

## **2010 Ozark Summit After Action Report**

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In October of 2010 the USFWS and the USGS co-hosted the third Ozark Summit themed “Living on Karst: Sustainable Management of Ozark Ecosystems” on the Northeastern State University campus in Tahlequah, OK. The primary purpose of the Ozark Summit is to provide the leadership needed to sustain the biologically rich, nationally-significant resources of the Ozark Plateau by improving natural resource management, research, monitoring, and conservation success. The Ozark Summit provides an opportunity for strengthening partnerships among Department of Interior and other federal agencies, state and tribal governments, educational institutions, private conservation organizations, landowners, and businesses resulting in more effective use of resources by coordinating landscape-scale research and resource management of Ozark ecosystems on which many local communities and economies depend with the goal to provide leadership through an Ozark partnership or federal initiative to facilitate effective cooperation among stakeholders. This partnership is extremely beneficial in identifying issues and establishing goals and objectives to be addressed in the Ozarks ecoregion.

The 2010 Ozark Summit was attended by approximately 120 natural resource professionals comprising regional and area representatives from the US Geological Survey, National Park Service, US Fish and Wildlife Service, Bureau of Indian Affairs, Bureau of Land Management, Forest Service, Environmental Protection Agency, Natural Resource Conservation Service, and US Army Corps of Engineers that encompass the Ozarks along with resource agency representatives from five states (MO, AR, OK, KS, IL), tribes, private conservation organizations, educational institutions, landowners and businesses. Guest speakers included Gary Tabor from Freedom to Roam, Jean Brennan and Bill Uihlein from the USFWS discussing Landscape Conservation Cooperatives (LCC), Steven Bond from the Chickasaw Nation, and Suzanne Collier from NRCS discussing the Healthy Forests Reserve Program in Oklahoma. Special emphasis was placed on the Gulf Coastal Plain/Ozarks (GCPO) LCC. In breakout groups, participants were asked to develop project proposals for the GCPO LCC due to be funded in FY11.

Participants were briefed on LCCs and the GCPO LCC by Bill Uihlein and Jean Brennan on the first day of the Summit. In World Café sessions following the briefing participants were asked to brainstorm a list questions or concerns they had about LCCs. These questions were tallied by student facilitators located at each table. In a following Q & A session some of the questions were addressed by the LCC panel. A list of questions about LCC generated by the participants is included in Appendix A.

Upon registration, participants were asked to complete an online survey detailing what they felt were the greatest threats/concerns/needs to the Ozarks ecoregion. Prior to the Summit, the NSU student facilitators tallied this list of concerns. The list of greatest threats/concerns/needs is found in Appendix B.

In a World Café session during the Summit, participants at each table were asked to rank and prioritize their top four concerns from the list in Appendix B. Student facilitators tallied responses in order to create day two breakout groups. The top key issues can be found in Appendix C.

Eight breakout groups were formed based on the top key issues identified. Each group was asked to discuss their topic, develop a strategy to address it, and summarize their findings. Summaries for each breakout group can be found in Appendix D.

## Appendix A. Questions generated about Landscape Conservation Cooperatives (LCCs) During Breakout Sessions

How can the field level become more involved with the LCC's?

How do the LCC's plan to integrate all the data into collaborate data between agencies? House and Share?

Are there plans for the LCC's to share information between them for lessons learned.

Is there a way to include the importance of geology into the LCC more? Not financially.

In Oklahoma, how could the LCC convince citizens and congressmen that climate change is real?

Do the LCC's plan on being involved with policies at the state level? Are they science minded or geared towards making policies?

What is the incentive for all the partners to stay involved in the LCC? A group could drop out. What are the deliverables?

How can the LCC move to longer term projects?

Will the LCC's exist in a few more years?

How can we ensure the LCC's will succeed if not well funded?

How much funding for 2011-12 LCC's? Is it 1 or 2 year money?

How are they going to prioritize between the 4 geographical areas? Distribute \$ of effort, what is it based on? Are they going to target one or spread it around?

