Fish and Wildlife Conservation in the 21st Century

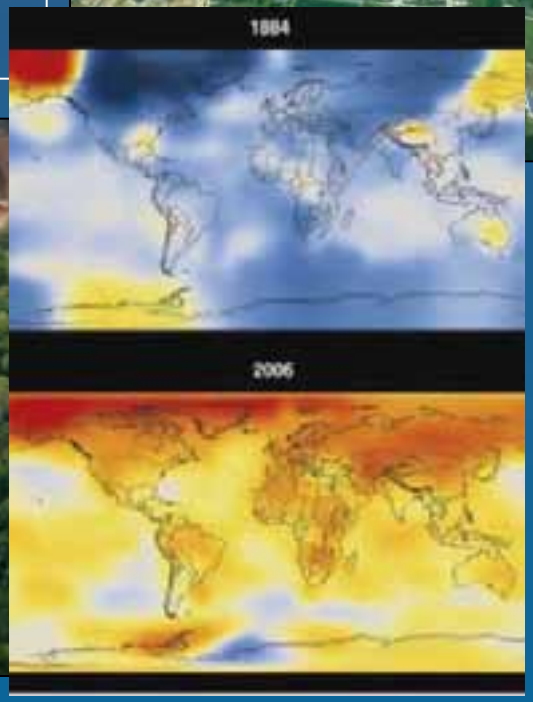
A Way Of Working Challenge

FWS – Gulf Coastal
Plains and Ozarks
SHC Workshop

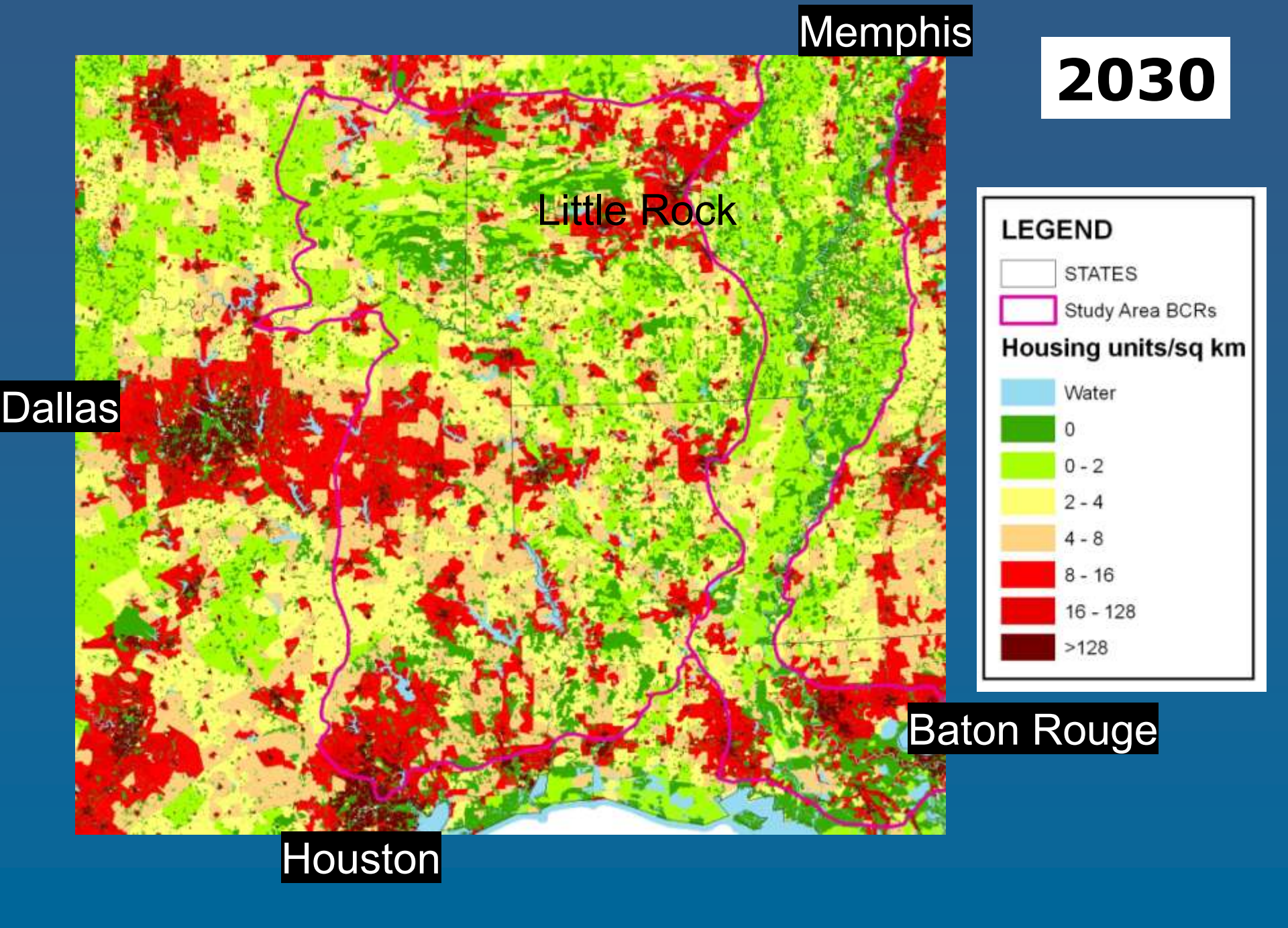
15 March 2010
Jackson, Mississippi

"The conservation community faces unprecedented issues of scale, pace, and complexity in sustaining our Nation's fish and wildlife resources."

Year: 2042
– Global Population ~9 Billion People –
habitat fragmentation, contamination, pollution, invasive species, disease, threats to water quality and quantity…



"The conservation challenges of the 21st Century represent a force of change more far-reaching and consequential than any previously encountered."


Memphis
2030
Little Rock
Dallas
LEGEND
STATES
Study Area BCRs
Housing units/sq km
Water
0
0 - 2
2 - 4
4 - 8
8 - 16
16 - 128
>128
Baton Rouge
Houston

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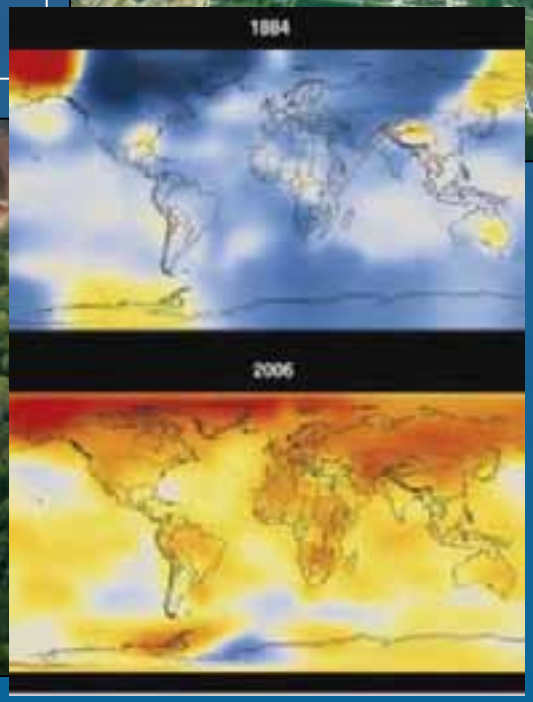

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"The conservation community faces unprecedented issues of scale, pace, and complexity in sustaining our Nation's fish and wildlife resources."

The Public Trust Doctrine

The Nation's fish and wildlife resources are publicly owned and held in trust by the government for the continuing benefit of the public.

- "21st Century resource challenges are formidable
  Challenge"

"The conservation challenges of the 21st Century represent a force of change more far-reaching and consequential than any previously encountered."

"The conservation challenges of the 21st Century represent a force of change more far-reaching and consequential than any previously encountered."

- Conservation In Transition
- A Way-of-Working Challenge
- Coming to "Terms"…

- "21st Century resource challenges are formidable and complex…Yet the most fundamental challenge facing the wildlife community is not a resource challenge at all; it's A Way-of-Working Challenge"

Trends Transforming Conservation

1) The emergence of Conservation Science as the 21st Century conservation paradigm

2) The changing conservation workforce

3) Escalating expectations regarding public sector performance

4) The increasing complexity of conservation issues

Three “ethics” or “philosophical movements” that have defined conservation in America*

- Romantic-Transcendental Conservation Ethic

  Exemplified by the work of early American naturalists, writers, and artists.

  Man/nature relationship seen in a spiritual renewal context.

- Resource Conservation Ethic

  Exemplified by public policies originating in the Roosevelt/Pinchot era.

  Man/nature relationship seen in a utilitarian, wise use context.

- Evolutionary-Ecological Land Ethic

  Defined by the theoretical thinking of Conservation Biology, Landscape Ecology, Ecosystem Management

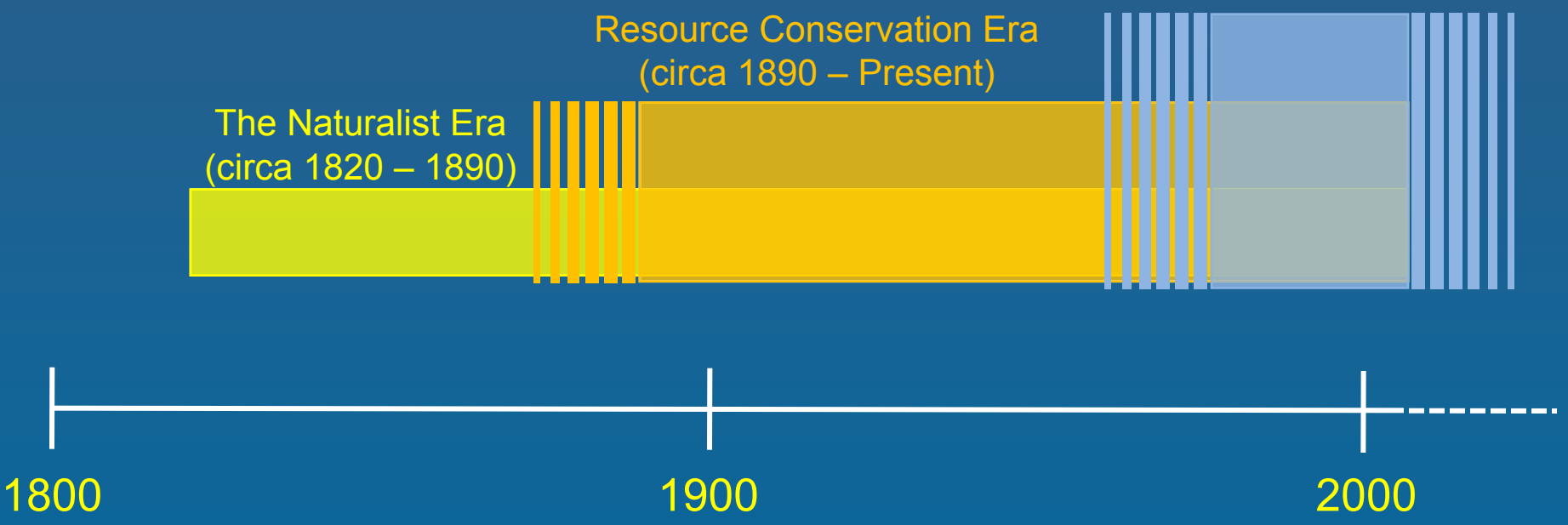
  Overtly seeks a change in the resource conservation ethic.

* Meffe and Carroll, Principles of Conservation Biology, 1994

Moving Toward the Third Era of American Conservation

- Crisis oriented, value laden, science driven
- Overtly seeks a change in the conservation target

Disruptive Change



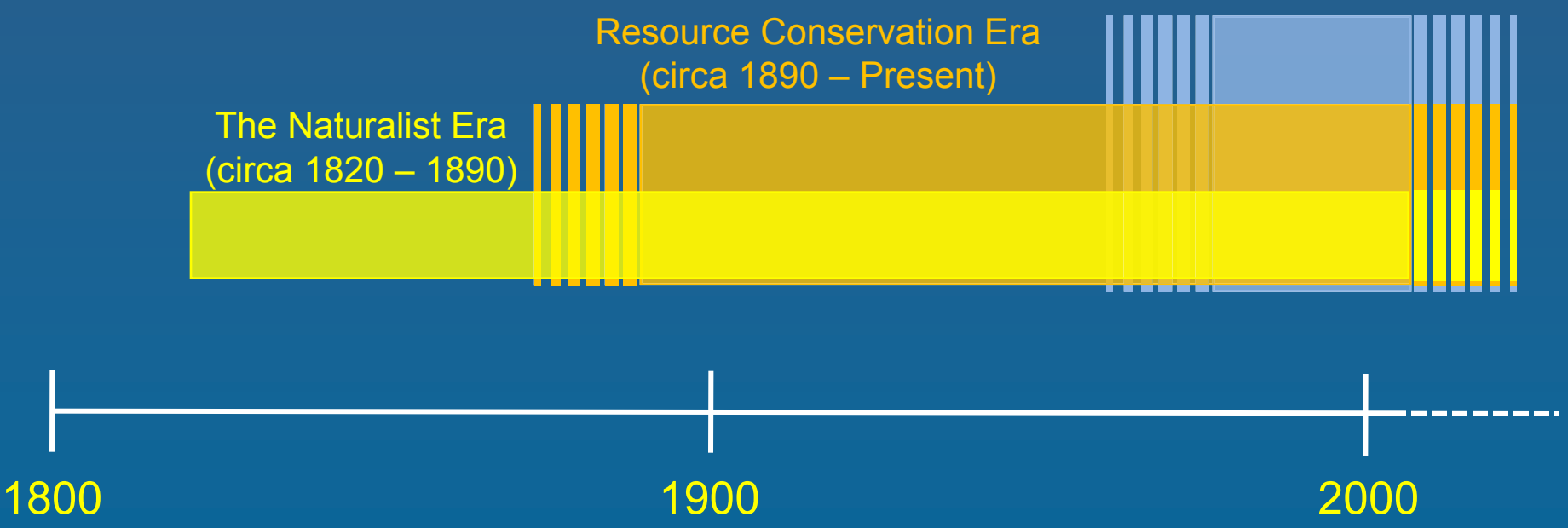
Adapted from Meffe and Carroll, Principles of Conservation Biology, 1994

Land use change (e.g., conservation, development) occurs at the site scale; yet population sustainability is system dependent, operating on outcomes manifested at broader spatial and temporal scales.

Conservation Target: Ecologically Sustainable Landscapes: sustaining ecological systems, processes, and functions.

