

U.S. Fish and Wildlife Service

Final Land Protection Plan & Environmental Assessment

Muleshoe National Wildlife Refuge



Sandhill cranes over Muleshoe NWR

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Executive Summary

The U.S. Fish and Wildlife Service (Service) prepared this Land Protection Plan and Environmental Assessment with the intent of establishing a limited acquisition boundary (also referred to as a Conservation Partnership Area) for Muleshoe National Wildlife Refuge. Within this boundary, the Service would work only with willing sellers to expand conservation through fee title and easement acquisitions consistent with our Strategic Growth Policy.

The following Land Protection Plan encompasses a portion of the Southern High Plains ecoregion in New Mexico and Texas where habitat for sandhill crane, pronghorn, and lesser prairie-chicken remains. This habitat could be readily enhanced through connectivity corridors and preservation of existing large block grasslands, playa wetlands, and saline lakes. The goal is to deliver in-perpetuity conservation of up to 700,000 acres of land, enhancing wildlife populations, preventing future listing of endangered or threatened species, and supporting the delisting of listed species.

This Land Protection Plan represents nearly 15 years of research, cooperation, and iterative planning by the Service, the Playa Lakes Joint Venture, Texas Parks and Wildlife Department, New Mexico Game and Fish Department, The Nature Conservancy, and many other conservation partners. In the fall of 2021, the director of the Service approved a Land Protection Strategy, acknowledging the sound scientific basis for this plan and the viability of the conservation partnerships refuge staff have fostered to ensure its success. The Land Protection Strategy provided the outline for the more detailed plan presented in this document.

If this plan is implemented, the Service would expand conservation for sandhill crane, pronghorn, and lesser prairie-chicken, as well as a full suite of other wildlife that relies on the same habitat types. This conservation would be durable, in-perpetuity protection of habitat from anthropogenic forces including energy development, climate change, habitat fragmentation, and aquifer decline.

The preparation of this plan was possible with the support of numerous conservation partners and landowners across the Southern High Plains ecoregion in New Mexico and Texas. The Service is grateful for everyone whose scientific contributions, planning support, and methodical input is reflected in this draft.

Note: In an effort to streamline this document and make it more accessible to readers, inline literature citations are not included in the body of this plan. References are provided in Appendix A and can be further examined in the associated Landscape Conservation Design.

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Abbreviations

BLM Bureau of Land Management

CPA Conservation Partnership Area

CRP Conservation Reserve Program

DOI Department of Interior

DU Ducks Unlimited

ESA Endangered Species Act

THE SERVICE Fish and Wildlife Service

IMP Inventory and Monitoring Plan

LCD Landscape Conservation Design

LPP Land Protection Plan

LPS Land Protection Strategy

MCP Mid-Continent Population

NEPA National Environmental Policy Act

NGO Non-Governmental Organization

NWR National Wildlife Refuge

NWRS National Wildlife Refuge System

NRCS Natural Resource Conservation Service

PLJV Playa Lakes Joint Venture

TNC The Nature Conservancy

TPWD Texas Parks and Wildlife Department

USDA U.S. Department of Agriculture

WAFWA Western Association of Fish and Wildlife Agencies

CHAT Crucial Habitat Assessment Tool

Chapter 1: Introduction

Project Description

The goals of the Land Protection Plan (LPP) for Muleshoe National Wildlife Refuge (NWR) are to expand conservation in the Southern High Plains of Texas and New Mexico (Southern High Plains) and further the protection and management of sandhill cranes (*Antigone canadensis*), pronghorn (*Antilocapra americana*), lesser prairie-chicken (*Tympanuchus palliducinctus*), and other species of concern that rely on saline lakes, playa wetlands, and shortgrass prairie. The Southern High Plains refers to the expanse of shortgrass prairie that is in the southernmost portion of the Great Plains, south of the Canadian River and encompassing parts of western Texas and eastern New Mexico.

NEPA Compliance

This LPP incorporates and integrates the elements of an Environmental Assessment (EA) consistent with White House Council on Environmental Quality regulations under The National Environmental Policy Act (NEPA). This contrasts with using a separate EA document. This document describes the purpose and need, proposed action, alternatives to the proposed action, and the affected environment and environmental effects. Results of the scoping, consultation, stakeholder coordination, and public comment period are also included. A separate Finding of No Significant Impact would be published with the final draft of this plan.

Purpose and Need for Plan

The proposed action has been developed to direct growth of Muleshoe NWR in a manner that best contributes to the conservation of the ecosystems on the Southern High Plains. This plan complements the efforts of states and other federal agencies to conserve fish and wildlife and their habitats, and to increase support and participation from conservation partners and the public.

The proposed action is needed because anthropogenic landscape drivers have caused aquifer decline, land use change, and climate change across the project area which impair the function of healthy ecosystems for humans and wildlife. Addressing these landscape drivers is within the Service's authority under the National Wildlife Refuge Administration Act of 1966, as amended.

No Action Alternative – Existing Refuge Extent

Under the no action alternative, the U.S. Fish and Wildlife Service (FWS; the Service) would not expand the boundaries of Muleshoe NWR through fee-title acquisitions or conservation easements with willing sellers in the Southern High Plains. Reducing the loss of habitat, wildlife, and natural resources is the Service's objective in preparing this plan, therefore, the no-action alternative represents future landscape conditions that the Service intends to prevent.

Without a LPP for Muleshoe NWR, the Service would not acquire new lands that address habitat needs for sandhill cranes, lesser prairie-chicken, pronghorn, or other wildlife in

response to climate change, habitat fragmentation, energy development, aquifer depletion, or other landscape drivers.

The boundary of Muleshoe NWR would remain unchanged, conserving 6,440 acres. The playas, saline lakes, and grasslands currently protected by the refuge would remain protected. No additional conservation areas or habitat connections for lesser prairie-chicken, pronghorn, sandhill crane, or other wildlife would be added to the refuge. Conservation values served by the refuge may be compromised as landscape drivers diminish resources available for wildlife across the region and opportunities for wildlife-based outdoor recreation and other benefits would be limited.

Some enhanced conservation may be provided by other entities through CRP or other initiatives. These initiatives alone do not meet the Service's purpose and need because there is limited assurance that the benefits to wildlife will be resilient and focused in the most strategic habitat areas, as outlined in this plan's priority areas.

Multiple Refuge Expansion Alternative

The Service considered a new expansion boundary for Grulla NWR in addition to Muleshoe NWR, working within the same area to enhance conservation for lesser prairie-chicken, pronghorn, and sandhill crane across the Southern High Plains. An expansion boundary for Grulla NWR was dropped from consideration because it does not currently have refuge management resources independent of Muleshoe NWR. Expanding only Muleshoe would allow the Service to allocate administrative and planning resources for this LPP more efficiently. Grulla NWR is within the plan area and contributes to the conservation goals of this LPP.

Proposed Action

The U.S. Fish and Wildlife Service proposes to establish a voluntary land acquisition program in the area around Muleshoe National Wildlife Refuge in west Texas and eastern New Mexico for the purposes of protecting and conserving additional lands and waters that support priority wildlife species. Grulla NWR would remain as a separate, unstaffed refuge in the project area that conserves saline lake and shortgrass prairie habitat. The proposed limited acquisition boundary would apply to Muleshoe NWR and encompasses roughly 7,000,000 acres, within which the Service would strategically protect habitat by acquiring lands in fee title or using conservation easements on up to 700,000 acres from only willing sellers.

Methods

Lands will be conserved through fee title acquisition and perpetual conservation easements only from willing landowners in the region. Areas were prioritized in the Landscape Conservation Design (LCD) based on habitat requirements for sandhill crane, pronghorn, and lesser prairie-chicken. Refuge staff also considered the connectivity of Muleshoe and Grulla NWRs and conservation corridors between important lesser prairie-chicken habitats. Areas are grouped into Priority Areas in the LCD and carried forward into this plan.

Boundaries

The proposed expansion area for this LPP is delineated by a limited acquisition boundary in which the Service would be authorized to acquire up to 700,000 acres out of a larger 7,000,000 acre footprint. This limited acquisition boundary is referred to interchangeably as the Conservation Partnership Area (CPA) throughout the plan because the Service is one of many entities working toward conservation outcomes within this area (Fig. 1). Within the CPA, the Service and its partners will focus on the priority areas where acquiring lands only from willing sellers would have the most conservation impact.

Issues

Biological Issues

This plan and the integrated Environmental Assessment (EA) consider a focused geographic section of the Southern High Plains as the affected environment and weighs the current ecosystem trends against the effects of implementing a LPP. Biological resources within the project area are influenced by factors outside of the Service's control. Some of the specific ecosystem attributes influenced by the landscape drivers include hydrologic function, habitat connectivity, disturbance (roads, structures, fences), forage, and vegetation cover.

Following the Service's Strategic Growth Policy (DM 602 FW5), this plan uses focal species to define measurable targets and guide conservation design. Focal species represent multiple species and habitats within a defined landscape or geographic area. The three focal species used in this plan - sandhill crane, pronghorn, and lesser prairie-chicken - represent many species and habitat types within the defined CPA.

Socioeconomic Issues & Environmental Justice

This plan acknowledges that the CPA includes communities that rely on the long-term viability of working lands for economic and environmental health. Meeting the conservation goals in this plan requires working with willing landowners and analyzing the long-term economic and social effects of expanding conservation in the Southern High Plains. Additionally, functional ecosystems benefit the human environment and any actions covered under this plan should not place an undue burden on any minority or low-income communities but instead stand to benefit local communities in their access to nature, clean water, and clean air.

Issues Considered but not Advanced for Analysis

Analysis under the National Environmental Policy Act (NEPA) requires a hard look at a range of issues. The environment of the Southern High Plains encompasses a wide range of resources and environmental issues, of which not all are appropriate to analyze in detail for this plan. The decision not to analyze the issues listed below is rooted in FWS policy that requires separate natural resource plans to accompany land management practices.

As new lands are added to Muleshoe NWR additional plans for vegetation management, hunting, wildlife observation, and other uses will be prepared that consider site specific

conditions rather than the broader landscape. These plans may require in depth analysis of:

- Cultural resources
- Public safety
- Water quality
- Soils
- Vegetation management
- Hydrology
- Other specific resources, depending on the location and the project.

National Wildlife Refuge System and Authorities

National Wildlife Refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The mission of the NWRS, as outlined by the National Wildlife Refuge System Administration Act (NWRSA), as amended by the National Wildlife Refuge System Improvement Act (16 U.S.C. 668dd et seq.), 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”

Additionally, the NWRSA mandates the Secretary of the Interior in administering the NWRS (16 U.S.C. 668dd(a)(4)) to:

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS;
- Ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the NWRS described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the states in which the units of the NWRS are located;
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the NWRS and the purposes of each refuge;

- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the NWRS through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the NWRS for compatible wildlife-dependent recreational uses; and monitor the status and trends of fish, wildlife, and plants in each refuge.

Muleshoe Establishment and Purpose

Muleshoe NWR was established on October 24, 1935 by Executive Order No. 7214, "...for the use of theas a refuge and breeding ground for migratory birds and other wildlife...". This acquisition was implemented under the authority of the:

- Migratory Bird Conservation Act (16 U.S.C. 712d) also established that the refuge is: "for use as an inviolate sanctuary, ...for any other management purposes, ...for migratory birds."
- Consolidated Farm & Rural Development Act: "for conservation purposes..." (7 U.S.C)

Habitat Protection and Land Acquisition

The Service has identified priority areas that encompass saline lakes, playa lakes, shortgrass prairie, and connective corridors between habitats. There are five priority areas, which are detailed in Chapter 4 of this plan.

Land Acquisition Process

The Service would acquire the minimum interest in land from willing sellers to achieve habitat acquisition goals. This land acquisition project would be authorized under U.S. Fish and Wildlife Act of 1956 (16 U.S.C.742 a-742j). The main sources of federal funding to acquire land and conservation easements include the Land and Water Conservation Fund, Migratory Bird Conservation Commission, and North American Wetlands Conservation Act. There could be additional funds to acquire lands, waters, or interest therein through sources such as congressional appropriations and donations. The Service would also use land exchanges, withdrawals, donations, and transfers to acquire lands.

The basic considerations in acquiring land are landowner interest in the project, the biological significance of the area, the biological requirements of wildlife species of management concern, and existing and anticipated threats to wildlife resources. The purchase of fee-title or conservation easements will occur with willing sellers only and will be subject to available funding.

Fee-Title Acquisition

A fee-title interest is normally acquired when: (1) The area's fish and wildlife resources require permanent protection not otherwise assured, (2) land is needed for visitor use development, (3) a pending land use could adversely impact the area's resources, or (4) it is the most practical and economical way to assemble small tracts into a manageable unit. Fee-title acquisition conveys all ownership rights to the Federal Government and provides the best assurance of permanent resource protection. In general, fee-title

interest may be acquired by donation or purchase (as the availability of funding allows). The Service also uses land exchanges, withdrawals, donations, and transfers from willing sellers or other agencies to acquire lands.

Conservation Easements

The easement program is a conservation tool, complementing other efforts in the area. Conservation easements can be the most cost-effective means to ensure protection of important habitats. An easement refers to the purchase of limited rights (less-than-fee) from an interested landowner. The landowner would retain ownership of the land but would sell certain rights identified and agreed upon by both parties. Conservation easements are a viable means to protect wildlife values on a landscape scale. The objectives and conditions of our proposed conservation easements would recognize lands for their importance to wildlife habitat or outdoor recreational activities, and any other qualities that recommend them for addition to the NWRS. Land uses that may be restricted under the terms of a conservation easement include development rights (residential, changes in agricultural use, wind energy, etc.), alteration of the area's natural topography or hydrology, uses adversely affecting the area's plant and wildlife communities, and certain hunting and fishing activities.

Related Actions and Activities

There are many conservation initiatives underway in the Southern High Plains region that compliment this plan or have supported plan preparation. These initiatives include land conservation programs administered by government agencies like the Texas Parks and Wildlife Department (TPWD), New Mexico Game and Fish Department, or the U.S. Department of Agriculture (USDA). Non-governmental organization initiatives directed by the Playa Lakes Joint Venture (PLJV), The Nature Conservancy (TNC), and Ducks Unlimited (DU) contribute to the science, management, and conservation of the Southern High Plains. Additionally, local communities are beginning to consider the role that habitat conservation may play in protecting groundwater resources into the future.