How are the executive committees (steering committee) and the technical committees of LCC determined? Is it based on votes? Does the agency decide?

What are other departments doing? Ex. Corp of Engineers

How do they anticipate how other departments interplay into LCC's?

What is the relationship between LCC and joint venture

How will carbon sequestration displacement work with LCC?

What final physical product will be expected from the LCCs (example in 50 years, how do you know your successful?)?

Is someone watching if there is a balance in/between LCC (example: water, insects/ included? Will they be data based?

What is the origin for regions, diverse geology?

How are LCCs currently funded?

Are you going to be addressing carbon sequestration with your land management LCC?

Is carbon sequestration being implicated in the Ozarks?

When we are going to start bringing in outside partners (state and non-traditional)

How are we going to coordinate efforts?

How do we implement the LCCs with what we are already doing?

How do we decide how funding will be spent?

Are the Corps of Engineers a player in the LCCs?

What are the LCC boundaries and how are we going to coordinate those?

How do we get information spread through other agencies' about the LCC program?

Would the conservation districts get any additional monies to use in this?

How can we separate the Gulf Coast from the Ozarks in the LCCs?

When are they beginning?

Do we have to be tied to the Gulf Coastal Plain?

Can boundaries be redesigned to be ecological sensible?

How do we propose the Inter-collaboration of the multiple agencies for funding?

How can it be people friendly with a name like LCC?

How will the federal agencies be dismantled and rebuilt to suit for this?

How will the non-federal partners going to feel ownership in this process?

How do we get public involvement about the LCC?

Education outside Federal sector and overall understanding?

Why are Ozarks in with Gulf Hydrology?

How were the LCCs written up?

How do national park service's fit into LCCs?

Who is responsible for the initiation of the program?

How many LCCs are there? Are they all funded?

