

USACE HYDROLOGY WORKSHOP DOGTOOTH BEND

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Kentucky/Tennessee

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DOGTOOTH BEND HISTORY & AGENCY INVOLVEMENT



**US Army Corps
of Engineers®**



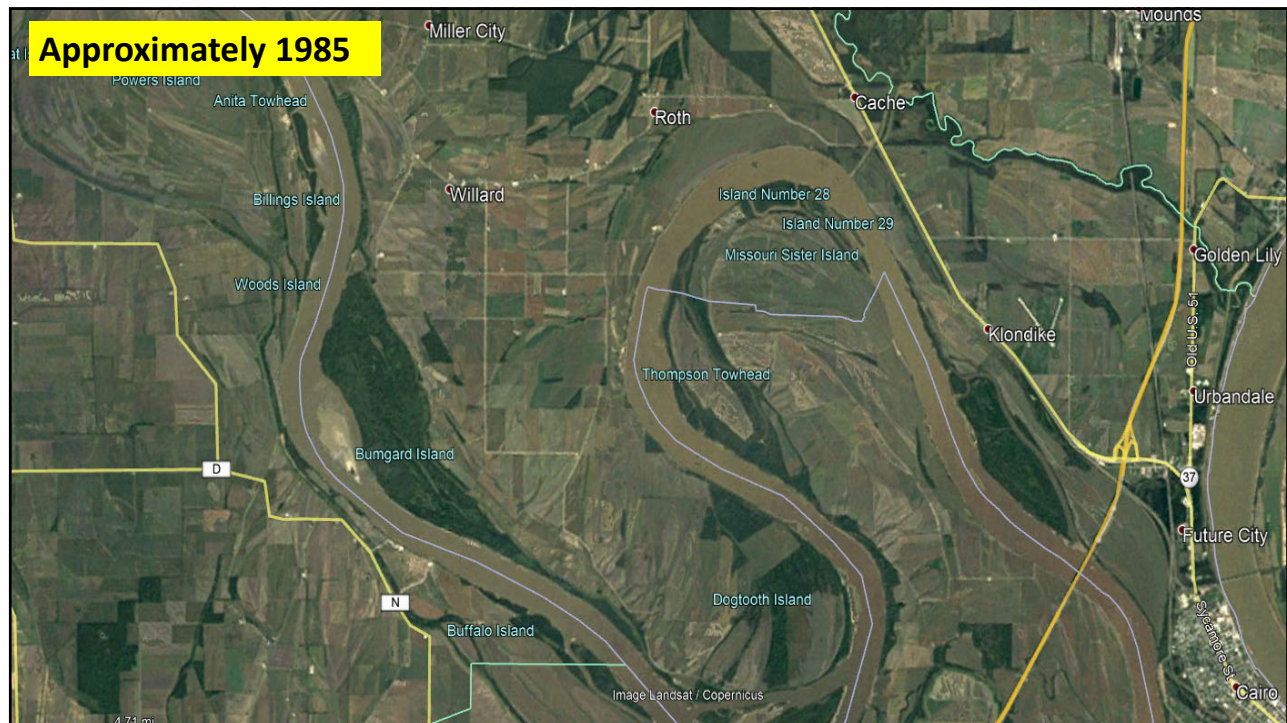
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Dogtooth Bend – Alexander County Illinois

- Land conversion beginning in 1840s
- Historically a complex of wetlands, floodplain lakes, and bottomland hardwood forest, cypress/tupelo slough, cane thickets
- Non-federal levee enrolled in the USACE's PL84-99 program
- Levee breaches in 1993, 2011, 2016, 2017 and 2019...becoming more frequent
- Major breach Jan 2016, inundated entire peninsula as well as several dozen residences in Olive Branch and Miller City; \$7.32M in damages
- Roads repeatedly being washed out and rebuilt in same fashion
- Repetitive crop loss
- Concerns over channel cut off, navigation impacts; during major flood events over 30% Mississippi River volume going through breach and across peninsula



