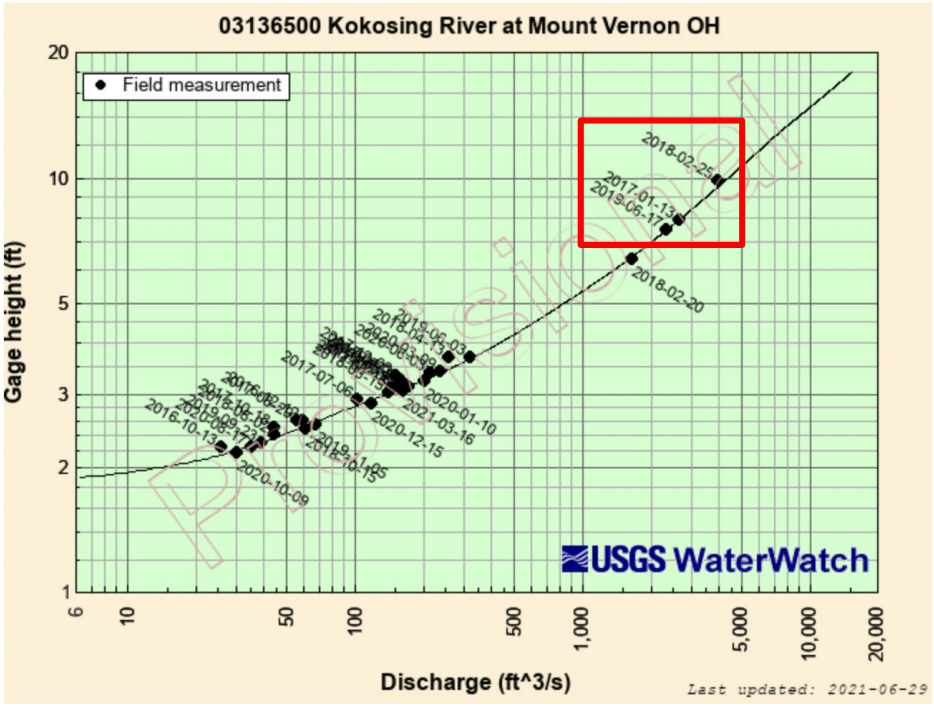
Kokosing River Restoration Project FAQs

This question and answer document is centered around the Engineering, Science, and Habitat Conservation Techniques that are being used to complete our Kokosing River Restoration.

What happened to the Phase One area at the West lake of Foundation Parks that made it necessary to make repairs and at what techniques are being used?

Flood events in 2017 and 2018 left the river bank severely eroded, resulting in a direct connection between the West Lake at Foundation Park and the Kokosing River. The goal for the West Lake project is to remedy the breach in the streambank between the lake and the river. You can see just how severe these flood events were by looking at data in the red box on the graph below which shows how much water discharge occurred during the events measured by the gage height (a gage is a tool used to measure river height. It is used to show large fluctuations in river depth, this U.S. Geological Survey graph uses a 2 foot height as a reference point which they then use to measure the water height above). The flood events that caused the most damage were a 2017 flood event that had a height of 8 ft and another event in 2018 with a height of 10 ft.

Large stone was placed to close the breach in the between the river and the lake. The material that now fills the breach is sturdy and has allowed for a wider, and taller structure to be made between these bodies of water. These changes made in this project will ensure stability for the raised bank in future flood events, Berm is the technical term for this structure.



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What work was done at Phase two along Norton Street and the East Lake of Foundation Park?

The goal for the Norton Street project was to restore approximately 700 linear feet of the embankment along a backwater channel section of the Kokosing River. The backwater channel of the river is located near Foundation Park's East Lake. It is a branch of the main river that curves around some small island features and has little or no current till it meets back up with the main river channel. By restoring the embankment between this channel and the East Lake it will protect the river from breaching into the lake in future flood events, like it has done in the past, and will also protect the riparian corridor (riparian corridor meaning the vegetation, habitat, and community situated on the bank of the river).

The restoration of the embankment consisted of using limestone rock to construct a stable foundation to stabilize the riparian corridor. Above the average high water line where the limestone rock foundation stops there are four soil lifts that were constructed that are encased in a product called "D" block, this is a burlap and jute matting material that holds the soil in place and allows for woody and herbaceous plants to grow as the matting slowly degrades. The rest of the projects focus was to plant vegetation of appropriate native plants for the area along the riparian corridor and down to the East Lake.