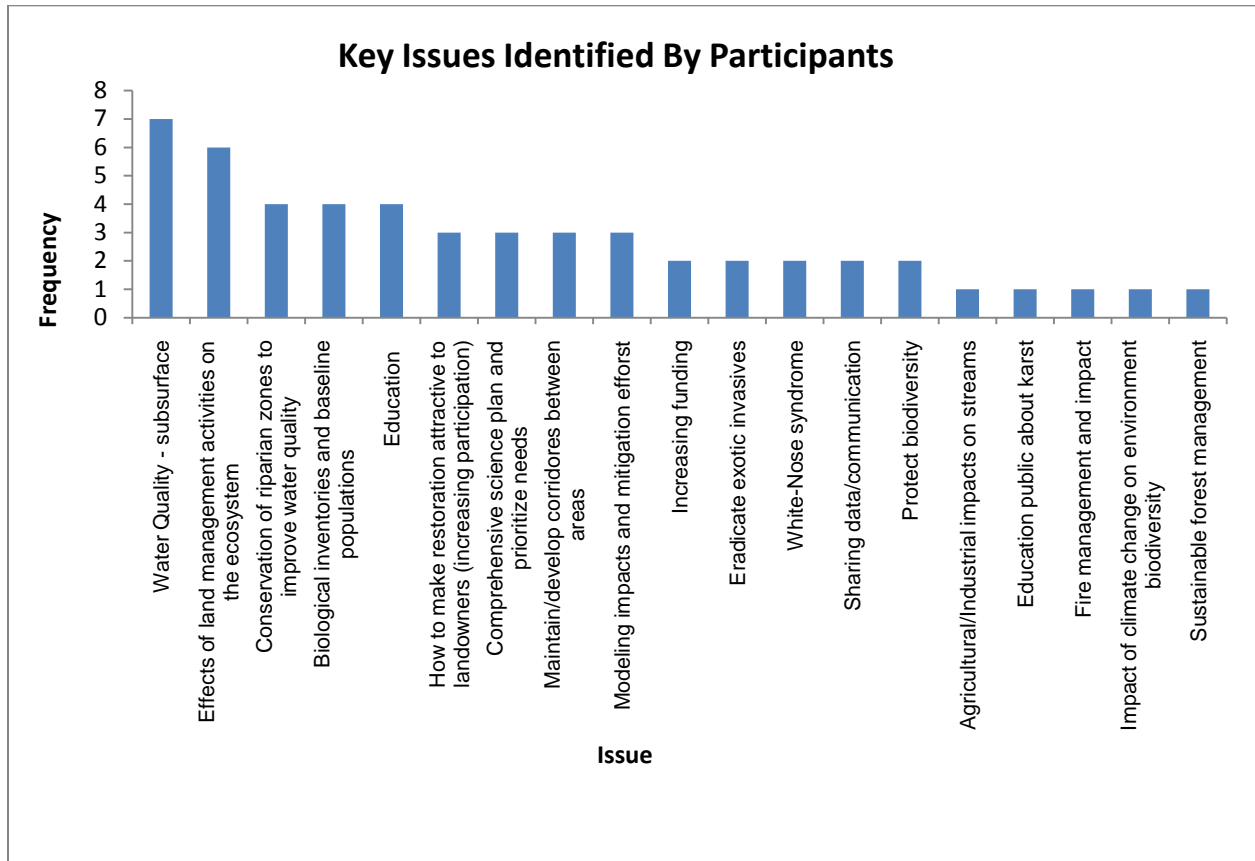
What will the “new moneys” fund?  
How does the Ozark region fit into the new Gulf Coast and Ozark Landscape Conservation Cooperative, since organization of the projects is so crucial to resource allocation?  
Are the regional lines going to be blurred in the Fish and Wildlife Service and going to need to be restructured?  
What are the deliverables?  
How can the LCC move to longer term projects?  
Will the LCC’s exist in a few more years?  
How can we ensure the LCC’s will succeed if not well funded?  
How through the LCC do we deal with intra LCC geography?  
How do we distribute funding adequately?  
Funding?  
Do we submit LCC proposals?  
Is there a mission statement?  
Will LCC funding be centered on spp. or landscapes?  
Why the LCC doesn’t mention the Washita?  
How do we overcome the hurdle of interstate travel? Missouri/Oklahoma for example.  
Why did they combine the Ozark Region and the Gulf Coastal Region?  
How do you know which habitats to focus on?  
What role can landowners and non government organizations play in facilitating functionality of LCC?  
Who coordinates for LCCs? Science coordinators?  
When can the Department of Interior and Agriculture and states get together on this?  
How do we get everyone together to prevent stacking effect?  
Are wildlife corridors also being discussed at this meeting?  
In a diminishing economy – are there concerns about funding?  
Is this a matter of thinking smart and using resources that are already available?  
Is this just another approach that will change in a few years? Will they stick with it?  
Did LCC come up with boundaries using biological or ecological reasons?  
How do you become a player in LCC’s?  
Is ODWC or any other conservation agencies involved?  
Do LCC’s show interest in private lands or just government and tribal lands?  
How are tribes tied into LCCs?

