Data for Conservation in the Mississippi River Corridor
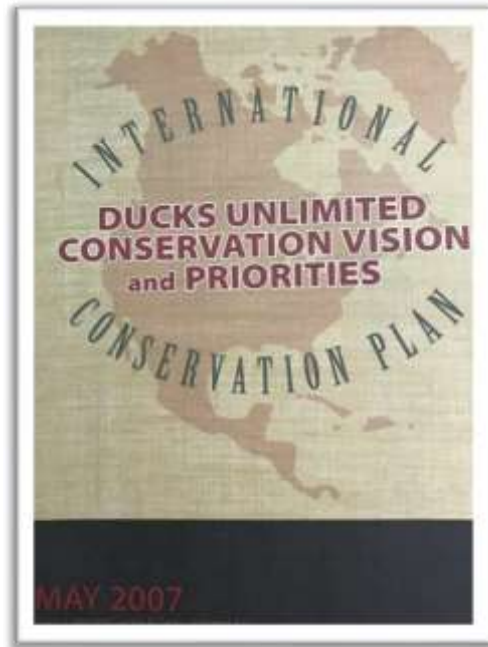
Dr. Karen Waldrop, Chief Conservation Officer
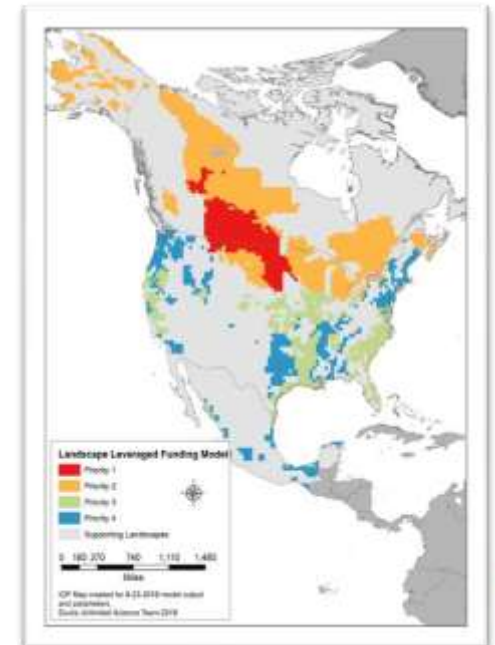*Ducks Unlimited*

