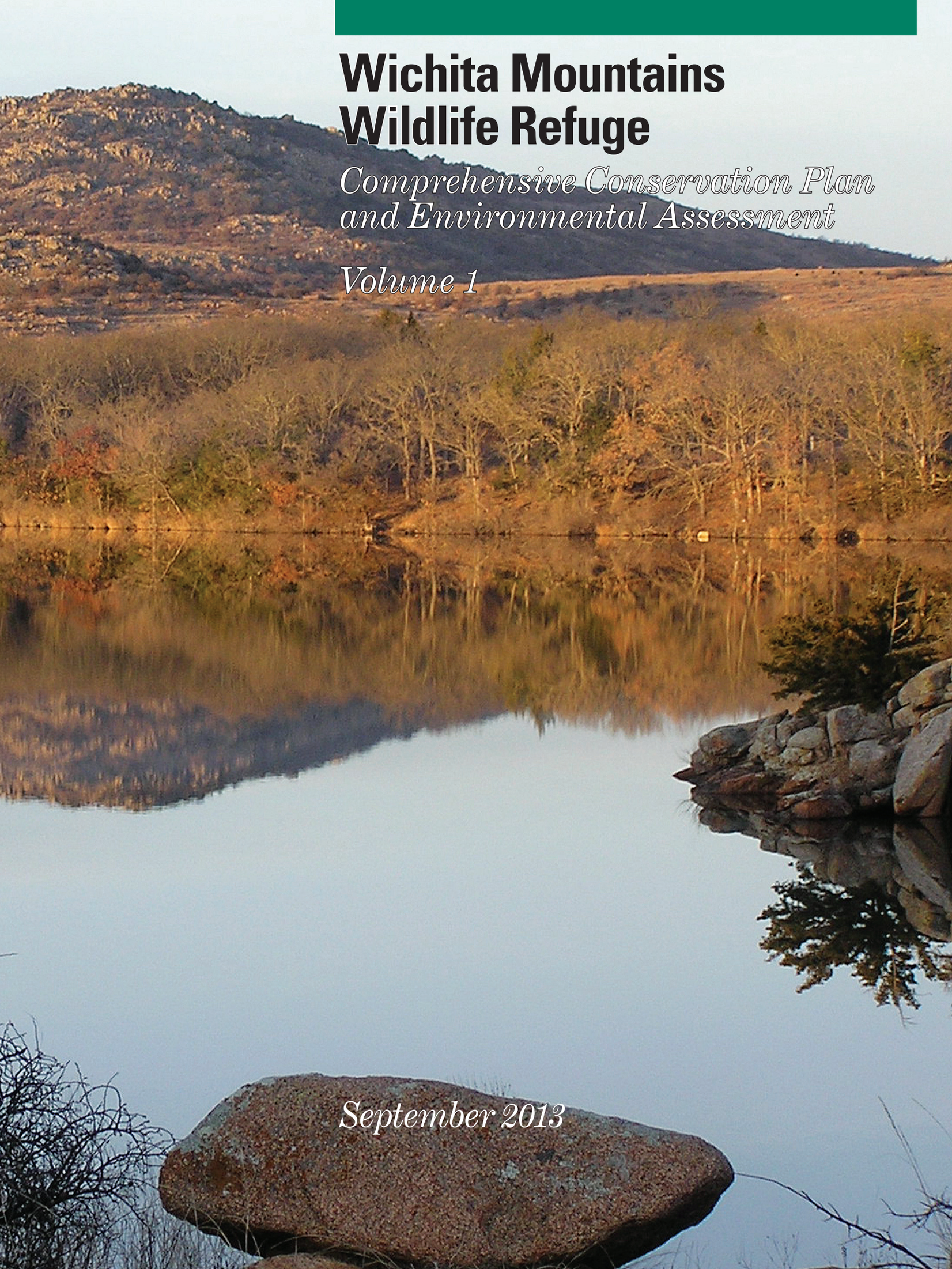
# Wichita Mountains Wildlife Refuge

*Comprehensive Conservation Plan and Environmental Assessment*

*Volume 1*



*September 2013*

**U.S. Fish and Wildlife Service Mission Statement**

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.

**National Wildlife Refuge System Mission Statement**

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

-National Wildlife Refuge System Improvement Act of 1997

*Comprehensive conservation plans provide long-term guidance for management decisions and set forth goals, objectives, and strategies needed to accomplish refuge purposes and identify the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.*

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
P.O. Box 1306
Albuquerque, New Mexico 87103

Dear Reader:

The U.S. Fish and Wildlife Service (Service) is pleased to provide you with a copy of the Final Comprehensive Conservation Plan (CCP), Environmental Assessment (EA), and Finding of No Significant Impact (FONSI) for Wichita Mountains Wildlife Refuge (Refuge) in Oklahoma. This CCP identifies the role that the Refuge will play in support of the mission of the U.S. Fish and Wildlife Service and National Wildlife Refuge System. It provides long-term guidance to the Refuge's management programs and activities.

The CCP was developed by an interdisciplinary planning team which evaluated three management alternatives and chose Alternative B as the proposed action. The Service believes this management action is a positive step in conserving and managing the refuge's fish and wildlife resources.

The Service would like to thank you for participating in the planning process. Comments you submitted helped us prepare a better plan for the future of the Refuge.

Additional copies of this CCP may be obtained by contacting: Tony Booth, Refuge Manager, Wichita Mountains Wildlife Refuge, 32 Refuge Headquarters, Indiahoma, OK 73552. The CCP is also available on the Service's Internet website as follows: http://www.fws.gov/southwest/refuges/Plan/planindex.html

Thank you for your continued support and interest in our fish and wildlife conservation efforts.

Sincerely,

Jay E Nicholopoulos

Dr. Benjamin N. Tuggle, Regional Director
U.S. Fish and Wildlife Service, Region 2

SEP 16 2013
Date

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**COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL ASSESSMENT**

# *WICHITA MOUNTAINS WILDLIFE REFUGE*

Comanche County, Oklahoma

**Prepared by:**

**Wichita Mountains Wildlife Refuge**
**32 Refuge Headquarters**
**Indiahoma, OK 73552**

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**COMPREHENSIVE CONSERVATION PLAN APPROVAL**

**For**

**Wichita Mountains Wildlife Refuge, Indiahoma, OK**

The attached Comprehensive Conservation Plan for the Wichita Mountains Wildlife Refuge has been prepared by Regional Office and Refuge staff. The contents and format are found to be in compliance with Service Policy on the preparation of comprehensive conservation plans, and is hereby submitted for approval.

Submitted by:

Tony Booth, Refuge Manager
Wichita Mountains Wildlife Refuge

Feb. 20, 2013
Date

Roxanne Turley, Natural Resource Planner
U.S. Fish and Wildlife Service, Region 2

02/20/13
Date

Concurrence by:

Kelly McDowell, Refuge Supervisor, Texas/Oklahoma
U.S. Fish and Wildlife Service, Region 2

9/4/2013
Date

Aaron Archibeque, Regional Chief, Refuge System
U.S. Fish and Wildlife Service, Region 2

9/11/13
Date

Approved by:

for Dr. Benjamin N. Tuggle, Regional Director
U.S. Fish and Wildlife Service, Region 2

9/12/13
Date

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**Wichita Mountains Wildlife Refuge Vision Statement**

The Wichita Mountains Wildlife Refuge, one of the earliest refuges established for habitat conservation, will continue to be known for its majestic ancient granite mountains surrounded by a diverse ecosystem of Crosstimbers and the largest remaining stretch of native southern mixed-grass prairie. The Refuge will continue to successfully manage bison and elk populations, influencing contemporary conservation movements. After more than a century of wildlife management, including contributions to the recovery of the black-capped vireo, the Refuge will continue to preserve its biological integrity by controlling invasive plants and animals, maintaining natural fire regimes, and incorporating extensive research and monitoring. Although altered by climate change and threatened by development and fragmentation on adjacent lands, these efforts ensure that the Refuge will remain resilient and offer the greatest promise to survive future natural and manmade disturbances. Establishing landscape connectivity by expanding the Refuge conservation footprint will increase the movement and interaction of flora and fauna, thereby increasing genetic diversity. Conservation partnerships, particularly within the Central Mixed-Grass Prairie and Crosstimbers and Southern Tallgrass Prairie, will be necessary to preserve this rare mountain-prairie ecosystem.

