

Oatka Creek Stream Stabilization and Habitat Restoration Project Narrative

This project was started from a previous Great Lakes Grant to identify concerns in the Oatka and Black Creek watersheds. Through this grant the site was listed as area of concern and a preliminary design was developed. This design was developed by Lu Engineering for the grant and there were funds placed in the grant to utilize Lu Engineers to develop a final design. Lu Engineers completed a full Topographic survey in the fall of 2006. This survey was to be used to complete a final design for the project. In March of 2007 before the final design was complete a heavy runoff event occurred completely changing the stream channel to be stabilized and making the topographic survey unusable.

The runoff event of March 16th changed all preliminary design plans. The stream channel was altered so much that the project landowner's bridge was in immediate danger of being completely under cut by the stream. This caused an immediate need to get emergency permits to protect the bridge and stabilize the stream until a new project could be completed to provide a more permanent solution. Under the emergency permit trees and debris were removed from the area above the bridge to prevent further damage. Rock was placed under the base of the bridge to protect from further under mining of the bridge. The stream was now stable enough to work on a design to stabilize the new concerns. The new concerns were the bypass of 1500' of stream channel causing a head cutting of 4-6' in many areas of the new stream channel. These concerns were highlighted by a 600' long vertical bank, which had been exposed by the runoff.

The concern now was to develop a new design with existing funds to address the new concerns. Working with Dave Derrick of US Army Corps of Engineers, Fran Reese of Lu Engineers and Scott Cornett of NYS DEC Fisheries the District staff worked on a new design. The design recommendations were to protect above the landowner's bridge with heavy rock to keep the stream from making any further channel changes. The area below the bridge will be protected by log revetments and plantings. The use of plantings will fit in the project budget but will also help to create fish and wildlife habitat. The final design was completed and permits were obtained to begin work.

The project had a late start due to design changes, permit concerns and contractor scheduling. Work was finally begun in late August with the cutting trees for revetments and poles for plantings. The trees were cut and dragged down to be soaked in a small pond area of the old stream channel. There was over 1000' of old cable brought in that had been donated by a local landowner. Finally the large rock was ordered and delivered just before the contractor started.

The first priority when the contractor started was to dig the diversion channel so most of the work would be completed in the dry. The construction of the new diversion channel provided much of the fill that was needed to grade the bank that the tree revetments would protect. To fill in the 600' long bank much of the old gravel deposits from past

runoff had to be used to get at least a 2:1 slope for proper stabilization. The removal of the gravel deposits help create a large floodplain, which will reduce concerns from future large runoff events. The construction of the diversion and grading the eroded bank took the first week of contractor time to complete.

The next step was placing the log revetments at the base of the slope of our newly completed bank. There was a key log laid into the bed of the stream as part of the DEC permit requirements. Then a second log was placed on top of the base log. Both of these logs were cabled together. These logs were also anchored to the bottom of the stream by a duckbill anchor and anchored into the slope of bank by a log dead man buried in the bank and cabled to the logs. The full 400' of revetments were constructed using the key logs with both dead men and duckbill anchors. At the beginning and middle of the revetments log grade control structures were placed to maintain the stream level and prevent undercutting of revetments. The log grade at the front of the revetments was 40'+ Sycamore tree with a 7' diameter root ball that buried in the stream bank and large rock was used to anchor the other end along with duckbill anchors. The log grade control in the middle was a large Cottonwood log that was tied into the revetments on one side and buried with stumps to protect the downstream as well as duckbill anchors. During construction concerns were raised about the amount of runoff coming down the slope in the middle of the revetments. There was concern that this concentrated flow would erode our bank behind the revetments. To address this issue a rock basin was constructed at the top of the slope and erosion blankets were stapled to the slope below the rock basin to reduce erosion concerns. The final part of the log revetments was to place gabion stone behind the

logs to prevent high flows from eroded the new soil from behind the logs.

