

Reach 2a (CD Lane Park Flood Control Structure to Intersection CR 40/56)

Reach 2a begins at the outlet of the CD Lane Park Flood Control Structure (FCS) and continues 1.17 miles to the county bridge (No. 3-30286-0) at the intersection of County Routes 40 and 56. The reach ranges in drainage area from 9.4 mi² to 11 mi² and includes six unnamed intermittent tributaries which contribute to the reach. The reach is located in Valley Zone 4 and has an average valley slope of 1.3% (**Figure V-11**).

Stream Morphology/Stability

As noted earlier, the entire segment is highly stable due to the influence of the C.D.Lane dam on stream flows and their ability to transport sediment. During the 1997 Inventory and Assessment, reach 2a exhibited minimal streambank erosion. On the watershed scale, reach 2a exhibited the third lowest erosion of all 21 management reaches. From a stability perspective, reach 2a is considered nearly as stable as a reference reach (a model reach for stability) by the GCSWCD and the NYCDEP Stream Management Program. While reach 2a has several areas that have been historically altered by rip-rap, channelization (straightening), and construction of floodplain berms in localized areas, these activities were associated with past protection efforts prior to construction of the flood control dam.

The channel has been classified as a B3c at the flood control structure outlet which transitions into a C stream type in the area above Slater Road. The channel transitions back into a B stream type below Slater Road with a berm along the left side of the stream cutting off the channel from its floodplain. The majority of the reach has low sinuosity and extensive channel and floodplain modifications. Immediately below the flood control structure, the Batavia Kill essentially has no sinuosity for the first several hundred feet. It is a constructed channel that was designed to accommodate the discharge from the structure. It has a floodplain and is not entrenched. Then, to Slater Road, the stream exhibits the highest sinuosity present in reach 2a as it meanders across the Hitchcock farm. Just below Slater Road, a floodplain berm was constructed in the past. The berm is located on the left bank, at this point the stream begins to become more entrenched. Between Slater Road and the bottom of the reach, entrenchment is moderate, but does not appear to be impacting stream stability. From Slater Road to the bottom of the reach, sinuosity is very low.

A single monumented cross section was installed below the CD Lane Park flood control structure for classification purposes in 1998 and was subsequently surveyed again in 2000 to determine if any stream changes had occurred as a result of the September 1999 flood event. (**Figure VI-21**). The cross section monitoring indicated that the channel has achieved a stable morphology that accommodates the modified water and sediment discharges from the flood control structure. Minimal erosion during the monitoring period validated the GCSWCD observation that the reach is highly stable.

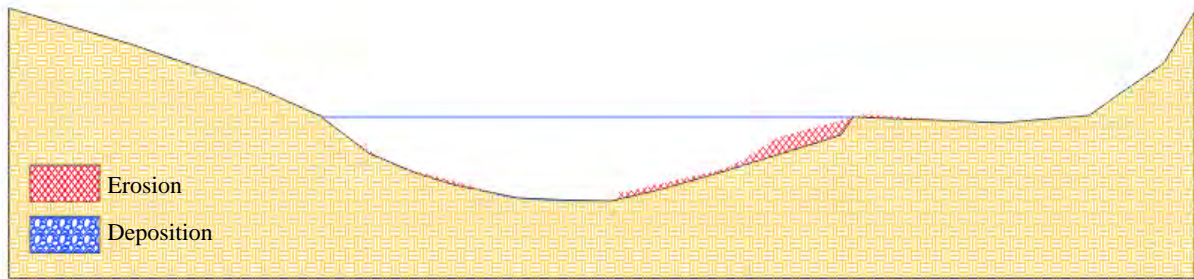


Figure VI-21: Overlay of 1998 and 2000 cross sections taken below CD Lane Park Flood Control Structure.

