

# **Oklahoma Comprehensive Wildlife Conservation Strategy**



## **Oklahoma Department of Wildlife Conservation**

### **Planning for the Future for Oklahoma's Wildlife**

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## Table of Contents

Chapter	Page
Roadmap to the Eight Federal Required Elements	i
Foreword	1
Executive Summary and Statewide Perspective	2
Introduction and Purpose	5
Approach and Methods	7
State Overview and Ecological Framework	13
Conservation Landscapes in Shortgrass Prairie Region	15
Shortgrass Prairie	16
Pinyon Pine/Juniper Woodland or Savannah and Juniper/Pinyon Pine Woodlands	21
Herbaceous Wetland	24
Small Rivers and Sloughs/Ponds	28
Sand Sagebrush/Bluestem Shrublands	32
Mixed-grass Prairie	37
Sandy-bottom Streams and Associated Riparian Forest	41
Sand Plum/Sumac Shrubland	45
Springs	47
Potential partnerships to deliver conservation for Shortgrass Prairie Region	49
Conservation Landscapes in Tallgrass Prairie Region	51
Tallgrass Prairie	52
Small River	58
Large River	62
Herbaceous Wetland	67
Post Oak and Black Jack Savannah and Woodland	72
Bottomland Hardwood Forest	76
Springs	81
Gravel-bottom Streams and Associated Riparian Forests	84
Sandy (soft)-bottom Streams and Associated Riparian Forests	90
Potential partnerships to deliver conservation for Tallgrass Prairie Region	96
Conservation Landscapes in Mixed-grass Prairie Region	98
Mixed-grass Prairie	99
Shinnery Oak Shrubland	104
Sand Sagebrush/Bluestem Shrubland	108
Gypsum or Sandstone Canyonlands and Gypsum Caves	112
Tallgrass Prairie	115
Large Rivers and Sloughs/Ponds	119
Herbaceous Wetland	124
Small Rivers	128
Post Oak/Blackjack Savannah or Shrublands and Post Oak/Blackjack Oak/Hickory Woodlands	132
Sand Plum, Hawthorn, or Sumac Shrubland	136
Streams and Associated Riparian Forests	139

Chapter	Page
Springs	143
Mesquite Savannah or Shrublands	145
Juniper Savannah or Woodlands	148
Potential partnerships to deliver conservation for Mixed-grass Prairie Region	151
Conservation Landscapes in Crosstimbers Region	153
Small River	155
Large River	160
Oak and Hickory Bottomland Hardwood Forest	165
Post Oak/Blackjack Oak/Hickory Woodland and Forest	170
Tallgrass Prairie	174
Small Gravel (hard)-bottom Streams and Associated Riparian Forest	179
Herbaceous Wetlands	185
Sandstone Canyonlands and Post Oak and Blackjack Oak Shrubland	190
Small Sandy (soft)-bottom Streams and Associated Riparian Forest	193
Mixed-grass Prairie	199
Limestone Cave	202
Springs	204
Potential partnerships to deliver conservation for Crosstimbers Region	207
Conservation Landscapes in Ouachita Mountains, Arkansas River Valley, and Western Gulf Coastal Plain Region	209
Small River	210
White Oak/Hickory Mesic Forest	218
Oak/Hickory Bottomland Hardwood Forest	223
Gravel (hard)-bottom Streams and Associated Riparian Forests	229
Shortleaf Pine/Oak Woodland or Savannah	235
Shortleaf Pine Woodland and Forest	240
Large River	243
Mesic Loblolly Pine/Oak Forest	250
Springs and Seeps	253
Herbaceous Wetland	257
Tallgrass Prairie	262
Sandy (soft)-bottom Streams and Associated Riparian Forests	267
Post Oak/Blackjack Oak Woodland	271
Potential partnerships to deliver conservation for Ouachita Mountains, Arkansas River Valley, and Western Gulf Coastal Plain Region	275
Conservation Landscapes in Ozark Region	277
Small River	278
Limestone Cave	286
Springs	290
White Oak/Hickory Mesic Forest	294
Gravel-bottom Streams and Associated Riparian Forests	299
Shortleaf Pine-Oak-Hickory Woodlands	305
Herbaceous Wetland	310
Oak/Hickory Bottomland Hardwood Forest	315
Post Oak/Blackjack Oak-Hickory Woodlands and Forests	320
Tallgrass Prairie	325
Large River (Grand-Neosho River)	330
Potential partnerships to deliver conservation for Ozark Region	333

Chapter	Page
Appendices:	
A: Glossary	335
B: Maps used in the Development of the Oklahoma Comprehensive Wildlife Conservation Strategy	336
C: Management Plans and Habitat Plans Relevant to Oklahoma's Comprehensive Wildlife Conservation Strategy	345
D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria	352
E. Oklahoma's Species of Greatest Conservation Need Grouped by Priority Sets	359
F: Oklahoma Species Which Did Not Meet Greatest Conservation Need Selection Criteria	365
G: Oklahoma Species Listed with Scientific Names	369
H: Public Outreach, Oklahoma Department of Wildlife Conservation In-reach, and Coordination with Land Managers	386
I: Advisory Group Charter	408
J: Oklahoma's Comprehensive Wildlife Conservation Strategy – Public, Advisory Group, and Oklahoma Department of Wildlife Conservation Staff Input Workshops	410
K: Literature Cited	415
L: Acknowledgements	417

## Roadmap to the Eight Federal Required Elements

*(Specific crosswalk between elements and the Comprehensive Wildlife Conservation Strategy)*

This chapter is provided for those who are evaluating this document for the purpose of determining if Oklahoma's Comprehensive Wildlife Conservation Strategy process meets the eight Congressionally required elements.

Please refer to the following chapters and page numbers to examine how each required element was addressed in the development of the Comprehensive Wildlife Conservation Strategy. *The references to Regions/Conservation Landscapes are examples; please refer to the Table of Contents for page numbers to determine how those elements were addressed for each Region/Conservation Landscape.*

### Element 1:

Information on the distribution and abundance of species of wildlife, including low and declining populations as the state deems appropriate, that are indicative of the diversity and health of the state's wildlife:

Note: Each Conservation Landscape chapter within each Region contains a list of the species of greatest conservation need found in that habitat type. Each species population status is indicated in relative terms of low, medium, abundant, and unknown. Each species population trend is indicated in terms of relative terms of declining, stable, increasing, and unknown. Species are prioritized in tiers (i.e., sets) of I, II, and III based on their scores.

- A. The Strategy indicates sources of information (e.g., literature, data bases, agencies, individuals) on wildlife abundance and distribution consulted during the planning process.

Chapter	Page
Executive Summary and Statewide Perspective	2-4
Introduction and Purpose	5-6
Approach and Methods	7-13
Each Conservation Landscape chapter contains wording referring to best professional judgment as described in the Approach and Methods Chapter and Appendix D as the primary source of information rather than literature searches and data base searches. For example: Shortgrass Prairie Region: Conservation Landscape: Shortgrass Prairie	16
Appendix L: Acknowledgements	417-421

- B. The Strategy includes information about both abundance and distribution for species in all major groups to the extent that data are available. There are plans for acquiring information about species for which adequate abundance and/or distribution information is unavailable.

