Oil and Gas

Habitat Conservation Plan

For the Lesser Prairie-chicken

Colorado, Kansas, New Mexico, Oklahoma, and Texas

Prepared by:

LPC Conservation LLC

In consultation with:

Western EcoSystems Technology, Inc.

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1 INTRODUCTION

1.1 Overview and Background

LPC Conservation LLC (Applicant) has prepared this Habitat Conservation Plan (HCP) in support of an application for an Incidental Take Permit (ITP) for the lesser prairie-chicken (LEPC; *Tympanuchus pallidicinctus*) under Section 10(a)(1)(B) of the Endangered Species Act of 1973 (ESA; 16 US Code [USC] 1531-1544 [1973]). While the LEPC is not at this time a federally listed species, on June 1, 2021 the US Fish and Wildlife Service (USFWS) published a proposed rule to list two distinct population segments (DPS) of the LEPC under the ESA (86 Federal Register (FR) 29432 [June 1, 2021]). The proposed rule includes listing the northern DPS as threatened, with a 4(d) rule, and the southern DPS as endangered. This HCP has been developed in collaboration with the USFWS, and is intended to provide a USFWS-approved mechanism for proponents in the oil and gas industry to participate in LEPC conservation while meeting the statutory and regulatory requirements of the ESA should the LEPC become an ESA-listed species. As such, this HCP was developed in accordance with the ESA (Section 10(a)(2)(A)), Federal Regulation (50 Code of Federal Regulations [CFR]17.22(b), 17.32(b)) and the *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (HCP Handbook; USFWS and National Marine Fisheries Service [NMFS] 2016) to meet ITP issuance criteria.

In March 2015, the USFWS announced finalization of the Lesser Prairie-Chicken Programmatic Conservation Bank Agreement (LPC PCBA), the first Programmatic Conservation Bank (PCB) to be approved by the USFWS for any species (USFWS 2015a). LPC Conservation LLC (the Applicant of this HCP), as part of Common Ground Capital, has been administering the LPC PCBA since its finalization. As described in Section 5.3.3 (Measures to Mitigate the Impact of the Taking), the LPC PCBA, other USFWS-approved LEPC conservation banks, LEPC in-lieu fee compensatory mitigation programs, or permittee-responsible mitigation efforts that meet the standards required by the HCP will provide the mitigation implemented through this HCP; however this HCP occasionally refers to the terms described in the LPC PCBA for specificity of conservation measures. The commitment documented under the LPC PCBA is for the establishment, use, operation, and maintenance of a PCB that can be used by developers or other project proponents who need to compensate for the adverse impacts their projects have on LEPC. The LPC PCBA will conserve and protect LEPC by means of restoring, creating, and/or enhancing habitat on Bank Parcels (land parcels enrolled in the LPC PCBA), which will then be managed and maintained in perpetuity for LEPC, resulting in permanent conservation for the species. In finalizing the LPC PCBA, the USFWS recognized the ability to conserve LEPC habitat, protect LEPC strongholds (i.e., important conservation areas within the species' native habitat [USFWS 2012a]), and create several contiguous LEPC habitat areas where only scattered fragments now exist. Mitigation provided through the LPC PCBA and other USFWS-approved mitigation implemented under the HCP will support LEPC conservation efforts.

This HCP is designed to minimize and mitigate the potential impact to LEPC on non-federal property within the Permit Area (see Section 1.5) from the development and operation of oil and

gas projects enrolled in the HCP. The Applicant will work only with property owners who voluntarily enroll lands in the LPC PCBA or other mitigation projects, or mitigation entities that commit to implementing equivalent management measures to conserve the LEPC. All conservation actions will meet the minimum criteria outlined within this HCP.

As previously stated, it is expected that the LPC PCBA will be used to secure mitigation for at least some of the projects enrolled in the HCP. Under the LPC PCBA, LPC Conservation LLC provides conservation sites for the LEPC in several strategic locations across the species' Estimated Occupied Range (EOR; Figure 1, Section 5.3) and will protect the conservation sites in perpetuity under the robust, rigorous, and proven USFWS conservation banking model (W. Walker, LPC Conservation, LLC, pers. comm., March 30, 2020). To meet this commitment, LPC Conservation LLC has accomplished the following (see Figure 1):

- Obtained full USFWS approval of a PCBA that covers the entire range of a species.
- Secured approximately 70,000 acres (ac; 28,328 hectares [ha]) of option agreements across three states, including Kansas, New Mexico, and Texas.
- Secured full USFWS approval of the 9,000-ac (3,642-ha) Hoeme Conservation Bank in western Kansas.
- Secured USFWS approval for 20,000-ac (8,094-ha) of the Gardiner Angus Ranch Conservation Bank in southern Kansas, with a total of 46,000 ac (18,615 ha) under option agreement.
- Secured full USFWS approval of the 3,000-ac (1,214-ha) Tomahawk Conservation Bank in west Texas, developed in coordination with RiverBank Ecosystems of Austin, Texas; approximately 1,400 ac (566 ha) remain available to meet future banking needs.
- Secured full USFWS approval of the 10,000-ac (4,407-ha) Lost Draw Conservation Bank in eastern New Mexico, developed in coordination with RiverBank Ecosystems of Austin, Texas. Of this, 8,000 acres (3,237 ha) remain available to meet future banking needs.

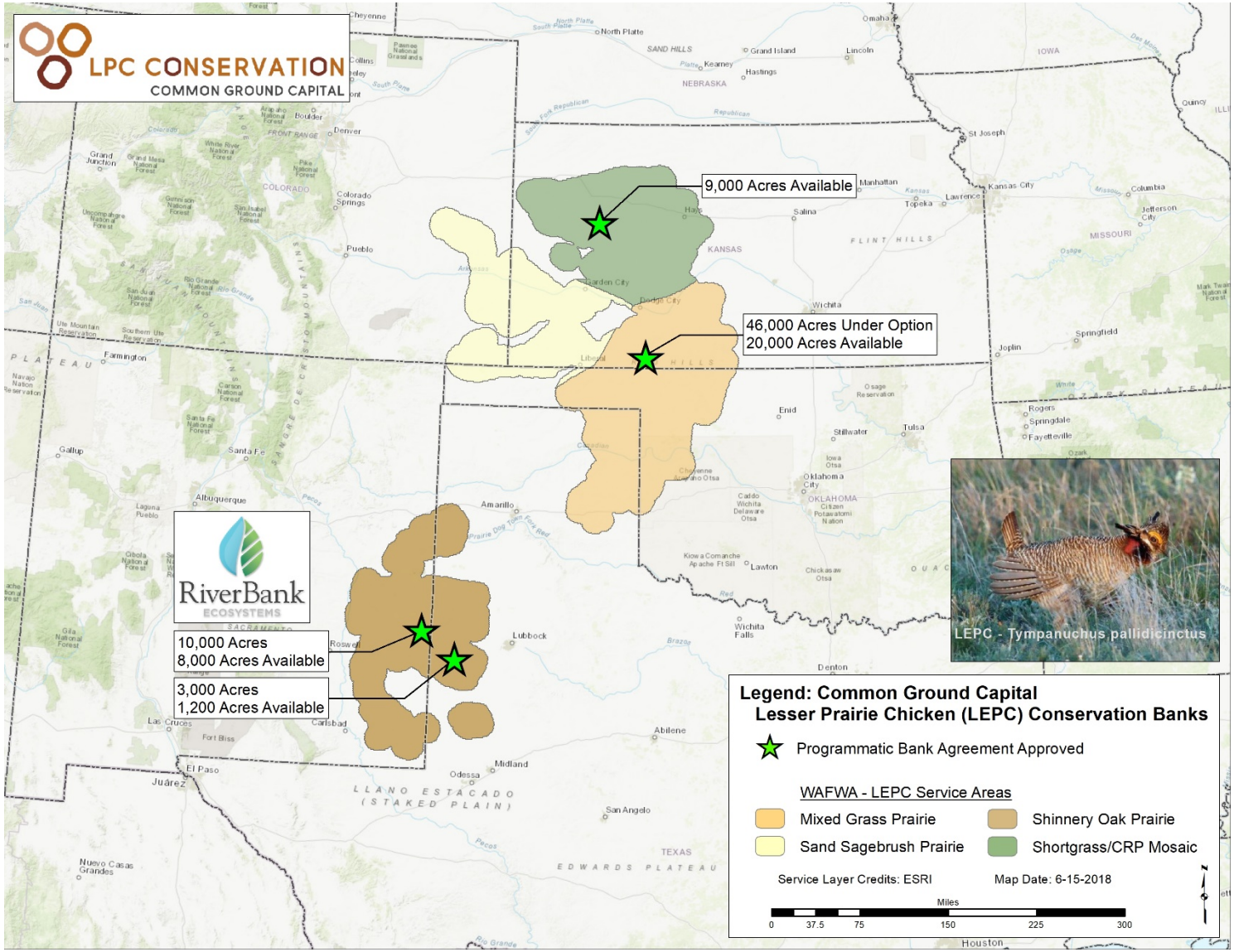

Figure 1. Lesser prairie-chicken (LEPC) conservation banks managed by LPC Conservation LLC / Common Ground Capital.

