

Preface

On October 10, 1992, Oklahoma Governor David Walters, the Oklahoma Department of Wildlife Conservation and Vice Presidents of Weyerhaeuser Company signed an agreement to develop a Biodiversity Plan for the State of Oklahoma. Weyerhaeuser Company agreed to award the Department of Wildlife Conservation \$50,000 per year, renewed annually, for three years to develop the plan. The Department of Wildlife Conservation contracted a biodiversity coordinator to facilitate the plan's development. The Department of Wildlife Conservation, in coordination with the Governor and the Wildlife Commission, appointed a Biodiversity Council to oversee the project and established a Biodiversity Task Force that developed the plan. According to the agreement, the plan would "assess and document biodiversity in Oklahoma, assess relationships of biodiversity to economic development and human use of land and natural resources, and propose the application of these assessments to integrate biodiversity, human use, and economic development to meet Oklahoma's needs into the future." Work on the project began on March 1, 1993 as the coordinator reviewed similar projects conducted by other states and organizations and drafted the structure of the project based on his findings.

Biodiversity Council

Because most of the land in Oklahoma is privately owned, the Department of Wildlife Conservation involved a broad range of interests in the plan's construction, rather than conducting the project as an in-house report. Council membership includes directorate-level individuals of various federal and state governmental agencies and private organizations that are responsible for biodiversity or whose activities impact biodiversity. The Council has overseen the project to ensure that all issues of biodiversity conservation are addressed fairly and served as a coordination body to provide direction to implementation efforts.

Biodiversity Task Force

The Biodiversity Task Force performed the labor involved in creating the Biodiversity Plan. Seven committees—biology, conservation and recreation, education, forestry and agriculture, land resources, mineral resources, and water resources—were formed to provide input from a variety of interests. Committee membership was designed through consultation with many organizations and individuals were selected from lists of nominees. These members were nominated as recognized leaders within their profession or organization. These included both governmental and private representatives.

The biology committee began working on the plan in 1993 and drafted the first five chapters of this document. Other committees were created after the biological information was complete enough to provide sufficient information for the other committees to explore ways of meeting biodiversity needs within their interests. During the period they were active, committees met approximately once every two months. The contents of this plan were written based on discussions at these meetings. As the chapters were written, committees reviewed the text and made comments and changes at each meeting. This document is the result of the hard work these committees gave toward developing a plan all participants could support.

Purpose of the Biodiversity Plan

The primary purpose of this plan is to provide information about Oklahoma's biodiversity and make recommendations on how biodiversity conservation can be included in a variety of economic and other activities. These recommendations are intended to function as a "shopping list" of ideas a landowner or company can review, selecting those to implement they believe relate to their circumstances. Participation in the Biodiversity Project is strictly voluntary and landowners and companies will not be required to follow the recommendations in this document. The Biodiversity Council and Task Force hope the information contained in this plan will encourage additional ideas that will benefit this resource and the individuals or group managing it.

Acknowledgments

I would like to express my appreciation to many people who made this project possible. Without the assistance of many individuals and companies, this plan could never have been completed. It is my hope that this cooperation will be the driving force of this project as it enters its implementation phase. If participants remain as open-minded as they have throughout the development of this plan, I believe Oklahoma's biodiversity will be better managed in the near future.

Weyerhaeuser Company began the project by providing the necessary finances to the Oklahoma Department of Wildlife Conservation. Weyerhaeuser employees have expressed continuing interest in the progress of the project and provided solid moral support as well.

The Oklahoma Department of Wildlife Conservation spearheaded this project and provided working space, transportation and other support necessary to conduct this project. Many of their employees provided encouragement and willingly assisted with various tasks.

Members of the Biodiversity Task Force donated their time to attend meetings, even when they were held on Saturdays. These committee members provided the ideas and information that were vital to the plan. Although they occasionally had to work with difficult topics, their efforts were productive.

