

# Using Section 729 Watershed Assessments for Ecosystem Restoration in the Ohio River Basin

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# Section 729 of WRDA 1986

## Watershed Planning

- Authorized assessments of river basins and regions
- Opens opportunities for collaborative ventures in watershed planning.
- Subsequent guidance and amendments:
  - ▶ USACE Policy Guidance Letter #61 on basin/watershed planning
  - ▶ Section 202 of WRDA 2000 amended Section 729
  - ▶ Section 2010 (WRDA 2007) further amended Section 729
  - ▶ EC1105-2-411 provided Section 729 Guidance
- Two-phase watershed assessment/planning process
  - ▶ Initial assessment 100% Federal cost - \$100K
  - ▶ Second phase cost shared (75%-25%)



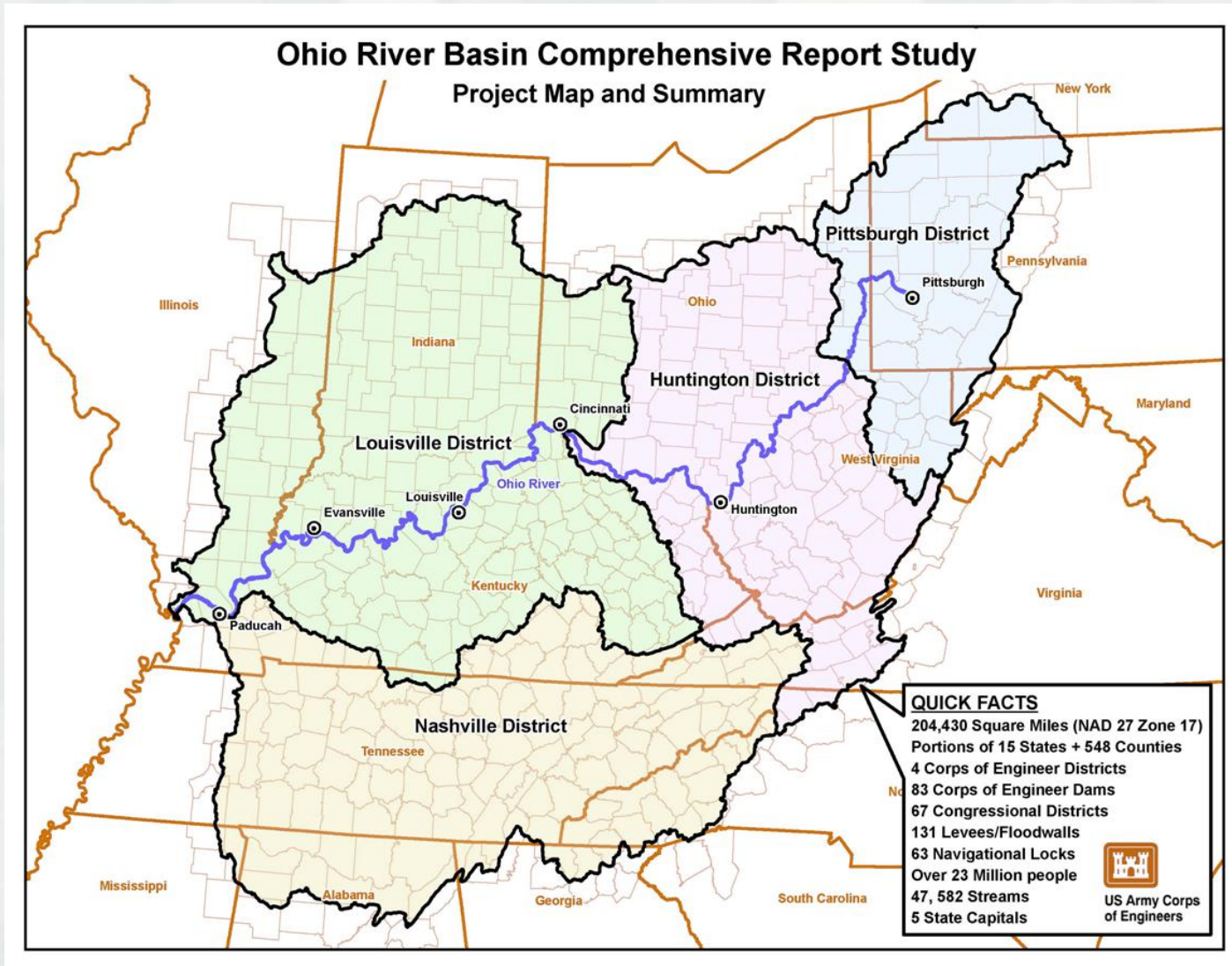
# EC1105-2-411

## Watershed Planning Concepts

- Strive to achieve Integrated Water Resources Management
- Identify watershed-scale land/water resources problems & opportunities
- Analyze multiple, interconnected systems including but not limited to:
  - ▶ Floodplain (natural and man-made components)
  - ▶ Land uses (urban, agricultural, industrial, resources development)
  - ▶ Transportation
  - ▶ Ecological services
  - ▶ Energy grids (generating and transmission)
  - ▶ Socioeconomic
  - ▶ Water supply (surface and subsurface)
  - ▶ Solid and liquid waste disposal
  - ▶ Institutional (including regulatory)
  - ▶ Weather including climate change
- Formulate a comprehensive assessment and management plan
- Apply Section 729 Authority to the Ohio River Basin.