The value brought to LEPC conservation efforts by this HCP relies on using knowledge and experience in selecting the highest value strategic conservation sites with private landowner partners, providing sustained and accountable habitat management of the conservation properties used in mitigation, and in successfully negotiating numerous commercial transactions with sophisticated industry parties in the ecosystem service market place. The conservation projects listed above show that LPC Conservation LLC has a demonstrated ability to meet the LEPC habitat mitigation and conservation needs under the terms of this HCP.

1.2 Purpose and Need

The LEPC is not federally listed under the ESA at this time (see Section 3.2); however, on June 1, 2021 the USFWS published a proposed rule to list the northern DPS as threatened with a 4(d) rule and the southern DPS as endangered under the ESA. The purpose of this HCP is to meet the statutory requirements of a Section 10(a)(1)(B) ESA permit should the LEPC (or any DPS) become federally listed as a threatened or endangered species, and to provide regulatory assurances and streamline the permitting process for oil and gas companies seeking to construct projects within the HCP Permit Area (see Section 1.5). This will be accomplished by providing a structured and USFWS agreed-upon approach that oil and gas companies participating in the HCP will use for avoidance and minimization measures (Section 5.3), take estimation (Section 4.4), and compensatory mitigation (Section 5.3). Oil and gas company participation in the HCP and an application for take authorization is voluntary. To be issued take authorization under an ITP associated with this HCP, the Applicant must provide an HCP which meets the issuance criteria found at 50 CFR 13 and 17 and ensure all participants implement the requirements defined in any Certificate of Inclusion (CI; see Section 1.3) as consistent with the HCP and ITP. This HCP will provide a pathway for oil and gas companies seeking future regulatory assurances with respect to LEPC. The construction and operation of additional oil and gas projects, and the appurtenant facilities associated with these projects, are expected to increase in the coming years. Because LEPC occur within the Permit Area (Section 1.5), incidental take of this species, resulting from habitat loss, fragmentation, and degradation from the construction and operation of oil and gas projects, is likely to occur.

Six years ago, the Western Association of Fish and Wildlife Agencies (WAFWA), in partnership with wildlife agencies in Colorado, Kansas, New Mexico, Oklahoma, and Texas, the five states where the species occurs (see Section 3.2), created and have since then sought to implement a range-wide conservation plan (the Range-wide Plan; RWP) that aims to balance LEPC conservation with economic activities that are regionally important (Van Pelt et al. 2013). While incidental take coverage for LEPC is currently not required because the species is not federally protected, the oil and gas industry was able to participate in LEPC conservation through a Candidate Conservation Agreements with Assurances (CCAA) associated with the RWP (USFWS and WAFWA 2014). At the present, WAFWA is currently accepting enrollment in the CCAA only by its existing oil and gas participants. This HCP will provide an additional pathway for oil and gas companies seeking future regulatory assurances with respect to LEPC under a non-listing or federally regulated environment.

The Permit Area (Section 1.5) includes portions of the nation where oil and gas development has been ongoing since the early 1900s. As such, oil and gas wells, distribution and gathering lines, meter and regulator stations, compressor stations, and other appurtenant facilities are present in high numbers. As depicted on Figure 2a and Figure 2b, this portion of the country has historically been a vital component of the nation's oil and gas production. In recent years, advances in technology have resulted in increased production in shale gas and tight oil plays both within and near the Permit Area (e.g., Niobrara, Woodford, and Spraberry plays) as well as in plays across the US (e.g., Bakken, Eagle Ford, Utica, and Marcellus plays). The construction and operation of additional oil and gas projects, and the appurtenant facilities associated with these projects are expected to increase in the coming years. Because LEPC occur within the Permit Area (Figure 3), incidental take of this species resulting from habitat loss, fragmentation, and degradation from the construction and operation of oil and gas projects is likely to occur.

This HCP is expected to fully offset the impacts to LEPC resulting from enrolled projects by protecting, enhancing, and restoring land of relatively high ecological value to the species. Specifically, mitigation offsets under this HCP will support the USFWS stronghold approach (USFWS 2012a), by protecting and expanding potential existing strongholds and other areas of relatively high-quality habitat and suitable patch size to support viable LEPC populations, and restoring currently unsuitable habitat. Furthermore, the HCP will minimize impacts to LEPC by providing impact minimization measures during the siting and construction of project infrastructure (Section 5.3.2) and incentivizing the siting of oil and gas development outside of strongholds and other suitable habitat through mitigation ratios based on the value of habitat impacted (Section 5.3.3.1). Mitigation ratios are expected to influence project siting by increasing the amount of mitigation required to fully offset the impacts of projects sited in higher priority LEPC habitat, creating a financial incentive for participants to site projects in low value habitat. Furthermore, by enrolling in the HCP, participating oil and gas companies can reduce the time and cost associated with implementing LEPC conservation to fully offset project impacts. Encouraging minimization of impacts to LEPC through the siting of projects in areas where anthropogenic disturbance has previously occurred will thereby reduce the overall impact of new project development to LEPC.

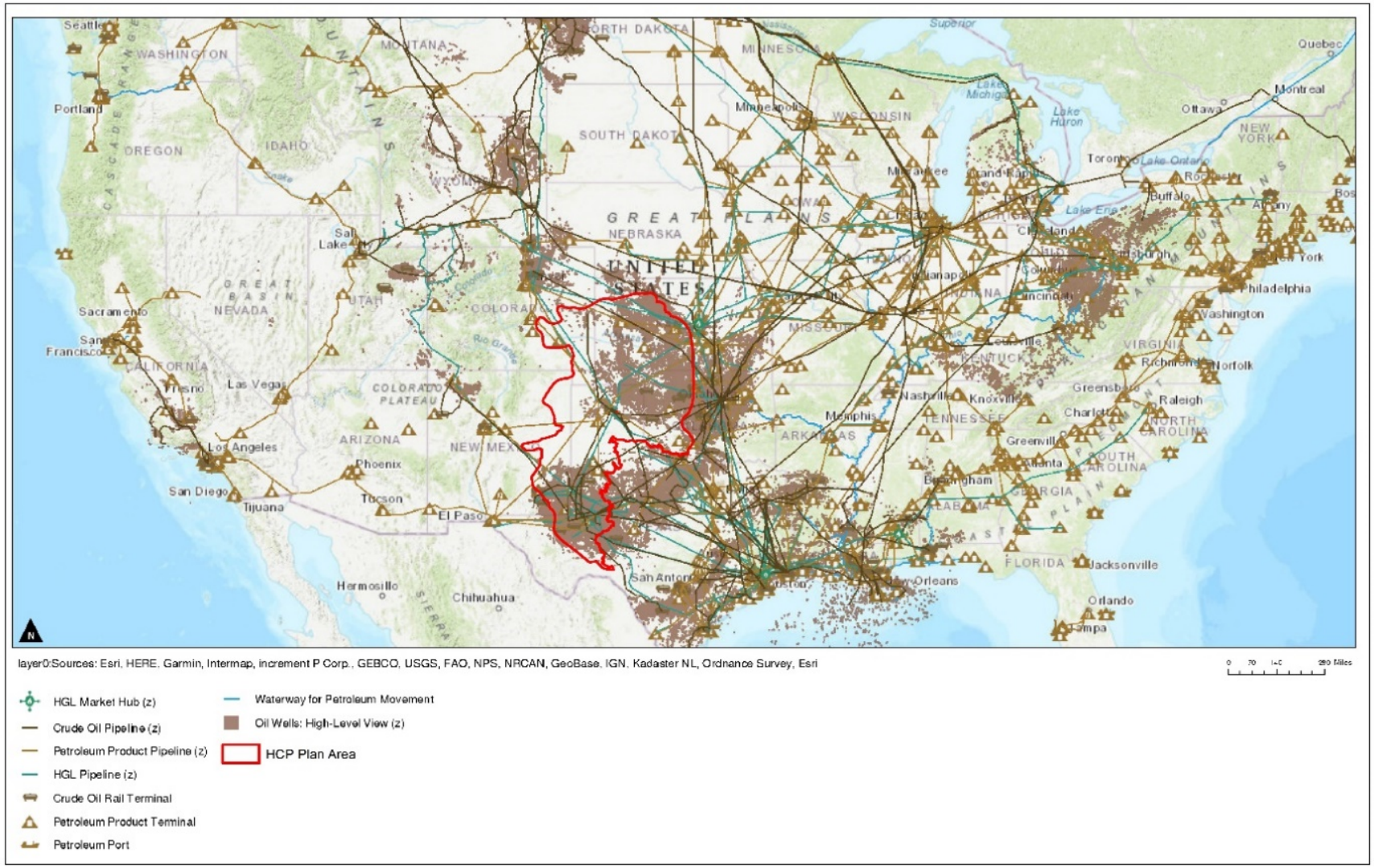

Figure 2a. Oil wells and distribution facilities in the Habitat Conservation Plan (HCP) Area.