## Appendix B. Topics of Concern Submitted by Summit Participants During Online Registration

**Ozark Summit Topics of Concern/Needs** the number indicates how many times each topic was listed

- \_\_\_\_\_ Water quality – subsurface (6)
- \_\_\_\_\_ Water quantity (2)
- \_\_\_\_\_ Water quality monitoring standardization (2)
- \_\_\_\_\_ Energy development and impact on watersheds (2)
- \_\_\_\_\_ Groundwater management- effects of land use (4)
- \_\_\_\_\_ Water quality as impacted by urbanization (1)
- \_\_\_\_\_ Wastewater treatment research (1)
- \_\_\_\_\_ Recreational impacts (2)
- \_\_\_\_\_ Agricultural / Industrial impacts on streams (8)
- \_\_\_\_\_ Stream ecology research (macroinvertebrates and zooplankton) (1)
- \_\_\_\_\_ Conservation of riparian zones to improve water quality (4)
- \_\_\_\_\_ Increasing funding (3)
- \_\_\_\_\_ Evaluate the effects of shale gas production (1)
- \_\_\_\_\_ Karst mapping (2)
- \_\_\_\_\_ Educate public on Karst (1)
- \_\_\_\_\_ Identification of subterranean species (1)
- \_\_\_\_\_ Maintaining karst groundwater systems in presence of increasing nutrients (4)
- \_\_\_\_\_ TE species recovery and understanding of life history (4)
- \_\_\_\_\_ Effects of land management activities on ecosystem (12)
- \_\_\_\_\_ Fire management and impact (9)
- \_\_\_\_\_ Forest restoration and assessment of success (5)
- \_\_\_\_\_ How to make restoration attractive to landowners (Increasing participation) (3)
- \_\_\_\_\_ Vegetative mapping (2)
- \_\_\_\_\_ Eradicate exotic invasives (7)
- \_\_\_\_\_ Comprehensive science plan and prioritize needs (1)
- \_\_\_\_\_ Equipment storage on refuges (1)
- \_\_\_\_\_ Environmentally friendly industrial techniques (1)
- \_\_\_\_\_ Impact of climate change on environment biodiversity (6)
- \_\_\_\_\_ Impact of human population growth (2)
- \_\_\_\_\_ White-nose syndrome (WNS) (3)
- \_\_\_\_\_ Biological inventories and baseline populations (5)
- \_\_\_\_\_ Carbon sequestration (2)
- \_\_\_\_\_ Sharing Data / Communication (2)
- \_\_\_\_\_ Education
  - \_\_\_\_\_ Aquatic (3)
  - \_\_\_\_\_ Public nature appreciation (2)
  - \_\_\_\_\_ Ozark region biodiversity (6)
  - \_\_\_\_\_ Watershed / Ecoregion (2)
  - \_\_\_\_\_ Visitor use of scenic river (2)
  - \_\_\_\_\_ Link special interest groups of agencies (2)
- \_\_\_\_\_ Protect biodiversity (2)
- \_\_\_\_\_ Sustainable forest management (2)
- \_\_\_\_\_ Preserving caves (1)
- \_\_\_\_\_ Habitat fragmentation (1)
- \_\_\_\_\_ Maintain/develop corridors between areas (2)
- \_\_\_\_\_ Modeling impacts and mitigation efforts (2)

Appendix C: Prioritized and Ranked Key Issues Identified by Participants during World Café Session



## Appendix D: Summaries, Strategies, and Group Participants for Break Out Sessions

### **Group 1**

#### **Broadening Our Horizons: Increasing habitat connectivity thru landowner participation in Ozark restoration**

**Problem:** Most of Ozarks is in private hands, and providing habitat connectivity to meet conservation goals will require significant involvement of private landowners. Currently no group has organized or connected landowners with each other with a focus on habitat restoration.

**Products:** Greater landowner participation in habitat restoration through landowner leadership of hands-on restoration demonstrations.

**Deliverables:** List of existing demonstration areas for all agencies grouped by theme/habitat/processes. Ozark-wide themed Demo days nested w/in themed months.

Landowner social network group on the Gulf Coastal Plain and Ozarks Ning site, featuring Ozark Landowner Leadership corner, ask an expert, agency landowner contract forms, lists of contractors who provide services, landowner reviews, links to resources/info/ occasional newsletter w/ summary of site activity/discussions. Landowner feature of the month/ Demo day features and pictures. Featured technical tips: time to plant, herbicide, etc. Landowner of of the Year/month.

**Relevance:** Demonstration areas serve as feedback loop for adaptive management studies; demonstrate how to fix “failed” activities, how to adjust management applications, etc, AND provides informal inventory/ monitoring of Demo sites. Illustrate over time that things don’t happen overnight, and restoration is not always perfect.

**Methods:** Inventory of existing areas, crosscut group many ways. Identify existing landowner mentors/ leaders to help locally, using agencies lists/connections

Get word pout: Use NRCS/USDA PSA on radio stations to announce the Demo days. Booths at fairs, farm shows, etc.