During the assessment period, the GCSWCD noted active incisement of several of the smaller tributaries that contribute to the reach; this was not physically measured. The intermittent tributary that enters from the base of Thomas Cole Mountain (**Figure VI-23a, photo G**) and the tributary that enters from the north just below the dam (**Figure VI-23a, photo C**) both are actively degrading (downcutting). The tributary from Thomas Cole is extremely active below County Route 56. The tributary passes through the Hitchcock property where it has incised substantially. The channel's banks have no cover and are mowed to their tops. Monitoring on the main stem Batavia Kill above the confluence has shown no vertical degradation. The vertical instability of the tributary is believed to be confined to the tributary itself.

Riparian Vegetation

The riparian community in reach 2a consists of moderate to low-density mixed deciduous/coniferous overstory, with a brush/grass understory. The entire length of the reach is characterized by extensive growth of sedges and other herbaceous plants within the active channel and on the lower streambanks. Several sections of the riparian buffer are regularly mowed, but these activities do not appear to be having an impact on channel stability. The stream riparian community immediately below the dam consists of highly dense grasses and sedges with some low shrub growth (**Figure VI-23a, photos A,B,C,D,E,F,G**). Between the dam and Slater Road, the reach is dominated by herbaceous growth, with limited areas of forest. While the reach has excellent riparian vegetation from a stability standpoint, much of the reach exhibits fair to poor conditions in regard to buffer species that provide stream cover and thermal benefits (**Figure VI-22**). The lower reach transitions to



Figure VI-22: While grasses and forbs provide stability, poor overhead cover reduces habitat value.

a higher density of woody growth, with trees and shrubs supplementing the herbaceous communities. During the assessment phase, the GCSWCD compared aerial photographs over a 41 year period from 1959 to 2000 which indicate that the riparian zone has remained essentially the same (**Figure VI-24**).



Figure VI-24: Aerial progression from 1959 (left), 1980 (middle) and 2000 (right), note that the riparian condition has essentially remained the same over 40 years.

Water Quality

During the assessment period, the GCSWCD did not note any priority water quality impacts within the management reach. In regard to turbidity, no clay exposures were noted in either the streambank or streambed. The contributing tributaries may be a source of suspended sediments, but their impact is not thought to be significant at this time. The most significant source of turbidity within the reach may be associated with roadside drainage. The section of County Route 56 running along the reach has several steep sections with narrow shoulders, and maintenance of stable roadway ditches is difficult. The GCSWCD has applied to the Catskill Watershed Corporation for a Stormwater Retrofit Program grant to address this source of turbidity.

There are several agricultural operations within the reach but they do not appear to have any impact on water quality. Only one operation involves animal production, with beef cattle being raised. The GCSWCD has not observed any agricultural impacts, but is currently discussing participation in the Watershed Agricultural Program with the farm operators.

Infrastructure

The central infrastructure feature within the reach is the outfall for the C.D. Lane flood control structure (**Figure VI-23a, photo I**) In the GCSWCD's initial assessment of the reach, the primary concern was related to the typical "clear water" effects seen below similar dam structures (**see section V-C**). The completion of the flood control structure in 1976 effectively created a large trap for sediment that significantly reduces the stream's sediment supply.

The reach also contains two county bridges and a short segment of County Route 56 which runs adjacent to the stream. The upper bridge, at Slater Road, is more than adequately sized for the modified flows from the flood control structure. During flood events, the bridge easily passes its flow (**Figure VI-23b, photo E**), and the bridge span is large enough to have allowed for development of an effective bankfull channel under the bridge's span. Streambank stability upstream of the bridge is influenced by older rip rap. The lower bridge, at the bottom of the reach, also does not appear to be impacting stream stability. Both bridges easily pass the reduced sediment load that is characteristic of this reach, and both have adequate hydraulic openings to pass the full range of discharges.

Reach 2a Summary

This reach is highly stable, although not necessarily naturally stable. While there is evidence of past disturbances and instabilities, the GCSWCD strongly believes that their construction was to enable farm and residential use of the floodplain prior to the dam's construction. The Batavia Kill has adjusted to its reduced sediment supply and streamflows and has limited streambank erosion or bed degradation. In comparison with the overall Batavia Kill stream corridor, the riparian buffer area is in good condition.

Table VI-5: Management Recommendations Reach 2a.