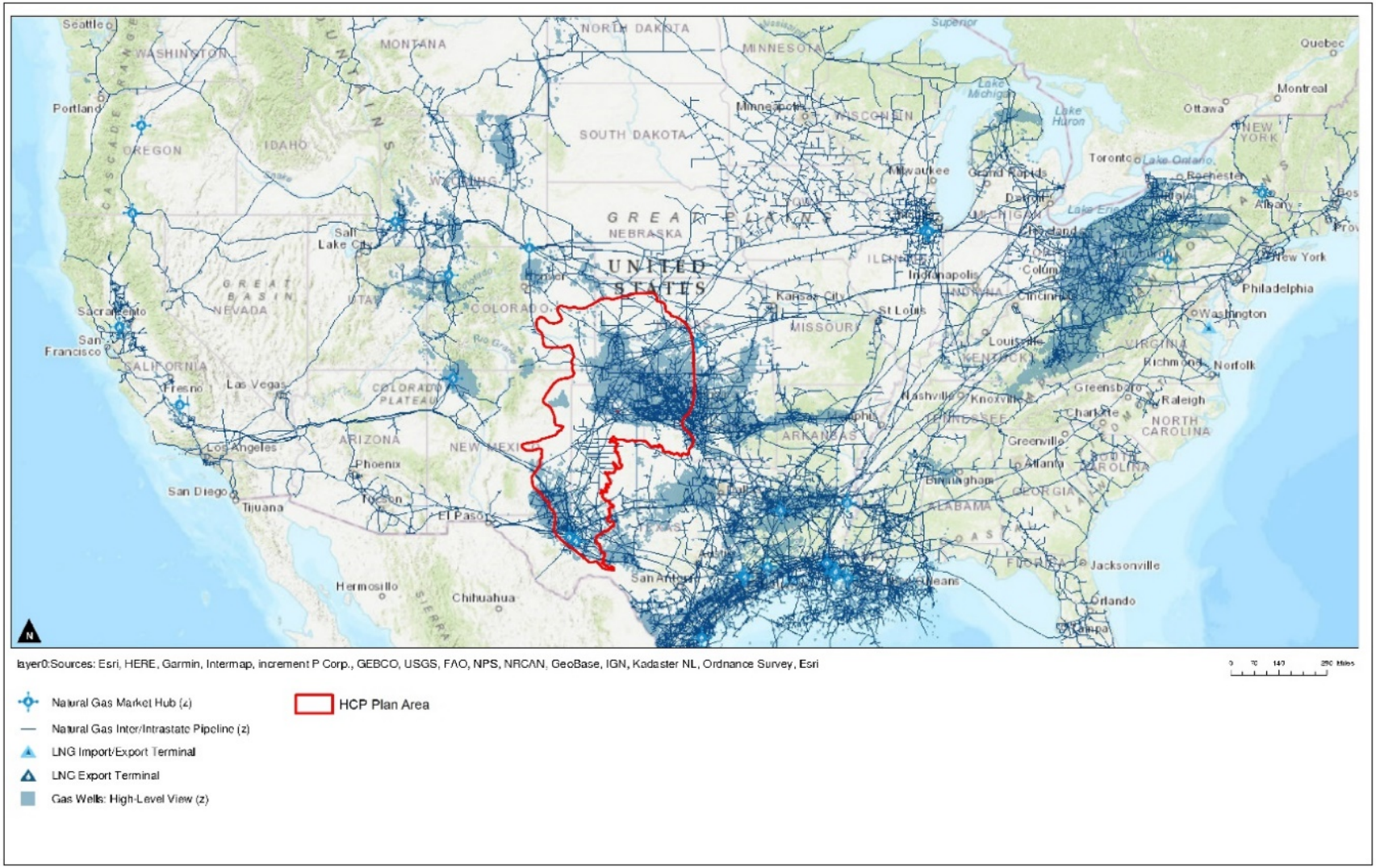

Figure 2b. Natural gas wells and distribution facilities in the Habitat Conservation Plan (HCP) Area.

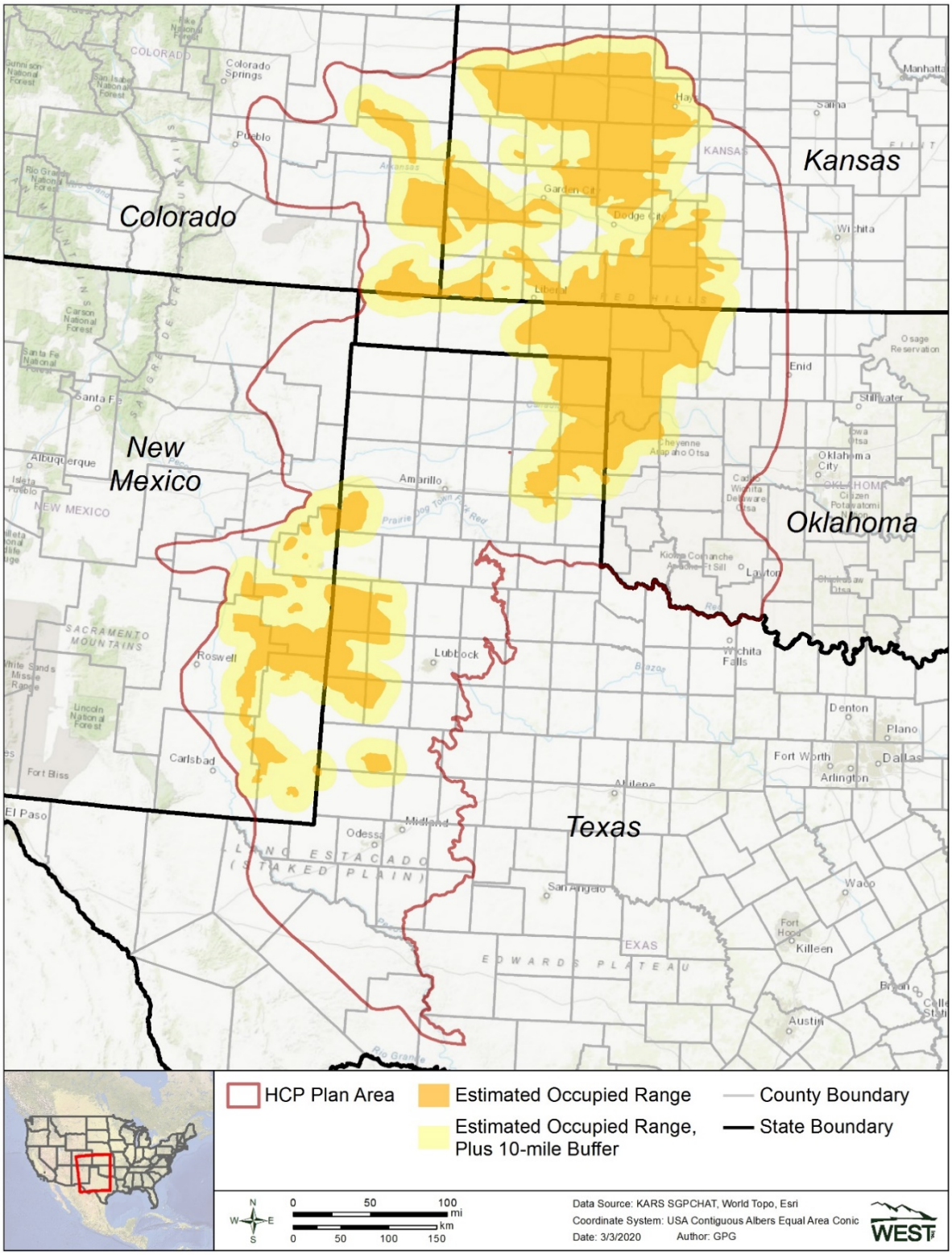

Figure 3. Plan Area of the lesser prairie-chicken Habitat Conservation Plan.