DUCKS UNLIMITED

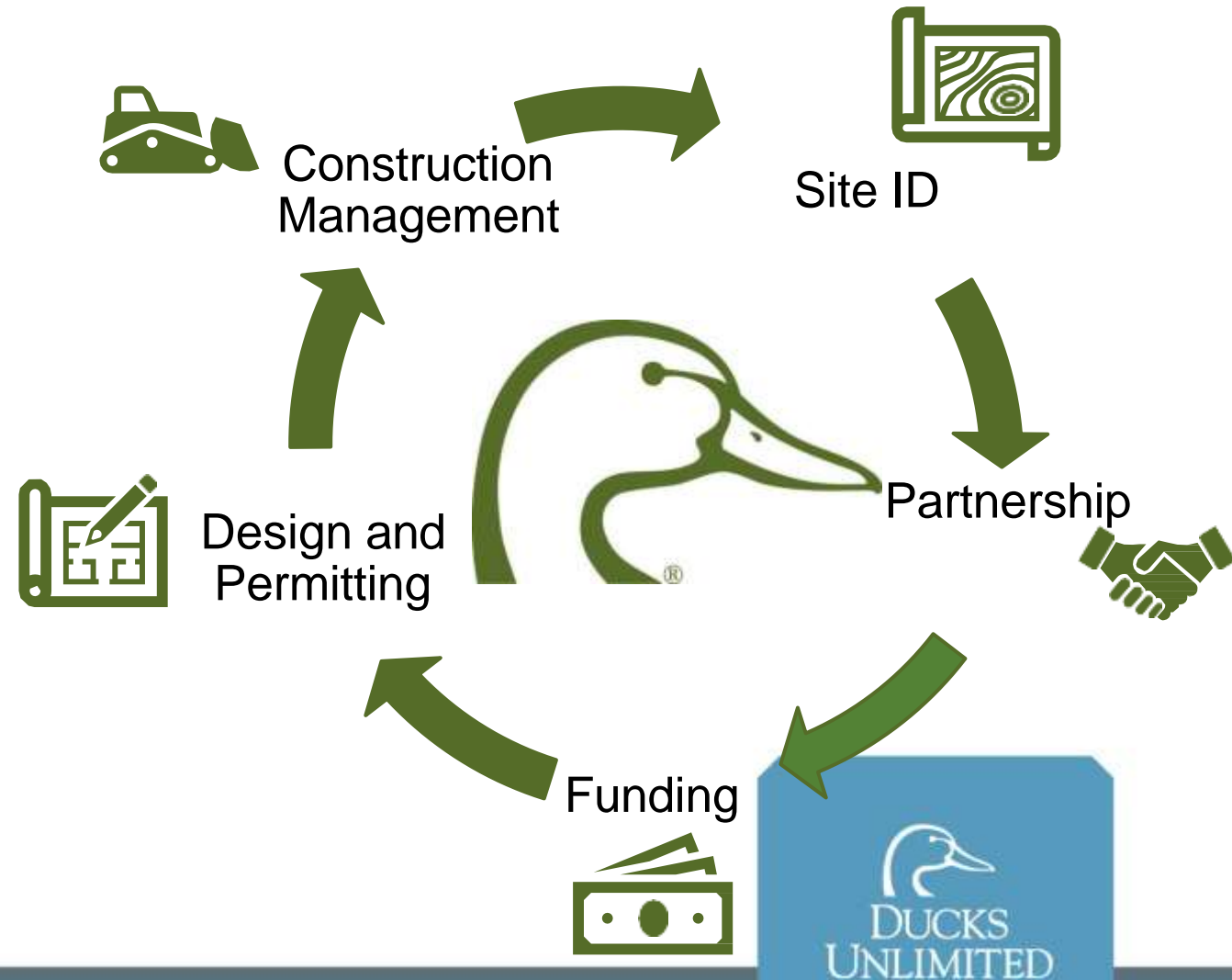# Ducks Unlimited's Conservation Mission

Ducks Unlimited conserves, restores, and manages wetlands and associated habitats for North America's waterfowl. <u>These habitats also benefit other wildlife and people.</u>
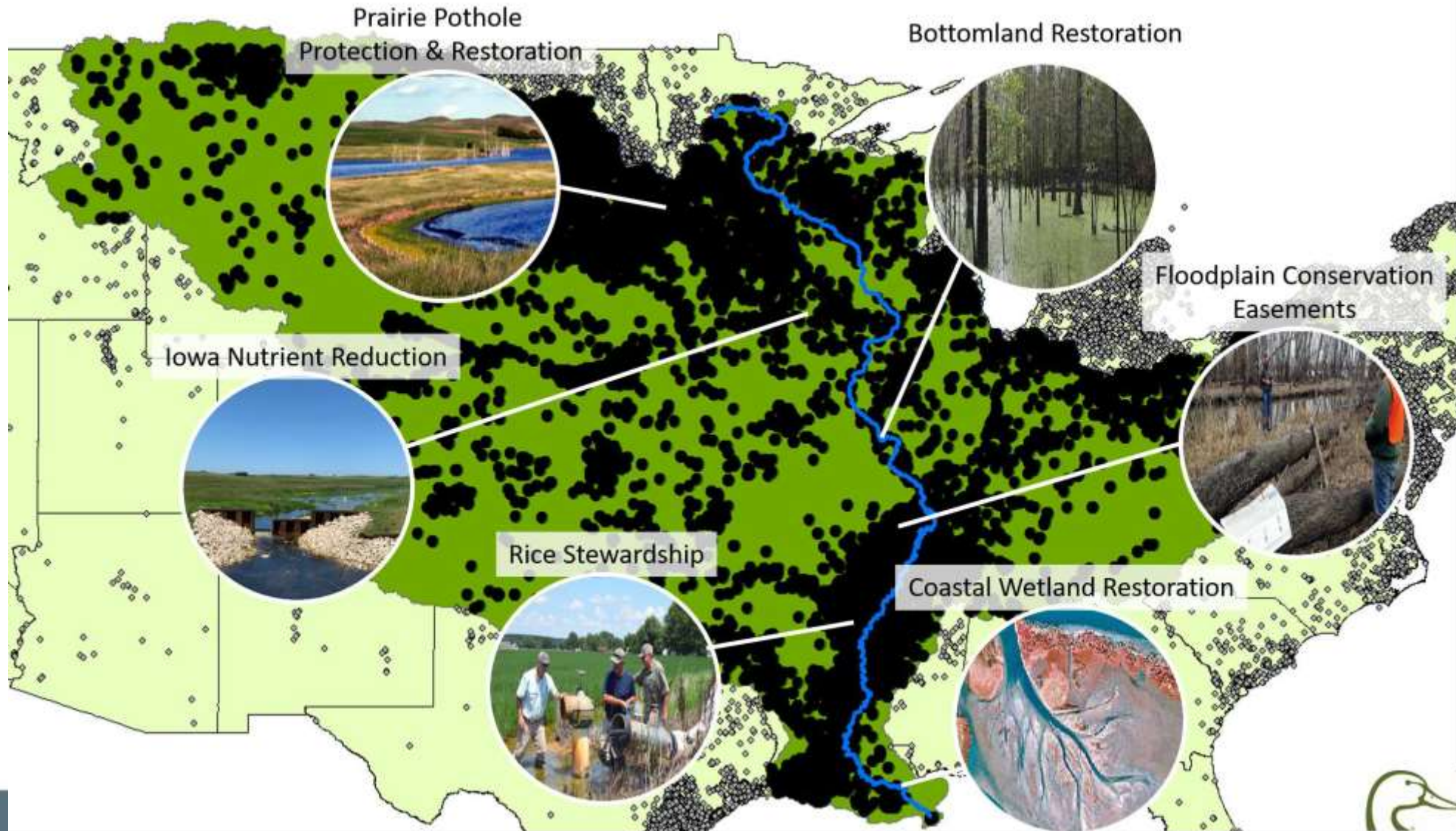
Priority Landscapes =

