

# Texas Climate Trends and Wildlife Conservation: PLANNING FOR THE FUTURE - WORKSHOP REPORT

## WORKSHOP AGENDA

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### WELCOME AND OPENING REMARKS

- Susan Kaderka - Regional Executive Director National Wildlife Federation, South Central Region
- Carter Smith - Executive Director, Texas Parks and Wildlife Department

### PLENARY SESSION

#### CLIMATE CHANGE & TEXAS' NATURAL RESOURCES

- Katharine Hayhoe, Texas Tech University
- Dr. Gerald North, Texas A&M University
- Dr. Jim Gibeaut, Harte Research Institute
- Dr. Timothy E. Fulbright, Caesar Kleberg Wildlife Research Institute

### PANEL DISCUSSION

- Moderated by Dr. Larry McKinney, Executive Director, Harte Research Institute

### INTRODUCTION TO THE STATE WILDLIFE ACTION PLAN

- Wendy Connally, Texas Wildlife Action Plan Coordinator, TPWD

### IMPLEMENTING TEXAS' STATE WILDLIFE ACTION PLAN

- Moderated by Matt Wagner, Program Director, Wildlife Diversity, TPWD

### LUNCH SESSION

- Moderated by Andrew Sansom, Executive Director, River Systems Institute
- David Braun, Chair, Teaming with Wildlife Coalition
- John Kostyack, Executive Director, Wildlife Conservation and Global Warming, NWF

### PLANNING FOR THE FUTURE

- Dr. Hector Galbraith, Manomet Center for Conservation Sciences

### WORK SESSION I

- Identifying key issues related to climate change and natural resources

### WORK SESSION II

- Identifying actions that need to be taken to address key issues

### CLOSING PLENARY

- Where do we go from here? Next steps and actions



A workshop on Texas wildlife conservation planning and climate trends was held at the Annenberg Conference Center on the Texas A&M University College Station campus on April 21, 2009, from 9:00 am to 4:30 pm. It was hosted by the National Wildlife Federation, Texas Parks and Wildlife Department, Texas Conservation Alliance, the Nature Conservancy, the Texas Teaming with Wildlife Coalition and the Institute for Renewable Resources at Texas A&M. Funding was provided by the Wildlife Conservation Society. More than one hundred participants, representing many conservation organizations including state and federal, agencies, academic institutions, and non-profit organizations, sportsmen's groups and private landowners attended. (*See agenda to the left*)

This workshop set the stage to address the threat of climate change to Texas wildlife. Additionally, the workshop provided an opportunity to discuss how the Wildlife Action Plan can be revised to include climate change and thus be more useful to Texas' conservation partners.



## WELCOME AND OPENING REMARKS

*Susan Kaderka*, Regional Executive Director, South Central Region, National Wildlife Federation (NWF), talked about why climate change is an important issue for Texas and about the importance of considering adaptation measures for wildlife when planning our conservation future. She then introduced the director of the Texas Parks and Wildlife Department, Carter Smith.

*Carter Smith*, Executive Director, Texas Parks and Wildlife Department (TPWD), welcomed everyone to the workshop and emphasized that climate change threatens Texas' natural landscapes, its water resources and wildlife. He called on people to recognize climate change as a significant factor when considering how to safeguard our natural resources in Texas and as we get ready to revise our state's comprehensive wildlife strategy, the Texas Wildlife Action Plan.

## PLENARY SESSION - CLIMATE CHANGE AND TEXAS' NATURAL RESOURCES

*Katharine Hayhoe*, Atmospheric Scientist Department of Geosciences, Texas Tech University, explained how projections of future climate change are necessary because climate today is changing in ways that cannot be predicted based on the last century. Examples of recent, rapid changes include shifts in the arrival of spring, the timing of wildlife migration and mating patterns, more frequent and severe heat waves, changing rainfall and drought patterns, and shrinking snow cover, sea ice, and mountain glaciers.

We can compare what has happened to our planet over the last century with simulations from complex, physics-based climate models. When we do so, we see that there is no way to explain the warming of the last few decades if we do not include the influence of human emissions of heat-trapping gases. Over the rest of this century, the amount of warming and other climate change we expect depends on the choices we make now – and over the next few decades – regarding our energy sources and our continued production of these heat-trapping gases. For example, if we continue to rely on fossil fuels as our primary energy source, average summer temperature in Texas (day plus night), currently in the mid-to-high-70s could average in the mid-90s by the end of the century. If we significantly reduce our emissions relative to today's levels, Texas summer temperatures could remain in the mid-80s.

