

STREAMBANK STABILIZATION OF A CONSTRICTED CHANNEL USING STORMWATER WETLANDS

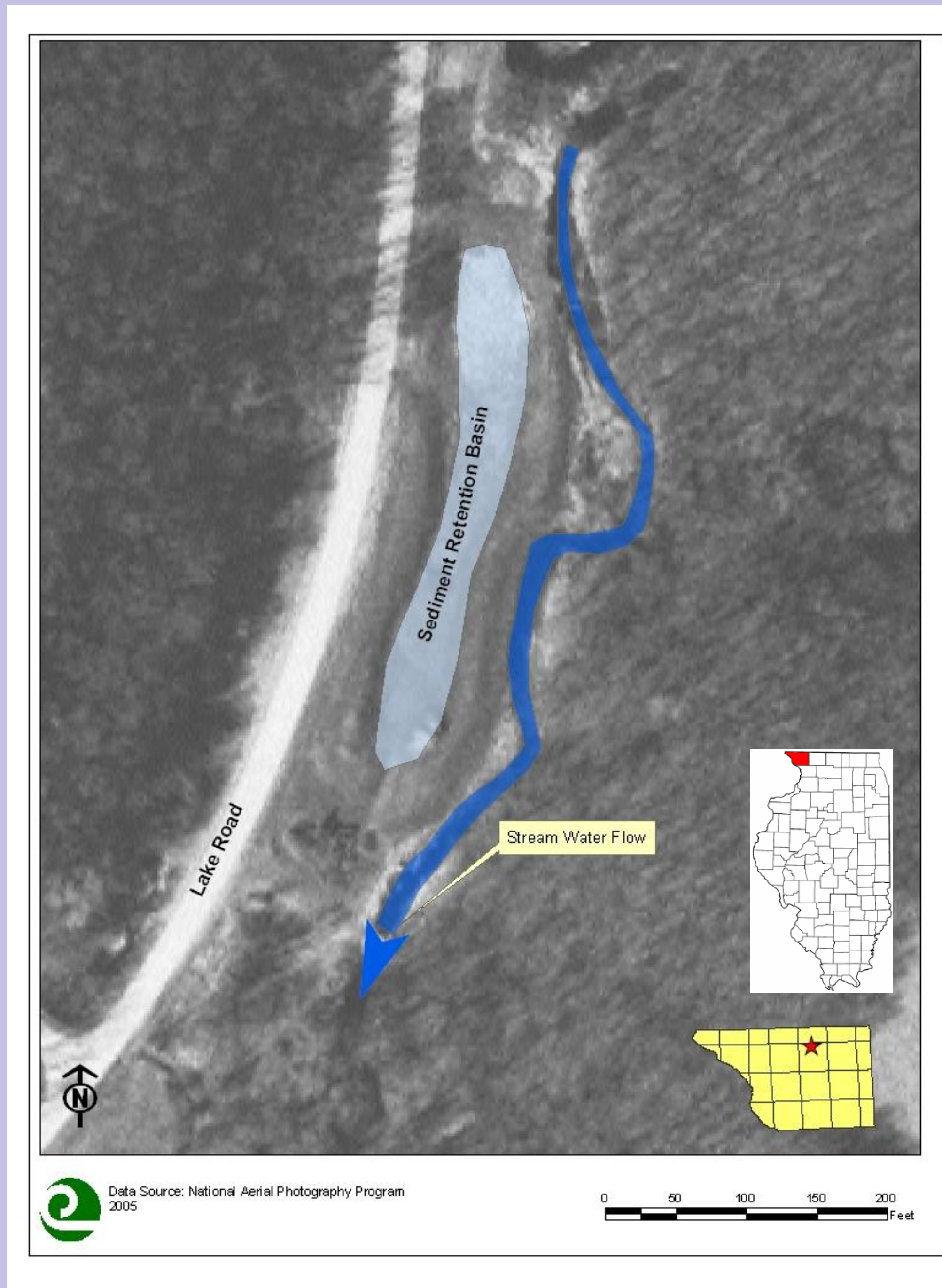
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Background

- In the fall of 2012 a stormwater wetland and streambank stabilization project was completed on a tributary stream which feeds a reservoir in Northwest Illinois that was susceptible to heavy erosion.
- The stream channel was constricted along both banks by a steep hillside and a berm from a sediment storage pond, preventing the channel from connecting with the natural floodplain.
- The Jo Daviess County Soil and Water Conservation District worked with the Illinois Department of Agriculture and the Apple Canyon Lake Property Owners Association to develop a method to prevent stormwater sediment from reaching the impoundment, and stabilize the stream.