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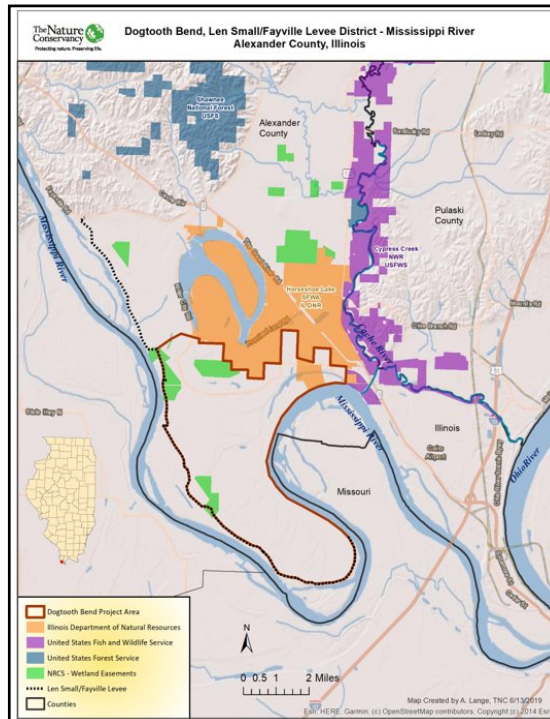
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Dogtooth Bend by the Numbers

- 17,000 acres within levee
- Adjacent to 15,000 acres in public conservation land
- 13,000 acres applied for permanent NRCS conservation easements
- \$30 million of federal funds have been committed to purchase easements in the area over the next three years
- TNC committed to raising \$583,200 match resulting in leverage ranging from 1:25 to 1:51 depending on which programs you include in the federal funds investment calculation
- Anticipating planting 1.6 million trees during restoration

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Overall Restoration Principles

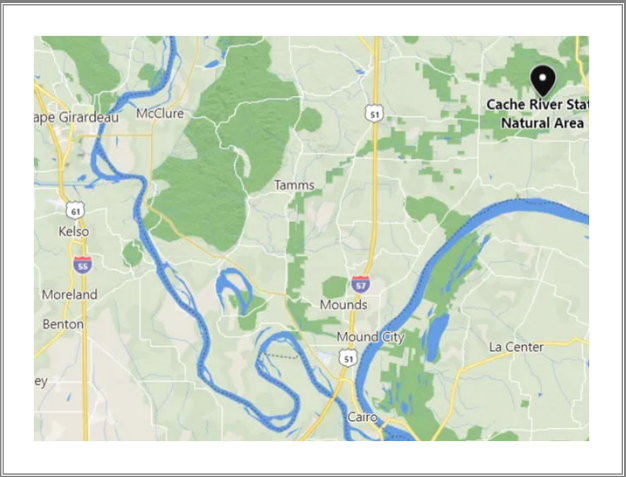
- The duration, flow rates, preferential flow paths and velocities of frequent flood flows will need to be considered when restoration planning.
- Long-term owners of land must be able to operate and maintain any restoration measures and not be hindered by complex maintenance requirements.
- Benefits to federal or state listed threatened and endangered species in the area must be considered during planning.
- Consideration of larger scale ecological goals since DNR –Horseshoe Lake State Conservation Area, the US Fish & Wildlife Service’s Cypress Creek National Wildlife Refuge, and existing WRP and ACEP easement are close.

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Overall Restoration Principles

- Extensive pre-historic occupation in Dogtooth Bend, therefore restoration measures must by law consider any effects on cultural resources in the area.
- Consider all existing laws, permits, easements, right-of-way, and infrastructure.
- USCOE’s need to protect the navigational channel.

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Ecological Concepts for Restoration

- Close to Horseshoe Lake State Fish and Wildlife Area (HSL) 10,200 AC
- Close to Cache River State Natural Area (CRSNA) 14,314 AC
- Creating 41,514 AC unfragmented riparian floodplain corridor.
- Consider T & E species, specifically IL Chorus Frog and Interior Least Tern.
- Importance of natural landforms, vegetation and natural disturbance regime for habitat.

