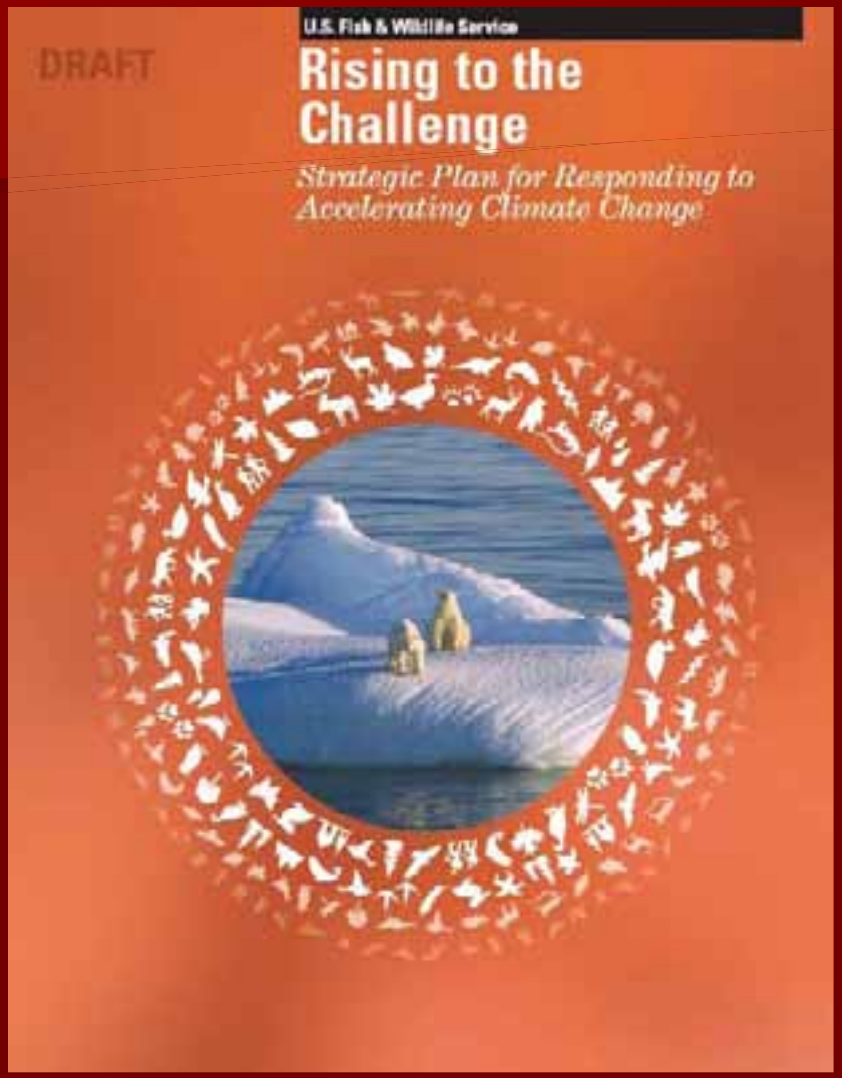
The Climate Change Connection: What's Been Done and What's Our Vision for the Future

"The supreme reality of our time is…the vulnerability of our planet."
-- John F. Kennedy, 35th President of the United States, 1963 --

FWS Climate Change Strategic Plan



- Public Review – ended Nov 18
- Process for compiling comments under development

Climate Change Strategies

- Fish and Wildlife Adaptation: "*adjustment in natural or human systems in response to actual or expected climatic stimuli or effects*"

- 3 Goals:
  - biological planning
  - conservation action
  - monitoring and research

Climate Change Strategies

- Mitigation:

"*human intervention to reduce the sources or enhance sinks of greenhouse gases*"

- 2 Goals:
  - Carbon neutrality
  - Carbon sequestration

Climate Change Strategies

- Engagement

- 1 goal: communication internal and external to better build partnerships and inform people

Climate Change 5-Year Action Plan

- Action Items identified for Strategies and Goals
- Regional Directorate leads identified for Actions Items
- Time lines and priorities identified for some Action Items
- Directorate is currently considering FY10-11 action items and funding priorities based on Regional input

SE Climate Team Agenda:
Addressing the Action Items

Relative to Engagement:

