

Reach 2c (Hensonville Market to CR 65)

Reach 2c begins at the Hensonville Market on County Route 40, and ends at the county bridge (No. 3-302890) at County Route 65. The total reach length is approximately 3,275 feet, with the drainage area of approximately 13.4 mi². Reach 2c is located along the transition between Valley Zone 4 and Valley Zone 3 (**Figure V-11**). The average valley slope begins to decrease from 1.3% to 0.7% slope. The valley type is classified as a valley type V, with moderately steep valley slopes generally less than 4% with a “U” shaped glacial trough valley. A crest stage USGS gage station (# 01349850) near Hensonville is located at bridge #3-30285-0 (**see Section V-C**).

Stream Morphology/Stability

A level one classification characterized the reach as being a moderately entrenched B stream type, with moderate width/depth ratio and moderate to low sinuosity. Further investigation of aerial photographs indicated a potential historic modification of the channel in the area adjacent to County Route 65A, and USGS topographic maps also display the stream crossing at County Route 65 in a different location. This suggests that the channel planform was adjusted, perhaps in the repair or construction of the County Route 65 bridge.

In 1997, the Phase I Inventory and Assessment identified reach 2c as a possible reference reach due to its physical appearance and health after the flood in January of 1996. There were no visually unstable streambanks or erosion noted through the entire reach length, and the stream appeared to be in equilibrium with the flow and sediment inputs. A review of aerial photographs from 1959 to 1997 was used to evaluate changes in channel planform based on historical channel alignments. Measurements showed no significant lateral channel migration since 1959. The sinuosity of reach 2c has remained very low. The available belt width and floodplain is limited by the constraints of the topography and the impingement of County Routes 40 and 65A.

In August of 1997, the upper section of reach 2c was classified as a B3c and surveyed as a potential reference reach. The data collection efforts included the installation of seven cross sections, and surveys of several hundred feet of channel profile. Two cross sections were monumented and monitored in July 1998 with the site re-surveyed by NYCDEP Stream Management Program later in the summer of 1998. All seven cross sections and the longitudinal profile was re-surveyed in August 2000 by the GCSWCD staff. The reach has a low to moderately entrenched channel, with a gradient less than 2%. The entire reach has good floodplain structure, with the exception of encroachments from bridge approach fill in the middle bottom of the reach.

The channel bed material is dominated by a cobble material, with channel bedform characterized by a series of rapids and unevenly spaced scour pools. The stream’s energy is dissipated by these fluctuations, which in turn maintain the channel form. This channel has very little erosion occurring to its bed and banks. At the top of the reach, there are several areas with exposed bedrock, with additional influences on the channel grade

exerted by a timber K-dam and a boulder sill (**Figure VI-28, photo B,E**), both located just below the County Route 40 bridge (No. 3-30285-0). The K-dam is in poor to fair condition and has lost much of its scour pool function. These structures are common, having been installed by the NYSDEC, the GCSWCD and others under state and federal conservation programs in the 1960s. The boulder sill was constructed in the early 1990s by the Town of Windham, under the technical assistance of the GCSWCD. The sill was constructed to provide grade control protection for a water service main that runs from the Town's well house to Hensonville under the stream. The rock sill has worked well, and survived the 1996 and 1999 flood events. There are no visual signs that either structure is impacting reach stability.

The bed and bank materials have also been classified as stable, with BEHI (bank erodibility hazard index) indicating very low erosion potential throughout the monitoring period. The channel streambed materials are well imbricated and stable, as evidenced by the extensive growth of grasses and sedges within the active channel. Streambank stability near both bridges is somewhat influenced by rip rap.

Riparian Vegetation

The riparian vegetation through the majority of the reach consists of a very thin buffer along County Routes 40 and 65A. The buffer is composed of a mixed population of mature deciduous species, conifers and grasses on the reach's lower banks (**Figure VI-28, photo A,C,D**). Although the forest buffer is thinner than desired in places along CR65A, the canopy cover appears to be providing excellent shading of the stream channel through the reach, and the vegetation is assumed to be a major factor in the stability of the reach. As noted in previous reaches in management segment 2, the stream channel is well vegetated with grasses and sedges (**Figure VI-28, photo D**).

Water Quality

The Phase I Inventory and Assessment did not indicate any potential water quality problems. Streambank erosion is low, and no clay exposures were noted. The reach is an insignificant contributor to turbidity. At the very bottom of the reach, a large stormwater outfall enters on the left bank above the County Route 65 bridge. This stormwater system drains a major portion of the Hensonville hamlet, and was substantially damaged in the 1996 flood event. Opportunities to retrofit the stormwater system for water quality improvements should be further investigated.

Infrastructure

There are two bridge crossings located along reach 2c. The first bridge (No. 3-30285-0) is located along County Route 40, and the second bridge (#3-302890) at the lower extent of the reach along County Route 65A. Neither bridge appears to be having a negative impact on stream stability. The hydraulic openings are adequate to pass the bankfull flow and no backwater deposition or bridge scour was noted. The lower bridge is characterized by having a center pier that should be observed to insure that debris buildup does not occur. Along County Route 65A there is evidence of rip rap protection which should be observed after future storm events. The rip rap is not currently thought to be having an impact on channel stability, but future repairs must be undertaken to prevent triggering stream channel response.

Reach 2c Summary

Similar to reaches 2a and 2b, the overall condition of reach 2c is highly stable. The reach has little to no erosion or streambed instability. Riparian vegetation is fair to good, and there are no known water quality impacts. While roads and bridges do impact the channel's morphology, they do not appear to be causing problems at this time.

