

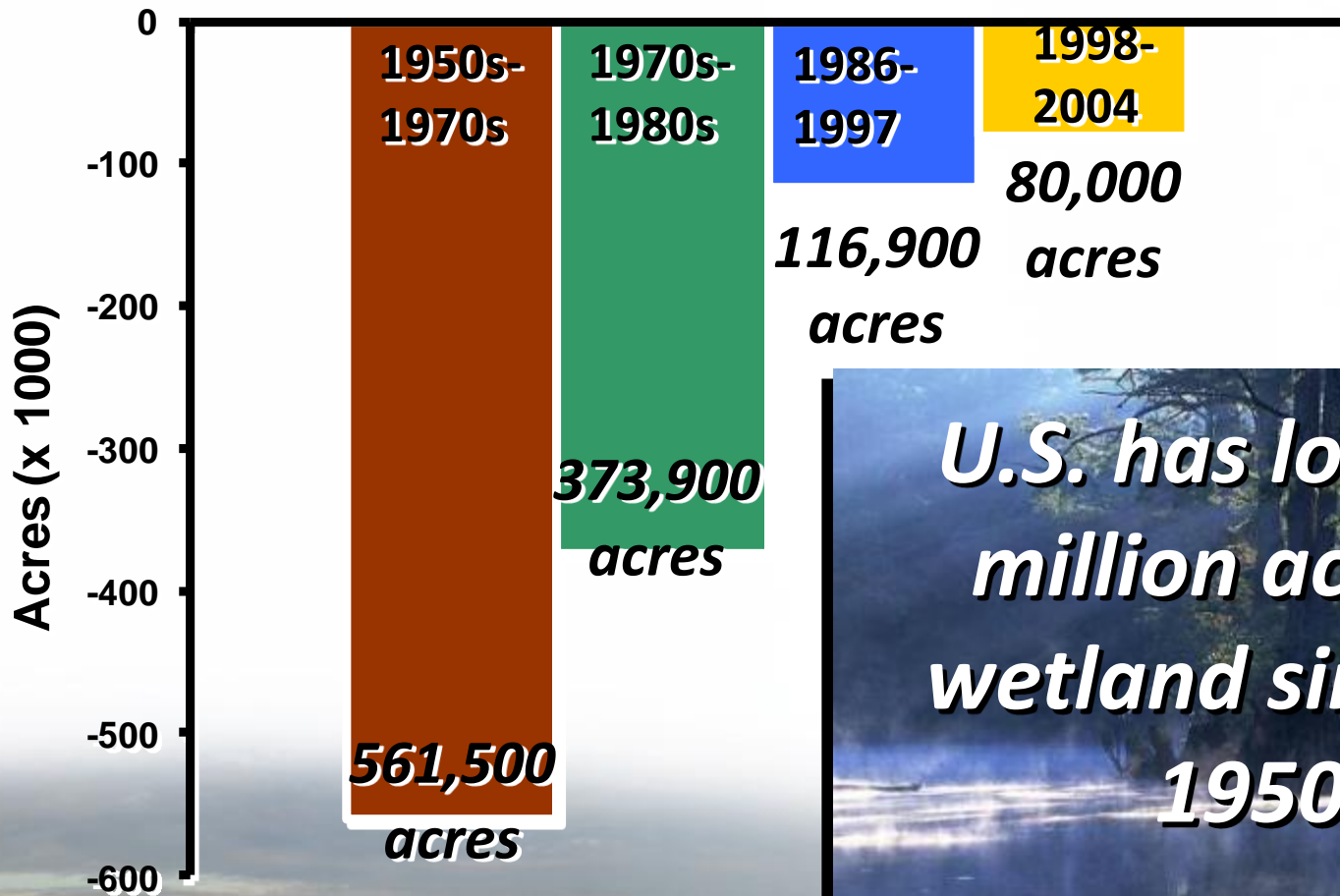
# Wetland Restoration on Private Lands: Changing Perspectives and Future Challenges

- **The problem is the same:  
Wetland loss and alteration**
- **Progress has been made**
- **Different partners: Changing expectations**
- **From restoration to maintenance**
- **Monitoring – evaluation - adaptation**



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# Annual Wetland Loss: U.S.



*U.S. has lost 16.8 million acres of wetland since the 1950s*

1884-'87 (Published 1887).

er ).