**Demo days:** In conjunction with existing days for which agencies typically have activities; arbor day, earth day, fire prevention month, range day, Agencies provide logistics, space, (sponsors provide food; thru challenge cost share), but landowners/citizen groups run the demos present the face of the program(Especially if on private land). Agencies provide tour if on public land. Follow-up features by journalists in newspapers, / rural electric newsletters, etc. with some focus on restoration goals, featured landowner, etc. Highlight involvement of kids.

**Incentives:** native riparian seedlings, shrubs, etc, seeds, gift certs to native seed companies, raffle off brush saw, chainsaw, etc, \$ goes back into habitat restoration

**Partners:** all state fed land mgmt agencies, NGOs stream teams, nonprofit groups, scouts, Farm Bureau, cattleman’s association, 4-H, conservation districts, etc...

**Duration:** ongoing, build momentum

**Working Group Attendees:** Andrea Korman (FWS), Scot Gilje (FWS), Liisa Niva (FWS), Bullit Farris (OCC), Chuck Bitting (NPS), Brett Thompson (student), Esther Stroh (USGS).

## Group 2

### Conservation of Riparian Zones to Improve Water Quality

**Expansion of cooperative partnerships for landowners to enhance riparian areas to improve water quality and fish and wildlife habitats in the Ozark highlands.**

#### Problem Statement:

1. Historical and current land use practices causing loss of riparian areas resulting in:
  - reduced stabilization
  - increased sedimentation and nutrient loading (reduced water quality)
2. Lack of cooperation and knowledge between agencies.

#### Objectives:

Increase water quality by:

- Educating private landowners on the importance of riparian areas.
- Provide technical assistance to preserve and restore riparian areas.
- Increase cooperation and communication among state and federal agencies

#### Anticipated products:

1. Quarterly Reports Documenting:
  - changes in water quality
  - changes in fish and wildlife habitat
  - Fish and wildlife communities
  - Changes in riparian acreages
2. Est. long term monitoring programs pre and post products.
3. Interagency checklist detailing all available programs and technical assistance available.

**Name:** \_\_\_\_\_ **Affiliation:** \_\_\_\_\_ **Email:** \_\_\_\_\_

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## Group 3

### Illinois River Basin and Ozark Stream Riparian Restoration

**Abstract-** Illinois River Basin's natural characteristics have changed over time due to human activities. Water quantity and quality have been deeply affected. Restoring previous characteristics of these rivers will take united efforts of many agencies. This would benefit aquatic and terrestrial wildlife and people. And also provide resiliency. The objective of this project is to restore river basin characteristics and provide resiliency to fluctuated climate. This effort will involve and unite (piggyback) other ongoing efforts from other agencies.

**Background-** Sedimentation, nutrient enrichment, riparian cover, in-stream gravel mining, in-stream debris, landowner participation and operations.

**Integration-** Unite agencies to address regional problems, increased resiliency in response to climate change.

**Problem Statement and Implication-** Stream characteristics have deteriorated due to past human developments, human activities.

**Objectives-** Increased biodiversity, increased water quality for downstream reservoirs, natural patterns to be restored.

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## Group 4

### The Internationally Significant Ozark Highlands

#### Introduction

The Ozark Highlands cover approximately 40 million acres in the states of Missouri, Arkansas, Oklahoma, Illinois, and Kansas. The Ozarks are characterized by extreme biological diversity, supporting 160 species that occur nowhere else in the world, including approximately 30 federally listed species. Fifteen species of amphibians, 20 species of crayfish, 23 species of mussels, and over 100 species of plants have distributions largely restricted to the Ozarks. Ozark water resources are nationally significant; supporting 2 National Scenic Rivers (NPS), 7 Wild and Scenic Rivers (USDA Forest Service), and a globally significant karst region. The mostly-forested Ozark karst supports the 3 longest single-conduit springs in the US; 77 karst-dependant species; and the largest extent of glade communities in North America. Human population growth in the Ozarks and increased mining, industrial and agricultural activities are negatively affecting terrestrial and water resources. Concerns include: sediments, nutrients, heavy metals, pesticides, pharmaceuticals, habitat degradation, and surface and groundwater withdrawals. This region, which served as a refuge for hundreds of species during past glacial maxima, is also at great risk to climate change, likely affecting water supplies for human consumption, agriculture, and unique Ozark wildlife and ecosystems.