Reach 2a: CD Lane Park FCS to Intersection CR 40/56	
<i>Intervention Level</i>	Protection
<i>Stream Morphology</i>	<ol style="list-style-type: none"> 1. Discourage in-stream alterations such as gravel mining and stream planform alterations that may promote increased instability in the reach. Prevent further entrenchment of the lower reach by any activity that would cause incision or fill the floodplain elevation. 2. Visually monitor the observed incision of tributaries in the reach.
<i>Riparian Zone</i>	<ol style="list-style-type: none"> 1. Implement riparian planting of trees and shrubs to improve stream cover. Area immediately below dam presents an opportunity to gain thermal benefits for habitat. 2. Investigate landowner participation in the federal CREP program to provide improved buffers. 3. See general recommendations
<i>Water Quality</i>	<ol style="list-style-type: none"> 1. Investigate landowner participation in Watershed Agricultural Program. 2. Seek funding, and implement stormwater BMPs along County Route 56 and Slater Road to reduce turbidity and NPS loading. 3. See general recommendations
<i>Infrastructure</i>	See general recommendations - Bridge Maintenance
<i>Habitat</i>	<ol style="list-style-type: none"> 1. Habitat in good condition. May achieve some additional benefit by construction of pool features in straightened sections. 2. See general recommendations
<i>Further Assessment</i>	<ol style="list-style-type: none"> 1. Continue to monitor stability. Implement detailed monitoring protocols if instability is observed. 2. Assess the benefits of additional habitat improvements.