To develop regional projections of climate change directly relevant to assessing climate impacts on ecosystems, scientists require information about climate-related ecological drivers from regional experts. Examples of climate drivers can include degree days, changes in hydroperiod, precipitation, etc. Examples of how climate projections have already been used to assess future impacts related to ecosystems and wildlife include projecting future shifts in cold temperature constraints that currently limit the northward expansion of pests and invasive species, identifying locations that could serve as refuges to protect temperature-sensitive species as a region warms, and modeling the movement of a broad range of tree species under climate change.

*Gerald North*, PhD, Distinguished Professor, Department of Atmospheric Sciences, Texas A&M University, presented climate information specific to Texas. He explained that state-of-the-art climate models tell us that Texas will continue to warm at least at a rate of 0.2 deg F per decade and the rate could be several times this. The warming is not steady but tends to occur in a see-saw fashion trending upwards, judging by records of the last century. A fairly robust finding of the models is the expansion of tropical climate toward the poles in both hemispheres. This means that typical storm tracks that cross the nation will shift a few degrees of latitude northwards. In Texas we might expect longer summers with fewer of the cold fronts that bring accompanying soaking rains. In the southern parts of the state, the last cold front passes during June and the first appears in September. The period of (frontless) dry summers (with the exception of occasional afternoon thunderstorms) is likely to grow.

Rainy East Texas might be spared somewhat because of the abundance of moist air from the Gulf of Mexico. The early part of the summer of 2009 might provide a hint of summers to come. Precipitation mechanisms in Texas are subtle and our current models cannot yet faithfully simulate them, but expansion of the dryer tropical band seems to be highly likely.

*Tim Fulbright, PhD, Regents Professor and Endowed Meadows Professor in Semiarid Land Ecology at the Caesar Kleberg Wildlife Research Institute*, discussed how climate trends affect the challenges in managing invasive grass species and conserving biodiversity. Biodiversity tends to be lower in landscapes dominated by non-native grasses. The climate warming and drying predicted for Texas will exacerbate the spread and dominance of invasive, warm season grasses including *Pennisetum ciliare* (buffelgrass), *Urochloa maxima* (guineagrass), and Old World bluestems. Increased precipitation during the summer months may have also facilitated an increase in invasive subtropical grasses. Options for managing these invasive grasses and mitigating negative effects are unfortunately limited. Restoration of native plants is difficult and costly. Manipulating structure of stands of exotic grasses with patch burning and grazing or mechanical treatments may be a viable option to increase native forbs and improve habitat for wildlife.

*James C. Gibeaut, PhD, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University – Corpus Christi*, presented a talk titled *Projecting Impacts of Relative Sea-Level Rise and Erosion on Texas Barrier-Island Environments*. He reported that fringing and interior salt- and fresh-water wetlands, interior ridges and swales, and the Gulf beach and foredune systems are habitats important to maintaining the ecological health of Texas barrier islands. These geomorphic features and habitats also act as buffers to the effects of hazardous geological processes such as flooding and storm washover. Rising sea level and ongoing shoreline retreat have caused and will continue to cause these features to migrate and change character. A principal challenge in barrier-island environmental management, therefore, is to anticipate these changes and to develop policy that will not only sustain or improve upon the current functions of natural environments, but will also allow them to maintain their effectiveness as sea-level rise and erosion continue in the future. A sea-level rise model, based on detailed topography and geo-environmental mapping, was developed and combined with shoreline-change information to project how the distribution of Texas barrier-island environments, including wetlands, beaches, and dunes, will change. Resulting maps can be used (1) to plan for future impacts to infrastructure, (2) to plan restoration and mitigation projects, and (3) to guide development away from areas prone to becoming future critical environments.

A brief panel discussion with the plenary speakers was then moderated by *Larry McKinney, PhD, Executive Director of the Harte Research Institute for Gulf of Mexico Studies*.

## INTRODUCTION OF THE STATE WILDLIFE ACTION PLAN

*Wendy Connally, Texas Wildlife Action Plan (TXWAP or Plan) Coordinator*, presented a brief overview of the TXWAP's original intent and how the document's use and focus have evolved over the last five years. The expanded uses of the Plan include leverage of new and existing federal, state, and private funding sources beyond the State Wildlife Grants and broad use by resource protection entities beyond TPWD to identify significant resources for protection and mitigation actions. Interviews with field-based conservation practitioners and private landowners throughout Texas will help identify areas for improvement and revision in the 2010 Plan update; this input will frame how to make the Plan more functional as an action-planning document, user-friendly and accessible. Additionally, since the original plan's launch, several emerging issues – including climate change – have come to bear on natural resources conservation planning in Texas.