Chapter	Page
Each Conservation Landscape chapter contains a table listing the species of greatest conservation need found in that region's habitat as well as the population status and trend for each species. For example: Shortgrass Prairie Region: Conservation Landscape: Small Rivers and Sloughs/Ponds	28

	Chapter	Page
	Each Conservation Landscape chapter contains conservation issues and actions addressing species for which abundance and/or distribution information is unavailable/unknown. For example: Shortgrass Prairie Region: Conservation Landscape: Sand Plum/Sumac Shrubland	46
	Appendix D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria (all species were weighed against population status criteria; Appendix D lists only those selected as species of greatest conservation need)	352-358
C.	The Strategy identifies low and declining populations to the extent data are available.	
	Chapter	Page
	Each Conservation Landscape chapter contains a table listing the species of greatest conservation need found in that region's habitat as well as the population status and trend for each species. For example: Tallgrass Prairie Region: Conservation Landscape: Small River	58-59
	Appendix D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria (all species were weighed against population status criteria; Appendix D lists only those selected as species of greatest conservation need)	352-358
D.	All major groups of wildlife have been considered or an explanation is provided as to why they were not (e.g., including reference to implemented marine fisheries management plans). The State may indicate whether these groups are to be included in a future Strategy revision.	
	Chapter	Page
	Appendix D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria (all species were weighed against the selection criteria; Appendix D lists only those selected as species of greatest conservation need)	352-358
	Appendix F: Oklahoma Species Which Did Not Meet Greatest Conservation Need Criteria	365-368
	Appendix G: Oklahoma Species List with Scientific Names (a list of species found in Oklahoma)	369-385
E.	The Strategy describes the process used to select the species in greatest need of conservation. The quantity of information in the Strategy is determined by the State with input from its partners, based on what is available to the State.	
	Chapter	Page
	Approach and Methods	9
	Appendix D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria	352-358

Chapter	Page
(all species were weighed against the selection criteria; Appendix D lists only those selected as species of greatest conservation need)	

Element 2:

Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1):

Note: Key habitats are located within six geographic regions. “Conservation Landscape” in this Strategy is the term used to convey the concepts of “key habitats and community types” identified by Congress, and is considered to be synonymous with “habitat type,” “vegetation communities,” and “aquatic communities.” Each Conservation Landscape chapter defines the habitat’s relative condition in terms of poor, good, excellent, and unknown.

- A. The Strategy provides a reasonable explanation for the level of detail provided; if insufficient, the Strategy identifies the types of future actions that will be taken to obtain the information.

Chapter	Page
Approach and Methods	10
State Overview and Ecological Framework	13-14
Each Region introduction page contains prioritized sets of key habitats found in that region. For example: Shortgrass Prairie Region	15
Each Conservation Landscape chapter contains a statement about the relative condition and trend of that habitat. For example: Tallgrass Prairie Region: Conservation Landscape: Bottomland Hardwood Forest	76
Each Conservation Landscape chapter contains conservation issues and actions addressing incomplete data/information about that habitat. For example: Tallgrass Prairie Region: Conservation Landscape: Sandy (soft)-bottom Streams and Associated Riparian Forests	91-92

- B. Key habitats and their relative conditions are described in enough detail such that the State can determine where (i.e., in which regions, watersheds, or landscapes within the State) and what conservation actions need to take place.

Chapter	Page
State Overview and Ecological Framework	13-14
Each Region introduction page contains a prioritized list of key habitats (Conservation Landscapes) found in that region. For example: Shortgrass Prairie Region	15
Each Conservation Landscape chapter contains a statement about the relative condition and trend of that habitat. For example: Mixedgrass Prairie Region: Conservation Landscape: Gypsum or Sandstone Canyonlands and Gypsum Caves	112
Each Conservation Landscape chapter contains conservation issues and	125-126

Chapter	Page
actions addressing incomplete data/information about that habitat. For example: Mixedgrass Prairie Region: Conservation Landscape: Herbaceous Wetland	

Element 3:

Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats:

Note: Each Conservation Landscape chapter contains issue (i.e., problem) statements relative to managing the species of greatest conservation need in that habitat. Issues are listed in general order of priority.

- A. The Strategy indicates sources of information (e.g., literature, databases, agencies, or individuals) used to determine the problems or threats.

Chapter	Page
Executive Summary and Statewide Perspective	2-4
Introduction and Purpose	5-6
Approach and Methods	7-12
Each Conservation Landscape chapter contains wording referring to best professional judgment as described in the Approach and Methods Chapter and Appendix D as the primary source of information rather than literature searches and data base searches. For example: Mixedgrass Prairie Region: Conservation Landscape: Streams and Associated Riparian Forests	139
Appendix L: Acknowledgements (sources of best available information)	419-422

- B. The threats/problems are described in sufficient detail to develop focused conservation actions (for example, “increased highway mortalities” or “acid mine drainage” rather than generic descriptions such as “development” or “poor water quality”).

Chapter	Page
Each Conservation Landscape chapter contains conservation issue statements. For example: Mixedgrass Prairie Region: Conservation Landscape: Juniper Savannah or Woodlands	140-141

- C. The Strategy considers threats/problems, regardless of their origins (local, State, regional, national and international), where relevant to the State’s species and habitats.

Chapter	Page
Executive Summary and Statewide Perspective	2-4 9-10

	Chapter	Page
	Approach and Methods	
	Appendix L: Acknowledgements (technical questionnaire and conference participants included diversity and out-of-state input)	419-422

- D. If available information is insufficient to describe threats/problems, research and survey efforts are identified to obtain needed information.

	Chapter	Page
	Each Conservation Landscape chapter contains conservation issues addressing incomplete data/information about that species of greatest conservation need and the habitat that is necessary for determining effect conservation actions. For example: Crosstimbers Region: Conservation Landscape: Post Oak Blackjack Oak/Hickory Woodland and Forest	171

- E. The priority research and survey needs, and resulting products, are described sufficiently to allow for the development of research and survey projects after the Strategy is approved.

	Chapter	Page
	Approach and Methods	9-11
	Each Conservation Landscape chapter contains conservation issues addressing priority research and survey needs to provide incomplete data/information about that species of greatest conservation need and the habitat that is necessary for determining effective conservation actions. For example: Crosstimbers Region: Conservation Landscape: Herbaceous Wetlands	186

#### Element 4:

Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions:

Note: Each Conservation Landscape chapter contains action statements relative to addressing specific conservation issues. Actions are listed in general order of priority.

- A. The Strategy identifies how conservation actions address identified threats to species of greatest conservation need and their habitats.

	Chapter	Page
	Each Conservation Landscape chapter contains conservation action statements immediately following conservation issue statements. For example: Crosstimbers Region: Conservation Landscape: Limestone Cave	202-203

- B. The Strategy describes conservation actions sufficiently to guide implementation of those actions through the development and execution of specific projects and programs.

	Chapter	Page
	Each Conservation Landscape chapter contains conservation action	219-222

	Chapter	Page
	statements immediately following conservation issue statements. For example: Ouachita Region: Conservation Landscape: White Oak/ Hickory Mesic Forest	
C.	The Strategy links conservation actions to objectives and indicators that will facilitate monitoring and performance measurement of those conservation actions (outlined in Element #5).	
	Chapter	Page
	Approach and Methods	9-12
	Each Conservation Landscape chapter contains a list of potential indicators for monitoring the effectiveness of the conservation actions; project writers may select from these lists and/or develop indicators more suitable to their proposed projects. For example: Ouachita Region: Conservation Landscape: Shortleaf Pine Woodland and Forest	242
D.	The Strategy describes conservation actions (where relevant to the State's species and habitats) that could be addressed by Federal agencies or regional, national or international partners and shared with other States.	
	Chapter	Page
	Executive Summary and Statewide Perspective	2-4
	Each Conservation Landscape chapter contains conservation actions that may be addressed independent of the Oklahoma Department of Wildlife Conservation. For example: Ouachita Region: Conservation Landscape: Springs and Seeps	253-255
E.	If available information is insufficient to describe needed conservation actions, the Strategy identifies research or survey needs for obtaining information to develop specific conservation actions.	
	Chapter	Page
	Each Conservation Landscape chapter contains conservation actions addressing priority research and survey needs to provide incomplete data/information about that species of greatest conservation need and the habitat that is necessary for determining effective conservation actions. For example: Ouachita Region: Conservation Landscape: Post Oak/Blackjack Oak Woodland	272
	Appendix E: Oklahoma's Species of Greatest Conservation Need Grouped by Priority Sets	359-364
F.	The Strategy identifies the relative priority of conservation actions.	
	Chapter	Page
	Executive Summary and Statewide Perspective	2-4

Chapter	Page
Approach and Methods	9-12
Each Conservation Landscape chapter contains conservation actions listed in general priority order. For example: Ozark Region: Conservation Landscape: Springs	291-293

Element 5:

Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions:

Note: Monitoring is addressed in the Approach and Methods chapter. Project writers may submit project proposals to monitor species of greatest conservation need and/or habitats. The primary source of monitoring is that of utilizing the best professional judgment available. This Strategy was built upon the best professional judgment available and will be reviewed and updated in future years utilizing the best professional judgment available.