The Refuge will offer quality outdoor environmental education opportunities covering a variety of natural resource subjects that are captivating and tailored to all generations. Interpretive infrastructure will further educate and inform individuals about the natural world. The Refuge will also provide environmentally compatible outdoor recreational hunting, fishing, photography, and wildlife observation that is enhanced through partnerships with local, State, and Federal agencies and other organizations. The designated wilderness area will continue to offer solitude and surprising beauty that has been shaped by forces of nature over hundreds of millions of years. The simple knowledge that public lands untouched by modern development exist will remain important to Americans, even those who may never visit. Visitors will have an opportunity to connect with nature to better understand its protection so that it will endure. The Wichita Mountains Wildlife Refuge's rugged peaks, native flora and fauna, breathtaking scenery, and solitude and peacefulness will continue to inspire present and future generations.

This Vision Statement was a collective effort on the part of the entire staff of the Wichita Mountains Wildlife Refuge.

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# Summary

*The Narrows. Photo: USFWS*

This Comprehensive Conservation Plan (CCP) is designed to guide management of the Refuge for the next 15 years. The CCP provides a description of the desired future conditions and long-range guidance to accomplish the purposes for which the Refuge was established. The CCP and accompanying Environmental Assessment (EA) address Service legal mandates, policies, goals, and National Environmental Policy Act (NEPA) compliance. The EA presents a range of alternatives for habitat and wildlife management, visitor services, and facilities management that consider issues and opportunities on the Refuge. It also identifies, describes, and compares the consequences (or impacts) of implementing three management alternatives (including current management) on the physical, biological, and socioeconomic environments described in the CCP. Alternative B was selected as the Refuge's management direction. The final CCP was developed after the public review process and will replace or expand on current management direction.

### Refuge Background

The Wichita Mountains Wildlife Refuge (Refuge) is a tract of 59,020 acres embracing a major portion of the ancient Wichita Mountains in southwestern Oklahoma. The Refuge was originally

established as a Forest Reserve by President William McKinley in 1901. By proclamation of President Theodore Roosevelt on June 2, 1905, the land was further designated as the Wichita Forest and Game Preserve. The land was administered by the U.S. Forest Service (Service) until June 1936, when it was transferred to the U.S Fish and Wildlife Service. Shortly thereafter, the area was renamed the Wichita Mountains Wildlife Refuge for administration under the National Wildlife Refuge System (Refuge System). In addition, two units of Wichita Mountains Wilderness were established by Public Law 91-504 on October 23, 1970. The long history of preservation of the Wichita Mountains Wildlife Refuge has protected this unique vast land as a reminder of southwestern Oklahoma's natural condition prior to European settlement.

### Purpose and Need for the CCP

The purpose of comprehensive conservation planning is to provide long-range guidance for the management of national wildlife refuges, as mandated by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act). The CCP will enhance the management of the Wichita Mountains Wildlife Refuge by:

*Historic Refuge Entrance Sign. Photo: USFWS*

- providing a clear statement of direction for the future management of the Refuge;
- providing long-term continuity in Refuge management;
- communicating the Service's management priorities for the Refuge to their partners, neighbors, visitors, and the general public;
- providing an opportunity for the public to help shape the future management of the Refuge;
- ensuring that management programs on the Refuge are consistent with the mandates of the Refuge System and the purposes for which the Refuge was established;
- ensuring that the management of the Refuge is consistent with Federal, State, and local plans; and
- providing a basis for budget requests to support the Refuge's needs for staffing, operations, maintenance, and capital improvements.

This CCP, with its management direction laid out in specific objectives and strategies, is needed to provide a vision for the Refuge and provide management direction for research, restoration, maintenance, and management of Refuge resources for the next 15 years. It will help explain how the Refuge fits into the larger landscape and its role in protecting natural resources for present and future generations. The CCP is also needed to ensure that the Refuge continues to conserve fish, wildlife, and habitat in the face of climate change and related stressors.

### The National Wildlife Refuge System

The National Wildlife Refuge System is the only existing system of federally owned lands managed chiefly for the conservation of wildlife. The Refuge System consists of over 150

million acres in over 560 refuges and 38 wetland management districts in all 50 states and U.S. territories. National wildlife refuges host a tremendous variety of plants and animals supported by a variety of habitats from arctic tundra and prairie grasslands to subtropical estuaries. The Refuge System is the world's largest collection of lands and waters set aside specifically for the conservation of wildlife and ecosystem protection. The Wichita Mountains Wildlife Refuge is administered under the National Wildlife Refuge System Administration Act of 1966, as amended in 1997.

### Refuge Purposes

National wildlife refuges are established under a variety of legislative acts, administrative orders, and authorities. These orders and authorities include one or more specific purposes for which the refuge lands are acquired. The purposes are of key importance in refuge planning and are the foundation for management decisions.

The Wichita Mountains Wildlife Refuge was established "for the protection of game animals and birds and shall be recognized as a breeding place thereof." Preservation of Wilderness is also a purpose for those portions of the Refuge designated as Wilderness.

*The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

### Appropriate Refuge Uses and Compatibility Determinations

#### *Appropriate Refuge Uses*

The Appropriate Refuge Uses policy (603 FW 1) describes the initial decision process the Refuge Manager follows when first considering whether to allow a proposed use or to revisit the compatibility of an existing use on a refuge. The Refuge Manager must find a use appropriate before undertaking a compatibility determination review of the use.

The following uses have been requested but were determined to not meet the conditions of "appropriate" according to policy (603 FW 1) for consideration in the compatibility determination process: swimming, horseback riding, geocaching, and pigeon racing.

#### *Compatibility Determinations*

In accordance with the Refuge Improvement Act of 1997, all public uses of a national refuge must be evaluated for compatibility. A compatible use is a proposed or existing wildlife-dependent recreation use or any other use of a national wildlife refuge that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. If a use is found to be incompatible, the Refuge will follow normal administrative procedures for terminating the use.

Compatibility determinations for existing hunting, fishing, wildlife observation and photography, and environmental education and interpretation must be re-evaluated at least every 15 years. Compatibility determinations for all other uses must be re-evaluated every 10 years or earlier if conditions change or significant new information relative to the use and its effects becomes

available. Refuge managers must complete a written compatibility determination for each use, or collection of like-uses, that is signed by the manager and the Regional Refuge Chief.

Thirty-one compatibility determinations have been developed as part of this comprehensive conservation planning effort. They are:

- Bicycling
- Bicycling Events
- Bison and Longhorn Auction
- Boating
- Camping
- Commercial Art, Filming, and Photography
- Commercial Fishing Tournaments
- Commercial Interpretive Tours
- Commercial Rock Sports
- Commercial Scuba Instruction
- Environmental Education
- Fishing
- Grazing
- Hiking
- Holy City
- Hunting
- Interpretation
- Job Corps
- Jogging and Strenuous Walking
- Mesonet Weather Station
- Mount Baker Repeater
- Natural Resource Collection
- Photography
- Picnicking (Including Rental of Boulder Cabin)
- Scuba Diving
- Rock Sports
- Running Events
- Scientific Research
- Tree Cutting
- Visitor Operation of Amateur Radio Equipment
- Wildlife Observation

**Public Involvement**

The scoping period began with a Notice of Intent to prepare a CCP and EA, which was published in the *Federal Register* on November 5, 2008 (Volume 73, Number 215, pp. 65872-65873). Shortly thereafter, a Planning Update was mailed requesting feedback and informing community members of upcoming public scoping meetings. The planning team solicited public comments on Refuge issues to aid in CCP development through four open house meetings held in January and February 2009.

The Planning Team held an ecoregion-wide coordination meeting at the Refuge's Environmental Education Center in December 2009 to gain a better understanding of the issues within the Central Mixed-Grass Prairie Ecoregion, where the Refuge is located, and to determine the Refuge's role in addressing issues affecting fish, wildlife, and their habitats within the larger landscape.

In addition to the scoping meetings, the Refuge also held an open house at the Refuge's Visitor Center on January 25, 2011. The purpose of this open house was to introduce the new Refuge Manager and to give the public an opportunity to discuss various Refuge projects and programs, including the planning process.

The feedback received at the conclusion of the public involvement period identified numerous concerns for a variety of stakeholders. These concerns were organized by five broad issue

categories and one administrative category: Ecoregion, Habitat, Wildlife, Public Use, Facilities, and Administrative Areas.