# The Ohio River Basin



# December 2009 Ohio River Basin Reconnaissance Study

- Five components of the 2009 Corps study
  - ▶ Identified water resources and related land use problems basin.
  - ▶ Identified potential solutions that are sustainable
  - ▶ Identified willing project/program sponsors
  - ▶ Identified pathways for solutions through:
    - Existing authorities
    - New authorities or
    - Existing programs of other Federal or State agencies.
  - ▶ Developing collaborative partnerships
    - The Ohio River Basin Alliance.



# Ecosystem Degradation Issues

- Land cover conversion
- Combined Sewer Overflows
- Habitat loss
- Loss of aquatic connectivity
- Nutrient loading
- Coliform loading
- Soil erosion – sedimentation
- Pharmaceuticals
- Loss of riparian ecosystems
- Invasive species
- Unabated stormwater flows



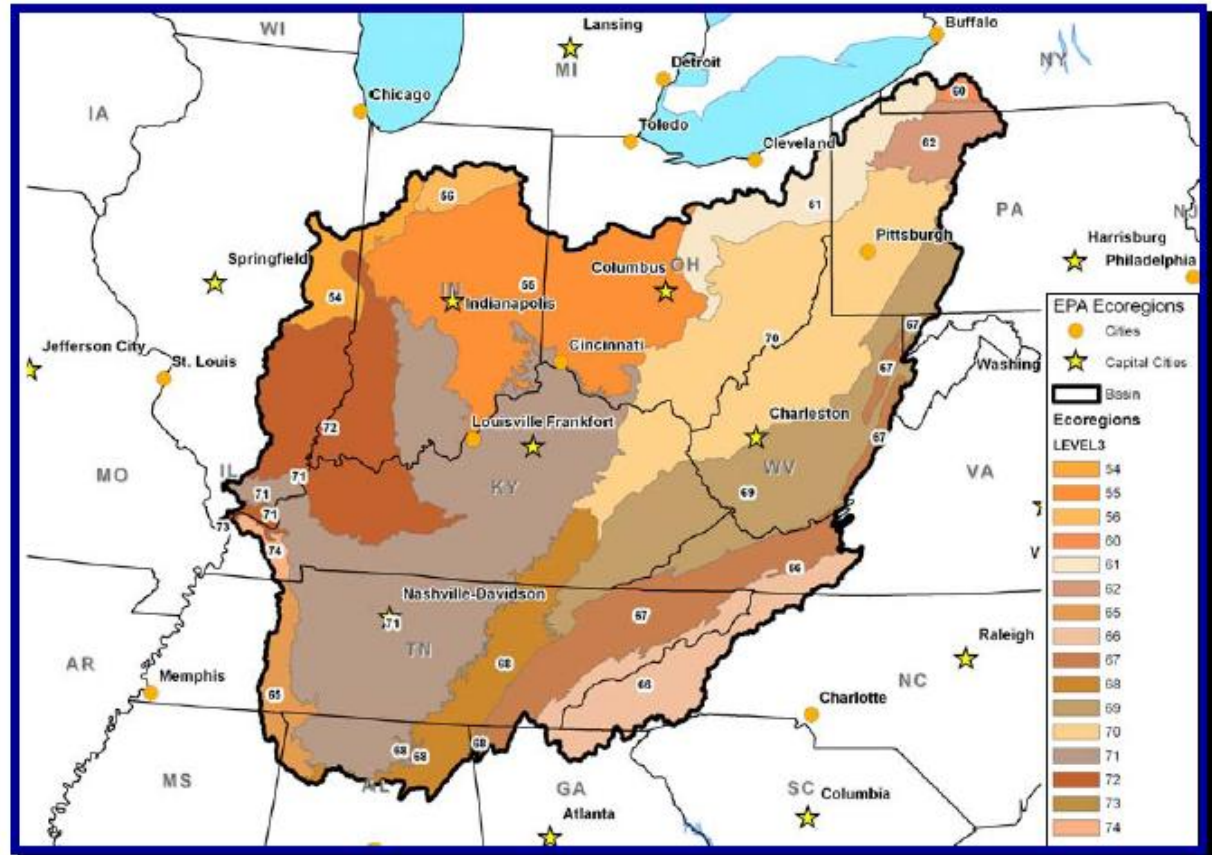
# Authorized Ecosystem Restoration in the Basin

- CAP Section 206 Aquatic Ecosystem Restoration
  - ▶ North Park Lake (PA) – dredge for warm water fishery & erect osprey nesting platforms.
  - ▶ Ely and Puckett Creek Acid Mine Remediation (VA) – alkalinity producing wetlands/basins/sedimentation cells
  - ▶ Lower Cumberland River Bank Stabilization (KY) - bank stabilization/riparian tree plantings
  - ▶ Pistol Creek (Greenbelt Lake) (TN) - sediment removal & riparian plantings in urban lake
  
- Specifically Authorized Restoration Projects
  - ▶ Section 1001 (37) of WRDA 2007 - Monday Creek Aquatic Ecosystem Restoration (Ohio) – abandoned mine land restoration
  - ▶ Section 101 (16) of WRDA 2000 - Ohio River Ecosystem Restoration Project – mainstem Ohio River aquatic habitat restoration