Plan Development and Consultation

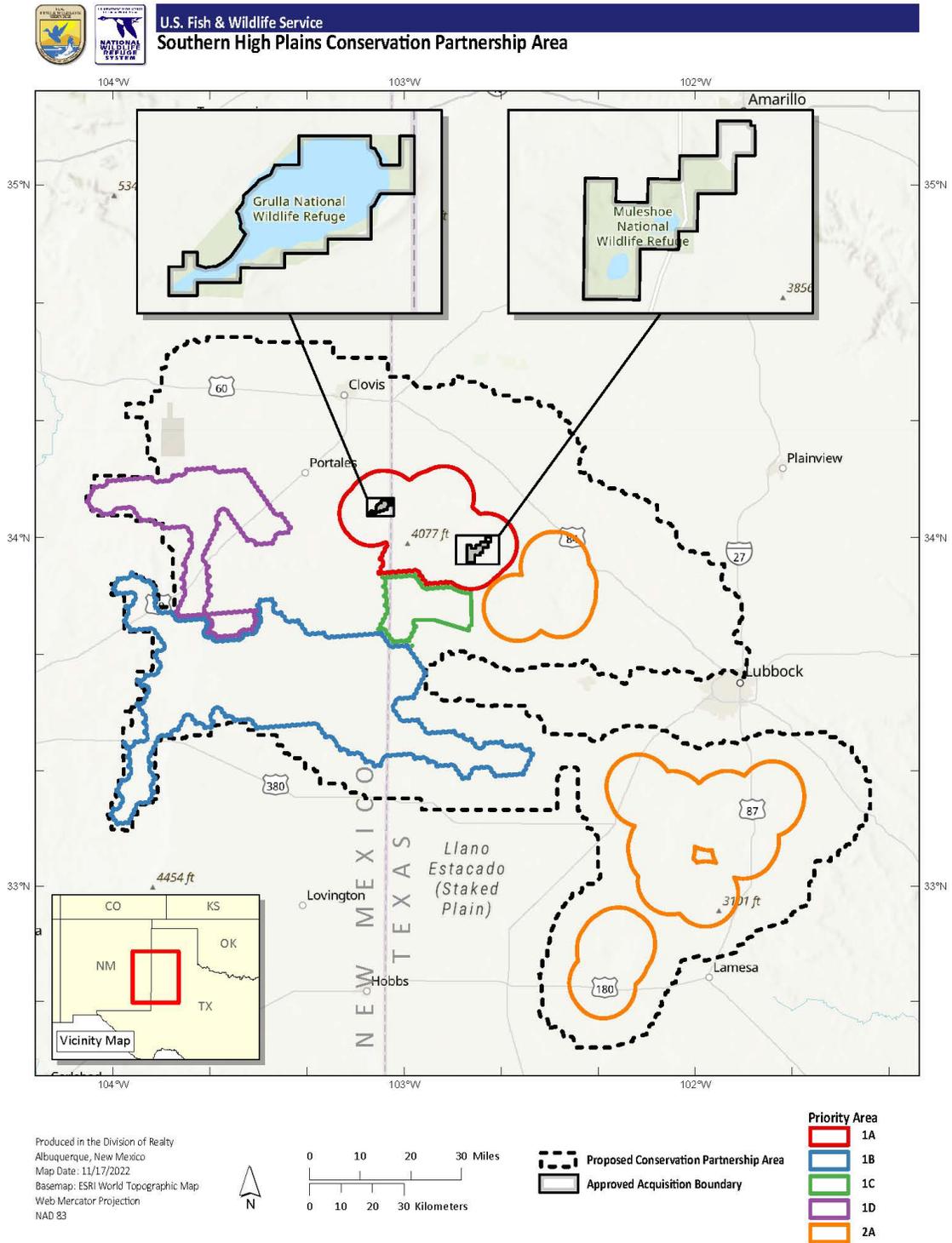
In March of 2022, the Service distributed an informal scoping pamphlet by mail and electronically, inviting input, questions, and feedback on the development of this LPP. The feedback from local landowners and stakeholders was uniformly positive, seeking clarification on how the process works and indicating eagerness to participate if the plan is finalized.

In June of 2022, the Service sent letters to tribal governments that may be interested notifying them of this planning effort and providing an opportunity to express concerns or submit comments. No responses were received.

In September of 2022, the Service began intra-service consultation under Section 7 of the Endangered Species Act (ESA) with the Arlington TX, Ecological Services office. This consultation is summarized in Chapter 2 of this plan with additional details in Appendix C.

From January 3, 2023 to February 3, 2023 the Service made the Draft LPP and Environmental Assessment available for public review online and in-person at the refuge and regional office. Informational brochures were mailed to interested parties, affected tribes were notified, and press releases were sent to regional newspapers and online news outlets. During the comment period the refuge answered many questions about lesser prairie-chicken conservation. All comments submitted supported the plan, with some including follow up questions about specifics of plan implantation and the project timeline. Comments, responses, and support letters are included in Appendix D.

Figure 1. Project Map



The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content. This map template is intended as a general guide for the creation of U.S. Fish and Wildlife maps at a small scale. This map is intended to show the general geographic extent of the proposed Land Protection plan for Muleshoe and Grulla National Wildlife Refuges. Map image is the intellectual property of Esri and is used herein under license. Copyright © 2019 Esri and its licensors. All rights reserved.

Chapter 2: Affected Environment

Biological Environment

The Southern High Plains is a shortgrass prairie that is in the southernmost portion of the Great Plains. This area is in the lower portion of the North American Bird Conservation Initiative's Shortgrass Prairie Bird Conservation Region. Approximately half of the shortgrass prairie in the region remains intact, the other half has been converted to row crop agriculture. Historically dominated by shortgrass prairie, the region is now a mosaic of cropland and rangeland (working grasslands) with competing pressures of wind energy, oil, and gas development. Major crop types are winter wheat, sorghum, cotton, and corn. The added pressure of aquifer decline is bringing rapid changes to agriculture, wildlife, and wildlife habitats that depend on a connection to groundwater. Many of the species found in shortgrass prairie are in steep decline due to habitat degradation and loss.

Currently over 3 million acres of former cropland in the region (about 8%) is enrolled in the Conservation Reserve Program (CRP), which pays rent to farmers to plant fields back to grass. Landscape-level changes in the amount and distribution of grain crops, due to declining availability of irrigation water, could have a significant effect on sandhill crane and waterfowl that forage in croplands. Conversely, increases in grasslands in areas no longer suitable for irrigated agriculture could benefit many grassland birds, including lesser prairie-chicken.

The shortgrass prairie itself is dominated by blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*). It is interspersed with some mid and tallgrass species like little bluestem (*Schizachyrium scoparium*) and shrubs including sand sagebrush (*Artemisia filifolia*) and sand shinnery oak (*Quercus havardii*). The major wetland types in the Southern High Plains are saline lakes and playas, which provide habitat for sandhill crane, and other waterfowl.

National Wildlife Refuges

Muleshoe NWR is the oldest National Wildlife Refuge in Texas, established in 1935 for the conservation of migratory birds and other wildlife. It is 6,440 acres in size, is dominated by shortgrass prairie, and has three large saline lakes. It is an important migrating and wintering site for sandhill cranes, supporting up to 15% of the Mid-Continent Population (MCP) in winter. Daily abundance of sandhill crane at Muleshoe NWR peaks at over 70,000 annually, and often exceeds 100,000. The refuge is also heavily used by migrating and wintering shorebirds and waterfowl.

At least three FWS Birds of Conservation Concern breed on Muleshoe NWR, including snowy plover (*Charadrius nivosus*), Cassin's sparrow (*Peucaea cassinii*), and burrowing owl (*Athene cunicularia*). Many other Birds of Conservation Concern winter on the refuge including golden eagle (*Aquila chrysaetos*), chestnut-collared longspur (*Calcarius ornatus*), and thick-billed longspur (*Rynchophanes mccownii*) or migrate through in large numbers such as long-billed curlew (*Numenius americanus*), willet (*Tringa semipalmata*), lesser yellowlegs (*Tringa flavipes*), semi-palmated sandpiper (*calidris pusilla*), pectoral

sandpiper (*Calidris melanotos*), and lark bunting (*Calamospiza melanocorys*). Mule deer (*Odocoileus hemionus*) are common on the refuge and pronghorn occur on occasion. There are multiple black-tailed prairie dog (*Cynomys ludovicianus*) colonies. The refuge hosts over 140 species of native bees, possibly the highest biodiversity of bees in the Southern High Plains. Management practices on the refuge include prescribed burning and rotational grazing.

Grulla NWR is in eastern New Mexico, approximately 25 miles northwest of Muleshoe NWR. Grulla NWR was established in 1969 for the purpose of providing habitat for migrating and wintering sandhill crane. The refuge is 3,236 acres in size, with 72% of the acreage being a large saline lake. The refuge hosts migrating shorebirds, and large numbers of migrating and wintering sandhill cranes. It also hosts snowy plovers, but its springs are no longer reliable year-round. Uplands are shortgrass prairie and breeding passerine birds like Cassin's sparrow are abundant. Grulla NWR is within the CPA but would not be expanded under this LPP, however, the saline lake and grassland habitat on the refuge contribute to the goals of this LPP.

Climate

Most precipitation in the Southern High Plains falls between the months of April and September. Average annual precipitation for the region is 18 inches, with early spring storms bringing prolonged, soil penetrating rain followed by intermittent, localized thunderstorms later in the summer. Drought conditions often emerge later in the summer, which may be relieved by thunderstorms. Year to year precipitation varies significantly, causing some extremely dry years.

The average low-high annual temperatures vary by latitude from 37–64 °F. The shortgrass prairie is also characterized by persistent winds, which are generally greatest in spring and contribute significantly to the semiarid conditions of this region.

Habitat & Connectivity

There are three main habitat types in the Conservation Partnership Area that are important to the focal species. Shortgrass prairie, saline lakes, and playa wetlands each have unique factors that relate to the focal species and define the size, functionality, disturbance, and connectivity characteristics that contribute to overall conservation on the landscape.

Shortgrass Prairie

Where it persists, contiguous shortgrass prairie is generally featureless in topography with a grassland component of blue grama grass, buffalo grass, and side-oats grama (*Bouteloua curtipendula*). These communities can also contain shrub communities of honey mesquite (*Prosopis glandulosa*), shinnery oak, and sand sagebrush. Shinnery oak and sand sagebrush shrub communities are normally associated with sandier soils and a mixed grass component of little bluestem, big bluestem (*Anrdropogon gerardi*), and western wheatgrass (*Pascopyrum smithii*) with a lower layer of blue and side-oats grama. Topography can be broken up by draws, caprocks, and sandhills that contain somewhat different communities such as alkali sacaton, western wheatgrass, big bluestem, little

bluestem, Indian grass (*Sorghastrum nutans*), sand plum (*Prunus angustifolia*), and oak mottes.

Based on modelling that conservatively assumes expired CRP contracts revert to cropland through 2027, large block grasslands (greater than 1920 acres) would significantly decrease. Over time, not all expired CRP lands would revert to cropland and future enrollment of CRP would limit loss of grasslands. However, it is strategic to target CRP lands for long-term conservation. CRP lands are important to the broader grassland landscape and to wildlife. The contribution of CRP to larger blocks of functional grassland habitat is especially important.

Saline Lakes

Historically, saline lakes were permanent wetland features. They functioned as discharge wetlands due to their strong connection to the aquifer; they were fed by multiple springs along their edges and by upward seepage through the lake floor. As aquifer levels have declined, many saline lakes have lost some or all their connection to the aquifer. Many springs have dried or function only seasonally (i.e., during winter, when irrigation wells are shut off). Saline lakes have thus become more ephemeral and more reliant on precipitation. Of the less than 40 saline lakes in the Southern High Plains, estimates suggest roughly 10 retain functioning springs. Additionally, several saline lakes have been directly impacted by oil and gas extraction, with pumpjacks, pads and roads constructed in the lakebed.

Saline lakes are critical to migrating and wintering sandhill cranes. Sandhill crane abundance on saline lakes is influenced by the presence of water or active springs, and the type, amount, and availability of cropland in the surrounding landscape. The continued suitability of the Southern High Plains for migrating and wintering sandhill crane is threatened by loss of hydrologic function, mineral extraction, changing agricultural practices, and developments that may cause sandhill crane to avoid or abandon traditional foraging areas.

The migrant shorebird community that utilizes saline lakes differs from that of playa wetlands. Both prairie and arctic breeding species are common, with American avocet (*Recurvirostra americana*), western sandpiper (*Calidris mauri*), Baird's sandpiper (*Calidris Bairdii*), and Wilson's phalarope (*Phalaropus tricolor*) being the most abundant shorebirds. Migrant shorebirds spend most of their stopover time on saline lakes foraging, and their use of saline lakes is related to the presence of functioning springs.

The occurrence of breeding snowy plover on saline lakes is also dependent upon the presence of functional springs. Snowy plover abundance on saline lakes in the Southern High Plains has declined greatly. The continued suitability of saline lakes as plover habitat is tied to maintaining and restoring spring integrity in saline lakes. The uniqueness of saline lakes is further highlighted by their plant and invertebrate communities, which are quite different from those of the region's freshwater playa wetlands.

Playa Wetlands

Playa wetlands are the most abundant wetland feature in the shortgrass prairie, comprising 2% of the landscape. Each playa is located at the lowest point of its own, individual watershed. They are shallow and highly ephemeral; they can be dry for much of the year, or many consecutive years. Most are filled solely by precipitation events, such as an intense thunderstorm. When wet, playas are biodiversity hotspots that provide high-calorie food resources for migrating waterbirds. They are the primary land-feature utilized by waterfowl hunters in the Southern High Plains.

Playa wetlands are important to migrating shorebirds and migrating and wintering waterfowl, particularly dabbling ducks. Up to 50% of the northern pintail (*Anas acuta*) that winter in the Central Flyway utilize the southern high plains playa wetlands during winter, and their abundance is even higher during spring migration. Shorebirds common on playas during migration include Wilson's phalarope, American avocet, and long billed dowitcher (*Limnodromus scolopaceus*). Playas also host many breeding waterbirds, including mallard (*Ana platyrhynchos*), cinnamon teal (*Spatula cyanoptera*), blue-winged teal (*Spatula discors*), American avocet, American coot (*Fulica americana*), and eared grebe (*Podiceps nigricollis*).

Playa wetlands are a primary source of recharge to the region's aquifer. The cracks that form in playa basins when they dry out serve as recharge conduits when it rains. Thus, playas have important ecological and hydrological functions. Agricultural development and accelerated sedimentation have affected over 90% of historic playas. These factors continue to affect the playa landscape today, and moderating their effects is a critical to future conservation efforts.

Focal Species

Sandhill Crane

The MCP of sandhill cranes is estimated at roughly 840,000. Over 90% of this sandhill crane population winters in the Southern High Plains. Muleshoe and Grulla NWRs hosts over 15% of the MCP of sandhill cranes. A combination of shortgrass prairie, agriculture/croplands, playas, and saline lakes are utilized by sandhill cranes. Saline lakes are critical to migrating and wintering sandhill cranes. Most cranes utilize saline lakes as evening/night-time roosting areas. These cranes typically make daily foraging flights, out to 10 km, away from saline lakes to feed in croplands.

Pronghorn

Pronghorn are an iconic prairie species; valued as game and for their unique attributes, including being the fastest land mammal in North America. Moreover, they indicate healthy grasslands. Individual pronghorn have extremely large home ranges, from 9.38 to 37.73 square kilometers, and herds, depending on size and locality, have even larger home ranges, from 50.27 – 201.1 square kilometers.

Pronghorn utilize a variety of vegetation communities across the landscape. Although their diet is forb and browse heavy, pronghorns in the Southern High Plains utilize a mosaic of grasslands, savannah-like areas, or mixed grasslands/shrublands. They may

also utilize certain types of agricultural fields (e.g., winter wheat), although cropland is not preferred for browsing and there is likely a limit to how much of their home range can be in cropland before the landscape becomes unsuitable.