### Planning Issues

Refuge planning policy defines an issue as any unsettled matter that requires a management decision: an initiative, opportunity, resource management problem, threat to Refuge resources, conflict in uses, public concern, or presence of an undesirable resource condition (602 FW 1.6I). Refuge issues identified during scoping include the following categorized topics:

#### *Ecoregion*

- climate change and its potential for alterations to habitat components and wildlife migrations
- habitat fragmentation from the development of sprawling communities or other land use developments, land protection, and future Refuge expansion
- health and productivity of riparian areas and impacts from increased development adjacent to rivers and river corridors
- air and water quality and the management of water resources

#### *Habitat*

- fire ecology, change in the Refuge's natural fire regime, and the corresponding habitat response
- invasive flora control
- habitat restoration
- habitat conditions and the health of wildlife in the Special Use Area
- lake management, riparian areas, spring modification, water conservation, and water rights

#### *Wildlife*

- maintaining bison populations, conditions of native fish populations, and managing prairie dog populations
- management of non-native fauna, such as feral hogs and longhorn cattle
- reintroduction of species, including pronghorn antelope, mustangs, and wolves

### Public Use

Hunting, fishing, wildlife observation, photography, interpretation, and environmental education are considered wildlife-dependent recreation activities and are given priority consideration through the 1997 Refuge Improvement Act. In addition, the Refuge provides associated uses that are supportive of the six wildlife-dependent recreation activities. Overall, public comments reflected concern over this unique area of Oklahoma, providing not only unique wildlife viewing and educational activities, but also unique recreational opportunities.

#### *Wildlife-Dependent Recreation*

- maintain hunting, fishing, wildlife observation, and photography activities with no significant change in the level of use or the scope of regulations and restrictions on use
- increase and/or improve signs, programs, and workshops for the interpretation and environmental education program

### *Supportive Recreation*

- bicycling, boating, camping, hiking, picnicking, rock sports, and scuba diving concerns reflected a wide range of interests, including minimizing, maintaining, or expanding on use levels and available recreation areas
- group size and erosion, litter, law enforcement, and habitat and wildlife disturbance impacts
- developing a program for trail maintenance projects, expanding 'Leave No Trace' education efforts, or other mitigations for public use activities
- allowing horseback riding and swimming and restricting military flyovers from nearby Fort Sill Military Base
- effectively managing special uses, including scuba diving instruction, tours, tournaments, commercial photography, and filming

### *Facilities*

- user-friendly visitor facilities
- green infrastructure
- availability of trash cans and recycling stations
- use of interpretative signs.
- maintenance of signs, roads, and buildings, and accessibility updates
- monitoring and preservation of archaeological and historic resources

### *Administrative Areas*

- Holy City concerns reflected a wide range of interests, including maintaining the site as is in its current location and function to relocating the site off-Refuge to removing the statue associated with the site.
- Treasure Lake Job Corps concerns suggested a partnership with the Refuge to assist in Refuge projects and complete removal of the site from the Refuge.

## Landscape Setting

In order to effectively achieve the National Wildlife Refuge System mission of conserving fish, wildlife, and their habitats, the Refuge took a landscape-scale approach to identifying Refuge resources, issues, and management direction. The Refuge is one small portion of land within a larger landscape, and as such, looked beyond its boundaries to determine its role in the larger conservation effort. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. These general purpose regions are critical for structuring and implementing ecosystem management strategies across Federal agencies, State agencies, and non-governmental organizations that are responsible for different types of resources within the same geographic areas (EPA 2010).

Wichita Mountains Wildlife Refuge exists at a crossroads of ecoregions where the Central Mixed-Grass Prairie meets Crosstimbers habitat. It exists west of the "ecoregional" boundary separating the prairies of the Great Plains from the Crosstimbers of the eastern deciduous forest.

Thus, Refuge acreage is addressed within the mixed-grass prairie region of the Oklahoma Comprehensive Wildlife Conservation Strategy (2005) and The Nature Conservancy's 'Conserving the Biological Diversity of the Central Mixed-Grass Prairie' (Steuter et. al. 2003) and 'A Conservation Blueprint for the Crosstimbers and Southern Tallgrass Prairie Ecoregion' (The Nature Conservancy 2009).

### Climate Change

Department of the Interior Secretarial Order 3226 states that "there is a consensus in the international community that global climate change is occurring and that it should be addressed in governmental decision making… This Order ensures that climate change impacts are taken into account in connection with Departmental planning and decision making." Additionally, it calls for the incorporation of climate change into long-term planning documents such as the CCP.

Managing for the change process through maintenance of biological integrity and heterogeneity, and connectivity of available habitats is the goal. The Refuge took climate change into consideration as an issue to address to ensure that resilient and adaptive habitats are maintained.

### Vision

*The Wichita Mountains Wildlife Refuge, one of the earliest refuges established for habitat conservation, will continue to be known for its majestic ancient granite mountains surrounded by a diverse ecosystem of Crosstimbers and the largest remaining stretch of native southern mixed-grass prairie. The Refuge will continue to successfully manage bison and elk populations, influencing contemporary conservation movements. After more than a century of wildlife management, including contributions to the recovery of the black-capped vireo, the Refuge will continue to preserve its biological integrity by controlling invasive plants and animals, maintaining natural fire regimes, and incorporating extensive research and monitoring. Although altered by climate change and threatened by development and fragmentation on adjacent lands these efforts ensure that the Refuge will remain resilient and offer the greatest promise to survive future natural and man-made disturbances. Establishing landscape connectivity by expanding the Refuge conservation footprint will increase the movement and interaction of flora and fauna, thereby increasing genetic diversity. Conservation partnerships, particularly within the Central Mixed-Grass Prairie and Crosstimbers and Southern Tallgrass Prairie, will be necessary to preserve this rare mountain-prairie ecosystem.*

*The Refuge will offer quality outdoor environmental education opportunities, covering a variety of natural resource subjects that are captivating and tailored to all generations. Interpretive infrastructure will further educate and inform individuals about the natural world. The Refuge will also provide environmentally compatible outdoor recreational hunting, fishing, photography, and wildlife observation that are enhanced through partnerships with local, State, and Federal agencies and other organizations. The designated Wilderness area will continue to offer solitude and surprising beauty that has been shaped by forces of nature over hundreds of millions of years. The simple knowledge that public lands untouched by modern development exist will remain important to Americans, even those who may never visit. Visitors will have an opportunity to connect with nature to better understand its protection so that it will endure. The Wichita Mountains Wildlife Refuge's rugged peaks, native flora and fauna, breathtaking scenery,* and *solitude and peacefulness will continue to inspire present and future generations.*

## Goals

### *Ecoregion*

Improve ecoregion conservation through comprehensive and strategic Refuge management and participation with landscape management partnerships.

### *Habitat*

Preserve the biological integrity of southern mixed-grass prairie and Crosstimbers habitats to enhance long-term resiliency of these habitats.

Manage to preserve the natural character of those Refuge lands designated as Research Natural Areas.

### *Public Use*

Visitors enjoy a world-class, wildlife-focused experience through public use opportunities that educate and increase the quality of life for current and future generations and promote the long-term health of the Refuge.

Manage to preserve the wilderness character of those Refuge lands designated by Congress as part of the National Wilderness Preservation System.

### *Facilities*

Administer safe, well-maintained, and energy-efficient facilities that allow the public and staff to enjoy and support the purpose of the Refuge and the mission of the Refuge System.

### *Cultural Resources*

Identify and protect the archaeological, historical, and cultural resources on the Refuge for the benefit of present and future generations.

## Alternatives

Following the Refuge's public involvement process in 2009, the Refuge developed a reasonable range of alternatives. The alternatives are combinations of wildlife and habitat management with corresponding levels of public use and services. The Refuge staff determined that each biological component required an equal or consistent public use element (e.g., restoring habitats would require that environmental education and interpretation activities be geared towards support and understanding of current management). The Refuge carried forward three alternatives and analyzed them in detail in the Environmental Assessment. Alternatives were examined in five broad issue categories and one administrative category: Ecoregion, Habitat, Wildlife, Public Use, Facilities, and Administrative Areas.