Habitat Loss Risk
+
Breeding
+
Bioenergetics
+
Cost

How We Work

Ducks Unlimited's Work on the Mississippi & Basin

Restoration Needs in the Mississippi Corridor

- Wildlife conservation
    - Insufficient or degraded habitat
    - Connectivity
    - Safeguards to protect against shortfalls driven by climate extremes
- Humans (Nature Based Solutions)
    - Hydrologic regulation (drought & flood)
    - Water quality
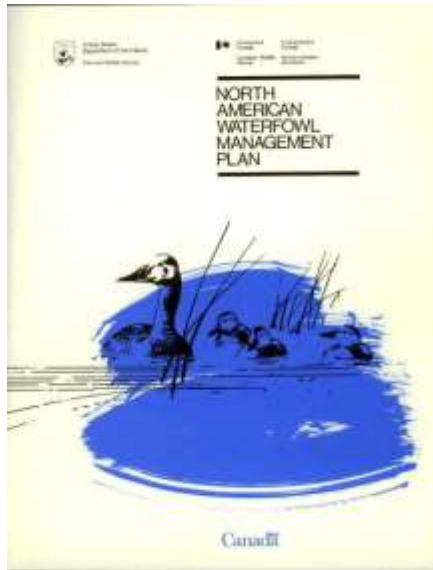- From headwaters to bottomland and batture lands

Basin

Potentially restorable wetland

DUCKS UNLIMITED
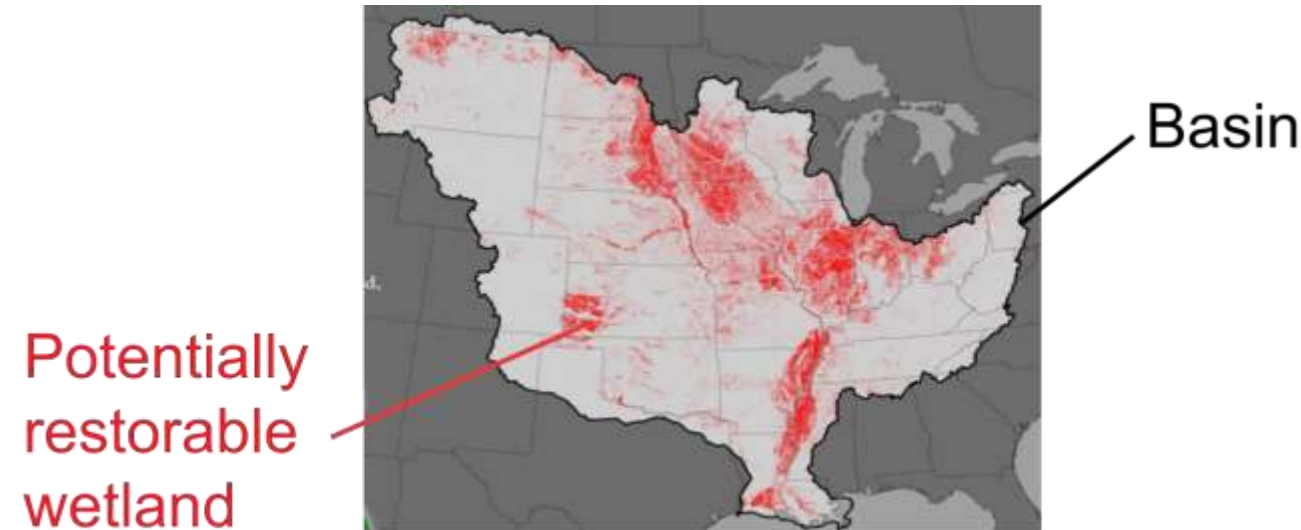
Data & Science for Habitat Conservation

- **Inform decisions**
  - Right projects, right places, right design
  - Bring stakeholders to the table early

- **Evaluate outcomes**
  - Multiple outcomes and tradeoffs
  - Intended and unintended consequences
  - Return on Investment or Benefit-Cost Analysis

- **Adaptive Management**
  - Feedback between science and practice

IL

KY

TN

AR

MS

LA

HISTORIC
FLOODPLAIN

CURRENT
FLOODPLAIN

GULF OF MEXICO

DUCKS
UNLIMITED

An Example From the Migratory Bird Community

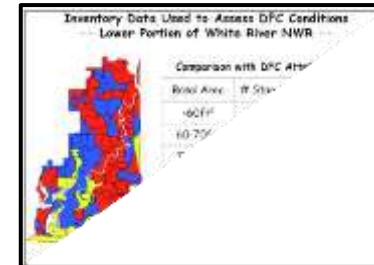North American Waterfowl
Management Plan

Migratory Bird
Joint Ventures

Regional Planning

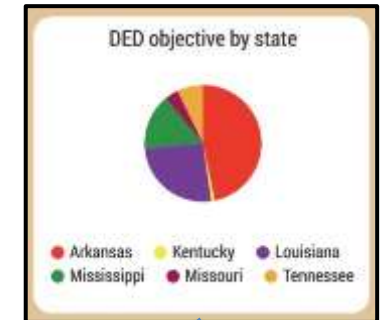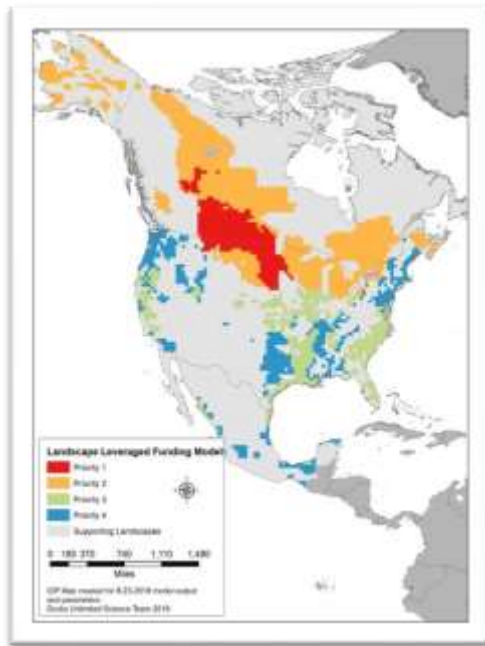Data Collection