Pronghorn home ranges surveyed in the Southern High Plains of Texas contain less cultivated area than the surrounding lands, suggesting grassland and grassland/shrubland habitats are more important. They are known to be sensitive to environmental and anthropogenic disturbances. Notably, they are negatively influenced by heavy encroachment of small trees or dense brush, particularly at scales that impact visibility and movement. Pronghorn are also sensitive to roads and fences, which fragment their habitats and greatly restrict movements. Because of their large home ranges, preference for intact native habitats and sensitivity to disturbance, they are an ideal focal species for biological planning at the landscape scale.

The minimal population objective for the proposed LPP area is 3,007 (2,829 for NM; 178 for Texas); this objective is based on the estimated population size of management and survey units in Texas and New Mexico portions of the CPA. Pronghorn habitat can be improved by minimizing human-made barriers to movement (e.g., conversion from traditional to pronghorn friendly fencing), addressing areas of dense brush/small tree encroachment that restrict visibility and/or movement, and minimizing further conversion of native habitats to cropland. Owing to their large ranges, pronghorn overlap with many other species of conservation concern and conservation focus such as mule deer, Cassin's sparrow, and grasshopper sparrow (*Ammodramus savannarum*). Some of these species are far more selective than pronghorn in their habitat use and may need additional management actions.

Lesser Prairie-Chicken

The lesser prairie-chicken is a species of prairie grouse that occurs in the grasslands and shrublands in parts of Colorado, Kansas, New Mexico, Oklahoma, and Texas. Lesser prairie-chickens depend on large continuous expanses of grasslands to complete their life history and to maintain healthy populations. Over the past century and a half, the Great Plains ecosystems have been greatly altered by human land use practices, primarily for agriculture and energy development. Most of the lesser prairie-chicken's range occurs on private lands and public lands that are available for energy development. These land uses have resulted in direct loss of habitat (largely through conversion of grassland to cropland and construction of anthropogenic features) and indirect loss of habitat (largely due to the avoidance of otherwise suitable habitat in proximity to anthropogenic features). Other activities, such as incompatible grazing management, could lead to habitat degradation. As a result, the lesser prairie-chicken has experienced substantial and protracted declines in distribution and abundance due to habitat loss and fragmentation across its range prompting concern about its status.

The lesser prairie-chicken became a candidate for listing under the ESA in 1998 and was listed as a threatened species in 2014. The listing was vacated in 2015 following a lawsuit. On November 25, 2022 the Service published final rule in the Federal Register listing two

distinct population segments of the lesser prairie-chicken under the Endangered Species Act (87 FR 72674). This rule lists the Northern distinct population segment of the lesser prairie-chicken as a Threatened species with an associated 4(d) rule and the Southern distinct population segment as Endangered. The Northern distinct population segment occurs across portions of Kansas, Colorado, Oklahoma, and the northeastern Texas Panhandle whereas the Southern distinct population segment occurs across the species range in eastern New Mexico and South Plains of the Texas Panhandle. The expansion boundary for this LPP only overlaps with portions of the Southern distinct population segment of the lesser prairie-chicken.

The CPA encompasses Focal Areas for lesser prairie-chicken identified by the Western Association of Fish and Wildlife Agencies (WAFWA) through their Southern Great Plains Crucial Habitat Assessment Tool (CHAT). The priority areas for this LPP align with CHAT Focal Areas, connectivity zones, and modelled habitat.

The priority areas include some of the highest quality remaining grassland habitat in the Southern distinct population segment of the lesser prairie-chicken. Current population estimates indicate a 5-year average population size of approximately 2,806 individuals in the Southern distinct population segment, representing about 9% of the range-wide total population.

Threatened and Endangered Species

The CPA supports a variety of species listed as Threatened or Endangered under the ESA. Concurrent with preparing this draft LPP, the Service is completing an intra-service Section 7 consultation to ensure that the proposed action has either a “no-effect” or “may affect, not likely to adversely affect” determination. The ESA listed species covered under this consultation and are listed below. Some of these species may only require consultation due to their occurrence within the counties where this LPP is proposed. A draft submission for intra-service Biological Evaluation is included in Appendix C.

Endangered

- Northern Aplomado Falcon (*Falco femoralis*)
- Pecos Gambusia (*Gambusia nobilis*)
- Sharpnose Shiner (*Notropis oxyrinchus*) (includes Critical Habitat)
- Smalleye Shiner (*Notropis buccula*) (includes Critical Habitat)
- Texas Poppy Mallow (*Callirhoe scabriuscula*)
- Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*), Southern Distinct Population Segment

Threatened

- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus*)
- Pecos Bluntnose Shiner (*Notropis simus*)
- Pecos Sunflower (*Helianthus paradoxus*)

Proposed

- Wright's Marsh Thistle (*Cirsium wrightii*)

Candidate

- Monarch Butterfly (*Danaus plexippus*)

Other Wildlife

The refuges support a diversity of wildlife species of the Southern High Plains, including game and nongame species, reptiles, amphibians, and invertebrates, which are important contributors to the overall biodiversity on the refuge. Approximately 320 species of birds use the refuge, consisting mainly of grassland songbirds that include the northern mockingbird (*Mimus polyglottos*), loggerhead shrike (*Lanius ludovicianus*), and western meadowlark (*Sturnella neglecta*). Around 51 species of mammals are found on the refuge, including porcupines (*Erethizon dorsatum*), white-tailed deer (*Odocoileus virginianus*), mule deer, and eastern cottontail rabbit (*Sylvilagus floridanus*). About 47 species of reptiles and amphibians occur on the refuge, including the prairie rattlesnake (*Crotalus viridis*), plains leopard frog (*Lithobates blairi*), and Texas horned lizard (*Phrynosoma cornutum*).

Cultural Resources

No comprehensive cultural resource surveys have been conducted on the refuge, and at this time no significant historic, prehistoric, or cultural resources have been identified (USFWS 2004). There are probably several undesignated archaeological sites on the refuge, particularly around the lakes (USFWS 2004). There may be additional undesignated significant historic, prehistoric, or cultural resources within the CPA and priority areas.

As a Federal agency, the Service is required to comply with many laws pertaining to cultural resources, including the National Historic Preservation Act (16 U.S.C. 470 et seq., Public Law 89–665, the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa–470mm; Public Law 96–95), as amended, and the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq., Public Law 101–601). The proposed action may benefit cultural resources because easements and fee title acquisition would preclude or limit most forms of surface disturbance. Any proposed surface disturbing activity covered under a later natural resource management plan on lands acquired under this LPP would require consultation in the future.

Socioeconomics

The neighboring communities to the refuges include Muleshoe, Morton, and Littlefield, TX, where most refuge staff live and shop. The CPA includes the communities of Clovis, NM and Portales, NM to the West and borders Lubbock, TX, Midland, TX, and Levelland, TX to the East.

Muleshoe NWR provides various recreational activities, with camping and wildlife observation being the most popular. The refuge attracts visitors from nearby communities, but most visitors come from outside the local area. Local community businesses, including restaurants, grocery stores, motels, service stations, and sporting goods stores, profit significantly from these public use programs.

Muleshoe NWR's annual budget is approximately \$400,000, and most of this money is recycled in the local economy through refuge staff salaries, purchases from local suppliers, and service contracts. Grulla NWR is not staffed and all funds, equipment, and management needs are handled through Muleshoe NWR resources. While land owned by the U.S. Government is not taxable by state or local authorities, the Service compensates local governments for foregone tax revenues. The Refuge Revenue Sharing Act of June 15, 1935, as amended (16 U.S.C. 715s) requires the Service to make payments to local taxing authorities, typically counties, to at least partially offset the loss of local tax revenues as a result of federal acquisition of private property. The Service makes annual payments to local taxing authorities, based on the estimated values of lands that the Service owns located in those jurisdictions. The actual Refuge Revenue Sharing payment does vary from year to year because Congress may or may not appropriate sufficient funds to make full payment. Properties subject to conservation easements remain on the tax rolls and taxes are still paid by the landowner. The Service does not pay refuge revenue sharing on easement rights.

In Bailey County, from 1970 to 2018, the population shrank from 8,444 to 7,027 people, a 17 percent decrease (Headwaters Economics 2021). In Bailey County, the unemployment rate is at 4.4 percent, which is a decrease from 1993, when it was at its highest, at 9.6 percent. Texas' unemployment rate in October 2020 was 6.9 percent—a decrease from the 8.3 percent September jobless rate, according to a U.S. Bureau of Labor Statistics report released on November 20, 2020. In 2018, the three industry sectors with the largest numbers of jobs were farming, retail trade, and accommodation and food services (Headwaters Economics 2021).

Environmental Justice

Within the CPA the largest communities are Clovis, NM and Portales, NM. Apart from these population centers and the smaller communities including Muleshoe, Sudan, Tahoka, Littlefield, Morton, and Brownfield the CPA encompasses mostly rural areas. Collectively, Clovis and Portales are roughly half minority populations, and in the 31st percentile nationwide for low-income population. Low-income and minority communities in the area are among the top third nationwide for unemployment, linguistic isolation, and individuals that did not finish high school.

The refuge employs Youth Conservation Corps members recruited from local communities every year to support refuge facility maintenance and habitat management projects. Youth Conservation Corps members gain an understanding of local ecology and new career opportunities, which may translate to increased awareness of the ecological services and recreation opportunities provided by the refuge.

Energy

Wind energy development has increased dramatically in the last ten years throughout the Great Plains. In terms of production capacity, the central United States contains the largest potential source of onshore wind in the nation. Texas contains the largest onshore capacity installation for wind energy in the region (~16,500 MW as of 2015). Energy development and associated infrastructure on or near playas or saline lakes may adversely affect wildlife through habitat fragmentation, displace wildlife from foraging or roost areas (avoidance), and increase the risk of collision mortality for waterfowl and other birds that roost and forage in the area.

Agriculture

Land use in Bailey County, TX is a good representative of overall trends throughout the CPA. Agricultural land use includes crop land (dryland and irrigated), rangeland, pasture/hay land (dryland and irrigated) and other uses. The county's agriculture is comprised of 248,657 acres of dryland cropland and 110,553 acres of irrigated cropland. Rangeland use acres are 119,950 acres. Pasture and hay land include 14,841 acres of dryland and 6,343 acres of irrigated land. Other land uses comprise an additional 36,616 acres. In 2021, Bailey County had 195,590 acres contracted to conservation CRP. By 2026, at least 177,619 of those acres will expire out of the CRP program.

Grazing

Historically, grazing by large bison (*Bison bison*) herds maintained the grasslands in a natural condition. Livestock grazing, applied appropriately, is a habitat management tool that may enhance, support, and achieve established wildlife management objectives. Controlled cattle grazing can mimic the effects of bison and elk on grasslands by removing dead vegetation and providing hoof cultivation. This aerates the soils and re-seeds native plants which prevents plant stagnation and promotes plant succession. Improved range conditions from effective grazing practices can provide habitat conditions that are desirable for a wide diversity of animal populations. Grazing is essential to help restore, preserve, and maintain grasslands on the Southern High Plains and will be analyzed as potential management tool within the LPP area.

Fire Management

The historic fire interval on the Southern High Plains has been investigated to a degree; however, it is not fully understood. Native American tribes likely started fires to move bison and rejuvenate grasslands which could have attracted bison to an area. Lighting strikes from summer thunderstorms also start wildfires in the area. Recently, fires have been suppressed to protect grass and ranching infrastructure. Prescribed fire is not a common tool used as range management on private lands due to the concept of lost grazing resources or the potential to cause damage to infrastructure.

The refuge uses a seven-year prescribed burn rotation on each pasture. This rotation helps top-kill mesquite and other undesirable brush species. Prescribed fire may also control young brush species encroaching into native grass stands. Prescribed fires range in size from 100 to 1000 acres annually when conditions warrant. During drought

conditions prescribed fires are cancelled or reduced in size. All prescribed fires on the refuge consider fuel loading and wildlife management goals prior to burning.

Recreation

Public Use

Muleshoe NWR supports five of the six priority wildlife-dependent uses outlined in the NWRS Improvement Act of 1997. There were approximately 32,000 visitors to the refuge in 2019, of which about 10,400 participated in wildlife observation and 400 in environmental education. The refuge provides opportunities for the public to observe, photograph, and learn about the unique shortgrass prairie ecosystem and the wildlife that inhabits it. The refuge also has a camping/picnicking area, hiking trails, and an auto tour for public enjoyment. Visitors can bird, hike, and drive on open areas of the refuge during daylight hours. The refuge also allows limited big game and small game hunting annually through the TPWD public hunting program. The refuge is closed at night, and campers are limited to the campground.

Hunting

The Service prioritizes wildlife-dependent recreation opportunities, including hunting, when those opportunities are compatible with the purposes for which the refuge was established and the mission of the NWRS. Adding hunting opportunities is consistent with the Service policy on wildlife-dependent recreation and hunting as mandated by the National Wildlife Refuge System Improvement Act of 1997, and Secretarial Order 3356 (Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories).

Hunting may expand on acquired refuge lands. Additional hunting opportunities will be analyzed and offered on a case-by-case basis following the Service's hunt and fish rulemaking procedures. The proposed action would not affect existing hunting opportunities at the refuges.

Chapter 3: Landscape Drivers & Effects

What is a Landscape Driver?

A landscape driver is a human influence on ecosystem or landscape processes and the resulting pattern of ecosystem function. Drivers change the landscape and can affect all aspects influencing the landscape including biological, social, cultural, and economic factors. Energy development, aquifer depletion, and climate change have been identified as the main landscape drivers on the Southern High Plains.

Energy Development

Past Actions

Wind energy development has increased over the last ten years throughout the Great Plains. The central United States contains the largest potential source of onshore wind energy production in the nation. Texas contains the largest onshore capacity installation for wind energy in the region. The entire CPA has relatively high wind production potential (potential megawatt capacity). Within the CPA, anticipated wind farm development is lower than other parts of the high plains due to topography, windspeed, and access to transmission lines. This suggests that conservation within the CPA is relatively protected from future development but advances in technology could make development in the area more feasible.

Reasonably Foreseeable Conditions

As of July 10, 2017, Federal Aviation Administration data suggest there were 11,600 wind turbines in Texas with an estimated 17 GW in production capacity. Much of this is in the Texas Panhandle. Through 2050, installed capacity in Texas is expected to reach more than 50 GW. It is reasonable to expect that additional capacity will be installed in areas with the best suitability for wind energy production.

Energy development and associated infrastructure on or near playas or saline lakes may fragment wildlife habitat, displace wildlife from foraging or roost areas (avoidance), and increase the risk of collision mortality for waterfowl and other birds that roost and forage in the area. Technology around wind energy production is advancing rapidly; advances like taller turbines (taller hub height) may increase suitability for wind development in some areas. Future projections that account for these advances (see “potential wind capacity” on NREL Wind Prospector <https://maps.nrel.gov/wind-prospector/>) may make it difficult to classify any areas in eastern New Mexico or west Texas as unsuitable for wind energy development.