# Level III Ecoregions

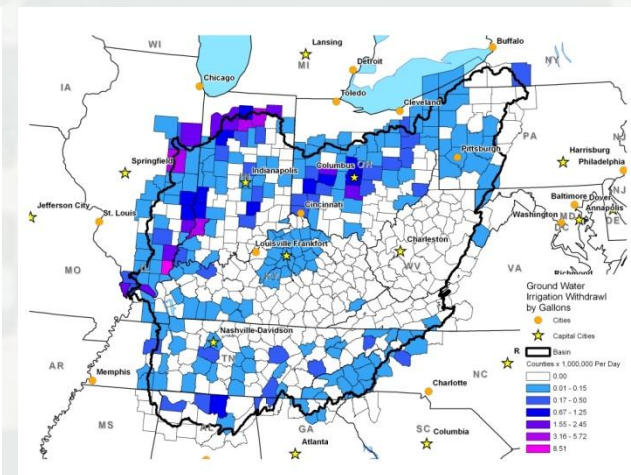
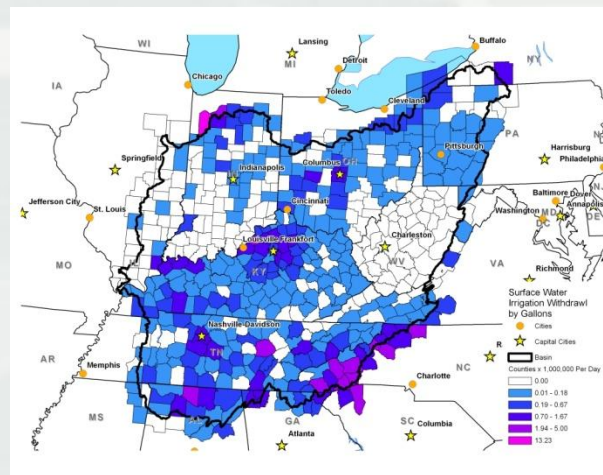
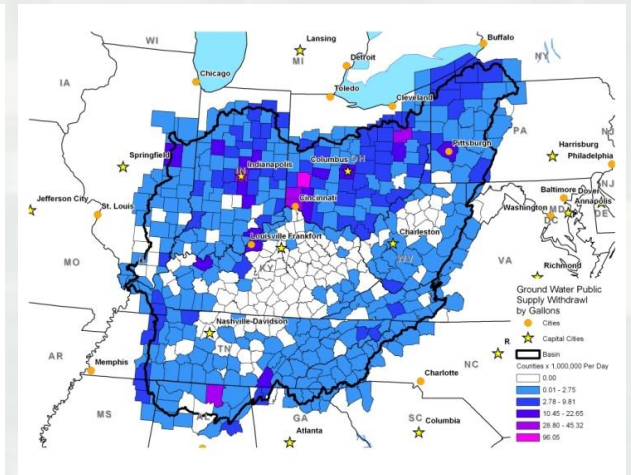
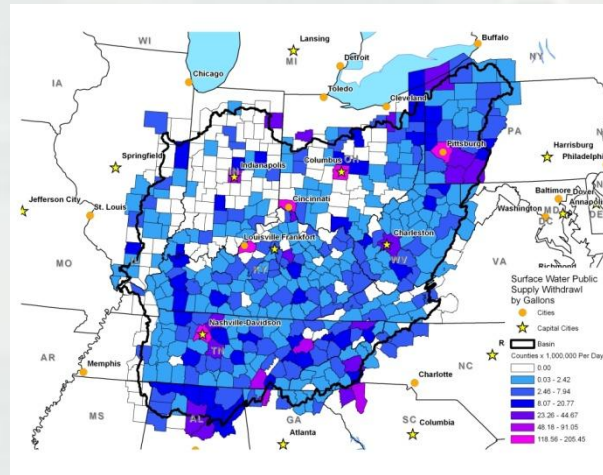
- Diversity exemplified by 16 separate ecoregions (Level III EPA data)
- Aquatic diversity - estimated 80 species of mussels, 154 species of fishes, between 35 and 39 species of freshwater snails.





# Water Consumption in the Basin

- Surface /groundwater usage for irrigation and M&I uses
- Future out-of-basin water transfers a concern
- Competition between municipal /irrigation needs and aquatic species habitat is growing daily.



# “The Elephant in the Room”

- Great promises of wealth and energy independence
- Current regulatory control of drilling and waste water is inconsistent among four states.
- State environmental impact statements identifying significant water usage and quality issues.



# “What the Report Recommended”

- Develop sustainable water management strategies
- Repair and rehabilitate critical infrastructure
- Conduct watershed assessments and develop management plans
- Improve local oversight of land development/conversion processes
- Improve management of stormwater and resolve CSO's
- Address nutrient loading, pharmaceuticals, bacterial loading and sedimentation
- Prepare land and water management plans recognizing potential threats of climate change – adaptive management
- Address reservoir storage and releases for downstream uses
- Develop adaptation strategies that address climate change impacts on water resources management
- Develop an alliance of states to address basin issues



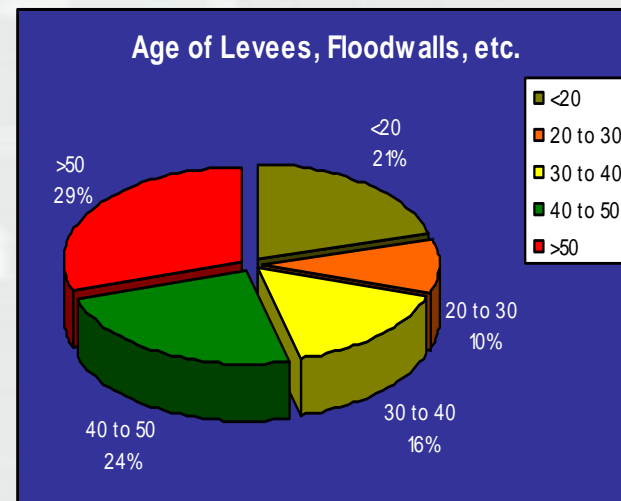
# Basinwide Water Management Plan

- Include all water managers
- Include all water users
- Balance competing water needs including aquatic species requirements
- Address climate change impacts on water availability.
- Assess out-of-basin water transfers
- Incorporate regional H&H modeling tools
- Foster collaboration among water users and managers