- A. The Strategy describes plans for monitoring species identified in Element #1, and their habitats.

Chapter	Page
Approach and Methods	11-12
Each Conservation Landscape chapter ends with a list of potential measurable objectives for monitoring the effectiveness of conservation actions. For example: Ozark Region: Conservation Landscape: Shortleaf Pine-Oak-Hickory Woodlands	309

- B. The Strategy describes how the outcomes of the conservation actions will be monitored.

Chapter	Page
Approach and Methods	11-12
Each Conservation Landscape chapter contains a list of potential measurable objectives for monitoring the effectiveness of conservation actions. For example: Ozark Region: Conservation Landscape: Post Oak/Blackjack Oak-Hickory Woodlands and Forests	324

- C. If monitoring is not identified for a species or species group, the Strategy explains why it is not appropriate, necessary or possible.

Chapter	Page
Monitoring for species is identified	n/a

- D. Monitoring is to be accomplished at one of several levels including individual species, guilds, or natural communities.

Chapter	Page
Approach and Methods	11-12

	Chapter	Page
	(i.e., monitoring of species populations, project deliverables, progress and effectiveness of conservation actions, and overall effectiveness of the Comprehensive Wildlife Conservation Strategy)	
	Each Conservation Landscape chapter contains a list of potential measurable objectives for monitoring the effectiveness of conservation actions. For example: Ozark Region: Conservation Landscape: Tallgrass Prairie	329
E.	The monitoring utilizes or builds on existing monitoring and survey systems or explains how information will be obtained to determine the effectiveness of conservation actions.	
	Chapter	Page
	Approach and Methods	11-12
	Each Conservation Landscape chapter contains a list of potential measurable objectives for monitoring the effectiveness of conservation actions. For example: Ozark Region: Conservation Landscape: Large River	332
	Appendix C: Management Plans and Habitat Plans Relevant to Oklahoma's Comprehensive Wildlife Conservation Strategy (project writers are encouraged to review other management plans and utilize available monitoring systems)	345-351
F.	The monitoring considers the appropriate geographic scale to evaluate the status of species or species groups and the effectiveness of conservation actions.	
	Chapter	Page
	Approach and Methods	9-11
	State Overview and Ecological Framework	13-14
G.	The Strategy is adaptive in that it allows for evaluating conservation actions and implementing new actions accordingly.	
	Chapter	Page
	Approach and Methods	10-11

Element 6:

Descriptions of procedures to review the Comprehensive Wildlife Conservation Strategy at intervals not to exceed 10 years:

Note: Reviewing and updating the Strategy is addressed in the Approach and Methods chapter. The Strategy will be updated in five to seven year intervals.

A.	The State describes the process that will be used to review the Strategy within the next ten years.	
	Chapter	Page
	Approach and Methods	12

Element 7:

Plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Comprehensive Wildlife Conservation Strategy with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats:

Note: In keeping with the partnership theme of developing this Strategy and for implementing conservation actions, the Strategy will be reviewed and updated utilizing the best professional advice available. We will also continue to seek input from the general public and specific interest groups.

- A. The State describes the extent of its coordination with and efforts to involve Federal, State and local agencies, and Indian Tribes in the development of its Strategy.

Chapter	Page
Approach and Methods	7-9
Appendix L: Acknowledgements	417-421

- B. The State describes its continued coordination with these agencies and tribes in the implementation, review and revision of its Strategy.

Chapter	Page
Approach and Methods	12

Element 8:

Provisions to ensure public participation in the development, revision, and implementation of projects and programs. Congress has affirmed that broad public participation is an essential element of this process:

Note: In keeping with the partnership theme of developing this Strategy and for implementing conservation actions, the Strategy will be reviewed and updated utilizing the best professional advice available and broad public input.

- A. The State describes the extent of its efforts to involve the public in the development of its Strategy.

Chapter	Page
Approach and Methods	7-9
Appendix H: Public Outreach, Oklahoma Department of Wildlife Conservation In-reach, and Coordination with Land Managers	386-407
Appendix I: Advisory Group Charter	408-409
Appendix J: Oklahoma's Comprehensive Wildlife Conservation Strategy – Public, Advisory Group, and Oklahoma Department of Wildlife Conservation Staff Input Workshops	410-414
Appendix K: Literature Cited	415-416
Appendix L: Acknowledgements	417-421

- B. The State describes its continued public involvement in the implementation and revision of its Strategy.

	Chapter	Page
	Executive Summary and Statewide Perspective	3-4
	Approach and Methods	8, 10-12

## Foreword

*From Horny Toads to Bobwhites*

History tells us that the Oklahoma Department of Wildlife Conservation has made great strides in fish and wildlife conservation since statehood. Oklahoma's fisheries resources, from Paddlefish to Largemouth Bass to Crappie and Catfish, are probably more abundant and more available to anglers than ever before. Likewise, White-tailed Deer and Wild Turkey are also more abundant today than possibly anytime in history.

These accomplishments were made possible by conservationists (i.e., anglers and hunters) who were willing to fund scientific management and provide resources for fish and wildlife habitat. However, some areas of the conservation effort have been historically under funded.

While White-tailed Deer, Wild Turkey and Largemouth Bass have benefited from sportsmen's dollars, their funding support has not been enough to address the needs of all 800-plus wildlife species in the state. That is why it has been so important for us to develop this Comprehensive Wildlife Conservation Strategy. This Strategy will serve as the blueprint for successfully establishing habitat management strategies that ensure the viability of all our native fish and wildlife.

We have endeavored to involve stakeholders in the process (e.g., state and federal agencies, Indian tribes, farm and ranch groups, conservation and sportsmen's groups, academic professionals, and other Oklahomans with an interest in wildlife). As a result, this Strategy is not about regulations. It is about positive ways to conserve wildlife and habitat, thus passing on a healthy wildlife legacy to future generations.

In Oklahoma we have:

- 18 Federally threatened or endangered animal species (U.S. Fish and Wildlife Service, 2004),
- four species in the pipeline as "candidate species" for listing (U.S. Fish and Wildlife Service, 2004),
- 29 percent of our fish species are rare or declining, according to the Oklahoma Department of Wildlife Conservation,
- 32 percent of our freshwater mussel species are considered species of conservation concern, according to the American Fisheries Society in 1996, and
- 26 species of our breeding land birds that have experienced population declines of 45 percent or more over the past 35 years, according to the U.S. Geological Survey Breeding Bird Survey in 2003.

Instead of focusing on single species in isolated areas, the conservation strategy focuses on the steps needed to protect, restore, and enhance habitat types (Conservation Landscapes) such as our native prairies thereby benefiting many species. We are looking at this strategy and subsequent funding as the key to our future successes as stewards and caretakers of Oklahoma's wildlife. And although the Department of Wildlife Conservation was responsible for preparing this Strategy, it was done for all Oklahomans and all of Oklahoma's wildlife resources.