Aquifer Depletion

Past Actions

The Ogallala aquifer supports irrigated farming on over 15 million acres across the Great plains. Since industrial-scale irrigation began in the 1950s, water level in the aquifer has steadily declined. Though some areas have more water than others, almost all areas are declining in saturated thickness, defined as the portion of the aquifer that contains water.

Reasonably Foreseeable Conditions

Below a certain threshold (about 30 ft saturated thickness), extraction of groundwater for high water crops like corn becomes impractical and subsequent conversion to dryland crops or grazing lands may become more economically viable. Landscape-level changes in the amount and distribution of grain crops may affect sandhill cranes and waterfowl that forage on nearby cropland. Conversely, increases in grasslands in areas no longer suitable for irrigated agriculture could benefit many grassland birds, including lesser prairie-chicken.

Due to declines in the Ogallala aquifer over the next 30 years, the distribution of crops and landcover types within the CPA is expected to change significantly. By 2050, many areas of the aquifer that support irrigated agriculture today may be unable to. Though much of the CPA is likely to experience changes, the northern-most area, where corn, winter wheat, and alfalfa are grown may see up to a 20% decrease in tillage suitability.

Climate Change

Past Conditions

Climate change is the pre-eminent issue for conservation in future decades. Current trends in climate change are expected to affect the Southern High Plains. Temperature has increased an average of 1-2 ° F since the beginning of the 20th century. The Southern High Plains has been vulnerable drought. Historic droughts have occurred in the 1910s, 1930s, 1950s, and 2010-2015.

Reasonably Foreseeable Conditions

Predictions on the effects of climate change within the Southern High Plains of Texas and New Mexico includes increasing temperatures, longer and more intense drought periods, and more extreme precipitation events as well as fewer extreme cold events. The extreme heat events on the Southern High Plains are projected to cause greater evaporation and surface water losses and longer periods without rainfall. With increasing climatic extremes, the frequency and extent of wildfires in grasslands will most likely increase.

Project Effects

Direct Effects

The direct effects of the LPP would occur as each acquisition from a willing seller is added to the refuge. These effects align with the goals and objectives of the plan to expand conservation in the Southern High Plains and further the protection and management of sandhill cranes, lesser prairie-chicken, pronghorn, and other species of concern that rely on saline lakes, playa wetlands, and shortgrass prairie.

It is anticipated that each new acquisition would advance conservation in a specific way by directly protecting and restoring grasslands, playa wetlands, or saline lakes. When these lands are added to the NWRS, their conservation would become more resilient compared to some other conservation programs or private ownership.

Socioeconomics and Environmental Justice

There are no anticipated significant effects under the proposed action to at-risk populations or broader economic opportunities within the Southern High Plains. There may be some indirect benefits to low income and minority populations which are discussed in the "Indirect Effects" section.

Under the proposed action, the Service would continue to make annual payments through the Refuge Revenue Sharing program to counties and other units of local government for the tax-exempt lands that the Service administers. These payments are one way the federal government fulfills its role of being a good neighbor to local communities. For easements, the tax responsibility would remain with the private landowner.

Energy

The proposed action may exclude some lands within the CPA from future energy development. Such a reduction in potential energy development would be negligible compared to the broader regional energy economy. Based on modelling provided by the Department of Energy and current development trends, most of the prime wind energy sites in the CPA have already been developed and future potential for fossil energy development is minimal.

The balance of lands conserved or developed for energy production would depend, in part, on the participation of willing landowners who choose conservation in easement or fee title for their lands. The proposed action would not limit energy development on private lands within the CPA.

The entire Southern High Plains region may have potential for wind development; however, the CPA is a small part of a much larger portion of eastern New Mexico and west Texas that has existing wind energy and potential for future wind development. During the development of the LCD, existing wind energy development and high-quality habitat was considered to ensure the CPA balances habitat needs with wind energy resources. Other areas, surrounding the CPA have higher levels of anthropogenic disturbance and higher potential for wind energy development. Removal of up to 700,000 surface acres from potential wind development would be a negligible portion of the broader wind energy resources in the Southern High Plains.

The proposed action would also have a negligible effect on future oil and gas development within the CPA. Most of the current oil and gas development in Texas and New Mexico is concentrated in the Permian Basin to the south with limited potential for expansion into the CPA area. Consistent with the Service's Oil and Gas policy, the Service cannot prevent a mineral rights holder from accessing oil and gas that is subsurface to refuge surface estate. The Service would work with potential oil and gas drillers to locate surface disturbing activity off of refuge lands or develop oil and gas infrastructure with the least disturbance possible.

Agriculture

The CPA encompasses more than 1 million acres of agricultural lands that were enrolled in USDA CRP in 2017, with potential for a decline over time as CRP contracts expire. Most of these CRP lands conserve large block grasslands. The proposed action would create a resilient conservation landscape as easements and fee title from willing sellers would be a permanent conservation measure rather than temporary.

Agricultural land use on easements would vary depending on specific rights or agreements retained by the landowner to continue grazing or farming. Any continued agricultural use on fee title lands would be consistent with this plan's habitat objectives and the Service's policy.

The CPA covers a portion of the Oglala aquifer that has experienced extreme groundwater declines. Many acres of land previously irrigated or dryland farmed for grain crops may revert to grassland due to shifting hydrologic regimes over the next 30 years. The proposed action would follow this land use shift by converting some of the lands that retire from agriculture into permanently conserved grasslands and playa wetlands.

Wildlife

The diversity of migratory birds, songbirds, raptors, reptiles, amphibians, and invertebrates in the Southern High Plains would benefit from expanded conservation alongside the focal species - sandhill crane, pronghorn, and lesser prairie-chicken – for which this plan was developed. Each type of acquisition would conserve habitat for a slightly different suite of species. Examples of wildlife anticipated to benefit from conserving playa wetlands, grasslands, and saline lakes are listed in Chapter 2.

Refuge Management

New lands would be managed as part of an administrative complex with Muleshoe NWR, Grulla NWR, and Buffalo Lake NWR, where staff share responsibilities across refuges. Initial costs may include minimal facilities management on some properties (e.g., pronghorn friendly fencing if the property is to be grazed), water development, prairie restoration, and invasive species management. Costs would be minimal on most properties and may be achieved through cooperative agriculture agreements on fee title lands or with the Partners for Fish and Wildlife Program on easement properties. Management of grasslands and wetlands in this area require little hands-on active management.

Additional employees may be needed for land management activities as the complex grows, but within the first decade it likely that most of the needed management can be accomplished at the current staffing levels.

Indirect Effects

Indirect effects represent the aggregated results of individual land acquisitions over time within the CPA.

National Wildlife Refuges

Muleshoe NWR would expand to manage the additional acres of conservation lands within the CPA, up to 700,000 acres. This would include additional saline lakes, large block grasslands, playa wetlands, and connective corridors. In addition to managing habitat on fee-title owned lands, refuge staff would work closely with willing, private landowners and partners to manage conservation easements. Gulla NWR would continue to exist as a separate, unstaffed refuge within the footprint of the CPA and managed by Muleshoe NWR resources.

Habitat & Connectivity

The proposed LPP would reduce further habitat loss due to fragmentation and land use changes. Over time, currently impaired or at-risk habitats and connective corridors would be restored, leading to a net increase in quality habitat for sandhill crane, pronghorn, lesser prairie-chicken, and other priority species. Anticipated effects of the LPP on the 3 main habitat types follow.

Saline Lakes

As the refuges acquire parcels in easement or fee title that contain saline lakes these lands would transition to in-perpetuity conservation. Long term, the refuge would remove salt cedar (*Tamarix sp.*) and other invasive, deep-rooted plants to restore springs and groundwater connection to benefit sandhill cranes and snowy plovers. Under the proposed action, an eventual increase in snowy plover population is anticipated. Springs that feed saline lakes may also benefit from retirement of nearby irrigation wells as irrigated farming become less favorable due to aquifer decline.

Concurrent to the Service's acquisition of saline lakes for conservation purposes, state, and local initiatives to protect groundwater may lead to stabilization or improved hydrologic function at some saline lakes in the CPA.

Grasslands

Restoration and management within priority areas for lesser prairie-chicken and pronghorn would lead to long term protection of large blocks of grassland within lesser prairie-chicken focal areas and connectivity zones that enhance pronghorn home ranges. Lands currently enrolled in CRP may become available for acquisition, creating long-term conservation. The proposed action was developed with the goal of supporting a population resiliency for the lesser prairie-chicken within the plan area by increasing conservation actions.

Many resident and migratory bird species would benefit from additional conserved grasslands under the proposed action. Cassin's sparrow, grasshopper sparrow, lark sparrow, and burrowing owl, and other species are expected to benefit from additional conservation.

Playa wetlands

Habitat for sandhill crane, northern pintail, and other migratory waterfowl would increase in area and quality as playa wetlands enter conservation and are restored. Based on

modelling prepared for the LCD, the CPA could provide up to 45.6 million crane energy days, and 2.37 million duck energy days for northern pintail.

Conserving and restoring playa lakes would support natural hydrologic function within the CPA. Playas would filter and recharge the aquifer while maintaining a wet-dry cycle that provides the most suitable habitat benefit.

Chapter 4: Project Implementation

Land Protection Options

This plan includes up to a total of 700,000 acres in conservation easements or fee-title acquisitions as two options for increasing conservation across the Southern High Plains. Use of these two options would provide the flexibility to meet the refuge's purposes and objectives more effectively, as outlined in the Comprehensive Conservation Plan. These two types of acquisition are described in detail in Chapter 1 of this plan.

Landscape Conservation Design

A collaborative process between the Service and stakeholders consistent with the Service's Strategic Growth Policy was used to produce a Landscape Conservation Design (LCD) that considers, current conditions, landscape drivers, and potential scenarios for future conservation and development in the Southern High Plains ecoregion. This LCD provided the scientific basis for developing the conservation objectives and strategies outlined in this Land Protection Plan. The LCD expands on the conservation goals outlined in the CCP for the refuges and responds to updated science and conservation trends.

Formulation of Habitat Objectives

The objectives of this LPP consider the influence of landscape drivers, described in previous chapters, on the long-term sustainability of focal species and describe desired, appropriate conservation outcomes. These objectives are:

1. Protect habitat for the MCP of sandhill cranes, 80% of which winter in the CPA. This includes saline lakes, playa wetlands, and surrounding foraging uplands that support other migratory birds, waterfowl, and wildlife.
2. Protect lesser prairie-chicken focal area habitat and conservation corridors within the CPA. These lands are primarily grasslands and retired agricultural lands that also support pronghorn and other wildlife.

These objectives would have secondary benefits to the conservation landscape by reducing further strain on groundwater resources, conserving and enhancing ecosystems that sequester carbon, and increasing opportunities for compatible recreation, including hunting and wildlife watching.

Priority Areas

As a result of the LCD planning process, priority areas and habitat corridors were identified where acquiring lands would have the greatest contribution toward the objectives of this LPP. These priority areas were identified using existing lesser prairie-chicken focal areas, ground cover mapping to identify suitable habitat, corridors between existing refuges and conservation areas, and buffers around saline lakes.

Priority areas were organized into five areas based on their conservation role and potential. Acquisitions may occur outside of the priority areas but within the CPA if they contribute to the conservation objectives of this LPP. It is anticipated that most willing sellers with lands that meet acquisition criteria will be located within the priority areas.

The priority areas are differentiated as follows. For a map for each priority area and its location within the CPA refer to Appendix B. Table 1 summarizes the acres included in the CPA and Priority Areas.

Priority Area 1A

This area addresses connectivity between the existing footprint of Muleshoe and Grulla NWRs. Acquisitions in this area would conserve grasslands, protecting and enhancing existing populations of lesser prairie-chicken and upland/wetland habitat for sandhill cranes, snowy plover, northern pintail, Cassin’s sparrow, and grasshopper sparrow.

Priority Area 1B

Land acquisitions in this area are intended to conserve lesser prairie-chicken and pronghorn habitat. The area encompasses Bureau of Land Management, non-governmental organization, and state managed lands that support the conservation objectives of this plan. Grasslands conserved in this area would also support long billed curlew, Cassin’s sparrow, and grasshopper sparrow.

Priority Area 1C

This area contains a movement corridor between priority areas 1A and 1B. Acquisitions in this area would benefit pronghorn and lesser prairie-chicken by improving migration corridors between populations. Much of this area is already high-quality native grassland that is conserved on a temporary or revolving basis under the USDA CRP.

Priority Area 1D

Land acquisitions in this area are intended to conserve habitat for pronghorn, lesser prairie-chicken, and grassland birds. It encompasses lands managed by the BLM and state agencies for conservation and has varying habitat types including grasslands and native shrublands.

Priority Area 2A

This area contains 32 saline lakes and includes a 10-kilometer buffer around each lake that encompasses the normal winter foraging range for sandhill crane as well as a variety of upland habitat required for different life stages of migratory grassland birds and waterfowl. Acquisitions in this area would protect functioning hydrology on the Southern High Plains, including aquifer recharge and natural seeps and springs.

Table 1. CPA and Priority Area Overview

Area	Total Acres	Potential conservation by the Service
Conservation Partnership Area	6,987,942	698,820
Priority Area 1A	388,141	299,882
Priority Area 1B	944,915	150,555
Priority Area 1C	119,003	68,484
Priority Area 1D	334,573	30,000
Priority Area 2A	953,722	150,000

Parcel Ranking

To meet the conservation goals of this plan there are three sets of criteria which will guide the selection of land parcels for conservation easement or fee-title acquisition from willing sellers. These criteria reflect the unique relationships playa wetlands, saline lakes, and grasslands have to the focal species and landscape drivers. These criteria are not intended to exclude any parcel from consideration, rather, they are intended to guide the Service toward prioritizing acquisitions with the greatest long-term conservation impact. When a parcel is partially within a priority area and is considered strategic under the criteria listed below, it would be considered as within a priority area for the purpose of ranking.

Some ranking criteria consider an energy development buffer or density. An energy development buffer includes factors such as proximity to wind turbines, location of transmission lines, and density of fossil fuel extraction.

Playa Wetlands

When considering acquisitions that contain a playa wetland the following criteria apply. The ranking of a parcel should be based on the condition of the highest quality playa. Multiple playas on one parcel should be considered additional benefit. The median playa size in the Southern High Plains is 2-3 acres. Often, a playa would be acquired within a larger parcel.

1. Does the parcel have an adequate energy development buffer?
 - a. Yes, proceed to 2
 - b. No, proceed to 5
2. Is the playa in excellent condition (<10% disturbance from siltation, pitting, buffer)
 - a. Yes, it is Tier 1.
 - b. No, proceed to 3
3. Can the playa be restored with low to moderate effort?
 - a. Yes, proceed to 4.
 - b. No, it is Tier 4.
4. Is the parcel within a priority area?
 - a. Yes, parcel is Tier 2
 - b. No, parcel is Tier 3
5. Is the playa in excellent condition?
 - a. Yes, parcel is Tier 5
 - b. No, parcel is Tier 6

Table 2. Playa Wetlands Ranked Tiers

Tier	Description
Tier 1	Adequate energy buffer, largely pristine or small pit/modification that is restorable; these will be mostly rangeland playas
Tier 2	Low to moderate disturbance that is restorable by backfilling, limited siltation, like to regain most function with restoration, and adequately buffered from energy development, within priority area
Tier 3	Low to moderate disturbance that is restorable by backfilling, limited siltation, like to regain most function with restoration, adequately buffered from energy development, outside priority area
Tier 4	High disturbance, intensive restoration required, adequately buffered from energy development
Tier 5	Excellent to moderate condition, no energy development buffer
Tier 6	Highly disturbed, no energy development buffer

Saline Lakes

When considering acquisitions that contain a saline lake the following criteria apply.