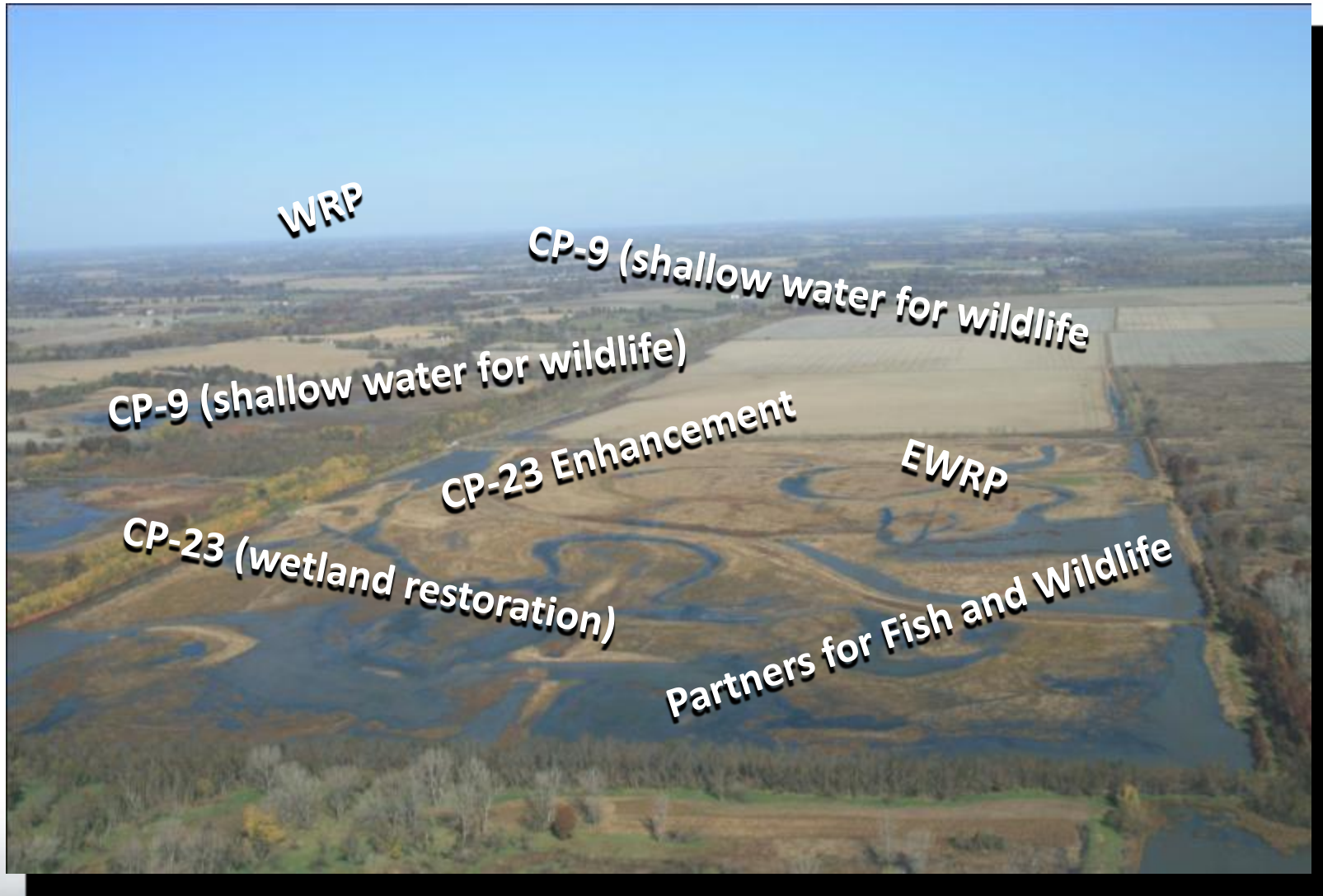
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# WRP Easements and Waterfowl Flyways