*"As soon as we take one thing by itself, we find it hitched to everything in the Universe."*  
John Muir

## **Executive Summary and Statewide Perspective**

### *Keeping Oklahoma's Common Species Common*

The development of Oklahoma's Comprehensive Wildlife Conservation Strategy is based upon guidance provided by Congress, the U.S. Fish and Wildlife Service, and the International Association of Fish and Wildlife Agencies. This Strategy is designed to not only meet the Congressional requirements but also to provide a menu of choices for wildlife conservation partners. Partners may choose between Oklahoma's regions, species of greatest conservation need, Conservation Landscapes (key habitats), issues, actions, monitoring mechanisms, and partnerships. Because elements in the Strategy are generally prioritized, conservation partners are encouraged to focus their attention to top priorities.

This is a Conservation Strategy for the State of Oklahoma, not just for the Department of Wildlife Conservation. Therefore at the earliest stages in the development of the Strategy, other stakeholders were brought into the process. Fifty individuals representing 35 state and federal agencies and non-governmental organizations formed an Advisory Group to the Oklahoma Department of Wildlife Conservation Planning Team. Technical input was sought from over 450 technical experts in fish and wildlife conservation from both within and outside the Department. The public was invited to participate in Strategy development through two rounds of statewide meetings (five meetings held in each round) and through interaction via the Internet. Internal stakeholders of the Oklahoma Department of Wildlife Conservation were also invited to participate through two rounds of statewide employee meetings (five meetings held in each round), through interaction via the Internet and through various internal communications.

Oklahoma's Comprehensive Wildlife Conservation Strategy is not a traditional scientific/research study by a single scientist. It is based on the professional judgment and the best available existing information contributed by more than 150 technical experts representing various aspects of the Oklahoma's ecology and land management. Stakeholder and technical information were gathered through:

- public and Department staff input meetings,
- a questionnaire that captured the species distribution and abundance information and habitat status and trend information,
- a two-day conference that brought together more than 100 experts to review and confirm the technical information (that was gathered through a questionnaire) and to identify relevant issues, conservation actions, monitoring strategies, and potential partners for each of the Conservation Landscapes within each geographic region, and
- two rounds of public reviews that were conducted on the draft Comprehensive Wildlife Conservation Strategy.

The results of stakeholder and technical expert participation produced multiple lists of conservation issues that eventually evolved into those addressed in this Strategy. The initial meetings (i.e., Advisory Group, public and Department staff) identified broad priority issues about the conservation of Oklahoma's wildlife including (1) habitat, (2) constituent needs, (3) funding, (4) personnel needs, and (5) exotic and invasive species that are either too abundant or in the wrong locations. The technical experts and stakeholders participating in the two-day conference identified a more focused level of priority issues about the management of Oklahoma's species of greatest conservation need and key habitats (i.e., Conservation Landscapes) including: (1) existing data gaps impede effective conservation planning and implementation, (2) land management practices that over time have changed the structure of habitats over large areas, (3) fragmentation and conversion of habitat, (4) invasive exotic plants and animals, and (5) water quality and quantity changes that affect habitat conditions. As a result of public and technical expert reviews on drafts of the Strategy, practically all of the issues can now be placed under one of the following subject headings:

- incomplete data/information regarding species of greatest conservation need and key habitats that are necessary to determine the most effective conservation actions,
- invasive and exotic species that negatively impact species of greatest conservation need and key habitats,
- land and water uses that do not consider impacts on species of greatest conservation need and key habitats, and

- the impacts of water quantity (i.e., loss of water) and quality (i.e., pollution) on species of greatest conservation need and habitats.

In addition, a common theme evolved throughout the development of this Strategy that encourages conservation actions being implemented with consideration for building partnerships, operating with open communications, and utilizing all available land management programs. Through on-going communication and coordination among all stakeholders, Oklahoma's Comprehensive Wildlife Conservation Strategy will remain a vital adaptive template for future fish and wildlife conservation efforts. Federal agencies and regional, national and international partners are encouraged to use this Strategy as a guide for their own activities and are encouraged to share the results of their efforts with other States.

We would be remiss to complete this Comprehensive Wildlife Conservation Strategy without addressing three critical aspects of wildlife management: education and outreach, recreation, and law enforcement. Congress has made it clear that the intent of the State Wildlife Grant Program is to deliver "on-the-ground" conservation actions. While this approach is commendable, major support functions are unfunded.

#### Education and outreach:

Education and outreach is a necessary component of successful wildlife conservation and Congress has allowed up to 10 percent of each State Wildlife Grant project to be spent in this area.

Congress has affirmed that broad public participation is an essential element in developing the state's Comprehensive Wildlife Conservation Strategies, requiring of the states "public participation in the development, revision, and implementation of projects and programs." There is federal funding for public interaction during the development of the strategies but there is no consistent funding mechanism within the State Wildlife Grants program for continued public awareness of project implementation. The State Wildlife Grants program is lacking a necessary component for conservation success: education and outreach.

It is difficult to accomplish conservation changes without public support of conservation projects and programs on both the behavioral and philosophical levels. More than 97 percent of Oklahoma's land area is owned by private citizens. Wildlife research and management on public lands alone are not enough to bring about significant conservation changes necessary to keep species and habitats healthy. It is vital to the success of conservation efforts in the state of Oklahoma that our citizens are not only aware of conservation projects but take action to support conservation projects, be it through on-the-ground implementation on private lands or through more intangible support methods such as adopting the mindset of a wildlife conservation steward. A number of partnerships should be pursued to raise awareness of conservation issues among the public. These partnerships could include working with the Oklahoma Department of Education to incorporate conservation education materials into school curricula, or collaborating with museums, nature centers, zoological parks and state parks to provide conservation information that is relevant to Oklahoma.

Oklahoma successfully melded conservation, education, and outreach through the creation of the non-profit Oklahoma Wildlife and Prairie Heritage Alliance in northwestern Oklahoma. The Alliance was made possible by the federal Wildlife Conservation and Restoration Program, a precursor to the State Wildlife Grants program. The Alliance encourages conservation of Oklahoma's wildlife and prairie heritage by increasing landowners' awareness of incentive funding, technical assistance, education, and rangeland program guidance. The Alliance is helping involve landowners with conservation programs to restore playa wetland habitats, Short-grass Prairie habitats and in the development of a road based, wildlife-viewing trail, which is projected to increase state revenue by a minimum of \$114 million by increasing domestic travel in Oklahoma. With so much of Oklahoma's land under private management, the Alliance's outreach and education has been more instrumental than anything the Wildlife Department alone could have achieved through only research and conservation management. The Alliance is an example of unquantifiable returns received from investing conservation funds into public outreach and education efforts.

The State Wildlife Grants Program exists as a solution to the nation's ever-growing number of threatened and endangered species, which often require costly and intrusive recovery efforts. Congress recognizes the importance of public support and education to proactively manage the nation's wildlife. Oklahoma recommends allowing a portion of the State Wildlife Grants to be spent on achieving such support.

#### Recreation:

Oklahomans take great pride in their wildlife heritage. In 2001, over 1.1 million people participated in wildlife watching activities in Oklahoma (U.S. Department of the Interior, et al. 2002). The number of wildlife watching enthusiasts outnumbered participants in both hunting (261,000) and fishing (774,000). Twenty-seven percent of Oklahomans enjoyed birding activities, surpassing other states in the West South Central U.S. Fish and Wildlife Service administrative region (Texas 14 percent, Louisiana 16 percent, and Arkansas 24 percent) as well as the national average of 22 percent (USFWS 2003b).

Wildlife watching contributes significantly to Oklahoma's economy as well. Participants spent \$193.2 million in wildlife-watching activities during 2001, yielding 6,141 jobs, and a total economic impact of \$370 million (USFWS 2003a). Wildlife observation, feeding, and photography were popular activities away from home, while wildlife feeding, observation, and habitat enhancement were important activities for participants around their home.