According to the HCP Handbook, HCPs with non-listed species, such as the LEPC, can provide early protection for the species and, ideally, prevent subsequent declines, which in some cases could prevent the need to list the species under the ESA (USFWS and NMFS 2016, pg. 1-2); however, this HCP does not predetermine the outcome of the USFWS' final listing determination. The USFWS' final decision on whether to list the LEPC under the ESA will be based upon an assessment of the current status of the species and threats to the species' continued existence range-wide, using the best available scientific and commercial data, in accordance with the factors set forth in Section 4(a) of the ESA.

1.3 Permit Structure

This HCP will operate under a Programmatic structure (see Section 3.4 of the HCP Handbook). There will be a single permit holder and a single plan under which multiple projects can be enrolled through a CI. The Applicant will serve as the Permit Holder and will hold the ITP. Individual oil and gas industry proponents (or associated project LLCs) interested in participating in the HCP and seeking take coverage under the ITP can enroll projects under the HCP and ITP via a CI. Coverage under the ITP will only apply to Covered Activities (Chapter 2) on and/or associated with enrolled projects in the HCP through execution of a CI in compliance with all elements of this HCP. The ITP provides assurances and coverage for anticipated incidental take associated with Covered Activities implemented under a CI. Companies or project LLC holding a CI for a project are referred throughout the remainder of this HCP as CI-holders.

The CIs will be assigned on a per-project basis, not on a collective (multiple project) basis, to an entity seeking Incidental Take authorization. As the Permit Holder, the Applicant will oversee HCP-related activities of CI-holders (USFWS and NMFS 2016, pg. 3-7) and collectively manage the requirements of the HCP, the ITP, and amendments thereto (Chapter 9) by also serving as the HCP Administrator (Section 9.1).

A CI-holder must agree to and abide by the obligations and responsibilities identified in the CI, this HCP, and the ITP. As long as CI-holders remain in compliance with the terms of their CI and this HCP, enrolled projects will be covered by the CI under the ITP until the ITP's expiration date, the date on which a CI-holder terminates the CI for an enrolled project, or the date at which the CI is terminated for non-compliance (Section 8.12), whichever comes first.

1.4 Permit Duration

This HCP is designed to meet the Biological Goals and Objectives described in Section 5.2. The Applicant considers this HCP a long-term conservation program that will strategically protect and restore LEPC habitat across the landscape to offset the impacts from projects enrolled in the HCP. In consideration of: 1) uncertainties inherent in the HCP; 2) the appropriate period of time to implement the HCP and maximize its contribution to the conservation of the LEPC; and 3) the need to ensure the costs and the effort of developing the HCP, obtaining the ITP, and implementing the HCP are spread over multiple years; the Applicant requests an ITP term of 30 years from the date the ITP is signed by the USFWS. This duration will ensure there will be sufficient time and funding to implement the conservation strategies defined in this HCP and make adjustments through adaptive management if needed (Section 5.5), in recognition that there are

uncertainties related to the location and timing of the Covered Activities, as well the likely additional needs for conservation to enhance the long-term survivability of the LEPC both within and beyond the Permit Area.

1.5 Permit Area and Plan Area

The lands addressed in this HCP include the Plan Area and the Permit Area. The HCP Plan Area includes the geographic area where both the Covered Activities, including conservation activities (Chapter 5), described in the HCP can occur (USFWS and NMFS 2016). The Permit Area is a subset of the Plan Area and includes all areas where take of the Covered Species is reasonably certain to occur as a result of Covered Activities and is authorized under the ITP. The specific areas within the Permit Area where take will be authorized is unknown at this time, and will depend on the location of projects enrolled under the HCP/ITP. For these reasons, the HCP Permit Area has been broadly defined to share the same outer boundary as Plan Area (Figure 3), but exclude the protected areas described below. This outer boundary is the same as that described as the "Service Areas for Mitigation Properties for the Lesser Prairie-Chicken" (Appendix A) as provided in the *Guidelines for the Establishment, Management, and Operation of Permanent Lesser Prairie-Chicken Mitigation Lands* (LEPC Mitigation Guidelines; USFWS 2014c). While the Plan and Permit Area encompass the entirety of current EOR and surrounding 10-mi buffer, LEPC are known to occur outside of the EOR and surrounding 10-mi buffer, and thus outside of the HCP Plan and Permit Area (C. Nichols, USFWS, pers. comm. April 2020). Projects with impacts to LEPC outside of the HCP Permit Area will need to seek alternative methods to ensure ESA compliance should the LEPC become federally listed in the future.

While the specific areas where take will be authorized and included in the Permit Area are not completely known at this time and will depend on the location of projects enrolled under the HCP, Covered Activities will not occur on lands used for mitigation under this HCP, or on certain other protected lands. The Permit Area will not include or overlap the following:

- lands designated under USFWS-approved mitigation banks, conservation plans, in-lieu fee programs, or permittee-responsible mitigation for any species;
- lands enrolled in any CCAA servicing the dunes sagebrush lizard (*Sceloporus arenicolus*);
- lands owned by The Nature Conservancy;
- lands owned and managed by a state wildlife agency;
- USFWS-approved acquisition lands;
- land that is listed on the National Register of Historic Places; and
- lands identified as US Geological Survey (USGS) Gap Analysis Program-protected conservation areas (Aycrigg et al. 2013).

Additional Permit Area exclusions could be added to the lands listed above; however, the exact location of such potential exclusions is unknown. It is expected that lands enrolled in the LPC PCBA as Bank Parcels and other USFWS-approved LEPC mitigation lands within the Plan Area

(see Section 5.3.3) will be acquired throughout the ITP term, but again, the exact location and extent of these lands is unknown. Specifically, the acquisition of Bank Parcels or other mitigation lands by mitigation providers during the ITP term is dependent on several factors, such as landowner agreement to enroll a parcel under a conservation banking agreement or existing parcel easements. In addition, mitigation providers can prioritize the pursuit of specific land parcels based on proximity to existing LEPC conservation lands or overall habitat characteristics, in order to provide the greatest aggregate conservation benefit to the LEPC.

1.6 Covered Species

The LEPC is the only species addressed in this HCP and therefore the only species covered under the associated ITP. The LEPC is described further in Chapter 3 of this HCP.

CI-holders must avoid or receive separate take authorization, as necessary for federally protected species that occur within their respective project area(s) in order to meet the issuance criteria for participation in this HCP. Failure to provide for ESA compliance for regulated species will result in a violation of ESA Section 9, and can result in suspension or revocation of CIs and the ITP issued in association with this HCP and the loss of assurances and incidental take coverage for LEPC (Section 8.12).

1.7 Regulatory Context

This HCP will provide CI-holders assurances that should the LEPC become listed during the ITP term, no additional land use restrictions or financial compensation will be required of them with respect to the Covered Species for projects with fully executed CIs and fully implemented mitigation, so long as CI-holders remain in compliance with the CI, this HCP, and the ITP.

The USFWS can only issue Permits to authorize incidental take resulting from activities that are otherwise lawful (ESA Section 10(a)(1)(B)); therefore, project proponents seeking coverage under this HCP, must comply with all applicable federal, state, and local statutes and regulations. All activities permitted through this HCP that occur on or impact any park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990 [1977]); floodplains (Executive Order 11988 [1977]); national monuments; and other ecologically significant or critical areas under federal ownership or jurisdiction will meet the requirements of the managing entities.

1.7.1 Incidental Take Permit Issuance Criteria Under the Endangered Species Act

Section 10(a)(1)(B) of the ESA provides that the Secretary of Interior must authorize a taking otherwise prohibited by ESA Section 9 if such taking is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity” and the applicant satisfies other criteria identified by the statute. To obtain incidental take authorization, the ITP applicant must submit an HCP that specifies:

1. The impact which will likely result from such taking;

2. Steps the applicant will take to monitor, minimize, and mitigate such impacts; the funding that will be available to implement such steps; and the procedures to be used to deal with unforeseen circumstances;
3. Alternative actions to such taking that the applicant considered and the reasons why such alternatives are not being utilized; and
4. Other measures that the Director of the USFWS may require as being necessary or appropriate for purposes of the HCP (50 CFR 17.22(b)(1) [1985]).