Table VI-7: Management Recommendations Reach 2c.

Reach 2c: Hensonville Market to County Route 65.	
Intervention Level	Protection
Stream Morphology	1. Prevent further entrenchment of stream reach below County Route 40 bridge. 2. See general recommendations
Riparian Zone	See general recommendations
Water Quality	See general recommendations
Infrastructure	See general recommendations
Habitat	See general recommendations
Further Assessment	1. Continue to monitor stability. Implement detailed monitoring protocols if instability is observed. 2. Assess the benefits of stormwater retrofits for water quality improvements.



A



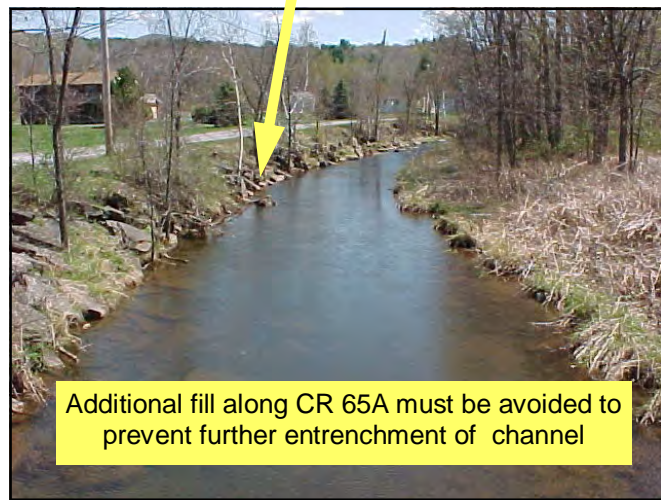
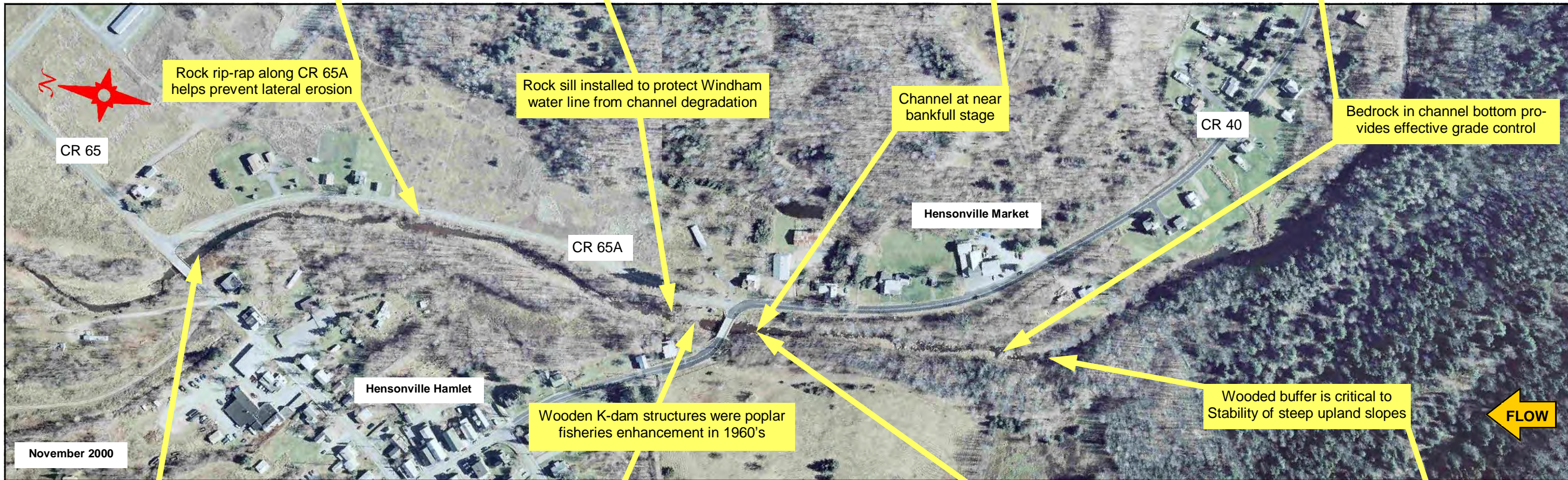
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C



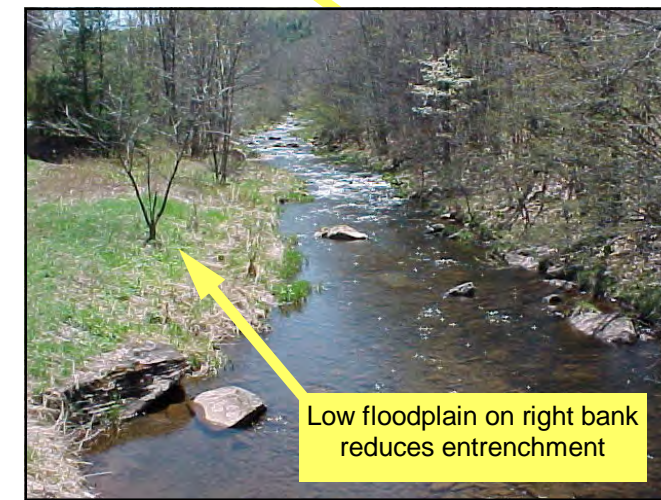
D



E



F



G



H

Additional fill along CR 65A must be avoided to prevent further entrenchment of channel

Low floodplain on right bank reduces entrenchment

Figure VI-28: Reach 2c