## Management Direction Common to all Alternatives

Some management actions would remain the same under each alternative. They are:

- developing a Water Resource Inventory and Assessment (WRIA)
- utilizing modified springs for animal management
- participating in State water planning
- maintaining existing water rights (State rights) and evaluating the need for more

- initiating prescribed fire according to the Fire Management Plan (2008) with a strategy to manage for or mimic natural fire occurrence and grazing interaction
- managing fire program to include prevention, preparedness, and suppression
- managing invasive and non-native flora and fauna according to the Refuge's forthcoming 2013 Integrated Pest Management Plan (IPMP)
- promoting the health of native species on the Refuge while containing, controlling, or eradicating non-native or invasive fauna

## Summary of Alternatives

| | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Ecoregion** | | | |
| **Refuge-Wide Management** | | | |
| **Climate Change** | Participate in the Great Plains Landscape Conservation Cooperative (GPLCC). Improve efficiency of fleet and facilities. | Same as Alternative A, plus: Seek additional monitoring opportunities. Identify alternative energy and water sources. | Same as Alternative B. |
| **Air Quality** | Implement prescribed burns according to smoke management criteria. Treat invasive plants with a directed spray boom or wand. Mitigate maintenance or round-ups to abate dust. Monitor Class 1 Airshed, atmospheric mercury, and particulates. | Same as Alternative A, plus: Pursue bio-utilization of woody biomass. Increase dust abatement efforts. Pursue park-and-ride commuting or tours and other means to reduce traffic on the Refuge. | Same as Alternative B. |
| **Fragmentation and Land Protection** | Participate in GPLCC. Recognize existing wildlife corridors on the Refuge and promote Refuge as a core habitat block. No Land Protection Plan (LPP) exists. | Identify wildlife corridors. Explore Refuge expansion opportunities (such as through land acquisition, conservation easements, or cooperative agreements) by developing a Preliminary Project Proposal (PPP) and, if approved, an LPP. | Same as Alternative B. |
| **Riparian Areas** | Manage with surrounding ecosystem. Construct and/or maintain low water crossings or bridges. | Same as Alternative A, plus: Outreach maintenance of riparian corridors to surrounding landowners. Prioritize efforts to connect valuable habitat fragments in identified corridors. | Same as Alternative B. |
| **Water Quality** | Monitor and provide public outreach on water quality and mercury contamination through partnerships. | Same as Alternative A, plus: Expand monitoring of mercury. | Same as Alternative B. |
| **Habitat** | | | |
| **Refuge-Wide Management** | | | |
| **Special Designations** | Reserve northwest portion of the Refuge as a Special Use Area (SUA). Prohibit unrestricted public access and use. | Designate and manage the SUA as a Research Natural Area (RNA). Continue public use and access as in Alternative A with the incorporation of adaptive management if/when resources are at risk. | Same as Alternative A, with the exception to allow more general, although controlled, public access and use. |