Planning Objectives

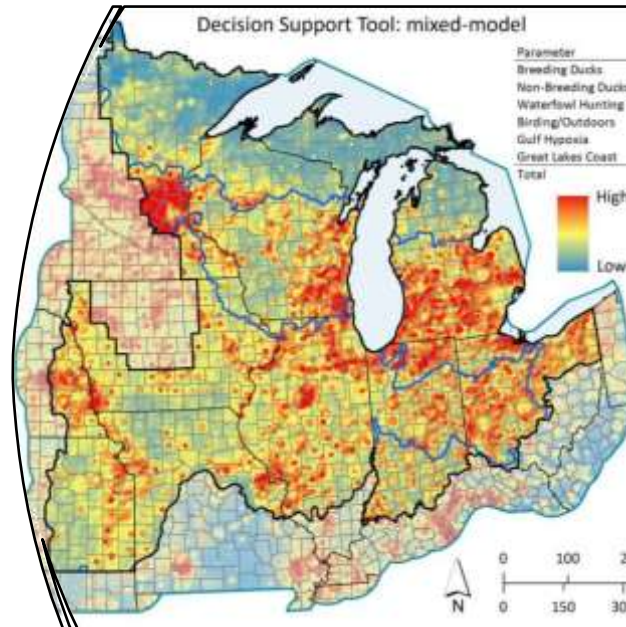Project Delivery

DUCKS
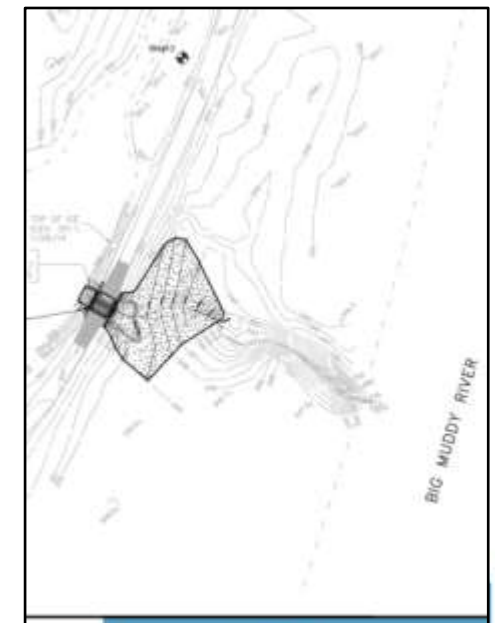UNLIMITED

Data Needs to Inform Across Scales

National planning
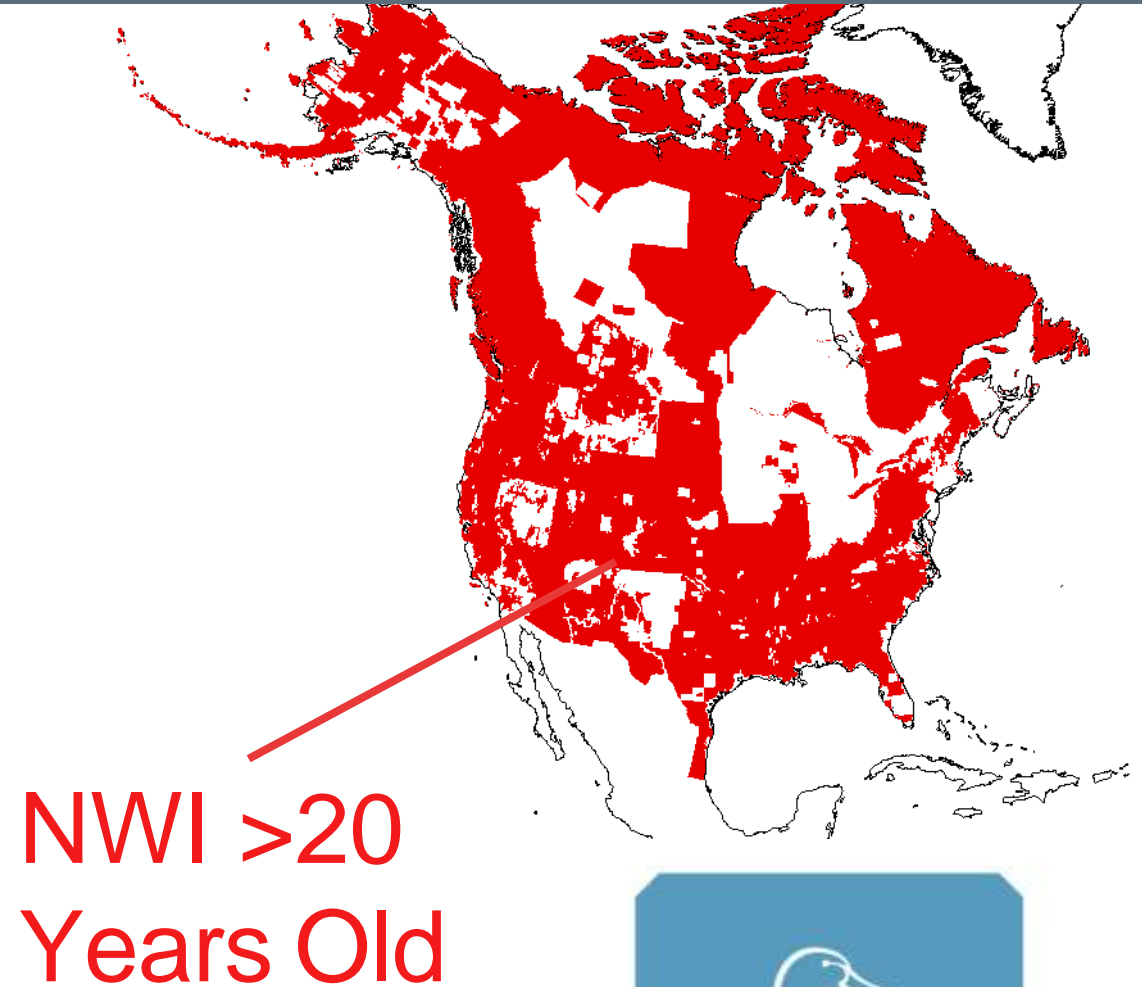
Regional planning

Local planning

Specific Data Needs

- National Wetlands Inventory (NWI)
  - >50 years old for much of the corridor