- Training : NCTC on-site and webinars
- Communications (internal and external) : websites, fact sheets, publications, meetings, outreach on non-traditional formats
- Legislative affairs : Congressional outreach, requested input on legislation (national, regional, and local)
- Partnership development and relationship building (national, regional, and local)

SE Climate Team Agenda:

Addressing the Action Items

Relative to Mitigation: "reduce the sources or enhance sinks of greenhouse gases"

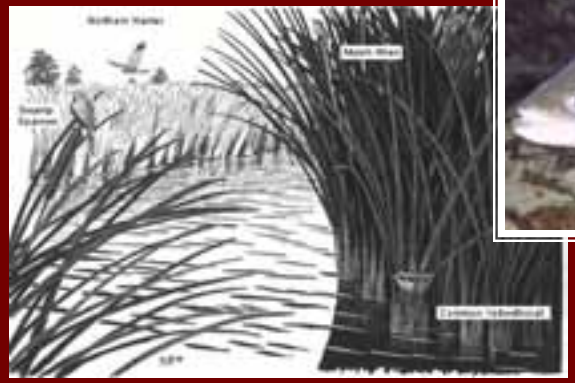
- Offsetting our carbon footprint
  - Fleet and Buildings (DOI Directive 8/2009)
- Carbon Sequestration
  - Using carbon sequestration opportunity as a habitat restoration tool
  - Region 4 National Lead: LOTS GOING ON!!

SE Climate Team Agenda:
Addressing the Action Items

- Relative to Fish and Wildlife Adaptation:
  - Species vulnerability assessments and management issues (adaptation scenarios)
  - Eastern Water Group to assess FWS freshwater priority needs for NWR and Hatcheries
  - GIS work – SLAMM, barrier islands, forest change
  - Biofuels , Alternative Energy production issues
  - Incorporation of climate change language to FWS documents and plans
  - Landscape Conservation Cooperatives (LCCs) and integration with SHC and ongoing Partnerships
  - Regional Climate Science Partnerships (DOI)

Discussion Examples

- Eastern Water Team: addressing climate related needs of our trust lands.
- Species Vulnerability Assessments: assessing climate impacts to our trust species.



Eastern Water Team

- The NWRS Chief, AD-FHC, and RD-6 and RD4 will: (a) convene eastern and western, intra-agency workgroups to assess FWS needs relative to water issues and climate change; and (b) identify 2 Refuges and 1 Hatchery where water quality or quantity is a key climate vulnerability and **recommend funding redirections** to address those needs and, thereby, provide explicit examples for future needs. NWRS Chief will provide a progress summary (April 1, 2009) and a final report (September 1, 2009).

NWR and Hatchery Priority Selections

- . . .selections are made based on a ranking criteria and scoring methodology developed by the Eastern Workgroup.

- The ranking criteria are a series of questions distributed by each Service region represented in the workgroup (Regions 3, 4, 5) to their refuge and hatchery field stations.

Agassiz NWR, Minn

- Climate change is expected to increase the importance of Agassiz NWR wetland habitats to migratory and breeding waterfowl as areas in the western and central Prairie Pothole Region experience decreased precipitation. The Refuge is currently experiencing water quality and spring flooding issues related to nearby land-use patterns and ditching. These issues will likely be exacerbated by climate change.
- The Refuge proposes to create conservation buffers along critical inflows into the Refuge to reduce flooding and improve water quality. The estimated cost is $2,750,000.

Cahaba River NWR, AL

- Climate change is likely to further exacerbate current threats from poor water quality, decreased water quantity, urban sprawl, dams, and commercial timber and mining operations.
- The Refuge proposes a phased expansion of the size of the station by 234,700 acres at an estimated cost of $508,930,000 and an annual increase of $3.3M in operations budget.

Neosho NFH, Mo

- The Hatchery is currently experiencing reduced water flow, and this reduction is expected to be exacerbated by climate change. The Hatchery has proposed to dig additional wells to augment water supply.
- The estimated cost will be $300,000, with an additional $100,000-150,000 needed in annual operations. The workgroup recommends that a hydrological study of the area be conducted to appraise the feasibility of additional wells as a solution to the Hatchery's water supply issues.