| | Alternative A<br>No Action | Alternative B<br>Proposed Action | |
|---|---|---|---|
| **Water Resources** | Manage lakes at full capacity. Conduct occasional drawdowns to control invasive species, manage fisheries, and improve fishing opportunities. | Same as Alternative A, plus: Construct a fish passage on West Cache Creek to improve fish crossings. | Same as Alternative B. |
| **Permitted Grazing** | Permit grazing on 5 small allotments on Refuge property located outside of the Refuge boundary fence to mimic grassland conditions on the Refuge. | Same as Alternative A, with the exception of phasing out and discontinuing grazing permits on Refuge lands when fences are moved to the true Refuge boundary. | Same as Alternative B. |
| **W** | | | |
| | | | |
| **Native Fauna** | Manage native fauna (elk, deer, and bison) at or near carrying capacity. Hold public auctions (bison) and hunts (elk and deer) to manage population levels. Manage black-capped vireo according to recovery plan. Promote the fire-grazing interaction that historically occurred. | Manage populations at levels targeted to allow for habitat variability. Evaluate increasing the bison herd. Improve genetic monitoring. Hold public auctions (bison) and hunts (elk and deer) to manage population levels. Monitor long-term trends in vegetation and animal health and adaptively manage all native wildlife. Promote expansion of black-capped vireo habitat on adjacent lands. Promote the fire-grazing interaction that historically occurred. Develop a Habitat Management Plan. | Same as Alternative B, plus: Evaluate the feasibility of pronghorn antelope and wolf reintroductions. |
| **Non-Native Fauna** | Manage non-native fauna (longhorn) at carrying capacity. Hold public auctions to manage longhorn population levels. Monitor for zebra mussels in Refuge lakes. Manage feral hogs according to the Integrated Pest Management (IPM) Plan. | Manage livestock populations at targeted levels to allow for habitat variability. Evaluate decreasing longhorn herd size, or move the longhorn herd to alternate location. Hold public auctions to manage longhorn population levels. Fully implement the fire-grazing interaction that historically occurred. Consider more aggressive and proactive measures to avoid zebra mussel introduction. Manage feral hogs according to the IPM Plan. Develop a Habitat Management Plan. | Same as Alternative A, except: Increase longhorn herd size. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Public Use** | | | |
| **Refuge-Wide Management** | | | |
| **Hunting** | Administer hunts to achieve population management objectives for white-tailed deer and elk hunts through a cooperative effort between the Refuge and Oklahoma Department of Wildlife Conservation (ODWC). | Same as Alternative A. | Review and revise administration of hunts. Consider turkey and feral hog hunts. |
| **Special Uses** | Allow Refuge management special uses including monitoring and research; economic/commercial special uses. including rock climbing, photography instruction, scuba instruction, auctions, and guided interpretive tours; and non-commercial special uses, including cultural (e.g., tribal) and religious events (e.g., Holy City) and public events. | Same as Alternative A, plus: Manage special use activities under a Special Use Permit. Update Visitor Services Plan. | Same as Alternative B. |
| **Public Use Area Management – Public Use Opportunities** | | | |
| **Fishing** | Allow fishing at 12 lakes in the Public Use Area (PUA). Allow the use of boats according to lake-specific guidelines. Stock resident fish species periodically in cooperation with the ODWC. | Same as Alternative A, plus: Improve fishing opportunities through signage, facilities, hardened boat ramps, and law enforcement. Focus improvements in the high density use zone to relieve fishing pressure from the medium and low density use zones. Add youth fishing day clinic. Add fishing piers at Quanah Parker, Jed Johnson, and Crater Lakes. | Same as Alternative B, plus: The Refuge would evaluate the need for additional fishing piers through the Visitor Services Plan based on fishing pressure. |
| **Wildlife Observation** | Provide viewing opportunities throughout Refuge. Protect sensitive areas or wildlife through temporary access restrictions. Maintain observation sites. | Same as Alternative A, plus: Provide more wildlife observation opportunities by upgrading existing facilities and constructing 2 new wildlife viewing blinds. Create online observation tools. Develop and designate a wildlife observation loop using existing roads and trails. Update Visitor Services Plan. | Same as Alternative A, plus: Update Visitor Services Plan. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Photography** | Manage opportunities, use patterns, and restrictions identical to the previous 'Wildlife Observation' section. | Same as Alternative A, plus: Offer evening and weekend photography workshops. Create online photography tools. Implement Photography program the same as the Wildlife Observation program. Update Visitor Services Plan. | Same as Alternative A, plus: Update Visitor Services Plan. |
| **Interpretation** | Provide interpretive talks, nature walks, and staffing at off-Refuge event booths and passive interpretation through displays and exhibits on Refuge. | Same as Alternative A, plus: Update exhibits at the Visitor Center. Construct an interpretive nature trail loop around the Visitor Center. Create designated auto tour. Install interpretive signs according to public use density zone. Expand public interpretive workshops. Update Visitor Services Plan. | Same as Alternative B. |
| **Environmental Education** | Hold environmental education classes on- and off-Refuge. Partner with Friends group to provide transportation assistance for students. | Work to develop Environmental Education Center as a training facility where school classes/programs on-Refuge would be emphasized. Continue to partner with Friends group to provide transportation assistance for students. Link Environmental Education programs to the Oklahoma State Curriculum. Increase emphasis on environmental education from 6% to 10% of annual school contacts. Update Visitor Services Plan. | Same as Alternative B. |
| **Bicycling** | Allow on paved roads and on the Mt. Scott access road. Pave highway shoulders along the section of State Highways 115 and 49 that extend from the Medicine Park gate west and south to the Cache gate. | Same as Alternative A, plus: Create/designate hiking and bike routes and connect existing routes. Increase quality (linking) of routes to/from Lake Elmer Thomas Recreational Area (LETRA), Cache, Medicine Park, Meers, and Lawton via partnerships. Consider a bicycle-share pilot program through an updated Visitor Services Plan. | Same as Alternative B, plus: Re-open the Burma Road to bicycling. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Boating** | Allow boating on 5 lakes on the Refuge. Paved and unhardened boat ramps, interpretive signs (including mercury warnings), and other facilities would be provided. Law enforcement of boating activities would occur. See *Fishing* alternative above. | Same as Alternative A, plus: Boating opportunities would be improved through increased interpretive signage or educational kiosks, increased visitor contacts, and increased law enforcement contacts. Improvements would be focused in the high density use zone. Problems with litter would be addressed through education, increased law enforcement, and additional trash/recycle facilities. See *Fishing* section. | Same as Alternative B. |
| **Camping** | Provide and maintain developed camping opportunities at Doris and Fawn Creek Campgrounds. Set fees according to site. Require reservations at Fawn Creek and for group sites at Doris Campground. | Same as Alternative A, plus: Increase camping opportunities by working with partners to meet the need for more camping in areas adjacent to the Refuge, including pedestrian and bicycle connection from adjacent campground to Refuge high density zone. | Same as Alternative B. |
| **Hiking** | Allow hiking throughout the Public Use Area on 12 trails totaling about 14.2 miles. Maintain trails. Allow use without group size restrictions. Protect resource values by closing areas seasonally where necessary. | Allow hiking throughout the Public Use Area on 12 trails totaling about 14.2 miles. Maintain trails. Protect resource values by closing areas seasonally where necessary. Increase and improve accessible hiking opportunities. Monitor participation by requiring participants to register on site. Conduct a study to determine social and biological resource thresholds. Manage areas to fit high, medium, and low density use zones. Update Visitor Services Plan. | Same as Alternative B, plus: Develop additional hiking opportunities in the high density use zone. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Picnicking** | Provide and maintain four picnicking areas. Allow use without group size restrictions. | Expand existing picnicking opportunities by working with partners to meet need for more picnicking in areas adjacent to the Refuge, including pedestrian and bicycle connection from adjacent campground to Refuge high density zone. Improve the quality of the opportunities in the high density use zone. Manage group size via infrastructure development and services. Increase utilization of less visited picnic areas in the medium density use area. | Same as Alternative B. |
| **Rock Sports** | Allow rock climbing, rappelling, and bouldering throughout the Public Use Management Area. Close locations seasonally where necessary to protect resource values. Maintain partnership and collaborative fixed anchor evaluation process with Wichita Mountains Climbers Coalition (WMCC). Allow use without group size restrictions. | Same as Alternative A, plus: Monitor participation by requiring participants to register on site. Conduct a study to determine social and biological resource thresholds. Manage areas to fit high, medium, and low density use zones. Incorporate fixed anchor review guidelines in the Visitor Services Plan. Replacement of fixed anchors would continue to be permitted but placement of new anchors would be limited. | Same as Alternative A, except eliminate technical (gear assisted) rock climbing. |
| **Special Use Area Management – Public Use Opportunities** | | | |
| **Interpretation** | Offer interpretive tours through the Friends of the Wichitas. Allow participants to get off the bus to observe or photograph wildlife and scenery. Include short walk on Fall Foliage Tour. | Same as Alternative A, plus: Maintain tours but move them from the Special Use Area to the Public Use Area if necessary to protect wildlife and habitat integrity. Update Visitor Services Plan. | Same as Alternative B. |
| **Wilderness Area Management – Public Use Opportunities** | | | |
| **Wildlife Observation** | Allow for hiking-based viewing opportunities only. Close to public use after sunset with the exception of backcountry camping. Use temporary access restrictions to protect sensitive sites. | Same as Alternative A, plus: Develop additional wildlife observation management direction as part of an updated Wilderness Stewardship Plan (WSP). | Same as Alternative B. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Photography** | Allow for hiking-based photography opportunities only. Close to public use after sunset with the exception of backcountry camping. Use temporary access restrictions to protect sensitive sites. | Same as Alternative A, plus: Develop additional photography management direction as part of an updated WSP. | Same as Alternative B. |
| **Interpretation** | Conduct a small amount of interpretative hikes in the Wilderness Area. Offer 3 spring hikes through the Friends of the Wichitas. Provide two Wilderness trailhead kiosks. Include Wilderness management and Leave No Trace information in talks and at event booths. | Same as Alternative A, plus: Limit group hikes to 15 people or less. Update the WSP. | Same as Alternative B. |
| **Environmental Education** | Conduct only a small amount of organized environmental education in the Wilderness Area. Include information on Wilderness management and Leave No Trace in education modules and events. | Same as Alternative A, plus: Limit group hikes to 15 people or less. Update the WSP. | Same as Alternative B. |
| **Camping** | Allow designated area backcountry camping through a backcountry permit with fee. Up to 10 permits issued weekly for a 2-night stay. | Same as Alternative A, plus: Decrease impacts of camping by implementing Leave No Trace. Update the WSP. | Same as Alternative B. |
| **Hiking** | Allow hiking anywhere within the Wilderness Area. Offer two designated trails totaling about 3.5 miles. Maintain trails by hand. Allow use without group size restrictions. | Continue trail maintenance. Implement Leave No Trace. Redistribute hiking pressure to high and medium density use areas. Monitor participation by requiring participants to register on site. Determine use thresholds. Create step-down trail plan. Groups would not exceed 15 without a Special Use Permit. Update the WSP. | Same as Alternative B. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Rock Sports** | Allow climbing, rappelling, and bouldering throughout the Wilderness Area. Close some locations seasonally to protect resource values. Maintain partnership with Wichita Mountains Climbers Coalition (WMCC). Implement all anchor replacements or modifications by hand. Allow use without group size restrictions. | Same as Alternative A, except: Develop fixed anchor management guidelines as part of an updated WSP. Fixed anchors would be evaluated by the WMCC. Approval of new routes requiring fixed anchors would be very limited. Users would be required to register on site to keep records of use whereby the Refuge could monitor use patterns. Groups would not exceed 15 without a Special Use Permit. | Same as Alternative A, except eliminate technical (gear assisted) rock climbing. |
| **Facilities** | | | |
| **Refuge-Wide Management** | | | |
| **Public Use Facilities** | Maintain Visitor Center, Environmental Education Center, roads, trails, campgrounds, picnic areas, fishing piers, boat ramps, etc. | Same as Alternative A, plus: Remodel Visitor Center and Environmental Education buildings using green technologies and make them fully accessible. Install 2 wildlife observation blinds at the Visitor Center and the Environmental Education Center. Increase trash collection infrastructure, place additional kiosks, and improve wayfinding signage. Update the Facility Management Plan. | Same as Alternative B, plus: Install emergency phones along roadways. |
| **Administrative Facilities** | Maintain headquarters and residence buildings, dams, fences, and corrals. | Same as Alternative A, plus: Replace headquarters building, enlarge corrals, and move fence to true Refuge boundary. Update the Facility Management Plan. | Same as Alternative A, plus: Remodel headquarters building and enlarge corrals. |
| **Cultural Resources** | Protect known archaeological sites. Protect and maintain designated sites or those sites eligible for designation to preserve historic character. | Same as Alternative A, plus: Update the 1964-1965 archaeological survey by completing systematic surveys Refuge-wide. Increase monitoring of known sites. | Same as Alternative B, plus: Identify sites in the Public Use Area at a greater risk of disturbance. Nominate additional historic sites for designation. |
| **Administrative Areas** | | | |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Holy City General Management** | Manage according to a 5-year Special Use Permit (renewable for 25 years) held by the Wallock Foundation to allow for management and administration of events. | Same as Alternative A, plus: Monitor use and effects to Refuge resources. Adapt management of activities if resources are being adversely affected. | Remove facilities and structures. |
| **Job Corps General Management** | Manage according to a Memorandum of Agreement (MOA) and easement with the U.S. Department of Labor and U.S. Department of Agriculture Forest Service. Administer site jointly as an educational and vocational training site for youth. | Same as Alternative A, plus: Consider partnership opportunities to include increased environmental education and Refuge-specific projects. | Relocate the Job Corps center off-Refuge. |

## Affected Environment

The CCP and EA describe the characteristics and resources of the Refuge and how existing or past management or other influences have affected these resources. The affected environment addresses the physical, biological, and socioeconomic environment of the Refuge that could be affected by management under the three alternatives. The Refuge used the best available data (see Literature Cited section) to expand on the existing conditions on the Refuge and projections for future conditions.