- Foundational Data Needs
  - Optical imagery
  - Lidar
  - Radar

- Update with higher frequency

- Other applications
  - Other Land Use Land Cover analysis
  - Status and trends
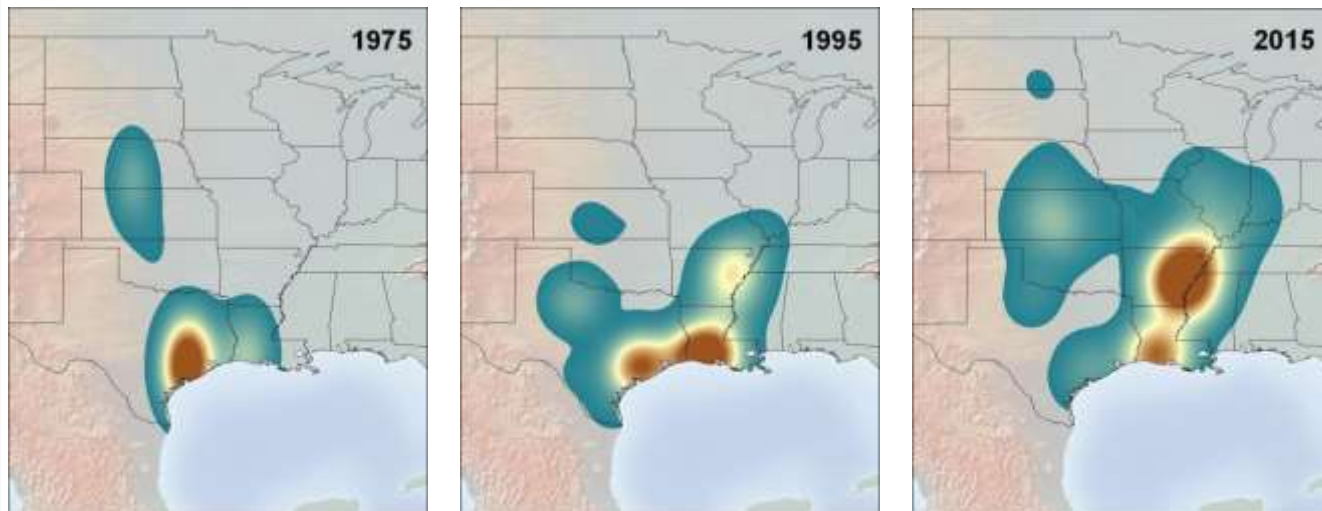 - Habitat modeling

NWI >20 Years Old

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National: Improved Data for Understanding Changing Habitat Conditions