1.7.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) of 1940 and its implementing regulations (50 CFR Part 22 [1974]), provides protection to bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) such that it is unlawful to take an eagle unless authorized pursuant to regulations. In 2009, the USFWS published a final rule under the BGEPA that authorized limited issuance of permits to take bald eagles and golden eagles where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, and cannot practicably be avoided (74 FR 46836 [September 11, 2009]).

In 2016, the USFWS issued a final rule revising the 2009 Eagle Rule (81 FR 91494 [December 16, 2016]. In the 2016 Eagle Rule, the USFWS revised its interpretation of the BGEPA preservation standard to mean “consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units (EMU) and the persistence of local populations throughout the geographic range of each species” (81 FR 91494 [December 16, 2016]). The Applicant, through the CI-holder assignment process, will include a brief description of its planned BGEPA compliance approach (Appendix B).

1.7.3 National Historic Preservation Act

USFWS issuance of an ITP under ESA Section 10(a)(1)(B) is considered an "undertaking" covered by the Advisory Council on Historic Preservation and must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA; 16 USC 470, et seq. [1966]) and its implementing regulations, 36 CFR Part 800 (2000). Advisory Council on Historic Preservation regulations define an undertaking as a “project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval” (36 CFR §800.16(y)). In this context, the federal undertaking is the approval of an HCP and issuance of an ITP.

NHPA requires that the geographic area within which an undertaking occurs be evaluated for potential changes in the character or use of historic properties. Through the CI-holder assignment process, prospective CI-holders will self-certify that they have followed measures to comply with NHPA Section 106 (Appendix B).

1.8 Alternatives to the Taking

Section 10(a)(2(A)(iii) of the ESA requires that the Applicant describe "what alternative actions to the taking the applicant considered, and the reasons why such alternatives are not being utilized."

The only alternative to the proposed incidental taking considered by the HCP was for project proponents to avoid any actions that could reasonably result in take of LEPC within the species' range. Under this alternative, some oil and gas development would be curtailed within the range of the LEPC (to avoid take of the species) and therefore would not meet the needs of project proponents. Complete avoidance of LEPC habitat is not practical or feasible for most oil and gas industry activities within the Plan Area, therefore this alternative was not considered further.

2 COVERED ACTIVITIES

The Covered Activities for this HCP include all activities associated with oil and gas upstream and midstream buildout, including ancillary (e.g., access road) ground disturbing activities associated with these project types within the HCP Permit Area that could impact potentially suitable LEPC habitat. The ground disturbance related to construction and/or placement of infrastructure as part of a Covered Activity is assumed to permanently impact LEPC and their habitat due to the expected duration of that infrastructure on the landscape, unless otherwise noted. In addition, the Covered Activities include grassland improvement and management activities that could occur in potential LEPC habitat on mitigation parcels in order to manage the parcel for LEPC. Beyond initial construction of a project, further ground disturbing activities could occur during some types of repairs required during the operations and maintenance phase, project repowering, or project decommissioning, however, once initial ground-disturbing activities have occurred, additional changes to those same areas will have minimal impacts to LEPC. The Covered Activities are limited to an aggregate take of up to 500,000 ac (202,343 ha) of affected potentially suitable LEPC habitat within the Permit Area, as described in Section 4.3, to encompass 200,000 ac (80,937 ha) in the LEPC southern DPS and 300,000 ac (121,405 ha) in the northern DPS. Given the nature of oil and gas development, it is possible the total project footprint of some enrolled projects could extend beyond the boundary of the Permit Area. For such projects, this HCP and the associated ITP will only be applicable to lands located within the HCP Permit Area, and CI-holders will need to ensure ESA compliance for any lands occurring outside of the Permit Area through other means.

The following descriptions provide a general overview of the types of activities commonly associated with oil and gas development that can affect potentially suitable LEPC habitat, as well as grassland improvement and management activities that, while expected to result in a net benefit for LEPC, may have temporary adverse effects upon initial implementation, and for which incidental take coverage will be available through this HCP. Ground disturbing activities can vary among oil and gas developments due to variability in the size of facilities and site-specific conditions. In addition, as technologies evolve the timeframes, processes, and specific methods could change. Covered Activities typically associated with most oil and gas projects are categorized into "upstream", and "midstream", commonly used terms in the crude oil, natural gas,

and petroleum products industries; however, overlap between these categories exists and different federal agencies may define these categories differently from the definitions used in this HCP. Where available, typical area dimensions for project infrastructure are provided and based on commonly reported specifications; however, these values are intended for reference only and will likely vary between projects. New infrastructure placed on an existing infrastructure (e.g., adding well heads to an existing well pad) will be treated as a new project, with impacts and mitigation evaluated accordingly. Activities associated with grassland improvement and management that could potentially occur on HCP mitigation parcels and have temporary impacts to LEPC include:

- Fire management
- Erosion control
- Mechanical brush control
- Herbicide treatments
- Grazing management
- Range planting
- Forage harvest management
- Fence installation

2.1 Upstream Production

Upstream Production, as defined by this HCP, includes activities associated with the construction of infrastructure required to extract oil, natural gas, and other petroleum products, as well as the processes to extract those resources. Covered Activities associated with upstream production include:

- Construction of well field infrastructure, including
  - Well pads
  - Access roads
  - Electrical distribution lines
  - Off-site impoundments
  - Drilling, completion, and production activities
  - Gas flaring
  - Communication towers
- Operation, maintenance, and decommissioning of upstream wells, roads, and electrical distribution lines

2.1.1 Construction of Well Field Infrastructure

Areas determined to have recoverable crude oil or natural gas deposits are developed as well fields to initiate extraction of these resources. Well fields include facilities and infrastructure that support oil and gas production, and may include one or multiple well pads.

2.1.1.1 Well Pads

Well pads include all structures and equipment necessary for recovering crude oil or natural gas (production wells). A single well or multiple wells can be drilled on each pad. Well pads may also be necessary for obtaining water for oil and gas recovery (water wells) or disposal of fluids used in the oil and gas recovery following production (disposal wells). Primary facilities involved in well pad construction include the pad, drilling rig, pump or well head, and reserve pits for the containment of drilling muds and cuttings. The well pad also includes facilities such as storage tanks for extracted water and crude oil, fuel tanks, water tanks, mist pumps, mud pumps, flow lines, pipelines, and associated electrical equipment. The pad also houses structures such as the cellar (where the well's main borehole is drilled), drilling pipe storage areas (referred to as the rat and mouse holes), and various trenches and sumps (to collect liquids).

Typical well pad construction requires vegetation clearing, grading to level the site, construction of storm water and erosion control structures, laying shale, gravel, and/or rock over the well pad, and constructing reserve/cutting pits, trenches, sumps, a cellar, and the rat and mouse holes. Land clearing, grading, and construction are typically performed with a bulldozer or other heavy equipment and soil is typically excavated to a depth of approximately 6.0 inches (in; 15.2 centimeters [cm]) during routine well pad installation, but may vary based on site-specific conditions. Topsoil removed from the construction area is typically stored for use during site restoration. Vegetation debris piles are stored along the edges of the construction site and are typically buried in the reserve pit, burned, or left in place after drilling operations are completed.

Additional shale, gravel, and/or rock may be delivered to the construction site via dump trucks to aid in leveling the site and raise the pad above grade. In most cases, two reserve pits, approximately 75.0 by 75.0 feet (ft; 22.9 by 22.9 meters [m]) each and are a minimum of 8.0 ft (2.4 m) deep, are excavated using a bulldozer within the well pad site. Additional soil or fill may be hauled in for pit construction and/or clay may be hauled to the site to line the reserve pits. Once completed, additional gravel or rock is hauled in to cover the vehicular traffic areas and trailer areas associated with drilling operations. Once constructed, the majority of the pad site is a long-term installation (30−40 years for a productive well). Once a well is ready for production, reserve pits and slopes used for drilling purposes are restored with topsoil and revegetated. Standard erosion control measures are incorporated into each well pad site. The average production well pad is approximately 4.0 ac (1.6 ha) in size, not including associated electrical distribution lines, offsite impoundments, and access roads. The average water well pad is approximately 1.0 ac (0.4 ha) and an average disposal well pad is approximately 6.0 ac (2.4 ha).