**> 2.4 million acres**

**> 12,000 contracts**

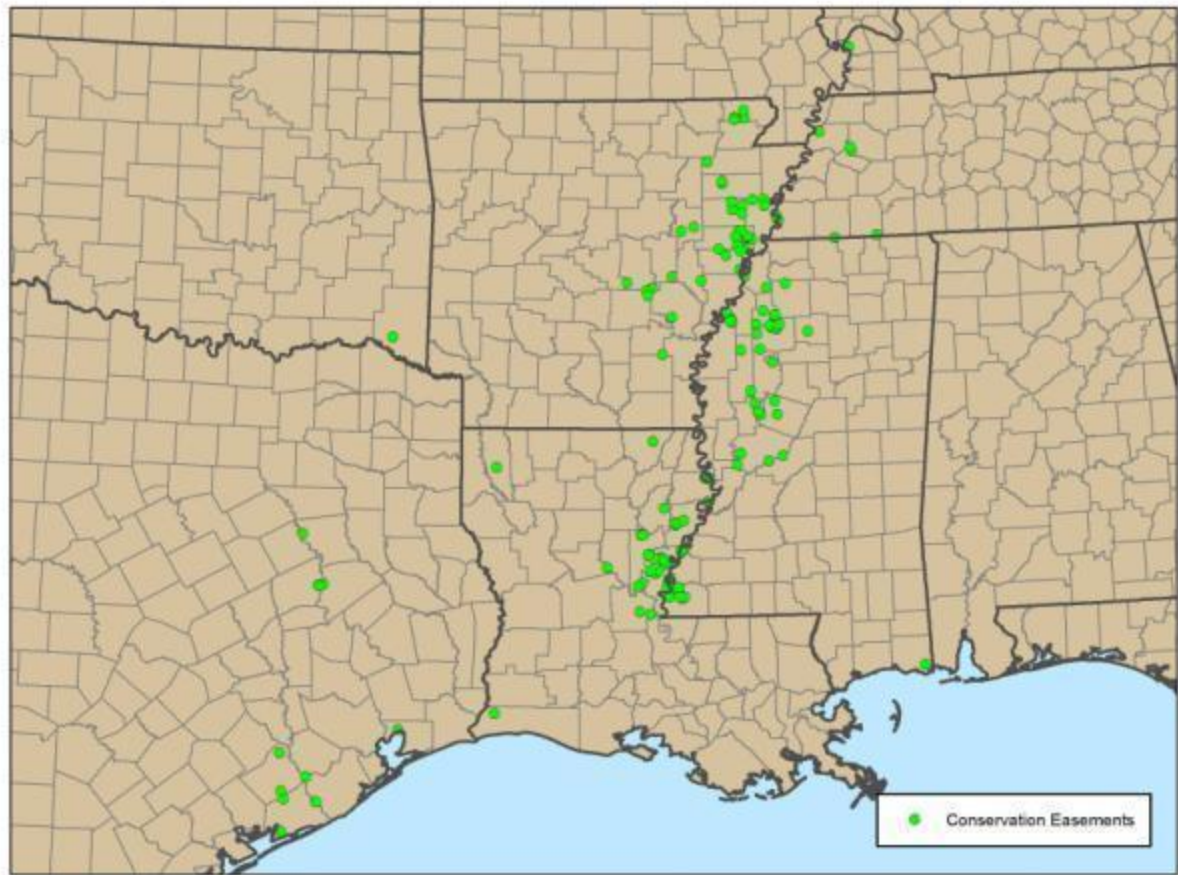


## ***Voluntary, incentive-based partnerships to deliver habitat on-the-ground***

- ***Landowners – Ranchers, Farmers, Recreational Owners.***
- ***Agencies – State, Federal, Regional.***
- ***Conservation Organizations – NWF, TNC, PF, NFW, etc.***
- ***Local Communities – Lake Associations, City and County Governments, Wildlife Clubs, etc.***
- ***Private Philanthropists – Individuals, Foundations, Corporations.***