Example: Understanding changes in wintering waterfowl distributions

Mizzou — University of Missouri

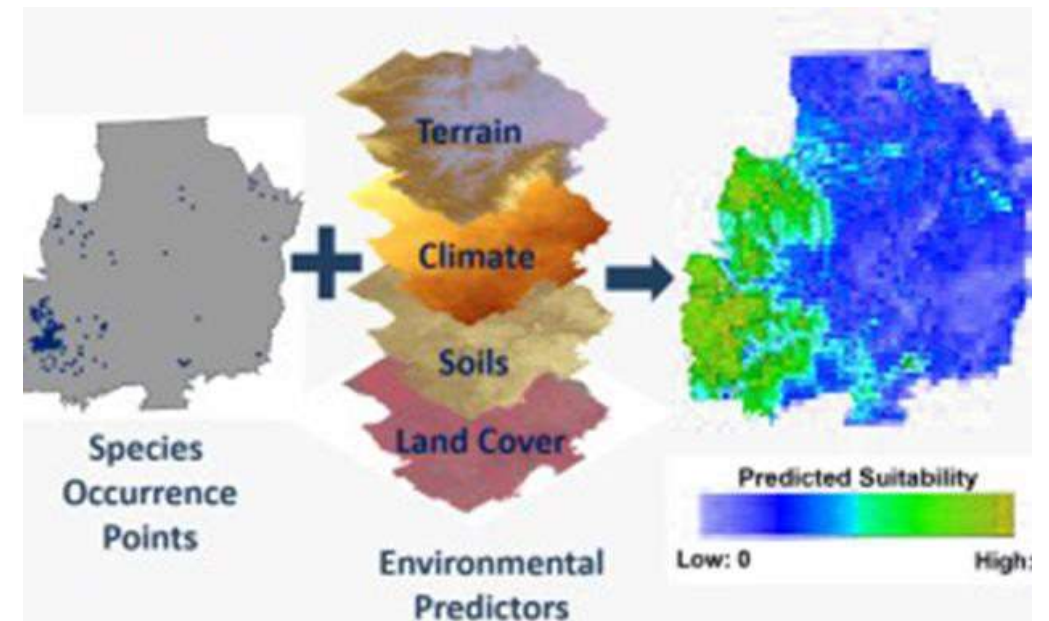USGS — science for a changing world

Winter distribution of white-fronted geese

Moore et al. *in press*

Investigate climate and land use drivers

UNLIMITED
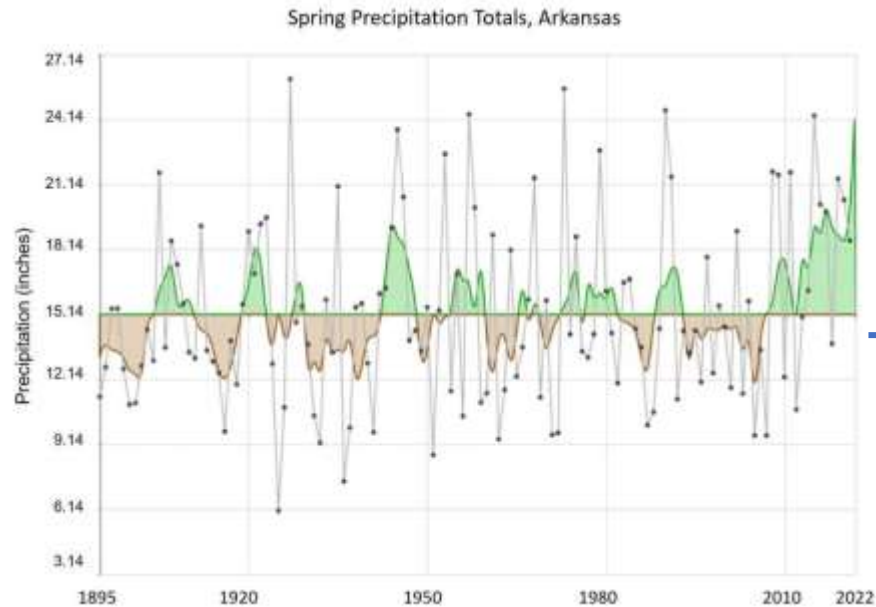
National: Data Assessment for Changing Habitat Conditions

- Past climate data: Good

- Waterfowl abundance data: Fair
  - Band recovery
  - Surveys
  - <u>Advancing citizen science</u>
    - eBird

- Land Use Land Cover: Needs Improvement
  - Index habitat conditions
    - Monthly or semi-monthly frequency
    - Flooding under vegetation

- Future climate & hydrology data: Fair
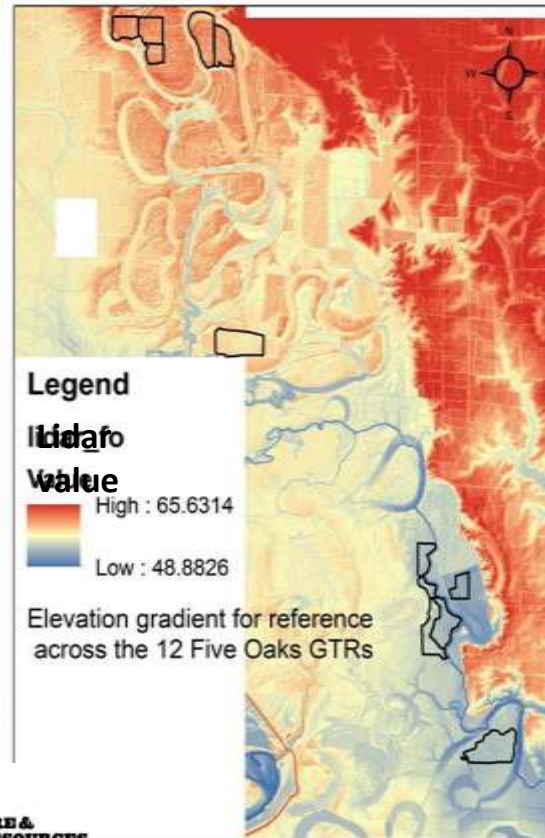 - Hydrologic change
  - Downscaling climate models

DUCKS UNLIMITED
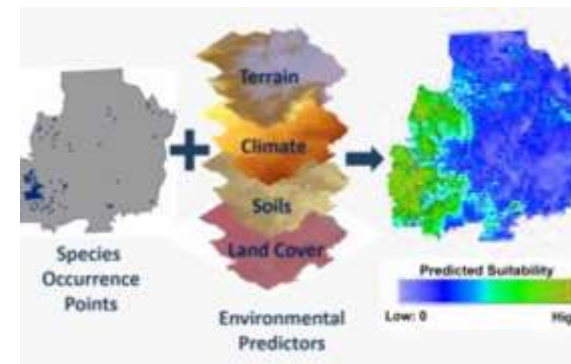
Regional: Bottomland Hardwood Health and Restoration Success
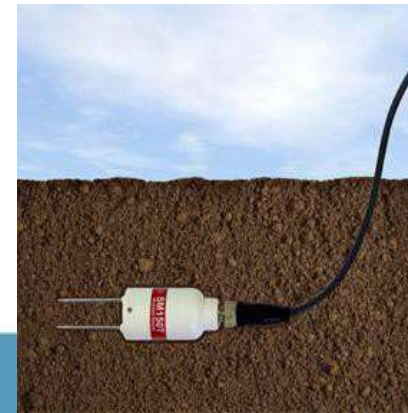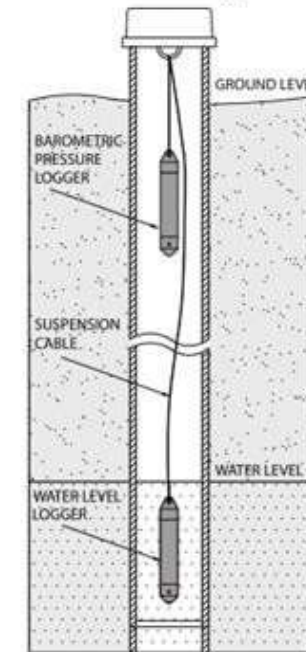
Increase in spring precipitation

