Two-stage Ditch Case Study:

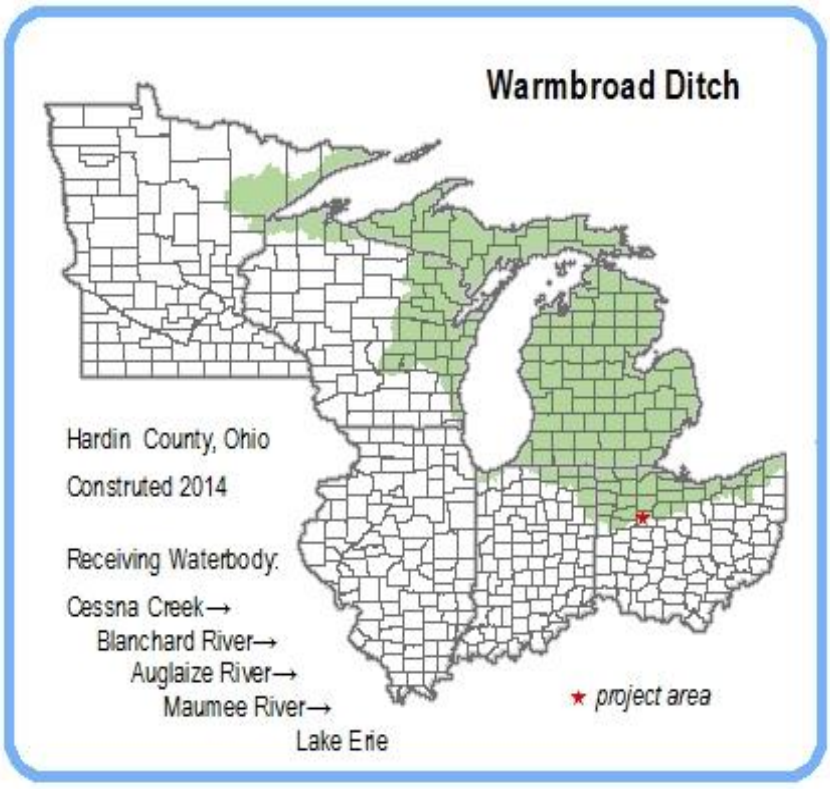
Cessna Creek – Warmbroad Ditch

Western Lake Erie Agriculture Project

Project History and Purpose:

Flooding, flashiness, and nutrient loading are systemic problems in the Blanchard River Watershed. Heidelberg University water quality data collected from stream gages show that the Blanchard River may be contributing higher nutrient loads to the Maumee in comparison to other rivers in the watershed. A USGS stream gage on the Blanchard River at Findlay, OH recorded 81 years of annual peak flow data; 53 years had water levels at or above flood stage. Higher flows carry with them higher sediment loads. According to the Blanchard River Watershed TMDL, Cessna Creek has approximately 9x more phosphorus in the stream other streams in the Upper Blanchard River watershed.

Warmbroad Ditch is a small, headwater tributary to Cessna Creek and the Blanchard River. It was modified to a two-stage channel to increase storage capacity and reduce excess sedimentation, stream flow velocities, and nutrient loading. The original channel was incised and had bank stability issues. Warmbroad Ditch has a small watershed that drains agricultural fields and pasture (94%), forest (6%), residential areas (0.4%), and water and wetlands (0.2%). All of the soils in the contributing watershed are Hydrologic Soil Group C and much of the agricultural lands have subsurface tile drains to facilitate production.



The two-stage channel was constructed in 2014 through the joint efforts of the landowners, Hardin County Soil and Water Conservation District, The Ohio State University, and The Nature Conservancy. The Ohio State University surveyed the site and developed a conceptual design that Miami Conservancy District Engineers used to create construction plans. Funding for the project was provided by the U.S. Environmental Protection Agency Great Lake Restoration Initiative. After construction, the landowner became part of the Ohio Farm Bureau and NRCS Blanchard River Demonstration Farms Network.

For more information, contact: Jessica D'Ambrosio, jessica.dambrosio@tnc.org

Before Construction, 2013

During Construction, 2014

After Construction, Before Seeding, 2014

Site Physical Characteristics:

Drainage Area: 953 acres

Channel Slope, Average: 0.3%

Project Length: 2,436 linear feet

Project Costs:

Earth Work Costs: $18,335.50

- Mobilization: $1,000.00
- Site Preparation, bridge removal: $1,400.00
- Soil Excavation, Hauling, Disposal: $15,935.50
  - 4,553 cubic yards @ $3.50 per cubic yard
  - 3.5 cubic yards per linear foot of channel

Outlet repair, protection and erosion control: $2,000.00

Seed and Seeding, 2.24 acres: $3,024.00

Miscellaneous Labor (rock pick-up): $1,200.00

Engineering, survey, and inspection: $0 (design completed by Hardin SWCD, OSU, Ohio NRCS)

Total Cost: $24,559.50

Cost per linear foot: $10.08

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