SUMMARY OF PROPOSED ACTIONS
WITHIN THE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT
FOR STREAM WORK PROJECTS
STATES OF ILLINOIS, INDIANA, MICHIGAN, MINNESOTA, OHIO, AND WISCONSIN

COMMON SCOPE OF WORK

- Work may take place where erosion has occurred, where damage by storm events has occurred, or in areas where no damage has occurred but improvements would mitigate future flood damage.
    - Scale Limits - no more than 1 linear mile and no more than 5 acres of ground disturbance. New bulkheads no more than 1,000 linear feet.
    - This PEA will not include work along Wild and Scenic Rivers.
- Typical construction activities for stream modification and erosion control hazard mitigation projects include:
    - Demolition or modification of existing facility or structure
    - Tree and vegetation cutting, clearing, removal, and restoration/planting
    - Excavation in upland, embankment, and streambed areas
    - Grading
    - Staging areas and site access routes
    - Erosion and sediment control measures
    - Dewatering and temporary stream diversion
    - Traffic disruptions, lane closures, and possible detours for projects in sites adjacent to roadways
    - Site closure and stabilization

PROPOSED ACTIONS

Minor Modifications to Restore Stream Functions

- Examples of minor modifications to restore stream functions include:
    - Sheet pile to replace damaged concrete bulkhead, maintaining pre-disaster geometry and dimensions.
    - Installation of stone toe protection to replace washed out riprap or native stone.
    - Minor extension of embankment structures to tie into stable ground.
    - Installation of drainage systems behind existing or restored retaining walls or revetments.
- Includes expanded footprint without changing function or capacity of pre-existing embankment.
- Covers changes required to bring a previously permitted facility into compliance with new state or federal permit conditions or accepted codes/standards.
- Typically performed in previously disturbed ground, generally in same footprint as damaged facility. However, best engineering practices may require increases in length or depth of excavation for footings.
- Specialized construction activities include but are not limited to:
    - Construction practices such as pile driving, cast-in-place concrete in water
    - Installation of drainage systems behind retaining wall

Bioengineering

- Bioengineering projects use a combination of biological, mechanical, and ecological concepts to control erosion and stabilize soil through the sole use of vegetation or a combination of vegetation and construction materials.
- Projects that use plant materials alone or in combination with other practices to stabilize embankments adjacent to streams.
- Includes fascines, coir logs and mats, root wads, tree revetments, vegetated banks, live stakes, spiling, wattles, live brush mattress, large woody debris structures (engineered log jams), and similar methods. Includes vegetating upland areas adjacent to bodies of water to minimize stormwater runoff impacts. Includes living shorelines.
- Specialized construction activities include but are not limited to:
    - Excavation landward of embankment
    - Bioengineering, including bare root planting, tree planting, hydroseeding
    - Post-construction monitoring and maintenance

In-Stream Structures

- In-stream structure projects use structures that extend into a stream or a river channel or fully cross a stream or river channel.
- Constructed of rock or woody plant material alone or in conjunction with other bank stabilization methods.
- Considered to be an indirect method. Functions by deflecting channel flows away from the bank or reducing flow to non-erosive velocities.
- Structures may be permanent or semi-permanent and are designed to be dynamic. Stream beds and banks will continue to change but within a contained proscribed corridor.
- Examples:
    - Stone structures- rock sills, cross-vanes, J-hooks, rock vanes, bendway weirs, stream barbs, and W-weirs.
        - Cross vanes and W-weirs span an entire channel and are keyed into both stream banks. Rock vanes, J-hooks, and bendway weirs are single-arm structures that extend into channel flow and are keyed into one side of the stream bank.
    - Woody structures- log weirs, or combinations of these practices with root wads, engineered log jams and other vegetative engineering methods.
- Specialized construction activities include but are not limited to:
    - Placement of large rock, woody materials, and similar natural material in stream channel
    - Use of geotextile or anchoring, such as pinning or grouting, in high-velocity conditions.
    - Excavation and placement of fill below the grade of existing streambed and banks as needed to place footers. Footers may be several feet deeper than what is typically encountered for embankment-only applications in similar conditions
    - Post-construction monitoring to ensure structures are performing as planned

Loose Stone/Riprap

- Loose stone and riprap projects repair or replace damaged facilities using riprap or stone for toe protection and embankment stabilization without anchoring, grouting, interlocking, or other method of joining units together or to a substrate.
- Includes a variety of stone-based practices including longitudinal toe slope, riprap armoring, stone fill trenching, and riprap blankets.

- Native stone, broken concrete, bricks, other masonry rubble or precast units may be used in lieu of processed stone, depending on design considerations, permit conditions, and availability of materials.
- Specialized construction activities include but are not limited to:
    - Machine placing riprap
    - Keyed in toe stone

Rigid and Semi-Rigid Armoring

- Rigid and semi-rigid armoring projects repair, replace, or install embankment armoring using structural methods like stone, concrete, or metal that is stacked, anchored, pinned, fastened, placed, or driven to form a semi-rigid to rigid structure.
- Includes methods such as articulated concrete blocks, gabions and gabion mattresses, geocellular containment systems, pinned or grouted riprap, stacked stone, revetment mats, sheet pile, retaining walls, and bulkheads.
- Specialized construction activities include but are not limited to:
    - Installation of drainage systems behind revetments and bulkheads
    - Soil nails
    - Flowable or sprayed concrete
    - Proprietary, patented systems
    - Stacked rock masonry
    - Sheet pile and micropile installation
    - Installation of concrete forms in and near water
    - Installation of cast-in-place concrete in and near water

Stream Channel Naturalization

- Stream channel naturalization projects restore streams and drainage channels into a more naturalized state. Naturalized streams mimic, to the extent possible, the former historical layout of the waterway.
- Naturalization may include rerouting of streams and would not exceed the historical footprint or move 100 feet beyond the current location of the bank.
- Naturalization may include dredging to restore the stream to its previous historical depth but would not exceed that depth.
- Specialized construction activities would include elements described for loose stone and riprap and bioengineering projects and would also include:
    - Dredging
    - Installation of vane structures
    - Installation of constructed riffles
    - Installation of step pools
    - Erosion control matting
    - Live staking