*View from Mt. Scott. Photo: USFWS*

## Physical Environment

### *Air Quality*

Pursuant to the Clean Air Act, as amended in 1977, the Service has an affirmative responsibility to protect air quality related values on national wildlife refuges, with special emphasis on Class I Wilderness Areas (areas in excess of 5,000 acres formally designated as Wilderness prior to August, 1977). Congress gave the U. S. Fish and Wildlife Service (FWS), a Federal land manager of Wilderness Areas, the responsibility to protect the air quality and natural resources, including visibility, of the area from man-made pollution. The National Atmospheric Deposition Program/Mercury Deposition Network (MDN) monitors weekly mercury concentrations and depositions near Refuge headquarters.

### *Water Resources and Water Quality*

The Refuge lies at a higher elevation than the surrounding landscape and is thereby situated at the top of the watershed. Creeks and streams on the Refuge are intermittent and seasonal. Prior to Refuge establishment, there were no year-round sources of water on the Refuge except small springs. Modified springs capture and store water making it available for animals to drink. Man-made reservoirs and ponds account for the largest waterbodies on the Refuge. Most

impoundments were constructed to provide a water source for wildlife and are fed by the numerous seasonal creeks that bisect the Refuge.

The Clean Water Act of 1977 requires states to identify and prioritize waters that do not currently support designated uses. Waterbodies that do not meet one or more applicable water quality standards and those that are threatened for a designated use by one or more pollutants are listed on each state's 303(d) list. Wichita Mountains Wildlife Refuge has one waterbody on the Oklahoma Department of Environmental Quality's 303(d) list. Lake Elmer Thomas is listed due to its low dissolved oxygen content load for fish and wildlife reproduction in a warm waterbody.

### *Soils and Geologic Resources*

The mountains of the Wichita region were formed some 300 million years ago (Pennsylvanian period). They were considerably higher than the present ones, as erosion has stripped off the upper parts and deposited this material in the intervening flats, reducing the relief. Granite is the dominant rock of the Refuge, and the gravels formed by erosion are mainly composed of granite fragments. The Refuge owns subsurface mineral rights. No energy developments or activities occur on the Refuge.

## Biological Environment

### *Habitat*

The Refuge is divided into three distinct terrestrial habitats: rocklands, central mixed-grass prairie, and Crosstimbers oak forest and woodland. The most extensive habitat on the Refuge is the Central Mixed-Grass Prairie, followed closely by the Crosstimbers Oak Forest and Woodland.

| Habitat/Ecosystem | Acres on Refuge | Percentage |
|---|---|---|
| Central Mixed-Grass Prairie | 30,941 | 52 |
| Crosstimbers Oak Forest and Woodland | 24,702 | 42 |
| Rocklands | 2,474 | 4 |
| Open Water | 568 | 1 |
| Developed | 335 | 1 |
| Total | 59,020 | 100 |

The Central Mixed-Grass Prairie contains elements from both shortgrass and tallgrass prairies with species densities and distributions controlled primarily by soil moisture and topography. The Crosstimbers habitat type is characterized by a "mosaic of forest, woodland and savanna." The Refuge's rockland habitats occur primarily on open and exposed mountain tops, southern slopes, and boulder slides. They are characterized by shallow soils, sparse vegetation, and gabbro and granite rock formations.

Natural aquatic classes on the Refuge, such as creeks and streams, are intermittent and seasonal. Man-made reservoirs and ponds account for the largest waterbodies on the Refuge.

### *Wildlife*

The Refuge supports habitats high in biodiversity. Vertebrate wildlife species that occur on the Refuge include: 60 species of mammals, 296 species of birds, 18 species of amphibians, 55 species of reptiles, and 35 species of fishes. Over 1,000 invertebrates have been found on the Refuge and surrounding lands including the Fort Sill Military Base.

The only federally listed species that occurs on the Refuge is the black-capped vireo (*Vireo atricapilla*).

Chapter 701 FW8 of the Service Manual states "By special acts of Congress or by special designation herein, five refuges are authorized to preserve and propagate remnant herds of nationally and/or historically significant animals. This chapter relates to the management of animal species now present on the refuges listed below where these species have historically occurred and where reintroduction has been authorized." The Wichita Mountains Wildlife Refuge is one of these designated refuges and thus manages the following megafauna: bison, elk, longhorn cattle, and white-tailed deer.

Focal species are the species and their associated habitats on which the Refuge focuses its management, research, and monitoring efforts. Focal species, similar to "keystone" species or "management indicator species," provide information to refuge managers about the conditions of habitats and guilds of species utilizing those habitats. The following species were selected as focal species by the Refuge based on the understanding that factors limiting their populations are sensitive to landscape scale characteristics and that by addressing the needs of these focal species, other species within a guild are expected to benefit:

| **Crosstimbers Oak Forest and Woodland Habitat Types** | |
|---|---|
| Black-Capped Vireo | Painted Bunting |
| **Central Mixed-Grass Prairie Habitat Types** | |
| Black-tailed Prairie Dog | Bison |
| **Rockland Habitat Types** | |
| Pale Lump-nosed Bat | Eastern Pipistrelle |
| **Water Habitat Types** | |
| Orangethroat Darter | |

## Socioeconomic Environment

### *Economic Benefits of Wichita Mountains Wildlife Refuge*

The socioeconomic benefits of the Wichita Mountains Wildlife Refuge consist of contributions it makes to local retail trade in the form of contracts, equipment rental and purchases, salaries paid to employees, permitted economic activities, and other services. Comanche County receives an annual payment in lieu of taxes, as provided by the Refuge Revenue Sharing Act of 1935.

### *Archaeological and Historical Sites*

An archaeological survey was conducted by the Museum of the Great Plains in 1964 and 1965. Most of the prehistoric sites found during the survey appear to be small, thin scatters of lithic debris with an occasional stone-lined hearth visible on the surface.

Five Refuge structures are listed on the National Register of Historic Places. These structures are Boulder Cabin, Buffalo Lodge, the Cedar Creek Arrastra Site, Ferguson House, and Ingram House.

### *Public Use*

Visitation at the Wichita Mountains Wildlife Refuge over the last 10 years has averaged about 1.5 million visitors a year, making it one of the most visited national wildlife refuges (U.S. Fish and Wildlife Service 2009). While annual visitation fluctuates, the long-term trend is one of increasing visitation.

#### *Wildlife-Dependent Recreation*

The Refuge Improvement Act of 1997 recognizes six wildlife-dependent forms of recreation that are determined to be appropriate uses of a national wildlife refuge and that receive priority consideration in refuge planning and management: hunting, fishing, wildlife observation, photography, interpretation, and environmental education. All six of these activities occur on the Refuge, primarily in the Public Use Area.

#### *Supportive Recreation*

The other recreation activities occurring on the Wichita Mountains Wildlife Refuge—bicycling, boating, camping, hiking, picnicking, and rock sports—are considered to be supportive of wildlife-dependent recreation.

Some commercial activities are allowed on the Refuge through a Special Use Permit obtained from the Refuge Manager. This includes instructional operators and guides who charge for their services while on Refuge lands. The Refuge also allows individual recreational pursuits such as jogging or strenuous walking, scuba diving, and amateur radio operation.

### *Facilities*

The Refuge maintains an array of public use and administrative facilities to support public use and to protect natural resource values. Among these facilities are the Visitor Center, Headquarters Office, two campgrounds, four picnic areas, the Environmental Education Center buildings, the bison and longhorn auction facilities, and numerous directional, informational, and interpretive signs.

### *Special Management Areas*

The 8,570-acre Wichita Mountains Wilderness Area, which was designated by Congress through Public Law 91-504 on October 23, 1970, consists of two units: the Charons Garden Unit (5,723 acres) and the North Mountain Unit (2,847 acres). The Charons Garden unit is located in the southwestern portion of the Refuge, which lies in the Public Use Area. The North Mountain unit lies in the north-central part of the Refuge and is located in the Special Use Area. The North Mountain unit is also managed as a Research Natural Area, with access and use limited to mostly scientific and educational purposes.

The Refuge contains one Research Natural Area (RNA), the North Mountain RNA, totaling 2,847 acres. This RNA is representative of the bluestem-gramma prairie habitat type.

