

Reach 1d (Peck Road Bridge to C.D. Lane Park)

Reach 1d is located between Peck Road and the C.D. Lane flood control structure. The reach is approximately 3,700 feet long, and is 75% bounded by properties owned by the Batavia Kill Watershed District. The drainage area of the reach ranges from 7.2mi² at the Peck Road bridge to 9.4mi² at the entrance to the lake. The reach is located in valley zone 4 (**Figure V-11**), having an average valley slope of 1.3%. A high bank runs along the south side of the stream for approximately 1,400 feet, with an accessible floodplain along the north bank. At the lower end of the reach, the high and low terraces switch sides.

Stream Morphology/Stability

Reach 1d is characterized as a moderately entrenched, single thread, channel in the upper section, transitioning to an over-widened and braided channel on the lower end. During the Phase I Inventory and Assessment, the reach was shown to have significant erosion along 34% of the streambanks, with an average of 3 ft² of exposed bank for every foot of stream length. The majority of the erosion was present in the upper half of the reach (**Figure VI-16, photo C,D,G,H**). A topographic survey of the lower half of the reach was completed in October 1997, and a Phase II analysis included one monumented cross section just above the flood impoundment.

Analysis performed on the 1995 and 2000 aerial photographs (**Figure VI-17**) revealed only minimal planform change through the majority of the reach, with the exception of two isolated areas. The first area is located along one meander, half way down the reach, that has migrated north nearly 50 feet in the 5 year period. The second area is near the bottom of the reach at the confluence of the stream and the flood retention pool. Historic aerial photograph interpretation of stream channel shifts through this reach is limited by the availability of photographs after construction of the flood control structure.



Figure VI-17: Comparison of 1995 (red) and 2000 (photo) stream Planform in management segment 1d.

While the GCSWCD did not complete a detailed Phase III/IV assessment of this reach, the instability problems represent classic responses to modification of a stream's natural form and/or function. First, the aggradation and frequent planform adjustments just above the

permanent lake is typical of those situations where an impoundment interrupts a stream's hydraulic regime, and subsequently its sediment transport capabilities. During larger storm events, the flood impoundment quickly increases its water surface elevation, with the flood pool backing up the stream channel. The backwater results in a dramatic reduction in stream velocity, with the sediment laden stream flow quickly dropping its sediment when it reaches the flood pool.

A second stability problem noted in the reach involves a moderate head-cut that has been observed in the center of the reach. Between 1995 and 2002, the stream channel has migrated against the high terrace on the south, and active degradation of the channel continues to destabilize the high slopes. In the area behind the Starr residence, many large trees have been lost and the slope has exposed clay material. The GCSWCD feels that the head-cut, and subsequently the slope failure, is most likely a result of past management activities related to gravel management at the flood structure.

Since the construction of the flood control structure, there has been active gravel removal in the area where the stream meets the permanent lake on several occasions. Large scale excavation of gravel last occurred under the supervision of the GCSWCD in the early 1990's. At that time, tens of thousands of yards of gravel was removed, leaving an over-widened channel with a very flat slope. At the upstream extent of the gravel removal, the final condition was a greatly steepened riffle that which most likely promoted the head-cut observed in the reach. Stream channel response to modification of local streambed slope during gravel management has been poorly understood, partly due to the fact that these changes take time to evolve. Modifications during gravel removal can result in instability problems both upstream and downstream from the disturbance.

Recognizing the fact that the flood control structure is a permanent feature, the GCSWCD strongly recommends development of a formal sediment management strategy. While maintenance of flood structure capacity by reducing sedimentation may be desirable, a formal management plan would assess alternative methods, and any impacts on the upstream reach. A management plan should address sedimentation of the flood pool, habitat, localized stability, and broader impacts upstream from the management zone. Development of the management plan should be done in cooperation with the Batavia Kill Watershed District, Town of Windham, USDA-NRCS , NYSDEC and NYCDEP.