After completion of the revetments the rock work was completed above the bridge. First a 55' rock key was buried into the stream bank to prevent the stream from bypassing the bridge to the west. There was a 130' slope rock protection completed below that key. There was similar rock key placed on the east side of the stream and keyed into to the large willows on the bank and the rock placed under the bridge in the spring. Then a compression rock grade control was installed from the key toward the bridge. The rock grade control was installed to prevent any further down cutting near the bridge and protect the landowners telephone and gas line buried upstream of the structure.

The last part of the project was to protect the bank from the rock under the bridge to the start of the new log revetments with large toe rock. Then the stream was diverted back into the old channel and a log grade control was placed into the new diversion channel. This log grade control was set to allow all base flow down along the new revetments. This grade control was set so when the stream becomes high enough it will flow down the diversion and take much of the pressure off the revetments. The goal of this will be to protect the revetments from being damaged during high flow events. The last part of the project was to seed all disturbed areas to reduce erosion.

The project will be monitored for the next year or 2 to determine if repairs are needed. The landowner and the SWCD will make repairs as needed and determine how well the different practices worked. The DEC and Trout Unlimited have committed to supplying trees and volunteers to plant the trees in the riparian areas along the stream.



Picture of bank below bridge in 2004



Bank area where original design was to protect as see in 2004



Lower section of that same bank that was eroded out and under cut in 2007 as it was in 2004



Area where debris collected in sharp bend at the end of our bank to cause the spring blow out in 2007



Trees and debris above bridge from March 16th runoff erosion



Landowner bridge being under cut from resulting head cutting by stream due to blow out of lower meander



Deeply eroded 600' bank area below bank which gravel has been blow out by March 16th runoff bypassing 1500' meander



Blockage in stream which caused blow out on March 16th



Moving tree out of stream and using it for temporary bank stabilization above the bridge



Using stump to key in rock to protect bridge



Placing rock to save bridge in high water under emergency permit authorization



Completed rock protection under bridge April 2007



Landowner and contractor working to clear area for new diversion channel



Digging new diversion channel to divert water during project and to be used as an overflow channel after completion



Moving stream flow to new diversion channel



Water diverted from work area so construction of revetments and grade controls can begin.



Stream is dry and debris and gravel to be placed on eroded bank



Starting to grade bank for revetments



Material was used from past runoff deposits to protect eroded bank now that the stream channel had been diverted



It took the contractor one week to install diversion and grade the eroded bank for the revetments with so much material to move



Landowner helps SWCD staff dragging logs and poles to be used with log revetments



Logs and poles were soaked in small pond area in old channel to help stimulate sprouting



Contractor then moved logs up to a staging area for use as revetments



Logs are placed near bank to be installed as revetments



Trenches were dug at the base of the slope to install key logs into the bed of the stream.



Key logs were placed in trenches and then logs were placed and cabled to the top of them



Logs were placed on top of key logs and cabled to the key log



Logs after being placed together and logs were secured both with a duckbill anchor and a deadman in the bank



The duckbill anchor was driven into the streambed



The anchor was then chained to the excavated arm



The excavator pulled and set the anchor in the stream to hold the key log down



Then the cable of the duckbill anchor was cabled around the logs to hold them in place



Holes were dug into the bank to place deadmen logs to hold in revetments



Logs were placed into the hole by the excavator



Cables were attached to the logs and later attached to the revetments to hold them in place



The logs were buried with poles placed into the side of the hole which will



A large log was used as a grade control at the midpoint in the log revetments



The log was anchored in with the duck-bills and revetment logs were cabled on top to hold it in place



Stumps were placed of the downstream side to further anchor the log and have sprouts come from the stumps



View of revetments anchored in place ready for rock to protect from scour



Rock was placed by excavator and hand behind revetments to protect newly graded slope



Preparing slope for rock protection above bridge



Placing slope rock and placing planting between rock as required by permit



Placing plantings on completed slope rock



Starting rock grade control at end of slope rock and keyed into bank on east side of stream



Rock grade completed and end of slope rock



Overflow diversion and new channel after complete



**Lower section complete at end of re-
vetments**