1. Is the saline lake hydrologically functional? Some input year-round from springs is highly desirable, precipitation input only is less desirable.
 - a. Yes – Proceed to 2
 - b. No – Proceed to 5
2. Is the parcel within a priority area?
 - a. Yes – Proceed to 3
 - b. No – Proceed to 4
3. Consider salt-cedar infestation or other restoration needs
 - a. Tier 1 if minimal invasive management needed
 - b. Tier 3 if initial infestation management needed
4. Consider energy development density, disturbance, and management needs
 - a. Tier 2 if minimal energy development and limited disturbance near the saline lake
 - b. Tier 4 if minimal energy development and intensive ongoing management needed
5. For precipitation-fed only saline lakes
 - a. If within priority area proceed to 6
 - b. If outside priority area proceed to 7
6. Consider the restoration potential and adjacent habitat quality
 - a. Tier 5 if regain of function/restoration possible (i.e., saltcedar removal to elevate water table)

- b. Tier 7 if little restoration potential but provides ephemeral benefits to waterfowl or conserves upland habitat
- 7. Consider energy development buffer and restoration potential
 - a. Tier 6 if regain of function possible and limited energy development
 - Tier 8 if only ephemeral benefit to waterfowl possible or impacted by nearby energy development

Table 3. Saline Lakes Ranked Tiers

Tier	Description
Tier 1	Within priority area, minimal invasive management needed, at least 1 year-round spring
Tier 2	Outside priority area, minimal invasive management needed, adequate energy buffer, at least 1 year-round spring
Tier 3	Within priority area, initial infestation management needed, at least 1 year-round spring
Tier 4	Outside priority area, adequate energy buffer, initial infestation management needed, at least 1 year-round spring
Tier 5	Within priority area, some spring activity but not year-round, may regain function with restoration
Tier 6	Outside priority area, adequate energy development buffer, some spring activity but not year-round, may regain function with restoration
Tier 7	Within priority area, little restoration potential but provides ephemeral benefits to waterfowl or conserves upland habitat
Tier 8	Outside priority area, ephemeral benefit to waterfowl or no energy development buffer

Grasslands

When considering acquisitions that contain shortgrass prairie the following criteria apply.

1. Is the parcel within a priority area or occupied by a focal species?
 - a. Yes – Proceed to 2
 - b. No – Proceed to 4
2. How large is the parcel?
 - a. Large, greater or equal to than 1920 acres – Parcel is Tier 1
 - b. Medium, between 640-1920 acres – Parcel is Tier 2
 - c. Small, between 40-640 acres – Proceed to 3
3. For small parcels 40-640 acres within priority area, is there a unique feature or connective value, or located adjacent to larger grassland block?

- a. Yes – Parcel is a Tier 3
 - b. No – Parcel is a Tier 7
4. Is the parcel <25% disturbed (fencing, dense roads, structures, etc.) with connective value?
- a. Yes – If large then parcel is Tier 4
 - b. Yes – If medium the parcel is Tier 5
 - c. No – Proceed to 5
5. Is the parcel >25% disturbed, without connective/unique feature, and outside priority area?
- a. If large, then parcel is Tier 6
 - b. If medium or small, then parcel is Tier 8

Table 4. Grasslands Ranked Tiers

Tier	Description
Tier 1	Large parcel within priority area or occupied by a focal species
Tier 2	Medium parcel within priority area or occupied by a focal species
Tier 3	Small parcel within priority area that has connective value or a unique ecological value
Tier 4	Large parcel outside priority area, less than 25% disturbed, provides connectivity
Tier 5	Medium parcel outside priority area, less than 25% disturbed, provides connectivity
Tier 6	Large parcel outside priority area, more than 25% disturbed, limited connectivity
Tier 7	Small parcel inside priority area, no unique ecological value, limited connectivity
Tier 8	Medium or small parcel outside priority area, more than 25% disturbed, limited connectivity

Land Management

Fee title and easement lands will be managed consistent with the CCP and natural resource management plans (step-down plans; hereby incorporated by reference) for Muleshoe NWR. Ongoing land management activities at the refuge include controlled grazing, prescribed burns, and invasive species control. As appropriate, natural resources plans will be updated to ensure refuge staff are meeting conservation goals of the CCP. Refuge staff will also consider compatible recreation uses at each new acquisition and prepare Compatibility Determinations and additional NEPA documentation as appropriate.

Where the Service obtains easements, the landowner may retain certain rights to access or manage the land for a purpose that is compatible with the Service's conservation goals. Refuge staff will ensure that land management activities are coordinated with the landowner.

Monitoring and Research

The Southern High Plains has attracted numerous researchers over the past decades. Most biological research has been on sandhill crane, northern pintail, lesser prairie-chicken, and various shorebirds. Many of these were academic studies conducted by graduate students with results published in professional publications or as part of a graduate program. During the 1970's through the early 2000's, most research consisted of two to four-year graduate projects that focused on migration and feeding habits of migratory birds. More recently, monitoring and research has focused on lesser prairie-chickens, grassland birds, pronghorn, mule deer, sandhill crane, pollinators, and waterfowl.

The refuge is currently operating under an Inventory and Monitoring Plan (IMP) which was approved in 2016. The IMP was developed at a landscape level where information and protocols could be expanded to areas off the refuge. Five priority monitoring programs were developed following strict protocols which allow for statistical analysis of the data. Grassland bird surveys are performed annually to determine grassland bird densities and diversity. These surveys allow the refuge to project bird density and diversity to similar lands in the landscape. The PLJV also does similar surveys on private properties in west Texas. These surveys help wildlife managers track key bird species like Cassin's sparrow, grasshopper sparrow, and other grassland birds on the Southern High Plains.

The Refuge also monitors the sandhill crane population within the saline lake region both on and off refuge. This consists of early morning roost counts on eight of the local saline lakes in the area. These are performed every two weeks at the same time of day so all the cranes can be surveyed in one morning, providing a snapshot of the population within the area. Cranes have been counted weekly to bi-weekly for eight decades. This protocol was developed for consistency, allowing for stronger population inferences. The refuge also helps with a coordinated spring sandhill crane MCP survey. This survey is done throughout the southern high plains of Texas. This survey is synchronized on the same day with aerial surveys made on the Platte River, Nebraska, and is used to estimate the entire sandhill crane MCP. This survey is used by state agencies to set hunt bag limits and seasons within the Central Flyway.

The Refuge cooperates with various educational institutions in the area, including Texas Tech University and Eastern New Mexico Universities. Recent study interests include sandhill crane movements, lesser prairie-chicken habitat use, invertebrate habitat use, and rangeland management. The refuge collaborates with students and advisors on studies and how they will benefit the Refuge and surrounding areas.

Project Coordination & Consultation

The refuge coordinates with TPWD on numerous projects at a landscape level. Refuge staff are active with the Texas Playa Conservation Implementation team. This team addresses funding and delivery of playa wetland conservation in the region. Refuge staff review ongoing playa projects which conserve water and wetland habitats.

The refuge is represented on the Texas State Implementation Team for the Lesser Prairie-Chicken Range-wide Conservation which reviews and provides guidance on the long-term management of the species. The team reviews the current status of the lesser prairie-chicken in Texas and makes recommendations on plans and projects that could improve habitat.

Refuge staff also attend meetings of the newly created Water Contingency Planning program. This is a new group under the South Plains Association of Governments (SPAG) which is considering how to conserve water in the region. This team is investigating various ways to conserve the aquifer. Methods may include purchase of lands or water to be held in trust for smaller towns. Any lands purchased may allow for some public use in the area. This group's plans fall within the scope of the LPP and most participating municipalities are located in the CPA.

Contamination and Hazardous Materials

A Level I Survey is required for all proposed land acquisitions. The instrument to determine whether there may be hazardous substances or environmental problems is the Environmental Site Assessment Level I Survey Checklist (Checklist). Completion of the Checklist, along with appropriate documentation, will help to determine whether there are any potential environmental problems and whether a Level II and/or III Survey is necessary. Realty or Refuge personnel trained to perform pre-acquisition Level I Surveys, will ensure that lands acquired by the National Wildlife Refuge System do not contain levels of contaminants that will affect natural resources.

List of Preparers

Jude Smith – Refuge Manager

Nicholas Pope – Wildlife Refuge Specialist

Bill Johnson – Natural Resource Biologist

Melanie Hartman – Wildlife Biologist

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Joel Miner – Conservation Planner

David Certain – Regional Planning Chief

Chapter 5: Appendices

Appendix A: References

The following references informed the development of the Landscape Conservation Design and Land Protection Strategy that are incorporated by reference into this document. The statements and analysis included in the Muleshoe NWR Land Protection Plan and Environmental Assessment are based on information obtained from these sources.

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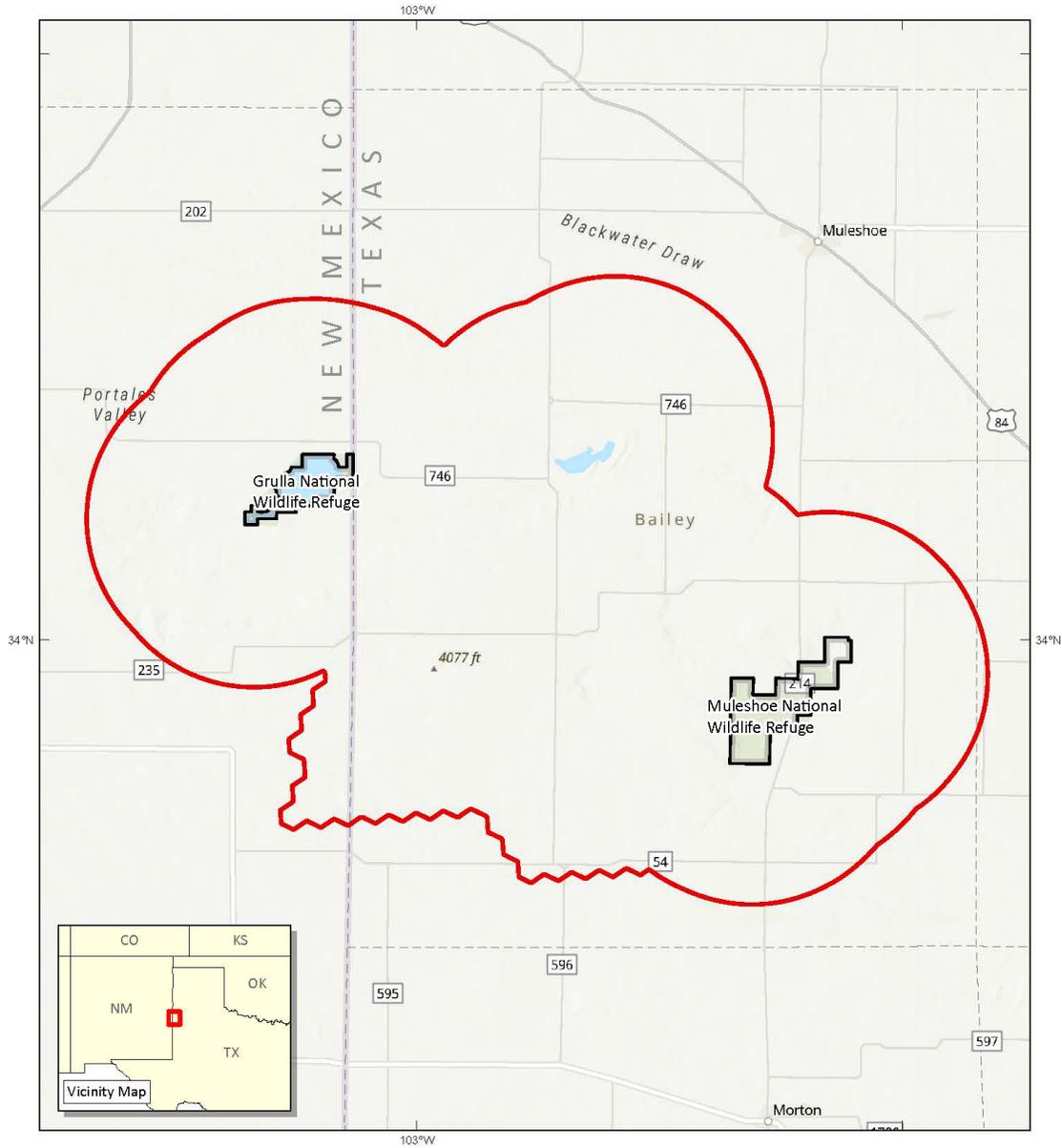
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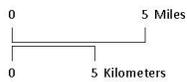
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Appendix B: Maps



Produced in the Division of Realty
Albuquerque, New Mexico
Map Date: 11/17/2022
Basemap: ESRI World Topographic Map
Web Mercator Projection
NAD 83



 Approved Acquisition Boundary

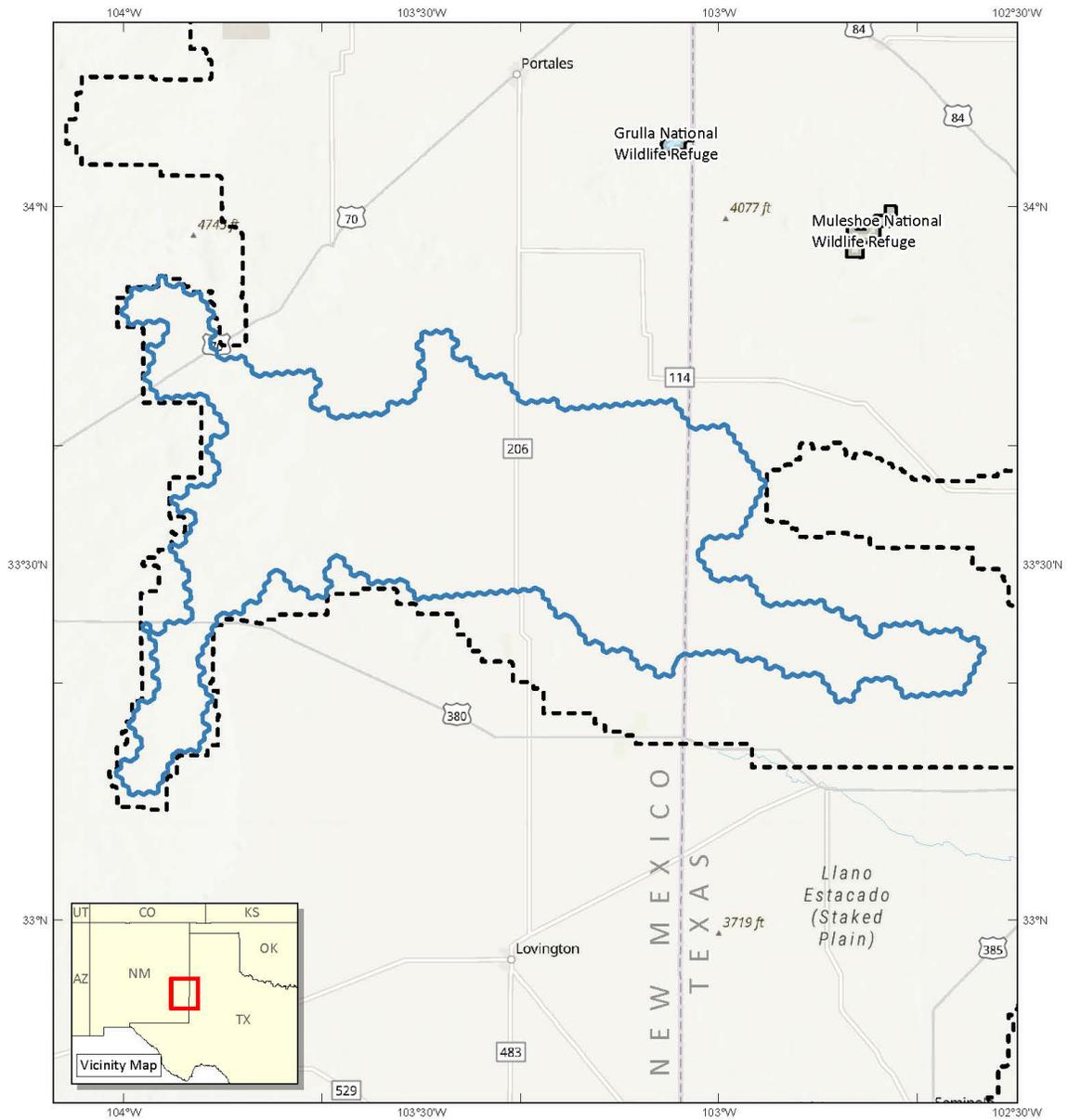
Priority Area
 1A

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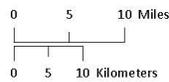