Despite the popularity of wildlife watching activities in Oklahoma, very little funding is available to the Department for enhancement of non-consumptive recreational opportunities. It is appropriate for all wildlife enthusiasts to contribute financially to the management of Oklahoma's wildlife, not just hunters and anglers. In the long-term it will be necessary to secure funding from wildlife watching enthusiasts at both the federal and state level, mirroring the Sport Fish and Wildlife Restoration Programs. Future funding for State Wildlife Grants (or a similar program) should allow up to 10 percent of funds to be spent on enhancement of wildlife recreation activities related to species of greatest conservation need.

#### Law Enforcement:

The success of the Sport Fish and Wildlife Restoration Programs cannot be disputed. Fish and game are perhaps more abundant in the United States today than in any time during the last century. However, one limitation to the Sport Fish and Wildlife Restoration programs is the prohibition against grant funding of routine law enforcement activities. Although the exclusion of field investigations was logical during the early years when funding for conservation, research, and habitat management were scarce, it is time to reconcile the U.S. Fish and Wildlife Service Federal Assistance programs with the current needs of state fish and wildlife agencies. It is undeniable that routine patrol activities conducted in the enforcement of hunting and fishing regulations are a valuable contribution to wildlife conservation. It is appropriate for Congress to consider additional funding sources and appropriations to include some level of wildlife law enforcement as eligible grant activities.

Using the same logic, it would be short-sighted to invest in the management of species of greatest conservation need but make no provisions for protection of those species. Yet that is just what may happen if State Wildlife Grants receives permanent funding but continues to designate law enforcement activities as ineligible. Enforcement of fish and wildlife laws is just as important as the management of populations and their habitat. Without an effective regulatory field presence, increased management of species of greatest conservation need will be inefficient at best, ineffective at worst. Future federal funding for State Wildlife Grants (or a similar program) should allow up to 10 percent of funds to be spent on law enforcement activities related to species of greatest conservation need.

## Introduction and Purpose

For years, fish and wildlife conservation in Oklahoma and in the Nation has been funded primarily by sportsmen and sportswomen. Funds are generated by two main sources: (1) the sale of state fishing and hunting licenses and (2) federal excise tax revenue from the sale of fishing and hunting equipment (i.e., apportioned back to states through the U.S. Fish and Wildlife Service according to set formulas). This system has been very effective at funding conservation of species that are hunted or fished. Under a separate funding mechanism, conservation of federally endangered and threatened species has also been possible through the Endangered Species Act. However, a reliable funding mechanism had not been established to adequately address the approximate 80 percent of species that are not hunted, fished, endangered, nor threatened.

In the latter part of the 20th Century, visionary leaders in the field of fish and wildlife conservation sought to provide a new source of funding for all species. In Oklahoma alone, a coalition of 175 sportsmen and women and conservation-minded agencies and organizations lobbied for passage of the necessary legislation at the national level.

The results have been encouraging. The Commerce, Justice and State Appropriations Act of FY 2001, Title IX, Public Law 106-553, created the Wildlife Conservation and Restoration Program. Although this act provided only one year's appropriation of funds for fish and wildlife conservation, it identified the elements required to be included in the "Wildlife Conservation Strategy and Plan" that states committed to develop by October 2005. A second act, the Department of the Interior and Related Agencies Appropriations Act of 2002, Public Law 107-63, Title 1, created a "State Wildlife Grants Program" and required the states to develop a "Comprehensive Wildlife Conservation Plan" by October 2005.

Oklahoma's Comprehensive Wildlife Conservation Strategy meets the requirements of both federal acts. This Strategy is not a traditional scientific/research study by a single scientist. It is based on the best available existing information contributed by more than 150 technical experts and numerous publics representing various aspects of Oklahoma's ecology and land management. It is truly a Strategy for Oklahoma, not just for the Oklahoma Department of Wildlife Conservation.

The enabling legislation, along with regulations governing the State Wildlife Grants and related programs, requires that Comprehensive Wildlife Conservation Strategies include the following elements:

1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the Oklahoma Department of Wildlife Conservation deems appropriate, that are indicative of the diversity and health of Oklahoma's wildlife;
2. Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1);
3. Descriptions of issues which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;
4. Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions;
5. Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions;
6. Descriptions of procedures to review the Comprehensive Wildlife Conservation Strategy at intervals not to exceed 10 years;
7. Plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Comprehensive Wildlife Conservation Strategy with federal, state, and local agencies and Indian tribes that manage significant land and water areas within Oklahoma or administer programs that significantly affect the conservation of identified species and habitats; and

8. Provisions to ensure public participation in the development, revision, and implementation of projects and programs. Congress has affirmed that broad public participation is an essential element of this process.

This Strategy is the result of a process that was specifically designed to meet the above required elements. Although this Strategy is required in order for Oklahoma to participate in the State Wildlife Grants Program, its purpose is far more basic. This Strategy began with species of greatest conservation need for Oklahoma and quickly transformed into a plan that identifies the key habitats (i.e., Conservation Landscapes) of the state and the most significant issues/threats to those habitats. The essence of this document is the identification of priority conservation actions that can and must be taken by all individuals, agencies, and organizations in order to conserve Oklahoma's wild heritage. The job of preserving and managing all of Oklahoma's fish and wildlife is too big for any one group or agency to achieve alone. This Strategy identifies a roadmap of actions that can be used by everyone for years into the future.

## Approach and Methods

### Organizational structure:

The Oklahoma Department of Wildlife Conservation chose to partner with a contractor (Dynamic Solutions Group, LLC) to develop the Comprehensive Wildlife Conservation Strategy. Once the necessary contract documents were in place, Oklahoma Department of Wildlife Conservation and Dynamic Solutions Group personnel met in Oklahoma to form a Planning Team (members are listed in Appendix L: Acknowledgements) and to develop a detailed workplan. This meeting occurred November 17-19, 2003, and was also attended by Bob Anderson, U.S. Fish and Wildlife Service, Albuquerque, as an observer. The Planning Team shared all responsibilities for project design and communicated through a special email distribution list. In the early stages and intermittently as needed after that, the Oklahoma Department of Wildlife Conservation and Dynamic Solutions Group project leaders held regular telephone conversations.

An Advisory Group (members are listed in the Appendix L: Acknowledgements) was formed of agencies and organizations best suited to assist with the process of developing the Comprehensive Wildlife Conservation Strategy. This group met once in person on January 8, 2004 and communicated continuously via email. A charter (see Appendix I: Advisory Group Charter) defined and detailed the roles and responsibilities of the Advisory Group, Oklahoma Department of Wildlife Conservation, and Dynamic Solutions Group.

Oklahoma's Comprehensive Wildlife Conservation Strategy was not to be a traditional scientific/research study by a single scientist. It was to be based on the best available existing information from a wide variety of publics and technical experts representing various aspects of the Oklahoma's ecology and land management. As such, the Planning Team chose an aggressive approach to public involvement based on the axiom of "early and often," including offering opportunities for early and continual input through websites and in an early round of internal and external public meetings. The March 1-5, 2004, public meetings and a website were publicized through three news releases, the Outdoor Oklahoma magazine (Oklahoma Department of Wildlife Conservation product), through the Advisory Group (they were asked to spread the news in their own organizations and publications), twice in the Oklahoma Department of Wildlife Conservation monthly employee newsletter (Wildlife-O-Gram), on the Oklahoma Department of Wildlife Conservation website, on the Outdoor Oklahoma television show (Oklahoma Department of Wildlife Conservation product), in a direct letter to Tribal leaders, in The Wild Side newsletter (Oklahoma Department of Wildlife Conservation product to approximately 15,000 wildlife enthusiasts), in a special postcard mailing to The Wild Side newsletter recipients, as well as interviews with several influential media personalities in the state. Each evening public meeting was preceded by an afternoon voluntary-staff meeting in the same city. These sessions provided early input on issues and strategies related to management of Oklahoma resources.