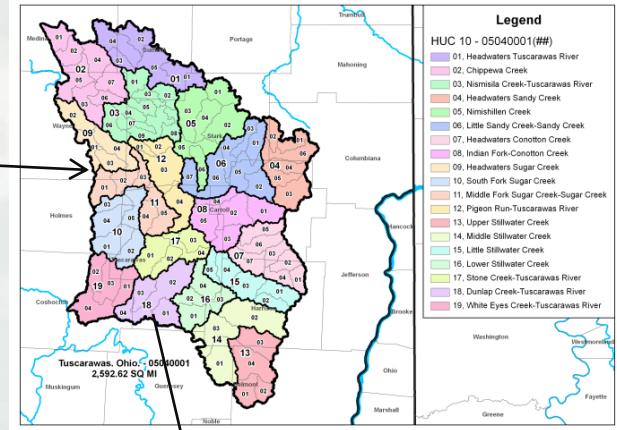
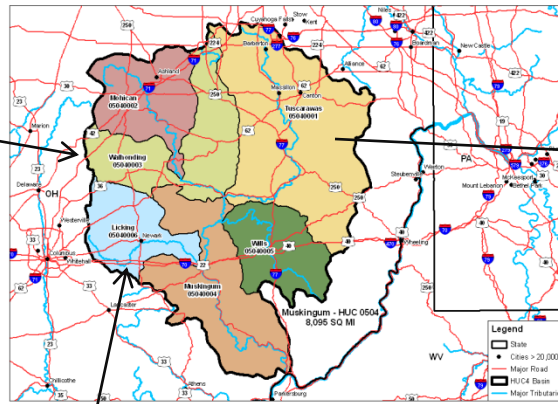
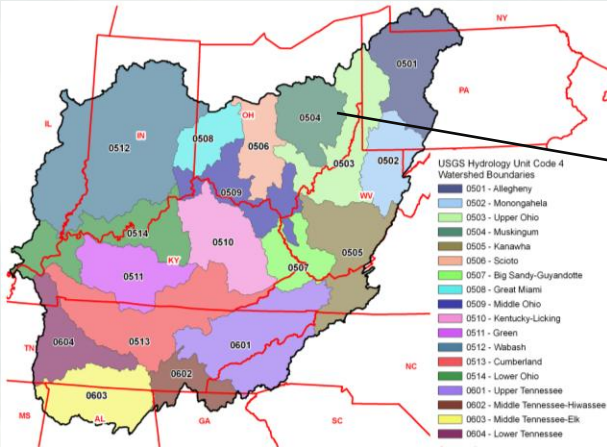
# Public Infrastructure Reinvestment Plan

- Include LPP's and dams/reservoirs
- Identify protected assets
- Investigate downstream and lake aquatic ecosystems supported by structure(s)
- Dam Safety and Levee Safety Programs
- Reinvestment alternatives (risk-based)
  - ▶ Project-based strategy (current)
  - ▶ Component-based strategy
- Sustainability issues - long-term O&M and replacement costs
  - ▶ LPP's (third-party fiscal capability)
  - ▶ Dams and reservoirs (Federal)
  - ▶ Navigation Dams
- Consider structure removal strategies – assess effects on downstream aquatics.

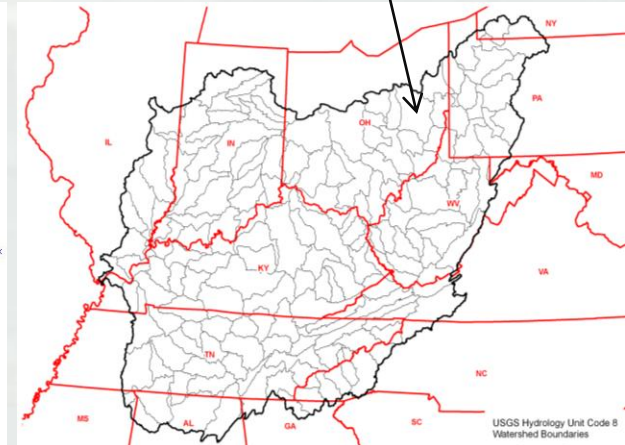
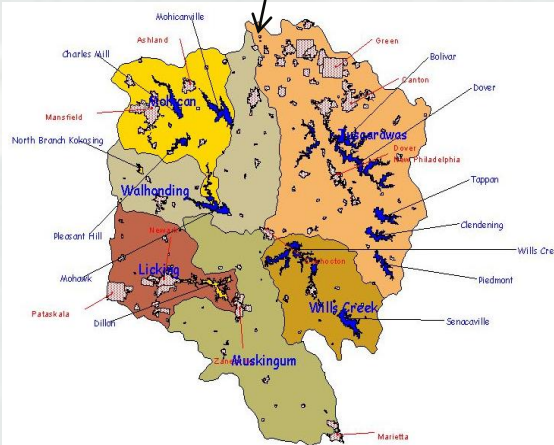