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Restoration Guiding Principles

- Tree planting in areas of low maintenance, planted parallel (or deflection angle) to the flood flow direction.
 - Not in areas of high flow velocity
 - Plant in areas outside the primary and tertiary preferential flow paths.
 - Select species based on depth and duration of flooding and other ecological parameters
- Site preparation for tree planting
 - Mowing and spraying of annual and invasive weeds prior to planting.
 - Disking or sand removal if needed, to allow proper seedling development



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Restoration Guiding Principles

- Herbaceous conservation seeding or critical area seeding
 - Might be needed on critical areas to stabilize any scouring areas.
- Exposed sand flats, sand bars and disturbed areas
 - Many T&E species benefit from these exposed areas.
- Utilize Horseshoe Lake (HSL) and Cypress Creek Refuge as reference wetlands


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Engineering Concepts for Restoration

- Site specific recommendation for engineering practices
 - Based on flow, velocity and hydrologic parameters
 - Follow NRCS Wetland Restoration Practice Standard
 - Utilize on-site surveys, post-flood LiDAR and other Science-based tools.
- Below-grade Excavation-type wetlands only
 - No above-grade dikes, levees or dams
 - Spoil areas will meet all federal and state requirements



HP-NC11



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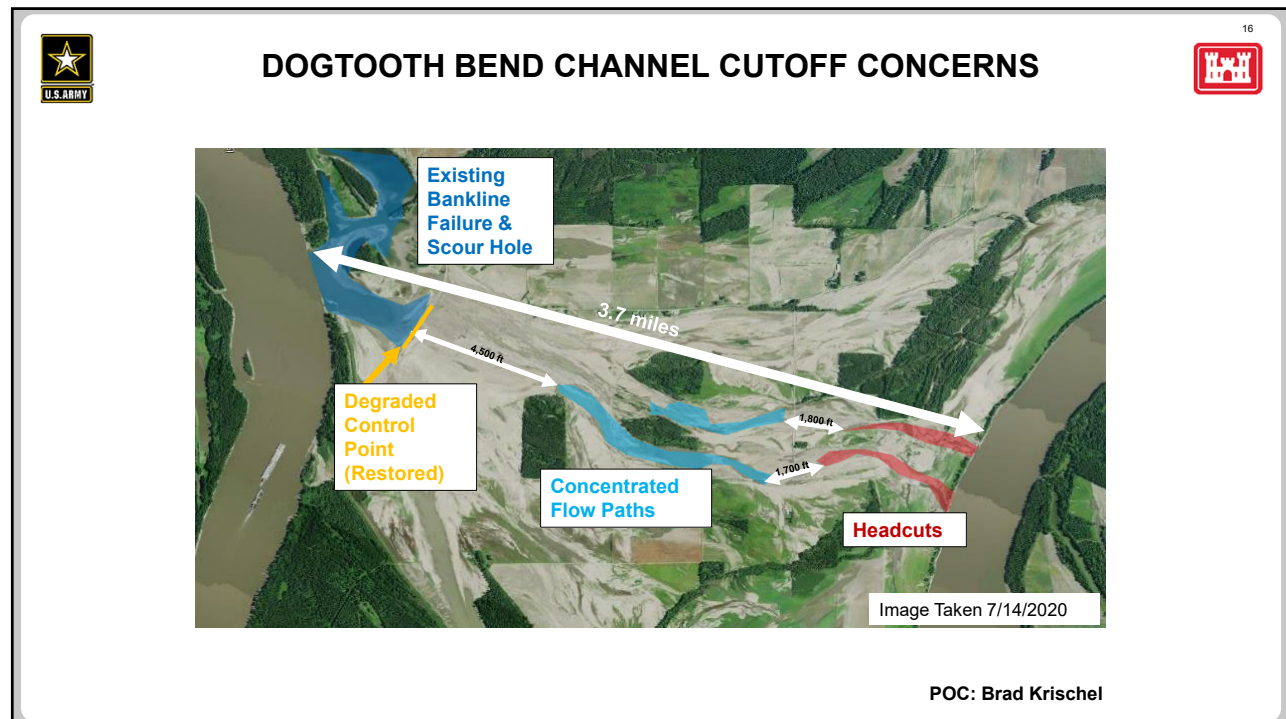
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HP-NCI1 Hingson, Paula - NRCS, Champaign, IL, 10/23/2021