#### Background

The Ozarks represent an unprecedented opportunity for DOI collaboration and cooperation with other partners. The USGS and partners are working to identify common goals, threats, emerging issues, and informational gaps; the 2008 and 2009 Ozark Summits brought together Federal, State and nonprofit scientists and managers to identify mutual needs. A desired outcome is a Science Plan for how best to collectively approach the many scientific information needs. USGS hosts a website for Ozark information: [ozarks.cr.usgs.gov](http://ozarks.cr.usgs.gov).

#### Current Status

A multidisciplinary effort to develop advanced techniques to more thoroughly and accurately map the occurrence of karst in the Ozarks to gain a better understanding of the impacts and consequences of karst, and to study the health of hydrologic ecosystem services is underway. The successful outcome of these studies will facilitate a more effective and more focused use of limited management resources. Other multidisciplinary research to begin to answer the multitude of questions raised by partners are underway or underdevelopment.

#### Position of Interested Parties

The Ozark Highlands are divided into four USFWS Regions (2, 3, 4, and 6); within USGS, the Ozarks are contained in the South Central Area Office of the Central Region. While as a whole the area is significant it is only a small part of each of these 4 USFWS Regions making it difficult to compete for funding and visibility with larger landscapes housed completely within a single USFWS Region such as: the Great Lakes, or the Everglades, or the Chesapeake Bay. Other public lands include two national forests, and significant areas of state-owned lands. Much of the forested land is in private ownership by small landowners. The regional population is primarily poor and rural, combined with a growing retirement community and increasing population of foreign-born workers in the meat packing industry. The uniqueness and beauty of the area supports a strong and growing recreation-based economy. The USGS is well suited for providing the scientific leadership necessary to address ecosystems management and protection goals due to its presence in each State, broad multidisciplinary expertise, and its non-regulatory/ non-management mandate.

The National Park Service, the U.S. Fish and Wildlife Service, and various other federal agencies own or manage over 5,500 square miles of karst land in the Ozarks. The complexity of this system of caves, sinkholes, springs, and subsurface drainage networks requires these various land and natural resource managers to consider impacts across a much broader context than would otherwise be necessary. For example, the quality of aquatic habitats in the Current River of southern Missouri is managed by the National Park Service, but affected by land use practices that may be occurring near a sinkhole or sinking stream tens of miles outside of the Park's boundary. Consequently, land and resource managers using best management practices, Strategic Habitat Conservation, or who are concerned with the protection of Ozarks water quality, or the valuation of Ozarks ecosystem services require a better understanding of the interrelationship and impact of karst.

Currently several ideas are under discussion within USGS:

1. To work with local groups to build a grassroots coalition to build support for research and science efforts in the Ozark Highlands. This would be a long term commitment with a hope of building political will to address the issues associated with the Ozarks.
2. Link multiple karst systems together such as the Edwards Aquifer in TX, the Ozark Highlands to build a larger effort to address the concerns of karst systems in relation to climate change and landuse change in hopes of raising the visibility of the issue with other federal partners. This idea may gain some traction but it will also result in a reduced total since any of the new resources would be shared among the all of the karst areas.
3. Approach USFWS about targeting a portion of the funds identified in the USGS budget to assist USFWS for research and science to efforts in the Ozarks. If USFWS makes the requests to the ADs and Program Coordinators who manage these funds it is much more likely to capture their interest than if this option were raised internally. However, the science centers must be poised to move on this opportunity with a science plan should the opportunity arise.