# “Wrestling with Data”

## A Quest for the Appropriate HUC\*

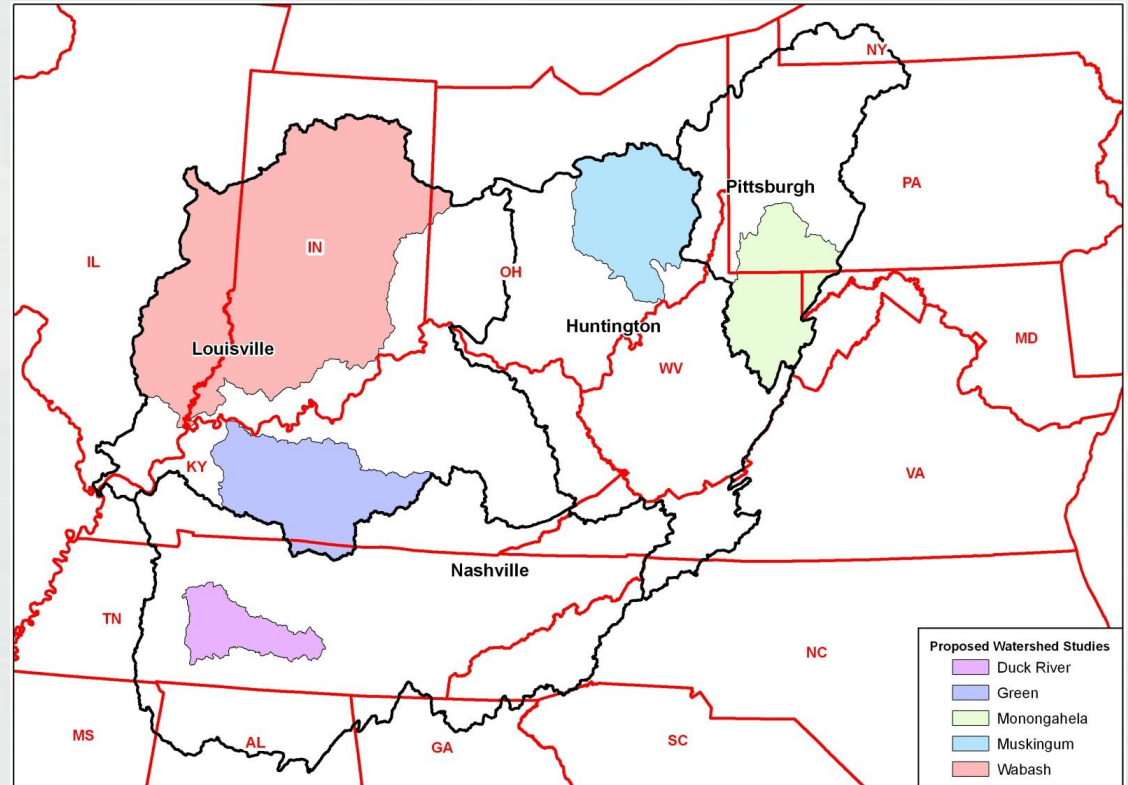


- \*HUC = Hydrologic Unit Code (USGS).
- Identified the optimal watershed size for analysis and comparison purposes
- Selected the 8-digit HUC coded watersheds (152 of them in ORB)