General Recommendations to Directorate

- **Water Resource Inventories and Assessments** (WRIAs) needed for baseline
- **Need to initiate/expand water quantity and quality monitoring** on Service lands, including both surface and ground water and biotic sampling
- **Climate models that are downscaled**
- **Need Basin-wide studies**

General Recommendations to Directorate (con't)

- **Identify and protect the most critical habitats and key habitats vulnerable to climate change and drought.**
- **Need to identify water-related issues on landscapes/ecosystems outside of FWS lands** vulnerable to climate change
- **Identify the role of aquatic invasive species** in climate change impacts
- **Vulnerability assessments of listed species**

Species Vulnerability Assessments

- National Team comprised of FWS species experts from all Regions
- Selected species to test various models, some species based, some habitat based, some process based:
  - NatureServe (Young)
  - EPA, USFS (Finch)
  - IUCN
  - U of Washington, U of Mass, U of Colorado
  - TNC (New Mexico)
  - others

Species Vulnerability Assessments

The **IPCC** defines vulnerability as:

"the extent to which climate change may damage or harm a system"

"depends not only on a system's sensitivity, but also on its ability to adapt to new climate conditions"

Species traits that contribute to climate change vulnerability

- Range size and relative abundance
- Vulnerable habitat (coastal zone, mountain top)
- Dispersal ability
- Migration status and phenology considerations
- Niche Specialization
- Many more…

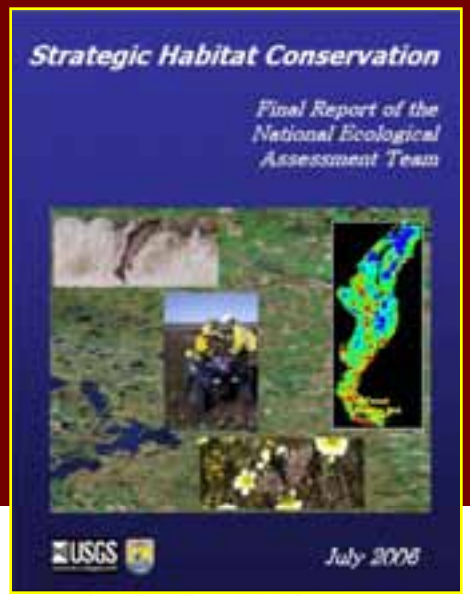
Species Vulnerability and Adaptation Workshop