U.S. Fish & Wildlife Service
 Southern High Plains Conservation Partnership Area

Priority Area 1B

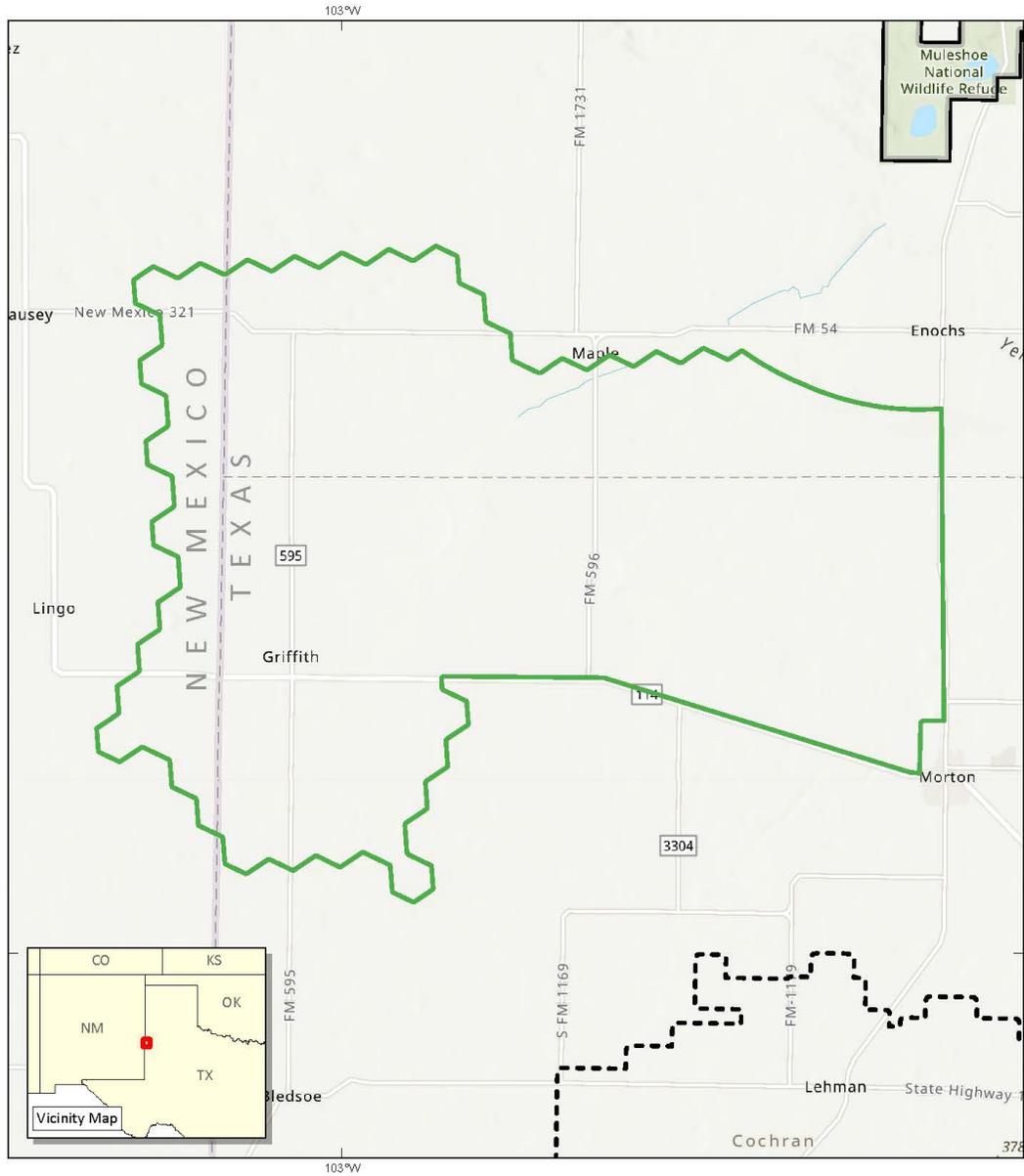


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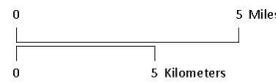


- Proposed Conservation Partnership Area
- Priority Area 1B
- Approved Acquisition Boundary

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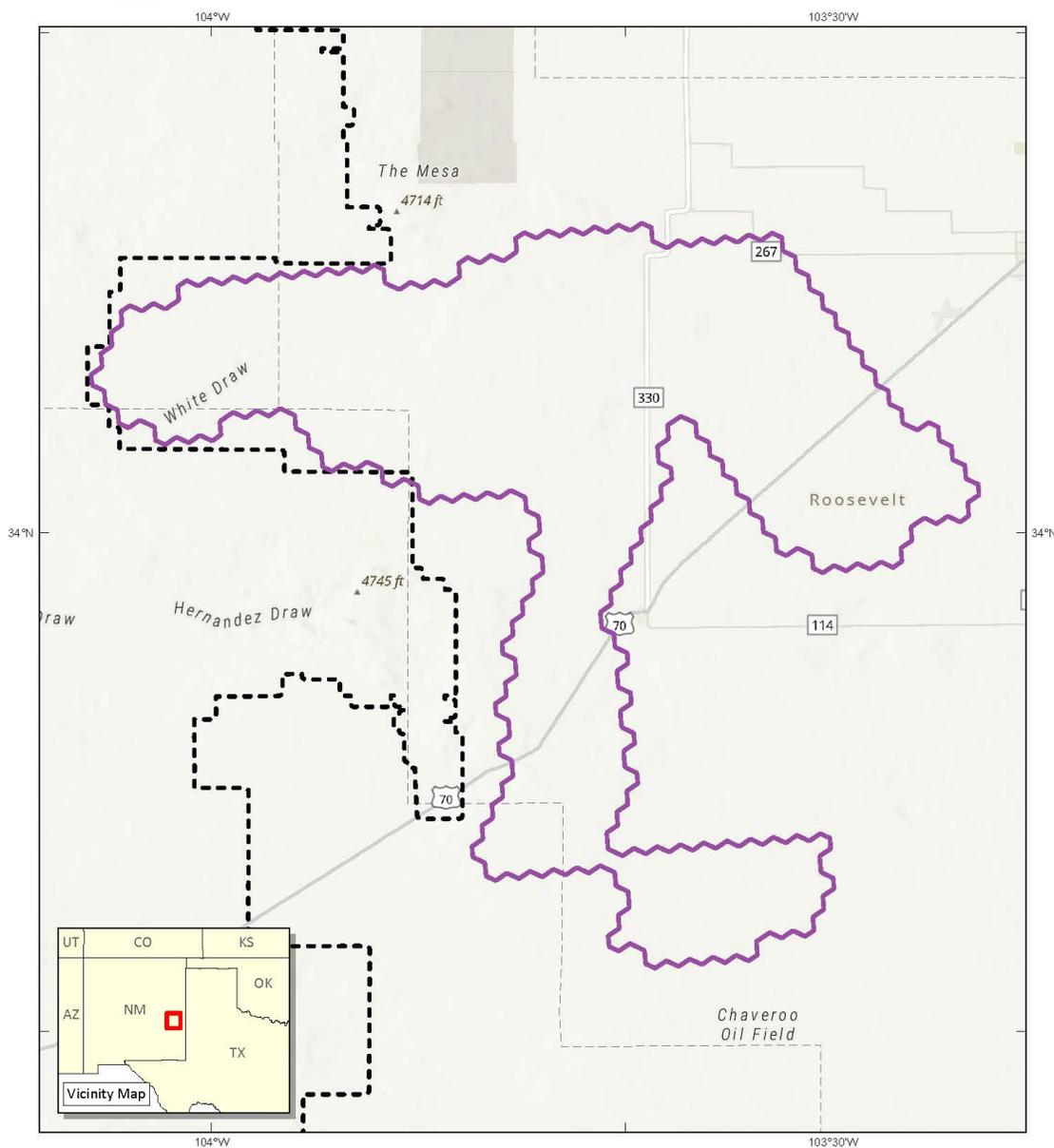


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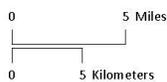


- Proposed Conservation Partnership Area
- Approved Acquisition Boundary
- Priority Area 1C

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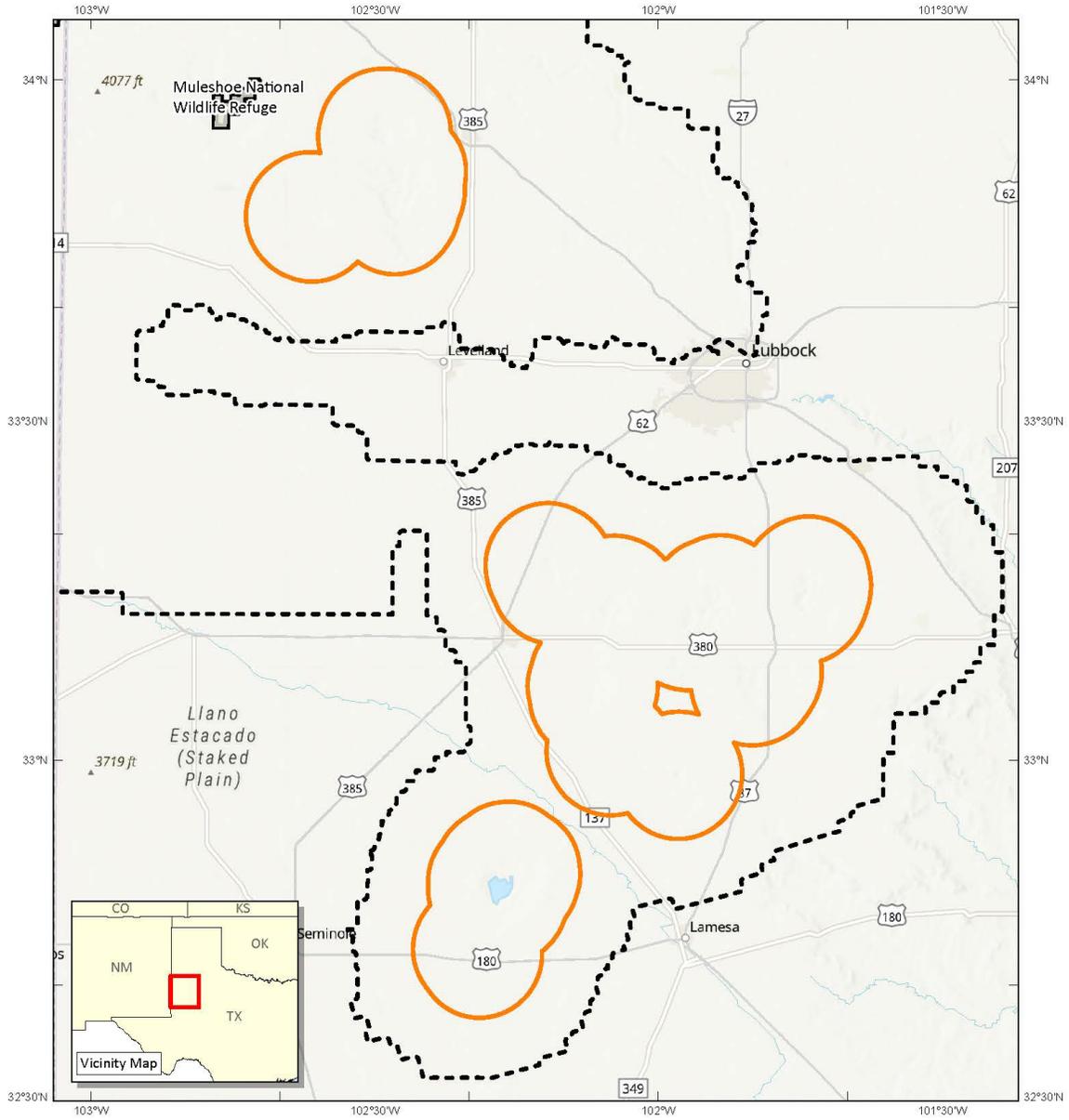


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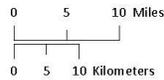


- Proposed Conservation Partnership Area
- Approved Acquisition Boundary
- Priority Area 1D

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- Proposed Conservation Partnership Area
- Priority Area 2A
- Approved Acquisition Boundary

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Appendix C: Intra-Service Section 7 Consultation

Intra-Service Section 7 Biological Evaluation Form

Originating person: Jude Smith, Nicholas Pope

Consultation Number: 2022-0075854

Telephone Number: 806-946-3341

Date: 10/07/2022

I. Service Program and Geographic Area or Station Name:

Division of Refuges, Region 2, Muleshoe and Grulla National Wildlife Refuges

II. Service Activity (Program):

The proposed action around Muleshoe and Grulla National Wildlife Refuges requires consultation under section 7 of the Endangered Species Act. This document includes an evaluation of potential effects to federally listed species resulting from the proposed action.

III. Pertinent Species and Habitat:

A. Listed Species and/or their critical habitat within the action area:

Northern Aplomado falcon (*Falco femoralis septentrionalis*), Pecos gambusia (*Gambusia nobilis*), Sharpnose shiner (*Notropis oxyrhynchus*), Smalleye shiner (*Notropis buccula*), Texas poppy mallow (*Callirhoe scabriuscula*), Piping plover (*Charadrius melodus*), Red knot (*Calidris canutus rufus*), Pecos bluntnose shiner (*Notropis simus pecosensis*), Pecos sunflower (*Helianthus paradoxus*).