Although the Planning Team decided not to create an official technical committee, more than 450 technical experts were invited to provide distribution and abundance information on the species of greatest conservation need. Early communication with these experts was conducted almost entirely by email. After several rounds of review and revision, the technical information on species, regions, habitats, population status and trend, and habitat status and trend was compiled into a 99-page workbook that served as a handout for the "Oklahoma's Wildlife Future Conference," held on the campus of Oklahoma State University, July 13-14, 2004. Recognized Oklahoma dignitaries who helped stimulate attendance and motivate thoughtful participation in the conference included Oklahoma Department of Wildlife Conservation Director Greg Duffy, Oklahoma Secretary of the Environment Miles Tolbert, and Oklahoma State University President David Schmidly. Attendance was open to all, as well as those specifically invited. Conference publicity included two news releases, Advisory Group contacts, the Wildlife-O-Gram, the website, The Wild Side newsletter, Your Side of the Fence (an Oklahoma Department of Wildlife Conservation newsletter to

landowners), Outdoor Oklahoma magazine, and individual contacts. The conference purpose was to help produce the first draft Comprehensive Wildlife Conservation Strategy. Over two days, the approximately 110 conference participants resolved remaining data discrepancies, but mainly focused on conservation issues, conservation actions, research and survey needs, monitoring mechanisms, plus identifying partnerships important in implementation. This conference ended the intensive data-gathering phase.

The writing phase began as soon as the conference adjourned, with the first draft of the Comprehensive Wildlife Conservation Strategy completed in September 2004. The Internet again proved highly useful in the several rounds of review and modifications, leading to a second round of internal (i.e., Oklahoma Department of Wildlife Conservation) and external (i.e., technical experts, specific interests, and other stakeholders) meetings in March 2005. The final report was produced in July 2005.

### Public involvement and partnerships:

Our approach to the two important topics of public involvement and partnerships was based on the twin premises that (1) the public must be involved for an endeavor such as this to be successful and (2) that fish and wildlife conservation in the future is simply too big a job for any one agency or organization (i.e., mandating an emphasis on partnerships). Immediately following completion of the project workplan in November 2003, work began on public involvement and partnership development. A portion of the initial workplan development meeting was devoted to stakeholder identification that started with the Conservation and Reinvestment Act Coalition list (which contained over 300 names). News releases announcing the inauguration of the Strategy development process, television and radio interviews, notices on the Department website, letters to targeted stakeholder groups, postcards to literally thousands of potential partners, the first round of internal and external public meetings, the creation and use of the Advisory Group, the work over the Internet with the hundreds of technical experts (i.e., conservation partners), the Oklahoma's Wildlife Future conference, several iterations of the draft report, and the second round of internal and external public meetings were all part of the concentrated public involvement and partnership development effort.

A complete chronological log of public involvement, partnership development, and communication throughout this project can be found in Appendix H: Public Outreach, Oklahoma Department of Wildlife Conservation In-reach, and Coordination with Land Managers.

As important as public involvement and partnerships have been in the development of this Strategy, nothing could be as important as their role in implementing specific conservation actions, monitoring progress, and revising the Strategy as needed.

### Coordination with other agencies and tribes:

Other agencies were notified by letter of the process for strategy development almost as soon as it began. A partial list of cooperators is contained in the listing of Advisory Group members in Appendix L: Acknowledgements. Potential partnerships with other agencies are also listed on the last page of each region chapter.

Tribes were given special consideration. They were specifically, directly, and individually notified of the process, invited to participate in public meetings, invited to provide technical expertise, invited to the conference, invited to comment on the various drafts, and invited to the second round of public review meetings. Assistance in communicating with tribes was provided by tribal coordinators in the U.S. Fish and Wildlife Service in Albuquerque and in Bureau of Indian Affairs in Washington, D.C. Tribal members or representatives participated in public meetings, providing technical input, attended the conference, and reviewed draft documents.

### Assigning species of greatest conservation need to key habitats:

Oklahoma's species of greatest conservation need were assigned to habitats (referred to in the text as Conservation Landscapes) by technical stakeholders. Methods to gather the data were a technical questionnaire, an Oklahoma's Wildlife Future Conference, and reviews of the Comprehensive Wildlife Conservation Strategy. Only the Big Cedar Grasshopper (*Eximacris phenax*) has not been assigned to a habitat.

### Identifying priorities, issues, actions:

The planning model followed in Oklahoma included the identification of species of greatest conservation need, geographic regions, Conservation Landscapes, conservation issues, conservation actions, potential indicators to monitor to evaluate progress, and partners who may help with implementation. The Comprehensive Wildlife Conservation Strategy was developed with an understanding that it is Oklahoma's Strategy, not just a Strategy for the Oklahoma Department of Wildlife Conservation. The priorities identified in the Strategy are meant to serve as guidance and to help focus the efforts of all conservation agencies and partners working in Oklahoma.

In the planning model used to develop this Comprehensive Wildlife Conservation Strategy, priorities were set for species of greatest conservation need, Conservation Landscapes within regions, and issues and actions within Conservation Landscapes. This means that when fiscal and human resources are allocated in the implementation phase, resources will be allocated first to higher ranked actions.

### Prioritizing species of greatest conservation need:

Using the following set of six selection criteria, all species in Oklahoma were evaluated as candidates for being listed as species of greatest conservation need:

- Species which are listed as federal candidate, threatened or endangered species under the ESA.
- Species which are classified as state species of special concern, threatened or endangered species (OAC Title 800).
- Species which have been assigned global ranking scores of G1, G2 or G3 by the network of state Natural Heritage Inventory programs.
- Species which have been identified as conservation priorities through a range-wide status assessment, or assessment of large taxonomic divisions. Examples of these include: assessments of freshwater fish, freshwater mussels and crayfish by the American Fisheries Society, and bird conservation plans such as the national Partners In Flight Conservation Plan, the North American Waterfowl Conservation Plan and the U.S. Shorebird Conservation Plan.
- Reptile, amphibian, fish and mussel species which are subject to commercial harvest in Oklahoma but are not eligible for funding under existing Federal Assistance Programs in order to monitor or periodically assess their status.
- Species which are regionally endemic regardless of their conservation status.

Once selected, species of greatest conservation need were then ranked according to the following five ranking criteria:

- Natural Heritage Global Rank.
- Availability of Other Federal Assistance Funding Sources.
- Percent of population size or geographic range within Oklahoma.
- Trend in population size or geographic range over the past 40 Years.
- Availability of existing data to support inclusion of the species as a species of greatest conservation need.

A detailed explanation of the selection criteria and the scoring criteria is located in Appendix D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria. For priorities see Appendix E: Oklahoma's Species of Greatest Conservation Need Grouped by Priority Sets.

Prioritizing research and survey needs:

Conservation landscapes or habitat types were identified based upon the vegetation communities identified in the draft Oklahoma Gap Analysis Project (Fisher et. al. 2002) and the game types identified in the Game Type Map of Oklahoma (Duck and Fletcher 1943). Key habitat types were those that occurred naturally in Oklahoma and supported a suite of species on the list of species of greatest conservation need. Twenty-four habitat types were identified, and a description of each is provided in the regions(s) where it occurs. As part of the habitat description, we have listed the recognized plant communities that are associated with each habitat type. These lists of plant communities are based upon the Oklahoma Natural Heritage Inventory publication “The Vegetation of Oklahoma: A Classification for Landscape Mapping and Conservation Planning” by Bruce Hoagland, 2000.

Conservation landscapes (habitats) were prioritized by a group process involving technical experts, specific interests, and other stakeholders within each geographic region. The six geographic regions were not prioritized. The species of greatest conservation need were prioritized according to their score and tier designation as detailed in Appendix D: Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria. For priorities see Appendix E: Oklahoma's Species of Greatest Conservation Need Grouped by Priority Sets.