Central Region, USGS - South Central Area  
Stanley Ponce  
Max Ethridge

## **Group 5**

### **Identification of Sources of Contaminant Transport Pathways Affecting Sensitive Aquatic Biota in Karst Hydrologic Systems**

**Background:** The original topic of the group was “Water Quality (Subsurface)” but group members, including those from USGS, USFWS, Oklahoma Conservation Commission, Arkansas Game and Fish, and Missouri Department of Conservation, agreed that the interaction between subsurface and surface waters in the Karst geology of the Ozark Region indicates that both surface water and groundwater quality should be considered when addressing water quality issues that affect aquatic biota. The affect of water quantity on water quality also cannot be ignored, as changes in streamflow and groundwater availability affect concentrations of critical contaminants.

**Problem Statements:** Changes in water quality and quantity are affecting biological communities, species diversity, and designated uses in Ozark waters. Sources and transport pathways in this region are poorly understood. Identification of critical sources of contamination, issues that affect the magnitude of contamination, and unique geologic features that drive contamination would be beneficial for identifying best management practices and regulatory goals for reducing the impact of contamination to aquatic biota in the Ozark Region.

#### **Objectives:**

- 1.) Review existing data and integrate findings from previous studies in the area (or studies for aquatic species found in the Ozark Ecoregions)
- 2.) Produce maps and areas of concern based on previous scientific and prioritization studies (for example, overlay of Conservation Opportunity Areas (COAs) with GIS coverage of areas where impaired water quality may be a concern)
- 3.) Identify three priority pilot areas (basins, aquifers, or ecosystems) within the Ozark region for in-depth study
- 4.) Identify ecosystem stressors and sensitivities to water quality and quantity in the pilot areas
- 5.) Within the pilot study areas, identify and map contaminant source areas and identify potential impacts to ecosystems from climate change as a result of projected changes in temperature and precipitation. Additional data collection may be needed to define source areas.
- 6.) Model and define contaminant transport pathways within pilot areas.

#### **Products:**

- 1.) Scientific publication (USGS Scientific Investigations Report, USFWS Biological Technical Publication, or Journal Article) and Summary Fact Sheet
- 2.) Map of areas of concern and map of priority area with contaminant sources areas identified
- 3.) Web access to data generated from study
- 4.) Conceptual Model – framework for identification, mapping, and modeling of priority basins using approach generated by study
- 5.) Priority list of areas of concern

#### **Parties:**

The parties involved with this proposal include:

Daniel Franke, Water Quality Specialist, Oklahoma Conservation Commission

Roderick May, Assistant Hatchery Manager, USFWS

Rick Horton, Missouri Department of Conservation

Carol Becker, Hydrologist, USGS Oklahoma Water Science Center

Rachel Esralew, Hydrologist, USGS Oklahoma Water Science Center

Kim Winton, Director, USGS Oklahoma Water Science Center

R. Mark Sattelburg, Field Supervisor, USFWS

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Jim Peterson, Hydrologist, USGS Arkansas Water Science Center

Steve Filipek, Fish Biologist and Assistant Chief, Arkansas Game and Fish, Fisheries Division

## Group 6

### **Biological Inventories and Baseline Populations: Sharing of biological inventory data among federal and state agencies and private organizations**

**Problem statement:** Insufficient sharing of existing data among agencies and private organizations, which leads to unnecessary duplication of effort and expenditure of funds. Data gaps may also go undetected placing rare species and ecosystems at risk.

#### Action Items:

- **Oversight and Support**
  - Funding
  - Inventory & Monitor as part of state and federal agencies core missions
  - Hiring qualified personnel
  - Network existing databases or develop common, shared database
  - Develop a common template for data storage
  - Education and Outreach
    - I-phone apps
    - Tokens and trinkets
    - Public meetings of shareholders
- **Habitat Monitoring & Inventory**
  - Identify data gaps
  - Identify and prioritize targets
  - Taxonomic expertise and standardization
  - Use data to Identify areas to preserve and protect
  - Accountability and reporting
  - Network government and private organizations

#### Objectives:

- Facilitate cooperation and sharing of data among state and federal agencies and private organizations
- Develop network or shared database using common template
- Identify data gaps.
- Prioritize effort for addressing data gaps.
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#### Existing Projects

- NPS Inventory & Monitoring Program
- USGS NAWQA
- State biological inventories (Natural Heritage programs)
- State fish and wildlife department databases
- Audubon bird counts
- Nature Conservancy
- Museums
- Others?