Moving Toward the Third Era of American Conservation

- Crisis oriented, value laden, science driven
- Overtly seeks a change in the conservation target
- Overtly seeks a departure from the resource conservation ethic



Adapted from Meffe and Carroll, Principles of Conservation Biology, 1994

The Resource Conservation Era (circa 1890 – Present)

- Conservation Ethic – Resource development as an economic imperative, stewardship as a public responsibility
- Natural resources were segmented and compartmentalized, i.e. forest, soil, water, wildlife, range, etc.
- Practitioners (both scientists and managers) trained in resource-specific disciplines, e.g. forestry, wildlife, range management, soil science.
- The Nation's private, state, federal conservation infrastructure developed following this compartmentalized approach.

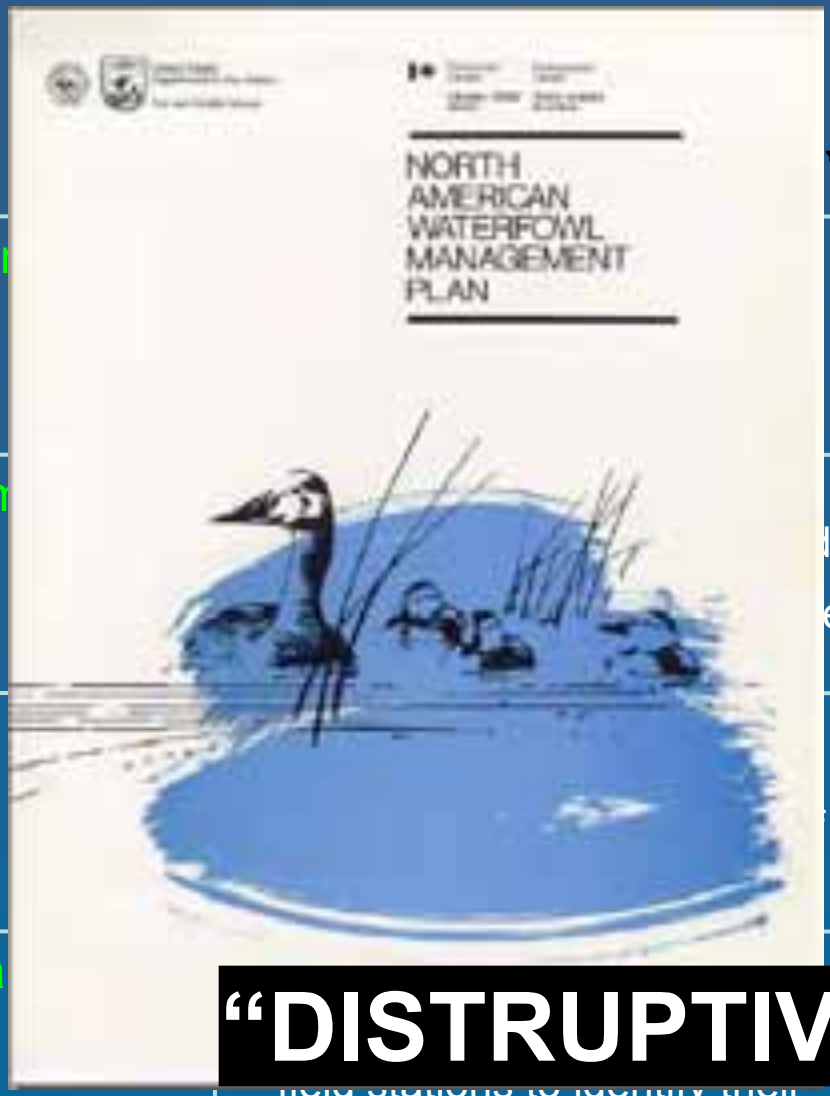
Resource Conservation and Conservation Science

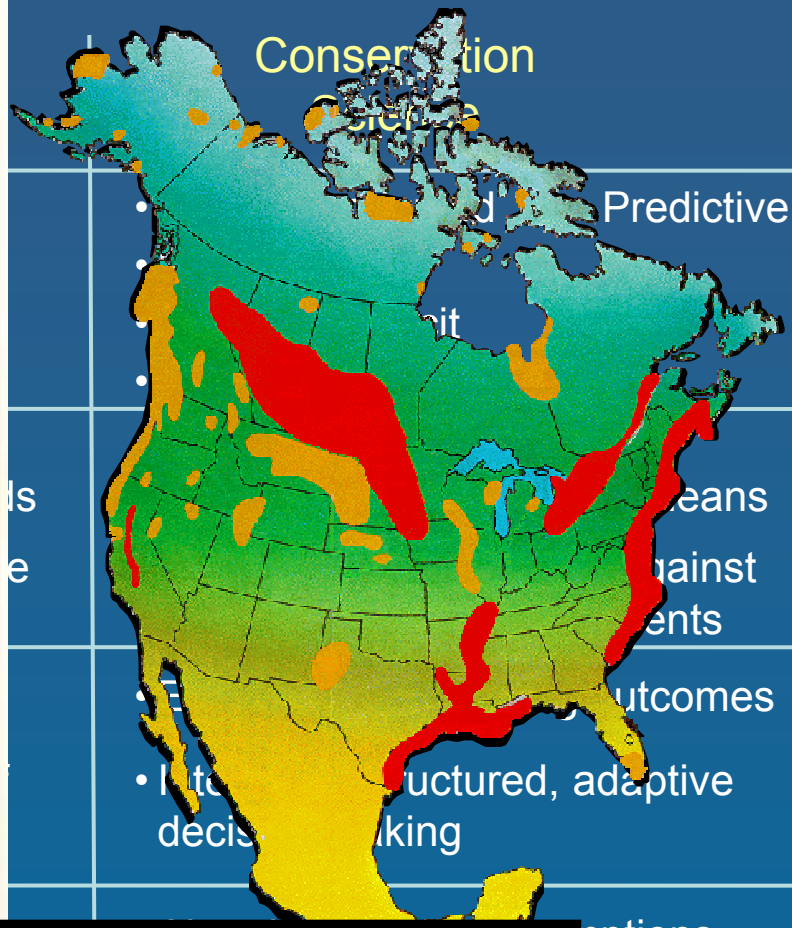
An Operational Comparison

	Resource Conservation	Conservation Science
Planning	• Activity oriented • Administratively focused • Programmatically explicit • Opportunity based	• Outcome oriented • Model based • Spatially explicit • Multi-scaled • Predictive
Implementation	• Protection, restoration, and management pursued as ends • Opportunities prioritized at the project scale	• Protection, restoration, and management pursued as means • Opportunities prioritized against landscape scale assessments
M&E	• An operational luxury • Appropriate as an element of research	• Essential to assessing outcomes • Integral to structured, adaptive decision making
Research	• Priorities are derived from periodic calls to programs and field stations to identify their needs	• Aimed at testing assumptions and uncertainties of biological planning and assessment

Resource Conservation and Conservation Science

An Operational Comparison





Planni

Implem

M&E

Resea

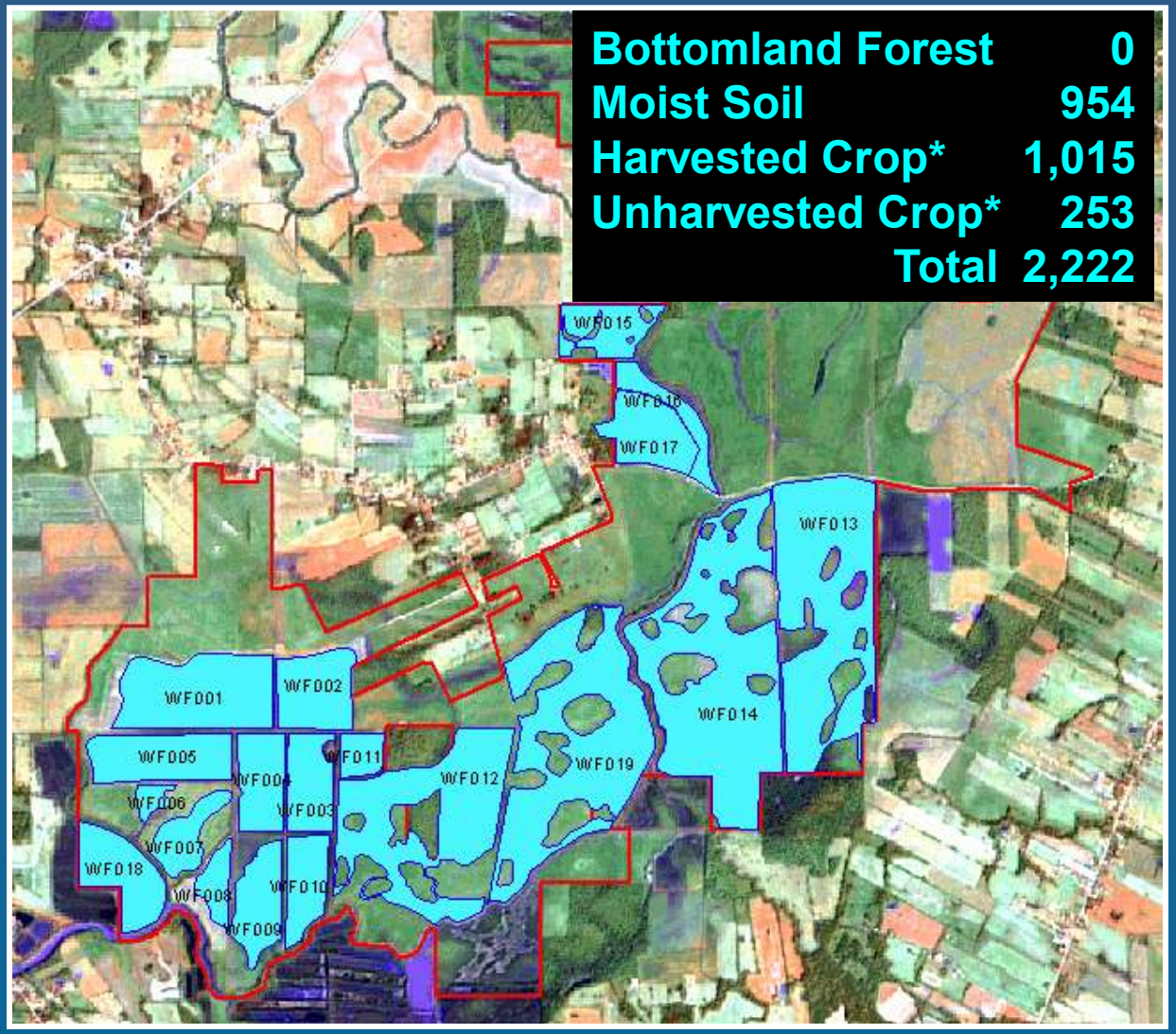
- Predictive
- eans
- ainst
- ents
- utcomes
- uctured, adaptive
- nptions
- ological

needs

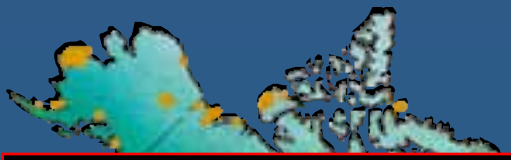
planning and assessment

“DISTRUPTIVE CHANGE”