Topographic relief and hydrologic modification

Change in hydroperiod = tree stress

- Feedbacks between hydroperiod & tree physiology (physical drivers & biota)
  - Tree species tolerance
- Current & future hydrologic conditions
  - Climate data: Good
  - Topographic/drainage modification: Needs Improvement
  - Lidar
    - Flood conditions
    - Drainage modification & water management*
- "Climate Ready Forests" in Central Hardwoods
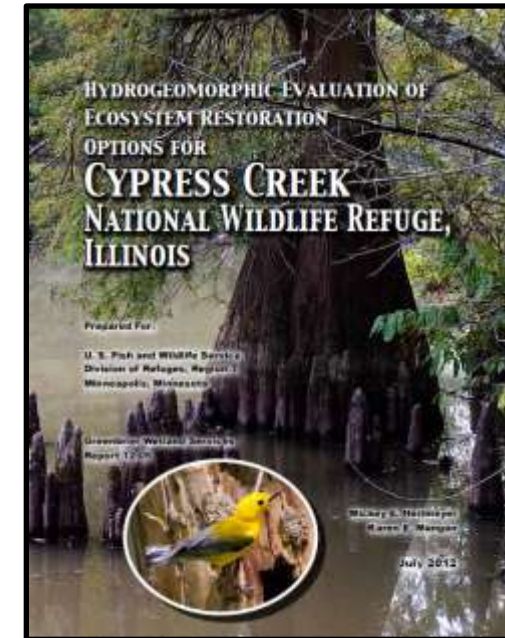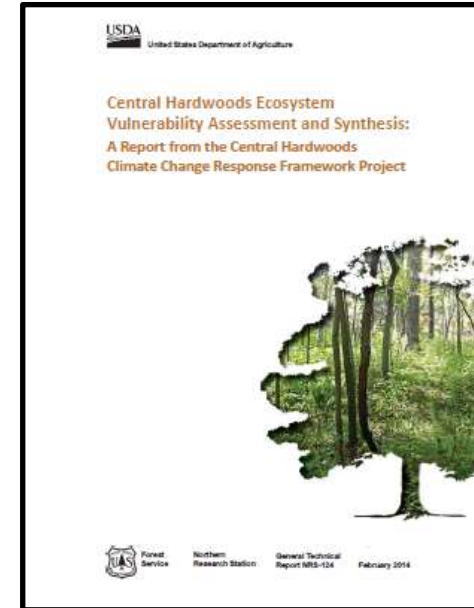
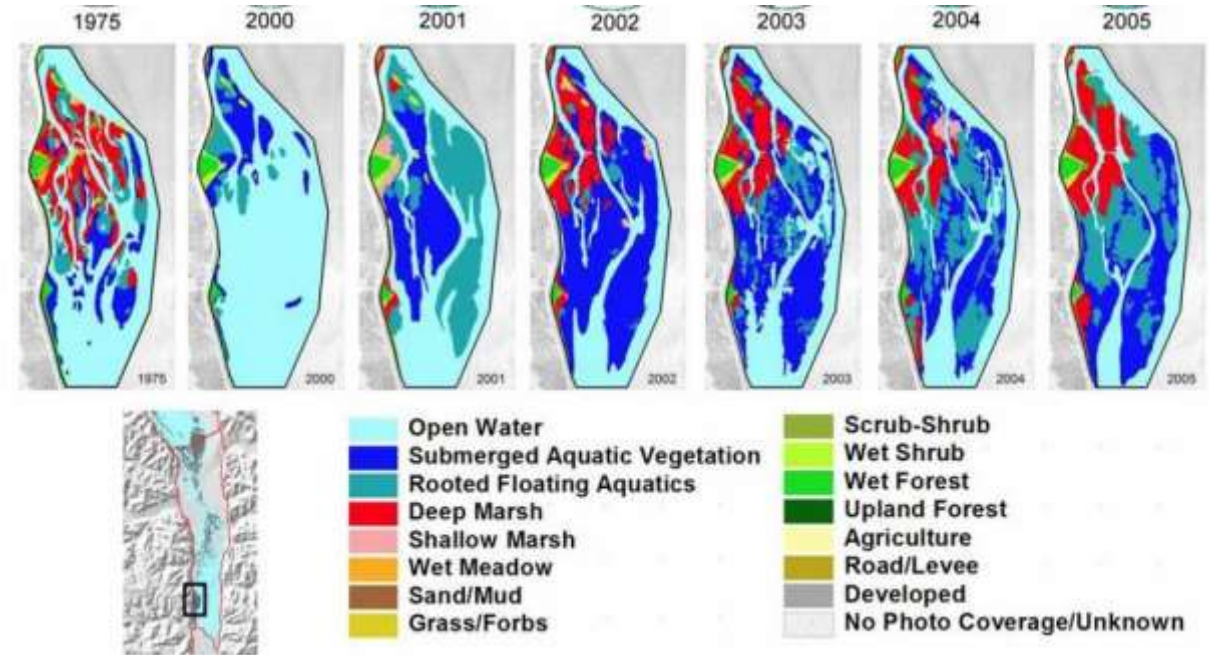# Regional: Navigation Pool Management & Habitat for Migratory Birds