Riparian Vegetation

The riparian buffer in reach 1d is variable. The majority of the reach is in relatively good condition, but several sections require attention. Comparison of aerial photographs from 1959 to 2000 (**Figure VI-18**) indicate that there has been relatively minimal change in the riparian zone over the past 41 years. Prior to the construction of the flood control dam, the reach had several active farms along its length, with pen fields bordered by thin woody buffers. Currently, the right bank has a good buffer condition with the exception of a short section at the bottom of the reach. The left bank has a good buffer at the top and bottom of the reach, but the middle of the reach exhibits poor conditions. Active erosion in this area has removed critical deep rooted vegetation. It is interesting to note the changes in **Figure VI-18** as the C.D.Lane flood control structure is constructed.



Figure VI-18: Aerial progression from 1959, 1980 and 1995 indicates reach 1d has exhibited poor riparian conditions for over 40 years. Note that the C.D.Lane lake is empty in the center photo.

Water Quality

The GCSWCD did not note any specific water quality issues in reach 1d. Much of the reach is bounded by lands owned by the Batavia Kill Watershed District and as such development has been minimal. There is one drainageway that enters on the right bank just above the lake, that may be impacted by stormwater discharges. The GCSWCD has noted erosion as well as sedimentation of the small stream channel that receives the flow from a piped stormwater system on the road above. Water quality benefits may be achieved by developing sediment basins along the channel.

Infrastructure

The only infrastructure within the reach is the flood control structure. As noted earlier, the GCSWCD recommends the development of a long term management plan for the site. The management plan would not only address issues such as gravel management, but also cold water releases, maintenance of the structure and its attendant facilities, as well as day to day operational procedures. These recommendations are provided in greater detail in Section VIII General Recommendations.

Habitat

Habitat conditions in reach 1d are generally poor. The aggradation within the channel causes summer flows to become sub-surface, cutting off migration to upstream reaches.

The channel has lost most of its riffle-pool structure, and inadequate riparian buffer areas do not provide adequate overhead cover in many places.

Flooding Issues

After the flood of September 1999, the GCSWCD discovered that a residence just above the C.D.Lane facility had been flooded, and that this was a repetitive problem with the home being flooded in 1987 and 1999. The flooding is a direct result of the flood pool behind the C.D.Lane dam backing up into the residence. When the flood event is of a great enough magnitude to cause the emergency spillways to flow, the home is flooded. At this time, the GCSWCD is aware of the problem, and has given it high priority under the District's flood mitigation program. The situation is discussed in greater detail in Section VIII General Recommendations.

Reach 1d Summary

Reach 1d presents a challenge to management of a stable stream system. The C.D.Lane flood control structure exerts significant influence on both stream form and function through the entire reach, and has strong potential to extend these influences much further upstream. The reach exhibits characteristics that are not unexpected given the influence of the dam and past management practices. Aggradation at the lake confluence due to loss of sediment transport capacity, lateral erosion in response to channel aggradation, and upstream migration of a head-cut due to management activities, have all been observed in the reach.

The GCSWCD strongly suggests that this reach be considered for further analysis and treatment. Since the 1996 flood event, the GCSWCD has noted that the center of the reach is showing increasing signs of incisement, and the stream is migrating laterally against the south high terrace behind the Starr residence. Slope failure of the high banks is ongoing, and noted along the majority of the both banks. There is evidence of a small head-cut in this area that appears to be working slowly upstream.

Table VI-4: Management Recommendations Reach 1d.

Reach 1d: Peck Road Bridge to C.D.Lane Park	
Intervention Level	Assisted Self Recovery/Preservation
Stream Morphology	Stream morphology is strongly influenced by the flood control structure. Channel aggradation in the lower reach will always be an issue, and will continue to impact local stability. Improper management of the gravel deposition will continue to degrade upstream conditions.
Riparian Conditions	The GCSWCD will continue to improve the riparian buffer on the right bank, in the area being used for the Plant Materials Center. Riparian buffer conditions on the left bank should be improved in the center of the reach, but only after the active degradation is addressed.
Water Quality	See General Recommendations
Infrastructure	<p>1. Observe function of Peck Road bridge at the top of the reach. Monitor bridge's impact on sediment transport, as well as local slope.</p> <p>2. Develop comprehensive long range management plan for flood control structure (see details in General Recommendations).</p>
Habitat	Investigate possible benefits of managing aggradation area such that fish migration can be reestablished.
Flooding	Address structural flooding at Starr residence (See general recommendations for more detail).
Further Assessment	Complete additional hydraulic analysis of flood control structure to better understand impact on sediment transport.