Grand Cote National Wildlife Refuge



Grand Cote National Wildlife Refuge



Bottomland Forest 0

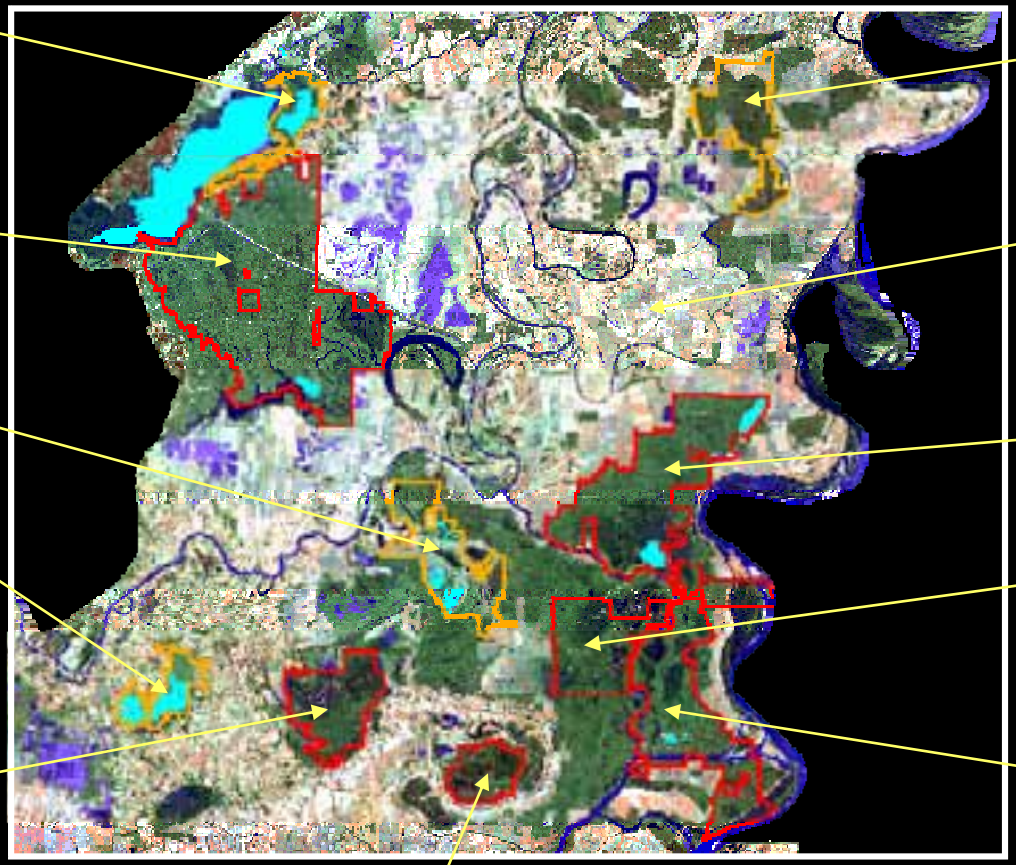
Catahoula NWR
Objective = 629 ac

Dewey Wills WMA
Objective = 0 ac

Lake Ophelia NWR
Objective = 1,550 ac

Grand Cote NWR
Objective = 1,600 ac

Spring Bayou WMA
Objective = 3,200 ac



Bayou Cocodrie NWR
Objective = 358 ac

Private Lands
Objective = 140,000 ac

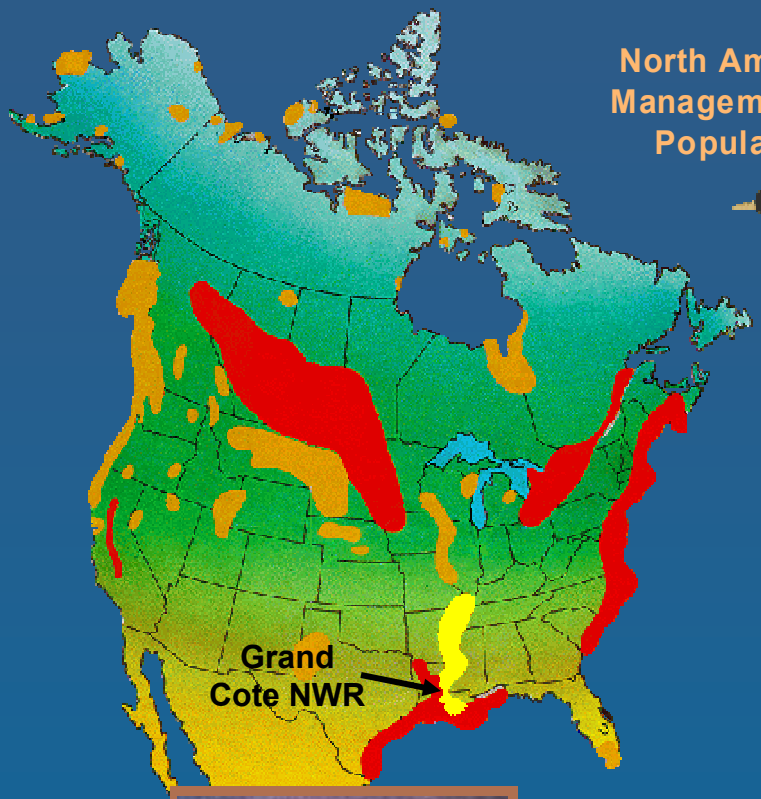
Red River WMA
Objective = 558 ac

Grassy Lake WMA
Objective = 0 ac

Three Rivers WMA
Objective = 153 ac

Pomme de Terre WMA
Objective = 2,406 ac

Conservation Programs Connected Through Ecological Pathways



North American Waterfowl Management Plan Breeding Population Objectives

Return "Our Share" of Mid-Continent Wintering Population to Breeding Grounds

Sum of Foraging Habitats Meets Needs of Wintering Duck Populations

Public Managed Lands

Private Managed Lands

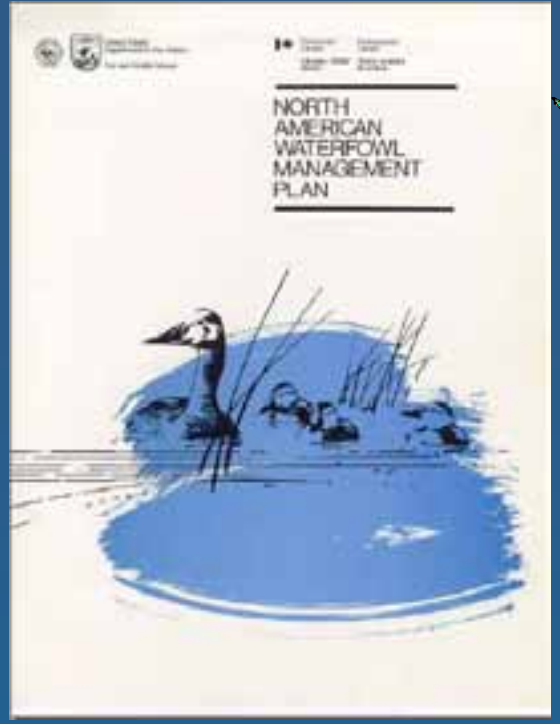
Naturally Flooded Lands

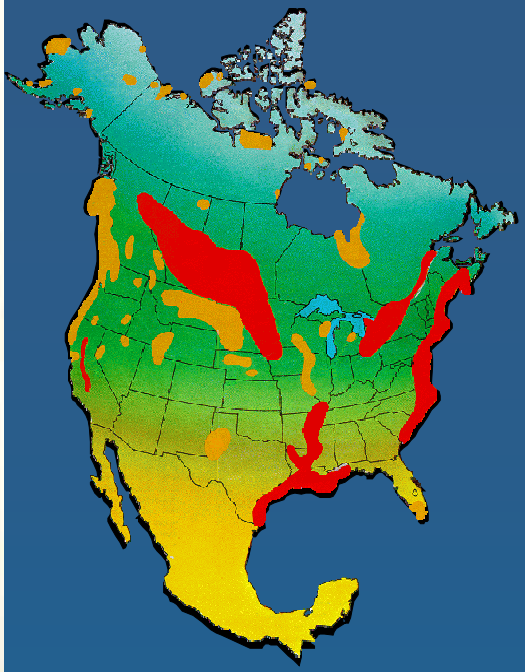
100,000 acres

121,000 acres

400,000 acres

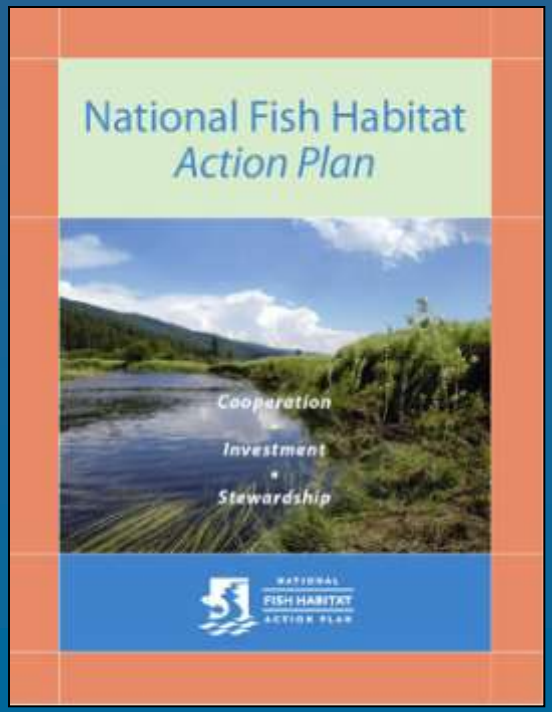
247,000 acres

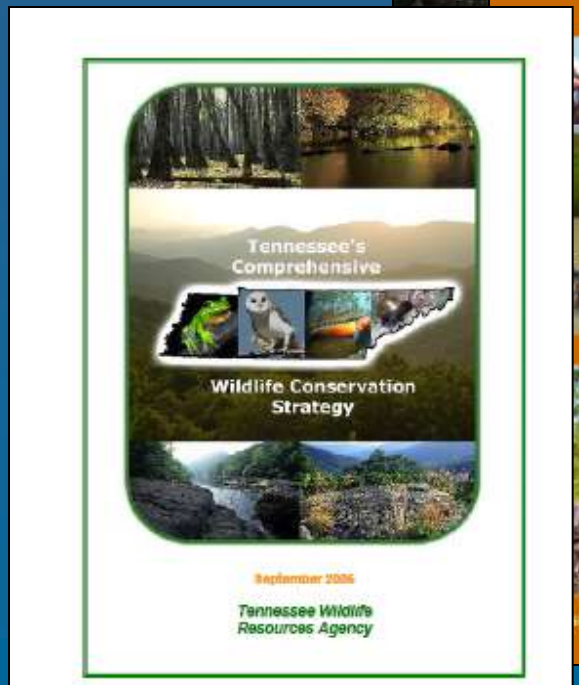

NORTH
AMERICAN
WATERFOWL
MANAGEMENT
PLAN




Arkansas Wildlife
Action Plan


Missouri Comprehensive
Wildlife Strategy
What is a wildlife action plan?
Missouri snapshot
Missouri's planning approach


National Fish Habitat
Action Plan
Cooperation
Investment
Stewardship
FISH HABITAT


Tennessee's
Comprehensive
Wildlife Conservation
Strategy
September 2006
Tennessee Wildlife
Resources Agency


LOUISIANA COMPREHENSIVE WILDLIFE
CONSERVATION STRATEGY
(WILDLIFE ACTION PLAN)
Department of Wildlife & Fisheries
December 2005

Four Trends Transforming Conservation

1) The emergence of Conservation Science as the 21st Century conservation paradigm

2) The changing conservation workforce

3) Escalating expectations regarding public sector performance

4) The increasing complexity of conservation issues

Four Trends Transforming Conservation

1) The emergence of Conservation Science as the 21st Century conservation paradigm

2) The changing conservation workforce
   - ✓ Educated and trained in systems thinking
   - ✓ Socially conditioned to networking
   - ✓ “Knowledge workers” uncomfortable in hierarchical, vertically integrated organizational structures.

Four Trends Transforming Conservation

1) The emergence of Conservation Science as the 21st Century conservation paradigm

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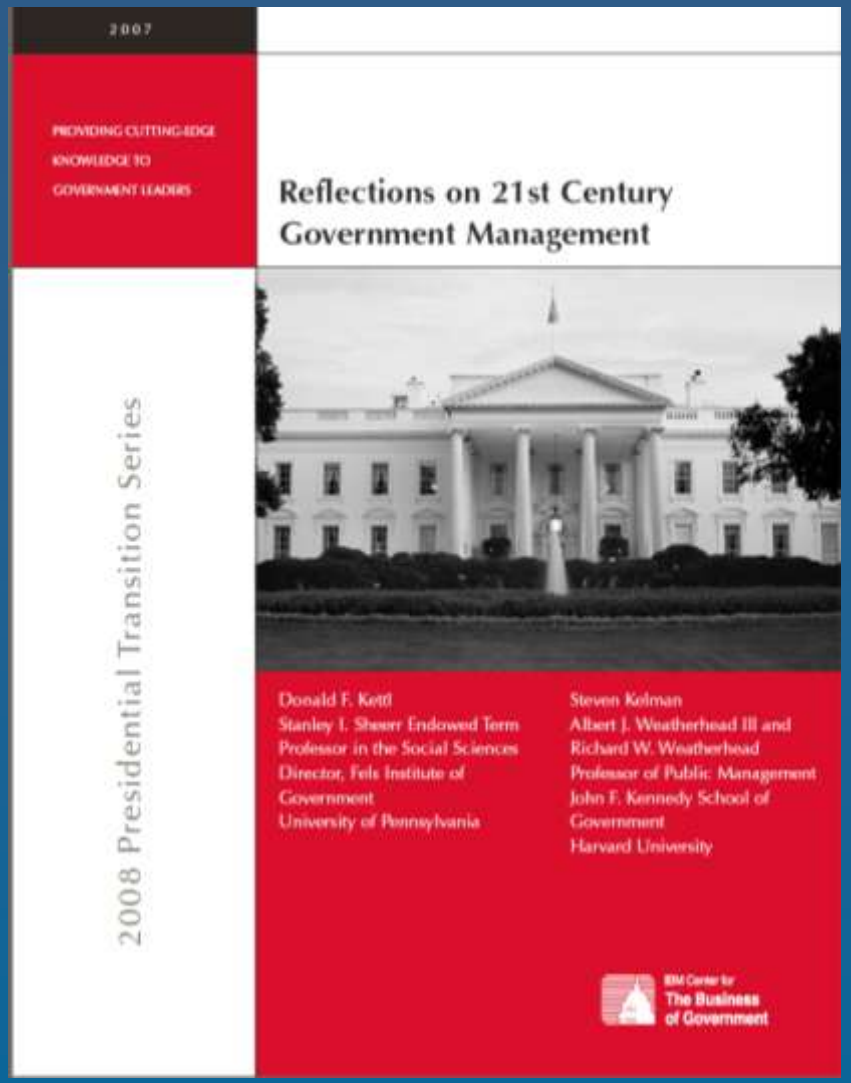
A Problem Statement re: Government Performance

"The current conduct of American government is a poor match for the problems it must solve…"

"American governments increasingly face problems that pay little attention to the boundaries created to manage them…"

"If government is to serve the needs of its citizens in the 21st century, it must reconfigure itself – to shift the boundaries of who does what and, even more important, how its work gets done."



A paraphrase…

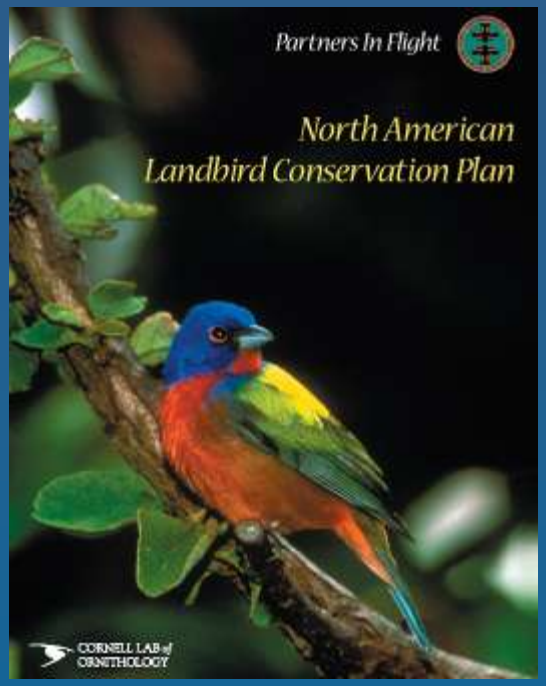
The conservation business models of most wildlife agencies and organizations are a poor match for the problems confronting 21st Century wildlife conservation.

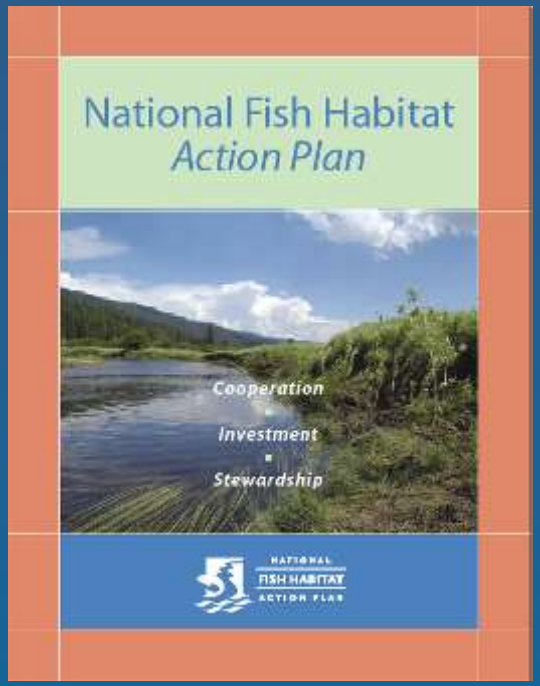
Increasingly, those problems transcend the boundaries of individual programs, agencies, and organizations and challenge traditional ways of thinking and doing.