- Navigation pools of the Upper Mississippi River = stopover habitats for diving ducks

- Climate & land use change
  - River flow
  - Management plans
  - Nutrients & sediment
  - Habitat

Pool 8 Raft Channel West Time Series

Water Level Management Taskforce, 2007

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- Land Use Land Cover
  - Vegetation
- Hydrology (current & predicted)
- Water management*
- Habitat use
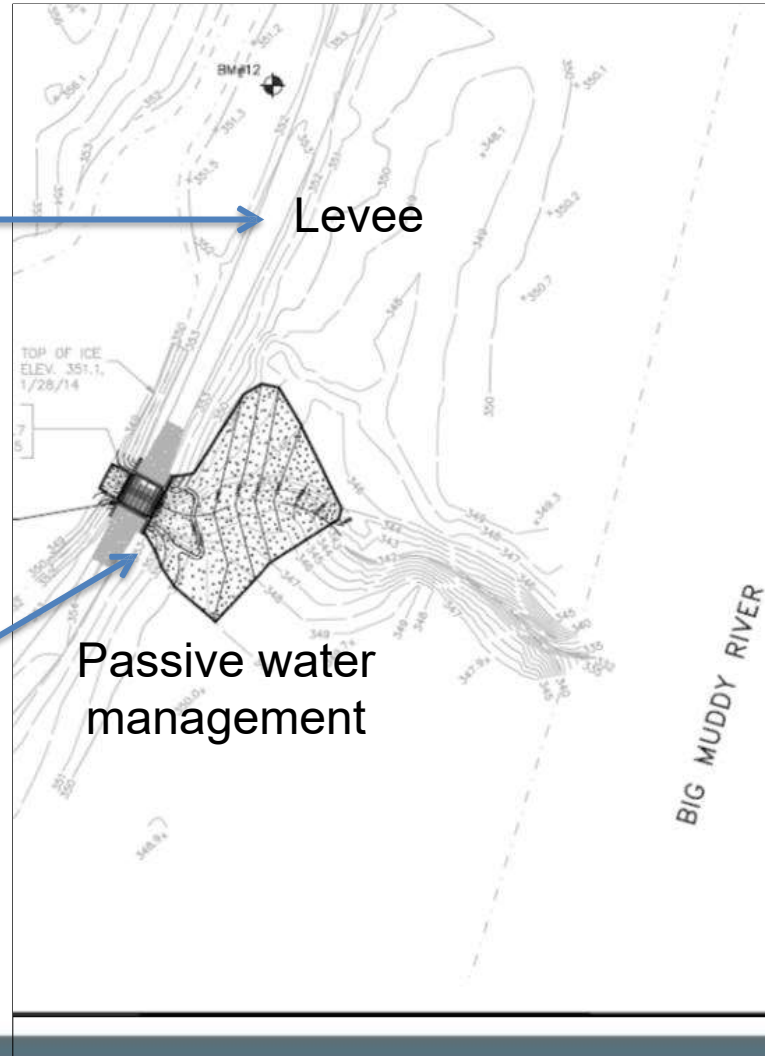 - Connect migratory bird use to changing landcover and abiotic drivers

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Local: Turkey Bayou - Shawnee National Forest
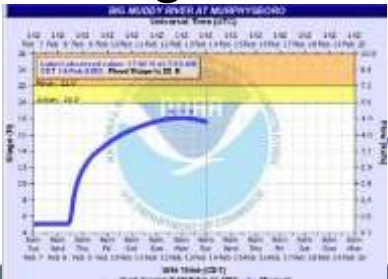
Local: Data Assessment for River Projects

- Data access efficiency: Needs Improvement
  - Ease of access
  - Clearinghouse

- Soils: Good

- Elevation/topography: Fair
  - Lidar frequency

- Land Use Land Cover: Needs Improvement
  - Historical imagery
  - Recent optical imagery

- Hydrology: Fair /Needs Improvement
  - Current and historic gauge data
  - Flood extent
  - Flood modeling (USACE)
  - Future flood regimes

Local + National: Geospatial Project Database

GLRI Project Map

USACE UMRR HREP Map

- Evaluate progress towards shared goals
- Coordinate resources
- ID sites and partners for monitoring
- Evaluate project persistence
- Assess cumulative impacts

Conclusions

- The river is a shared resource… How do we better collect and share data and planning objectives?
    - Data & project clearinghouse

- Data should inform planning, evaluation and adaptive management.
    - Climate & soils
    - Land Use Land Cover
    - Lidar topography
    - Flood extent & flooded habitat condition
    - Biotic response to flooding and other abiotic drivers
    - Current & future hydrologic models

- These data are crucial for many purposes, including conservation to benefit waterfowl, other wetland-dependent wildlife, and people that value them.