Engineering Concepts for Restoration

- On site soil analysis will be required
 - Soils must be compatible with wetland functions and restored hydrology of the restoration.
- Special consideration for roads, tree planting locations and natural features

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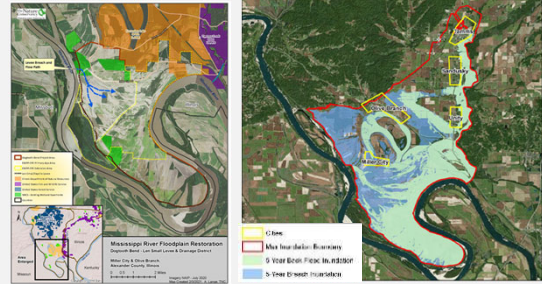


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DOGTOOTH BEND NON-STRUCTURAL MITIGATION PLAN

PROJECT SCOPE

- Coordination and development of a non-structural mitigation plan creating an interagency vision for this large geographic area.
- **Objective No. 1:** Increase understanding of what mitigation actions have occurred and where as well as future flood mitigation and restoration actions that may/will be undertaken by interagency partners.
- **Objective No. 2:** Evaluate alternatives for with breach or without breach condition with nonstructural project features captured in the analysis.
- **Objective No. 3:** Develop interagency vision and available mitigation options for the planning area.
- Funding for coordination, modeling, and plan development, no implementation funding.



MILESTONES

- Schedule:
 - Project Kickoff Nov 21
 - Draft Report Aug 22
 - DQC Sep 22
 - Partner comment period Oct 22
 - Project Close Out Dec 22
- Create a nonstructural mitigation plan that is coordinated across agencies and aligns the multiple authorities and agency interests bringing together a consolidated plan under one cover.
- We anticipate over the term of this SJ project the levee district may decide to pursue a non-structural alternative project under PL84-99.
- This advanced coordination and plan development may facilitate and inform a future nonstructural project for documentation, design, and implementation.
- Leverage work and coordination of the Engineering with Nature Program.

FY22 ANTICIPATED RESOURCES & LABOR

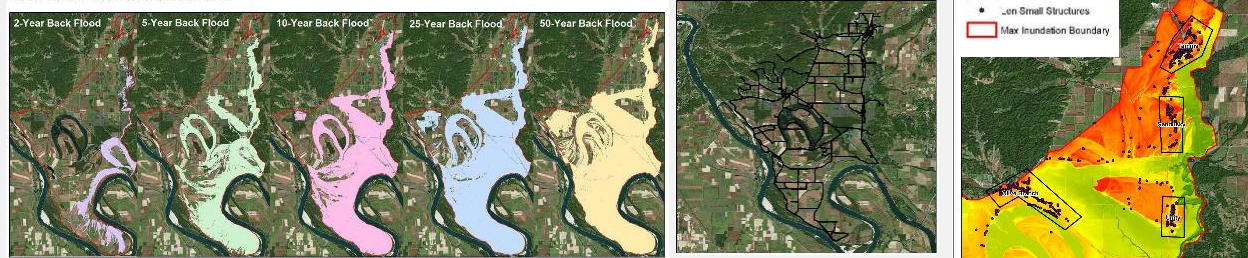
Discipline	PDT Member	Labor Estimate
Project Manager	Hal Graef	\$16,000
Environmental Planning	Alison Anderson	\$19,000
Design	Asher Leff	\$8,000
H&H Engineer	Gordon/Krischel	\$40,000
Cost Engineering	Brandon Lewis	\$3,000
Readiness	John Osterhage	\$3,000
Program Analyst/Scheduler	Cindy Wood/Jamie Simmons	\$1,500
GIS	Clare Kretzman	\$12,000
Economist	Stewart/Karnish	\$21,000
Technical Editor	Cathy Vanarsdale	\$1,500