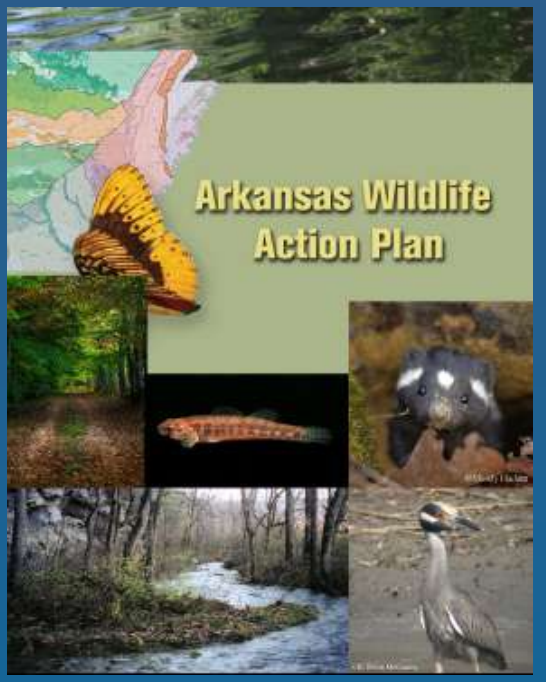
If 21st Century challenges are to be met, transformational change will be needed in how wildlife agencies and organizations work, individually and collectively.

A Discipline-Specific Emphasis On Performance and Accountability

Socio-Ecological Accountability







- Outcome based goals and objectives that exceed the singular grasp of any one organization.
- Measurable change at landscape scales.
- Collaborative strategies, interagency collaboration

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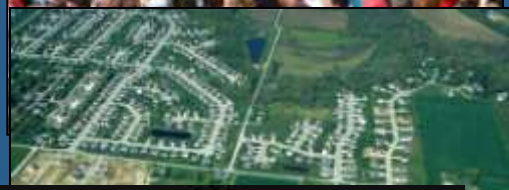

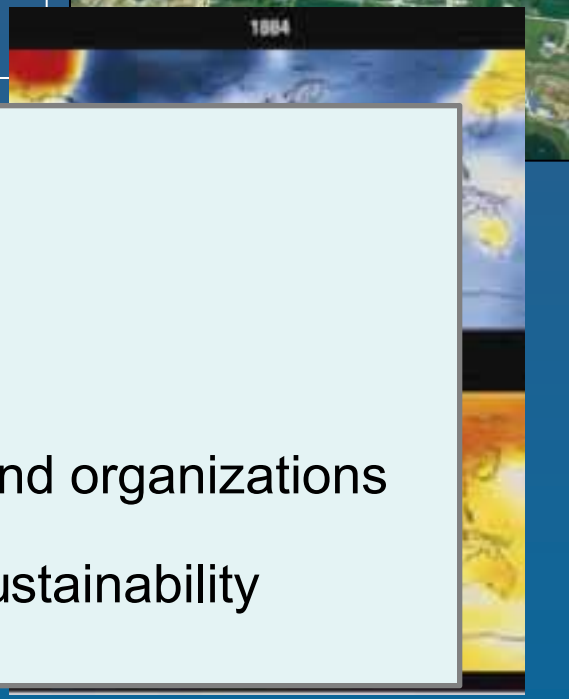

Year: 2042
– Global Population ~9 Billion People –
habitat fragmentation, contamination, pollution, invasive species, disease, threats to water quality and quantity…

21st Century conservation issues…

- Inter-disciplinary in nature
- Multi-scaled in scope
- Span the jurisdictions of multiple agencies and organizations
- Intertwined with issues of socio-economic sustainability

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Implications?

Conservation in Transition

Implications to Wildlife Agencies and Organizations

The 21st Century wildlife agency will need…

- A capacity for conservation that extends beyond the operational footprint of its programs – the capacity to characterize, assess, and predict population and habitat sustainability at landscape scales.
  - Problems transcend the boundaries of individual programs.
  - Goals and objectives defined at landscape scales exceed the operational reach of individual programs.
  - Solutions extend beyond the operational footprint of individual programs, agencies, and organizations.

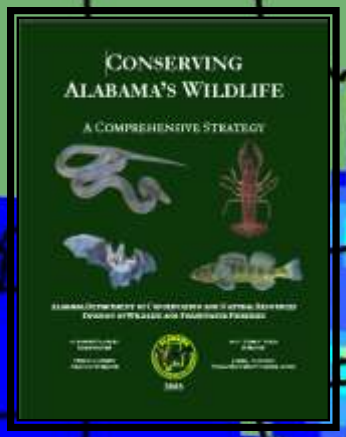
Swainson's Warbler

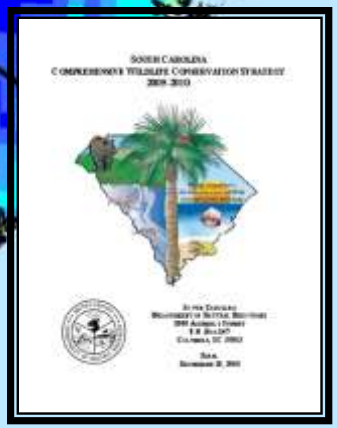
Swainson's Warbler

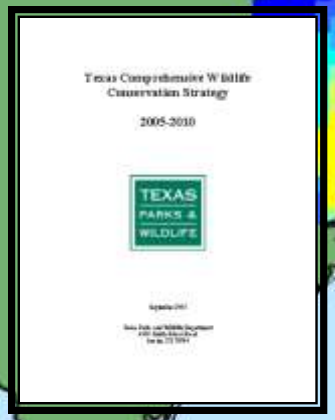
Swainson's Warbler

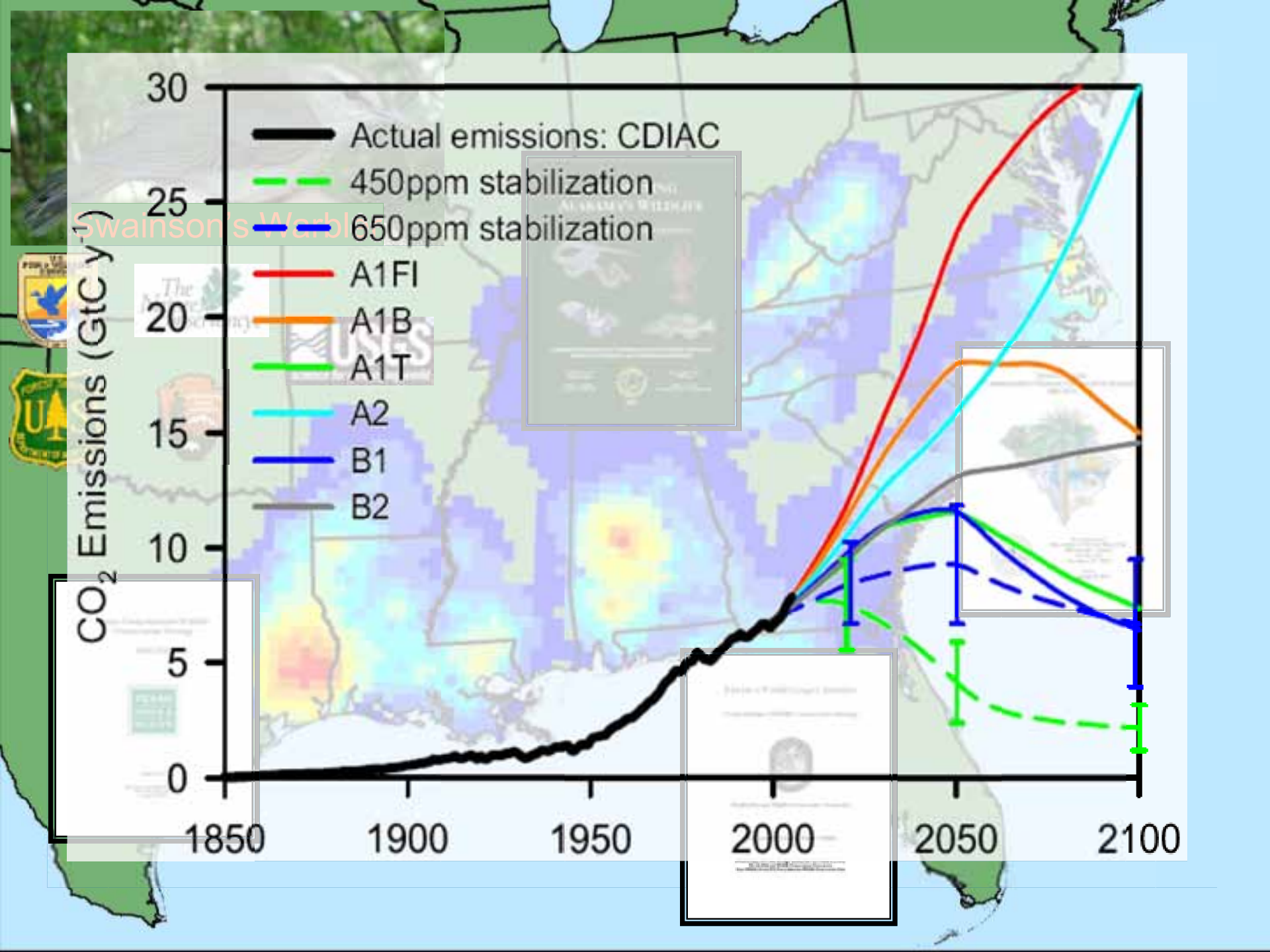
The Nature Conservancy

USGS
science for a changing world








30
25
20
15
10
5
0
1850
1900
1950
2000
2050
2100
CO_2 Emissions (GtC y^{-1})
Actual emissions: CDIAC
450ppm stabilization
650ppm stabilization
A1FI
A1B
A1T
A2
B1
B2

Conservation in Transition

Implications to Wildlife Agencies and Organizations

The 21st Century wildlife agency will need…

- A capacity for conservation that extends beyond the operational footprint of its programs – the capacity to characterize, assess, and predict population and habitat sustainability at landscape scales.
- New organizational core competencies[1] in landscape assessment.
  - Assessing and predicting sustainability at the landscape scale
  - Spatially depicting goals and objectives that reflect measurable biological outcomes
  - Assessing and characterizing the environmental sensitivity of landscapes to species and populations

[1] Prahalad, C.K. and Gary Hamel. The Core Competence of the Corporation. Harvard Business Review. May-June 1990

Conservation in Transition

Implications to Wildlife Agencies and Organizations

The 21st Century wildlife agency will need…

- A capacity for conservation that extends beyond the operational footprint of its programs – the capacity to characterize, assess, and predict population and habitat sustainability at landscape scales.
- New organizational core competencies in landscape assessment
- An approach to partnering that enables a region's private, state, federal conservation infrastructure to operate as a networked, leveraged system.

A Way-of-Working Challenge

Conservation in Transition

Implications to Wildlife Agencies and Organizations

The 21st Century wildlife agency will need…

- A capacity for conservation that extends beyond the operational footprint of its programs – the capacity to characterize, assess, and predict population and habitat sustainability at landscape scales.
- New organizational core competencies in landscape assessment
- An approach to partnering that enables a region's private, state, federal conservation infrastructure to operate as a networked, leveraged system.
- To assume a role in the Public Square that extends beyond the operational footprint of its programs.
  - Make available transparent, science-based assessments of population and habitat sustainability
  - Engage the citizenry in the search for socially viable solutions

A Way-of-Working Challenge

- Designing An Ecologically Sustainable Landscape

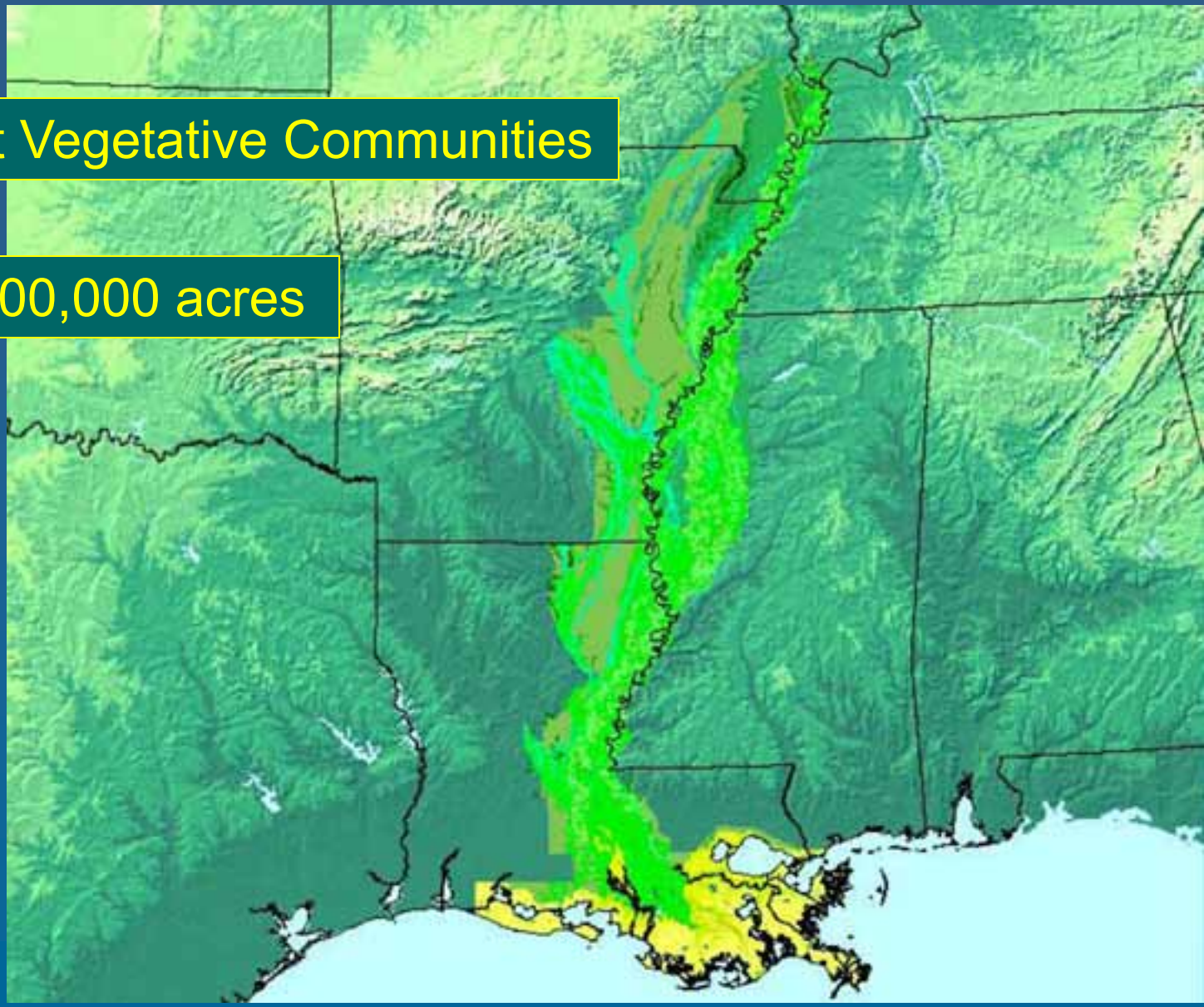
- Toward An Ecological View of Organizational Relationships