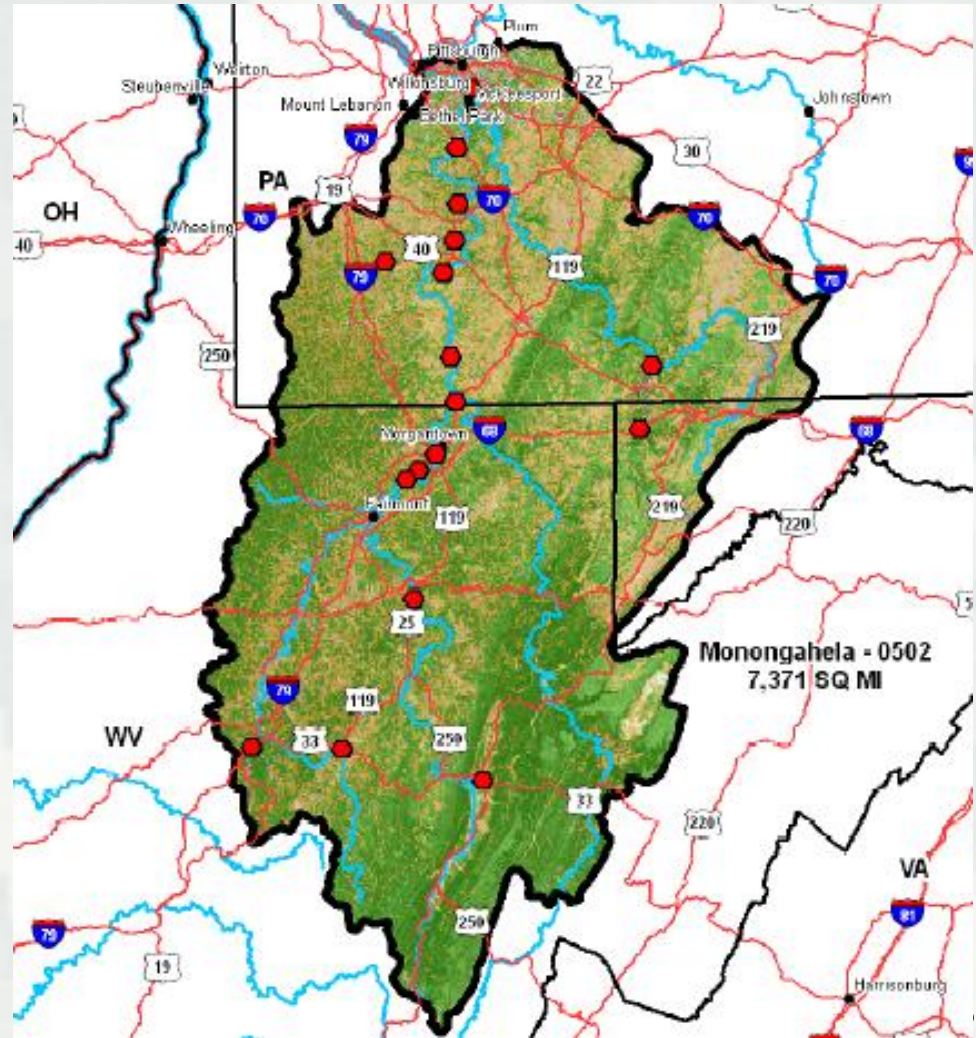
# Initial Watershed Assessments

- Four Section 729 Watershed Assessments at the HUC 4 sub-basin level and one HUC 8 level (3 HUC 8's) watershed assessment.
- Assessments include analyses of interconnected systems – a holistic view
- Focuses on problems and partnering at the watershed level
- Identifies other non-Corps initiatives to resolve issues through coordinated watershed management plans.



# Monongahela River Sub-Basin

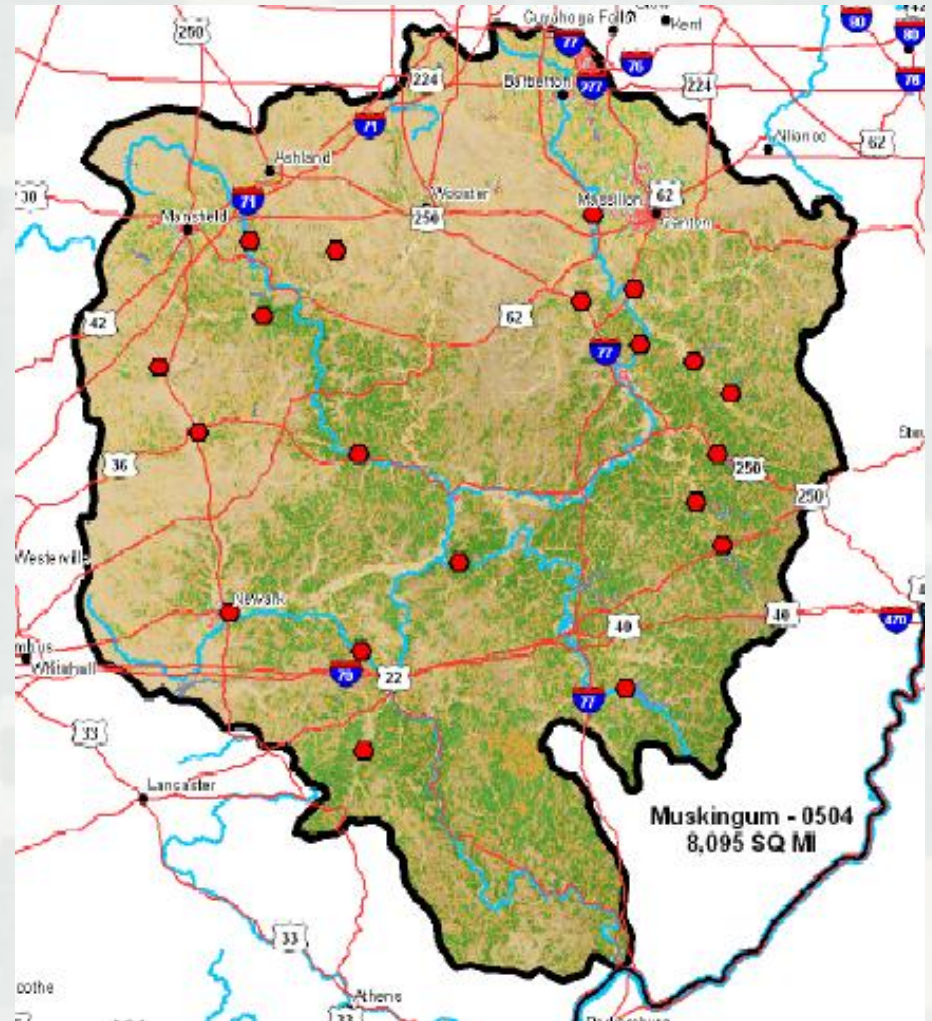
- Monongahela River – 7,371 sm in size.
- Past and present coal mining and timber harvesting.
- Accelerating urban growth – stormwater issues
- Abandon mine runoff, sedimentation, and gas extraction (Marcellus Shale) issues.
- Terrestrial and aquatic ecosystems at risk and being threatened by new growth.
- Multi-state issues.