The Special Use Area was administratively designated on the Refuge as an area with restricted public access intended to benefit natural conditions and allow for natural processes. The 34,932-acre Special Use Area covers the Refuge's northwest half.

The Public Use Area was administratively designated on the Refuge as an area for public access, intended to benefit public use opportunities and promote awareness of the Refuge's wildlife and habitats. The 24,088-acre Public Use Area covers the Refuge's south and southeast portions.

The Wichita Mountains Scenic Byway was designated in 2009 and includes the portions of State Highways 49 and 115 that bisect the Refuge. The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The designation was based on the outstanding natural and scenic qualities of the area and route.

***Administrative Areas***

*Holy City*

The construction project of the Holy City of the Wichitas was completed in 1934, and the first Easter Pageant was conducted in 1935. The Refuge issues a five-year permit with the option of renewal in five-year increments at the Refuge Manager's discretion (not to exceed 25 years) for use of the 65-acre Holy City site. Granting the five-year permit allows for frequent reassessment of the permit terms and conditions to adjust for environmental and other effects, whether those effects stem from use of the site by the Wallock Foundation or by other groups using this or another site. The five-year permit with renewal options is considered the most prudent means of protecting Refuge resources, while allowing the Wallock Foundation to maintain a regionally important cultural and historical event and associated facility.

*Treasure Lake Job Corps*

The Treasure Lake Job Corps Center was established in 1965 on approximately 80 acres near the southwest corner of the Refuge. The purpose of the Job Corps is to provide disadvantaged youth an opportunity for education, vocational training, and useful work experience for the purpose of increasing their employment capability and preparing them for the responsibilities of citizenship. On January 17, 2010, the administration and operation of the Center was transferred from the Bureau of Reclamation to the Forest Service. All land, buildings, and structures at the Center remain under the jurisdiction of the Fish and Wildlife Service as part of the Refuge.

## Environmental Consequences

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Climate Change** | ▪ Increase in annual mean temperature predicted.<br>▪ Increased frequency of hot extremes and heat waves predicted.<br>▪ Fewer and less severe cold extremes predicted.<br>▪ Warm season predicted to become longer and arrive earlier.<br>▪ Cool season predicted to warm and shorten.<br>▪ Larger changes in summer temperatures than winter temperatures predicted. | Same as Alternative A. | Same as Alternative A. |
| **Physical Resources** | | | |
| **Air Quality** | ▪ Impacts would be both adverse and beneficial.<br>▪ Adverse impacts would occur from prescribed fires, fugitive dust, and spray drift.<br>▪ Adverse impacts would be short-term, negligible to moderate, and localized to widespread.<br>▪ Direct and indirect beneficial impacts would occur from maintaining habitat and monitoring mercury and regional haze parameters.<br>▪ Direct beneficial impacts from habitat conservation would be moderate, long-term, and widespread.<br>▪ Indirect beneficial impacts from monitoring would be long-term, negligible to minor, and widespread. | ▪ In general, adverse impacts would be the same as Alternative A, except that there may be some reduction in certain emissions overall.<br>▪ Beneficial impacts would be the same as Alternative A. | Same as Alternative B. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Water Resources** | ▪ Overall net effect from management actions would be beneficial.<br>▪ Effects range from short-term to long-term in duration.<br>▪ Effects would be minor to moderately beneficial.<br>▪ Any adverse effects would be negligible to minor and localized (Refuge-wide). | Same as Alternative A except for possible beneficial, long-term, localized effect on fisheries related to fish passage structure on West Cache Creek to improve fish passage. | Same as Alternative A. |
| **Water Quality** | ▪ Impacts would be both adverse and beneficial.<br>▪ Adverse impacts would result from a variety of sources.<br>▪ Adverse impacts would be short-term from specific actions, of negligible to moderate intensity, and on a localized to moderate scale.<br>▪ Beneficial impacts would occur from monitoring mercury levels in fish, low-water stream crossings, and conserving Refuge vegetative cover.<br>▪ Beneficial impacts would be long-term, of minor to moderate intensity, and on a localized to moderate scale. | ▪ In broad terms, overall impacts would be the same as Alternative A.<br>▪ There would be additional short-term, localized, minor adverse impacts on water quality (due to suspended solids and turbidity) from proposed construction of a fish crossing structure and other new facilities.<br>▪ New low-water stream crossings would have long-term, beneficial, localized, minor effects on water quality.<br>▪ Managing group size in low and medium density areas for hiking, rock climbing would be an added benefit, although probably negligible. | ▪ Effects similar to Alternative A.<br>▪ Possibility of increased erosion, turbidity, and sedimentation from overgrazing. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Soils** | ▪ Impacts would be both beneficial and adverse, largely the former.<br>▪ Roads, trails, construction and maintenance activities would have localized, negligible to minor adverse impacts.<br>▪ The pyric-herbivory model of grazing interactions would lessen long-term damage to grasslands by attracting grazers (by post-burn growth) across the Refuge.<br>▪ Livestock grazing under special use permit would cause localized soil compaction and erosion.<br>▪ Effects range from short-term to long-term.<br>▪ Beneficial effects would be minor to moderate, long-term, and widespread. | ▪ Same as Alternative A, with the exception of:<br>▪ Reduction in hiking, rock climbing, etc., group size a beneficial resource impact.<br>▪ Short-term adverse, localized impacts from constructing new facilities. | ▪ Same as Alternative A, with the exception of:<br>▪ However, increased erosion, turbidity, and sedimentation could occur if overgrazing takes place. |
| **Biological Resources** | | | |
| **Wildlife Habitats (General)** | ▪ Overall net beneficial impacts on habitat from fire program, invasive species control, and other activities such as exclusion from Special Use Area.<br>▪ Impacts are moderately beneficial.<br>▪ Effects are short-term to long-term and widespread. | ▪ Similar to but somewhat more beneficial than Alternative A.<br>▪ Reduction in hiking group size a beneficial resource impact. | ▪ Same as Alternative B, but with additional minor impacts from increasing public use in the SUA.<br>▪ Possibility of moderate to major, localized, long-term damage to grassland habitats from overgrazing. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Native Fauna** | ▪ Overall moderately beneficial, long-term effects from current management (including invasive species control).<br>▪ Adverse effects from reduced forage due to maintaining non-native fauna (longhorns).<br>▪ Effects would be localized to widespread (Refuge-wide and beyond due to bison initiative). | ▪ Even more beneficial than Alternative A due to estimated increase in bison (and perhaps deer and elk) population because of decrease in longhorn population.<br>▪ Reduction in hiking group size a potential minor beneficial resource impact. | ▪ Superficially more beneficial than Alternatives A and B due to possible reintroduction of wolves and pronghorn antelope; however, these proposed reintroductions may not be ecologically or politically feasible.<br>▪ Potential adverse impact to bison if longhorn population is allowed to increase.<br>▪ Additional minor to moderate adverse impacts on wildlife from increasing public use in the SUA due to habitat effects and disturbance. |
| **Non-Native Fauna** | ▪ Maintaining Texas longhorn cattle population as a living cultural resource, which is minor to moderately beneficial, given existing directives.<br>▪ Effects are long-term and localized to widespread (Refuge-wide and beyond).<br>▪ Efforts to control feral hogs and mussels restrict impacts to localized, long-term, and minor. | Same as Alternative A, except that longhorn population might (subject to results of evaluation) be managed at lower level or relocated (to allow for increase in bison population). | ▪ Same as Alternative A, except that longhorn population might (subject to results of evaluation) be managed at higher level.<br>▪ May not be realistic to maintain higher longhorn population for several reasons, including increased bison herd, adding wolves, and available forage. |
| **Federal Trust Species** | ▪ Long-term, moderately beneficial effects on black-capped vireo and populations of other Federal trust species.<br>▪ Population impacts would be widespread because they would help overall recovery of species that range well beyond Refuge's boundaries. | ▪ Likely to be somewhat more beneficial for the black-capped vireo and other Federal trust species than Alternative A. | Same as Alternative B. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Socioeconomic Resources** | | | |
| **Hunting** | ▪ Beneficial effect on hunting would be moderate, long-term, and localized to widespread. | Same as Alternative A. | ▪ Potentially more beneficial than Alternative A because of addition of turkey and feral hog hunts.<br>▪ However, feral hog hunts use too many Refuge resources and are not an effective method for hog control. |
| **Fishing** | ▪ Beneficial effect on fishing would be moderate, long-term, and localized to widespread. | More beneficial than Alternative A because of additional facilities and opportunities. | ▪ Even more beneficial than Alternative B because of additional fishing piers beyond those offered under Alternative B. |
| **Wildlife Observation & Photography** | ▪ Beneficial effect on wildlife observation and photography would be minor to moderate, long-term, and localized to widespread. | ▪ More beneficial than Alternative A because of additional facilities and opportunities.<br>▪ Opportunities will be organized according to use density zones. | ▪ Beneficial effects from potentially increased bison population and proposed new facilities.<br>▪ Potential adverse effects (minor to moderate, long-term, localized) from added hunts, further restricting access to observers and photographers for part of the year. |
| **Interpretation** | ▪ Beneficial effect on interpretation would be moderate, long-term, and localized to widespread. | ▪ More beneficial than Alternative A because of additional facilities and opportunities. | Same as Alternative B. |
| **Environmental Education** | ▪ Beneficial effect on environmental education would be moderate, long-term, and localized to widespread. | ▪ More beneficial than Alternative A because of additional facilities and opportunities. | Same as Alternative B. |
| **Bicycling** | ▪ Beneficial effect on bicycling would be moderate, long-term, and localized to widespread. | ▪ More beneficial than Alternative A because of additional facilities and opportunities. | ▪ Even more beneficial than Alternative B because of re-opening Burma Road to bicycling. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Boating** | ▪ Beneficial effect on boating would be moderate, long-term, and localized to widespread. | ▪ More beneficial than Alternative A because of additional facilities. | Same as Alternative B. |
| **Camping** | ▪ Beneficial effect on camping would be moderate, long-term, and localized. | ▪ More beneficial than Alternative A because of encouraging opportunities off-Refuge. | Same as Alternative B. |
| **Hiking** | ▪ Beneficial effect on hiking would be moderate, long-term, and localized to widespread.<br>▪ Hiking experience and trail quality likely to decrease due to increasing pressures and use. | ▪ Minor adverse effect due to limitations on group size.<br>▪ Minor beneficial effect on hiking experience in Wilderness due to group size management.<br>▪ Beneficial effects from increase in accessible opportunities, increased trail maintenance, and redistribution to appropriate density zones.<br>▪ Overall net effect would still be moderately beneficial, long-term, and localized to widespread. | ▪ Similar to Alternative B, with some exceptions.<br>▪ Minor added beneficial effect from additional opportunities in the high use density area.<br>▪ Potential adverse effect due to increased hunting opportunities.<br>▪ Overall net effect would still be moderately beneficial, long-term, and localized to widespread. |
| **Picnicking** | ▪ Beneficial effect on picnicking would be moderate, long-term, and localized to widespread. | ▪ More beneficial than Alternative A because of encouraging opportunities off-Refuge and improving existing sites on-Refuge. | ▪ Moderate adverse effect due to loss of opportunities. |
| **Rock Sports** | ▪ Beneficial effect on rock sports would be moderate, long-term, and localized to widespread. | ▪ Same as Alternative A except for minor adverse effect due to loss or change of opportunities for groups larger than 15 in the Wilderness Area and larger than 30 in the medium density use zone.<br>▪ Overall net effect would still be moderately beneficial, long-term, and localized to widespread. | ▪ Moderate to major adverse impacts due to elimination of technical rock climbing. |