Mississippi Alluvial Valley – Designing the Landscape

“The Nation’s Floodplain” – A Dynamic Ecological System

Pre-Settlement Vegetative Communities

24,000,000 acres



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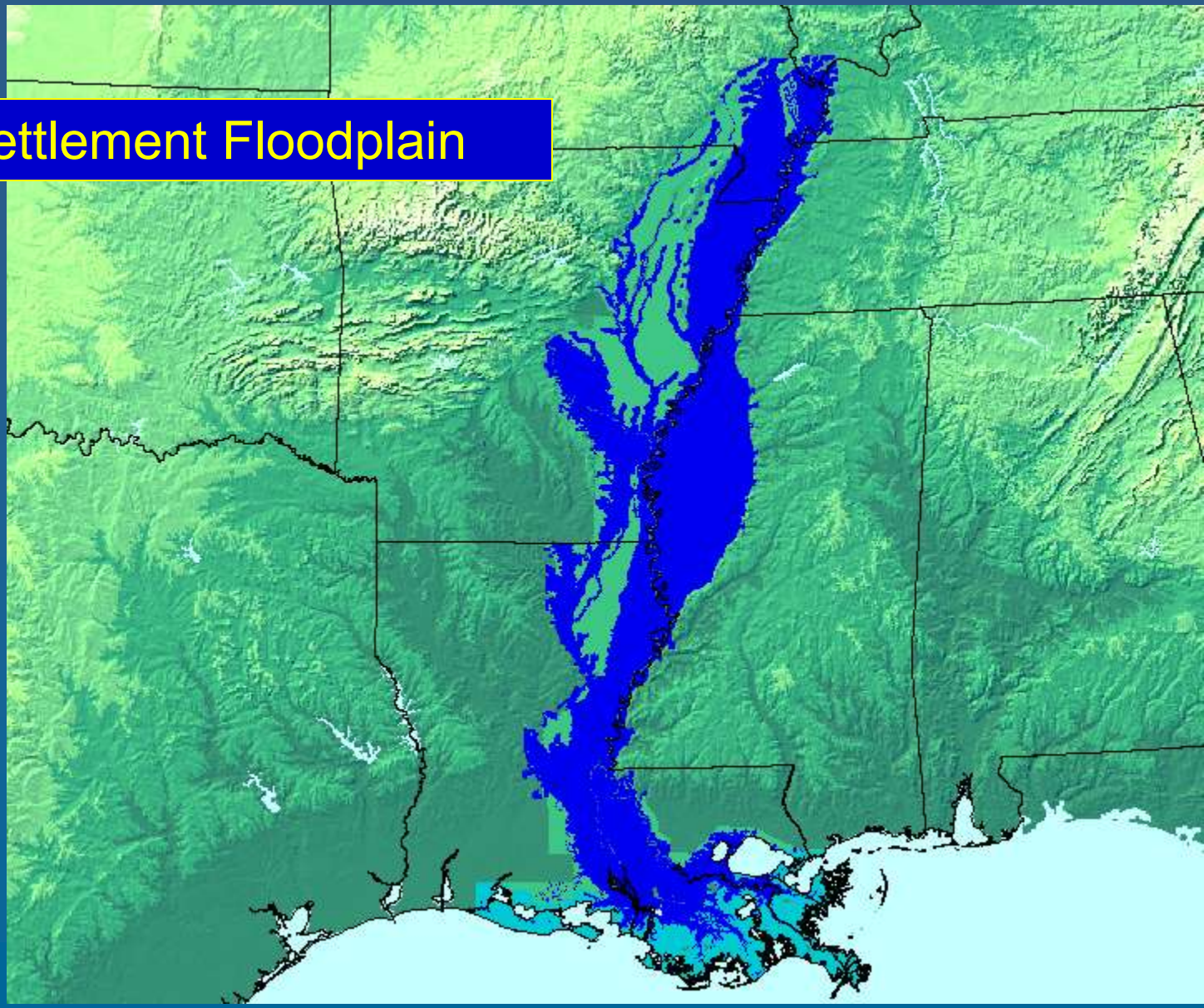
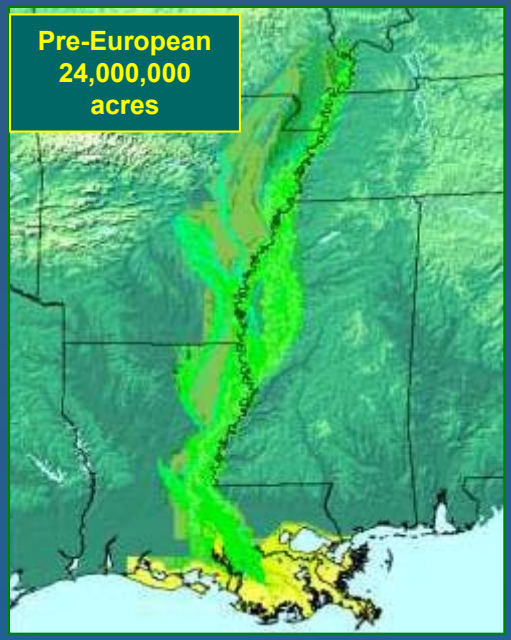
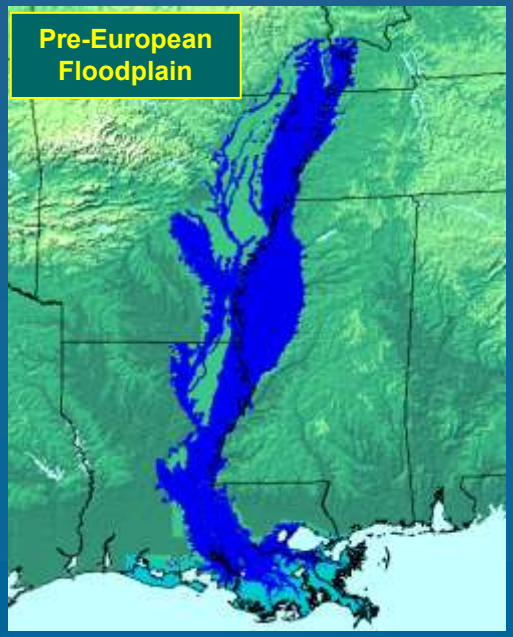
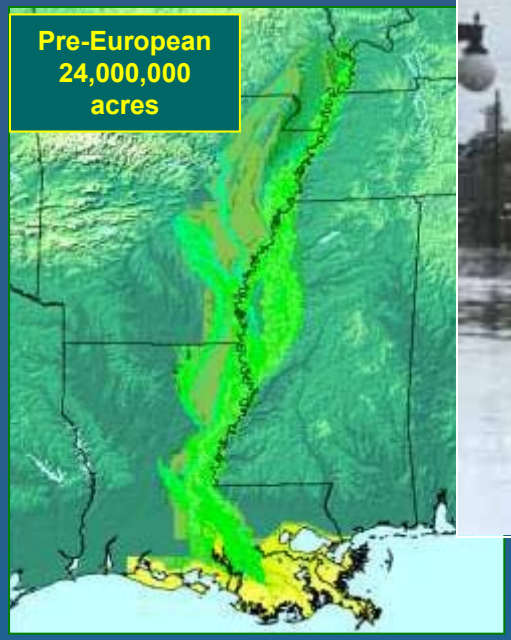


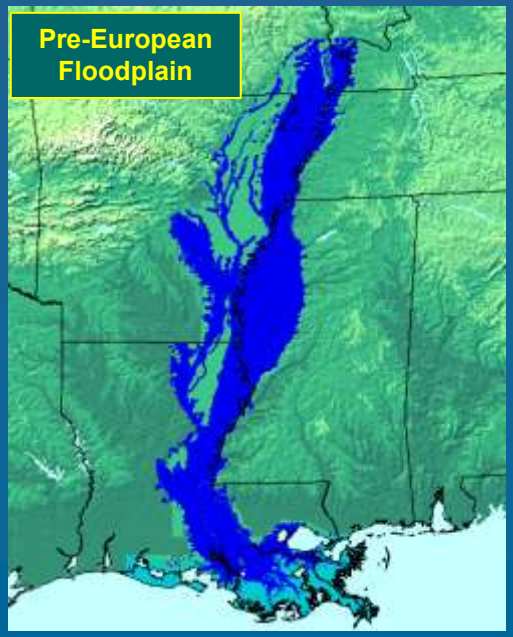
Mississippi Alluvial Valley – Designing the Landscape





Mississippi Alluvial Valley – Designing the Landscape





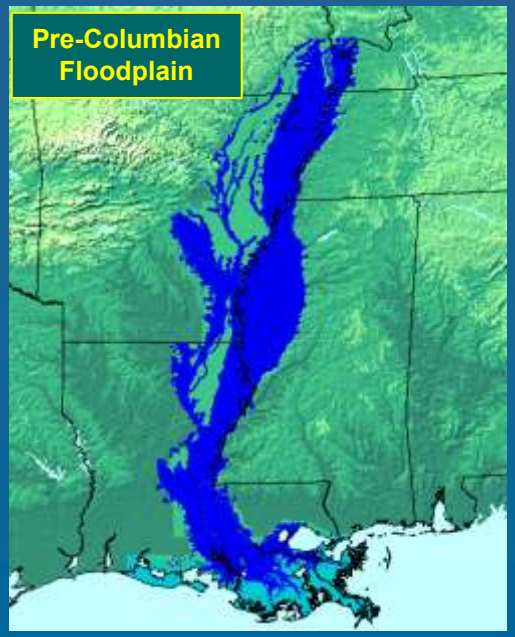
Mississippi Alluvial Valley – Designing the Landscape