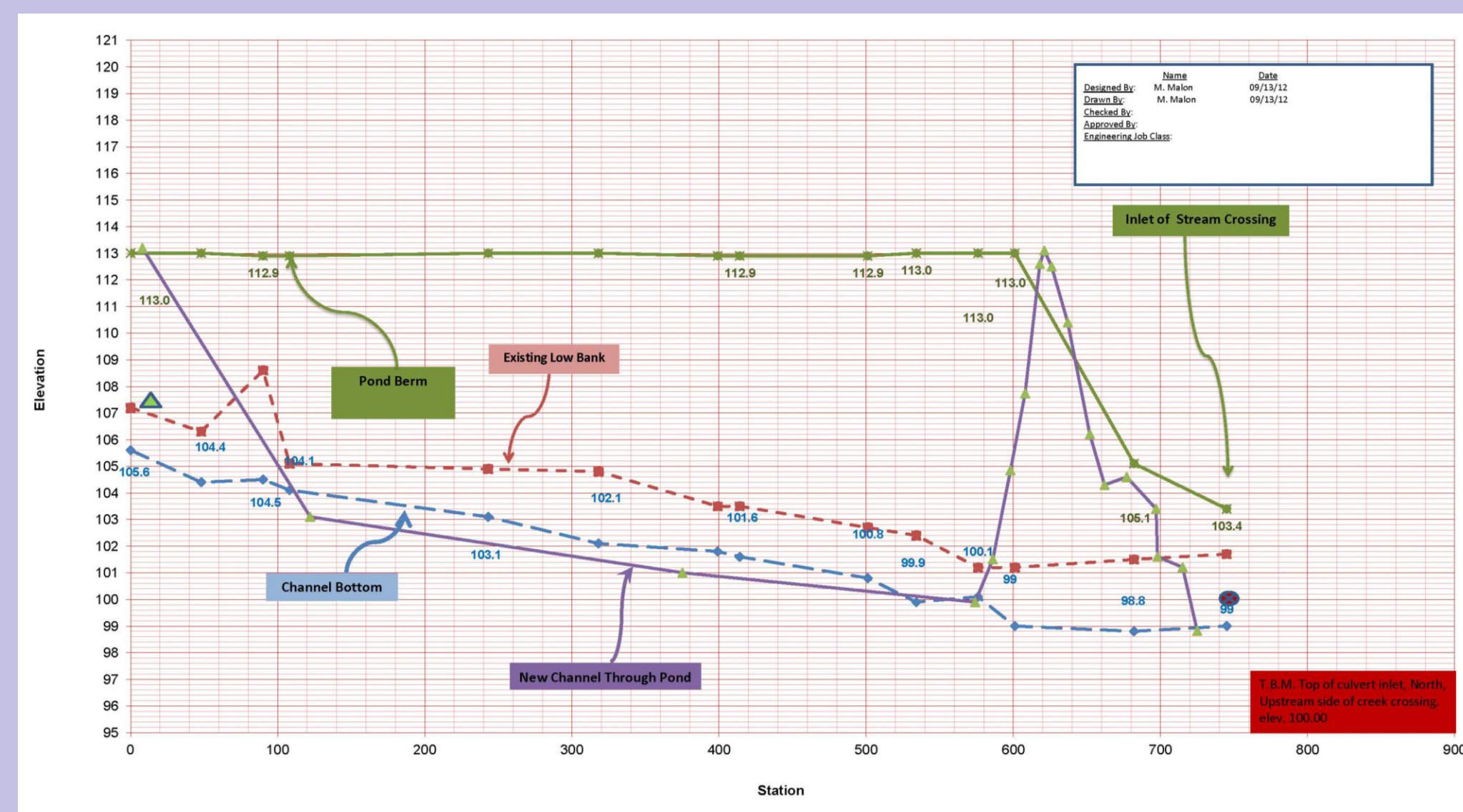
Project Site Aerial

A water and sediment retention basin adjacent to the stream was being compromised from the stream erosion. 500-year storm events in 2011 and 2012 destroyed the dewatering apparatus and rendered the basin inoperable.



Looking downstream showing stream bank erosion and damage to water and sediment basin infrastructure.

Design and Permitting



- The basin was converted to a wetland area to relieve out of bank flow and capture sediment and nutrients.
- The berm forming the basin walls was notched at the North and South ends. The entrance notch at the North end was set with a low grade at the bankfull elevation of the stream and protected with RR-5 rock.
- The downstream end was opened and stabilized with a rock-riffle terminating at the elevation of the adjacent stream.
- During out of bank flows this reconstructed wetland offers 17,500 cubic feet of storage and 1.2 minutes of residence time.
- Grade control was implemented in the stream channel with two rock riffles to help connect the stream with the small floodplain where it existed.
- Longitudinal peaked stone toe protection (LPSTP) was used on eroded corners. The stream channel was moved on one severe corner to reduce radius of curvature.



Plan Map

- A joint permit for streambank stabilization and restoration was acquired from the U.S. Army Corps of Engineers, Environmental Protection Agency, and Illinois Department of Natural Resources.

Construction



LPSTP and inlet to wetland.



New wetland structure looking downstream.



New corner alignment with LPSTP.



Convergence of wetland with stream under storm flow.

Monitoring

Ongoing monitoring of the performance of this design will take place through the Jo Daviess S.W.C.D., Apple Canyon Lake Property Owners Association, and undergraduate research at the University of Dubuque.