#### Anticipated Products

- Web portal to access database or link databases
- Publicly accessible and searchable database (to help ID and address data gaps)
- Lists of data gaps identified through linking databases
- Reports (with glossy covers and photos of charismatic flora and fauna)
- Education and outreach products
  - I-phone apps
  - Tokens and trinkets
  - Public meetings of shareholders

#### The Team

- Doug James- University of Arkansas
- Elizabeth Adam-University of Arkansas
- Hope Dodd-NPS Heartland I&M Network
- Ken Frazier-US Fish & Wildlife Service

- David Bowles-NPS Heartland I&M Network
- Gina Levesque- Oklahoma Conservation Commission
- Richard Stark- US Fish & Wildlife Service
- Ryan Allen- Missouri State University
- Steve Hensley (US Fish & Wildlife Service) and Steven Bond (Chickasaw Nation)

## **Group 7**

### **Prioritizing privately held lands in the Ozark Plateau for habitat restoration**

**Goal:** Increase landowner participation in restoration. (I don't have this page from our group.)

**Problem Statement:** Due to increasing pressure from agriculture, mining, and urbanization, the Ozark Plateau is losing critical habitat (terrestrial, aquatic, subterranean) on private lands. Trust species are in decline and water quality is degraded due to anthropogenic pressures, which may be exacerbated by climatic changes.

**Objectives:**

1. Identify and quantify critical habitats within the Ozark Plateau.
2. Prioritize habitats using modeling.
3. Enhance and maximize the use of existing federal, state, and private funds for targeted habitat and trust species.

**Products:**

1. If needed, survey for presence/absence of trust species and their movement corridors through Ozark Plateau.
2. GIS maps of land use, important habitats, and land ownership.
3. Create a model to identify and prioritize private landowner habitat restoration.
4. Develop an Ozark Farm Bill initiative.
5. Prioritize private lands in Ozark Plateau for protection and restoration.

**Writing Team**

Curt Allen, OK Department of Wildlife Conservation  
Dr. Dixie Bounds, US Fish and Wildlife Service  
Scott Hamilton, US Fish and Wildlife Service  
Stacy Hansen, Oklahoma Conservation Commission  
Sam Ziara, Grand River Dam Authority

## **Group 8**

### **Coordinating Place-Based Education in the Ozark Highlands**

**Problem:** Lack of Continuity and Coordination of experiential, place-based karst education.

#### **Objectives:**

Establish education coordinators

Research existing programs

Promote experiential learning

- Outdoor classrooms
- Nature connection
- Promote and fund Field days
- Involve school programs in science programs; including home school and citizen science (IE: Blue Thumb, involve classes in water monitoring programs, bat monitoring routes, herp surveys, etc... with “real” researchers on hand, utilize/create pollinator programs, be creative...and remember to have fun! Fond memories of nature do not require a follow up test, but rather a bath.)
- Utilize/fund already established 501c3 groups who specialize in outdoor education to provide programs on public lands. More bang for the buck, use locals!
- Remember, it’s not just kids...young adults, adults, older landowners, parents; everyone needs to be reconnected to nature.

Train Trainers and volunteers

- Nature connection and experiential learning is a great way to involve youth in the outdoors.
- Train locals in nature mentoring techniques. This will help gain community support, build trust with locals, will create a sense of connection with community, and if done correctly will provide many more teaching lessons than any one nature “event or show” will as locals have daily interactions with the people in the community.

Coordinate symposia and products

- Events clearing house web page and advertisement
- Help coordinate an online community to share information and experiences
- Utilize social media

Marketing

- Remember “Smoke Bear”...what message does he bring? What other simple marketing technique can be used to help teach lessons and send a message to the general public?
- Newsletter
- Arnt we all on the same team? Collaborative effort! Help one another.

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