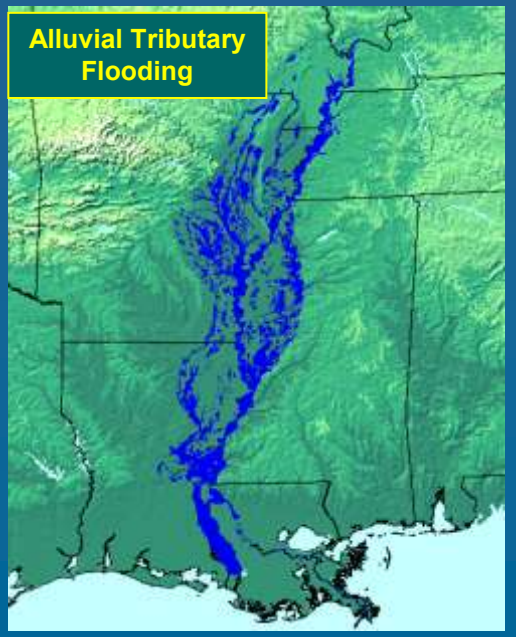
Levee Construction

Channel Realignment

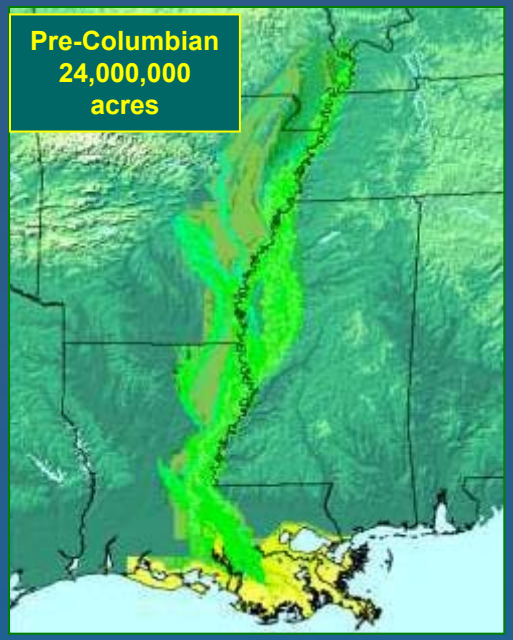
Channel Revetments

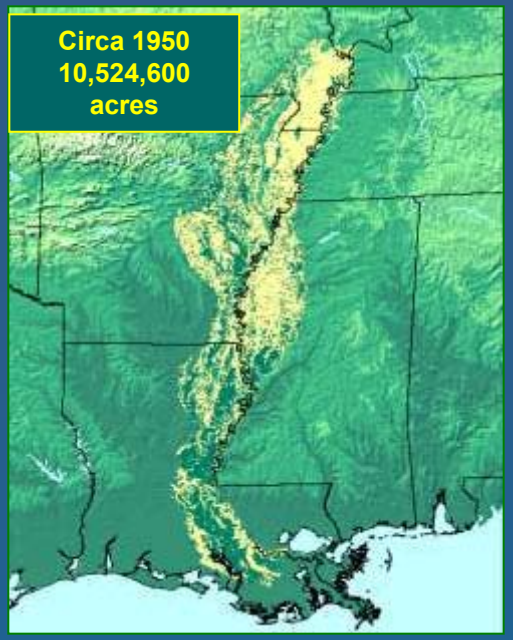
Bank Stabilization

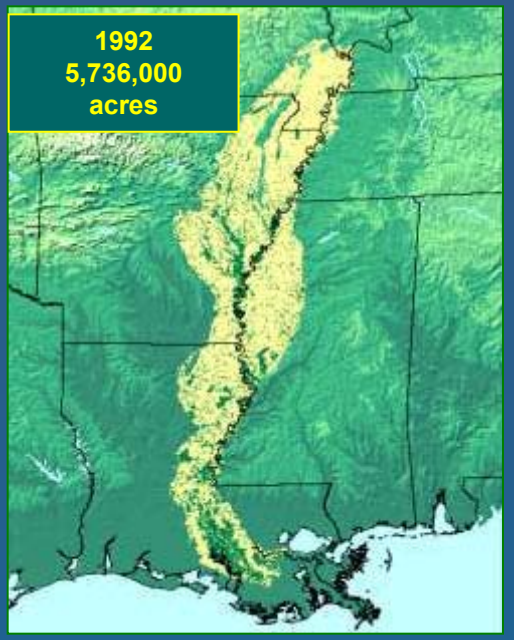


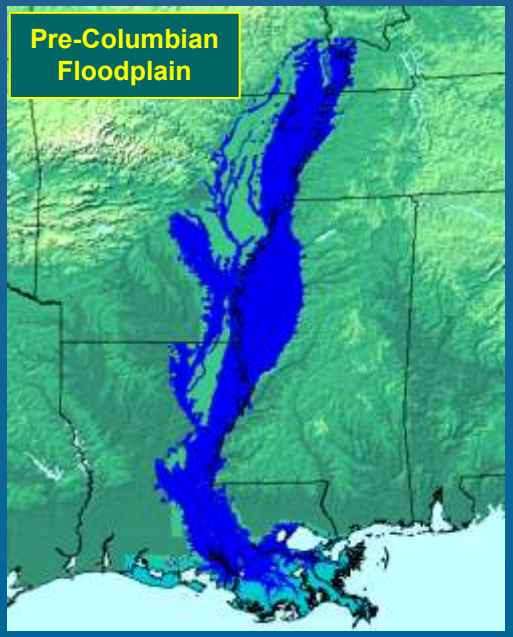


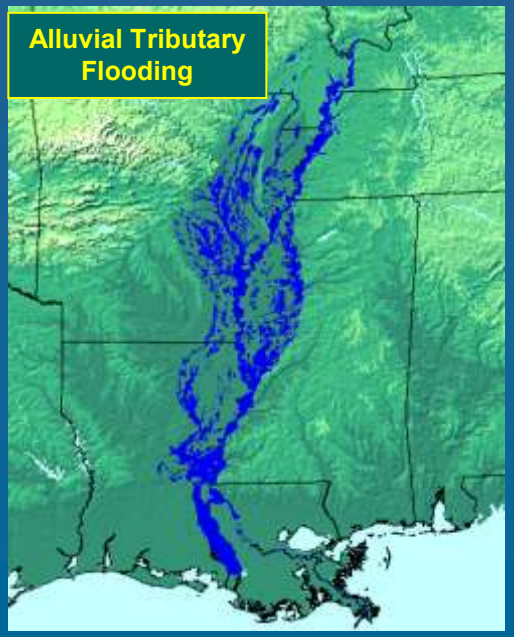
Mississippi Alluvial Valley – Designing the Landscape



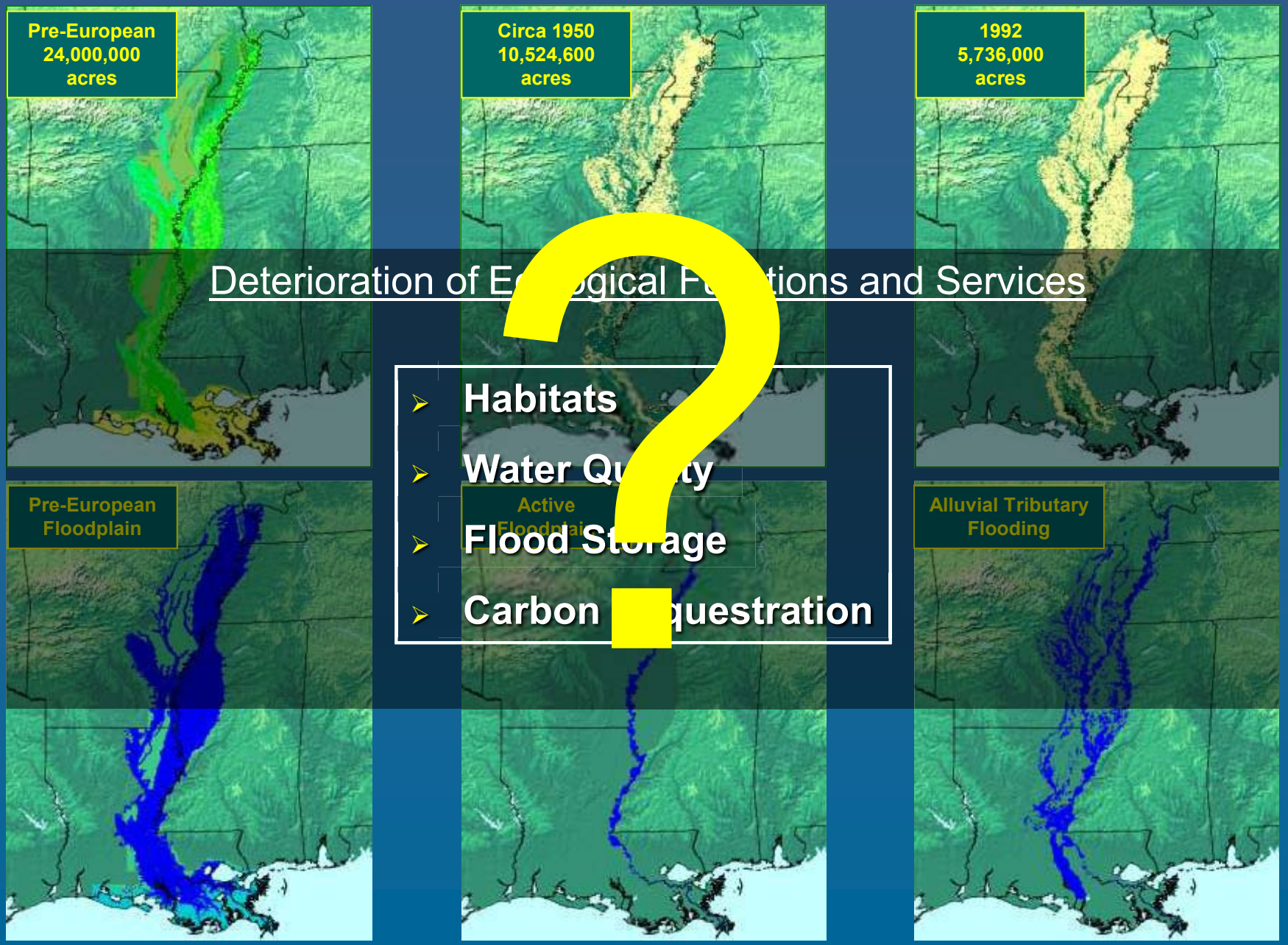








Mississippi Alluvial Valley – Designing the Landscape



Mississippi Alluvial Valley – Designing the Landscape

Biological Planning and Conservation Design


North American Landbird Plan


North American Waterbird Plan


U.S. Shorebird Conservation Plan


North American Waterfowl Management Plan


Northern Bobwhite Quail Conservation Initiative

Landscapes capable of sustaining bird populations ecoregionally

On-the-ground conservation actions

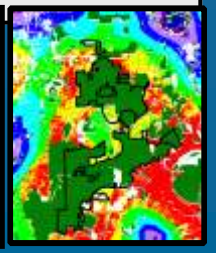
Swainson's Warbler
Prothonotary Warbler
Hooded Warbler
Wood Thrush
Acadian Flycatcher

Patch Size Model: $A = (N * D) + B$

A = Area of forest required to support a source population
N = Desired number of breeding pairs
D = Density of breeding birds (pairs / area)
B = Area of a 1-km wide forested buffer around the core (N*D)

Source Population Objectives

State	10K	20K	100K
Arkansas	9	11	3
Illinois	0	1	0
Kentucky	2	1	0
Louisiana	19	15	7
Mississippi	14	6	2
Missouri	6	1	0
Tennessee	1	1	1
Totals	51	36	13



Species' range-wide population objectives.

Mississippi Alluvial Valley – ~~Designing~~ the Landscape
Redesigning

2000

A Vision of An Ecologically Sustainable Landscape

2050

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Prothonotary Warbler
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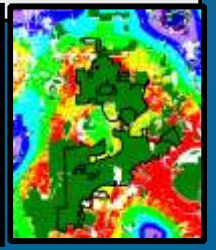
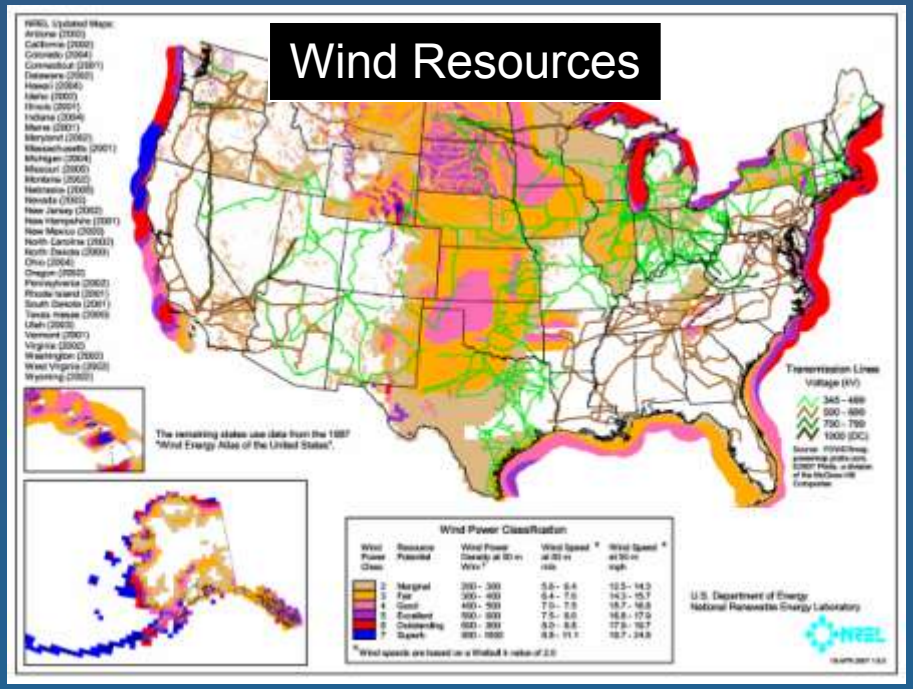
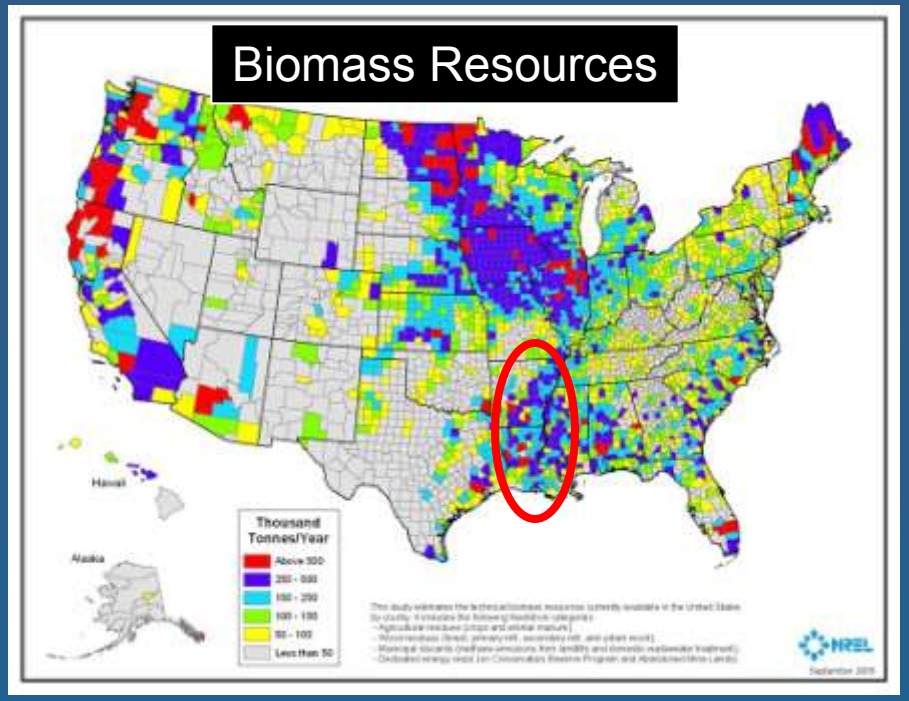