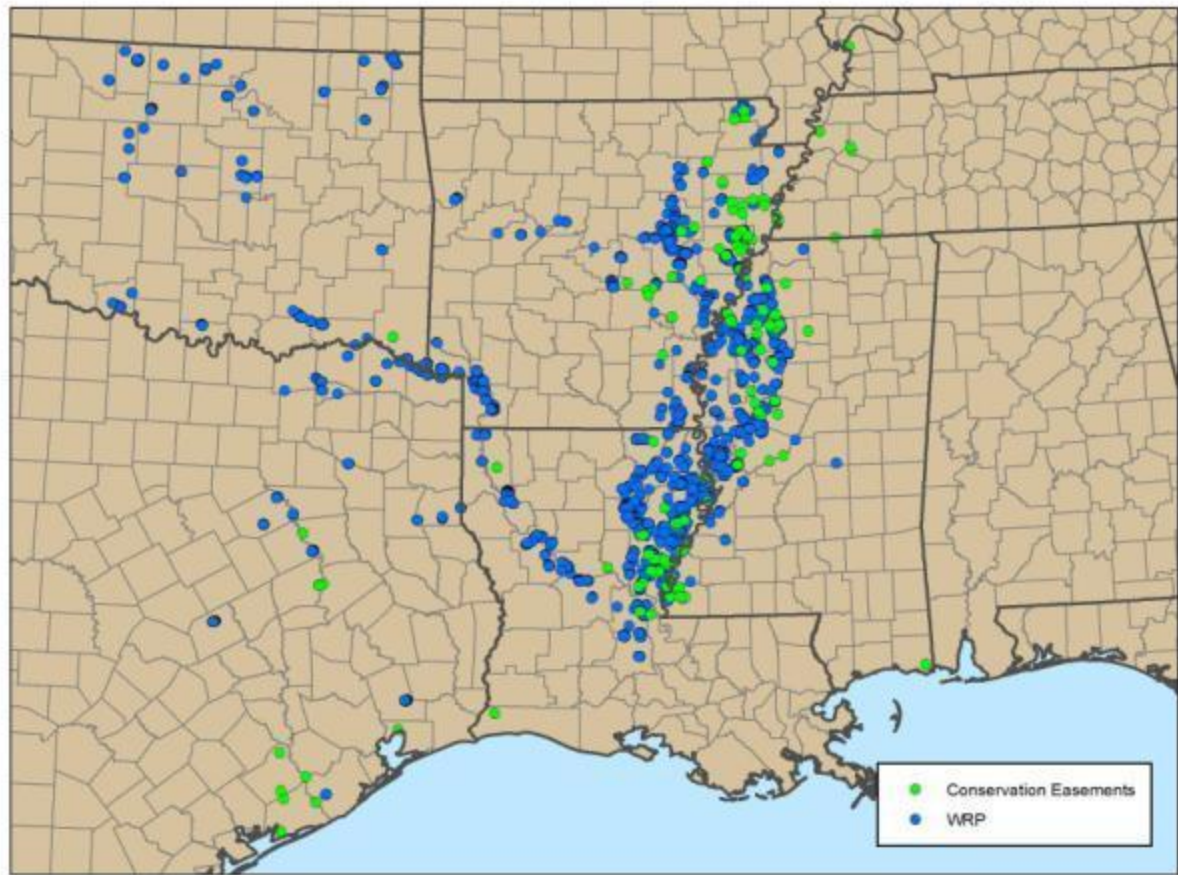


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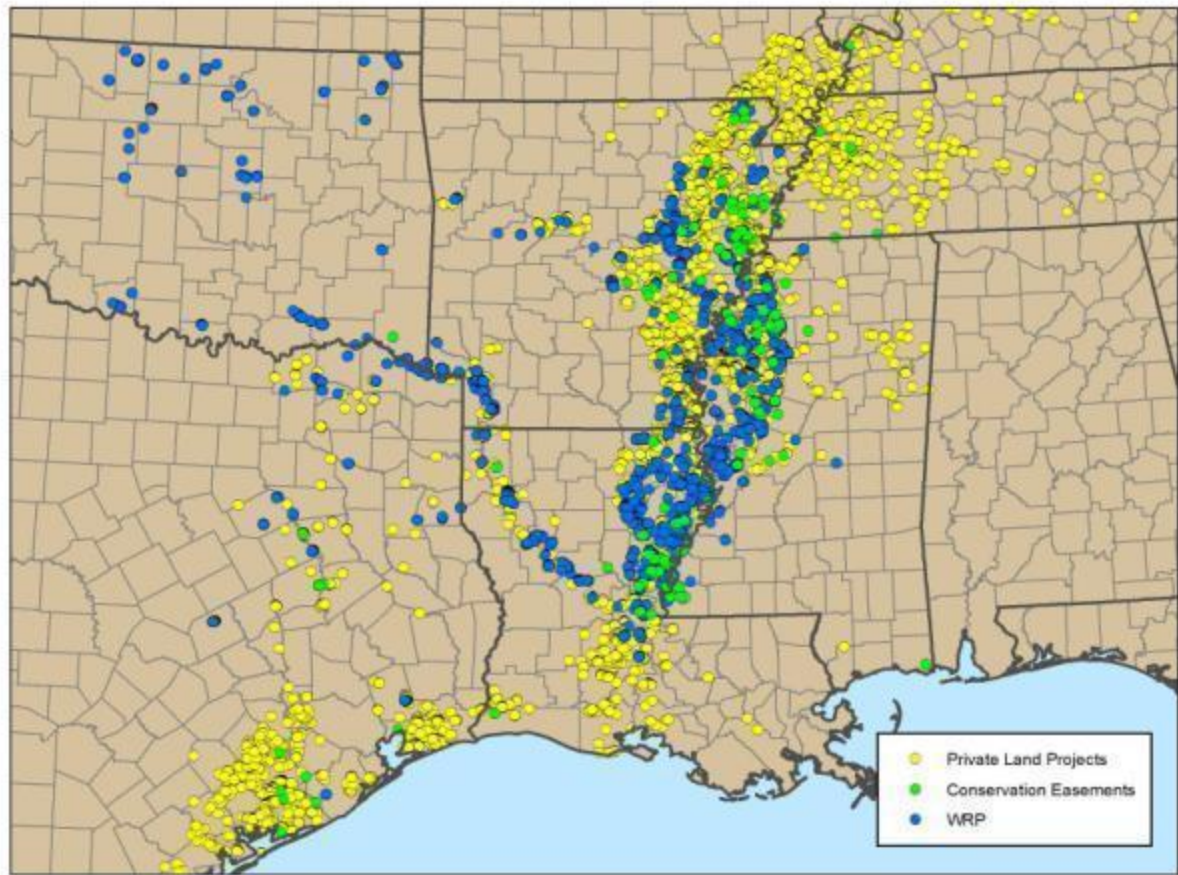