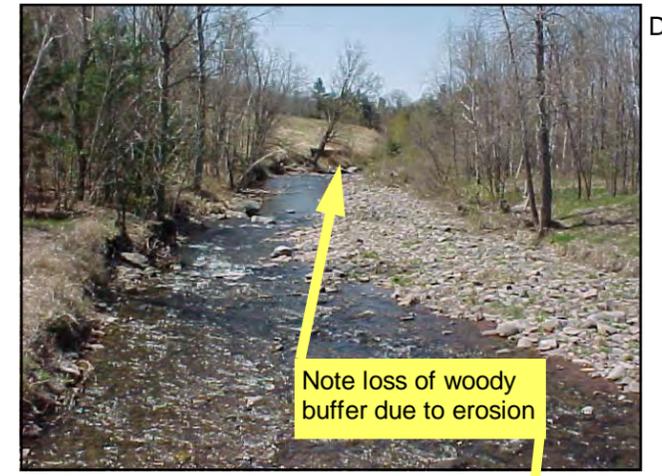
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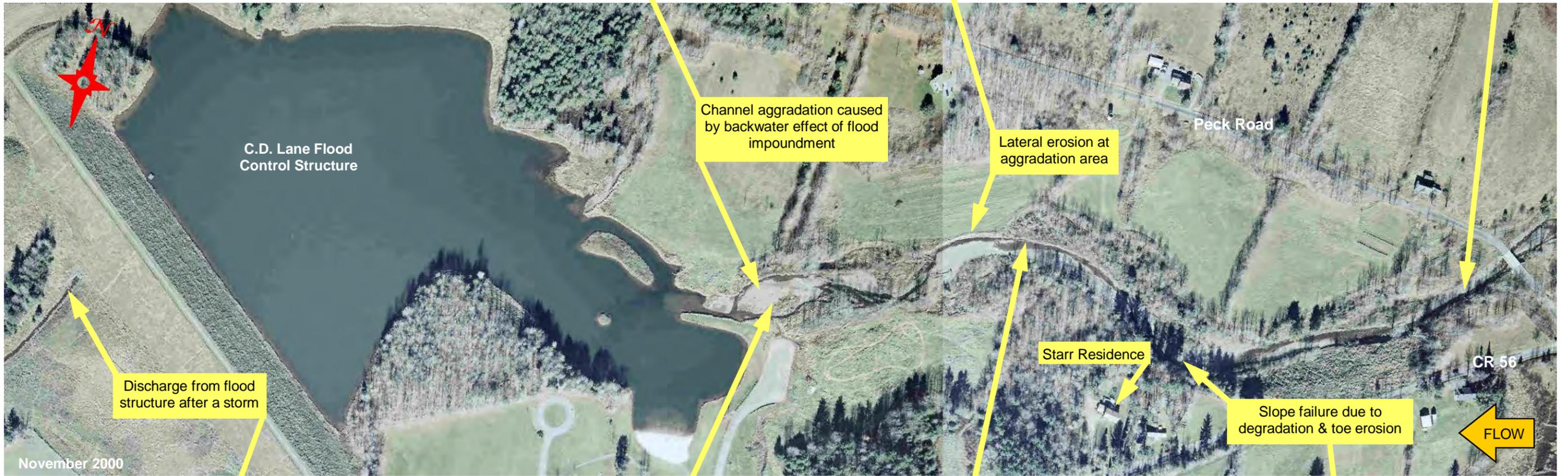


C



D

Note loss of woody buffer due to erosion



C.D. Lane Flood Control Structure

Channel aggradation caused by backwater effect of flood impoundment

Lateral erosion at aggradation area

Peck Road

Starr Residence

CR 56

Slope failure due to degradation & toe erosion

FLOW

Discharge from flood structure after a storm

November 2000



E



F



G



H