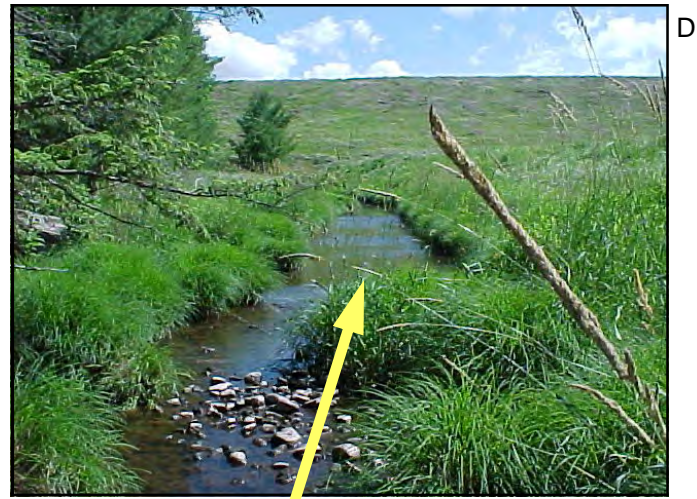
A



B



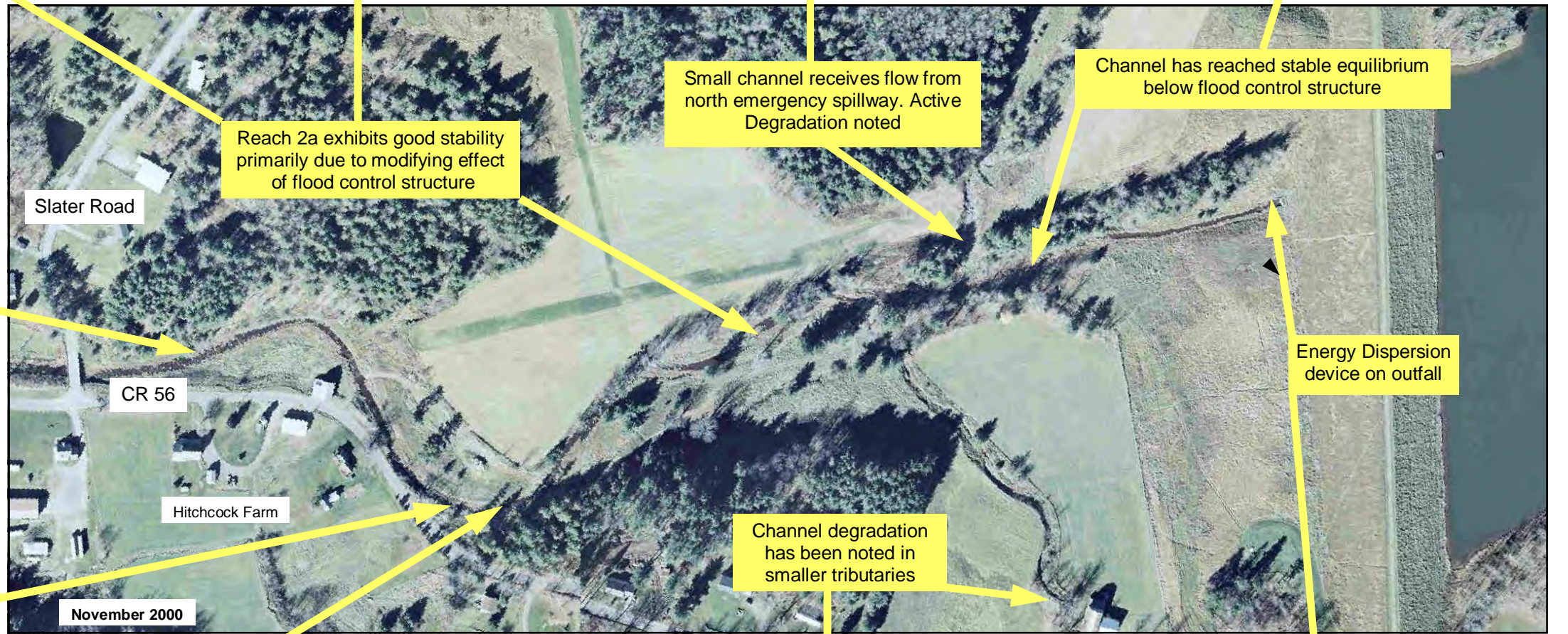
C



D



E



Slater Road

CR 56

Hitchcock Farm

November 2000

Reach 2a exhibits good stability primarily due to modifying effect of flood control structure

Small channel receives flow from north emergency spillway. Active Degradation noted

Channel has reached stable equilibrium below flood control structure

Energy Dispersion device on outfall

Channel degradation has been noted in smaller tributaries



F



G



H



I



A



B

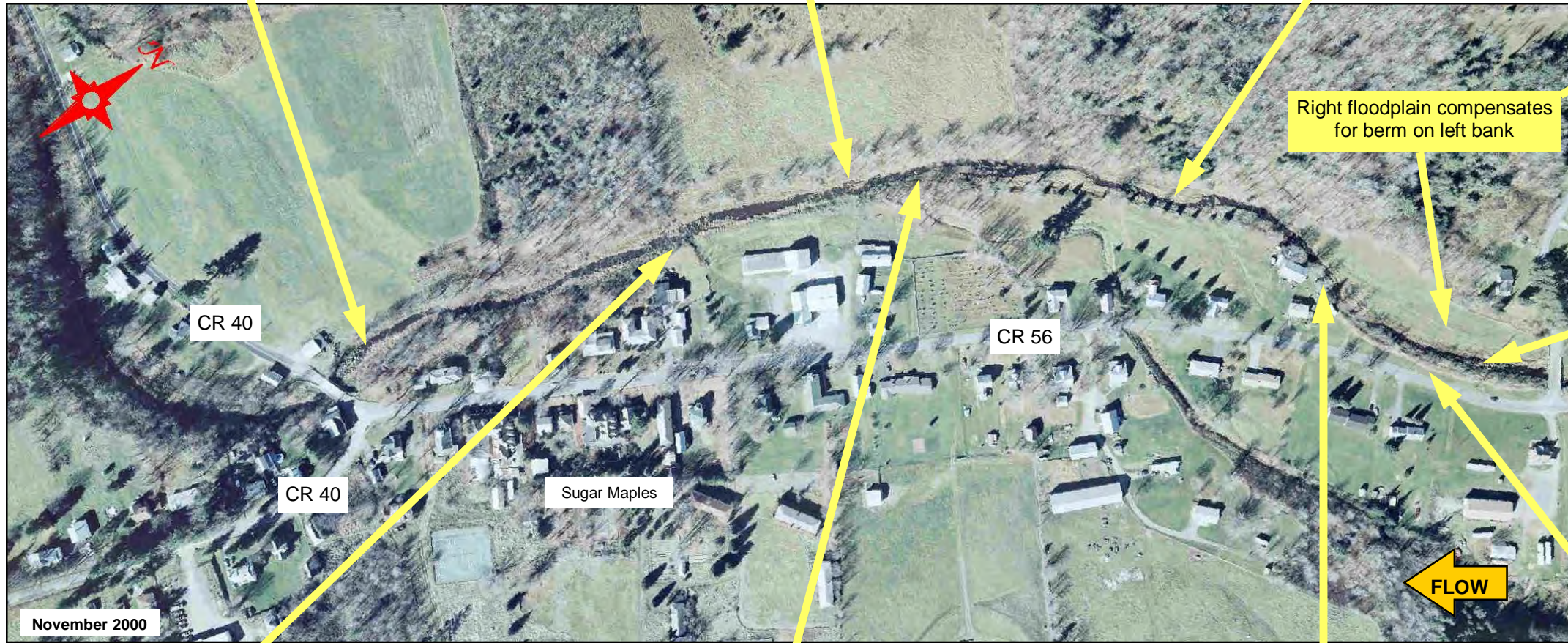
Note in-channel and riparian vegetation promote stability. Additional woody vegetation would improve habitat