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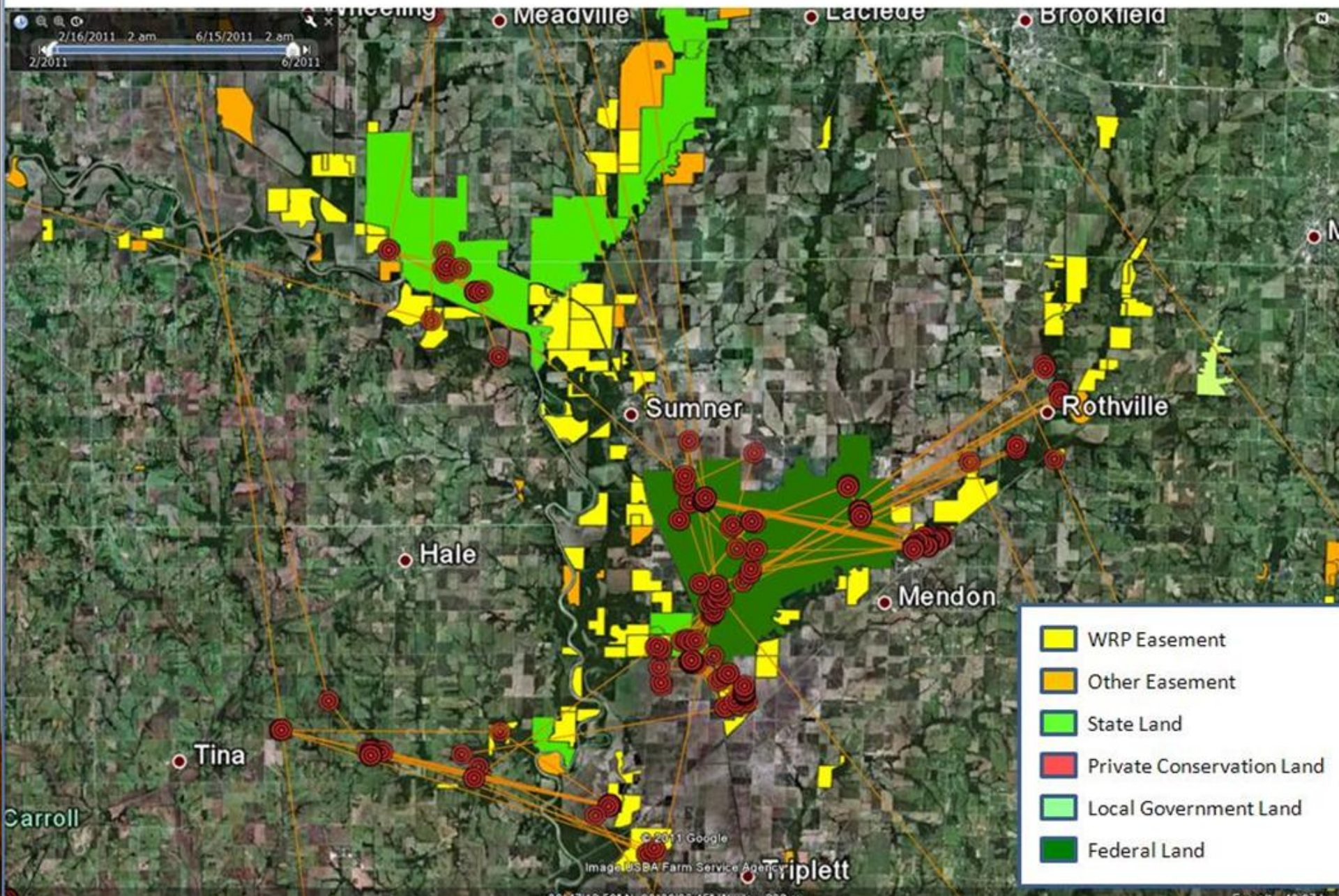