B. Proposed species and/or proposed critical habitat within the action area

Wrights's marsh thistle (*Cirsium wrightii*), Lesser prairie-chicken (*Tympanuchus pallidicinctus*)

C. Candidate Species within the action area:

Monarch Butterfly (*Danaus plexippus*)

IV. Geographic area or station name and action:

Land Protection Plan Acquisition boundary around Muleshoe and Grulla National Wildlife Refuges.

V. Location:

A. Ecoregion Number and Name: 25 High Plains

B. County and State: The Land Protection Plan acquisition boundary located in Lamb, Bailey, Parmer, Castro, Yoakum, Crosby, Lubbock, Hockley, Cochran, Hale, Gaines, Dawson, Garza, Lynn, and Terry Counties in Texas; and Lea, Chaves, Roosevelt, De Baca, and Curry Counties in New Mexico (Figure 1).

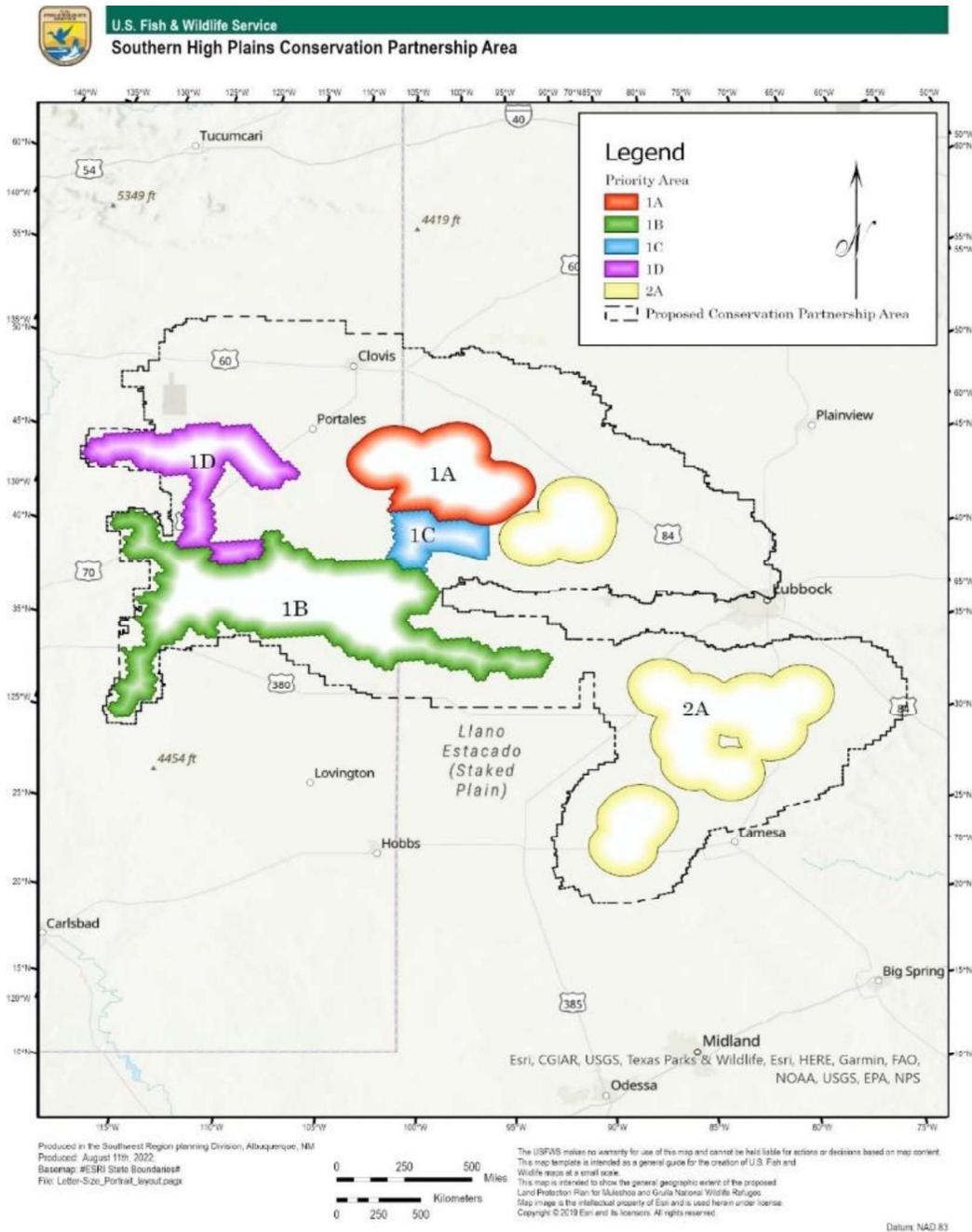


Figure 1: Land Protection Plan acquisition boundary

VI. Project Description:

The U.S. Fish and Wildlife Service (Service) is proposing a limited acquisition boundary for the Land Protection Plan (LPP) for Muleshoe and Grulla National Wildlife Refuges in west Texas and eastern New Mexico. The acquisition boundary covers roughly 7,000,000 acres, within this area the Service would strategically acquire conservation easements and fee title acquisitions, totaling up to approximately 700,000 acres. The proposed action for this Biological Evaluation is only for the LPP, which would be the potential effects of future land acquisition

and easements on listed, proposed listed, or candidate species. At this time, no potential parcels have been acquired, or identified for acquisition into the refuge system. Once the LPP is approved, land acquisition for incorporation into the refuge system would require a separate consultation under Section 7 of the Endangered Species Act for each potentially acquired parcel.

The purpose of the LPP is to protect areas important to our selected focal species and their habitats. Around eighty percent of the mid-continental sandhill crane population winter within our proposed acquisition boundary. Approximately 300,000 acres of lesser prairie-chicken focal area habitat is also located within this area, along with habitat connectivity zones. Three focal species were selected that represent landscape types that will receive priority for purchase of fee-title lands and conservation easements. Sandhill cranes were selected to represent wetland areas, which include saline lakes and playa wetlands. Lesser prairie-chickens and pronghorn antelope represent upland areas including shortgrass prairie.

The area within the LPP acquisition boundary for Muleshoe and Grulla National Wildlife Refuges is located within the Southern High Plains, which is in the North American Bird Conservation Initiative's Bird Conservation Region 18. Historically dominated by shortgrass prairie, the region is now a mosaic of cropland and rangeland (working grasslands) with competing pressures of wind energy, oil, and gas development. The added pressure of aquifer decline is bringing rapid changes to both agriculture, wildlife, and wildlife habitats that depend on a connection to underground water. Landscape-level changes in the amount and distribution of grain crops, due to declining availability of irrigation water, could have a significant effect on sandhill cranes and waterfowl that forage in croplands. These stressors are also impacting native grasslands by fragmentation with anthropomorphic changes such as roads, infrastructure, and invasive vegetation. These impacts are reducing the number of grasslands and their associated species.

The Proposed LPP is divided into five priority areas based on priority conservation goals and modeling results. The total acreage for the LPP encompasses approximately 7,000,000 acres, however the goal for the LPP is to strategically acquire up to 700,000 acres within the acquisition boundary. This equates to around 10 percent of the LPP area that the Service can acquire by conservation easements or fee title sales.

The descriptions of the priority areas are addressed below:

Priority Area 1A: Addresses connectivity of Muleshoe and Grulla National Wildlife Refuges through conservation of approximately 388,000 acres of grasslands, including Conservation Reserve Program lands, and eight saline lakes.

Priority Area 1B: Addresses conservation of the lesser prairie-chicken, pronghorn antelope, and other grassland species. This area is approximately 944,916 acres.

Priority Area 1C: Provides a movement corridor for lesser prairie-chickens and others grassland species between Priority Areas 1A and 1B. This Priority Area is approximately 89,060 acres in size.

Priority Area 1D: The priority area will foster the conservation of approximately 334,573 acres of grasslands/shrublands for lesser prairie-chickens, pronghorns, and grassland birds.

Priority Area 2A: Addresses conservation on 955,010 acres with 32 saline lakes. Saline lakes are the primary roosting area for sandhill cranes in the Southern High Plains.

VII. Determination of Effects:

The proposed LPP is anticipated to have an overall beneficial effect for listed species within the area, due to the stated goal of providing “*further protection and management of sandhill cranes, lesser prairie-chicken, pronghorn antelope, and other species of concern that rely on saline lakes, playa wetlands, and shortgrass prairie.*” Additionally, the purpose of developing this plan was to address habitat fragmentation, aquifer depletion, and changes in agricultural practices in this region. However, because acquisition of properties is expected to occur in the future on areas not yet identified, the specific biological resources that may be present are not known. In addition, the management prescribed to future acquisitions may also have temporary adverse effects to listed or proposed listed species, depending on resources present and management needs. Therefore, this effects analysis is directed at the acquisition plan and expected effects to species within the acquisition boundary. It does not include the effects of management actions that may be implemented in the future. Subsequent consultation will occur for each parcel that is identified, and the acquisition process is initiated; this would include a more specific effects evaluation, which may draw upon the expected effects listed here, as well as other direct/indirect effects relevant to the action at the time of consultation.

Northern Aplomado Falcon

The range of the endangered Northern Aplomado falcon extends into Lea and Chaves County within the proposed LPP acquisition boundary. Where falcons have been reintroduced, they are considered an experimental-nonessential population. Historically, falcons occurred throughout coastal prairie habitat along the southern Gulf coast of Texas, the trans-Pecos in Chihuahuan desert grasslands, as well as savanna and grassland habitat along both sides of the Texas-Mexico border, southern New Mexico, and southeastern Arizona. Acquisition of property through easement or fee-title sale containing habitat for the Northern Aplomado falcon would have no adverse effects on the species but is expected to result in future beneficial effects through conservation and protection of suitable habitat. Therefore, the proposed action of acquiring land for protection through conservation easements and fee-title sales is not likely to adversely affect the Northern Aplomado falcon.

Piping Plover

The range of the threatened piping plover currently covers most of the Texas panhandle and areas in New Mexico that are within the LPP boundary. The species historical range included Alabama, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, South Dakota, Texas, Virginia, Virgin Islands, Wisconsin, and Wyoming. Critical habitat is designated along the Texas coast. Within the LPP acquisition boundary, the piping plover would only be encountered during migration. For this reason, actions that may impact the species are limited to those that would expose the species to risk during migration, such as construction of wind turbines, which pose a collision hazard to many migratory birds. The LPP does not contain any actions expected to adversely affect the piping plover; the acquisition of property in the LPP is expected to result in a beneficial effect for the species and its habitat through land preservation and protection. Therefore, the proposed action of acquiring land for protection through conservation easements and fee-title sales is not likely to adversely affect the piping plover.

Red Knot

The range of the threatened red knot covers the majority of Texas and Oklahoma in the southwest. This range encompasses a large portion of the proposed land acquisition boundary. However, this species would only be encountered during migration. Like the piping plover, actions expected to impact the species would be those posing a risk to the species during migration, such as wind energy development. The LPP does not contain any actions expected to adversely affect the piping plover; additionally, the acquisition of land within the LPP is expected to have future benefits to the red knot through land conservation and protection. Therefore, the proposed action of acquiring land for protection through conservation easements and fee-title sales is not likely to adversely affect the red knot.

Pecos Bluntnose Shiner

The threatened Pecos bluntnose shiner range historically occurred in the Rio Grande in New Mexico from El Paso, Texas north to near Abiquiu Reservoir in the Chama River, and in the Pecos River in New Mexico from the upper reaches of Avalon Reservoir north to Santa Rosa. The acquisition boundary lies within parts of the Pecos bluntnose shiner's range; however, it does not include the Pecos River, but includes portions of the Pecos River basin. The proposed action of land acquisition within the Pecos River catchment may be beneficial to this species through conservation and protection, which would maintain natural ecological function in the watershed, and therefore may affect, but is not likely to adversely affect this species or its critical habitat.

Pecos Gambusia

The endangered Pecos gambusia range is in Chaves County, New Mexico along with other counties along the Pecos River in New Mexico and Texas. The acquisition boundary lies within parts of the Pecos gambusia's range; however, it does not include the Pecos River, but includes portions of the Pecos River basin. The proposed action of land acquisition within the Pecos River catchment may be beneficial to this species through conservation and protection, which would maintain natural ecological function in the watershed, and therefore may affect, but is not likely to adversely affect this species.

Sharptnose Shiner and Smalleye Shiner

Sharptnose and smalleye shiners are broadcast-spawning minnows currently restricted to the upper Brazos River Basin in north-central Texas and its major tributaries that occur within the following counties in north-central Texas: Archer, Baylor, Crosby, Dickens, Fisher, Garza, Haskell, Jones, Kent, King, Knox, Lubbock, Lynn, Palo Pinto, Scurry, Stephens, Stonewall, Throckmorton, and Young. Critical habitat is also designated within the counties of occurrence. The LPP acquisition boundary extends into several counties where the range of the two fish species and critical habitat occurs. The acquisition of lands in this area may have a beneficial effect for the two species and their critical habitat, through land conservation and protection, which would maintain natural ecological function in upland areas within the species' watershed. Therefore, the proposed action is not likely to adversely affect the sharptnose and smalleye shiner or their critical habitat.

Monarch Butterfly

The monarch butterfly is a candidate species and not yet listed or proposed for listing. However, for the purpose of Intra-Service consultation, the Service treats candidate species as proposed species. Monarch butterflies migrate throughout Canada, the United States, and Mexico. In many regions where monarchs are present, monarchs breed year-round. Individual monarchs in temperate climates, such as eastern and western North America, undergo long-distance migration, and live for an extended period. In the fall, monarchs begin migrating to their respective overwintering sites in both eastern and western North America. This migration can take monarchs distances of over 3,000 km and last for over two months. The LPP and acquiring land would benefit the monarch due to land conservation and protection. Therefore, the proposed action is not likely to jeopardize the continued existence of the monarch butterfly.

Pecos Sunflower

The threatened Pecos sunflower's historical range included parts of New Mexico and Texas. It is now known or believed to occur in the following counties: Chaves, Cibola, Guadalupe, Socorro, Valencia in New Mexico and Pecos and Reeves County in Texas. Pecos sunflower is a wetland plant that grows on wet, alkaline soils at spring seeps, wet meadows, stream courses and pond margins. It has seven widely spaced populations in west-central and eastern New Mexico and adjacent Trans-Pecos region of Texas. These populations are all dependent upon wetlands from natural groundwater deposits. Incompatible land uses, habitat degradation, and groundwater withdrawals are historic and current threats to the survival of Pecos sunflower. The acquisition boundary for the LPP overlaps a small portion of Chaves County, New Mexico. Land acquisition in this area would likely result in beneficial effects for this species through land conservation and protection, therefore this action is not likely to adversely affect the species or its habitat.

Texas Poppy-Mallow

The endangered Texas poppy-mallow is endemic to the upper Colorado River watershed on midslope terraces. Texas poppy-mallow is known or believed to occur within Coke, Mitchell, and Runnels, Scurry, and Borden County Texas. The LPP acquisition area does not include these areas but includes historic ranges, however acquisition of lands in this area would likely be beneficial to the species through conservation and protection of portions of the historical range. Therefore, this action is not likely to adversely affect the species or its habitat.