Research and survey efforts (e.g., State Wildlife Grants) should first address the needs identified for the highest priority Conservation Landscapes (i.e., those listed first within each geographic region); and secondly, according to the species of greatest conservation need tier/score designations. Those species of greatest conservation need having an “unknown” status/trend are of particular priority for research and/or survey efforts. Also, in each Conservation Landscape chapter, the first (i.e., top priority) conservation issue addresses the need for providing more complete data on species of greatest conservation need and their habitats.

Prioritizing key habitats (Conservation Landscapes), issues and actions:

Within each region, key Conservation Landscapes were ranked based upon four factors: 1) the uniqueness of each Conservation Landscape to that region, 2) the number of tier I species of greatest conservation need occurring within each Conservation Landscape, 3) the number of tier II species of greatest conservation need occurring within each Conservation Landscape, and 4) the number of tier I and tier II species of greatest conservation need that were unique or endemic to that Conservation Landscape. Once evaluated, the Conservation Landscapes within each region were grouped into three categories of conservation priority: 1) very high, 2) high, and 3) moderate. Conservation Landscapes were not ranked further with each of the three categories of conservation priority; therefore the order in which Conservation Landscapes are listed within each priority category does not imply rank or importance. For purposes of the Comprehensive Wildlife Conservation Strategy, no attempt was made to prioritize regions or Conservation Landscapes across regions.

“Conservation issues” in this Strategy is the term used for the “conservation problems” identified by Congress (i.e., required element 3). Issues and conservation actions were identified and prioritized by a group process involving technical experts, specific interests, and other stakeholders according to their impact on conservation and management of the species of greatest conservation need.

## Adaptive management and monitoring:

### Adaptive Management:

Adaptive management has been used by planners and managers for decades. Adaptive management involves four essential pieces: (1) developing plans, (2) implementing those plans, (3) monitoring the effects of management actions, and (4) adjusting future plans. This approach is being applied in Oklahoma.

### Monitoring:

Potential monitoring approaches are identified for conservation actions within each Conservation Landscape. Monitoring is crucial to employing adaptive management approaches and assuring that conservation actions are having the desired results.

In keeping with the concepts behind the design of the Comprehensive Wildlife Conservation Strategy approach and advice from U.S. Fish and Wildlife Service, and International Association of Fish and Wildlife Agencies, at first Oklahoma's monitoring will employ existing surveys and inventories, including monitoring being done by conservation partners. Monitoring will initially be keyed to priority research and survey needs to obtain basic information. Monitoring will also be used to determine when conservation actions have adequately ameliorated conservation issues. When conservation success is not what was anticipated, monitoring will allow plans to be updated and altered so that new actions can be developed and implemented – the “adaptive” part of adaptive management. In a number of cases, monitoring or research will need to be the first step to determine existing conditions where this basic knowledge does not now exist.

As implementation of the Comprehensive Wildlife Conservation Strategy proceeds and knowledge builds, monitoring (i.e., through the actions and approaches identified for individual actions, issues and habitats) will shift to tracking tangible achievement of resource conservation. Again, in many cases, monitoring will rely heavily on conservation partners. As knowledge accumulates and conservation issues are solved, or managed significantly, new conservation actions will become possible.

In summary, the following items have been identified for monitoring purposes:

- **Species of greatest conservation need population status and trends and key habitat status and trends:** Although there are very effective efforts (e.g., Natural Heritage Inventory) currently in place for tracking species populations, providing species of greatest conservation need data specific to Conservation Landscapes are incomplete. Likewise, key habitat data (i.e., quantity, quality, and trends) are also incomplete. In each Region/Conservation Landscape chapter of this Strategy are monitoring actions to guide project writers. Monitoring of species will also incorporate the best professional advice available during the Strategy review and update process (i.e., a process similar to the July 2004, Wildlife Future Conference).
- **Project deliverables and connection to conservation actions addressed:** The operational aspect of this Strategy is the development and implementation of projects (e.g., State Wildlife Grants). The required elements for developing this Strategy do not specifically address implementation (i.e., operational actions). Never-the-less, the overall effectiveness of the Strategy will greatly depend on the success of projects funded. Operationally, each individual project agreement will identify specific deliverables addressing specific conservation actions outlined in the Strategy. Projects will be monitored to insure deliverables are received within the guidelines and purchasing regulations of the state of Oklahoma and grant requirements of the Federal Assistance Division of the U.S. Fish and Wildlife Service.

- **Progress on conservation actions:** Each Conservation Landscape chapter contains a list of potential measurable objectives for monitoring the effectiveness of conservation actions. The lists are provided so that project writers may choose and/or add their own measurements. Progress on conservation actions will entail at least two processes. The Department of Wildlife Conservation will monitor projects (i.e., State Wildlife Grants and other Department funded projects) and results that address specific conservation actions. Conservation partners will be periodically surveyed about their activities toward specific conservation actions. The survey of conservation partners will be incorporated into the Strategy review and revision process (i.e., a process similar to the July 2004, Wildlife Future Conference) outlined below in the “Strategy review and revision” section.
- **Overall effectiveness of the Comprehensive Wildlife Conservation Strategy (i.e., impact by projects funded and actions/issues addressed):** The overall effectiveness of the Strategy will be incorporated into the Strategy review process (i.e., similar to the July 2004, Wildlife Future Conference) as outlined below. Using the best professional advice available, this process will include a review of the projects funded (i.e., State Wildlife Grants and conservation partnership efforts), changes in species of greatest conservation need status and trends, changes in Conservation Landscape status and trends, changes in priority conservation issues and changes in priority conservation actions.

### Strategy review and revision:

The Comprehensive Wildlife Conservation Strategy, as with any planning document, will require periodic review and revision (i.e., updating). New information will become available, implemented actions will resolve issues, and new situations or circumstances (i.e., unforeseen when the Comprehensive Wildlife Conservation Strategy was first developed) will occur.

As a normal part of Oklahoma Department of Wildlife Conservation operations, information will be accumulated continuously on Comprehensive Wildlife Conservation Strategy elements for such things as status and trends of species of wildlife, including their current distribution within Oklahoma. This monitoring will also involve habitat condition and trends.

Communication and coordination with the conservation partners involved in preparation of this initial Comprehensive Wildlife Conservation Strategy will continue. This will help track progress (i.e., monitor) and identify new circumstances or changing situations. It is anticipated that many of these conservation partners will contribute information gained through their normal operations which will be vital to the review and revision of the Comprehensive Wildlife Conservation Strategy.

In most cases, several years of actions may be needed before real conservation progress can be demonstrated. Allowing for this time lag between planning, implementation of strategies, and responses of natural systems will influence Oklahoma’s schedule for review and revision of their Comprehensive Wildlife Conservation Strategy.

At five to seven-year intervals, Oklahoma’s Comprehensive Wildlife Conservation Strategy will be thoroughly and completely reviewed and revised as needed. This will include something considerably less than the level of effort put into the initial Comprehensive Wildlife Conservation Strategy development but will involve all conservation partners and all eight of the required elements. It is thought that evaluation of all eight required elements can be accomplished by ongoing interactive communication with conservation partners, stakeholders, and the general public. As new conservation partners are identified, they will be integrated into the process.