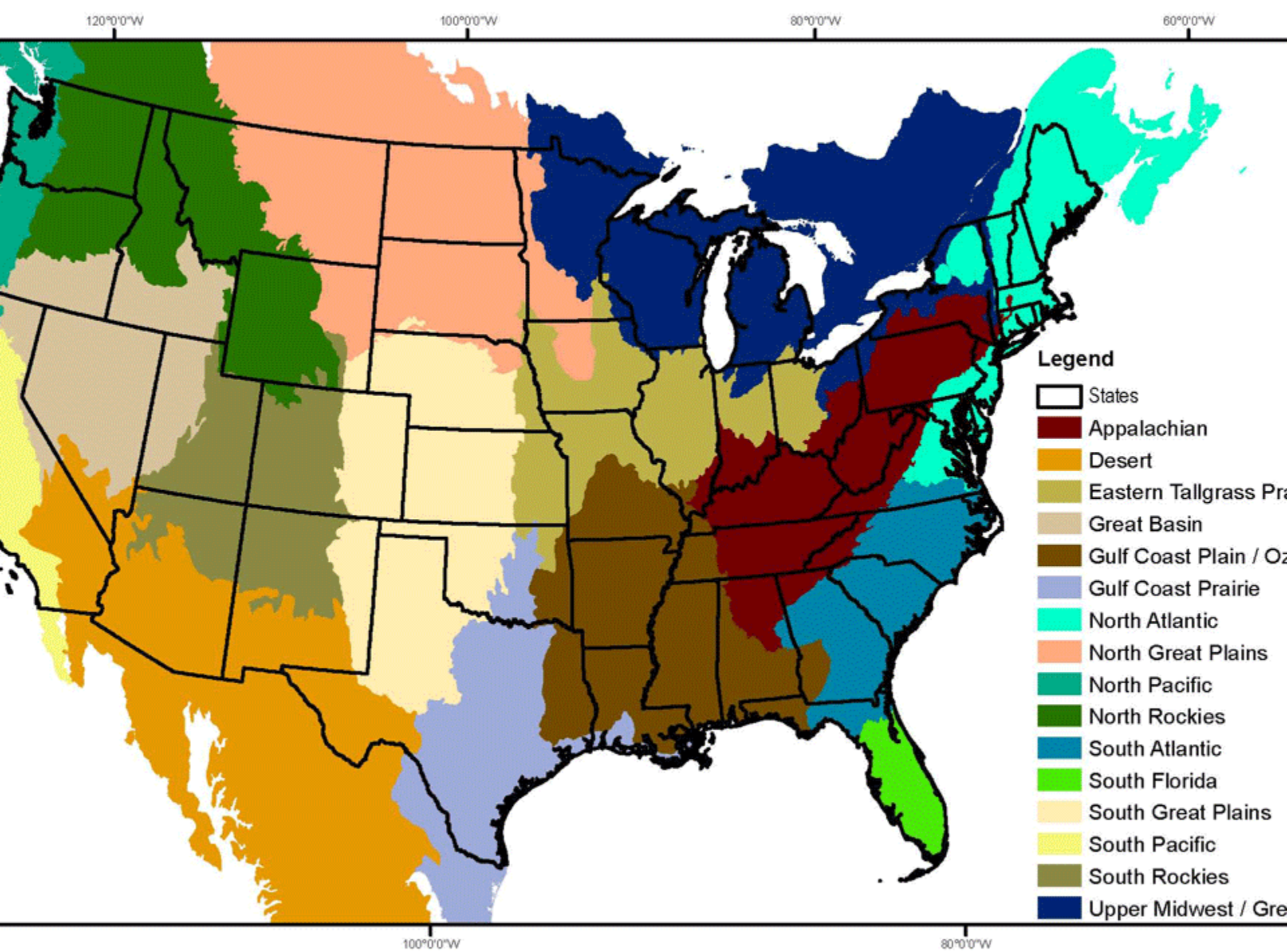
- Integrating Species Vulnerability Assessment with downscaled climate model scenarios to identify potential management actions or adjustments
- National Test Case: SALCC for coastal species and Refuges: seaturtles, selected shorebirds, flatwoods salamander
- Jean Brennen (Defenders for Wildlife)
- Cape Roman: this week as we speak!

SO, Where do we go in the future to get species based population needs and information to the ground for best management decisions in a context to address the affects of climate change?

SHC is Part of the Answer

- Species Population Outcome-based adaptive management practiced at landscape scales
- INTEGRATION of species and habitats at multiple scales
- Bureaus (and partners) collaborate in biological planning, conservation design, monitoring and research in a true Service-USGS partnership.

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Gulf Coast Prairie
North Atlantic
North Great Plains
North Pacific
North Rockies
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South Florida
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Regional DOI Science Hubs

- focus primarily on stepping down various scenarios of global climate change models to scales relevant to the wildlife conservation needs within the region.

- assess regional climate-related trends and predictions in temperature, precipitation, and moisture and apply this information in broad-scale ecological and biological response models to forecast regional changes in ecological systems, species distribution and population responses within a region.

SE Regional Science Hub Pilot

- Demonstration project: integrates climate change science with habitat and species response models to assess impacts on avian and aquatic species
- Cast predictive models calibrated from data gathered during recent decades
  - NOAA Climate data
  - Remote sensing data
  - USGS - BBS & MAPS data
  - Downscaled climate models
  - Watershed modeling

Adapting to a *Changing Climate*

Web resources about the
U.S. Fish and Wildlife Service's response
to accelerating climate change
relying on landscape conservation through the
Strategic Habitat Conservation framework

Southeast:

Climate Change Resources
http://www.fws.gov/southeast/climate/

Strategic Habitat Conservation
http://www.fws.gov/southeast/SHC/

Landscape Conservation Cooperatives
http://www.fws.gov/southeast/LCC

National

Climate Change Resources
http://www.fws.gov/home/climatechange/

Strategic Habitat Conservation
http://www.fws.gov/science/shc/

Landscape Conservation Cooperatives
http://www.fws.gov/science/shc/lcc.html