## IMPLEMENTATION OF TEXAS' WILDLIFE ACTION PLAN

*Matt Wagner*, Program Director for Wildlife Diversity at the Texas Parks and Wildlife Department, led a panel discussion of private landowners and practitioners in land and wildlife stewardship in the context of climate change. Panel members included Gary Price, rancher and Chairman of the Blackland Prairie Grazing Land Conservation Initiative, Jim Willis, co-owner of WW Ranch and President of Wildlife Habitat Federation, and David Wolfe, Director of Conservation Science, Environmental Defense Fund.

Each panel member discussed management actions to restore wildlife, including endangered species on private lands. In the face of a warming environment, increased incentives to implement adaptation strategies will be needed. This may include cost share and technical assistance to provide corridors linking high quality habitat areas, native plant materials and supplies for habitat restoration, freshwater environmental flows, the development of a carbon credit market in the state, invasive species management, endangered species recovery through safe harbors, habitat conservation plans, recovery credits, and other strategies. In addition, land use planning will become more important to accommodate rural wind power development and other renewable energy technologies.

## TEXAS TEAMING WITH WILDLIFE COALITION

*David Braun*, Chair of the Teaming with Wildlife Coalition, introduced the coalition in Texas and described the coalition's efforts to secure dedicated funding for habitat and wildlife in Texas. The mission of the Texas Teaming with Wildlife Coalition (TTWW) is to increase public funding for the stewardship of all fish and wildlife resources for the enjoyment of future Texans. TTWW leverages the collective power of statewide partner agencies, non-governmental organizations, businesses, and individuals to support the priorities of the Texas Wildlife Action Plan, and to help prevent Texas wildlife from becoming endangered.

## FUNDING FOR NATURAL RESOURCES ADAPTATION IN CLIMATE LEGISLATION

*Andy Sansom*, Director of the River Systems Institute at Texas State University, took a few moments to link the problems of climate change to current natural resource issues in Texas. Drawing on his experience as former director of Texas Parks and Wildlife Department and former director of The Nature Conservancy in Texas, Andy inspired future cooperation among a broad range of interests who share a common concern for the future of Texas wildlife. Andy then introduced John Kostyack, Executive Director, Wildlife Conservation and Global Warming, National Wildlife Federation.

*John Kostyack*, Executive Director, Wildlife Conservation and Global Warming, NWF, discussed potential funding from climate legislation, which could be directed toward the threat of climate change to wildlife and their habitats. Kostyack outlined three key elements of safeguarding natural resources from climate change:

- 1) Securing dedicated funding for natural resources in climate legislation
- 2) Making conservation programs "climate-smart"
- 3) Making on the ground actions "climate-smart": *Learning by Doing*

Kostyack also explained how federal cap and invest bills help to conserve natural resources threatened by climate change. A few examples include setting greenhouse gas emissions reductions, shifting to low carbon technologies, sequestering carbon on land, and providing dedicated funding for natural resources adaptation.

## PLANNING FOR THE FUTURE

*Hector Galbraith, PhD, Director, Climate Change Initiative, Manomet Center for Conservation Sciences*, set the stage for our afternoon working sessions by making the case for why adaptation is such a critical factor in addressing the impacts of climate change on our natural resources. He began by reiterating the evidence that the planet's climate system is being affected by increased concentrations of greenhouse gases and that we are already witnessing clear signals of this climatic change in ecosystems around the world. He explained that even if we were to drastically reduce our emissions rates, there is so much inertia in the climate system that we will continue to see further warming for the next few decades. These changes will stress our natural environment still further. Dr. Galbraith went on to explain that emissions control in and of itself will not be sufficient to protect the environment – we need to adapt! His



presentation reported on an important Wildlife Conservation Society-funded adaptation study taking place in Massachusetts, organized by Manomet Center for Conservation Sciences and the state's Division of Fisheries and Wildlife. The overall objective of the study is to make the existing state Wildlife Action Plan and conservation policies “climate-smart.” The first objective was to evaluate the comparative vulnerabilities of fish and wildlife habitats and their likely trajectories under climate change. The study has now moved on to evaluating how climate change will affect our ability to manage habitats and how it will affect future acquisition strategies.

## AFTERNOON WORKING SESSIONS

The purpose of the afternoon session was to begin to discuss how climate change is impacting the natural resources of Texas and what we need to do to mitigate those impacts. The overarching question for these work sessions was:

Relative to climate change and its impacts on our natural resources, what do we know, what don't we know, and what are the steps we need to take to get us the information we need?

### Methodology

Participants were divided into small groups of 8-10 at round tables. The groups were diverse in nature, rather than representing a specific resource type. There was a recorder and a facilitator at each table.