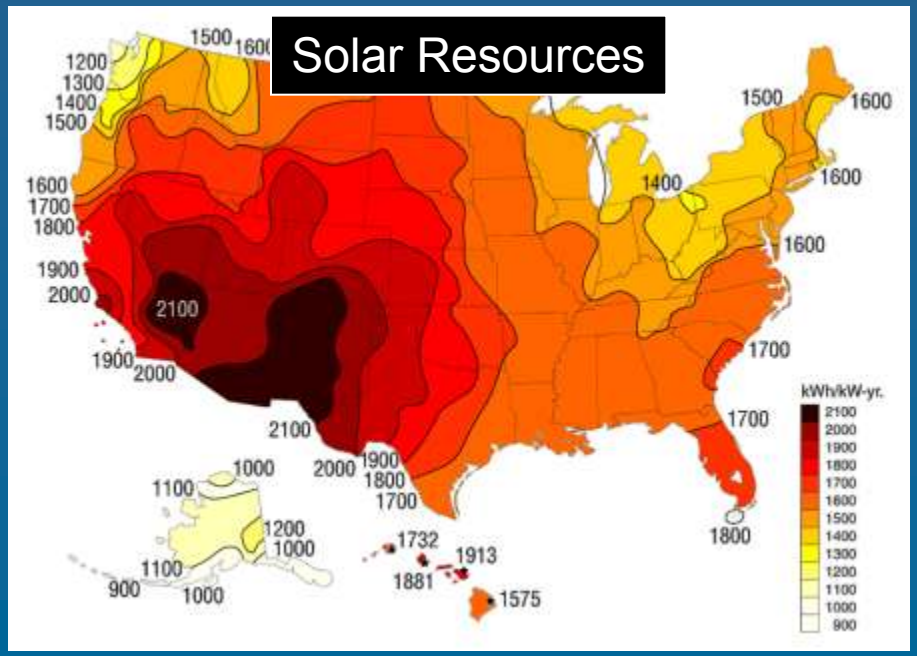
Wind Resources



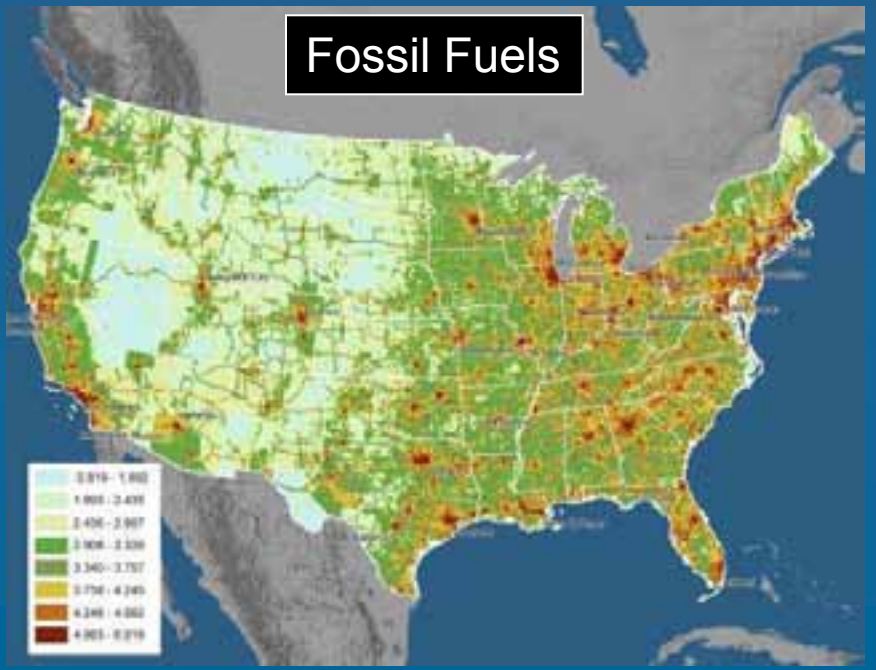
Biomass Resources



Solar Resources



Fossil Fuels



Mississippi Alluvial Valley – ~~Designing~~ the Landscape Redesigning

2000

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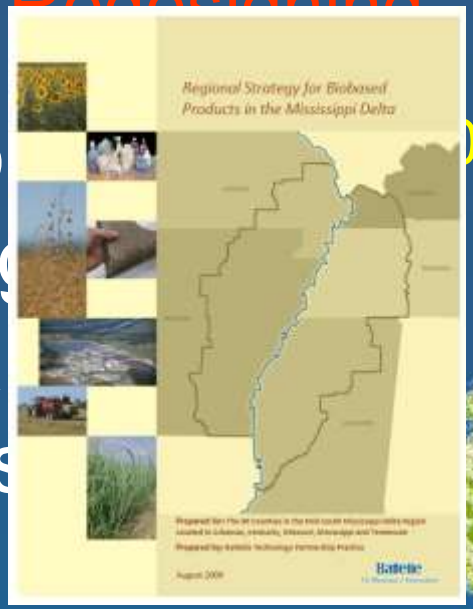

050

Swainson's Warbler
Prothonotary Warbler
Hooded Warbler
Acadian Flycatcher

Patch Size Model: A = (N * D) / B
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core (N*D)

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- **Collectively the five states can secure a key leadership role in the emerging multi-billion global bioeconomy by leveraging their assets and attracting technology partners from outside the region.**
- **Sustainably grown and harvested biomass in the 98 county region can adequately supply an $8 billion biofuels and biobased products industry without affecting the food and feed supply chain.**
- **The bioeconomy will open up markets for new crops… Increase biodiversity and wildlife**

A Way-of-Working Challenge

- Designing An Ecologically Sustainable Landscape

- Toward An Ecological View of Organizational Relationships

Sustaining ecological systems, processes, and functions.

Building Conservation Partner Ecosystems
An Ecological View of Organizational Relationships

- Work as a System – a region's private, state, federal conservation infrastructure will need to interact as a system if measurable outcomes are to be achieved at landscape scales.

- Recognize our functional interdependence – Partners are mutually dependent in accomplishing outcomes at landscape scales.

- Strive for functional connectivity – leveraged capacity for biological assessment, conservation design, conservation delivery, monitoring, and research built on the principle of horizontal integration.

- Niche recognition and support – the performance and accountability of our partners will often relate to their ability to access, use, and leverage our assets and vice versa.

- System sustainability – organizations strive to leverage assets in a way that sustains the health of their conservation partner ecosystem.

"The conservation challenges of the 21st Century represent a force of change more far-reaching and consequential than any previously encountered."

- Conservation In Transition
- A Way-of-Working Challenge
- Coming to "Terms"

- "21st Century resource challenges are formidable and complex…Yet the most fundamental challenge facing the wildlife community is not a resource challenge at all; it's A Way-of-Working Challenge"

Coming To “Terms”

Strategic Habitat Conservation

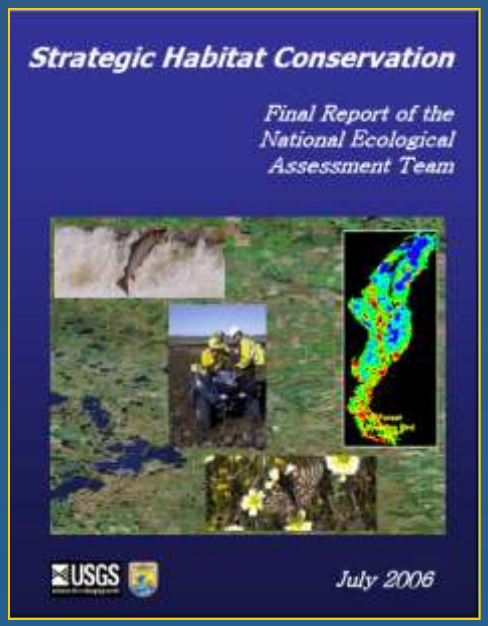
SHC Framework (Adaptive Management Cycle)

Landscape Conservation

Landscape Conservation Cooperative

Climate Change

Adaptation Strategy



Strategic Habitat Conservation

…a conservation approach that seeks to define, design, and deliver landscapes that support and sustain socio-viable populations of fish and wildlife and the ecological processes on which they depend.

Requisites:

Science

As A Body of Knowledge

As A Method of Discovery

Iterative Process – Adaptive Management Framework: Learning from Successes and Failures

Scalability

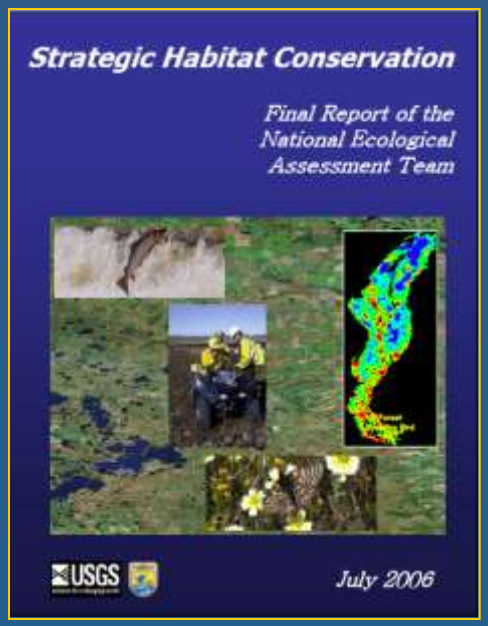
Management Occurs At The Site Scale Yet Population Sustainability Is System Dependent, Operating On Outcomes Manifested Across Scales.

A Forecast of Alternative Futures Will Help Guide Implementation Decisions Today

Interdependence

Goals And Objectives Of Sustainable Landscapes Exceed The Operational Reach Of Individual Programs, Agencies, And Organizations.

Problems And Solutions Transcend The Boundaries Of Individual Programs, Agencies, And Organizations.



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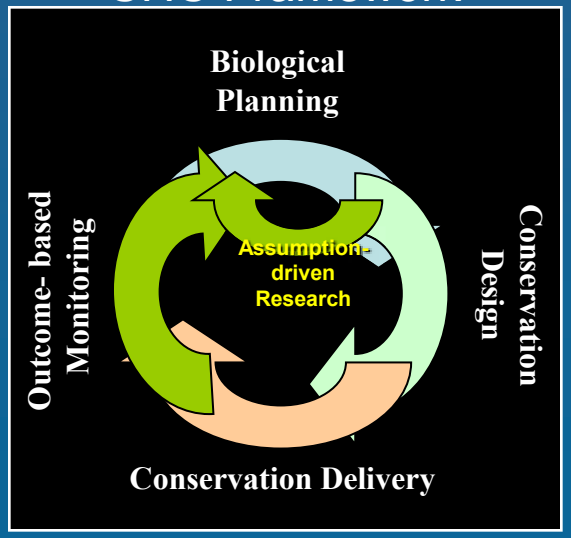

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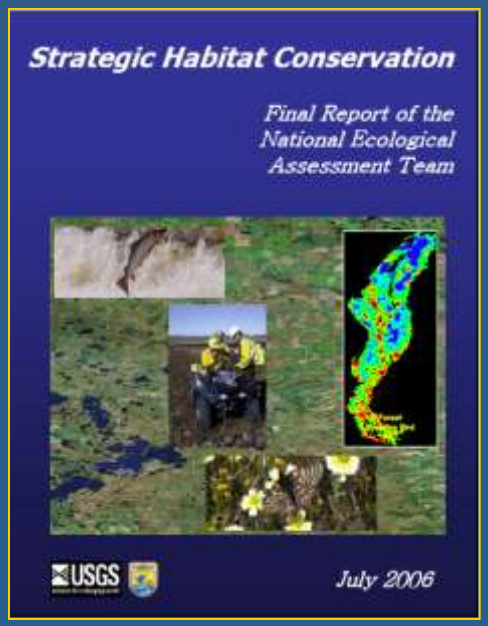

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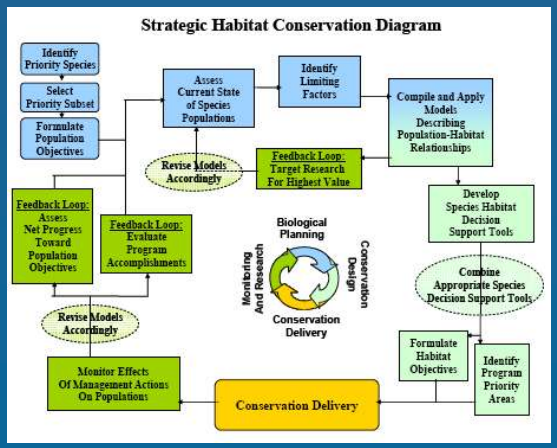

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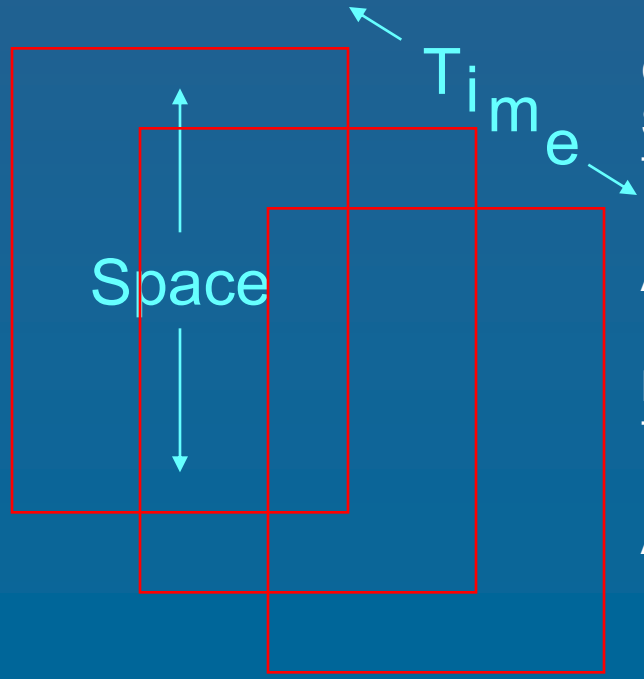

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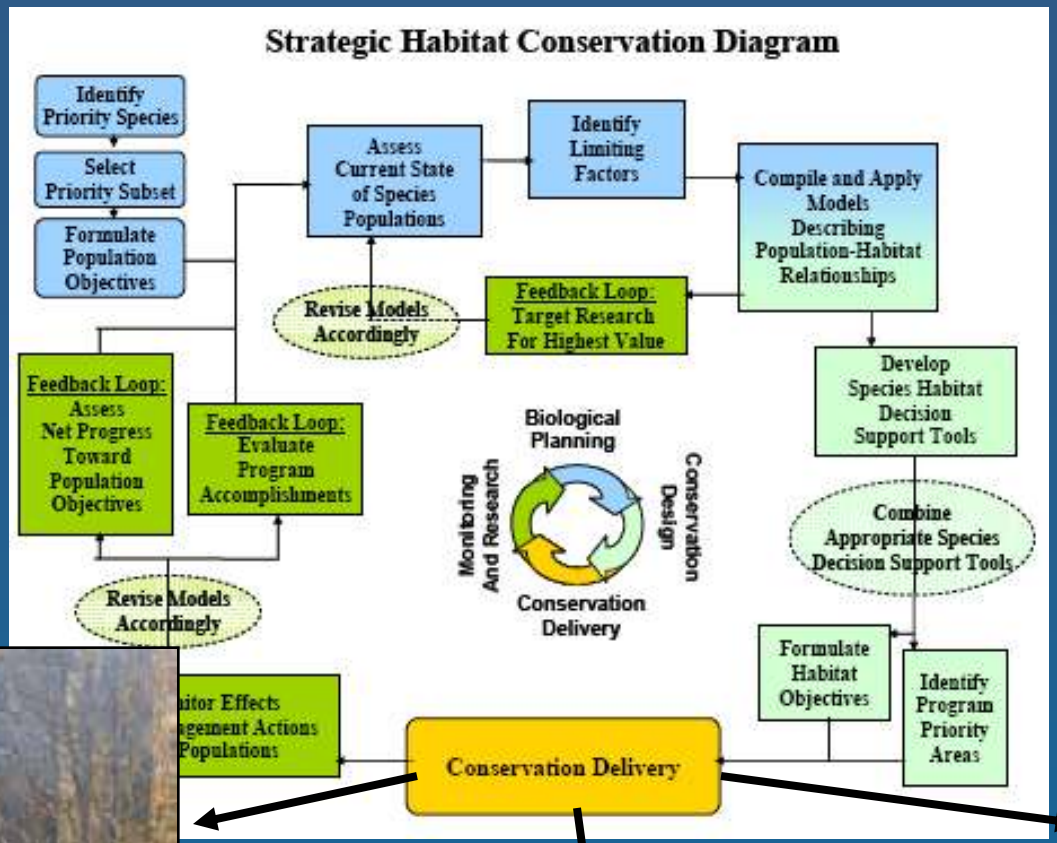
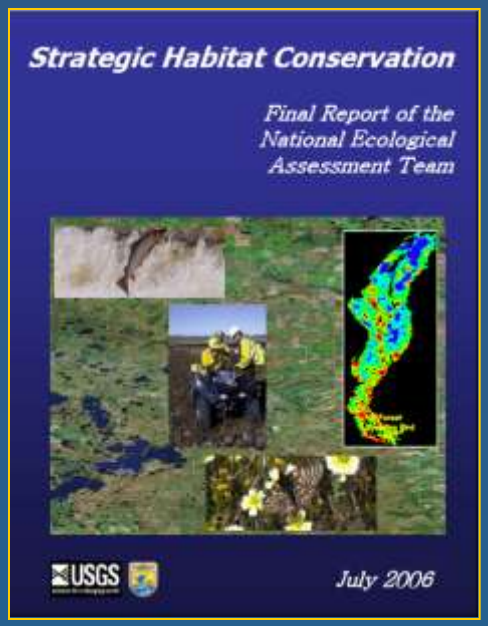