= Construction area

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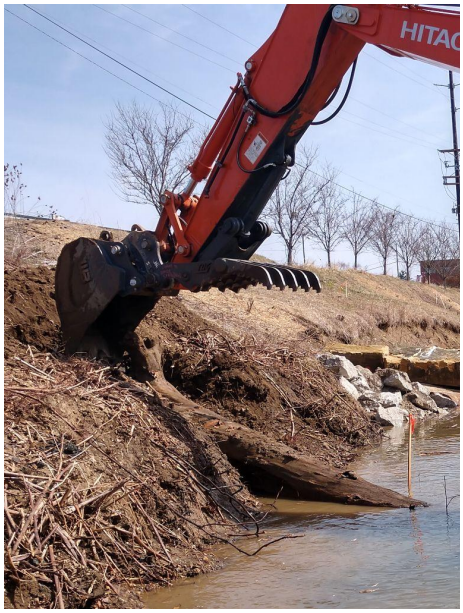
Phase three on Phillips drive used multiple types of gravel, sandstone rocks, and vegetation, what were those for?

The goal for the Phillips drive project is to restore approximately 800 linear feet of failing and unstable river bank. In order to fulfill that conservation goal different types of rock, gravel, and boulders were embedded along the river bank to provide it with additional stabilization along with the replaniting of 21 different types of vegetation on the bank. This work will ensure that the soil below the rocks and vegetation will not get washed away and continue to be eroded during flood events.

The largest rocks used along the river bed were sandstone slabs. These ranged from 2.7 to 7.9 tons each. The slabs were maneuvered into the river and stacked at an angle from the river bank into the river about 12 feet. These are called Cross Vanes. The use of Cross Vanes are considered a deflection technique. They deflect water flows away from the river bank creating turbulence which dissipates energy and lowers the stress that is applied near the bank. This deflection and dissipation of energy not only prevents erosion but also improves the establishment of protective vegetation along bare river banks.



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Bellow are helpful links to additional information on the work completed and being done for restoring this section of the Kokosing river corridor:

Research papers:

1. Impacts of Stabilization Measures by Craig Fischenich
   a. https://erdc-library.erdc.dren.mil/jspui/bitstream/11681/3937/1/TN-EMRRP-SR-32.pdf
2. Monitoring of Streambank Stabilization and River Restoration Structures on Ice-Affected Rivers in Northern Vermont by Andrew Tuthill
   a. https://erdc-library.erdc.dren.mil/jspui/bitstream/11681/5535/1/CRREL-TR-09-14.pdf

Other examples of similar work:

1. The Village of Chagrin Falls Stabilizes Eroding Bank of the Chagrin River
   a. https://chagrin-falls.org/the-village-of-chagrin-falls-stabilizes-eroding-bank-of-the-chagrin-river/
2. Preliminary Design Report, Streambank Stabilization and Water Quality Improvement Practices Defiance, OH May 19, 2017
   a. https://cityofdefiance.com/wp-content/uploads/Pontiac-Park-Stabilization.pdf

Articles and guides:

1. Streambank Stabilization Method: Rock Vanes by Submar Inc.
   a. https://submar.com/streambank-stabilization-method-rock-vanes/
2. Kentucky Erosion Prevention and Sediment Control Field Guide, Section 10 Protecting Stream Channels, Wetlands, and Lakes, Pages 62-65
   a. https://www.epa.gov/sites/production/files/2015-11/documents/esc_guide_0.pdf

Resources used in FAQs:

1. Flow Structures by Carleton College
   a. https://www.carleton.edu/departments/geol/links/alumcontributions/antinoro_03/smcwebsite/FlowStructures.htm
2. Stream Restoration Series: Cross Vane by E.L. Hickman and T.M. Thompson, and Biological Systems Engineering of Virginia Tech
   a. https://cbtrust.org/wp-content/uploads/Cross-Vane-Fact-Sheet.pdf
3. USGS WaterWatch Streamgage Dashboard
   a. https://waterwatch.usgs.gov/?id=wwsa&site_no=03136500

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