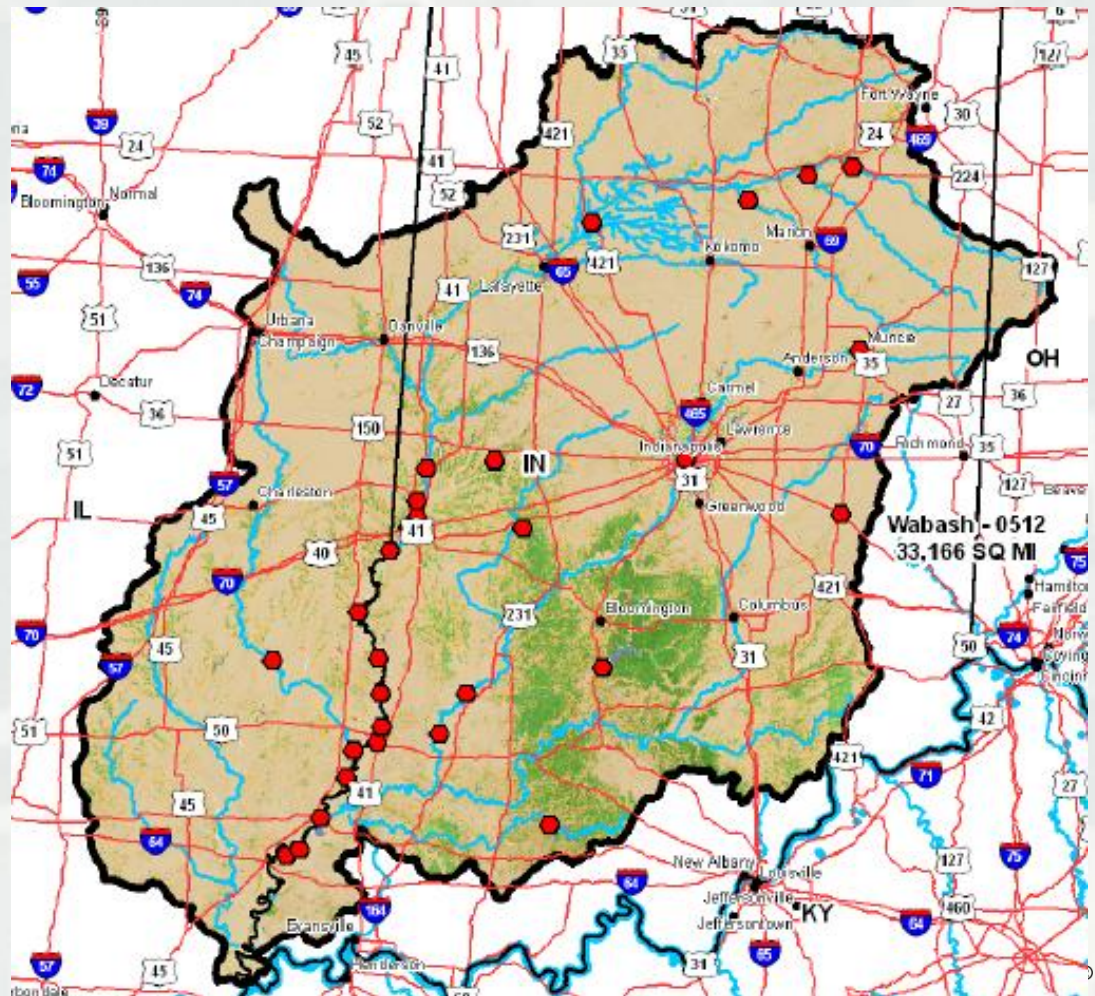
# Muskingum River Sub-Basin

- Muskingum River – 8,095 sm in size.
- West and northwest portions in agriculture with erosion and heavy nutrient loading.
- Growing urbanization with unregulated stormwater issues, CSO's, and habitat loss issues.
- Aging infrastructure (14 dams built in the late 1930's needing repair) that supplies flood damage reduction and potable water supplies.
- Muskingum Watershed Conservancy District area.