2.1.1.2 Access Roads

Development of well fields relies on existing roadways or may require construction of new roads. Newly constructed roads are first cleared of vegetation with a bulldozer and leveled with a road grader. Shale/rock/gravel is used to stabilize the length of the road. It is estimated approximately 80% of newly constructed roads remain in permanent use, and 20% are used only temporarily (existing for less than five years) and are restored to natural conditions. Roads are designed to meet rigorous state standards to control erosion and sedimentation and specifications may vary between different oil and gas companies. Road length can vary significantly; however, the average road length per well pad is 300.0 ft (91.4 m). Rights-of-way (ROW) for access roads average 25.0 ft (7.6 m) in total width for permanent roads and 15.0 ft (4.6 m) for temporary roads. Roads require periodic maintenance to correct washouts or other deterioration. Where necessary, culverts and ditches may be installed to facilitate drainage away from the road.

2.1.1.3 Electrical Distribution Lines

Each well pad has its own electrical distribution line unless a generator provides power. Vegetation clearing and grading along the electric transmission ROW are typically necessary prior to installation. The length of electric distribution line necessary at each facility is determined by the location and distance to the nearest existing active line and is, on average, 300.0 ft in length. ROWs average 30.0 ft (9.1 m) in width. Distribution lines are typically suspended 30.0 ft above grade and are typically constructed above-ground, with 18.0-in (45.7-cm) diameter poles approximately every 75.0–80.0 ft (22.9–24.4 m). Electrical distribution lines and poles are needed throughout the life of the well. Less often, electrical distribution lines may be buried to meet the needs of the project design. If distribution lines are buried below-ground, trenching is accomplished with back-hoes, track-hoes, or similar other ditching equipment. Excavated soil is placed to one side of the trench in a spoil pile. After the trench is excavated, the electric line is then strung in the open trench and the excavated trench is backfilled with the previously removed soil.

2.1.1.4 Off-Site Impoundments

Construction of an impoundment outside of the existing well pad is sometimes necessary to maintain a water source for hydraulic fracturing operations. Hydraulic fracturing is a well stimulation process used to maximize the extraction of crude oil and natural gas by injecting fluids into the geologic formation. Excavating equipment is used to construct impoundments and fill from the pit is stockpiled along its edge. Impoundments are lined with an impermeable liner to prevent leaks, breakage, or discharge of impounded materials into ground or surface water. Water is then pumped into the impoundment. Less than 1% of well pads require off-site impoundments. The average size of such impoundments is 2.5 ac (1.0 ha) and the structure typically remains permanent after project completion.

2.1.1.5 Drilling, Completion, and Production Activities

Following construction of access roads and well pads, drilling rigs and associated equipment are transported to the well pad and installed. Drilling rigs are typically 140.0−180.0 ft (42.7−54.9 m) in height. All drilling activities occur within the previously disturbed (cleared and graded) well pad.

After drilling is completed, the rig is removed and hydraulic fracturing equipment may be brought onto the well pad to facilitate production. All activities associated with drilling and well completion occurs on previously disturbed areas. Drilling rigs typically include multiple sources of light. After drilling and completion, typically 35% of the well pad is re-vegetated. The remaining 65% is typically maintained as a well pad for 30−40 years.

2.1.1.6 Gas Flaring

Some operations may produce natural gas as a byproduct of other operations at rates that are not economically feasible to collect for sale. In some locations, no pipeline infrastructure is available to transport natural gas off-site. If no other use for the gas is found, such gas may be flared (burned in the air) for disposal over a three to six day initial period during drilling and production. This gas passes through a vent away from the well and is burned in the presence of a pilot flame. Additionally, smaller flares may be associated with tanks at production sites. These smaller flares may be burning constantly throughout the production process.

2.1.1.7 Communication Towers

Communication towers may be required at some facilities, are usually constructed within the permanent footprint of the well pad, and typically range from 10.0– 200.0 ft (3.0–61.0 m) in height. Under the HCP, communication towers must be under 200.0 ft in height, shall not use any guy wires, and shall not use lighting, unless required by the Federal Aviation Administration (FAA). Communication towers that exceed 200.0 ft in height or require guy wires are not eligible for inclusion under this HCP and will require CI-holders to seek ESA compliance through other means. Towers exceeding 200.0 ft in height typically have Federal oversight through the FAA or Federal Communications Commission (FCC).

2.1.2 Operation, Maintenance, and Decommissioning of Upstream Wells, Roads, and Electrical Distribution Lines

Operation and maintenance activities may be routine (i.e., planned upgrades to equipment) or emergency (i.e., unplanned repairs). While well operation and maintenance activities typically occur within the existing well pad, erosion affecting adjoining property may require disturbance outside of the existing well pad to repair and install additional erosion control features. Wells for which commercial life is over, or unsuccessful wells, will be decommissioned and plugged according to state regulations that protect groundwater, surface water bodies, and soil. Decommissioning of wells typically involves removing the permanent structures and restoring the area of the well pad to its original condition.

Operation and maintenance of permanent access roads includes adding additional surface material (i.e., gravel, dirt) to the road and maintaining bar ditches. Roads will require periodic maintenance to correct washouts or deterioration. To minimize dust, water may be applied to roads. All additional disturbances would occur within previously disturbed areas.

If a road is no longer needed, surface material would be removed and native vegetation is typically restored by seeding. Temporary roads may be restored with native vegetation following construction and would not require any operation and maintenance activities.

Operation and maintenance of electric distribution lines may include pole replacement and repairing above-ground lines. Most repairs require less than one ac of disturbance, typically about 50.0 square ft (4.6 square m). Electric distribution line ROWs are kept clear of trees and brush to provide for line maintenance. Vegetation is typically maintained with mowing equipment (e.g., tractor, brush hog) or herbicide application (by applicators on foot or all-terrain vehicles) once every one to three years. Decommissioning of above ground electric distribution lines may involve removal of poles and distribution lines for above-ground lines. Buried electric lines would likely be left in place once disconnected from power sources.

2.2 Midstream Development

Midstream development, as defined in this HCP, includes gathering, processing and treatment, transmission, and distribution of crude oil, natural gas, or other petroleum products. Midstream activities begin at the gathering lines that connect wells with the pipelines, processing facilities, compressor stations, and related infrastructure necessary to prepare natural gas and oil for market. Gathering lines terminate at a processing plant, from which a transmission line departs to serve various markets, where consumers are served by distribution lines. Another aspect of midstream activities is the processing and transport of natural gas liquids (NGLs) derived from condensate. These are hydrocarbons in the same family of molecules as natural gas and oil, including ethane, propane, butane, isobutene, and pentane (US Energy Information Agency [USEIA] 2012). NGLs require their own pipelines to reach market.

Extracted gas goes through an initial separation process at the well pad in which water and condensate are separated from the gas. The condensate is stored in tanks and is then hauled by truck or transported via pipeline to processing facilities. The gas that leaves the well pad in gathering lines is raw gas and requires further processing to remove hydrogen sulfide, water, mercury, nitrogen, and NGLs before it enters transmission pipelines to be piped to market.

Covered Activities associated with midstream development include the following:

- Construction of gathering, transmission, and distribution pipelines
- Construction of associated surface facilities, including
    - Access roads
    - Booster, compressor, and pump stations
    - Meter stations, mainline valves, pig (a device used to clean and/or inspect pipelines) launchers and receivers (locations where pigs are inserted into or removed from a pipeline), regulator facilities, and other required facilities
    - Natural gas processing and treatment facilities
    - Communication towers
    - Electric distribution lines
    - Electric substations

- Operation and maintenance of pipeline and associated surface facilities
- Decommissioning and reclamation of pipeline and associated surface facilities

2.2.1 Construction of Gathering, Transmission, and Distribution Pipelines

Pipelines located within the boundaries of well pads are included in upstream production, while gathering, transmission, and distribution pipelines are considered midstream development. Oil and gas pipeline construction involves land clearing activity where ROWs are cleared and graded. Pipeline construction ROWs are typically divided into four areas of activity: trenching, spoil piles (excavated materials consisting of topsoil or sub-soils that have been removed and temporarily stored during the construction activity), pipeline assembly, and vehicle traffic areas. Clearing and installation of the pipeline typically requires the use of heavy equipment. The types of equipment used during construction may include track-hoes, bulldozers, side booms, bending machines, ditching machines, boring machines, and, in some cases, hydraulic directional drilling rigs. Pipe hauling and welding trucks, as well as miscellaneous smaller vehicles, are also used on most projects.