## State Overview and Ecological Framework

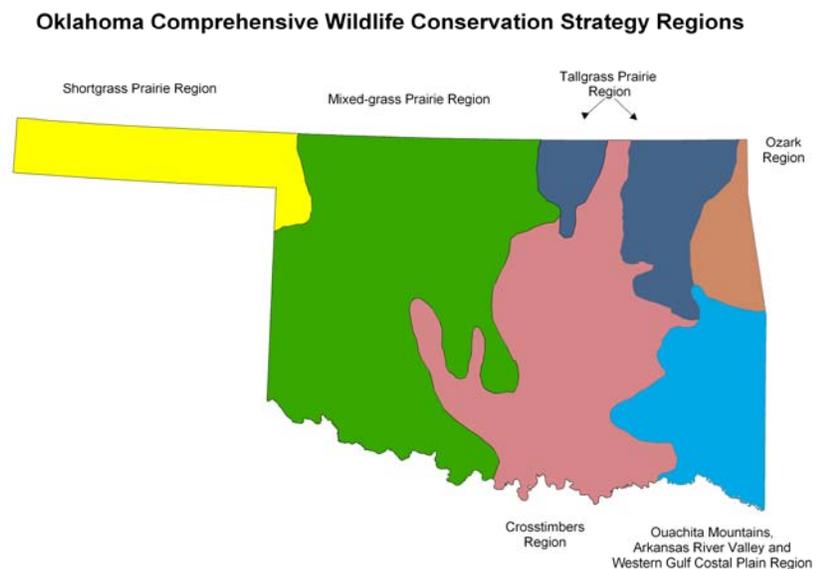
Oklahoma is very diverse geologically and ecologically. Depending upon the classification system used, Oklahoma encompasses portions of 11 to 15 ecological regions. It spans the transition between the eastern deciduous forests to the shortgrass prairie/High Plains, and from the West Gulf Coastal Plain to the foothills of the Rocky Mountains in the Black Mesa area. Rainfall ranges from an average of 55 inches in portions of the Ouachita Mountains to only 18 inches at the western end of the panhandle. This diversity in rainfall, elevation and soil conditions results in a dramatic richness of plant and animal communities.

The Oklahoma Comprehensive Wildlife Conservation Strategy is organized into six regional chapters. These six regions were identified during a process to reconcile the two most widely used ecological classification systems in the United States - Bailey's Ecological Regions developed by the U.S. Forest Service and Omernick's Ecoregions developed by the Environmental Protection Agency. Both of these systems are hierarchical (meaning that they operate at multiple spatial scales) and are based upon a combination of climate, soils and dominant vegetation. The classification system of Bailey / USFS divides Oklahoma into 15 Ecological Sections, while the system of Omernick / EPA divides the state into 11 Ecoregions. While these two ecological classification systems are similar, they use different nomenclature and boundaries for their ecological regions. In eastern Oklahoma, there is a high degree of similarity between Omernick's Ecoregions and Bailey's Ecological Sections, but only a modest degree of similarity in western Oklahoma. The designation of ecological region boundaries is complicated because landscape changes are gradual and occur over a large area. Therefore ecological boundaries are not exact cut-off lines but wide bands of interdigitated habitats.

For purposes of the Comprehensive Wildlife Conservation Strategy, the state of Oklahoma has been divided into six large regions. Each of these regions encompasses one to three of Bailey's Sections and one to three of Omernick's Ecoregions. We have attempted to reconcile the differences between the ecological regions proposed by Bailey / USFS with those proposed by Omernick / EPA by grouping together similar regions. In so doing, we have produced a Conservation Strategy that we believe can be applied by agencies using either ecological classification system. Additionally, these regions are similar to the Bird Conservation Regions recently developed under the North American Bird Conservation Initiative. The Bird Conservation Regions were adapted from Omernick's classification system and are used widely by the U.S. Fish and Wildlife Service, Joint Ventures and other conservation partners.

**Shortgrass Prairie Region:** This region is often referred to as the High Plains. It encompasses the panhandle counties and the northwestern corner of the main body of the state, and includes all or portions of Cimarron, Texas, Beaver, Harper, Woodward and Ellis Counties. It is equivalent to the combination of the Southern High Plains, Arkansas Tablelands and Texas High Plains sections of Bailey's ecological classification system, and to the Western High Plains and a portion of the Southwestern Tablelands under Omernick's classification system.

**Mixed-grass Prairie Region:** This is a large and diverse ecological region that encompasses much of western Oklahoma including all or portions of Harper, Ellis, Woods, Woodward, Major, Alfalfa, Grant, Kay, Noble, Logan, Garfield, Kingfisher, Canadian, Blaine, Dewey, Custer, Washita, Roger Mills, Beckham, Harmon, Greer, Jackson, Kiowa,



Tillman, Caddo, Comanche, Cotton, Oklahoma, Grady, Cleveland, McClain, Stephens, and Jefferson counties. Within Bailey's classification system, it is equivalent to the combination of the Red Bed Plains and the South-central Great Plains sections. Using Omernick's ecoregion classification system, it is equivalent to a portion of the Southwestern Tablelands Ecoregion and the entire Central Great Plains Ecoregion.

Crosstimbers Region: This region encompasses a mosaic of oak woodlands and tallgrass prairies in approximately the central one-third of Oklahoma. All or portions of the following counties are part of Crosstimbers Region: Kay, Noble, Pawnee, Payne, Logan, Lincoln, Oklahoma, Cleveland, McClain, Grady, Caddo, Stephens, Jefferson, Garvin, Murray, Carter, Love, Marshall, Johnston, Pontotoc, Coal, Atoka, Bryan, Choctaw, Pittsburg, McIntosh, Hughes, Seminole, Pottawatomie, Okfuskee, Creek, Okmulgee, Tulsa, Osage and Washington. It is equivalent to the combination of the Crosstimbers and Prairies Section and the Blackland Prairies Section in Bailey's classification system. It is also equivalent to Omernick's Central Oklahoma/Texas Plains Ecoregion.

Tallgrass Prairie Region: This region encompasses two portions of the state that were historically dominated by tallgrass prairie landscapes. One of these areas is commonly referred to as the Flint Hills and includes portions of Osage, Kay, Pawnee and Payne counties. The other region is often called the Osage Plain and includes portions of Washington, Nowata, Rogers, Wagoner, Tulsa, Okmulgee, Muskogee, Mayes, Craig, and Ottawa counties. The Tallgrass Prairie Region is equivalent to the combination of Bailey's Flint Hills and Osage Plains sections. It also is equivalent to Omernick's Flint Hills and Central Irregular Plains ecoregions.

Ozark Region: Often referred to as the Ozark Highlands, this region encompasses all or portions of six counties in northeastern Oklahoma: Ottawa, Delaware, Mayes, Cherokee, Adair, and Sequoyah. It is equivalent to the Ozark Highlands and the Boston Mountains in both Bailey's and Omernick's ecological classification systems.

Ouachita Mountains/West Gulf Coastal Plain Region: This is a large and diverse region that encompasses three subregions: the Ouachita Mountains, Arkansas River Valley and the Western Gulf Coastal Plain. It includes all or portions of the following southeastern counties: Sequoyah, Muskogee, Haskell, LeFlore, Latimer, Pittsburg, Atoka, Pushmataha, Choctaw, and McCurtain. It is equivalent to the combination of Bailey's Ouachita Mountains, Western Mid-coastal Plains and Arkansas Valley sections. Under Omernick's ecological classification system, it is equivalent to the Arkansas Valley, Ouachita Mountains and South Central Plains ecoregions.

Additional maps are located in Appendix B: Maps used in the Development of the Oklahoma Comprehensive Wildlife Conservation Strategy.

- CWCS Regions Compared to Duck and Fletcher Game Types
- CWCS Regions Compared to Soil Class
- CWCS Regions Compared to Soils
- Central Mixed-grass Prairie Ecoregion, The Nature Conservancy
- Ouachita Mountains and Upper West Gulf Coastal Plain Ecoregions, The Nature Conservancy
- Osage Plains/Flint Hills Prairie Ecoregion, The Nature Conservancy
- Ozark Ecoregion, The Nature Conservancy
- Southern Shortgrass Prairie Ecoregion, The Nature Conservancy
- Southern/Central Shortgrass Prairie Ecoregion, The Nature Conservancy