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# Wetlands Conservation at Landscape Scales





# Wetlands restoration and management: Hydrology, Disturbance Regimes, Connectivity



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# Restoration Tools



The "Iron Glacier"









# Considerations of scale

**Across wetland landscapes**

**Across basins within a landscape**

**Across time within site**

**Across landowner objectives**







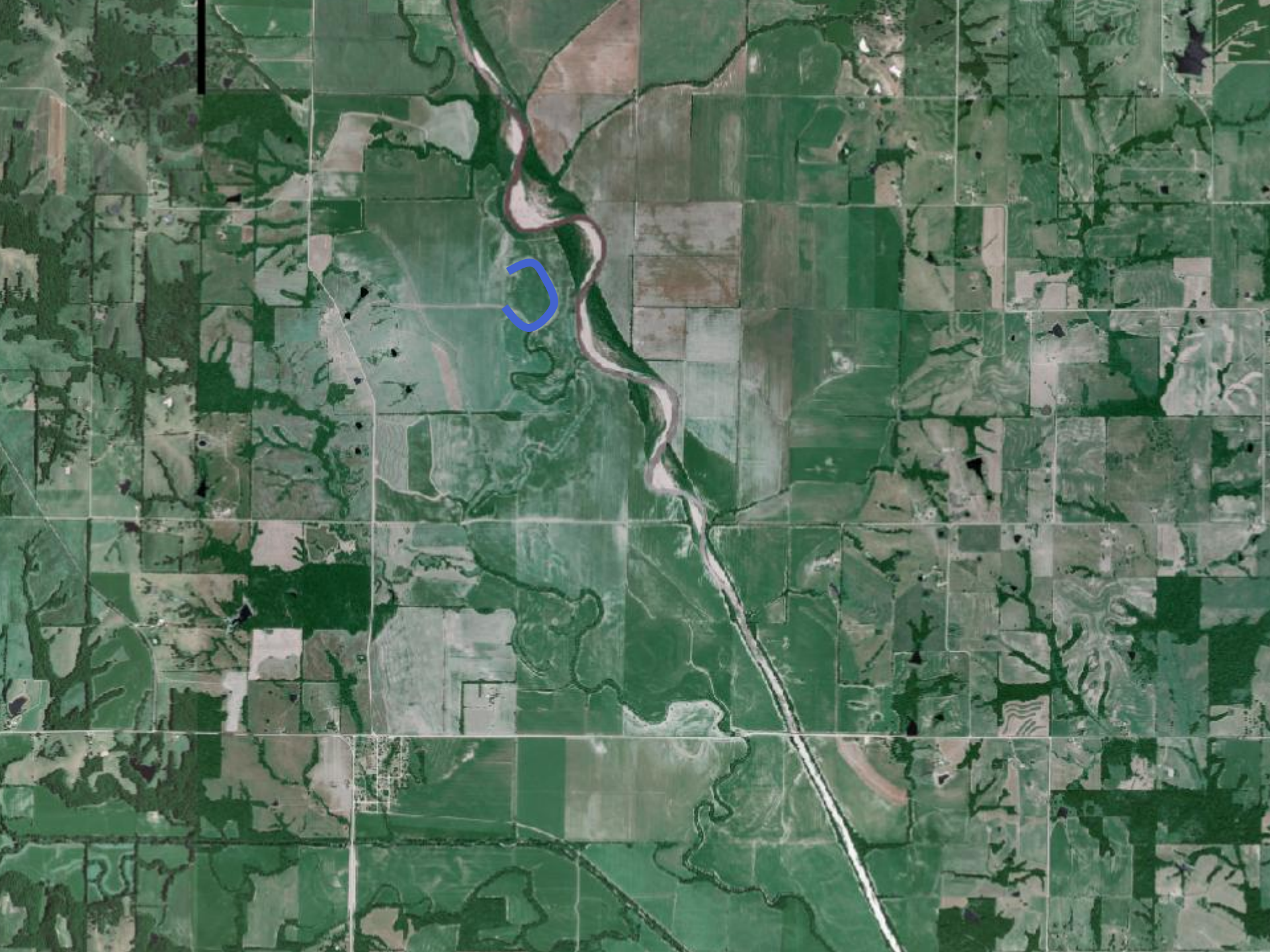
# Rivers and Floodplains







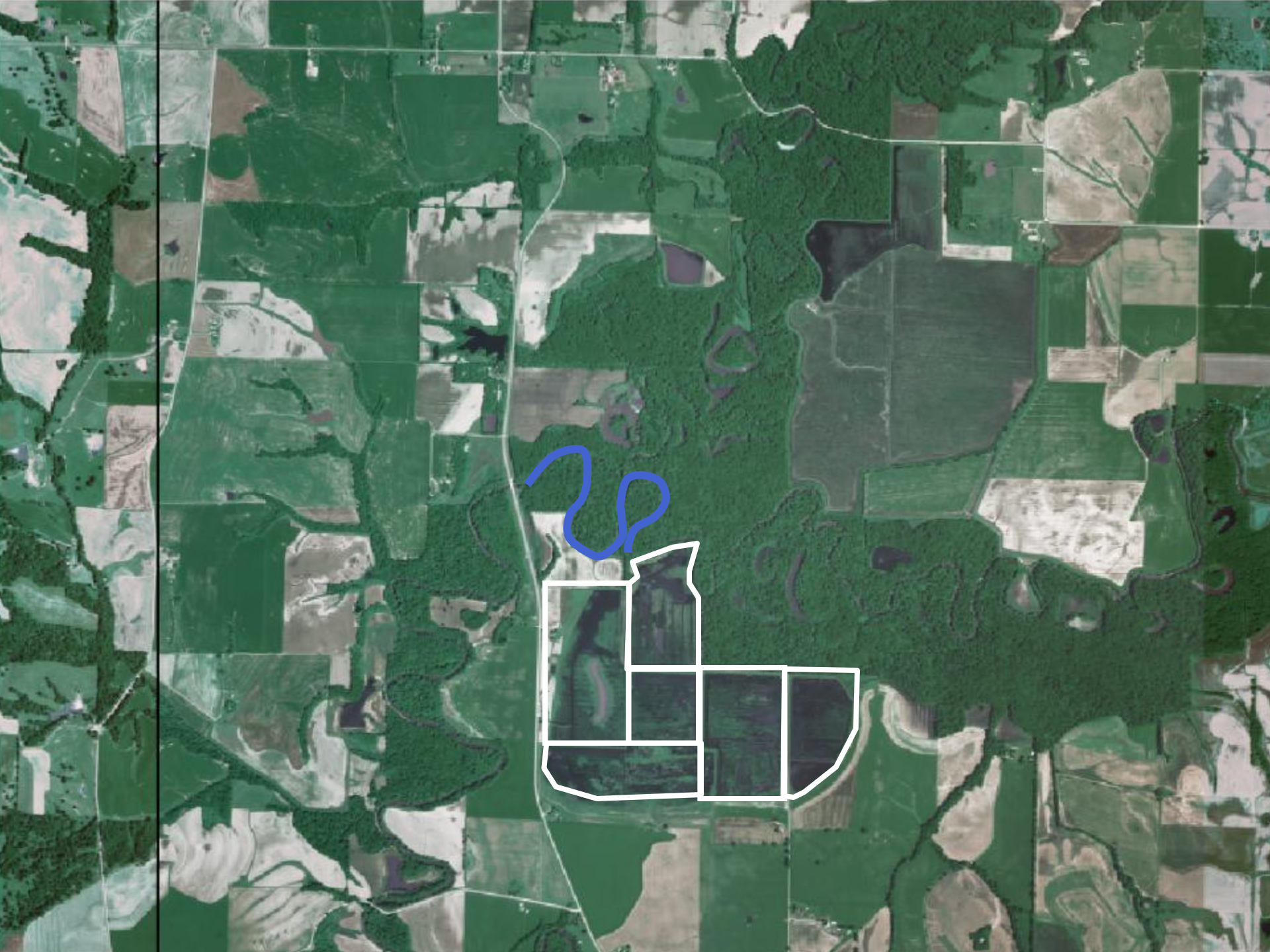
















Grand River

Chariton River

East Chariton River

Thompson River

Missouri River



# Water regimes on managed wetlands

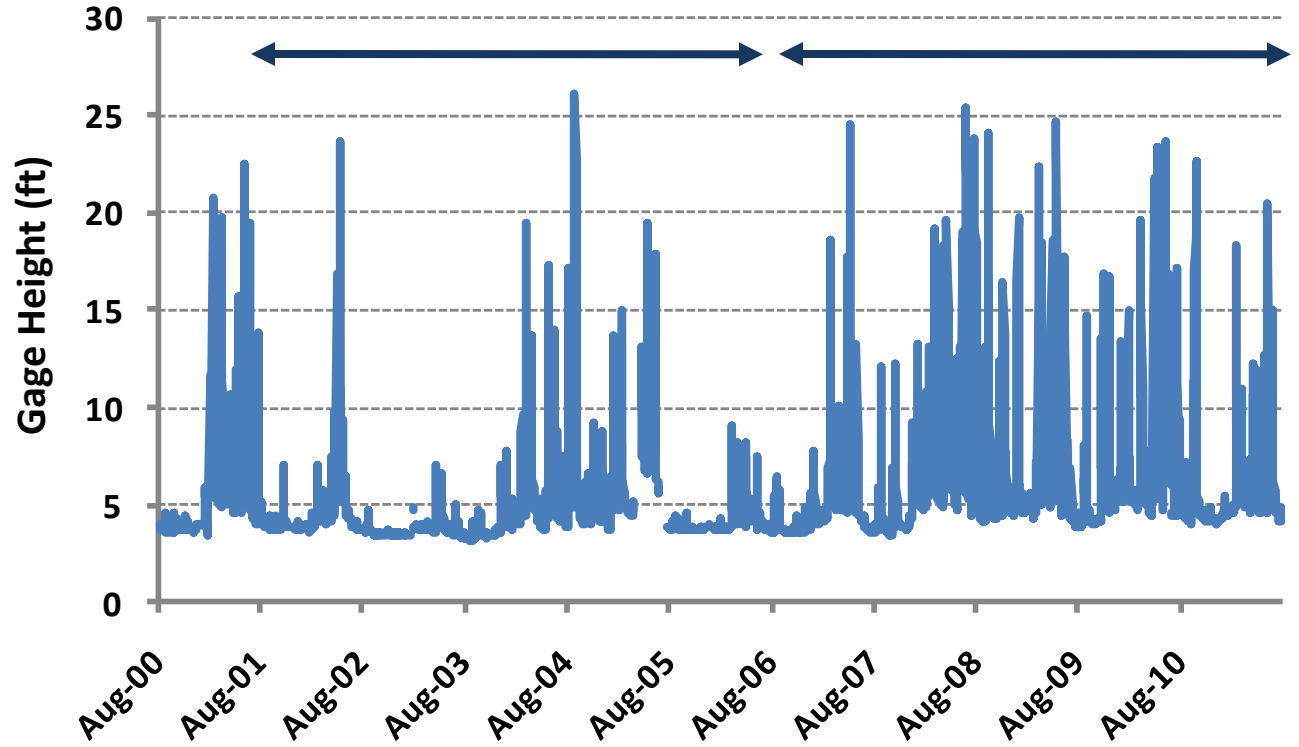




**Drawdown Sloooooowly!**  
**Reflood Sloooooowly!**



# Flood Frequency on Locust Creek - Missouri



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## Managing the investment:

- Maintaining infrastructure
- Vegetation management
- Water management
- Sedimentation



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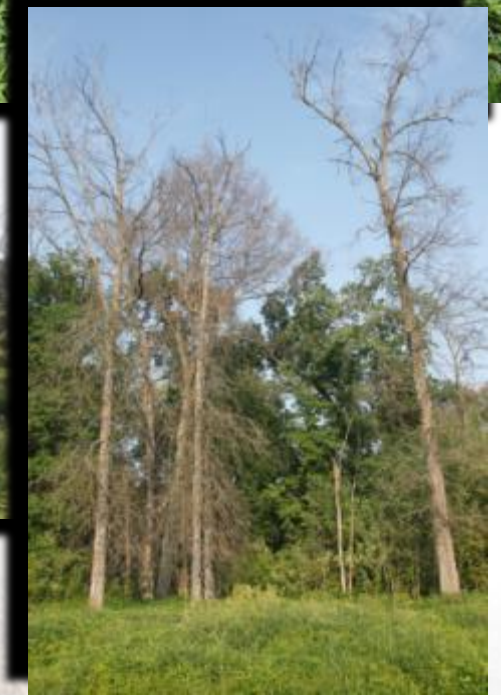


➤ Invasive exotic species – reed canary grass, purple loosestrife

➤ Undesirable vegetation – cocklebur, sunflowers, bulrush, primrose, phragmites

➤ Tree invasion – cottonwood, willow, maples

➤ Tree mortality



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# Deteriorating Infrastructure



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# Modified disturbance regimes



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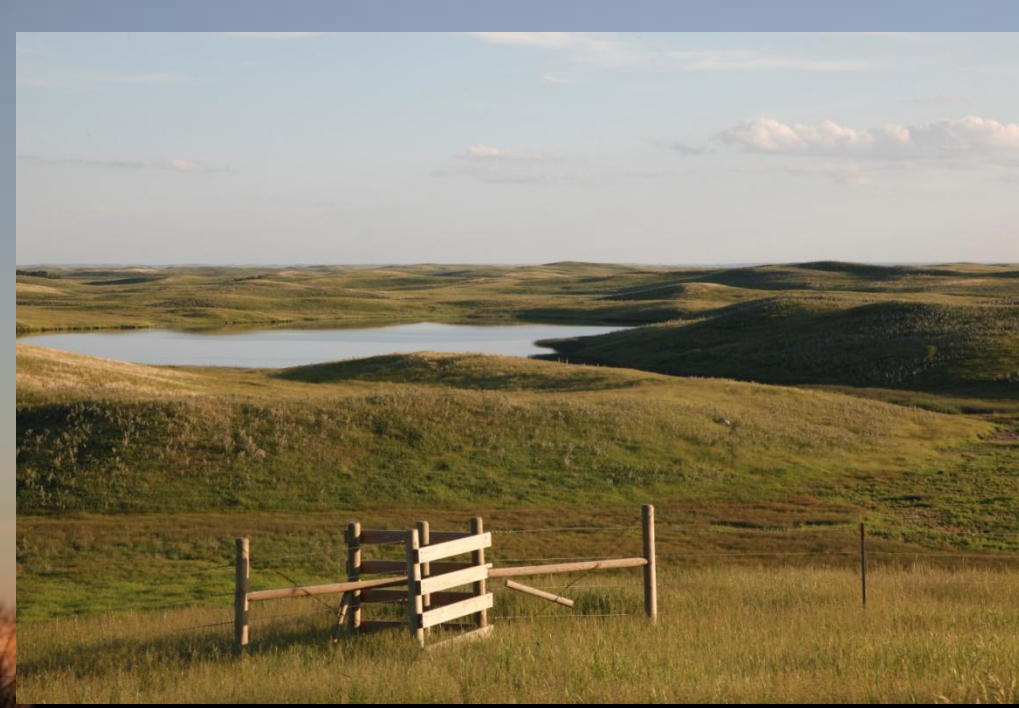
# What's Your Objective?

- Recreation?
- Wildlife Habitat?
- Water Quality?
- Nutrient Management?
- Financial?
- All the Above?



