7 and 6 (**Figure V-11**), and is characterized by valley slopes ranging from 13.4% in the headwaters to 6.8% at the lower reach. Land use in reach 1a is overwhelmingly forest, with low density development along the immediate stream corridor consisting of older farmsteads, seasonal cabins and small scale agriculture

Stream Morphology/Stability

During the 1997 Phase I Inventory and Assessment process, the GCSWCD noted that reach 1a was characterized as stable, with no measurable erosion noted. Interpretation of historic and recent aerial photographs for current stream conditions and changes over time was generally inconclusive due to the small stream size and dense forest canopy which obscures the stream location on older aerial photographs. Assessment of this reach was limited to field inventories, and observations of both current stream process and evidence of past instability.

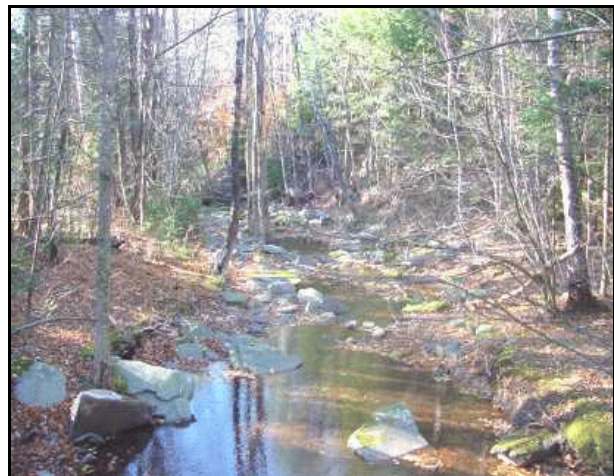


Figure VI-1: Headwater segments in 1a are characterized by a healthy riparian forest and a course streambed of boulders and cobble.

Based on *Phankuch* stability indices, reach 1a scores showed that the reach was in general good physical health in the upper section of the reach, with stream health slightly declining in the lowest section of the reach. The GCSWCD has observed several isolated sections of instability, but these were considered localized disturbances and not representative of a larger instability problem. The GCSWCD continued to observe the condition of these areas, and has not noted any continued degradation of the stream's health as of the summer of 2002.

The GCSWCD established three monumented cross sections within reach 1a. These sections were used to determine Level II stream classification (Rosgen 1996). Cross section #3, located at the USGS gage station, was established in 1998 to monitor stream behavior in this highly stable reach and to verify bankfull estimates at the stream gage. The other two cross sections are located upstream of the gage station and were installed in 1999 to classify the reach for management purposes. In reach 1a, the Batavia Kill is an A3

stream type in the upper portion, transitioning to a B3 stream type through the second cross section and continuing down the reach to the gage station. Profiles of stream slope through the sections was surveyed in the summer of 2000 to calculate stream discharge and channel shear stress.



Figure VI-2: Heavy moss growth and imbrication of boulders and cobbles are characteristic of a stable stream profile.

Cross section #1 is classified as an A3 stream type, which is generally very steep, highly entrenched, with confined channels. These channels are typically sensitive to disturbance and have poor recovery potential (Rosgen 1996). Sediment supply is also high, with bed and bank erosion typically occurring. The catchment's steep topography and poor drainage classification results in runoff events characterized by rapid increases in stream stage and a pulse of water and sediment that the channel must convey during storm events. Assessment of cross section #1 between 1999 - 2000 indicated only minor erosion, with no evidence of either channel aggradation or degradation. The erosion is considered to be minor and localized.

The stream channel approaching cross section #2 transitions from an entrenched A stream type into a moderately entrenched channel with the introduction of a narrow, defined floodplain. Stream type changes to B3, with channel material remaining fairly constant from cross section #1. Cobble is the predominant particle size, although bedrock and medium boulders are also frequently seen throughout the entire reach. Cross section #2 has exhibited a consistent and stable channel morphology throughout the monitoring period, with no appreciable lateral erosion observed. Measurements of width/depth ratio, entrenchment ratio, and cross sectional area have remained essentially unchanged (**Figure VI-3**).