Wright's Marsh Thistle

This species occurs in New Mexico in wet, alkaline soils in spring seeps and marshy edges of streams and ponds between 3,450 and 7,850 feet in elevation. Its flowers are white to pale pink in areas of the Sacramento Mountains but are vivid pink in all the Pecos Valley locations. The locations in the Pecos Valley also tend to have taller plant heights and darker green foliage. Historically this plant occurred in Arizona, New Mexico, Texas, and parts of Mexico. The Wright's marsh thistle historic range extends into the LPP boundary, but it is not known to occur in this area. Therefore, the action of acquisition of property would have no effect on the species or its critical habitat.

Lesser Prairie Chicken

The lesser prairie-chicken is proposed to be listed as endangered within the LPP in Texas and New Mexico. The historical range included grassland and shrublands in Colorado, Kansas, New Mexico, Oklahoma, and Texas. Lesser prairie-chickens depend on large continuous expanses of grasslands. Habitat loss and fragmentation within the range of the lesser prairie-chicken include: the largescale conversion of prairie to cultivated agriculture; the construction of infrastructure for petroleum

production; recent construction of infrastructure to support wind energy development; the encroachment of woody vegetation; and the construction of roads and electrical distribution lines. The cumulative impacts of these landscape changes have resulted in modification of large grassland areas. These modifications have caused the extirpation of the lesser prairie-chicken throughout most of its historic and current range. The lesser prairie-chicken was selected as one of the focal species during the landscape conservation design process, which helped develop our current LPP acquisition boundary. Approximately 300,000 acres of lesser prairie-chicken focal area habitat is also located within this area, along with 68,000 acres of lesser prairie-chicken habitat connectivity zones. The LPP acquisition boundary contains most of the remaining lesser prairie-chickens' current habitat in New Mexico and Texas. The LPP would be a beneficial action for the lesser prairie-chicken and its habitat through land conservation and protection and, therefore, the proposed action is not likely to jeopardize the continued existence of the species.

VIII. Effects Determination and Response Requested:

A. Listed Species

Determination	Response Requested
No effect/ no adverse modification <ul style="list-style-type: none"> • [None] 	Concurrence
May affect, not likely to adversely affect species/ adversely modify critical habitat: <ul style="list-style-type: none"> • Northern Aplomado Falcon • Piping Plover • Sharpnose Shiner • Smalleye Shiner • Texas Poppy-mallow • Pecos Sunflower • Pecos Gambusia • Pecos Bluntnose Shiner • Red Knot 	Concurrence
May affect, is likely to adversely affect species/ critical habitat: [None]	Concurrence

B. Proposed Species

Determination	Response Requested
No effect on proposed species/ critical habitat: <ul style="list-style-type: none"> • Wright's Marsh Thistle 	Concurrence

Appendix D: Public Comments and Letters

Comments and Responses

Comment	Plan Section	Response
Please ensure that the bubbles correspond to existing property lines so as not to divide properties...	Priority Areas, Page 29	The limited acquisition boundary corresponds to existing property lines. Acquisitions along the edge of the Priority Areas would not be divided.
After comments close of this draft proposal, what is the timeline of events for this program to get funded and fully approved?	N/A	Plan approval is expected by spring 2023 and funding will be variable in following years with a limited number of acquisitions each fiscal year.
When should we expect the next formal update?	N/A	Next formal update will be publishing of the final approved plan.
What percentage of the expanded territory is targeted to become an opportunity for public access...either for recreational or hunting purposes thru TPWD's draw system?	Hunting, Page 22	The availability of acquired lands for hunting will depend on the proportion of fee-title acquisitions and the size of the tracts assembled. As suitable lands are added, hunt plans will be prepared along with required regulations published in the Federal Register to allow hunting.
With an expansion of this magnitude and resources stretched thin now, the Muleshoe NWR needs additional staff and resources allocated in advance of the LPP implementation to accommodate the additional planning and stewardship responsibilities associated with a refuge of this magnitude.	Refuge Management, Page 26	The Service does not expect an immediate need for staff increases. This plan reflects the need for additional resources at the refuge as it grows.

Letters



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Texas Parks & Wildlife Department
109 S. Cockrell St.
Alpine, TX 79830
January 17, 2023

Commissioners

Arch "Beaver" Aplin, III
Chairman
Lake Jackson

James E. Abell
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Cleveland

Paul L. Foster
El Paso

Anna B. Galo
Laredo

Jeffery D. Hildebrand
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Robert L. "Bobby" Patton, Jr.
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Travis B. "Blake" Rowling
Dallas

Dick Scott
Wimberley

Lee M. Bass
Chairman-Emeritus
Fort Worth

T. Dan Friedkin
Chairman-Emeritus
Houston

Carter P. Smith
Executive Director

Muleshoe National Wildlife Refuge
Jude Smith – Refuge Manager
1531 County Road 1248, Muleshoe, TX 79347

Mr. Smith:

The Texas Parks and Wildlife Department - Wildlife Division has a long and successful history of partnering with conservation organizations, including the US Fish and Wildlife Service, across West Texas to develop and inform landscape-scale management and conservation actions for priority species and their habitats. The Draft Land Protection Plan for Muleshoe National Wildlife Refuge, as proposed, will build on the ongoing efforts between our agencies to conserve several priority habitat types, including shortgrass prairie, playa wetlands, and saline lakes, and to support lesser prairie-chicken and sandhill crane conservation in the High Plains ecoregion of Texas.

I support to the Draft Land Protection Plan for Muleshoe National Wildlife Refuge as proposed.

Sincerely,

Calvin Richardson
Wildlife Division – Region 1/West Texas Director
Texas Parks & Wildlife Department



The Nature Conservancy
1613 Paseo de Peralta, Suite 200
Santa Fe, NM 87501
Phone: [505-988-3867](tel:505-988-3867)
Email: nm@tnc.org

U.S. Fish and Wildlife Service
Muleshoe National Wildlife Refuge
1531 County Road 1248
Muleshoe, TX 79347

February 2, 2023

Submitted electronically to r2_plancomments@fws.gov

Subject: Muleshoe WMA Proposed-Expansion Land Protection Plan comments

To Whom It May Concern:

On January 3, 2023, the USFWS requested comments regarding the Land Protection Plan (LPP) for the Muleshoe National Wildlife Refuge (NWR) and to expand the conservation of the Southern High Plains of Texas and New Mexico and further the protection of several species of concern. The Nature Conservancy of New Mexico (TNC) respectfully submits this letter for your consideration for the proposed Muleshoe Wildlife Management Area Land Protection Plan (LPP).

TNC currently owns and manages the Milnesand Preserve consisting of 28,000 acres of unfragmented grassland in Roosevelt and Lea County New Mexico. The Milnesand Preserve was purchased with the intent of protecting critical habitat for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and the Dunes sagebrush lizard (*Sceloporus arenicolus*). In 2005, TNC purchased the Creamer Ranch and in 2009 the Johnson Ranch totaling 28,000 acres of unfragmented grassland with shinnery oak shrubs in the heart of New Mexico's Lesser Prairie-Chicken population. Milnesand has more than 50 leks and provides habitat for the imperiled black-tailed prairie dogs (*Cynomys ludovicianus*), burrowing owls (*Athene cunicularia*), plains leopard frogs (*Rana blairi*), and many other prairie-dependent species.

TNC recognizes the need for further protection of the remaining intact and functioning Southern High Plains and the many species that depend on this diminishing habitat. Considering the Milnesand Prairie Preserve's contiguous acreage and strategic location within the Lesser Prairie-Chicken priority area, TNC strongly encourages the USFWS to consider incorporating the Milnesand Prairie Preserve into plans involving conductivity and unfragmented protected areas within the proposed Muleshoe Wildlife Management Area LPP. See attached map for location reference.



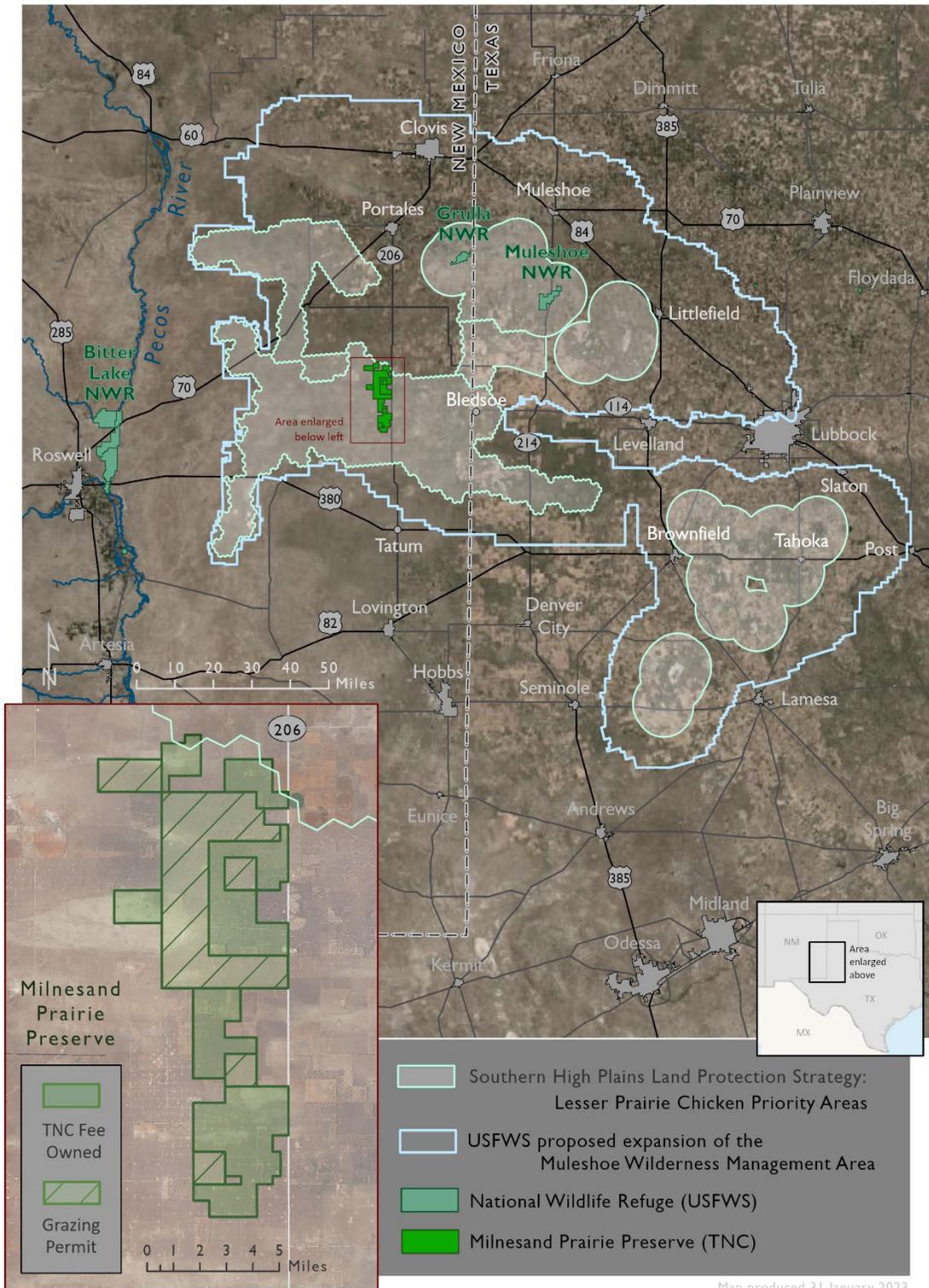
The strategic goals of the Muleshoe NWR LPP and TNC both align, regarding the Southern High Plains, allowing us to be working partners and collaborate during the LPP process. With an expansion of this magnitude and resources stretched thin now, the Muleshoe NWR needs additional staff and resources allocated in advance of the LPP implementation to accommodate the additional planning and stewardship responsibilities associated with a refuge of this magnitude.

In closing, TNC recognizes and appreciates the important responsibilities the U.S. Fish and Wildlife Service and the Muleshoe WMA are taking on to provide additional protection to the Southern High Plains and the host of flora and fauna that depend on it. We support your efforts and if we can assist in any way, please feel free to reach out to our Santa Fe, New Mexico office at 505-988-3867 or email at nm@tnc.org. We look forward to working together in protecting the remaining Southern High Plains.

Thank you for your consideration of these comments.

Sincerely,

David Hernandez
Stewardship Ecologist New Mexico



Miner, Joel C

From: Julie Shackelford <jshackelford@conservationfund.org>
Sent: Thursday, February 2, 2023 8:23 AM
To: Plan Comments, FW2
Subject: [EXTERNAL] Muleshoe LPP comments

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

On behalf of The Conservation Fund, I would like to express our organization's support for the approval of the draft LPP and EA for Muleshoe NWR. This expansion would improve conservation for sandhill crane, pronghorn, and lesser prairie-chicken, as well as a full suite of other wildlife that rely on the same habitat types. Expansion would protect and create buffers between saline lakes, playa wetlands, and shortgrass prairie. The proposed expansion is needed because aquifer decline, land use change, and climate change across the project area have impaired the function of ecosystems in the region to provide quality habitat for the identified species, whose numbers are declining precipitously.

Having worked at length with USFWS in refuge acquisitions around the country, The Conservation Fund is particularly supportive of the bubble and priority system for delineating expansion boundaries, rather than hard lines on a map. This system provides significantly more flexibility, allowing the agency and its partners to pursue the best and most strategic lands for protection. Please ensure that the bubbles correspond to existing property lines so as not to divide properties however. The Conservation Fund stands ready to continue to assist USFWS with any acquisition/easement needs it will have on this Refuge. Thank you for the opportunity to comment.

Julie Shackelford
Texas Director
The Conservation Fund
2900 Raguet Street
Nacogdoches, TX 75965
(936) 468-5490 (office)
(936) 585-3311 (cell)
www.conservationfund.org

GOVERNOR
Michelle Lujan Grisham



DIRECTOR AND SECRETARY
TO THE COMMISSION
Michael B. Sloane

**STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH**

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SHARON SALAZAR HICKEY
Santa Fe

March 27, 2023

Mr. Jude Smith
Muleshoe National Wildlife Refuge
1531 County Rd. 1248
Muleshoe, TX 79247

Dear Mr. Smith:

The New Mexico Department of Game and Fish (Department) supports the Land Protection Plan for the Muleshoe National Wildlife Refuge (Plan). We appreciate having been involved during the development of the Plan, including making recommendations on the geographic extent of the plan, identifying priority areas, and species that would benefit from the proposed actions and protections. Protecting sensitive grasslands and wetlands would benefit species such as sandhill cranes, pronghorn, and lesser Prairie-chicken, but also a large variety of nongame species such as declining grassland songbird species, massasauga, and horned lizards. Expanding the geographic boundaries to protect these habitats and their wildlife inhabitants will help ensure their continued presence on the landscape. We look forward to continuing our successful partnership with the US Fish and Wildlife Service, to include managing wildlife under the Plan should it be approved.

Sincerely,

Stewart Liley
Chief, Wildlife Management Division