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# Technical assistance



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# The partnership is changing:

- The landowner base over time is changing
- Continuing landowner education
- Follow up to ensure conservation practice in place
- Need to stay with landowners
- Landowners need “skin in the game”
  
- Annual landowner checks
- Newsletters and management guides
- Assess objectives and expectations



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# Landowner education



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**Take Home Point**  
**Get Professional Help!!!**

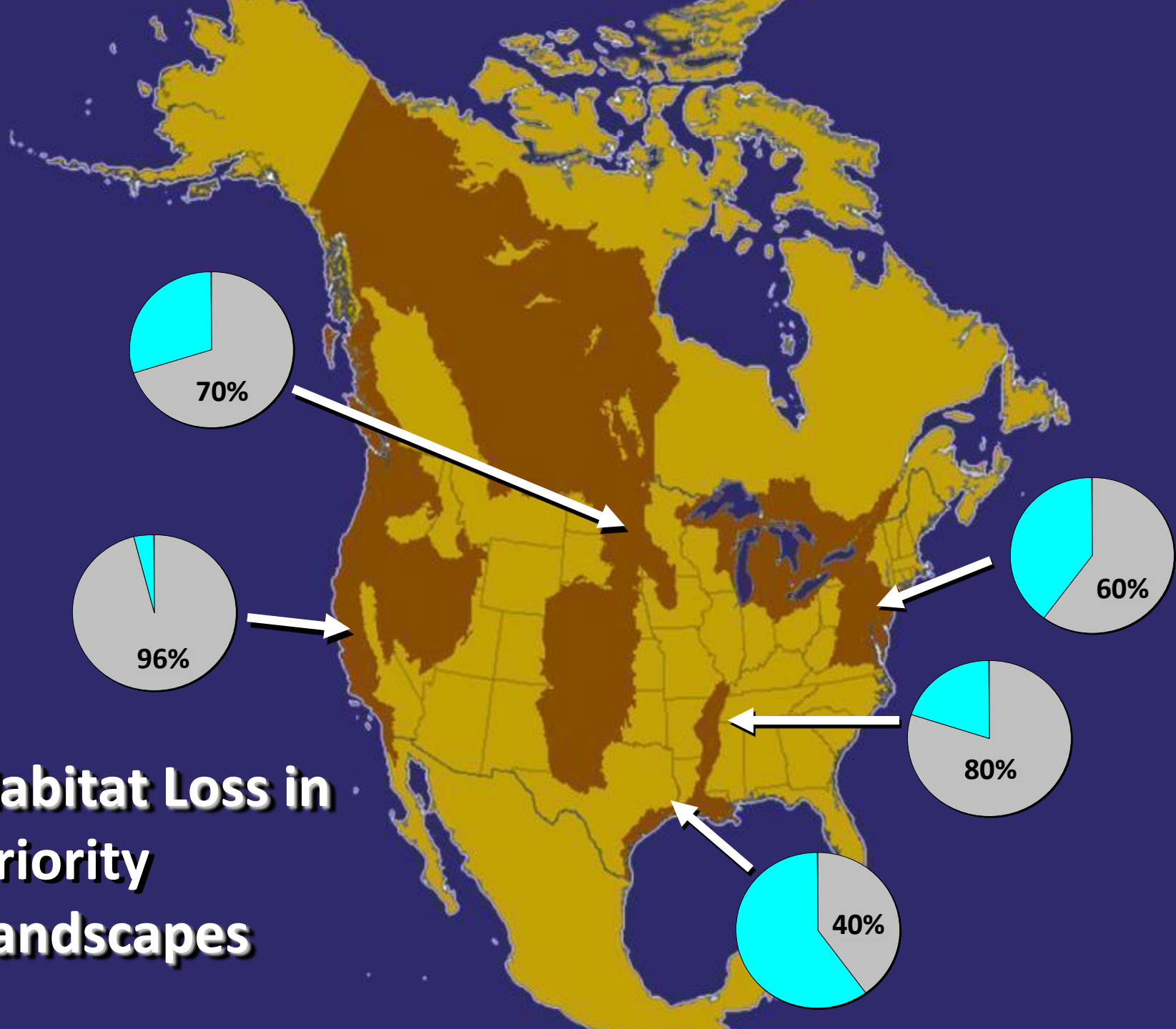


# Evaluating and adapting with a focus on uncertainty



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# Habitat Loss in Priority Landscapes







# A model of Restoration and Management



**Restore  
Basin  
Integrity**

**Intensive restoration  
and management**

Degree to which physical integrity is altered

**Restore  
Natural  
Processes**

**Protection**

**Mimic  
processes**



Degree to which natural processes are altered





# Sources of uncertainty:

## Biological / Ecological

**Environmental**    **Flood Frequency**

**Structural**        **Seed bank response**

**Management control**    **Invasive species control**

**Measurement**    **Waterbird response**



**Landowner incentive for participation**

**Landowner capacity for wetland management**

**Society's support for ecological goods and services**



**Avoid biological arguments for social uncertainties**

**Source of Uncertainty**

**Decision**

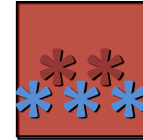
*Environmental*

*Structural*

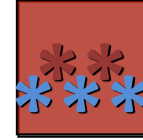
*Mgt control*

*Measurement*

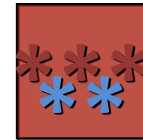
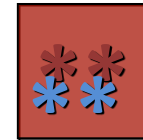
**Manage waterfowl hunting**



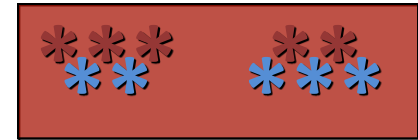
**Passive vs. active management**



**Fund wetland restoration**



**Increase flood control**



**Respond to climate change**