Pipeline ROW widths are determined by the pipeline diameter and material, as well as terrain and site-specific conditions. Trench widths are determined by the pipeline diameters (e.g., typically the diameter of the pipe plus 6.0−12.0 in [15.2−30.5 cm] clearance between the pipe and the trench wall) and pipeline burial depths (e.g., deeper trenches usually dictate greater trench widths to address sidewall instability and worker safety). Pipeline construction ROWs also vary based on the type of pipeline. Gathering pipeline ROWs (the smaller interconnected pipeline networks that bring crude oil or natural gas from wells to treatment plants or processing facilities) average 50.0 ft (15.2 m) in width. Transmission pipeline (longer pipes with larger diameters that move oil and gas from processing facilities to market) typically have construction ROWs of 75.0−150.0 ft (22.9−45.7 m) depending on pipe sizes. Distribution pipelines (pipelines used to take products to the final consumer, including feeder lines) typically consist of small diameter, pipelines with construction ROWs of 10.0−50.0 ft.

Typical pipeline construction proceeds along the ROW in one continuous operation. Prior to initiating ground-disturbing activities, existing underground utilities (i.e., cables, conduits, and pipelines) must be located, identified, and flagged to prevent accidental damage during pipeline construction. Project areas are cleared of vegetation and large obstacles, such as trees, rocks, brush, and logs. Timber is only removed where necessary for construction purposes. Timber and other debris are burned or disposed of in accordance with applicable regulations.

Following clearing, the construction workspace is graded where necessary to allow safe passage of equipment. Temporary erosion and sediment controls are installed after initial disturbance of the soils, in accordance with local, state, and federal regulations. Also during grading, topsoil may be stripped from the area overlying the pipeline trench and spoil piled in the ROW. The topsoil is stockpiled separately from the subsoil. The segregated topsoil is typically restored to its original location immediately following installation of the pipe and backfill of the trench to reduce erosion and preserve native seed stock.

Trenching may be accomplished with back-hoes, track-hoes, or similar other ditching equipment. Excavated soil is placed to one side of the trench in a spoil pile. After a trench is excavated and pipeline assembled, the pipe is laid in the open trench using a side boom. The excavated trench is backfilled with the previously removed soil.

After backfilling the trench, work areas are graded and restored as closely as possible to preconstruction contours, and previously segregated topsoil is spread across the construction ROW. Surplus construction material and debris is removed, and, typically, vegetation is reestablished (usually through seeding). To minimize future settling, the trench may be compacted with tracked construction equipment or left crowned. Permanent erosion controls are installed within the ROW as needed during the restoration phase.

Horizontal directional drilling (HDD) may be used to install pipeline beneath roads, railroad crossings, water crossings, or in other sensitive areas. This method generally requires excavation of a pit on either side of the feature, the placement of boring equipment in the pit, and boring underneath the feature. This is a trenchless crossing method, and, while costly, it is becoming more common as a measure to avoid impacts to above ground features. In HDD, a small-diameter pilot hole is drilled under the aboveground feature, aided by a surface monitoring system that tracks the location of the drill bit. The hole is enlarged to more than 12 in wider than the pipeline to be installed. Finally, the pipeline is pulled through the HDD hole. Similar to trenching, once the pipeline is installed, the excavated pits are backfilled with the previously removed soil, surplus construction material and debris is removed, vegetation is typically reestablished.

For pipelines that must cross a stream or other body of water, an open-cut, dry-ditch method may be used in place of HDD. This method diverts a stream or body of water around a work area using cofferdams. In high-flow streams, one or more flume pipes are used, with stream flow propelling water through the flumes. In low-flow streams, stream flow is diverted around the work area using pumps and hoses. This provides a dry work zone to dig the trench, lay pipe, backfill, and stabilize the substrate. In small streams, a wet-ditch method may be used, whereby a trench is excavated without cofferdams and water diversion.

Contractor yards and pipe storage areas are generally located in existing commercial/industrial sites or other previously disturbed areas, but may require land clearing in areas with native vegetation. In addition, extra work space (i.e., areas needed for equipment storage and trenching) is sometimes required at stream, wetland, railroad, road, and other pipeline crossings due to extra safety and environmental precautions often taken in these areas.

2.2.2 Construction of Associated Surface Facilities

Surface facilities associated with crude oil, natural gas, and petroleum product pipelines may include access roads, booster stations, pump stations, compressor stations, valve sites, meter stations, pig launchers and receivers, processing/treatment plants, communication towers, electric distribution lines and other utilities, electric substations, and others. The number, type, and size of facilities required for each pipeline varies depending on the size of the pipeline, product

being transported, topography of the area, existing infrastructure in the area, and needs of the project proponents.

2.2.2.1 Access Roads

Construction of access roads may be necessary to reach pipelines and/or associated facilities if existing roads are not available. Some of these access roads may be reclaimed following construction; however, others remain for operation and maintenance of the pipeline and associated facilities. Roads typically range in widths from 15−30 ft, with an average length of 0.25 miles (mi; 0.40 kilometers [km]), depending on the location and necessary use. In addition, roads are expected to require periodic maintenance to correct washouts or other deterioration. Where necessary, culverts and ditches may be installed to facilitate drainage away from the road.

2.2.2.2 Booster, Compressor, and Pump Stations

Booster, compressor and/or pump stations are generally required at intervals between 25 and 100 mi (between 40 and 161 km) along a pipeline to maintain or increase internal pressures and keep the flow of oil or gas moving through the pipeline at an appropriate rate. The location of these stations is typically determined by topography, the type of product being transported, and system hydraulic requirements. Compressor, booster, and pump stations are usually built within or adjacent to the pipeline ROW. Additional clearing and grading may be required at these facilities during construction. Office, control, utility, storage, and maintenance buildings and parking areas, may be associated with these facilities. These associated facilities typically range in size from approximately 0.10 to over 5.00 ac (0.04 to over 2.02 ha). Compressor and pump station facilities generally incorporate gravel or other hardened surfaces, lighting, and perimeter fencing.

2.2.2.3 Meter Stations, Mainline Valves, Pig Launchers and Receivers, Regulator Facilities, and Other Required Facilities

Connections between large transmission pipelines and smaller pipelines require meter/regulator stations to control the metering and flow control. Mainline valves are installed along transmission pipelines to enable portions of the pipeline to be shut down or isolated, if necessary. Pig launcher/receiver facilities are usually installed at locations of other aboveground facilities such as compressor stations or meter stations, but these facilities may also be required at points of pipeline diameter change or to accommodate the maximum practical distance that can be recorded by a pig during internal inspections. Regulators, which control the pressure of sections of pipeline, are associated surface facilities for natural gas distribution pipelines. Gas flaring may be associated with tanks at surface facilities. Each meter station, mainline valve site, pig launcher/receiver, and regulator facility may be surrounded by security fencing. Other appurtenances include miscellaneous facilities such as filter/separators, miscellaneous valves, sumps, tanks, yard piping, pipeline markers, cathodic protection system (a method of protection for iron and steel against electrochemical corrosion) components, offices, storage buildings, and sheds. These are often associated with other surface facilities like compressor stations, but some, such as pipeline markers, may be located independently on pipeline ROWs.

2.2.2.4 Natural Gas Processing and Treatment Facilities

Additional processing or treatment facilities may be required to process natural gas before it can be transported. Relatively few natural gas processing facilities are necessary, as gathering systems may interconnect more than 100 wells to a processing facility. These facilities generally range in size from approximately 5.0−30.0 ac (2.0−12.1 ha). Processing facilities generally include hardened surfaces, lighting, and perimeter fencing.

2.2.2.5 Communication Towers

Communication towers may be required at some of the associated surface facilities, are usually constructed within the permanent footprint of the facility, and typically range from 10–200 ft height. Under the HCP, communication towers must be under 200 ft in height, shall not use any guy wires, and not use lighting, unless required by the FAA. Communication towers that exceed 200 ft in height or require guy wires are not eligible for inclusion under this HCP and will require CI-holders to seek ESA compliance through other means. Project proponents with these towers should seek consultation with the Oklahoma Ecological Services Field Office to address potential impacts to listed species through a separate permitting process. Towers exceeding 200 ft in height typically have federal oversight through the FAA or FCC.