Members of the Biodiversity Council provided advice in the structure of the project and assisted with the plans for the Biodiversity Conference (March 4-5, 1996). These members also donated their time to help with this project.

Coral McCallister, artist for University of Oklahoma Department of Zoology, graciously created the illustrations for the plan from my all-too-rough ideas. She did some of them with very short notice yet still completed them efficiently.

Employees of the Missouri Department of Conservation and Tennessee Conservation League provided valuable information on similar projects in their states and gave advice for structuring this project. Their experience was helpful in creating Oklahoma's Biodiversity Project and their assistance is appreciated.

Norman L. Murray,
Biodiversity Coordinator and Editor
Oklahoma Department of Wildlife Conservation

Executive Summary

Biodiversity is the variety of native living organisms occurring in Oklahoma. Oklahoma has a rich biodiversity, rivaling Texas for the widest range of natural communities in the United States. This variety of natural communities accounts for the large number of native species that inhabit the state, with 747 native species of vertebrates and molluscs and an estimated 1,790 species of plants. The number of other invertebrate animal species and fungi is unknown.

Because of its complexity, biodiversity has been divided into three levels: genetic diversity, species diversity and community diversity. By understanding each of these components, we can better comprehend the whole of biodiversity.

Genetic diversity is the variation in genetic make-up of individuals or populations within a species. High levels of genetic diversity are important to allow populations to adapt to local conditions or adjust to changes in their environment. Loss of genetic variability, which is most often evident in endangered species, results in lowered reproductive rates, deformities and, possibly, in species extinctions.

Species diversity is the variety of species found within an area of interest. This level receives the most attention and is usually the most easily noticed part of biodiversity. Although the total number of species present may indicate the general health of a particular natural community, one must look at which species are represented in that total to clearly assess the overall health of biodiversity. Shortgrass prairies in Oklahoma support fewer species than forests in the eastern part of the state but are equally valuable for biodiversity because those species are unique to that natural community and are not found elsewhere.

Community diversity is the variety of natural communities (e.g., prairies, forests and streams) across a landscape or region and is important for supporting high levels of species diversity. Due to Oklahoma's varied environmental conditions, there are a wide array of natural communities ranging from cypress swamps to arid shortgrass prairies and Rocky Mountain foothills.

Biodiversity has personal, community processes, and commercial values. Many people believe that we should be good stewards of our natural heritage and use it without destroying it. Many community processes are vital to human needs by protecting soil and water, neutralizing waste products, pollinating plants and serving as environmental barometers. Ecotourism, medicines, agricultural products and native plants for landscaping are some of the economic values derived from Oklahoma's biodiversity. However, one of the most difficult values to measure is the value of maintaining our biodiversity to maintain any future values or uses that might be discovered and passing on our natural resources to future generations.

Oklahoma's geographic location, landscape diversity and variety of climates provide a foundation for the state's biodiversity and define broad limits on the species that can occur here. Factors that contribute to our high levels of biodiversity include dispersal, isolation, local adaptation, speciation, natural disturbance and succession and efforts to restore species or natural communities. Factors causing declines in biodiversity are habitat fragmentation, disruption of natural processes, reductions in population sizes, hybridization, species eliminations, species introductions and myths or misunderstanding of biodiversity. Most of the factors causing negative impacts are due to human activities and cause environmental changes too rapidly for species to adapt. The underlying cause for most of these actions is increasing demands that are placed on the land and natural resources.

Five biological recommendations were identified as necessary to maintaining Oklahoma's biodiversity.

- (1) Integrate biodiversity conservation with activities at all societal and economic levels.
- (2) Identify and protect natural areas that are especially sensitive to disturbance.
- (3) Improve biodiversity management on public lands.
- (4) Continue research to address information needs for biodiversity conservation.
- (5) Provide scientific oversight to biodiversity conservation efforts.