| Issues | Alternative A<br>No Action | Alternative B<br>Proposed Action | Alternative C |
|---|---|---|---|
| **Special Uses** | ▪ Beneficial effect to public uses would be negligible to minor over the long-term and would occur over the localized to widespread geographic scale.<br>▪ Adverse effects would be negligible to minor and would occur over the long-term, localized to widespread geographic scale. | ▪ Same as Alternative A except the Refuge would require a Special Use Permit for each activity.<br>▪ Beneficial effect to public uses would be negligible to minor over the long-term and would occur over the localized to widespread geographic scale. | Same as Alternative A or B (depending on the use). |
| **Commercial Uses** | ▪ Beneficial and adverse effects would be negligible to minor over the long-term and widespread scale.<br>▪ All uses would be conducted in support of one of the six wildlife-dependent recreational uses. | ▪ Same as Alternative B, except all uses would now require a Special Use Permit.<br>▪ Beneficial and adverse effects would be negligible to minor over the long-term and widespread scale. | Same as Alternative A or B (depending on the use). |
| **Wilderness** | ▪ Beneficial effect on designated wilderness area would be moderate, long-term, and localized to widespread.<br>▪ There would likely be some loss of the solitude that now prevails in the Wilderness due to increasing visitation pressures. | ▪ More beneficial than Alternative A from managing wilderness visitation and improved trail maintenance.<br>▪ Would preserve more of wilderness character by limiting activities and group size in wilderness areas. | Same as Alternative B. |
| **Special Use Area/Research Natural Area** | ▪ Beneficial effect on special use area would be moderate, long-term, and localized to widespread. | ▪ Generally similar effects as Alternative A, plus designation of Research Natural Area at Special Use Area boundary. | ▪ Minor to moderate adverse effect on habitat and wildlife values from increased public use in special use area.<br>▪ Minor beneficial effect due to increased recreational opportunities. |
| **Facilities and Administrative Areas** | ▪ Effect on facilities and administrative areas is neutral, long-term and localized. | ▪ Beneficial, long-term, localized impacts from new and rebuilt facilities.<br>▪ Beneficial, long-term, localized impacts from monitoring and mitigations. | Same as Alternative B. |

| | No Action | Proposed Action | |
|---|---|---|---|
| **Socio-economics** | ▪ Minor to moderate beneficial effects on the local economy from Refuge visitation and expenditures.<br>▪ Impacts would be long-term and localized to widespread. | Same as Alternative A. | Same as Alternative A. |
| **Cultural Resources** | ▪ Neutral to beneficial effects in general from managing according to directive and National Historic Preservation Act.<br>▪ Effects would be minor, long-term, and localized. | ▪ Moderately beneficial, which is more beneficial than Alternative A because of proposed surveys and increased monitoring.<br>▪ Impacts would long-term and localized. | ▪ More beneficial than Alternative B because of risk assessment of sites in PUA and additional sites nominated for National Register of Historic Places.<br>▪ Impacts long-term and localized. |
| **Scenery** | ▪ Adverse impacts would be negligible to minor, long-term and localized to widespread.<br>▪ Moderately beneficial, long-term, widespread impact. | Same as Alternative A. | Same as Alternative A. |

### Public Involvement on the Draft Plan and EA

The public was notified of the release of the Draft CCP and EA through local media outlets and a Notice of Availability in the *Federal Register* on August 9, 2012 (Volume 77, Issue 154, pp. 47657-47660). Subsequently, the Refuge held a 30-day public comment period from August 9, 2012 through September 10, 2012. During that time the Refuge conducted two public meetings – one at the Lawton Public Library on August 13, 2012 and the other at the Refuge Visitor Center on August 14, 2012. Approximately 50 people attended these meetings. Eighty-six individual comments were received by mail, email, phone call, and comment form. Comments received on the Draft CCP and EA were responded to (see Appendix I) and some resulted in modifications to the CCP. The Final CCP replaces current management direction after the decision document is signed (see Appendix G).

### Implement Plan, Monitor, and Evaluate

The Final CCP provides management direction for the Refuge over the next 15 years. It will guide the development of more detailed step-down management plans for specific resource areas and will be the basis for the annual budgeting process for Refuge operations and maintenance (see Chapter 5). Most importantly, it describes the general approach to managing habitat, wildlife, and public use on the Refuge that will direct day-to-day decision making and actions.

A critical component of management is monitoring and measuring resources and social conditions to make sure that progress is being made toward meeting goals. Monitoring also detects new problems, issues, or opportunities that should be addressed. The Refuge is using an adaptive management approach, which means that information gained from monitoring is used to evaluate and, as needed, to modify Refuge objectives.

### Review and Revise Plan

Agency policy directs that the CCP be reviewed annually to assess the need for changes. The CCP will be revised when significant new information becomes available, ecological conditions change, or the need to do so is identified during the annual review. If major changes are proposed, public meetings may be held, or new environmental assessments and environmental impact statements may be necessary. Consultation with appropriate State agencies will occur at least every 15 years.

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