### Session 1 - *Identifying key issues related to climate change and natural resources*

Based on information provided in the plenary session and their own observations, participants were asked to answer the following questions related to their area of expertise:

- 1) What are some of the key natural resources that you feel will be impacted by climate change?
- 2) What are the ways you think these natural resources will be impacted?
- 3) What are the problems and/ or opportunities that climate change presents ?
- 4) Where are the information gaps?

After developing a comprehensive list of natural resources and information gaps, the group then ranked its “Top 5” of each category.

## Session 2 - Identifying actions that need to be taken to address these issues

Participants were asked to answer the following questions:

- 1) With unlimited resources what would it take to avoid, minimize, or mitigate impacts to our natural resources associated with climate change?
- 2) Working within the realm of what is possible for your agency/organization/business what are the actions or strategies that need to be developed/implemented to help wildlife respond to those impacts?
- 3) What types of policy, funding, and research are needed?

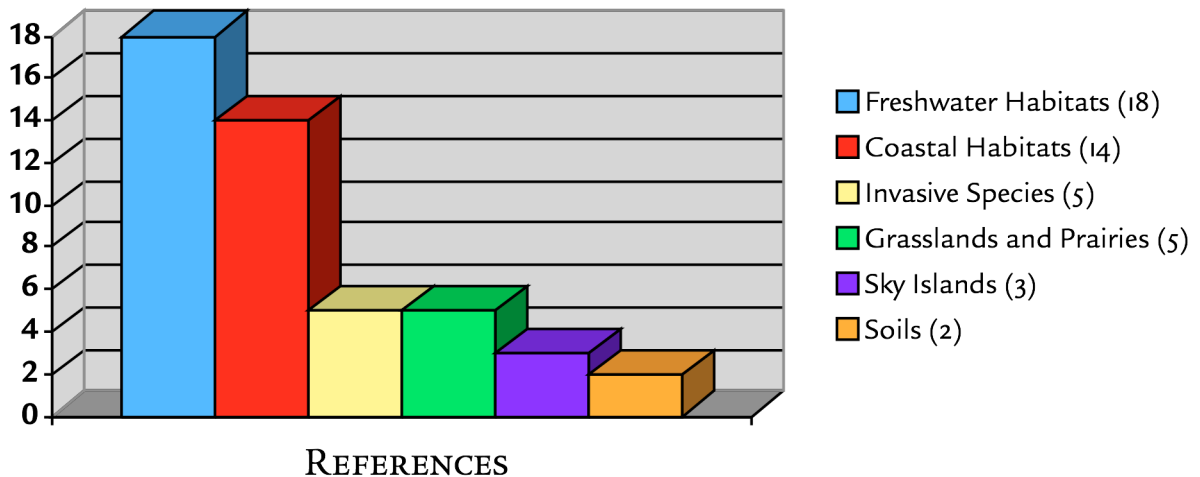
Each group then ranked its “Top 5” actions to be taken.

### Results

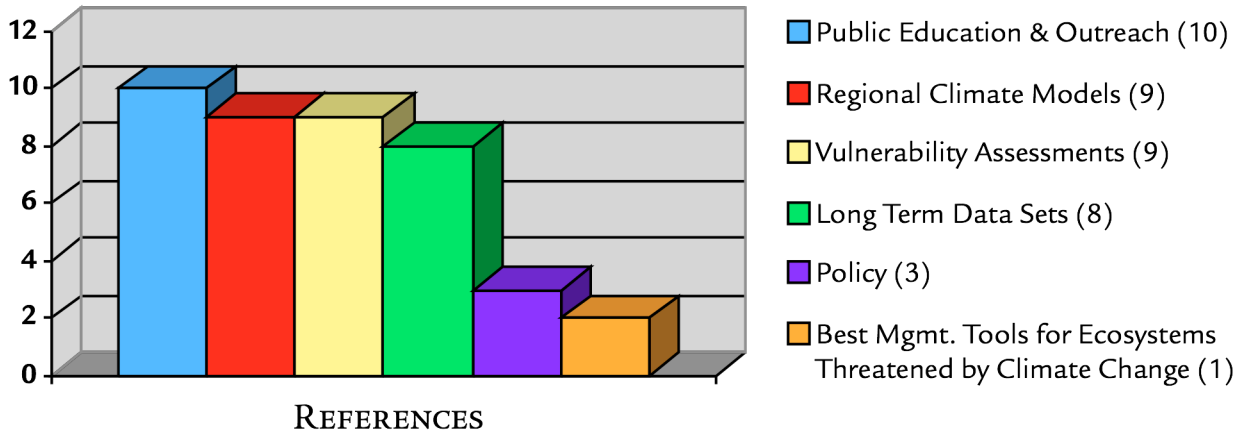
The results of the working sessions showed that participants overwhelmingly believe that the top natural resources to be affected by climate change in Texas are freshwater and coastal habitats. Participants indicated that the greatest information gaps regarding how to protect our natural resources from climate change are public education and outreach followed closely by local/regional climate models and vulnerability assessments of species and habitat. The group concluded that the top action that needs to be taken to help wildlife respond to climate change is protection of natural resources followed by education and outreach.