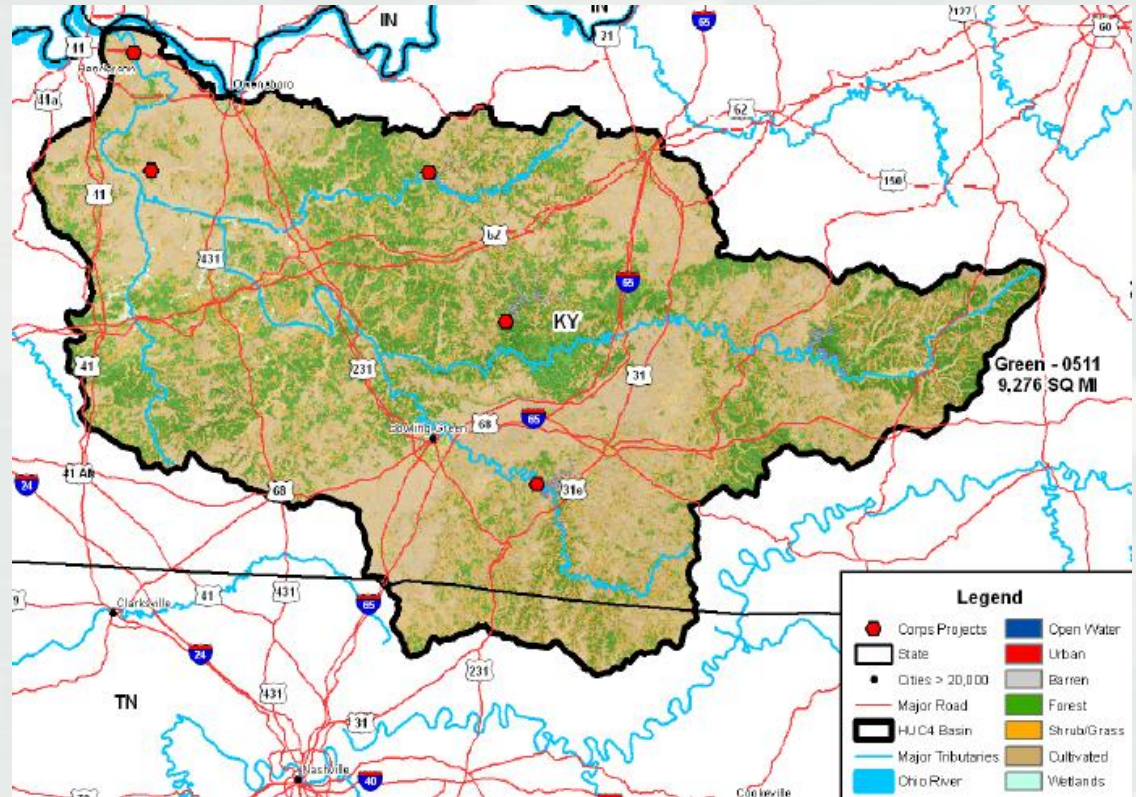
# Wabash River Sub-Basin

- Wabash River – 33,166 sm in size
- Heavy agricultural land use (66%) with erosion, nutrient and bacterial loading issues.
- Significant water quality and aquatic habitat issues exacerbated by urban CSO's and land development.
- Flood damage issues



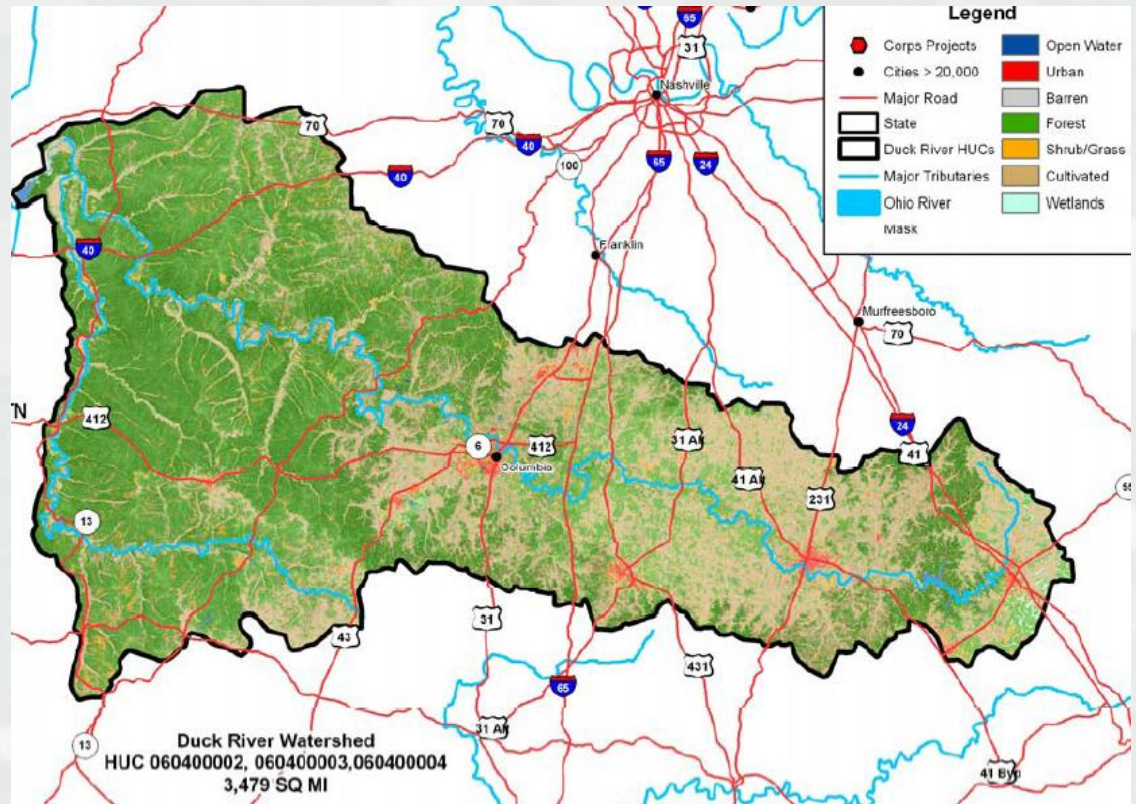
# Green River Sub-Basin

- Green River – 9,276 sq mi in size.
- One of top four river systems in the US in aquatic biodiversity (151 fish species and 71 mussel species).
- Ongoing Sustainable Rivers Project
- M&I water supply needs and T&E aquatic species flow requirements clashing.
- Past drought conditions in 1999 and 2007



# Duck River Watershed

- Duck River – 3,479 sm in size
- Classic water resources confrontation between water supply needs and aquatic species habitat
- An abundance of T&E fish and mussel species exposed to nutrient and bacterial loading from livestock and farming.
- Multiple partnering opportunities with TN and TNC.



# Strategic Ecosystem Restoration Activities in the ORB

- Use Section 729 watershed planning processes to identify eco-restoration opportunities.
  - ▶ Implement using existing ecosystem restoration authorities or special authorizations
- Formulate strategic watershed management plans that:
  - ▶ Resolve water quantity and quality problems.
  - ▶ Widespread institution of local oversight on land development.
  - ▶ Expand existing programs that address CSO conditions.
  - ▶ Apply programs to address losses of and restoration of riparian ecosystems in agriculturally active regions.
  - ▶ Formulate adaptive management strategies to mitigate potential climate change impacts.
  - ▶ Plan for and manage public lands to sustain healthy habitat for threatened and endangered species.