C



D



Right floodplain compensates for berm on left bank

CR 40

CR 56

Sugar Maples

FLOW

November 2000



Channel at near bankfull conditions after flood event

E

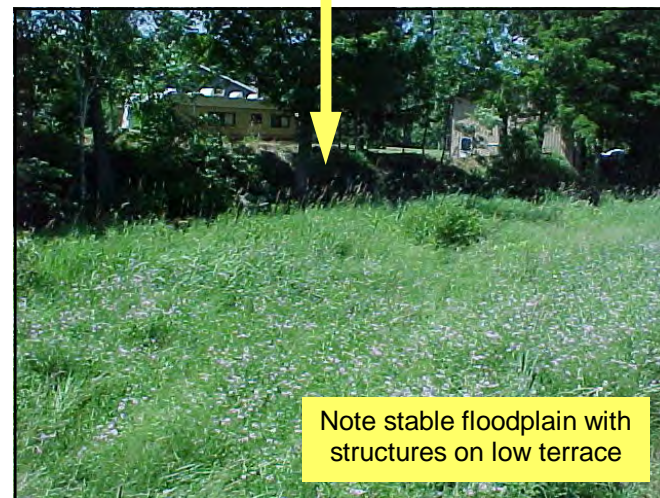


F

Riparian buffer enhancements could improve fisheries habitat. Note Japanese knotweed in front

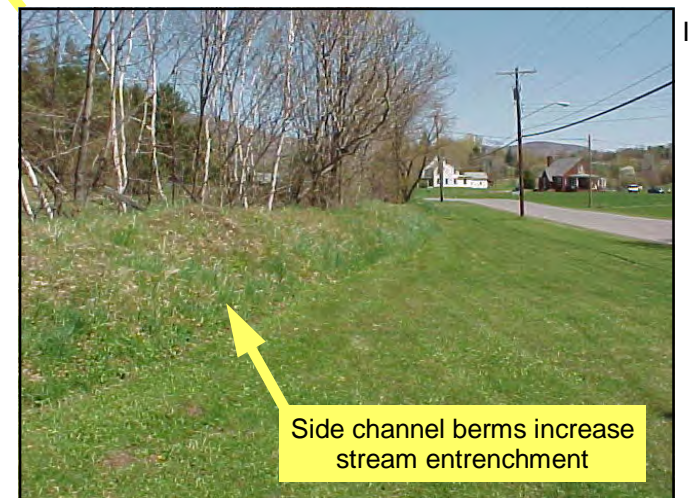


G



H

Note stable floodplain with structures on low terrace



I

Side channel berms increase stream entrenchment