Results to each question are listed below:

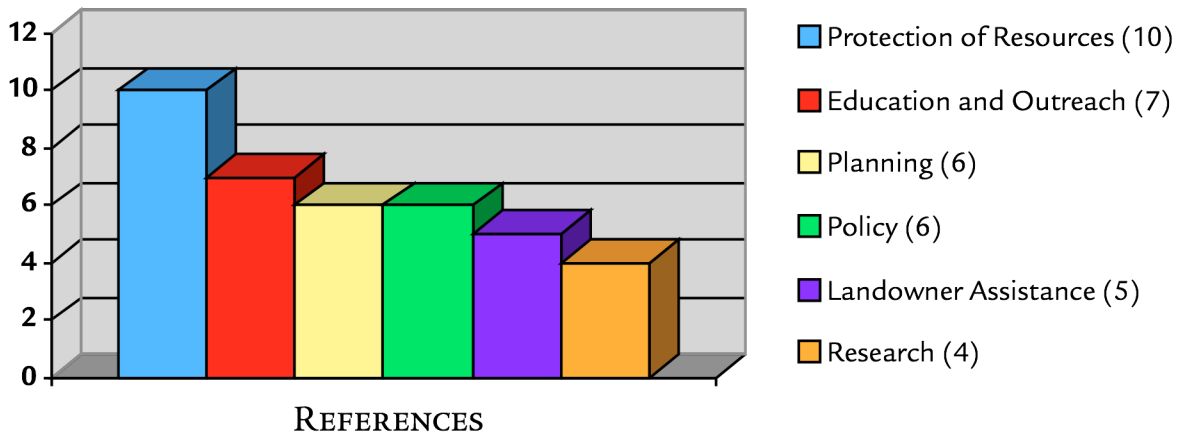
- 1) What are the top 5 natural resources we expect to be impacted by climate change?



2) What are the top 5 information gaps?



3) What are the top 5 actions that need to be taken to help wildlife respond to the impacts of climate change?



### Evaluation of the Workshop

Overall the pre- and post-surveys from the workshop show that the percentage of respondents who thought climate change poses a serious threat to Texas rose from 56% in the pre-survey to 72% in the post-survey. When participants ranked the top three conservation challenges facing Texas, there were notable changes in the ranking of climate change. In the pre-survey, climate change was mentioned *once* as number one, *three* times as number two, and *four* times as number three. In the post-survey, climate change was mentioned *four* times as number one, *four* times as number two, and *six* times as number three. Even with fewer respondents (43 pre and 36 post), climate change was mentioned a total of *eight* times as a significant threat before the conference and *fourteen* times afterwards!

## NEXT STEPS

The TXWAP revision is due in December 2010. Teams will be engaged throughout the state at ecoregion and statewide/multi-region levels to do the following: 1) focus objectives and tasks in each region; 2) identify site-specific conservation actions; 3) set some timelines, partners, funding opportunities, and responsible parties for actions; and 4) create a mechanism to measure and demonstrate progress. This Plan's expanded functions and funding opportunities are nationally driven. It will be important that the revision reflects Texas' conservation community's actionable priorities, the intersection of multiple partners for common conservation goals.

Throughout the Plan revision process, members of the statewide/multi-regional team and the eleven ecoregion teams will be participating in climate change workshops, webinars, and presentations to identify emphasis areas, data, and resource considerations to include in the Plan update. Additionally, as climate change science and state-of-the-practice evolve in Texas, the state's conservation community will continue to hold workshops that will help guide implementation in certain geographic and resource focus areas (e.g., gulf coast, grasslands, invasive species, water quantity and quality, and priority actions that may be identified in the revision process). The Plan revision will build in flexibility to adapt to information, data, and activities as needed.

A draft framework for the revision concepts will be circulated for comment in summer 2009, kicking off the stakeholder-building process. Workshops will be ongoing through fall 2009–spring 2010. A draft document will be circulated for peer, stakeholder, and public comment through summer 2010, with an anticipated delivery to USFWS for review by December 2010.

## WORKSHOP SPONSORS