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USACE NONSTRUCTURAL PROJECT CONSIDERATIONS

- (1) Acquisition of land or interests in land.
- (2) Removal of structures, including manufactured homes, for salvage and/or reuse purposes.
- (3) Demolition and removal of structures, including utility connections and related items.
- (4) Debris removal and debris reduction.
- (5) Removal, protection, and/or relocation of highways, roads, utilities, cemeteries, and railroads.
- (6) Construction to promote, enhance, control, or modify water flows into, out of, through, or around the nonstructural project area.
- (7) Nonstructural habitat restoration, to include select planting of native and desirable plant species, native species nesting site enhancements, etc. (restoration of floodplains and floodways).
- (8) Total or partial removal or razing of existing reaches of levee, to include removal of bank protection structures and riprap.
- (9) Protection/floodproofing of essential structures and facilities.


Figure 3. Len Small Back Water by Flood Interval

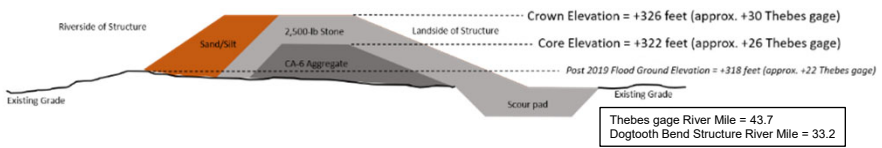



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DOGTOOTH BEND EMERGENCY OVERFLOW STRUCTURE







Final structure alignment




Photo from March 3, 2021 site visit. Stage at Thebes +23.75

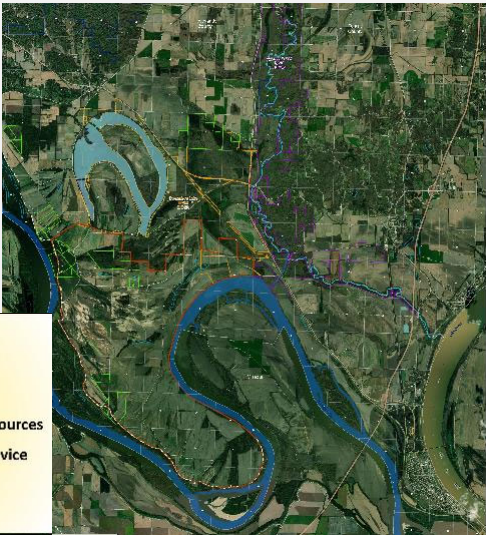
POC: Brad Krischel

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ADDITIONAL CONSIDERATIONS

- Legal restrictions on formerly “levee” protected lands to preclude future use and/or development in a manner incompatible with the purposes of the nonstructural alternative project.
- Possible combining land acquisition funding with the funding of other Federal agencies for the acquisition of land, interests in land, easements, and rights-of-way
- Reimbursement for acquisition of land, interests in land, easements, and rights of way for a nonstructural project, and subject to availability of appropriations.


- Dogtooth Bend Project Area
- Len Small/Fayville Levee
- Private WRP
- Illinois Department of Natural Resources
- United States Fish and Wildlife Service
- United States Forest Service
- Counties



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Connecting People and Ecosystem Services

Water quality and nutrient reduction
Features
Metrics
Science
Markets



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Connecting People and Ecosystem Services

Public access, economic impact, DEIJ, Equitable Transitions
Access for Landowners
Access for Management
Access for the Public
Landscape Design

Tax Base Loss, Ecotourism, Revenue Generation
Buyouts, Resilient and Sustainable Infrastructure
Job creation
Job training



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Connecting People and Ecosystem Services

- **Community listening sessions**
 - Cairo and DEIJ
 - Public phase of USFWS MMR NWR Boundary Expansion
 - Community and Groups
- **All Partners**
 - Create oxbows for sediment processing
 - Design for “easier” long-term management and maintenance
 - Wide grass trails
 - White Paper to rebuttal Netherland study