Conservation and recreation organizations have been strong supporters of conservation efforts for many years. Their activities that help with biodiversity conservation include protection of natural areas, a variety of management and stewardship activities, conducting and funding research, educational programs and political action. Improved regional coordination, establishing a funding source for biodiversity conservation, inventorying and monitoring species populations, integrating biodiversity conservation with group activities and changing public perceptions that result in degradations of biodiversity are ways these organizations can increase their participation in biodiversity conservation.

Forestry and agricultural operations manage a major percentage of the land in Oklahoma and much of the state's biodiversity occurs on this land. Practices implemented on these properties have significant impacts (both positive and negative) on the state's biodiversity. A variety of land management practices, governmental services and educational efforts were identified as being beneficial to biodiversity management efforts. Recommended methods of better integrating biodiversity concerns with this field included exploring alternative methods of animal waste disposal, controlling or restricting the introduction of exotic species, investigating alternative crop markets, increasing the benefits of conservation practices for biodiversity and adjusting public policy to encourage landowners to manage for biodiversity benefits.

Heavily used areas, such as cities, towns and roadsides, often are ignored in conservation efforts because of their limited potential for biodiversity. However, because a growing proportion of the human population lives in urban areas, which can have significant negative impacts on biodiversity, intensively used areas must be addressed. Including biodiversity concerns in project planning, educational and recreational activities and land-management practices were identified as activities that benefit or protect biodiversity in these areas. Landscaping yard areas for biodiversity, reducing mowing, minimizing chemical use, incorporating natural areas and native plants into parks, habitat banking, controlling exotic species and reducing illegal dumping are ways that these areas could better address biodiversity conservation.

Although mineral-extraction operations, such as petroleum production and mining, tend to negatively impact biodiversity, these activities can be planned and carried out so their impact on biodiversity is minimal. Practices currently employed by some operations to assist conservation include initial and reclamation planning, minimizing exposure to oil and related substances and supporting conservation programs. Ways to further incorporate biodiversity needs with mineral-extraction activities include incentives for good management, adjusting regulations to better encourage use of native plants during reclamation, planning, mitigation banking and educational efforts.

Because of the diversity and sensitivity of aquatic communities in Oklahoma, they receive special attention to protect them from degradation and ensure an adequate water supply for human use. Most of the efforts directed toward aquatic communities concern water quality, water quantity and the management of wetlands and fisheries.

Educational efforts are vital to increasing biodiversity management efforts. The following goals were identified for biodiversity educational efforts.

- (1) Define and describe Oklahoma's biodiversity.
- (2) Dispel myths about biodiversity.
- (3) Emphasize proactive benefits of biodiversity conservation.
- (4) Explain how biodiversity benefits individuals.
- (5) Explain the Oklahoma Biodiversity Project and Plan.
- (6) Develop educational tools targeting specific audiences.

Three audiences (residential, agriculture, and business and industry) were identified as highest priority for educational efforts. A variety of educational products and outlets for biodiversity information also was identified.

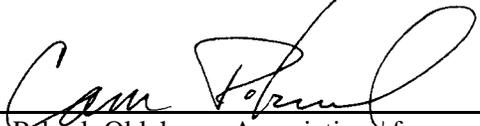
Biodiversity Council

We commend the efforts of the many interests that cooperated in preparation of this document; however, this Plan is only a beginning in conserving Oklahoma's biodiversity. Regardless of our individual viewpoints or interests, Oklahoma's biodiversity is an important part of our heritage. Therefore, we encourage readers to share these ideas with others and to cooperate with landowners and organizations to achieve the common goal of ensuring that our natural heritage is passed on to future generations.

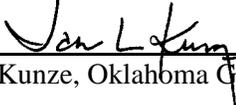

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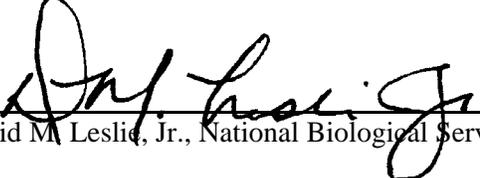

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