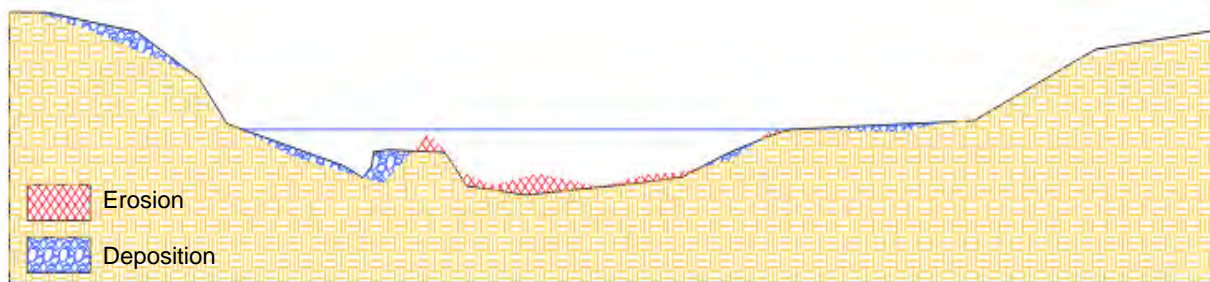


Figure VI-3: Overlay of 1999 and 2000 monitoring surveys for Headwaters #2 cross section, depicting minimal erosion or aggradation.

Cross section #3 is located at the USGS Maplecrest stream gage station, and was established to verify bankfull discharge at the gage station. The cross section indicates a

B3 stream type, and the channel's morphology exhibits a high state of stability. Based on visual observations and monitoring of the cross sections, there has been no evidence of lateral migration, aggradation, or degradation and the stream banks are well vegetated in the area represented by the cross section.

Riparian Vegetation

The riparian vegetation community in reach 1a is primarily second growth, mixed deciduous forest with intermittent stands of conifer. Historically, the upper watershed was dominated by hemlock forest, but was harvested to support the tanning industry over 100 years ago. Reintroduction of conifer species on the high slopes of the watershed, near Black Dome Mountain, is apparent in aerial photography, and it is unknown if these plantings were done before, or after ownership by New York State. The forest canopy in reach 1a nearly completely covers the stream in summer, keeping the water cool and providing good fisheries habitat. The GCSWCD has not noted the presence of any invasive species such as knotweed.

Water Quality

The GCSWCD has not inventoried any significant water quality impacts in reach 1a. Only one part-time residence is located in the reach, and the structure is located well above and over 300 feet from the stream. On-site waste water treatment is not considered an issue. Minimal impacts may be attributed to runoff from Big Hollow Road, which is narrow and unpaved through reach 1a. The road does run close to the stream, and maintenance of the road surface and drainage systems should be conducted in a manner which would reduce erosion, as well as any entrenchment of the stream channel.

Infrastructure

Infrastructure in reach 1a is limited to two small bridges spanning the Batavia Kill, including a private driveway accessing the Gundersen property, and a small footbridge that provides access to the NYSDEC trail system. Neither structure appears to have an impact on either the stream's stability or its ability to transport sediment from the steep slopes above. Neither structure impedes access to the adjoining floodplain and both structures are in good condition. The Gundersens have requested the assistance of the GCSWCD to advise them on maintenance of their bridge. A short section of town road is also present in the reach. The road provided access to the NYSDEC trailhead and appears to be adequately protected from erosion by the woody riparian buffer. The GCSWCD and Town of Windham highway department work cooperatively on stream related maintenance issues.

Flooding Issues

The GCSWCD is not aware of any flooding issues in reach 1a.

Reach 1a Summary

The stream morphology in reach 1a can be characterized as being very stable. Stability is strongly influenced by both the lack of human activity, as well as the numerous bedrock sills, boulders, and woody debris formations that provide effective grade control structures. A well imbricated bedform (shingle-like deposit in which upstream particle partially overlaps the downstream particle) is resistant to degradation. The reach is strongly confined by valley topography as reflected by its sinuosity of 1.14, and future management activities must take caution to prevent further entrenchment of the stream channel. The GCSWCD has not observed any significant stream processes that would indicate broader instability problems.

Table VI-1: Management Recommendations Reach 1a.

Reach 1a: Headwaters to USGS Maplecrest Gage Station.	
Intervention Level	Preservation
Stream Morphology	No action recommended at this time, stream morphology is stable, and exhibits an appropriate form. Continue to monitor minor instabilities.
Riparian Zone	Good condition, See General Recommendations.
Water Quality	Good condition, See General Recommendations.
Infrastructure	<ol style="list-style-type: none"> 1. Avoid widening of trailhead access road to prevent entrenchment and loss of riparian zone. 2. Use appropriate BMPs to provide stormwater protection along trailhead access road to minimize NPS impacts. 3. Avoid stream disturbances associated with future maintenance or repair to existing bridges. Prevent further entrenchment with abutments or rip-rap and avoid disturbance of channel bed protective cover.
Habitat	Good Condition, See General Recommendations.
Further Assessment	<ol style="list-style-type: none"> 1. Continue to monitor USGS gage for refinements of stream flow calculations. 2. Inventory/Investigate role of large woody debris in relation to stability and habitat in Batavia Kill headwaters. Manage woody debris as appropriate to maximize stability.