Protection, Restoration, Management

Communication and Education

Regulation and Policies



Landscape Strategic Conservation

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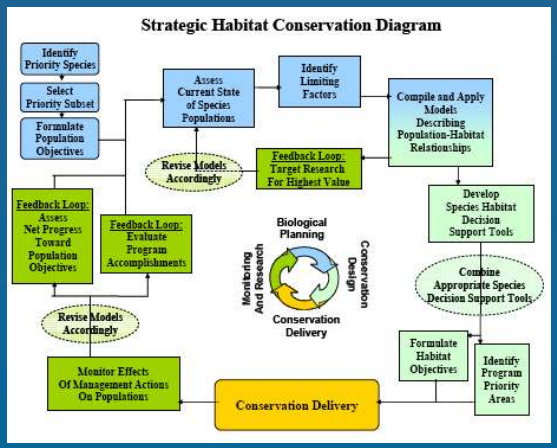

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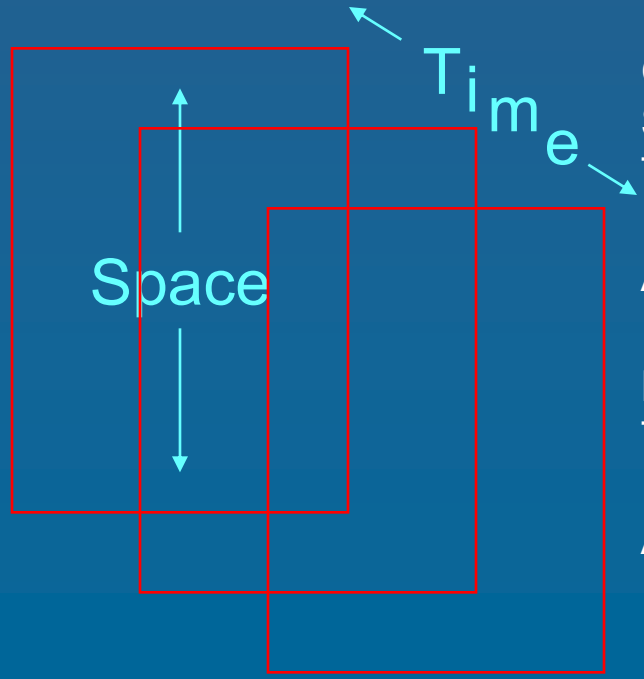

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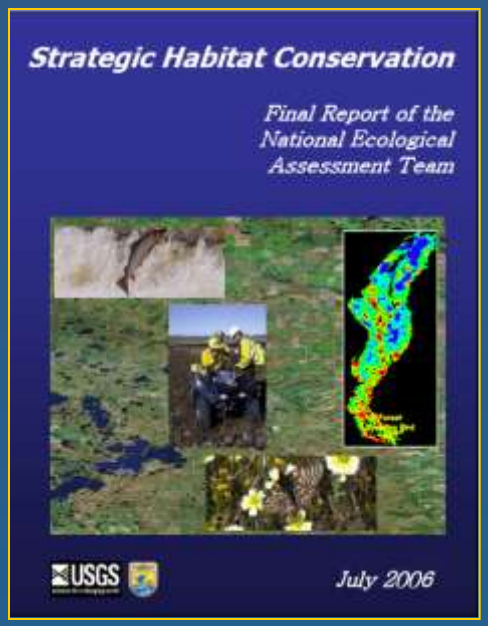

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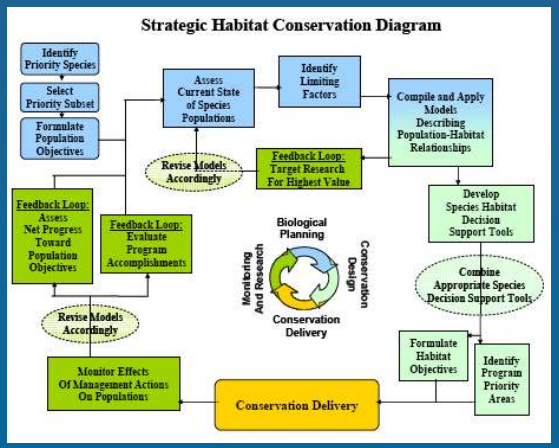

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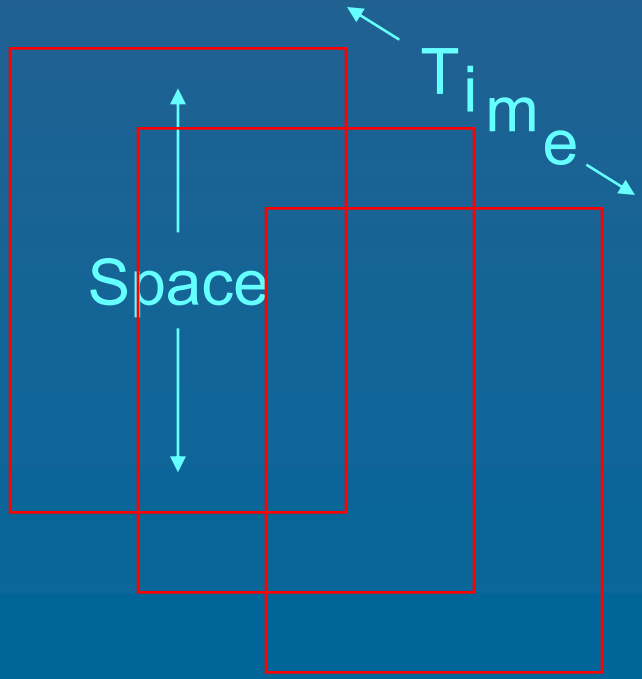
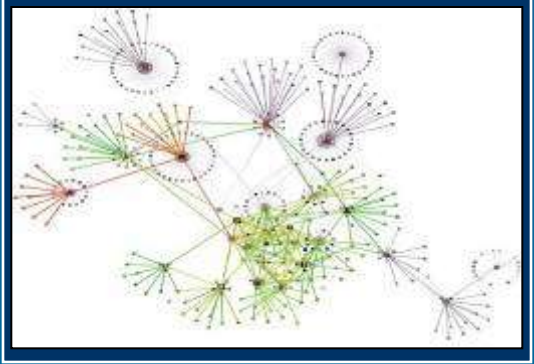
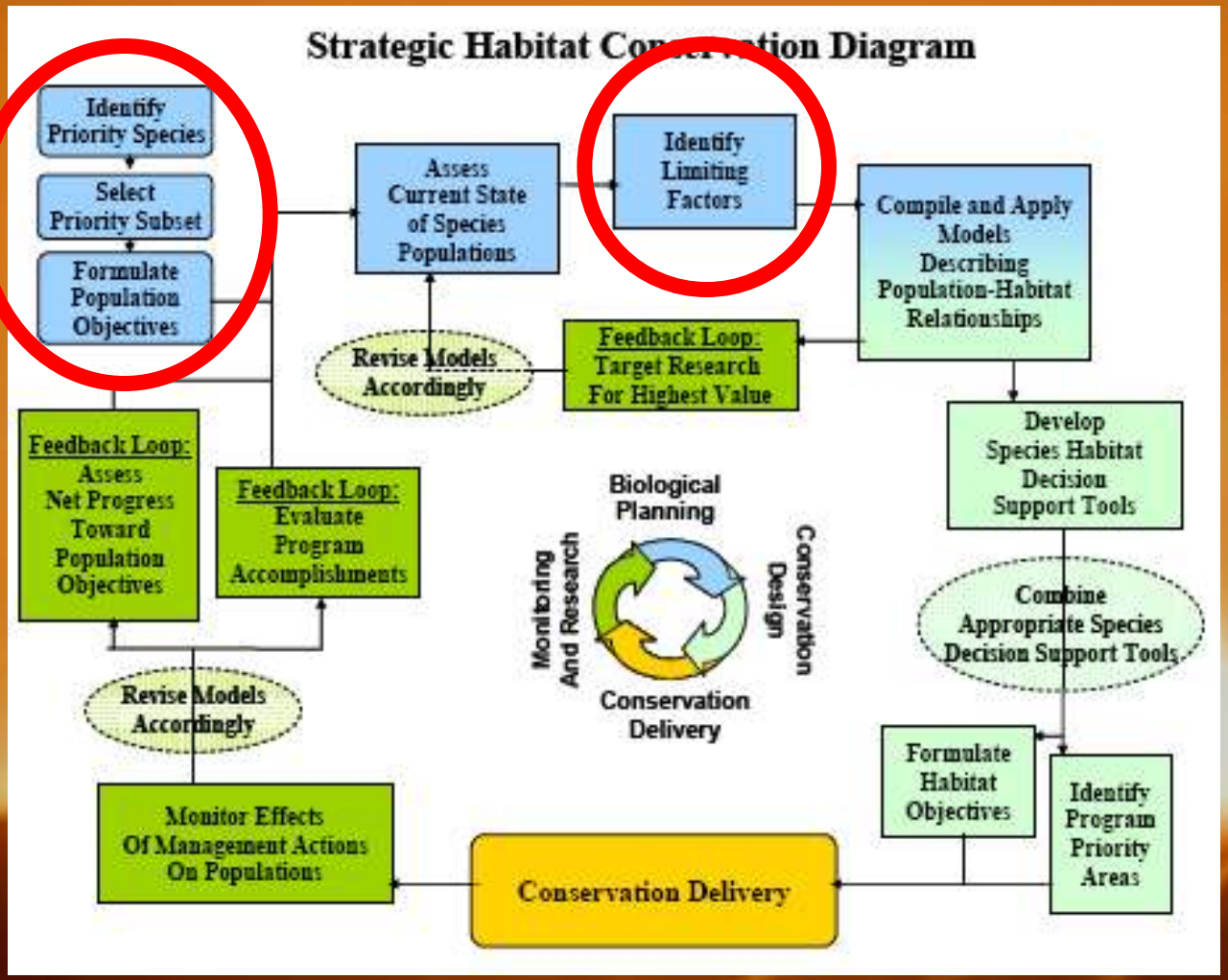


Interdependence

Landscape Conservation Cooperative (Conservation–Science Network)



Climate Change Adaptation Strategy



Climate change adaptation for natural systems is a ***management strategy*** that involves identifying, preparing for, and responding to expected climate changes in order to promote ecological resilience, maintain ecological function, and provide the necessary elements to support and sustain fish and wildlife resources.

Mississippi Alluvial Valley – ~~Designing~~ the Landscape
Redesigning

2000

A Vision of An Ecologically Sustainable Landscape

2050

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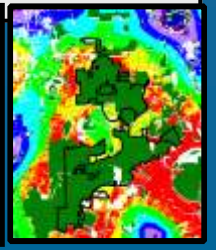

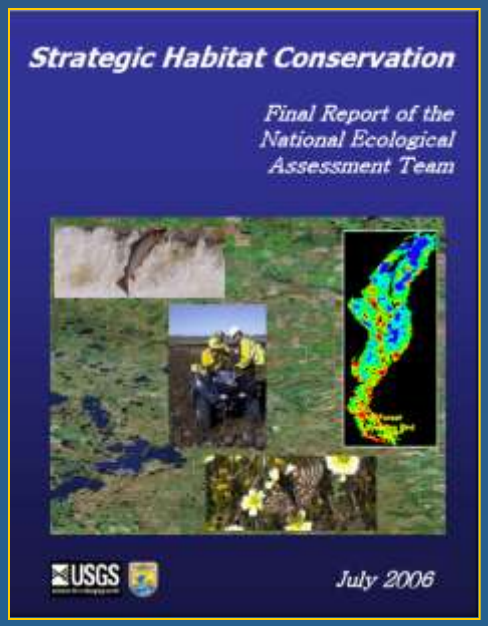

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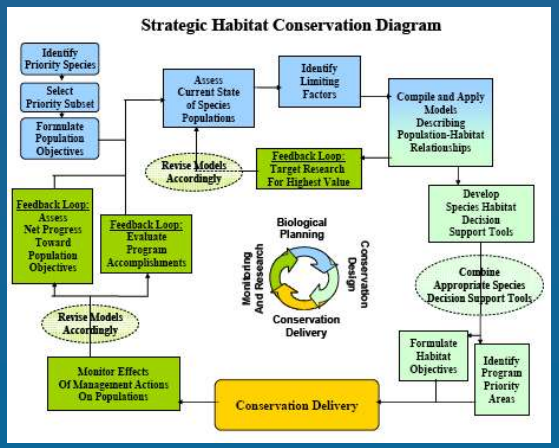

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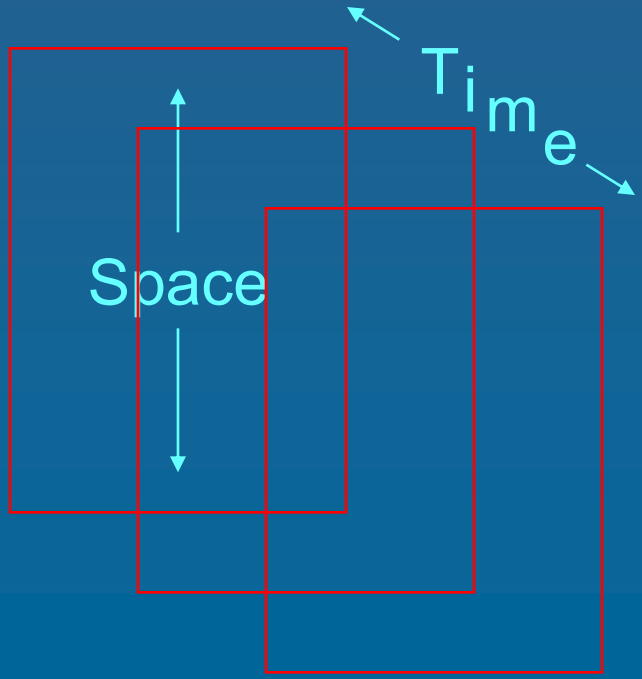

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