2.2.2.6 Electric Distribution Lines

Electric distribution lines and other utilities are often constructed to serve facilities that need a source of electricity, such as compressor and pump stations, valve sites, and processing plants. Vegetation clearing and potentially grading along the electric distribution ROW are typically necessary prior to installation. The length of electric distribution line necessary is determined by the location and distance to the nearest substation. Distribution lines are usually between 0.5 mi (0.8 km) and 5.0 mi (8.0 km) in length. If distribution lines are buried below-ground, trenching is accomplished with back-hoes, track- hoes, or similar other ditching equipment. Excavated soil is placed to one side of the trench in a spoil pile. After the trench is excavated, the electric line is then strung in the open trench. The excavated trench is backfilled with the previously removed soil. If above-ground, distribution lines are approximately 18.0–40.0 ft (5.5–12.2 m) high, depending on the voltage required. Poles are usually constructed every 75.0–80.0 ft. The typical permanent ROW is approximately 20.0-ft (6.1-m) wide. Electrical distribution lines and poles are needed throughout the life of the well pad and are considered permanent structures; however, ROWs associated with these lines may be maintained as native vegetation.

2.2.2.7 Electric Substations

Electric substations may be associated with electric distribution lines. These substations generally require approximately 2.0−5.0 ac (0.8−2.0 ha) of disturbance. Electric substations are usually located off a county road, but occasionally require an access road built to the site. Electric substations are typically surrounded by fencing. When constructed in association with an associated facility, the substation may be constructed on the same facility site within an easement granted to the electric service provider.

2.2.3 Operation and Maintenance of Pipeline and Associated Surface Facilities

Operation and maintenance activities may be routine (i.e., planned upgrades to equipment) or emergency (i.e., unplanned repairs). Pipelines may require maintenance for a number of reasons including corrosion, correction of manufacturing and component defects, weld failures, stress caused by flooding, land movement (landslide and erosion) that may occur particularly in steep and variable terrain (sometimes referred to as “slips”), and excavation damage. During the operation and maintenance phase of midstream development, visual inspections are performed in accordance with State Department of Transportation regulations and pipeline operator procedures. Personnel may carry out such inspections on foot, in all-terrain vehicles, or aerially. Pipeline integrity is checked throughout the pipeline’s lifespan, sometimes requiring soil disturbance. Digging to, exposing, and, in some instances, replacing pipeline, may be necessary based on inspection results.

Operators typically minimize the need for corrective maintenance by implementing quality control and rigorous inspection and testing. Pipelines are inspected regularly using devices called pigs that travel from launching sites to receiving stations installed along the pipeline. The gas or liquid pressure within the pipeline propels the pig along. “Smart pigs” inspect for leaks, while other types of pigs are specially designed to clean the pipeline.

The permanent ROWs of larger transmission pipeline, some gathering lines, and the electric distribution lines are kept permanently clear of trees and brush to allow future maintenance and inspections. Vegetation maintenance is typically done by large mowing equipment (e.g., tractor, brush hog) or herbicide application, by foot or all-terrain vehicles, once every one to three years.

Gas flaring may be used at associated surface facilities and pipelines. Smaller gas flares may be burning constantly throughout the life of the project, while others may be short-term (20−30 minute intervals) that are used as control of pressure for emergency releases.

Operation and maintenance of permanent access roads includes adding additional surface material (i.e., gravel, dirt) to the road and maintaining bar ditches. Disturbances are expected to occur within previously disturbed areas. Roads will require periodic maintenance to correct washouts or deterioration. To minimize dust, water may be applied to roads.

Operation and maintenance of electric distribution lines may include pole replacement for above-ground lines. Repair of buried lines may require soil disturbance to locate problems. These repairs typically rely on existing roads. Most repairs require less than one ac of disturbance, typically about 50 square ft.

2.2.4 Decommissioning and Reclamation of Pipeline and Associated Surface Facilities

Decommissioning a pipeline and associated facilities occurs when the pipeline or facility is no longer functional or necessary. Such facilities are typically removed and the area may be restored to native vegetation conditions. Decommissioned pipelines are either dismantled and removed or left in place. Leaving pipe in the ground protects nearby pipelines from excavation damage, maintains soil stability, and minimizes soil disturbance. Pipelines left in place are capped and

grouted at locations of road/railroad crossings, which requires minor soil disturbance at the locations of the capping. Removing pipelines involves excavating to expose the pipeline, cutting and removing the pipe, and backfilling and reclaiming the area.

If an access road is no longer needed, surface material would be removed and native vegetation is typically restored by seeding. Decommissioning of above ground electric distribution lines involves removal of poles and distribution lines. Buried electric lines would likely be left in place following disconnection from power sources.

2.3 Grassland Improvement and Management

Activities that can impact potentially suitable LEPC habitat could occur on mitigation parcels during improvement and management activities to enhance or maintain habitat for LEPC. These activities, while intended to ultimately result in a net benefit to LEPC in the long-term, may initially have temporary impacts, as described below.

2.3.1 Fire Management

Benefits of fire to grassland ecosystems are well-documented. Fire can reduce the density of unwanted woody vegetation and brush, slow the spread of woody vegetation, and increase grass and forb production, among other uses. As such, fire management activities could be implemented on some HCP mitigation parcels to improve habitat conditions for LEPC. Areas burned during fire management activities could temporarily become inaccessible or unsuitable for LEPC until the targeted grass and forb species regrow, or could injure, kill, or destroy LEPC nests if present in the immediate vicinity of fire management activities. Ultimately, fire management activities are expected to benefit LEPC in the long-term by improving overall habitat quality, however short-term impacts could occur initially.

2.3.2 Erosion Control

Erosion control could be used on some HCP mitigation parcels to maintain or improve LEPC habitat conditions. Within grassland habitat, erosion control generally consists of planting native grasses and forbs to increase ground cover. On parcels with surface water resources, other erosion control measures to protect those features (e.g., dams, gabions, bank stabilization structures) could be necessary. While erosion control measures would be implemented to maintain or improve LEPC habitat, vehicles and equipment used during site preparation and seeding (or structure installation for the protection of water resources) could injure, kill, or destroy LEPC nests if present in the immediate vicinity of erosion control activities. In addition, increased noise and human presence could displace LEPC (if present on site) temporarily from the area.

2.3.3 Mechanical Brush Control

Mechanical brush control is another method for removing woody vegetation from grasslands, but can be more costly on a per-acre basis than fire management because of the required equipment, and is typically reserved for use in relatively small areas. Various types of equipment can be used to mechanically remove brush or woody species by bulldozing, chaining, roller-chopping, or grubbing unwanted vegetation. Noise and increased human presence associated with these activities could temporarily displace LEPC in the general vicinity of activities from otherwise

suitable habitat. In addition, the machinery used could injure, kill, or destroy LEPC nests (if present) in the immediate area where mechanical brush control is implemented.

2.3.4 Herbicide Treatment

Herbicide treatments could be used on some HCP mitigation parcels to control mesquite (*Prosopis* spp.), other woody vegetation, or reduce shinnery oak (*Quercus havardii*) canopy cover in order to improve LEPC habitat conditions. Herbicide applications on mitigation parcels will be consistent with the USFWS LEPC Mitigation Guidelines (USFWS 2014c). Various types of equipment ranging from hand applicators to small broadcast spreaders could be used depending on the extent of vegetation to be controlled. Noise and increased human presence associated with these activities could temporarily displace LEPC in the general vicinity of activities from otherwise suitable habitat. In addition, if methods other than hand application is implemented, the machinery used could injure, kill, or destroy LEPC nests (if present) in the immediate area where an herbicide treatment is being applied.

2.3.5 Grazing Management

Livestock grazing could be implemented on some HCP mitigation parcels as a means to manage the vegetation composition of the parcel and maintain health grasslands. Livestock allowed to graze on mitigation parcels are unlikely to disturb adult LEPC, but could damage or destroy LEPC nests (if present) by trampling them. LEPC nests could also be trampled when livestock are herded and moved between grazing areas. In addition, increased human presence associated with the management of livestock (e.g., stock tank and feeder maintenance, herding livestock between pastures, and monitoring) could temporarily displace LEPC in the general vicinity of activities from otherwise suitable habitat.

2.3.6 Range Planting

Range planting could be used on some HCP mitigation parcels to restore or enhance LEPC habitat. Various types of equipment can be used to plant native vegetation ranging from hand-held tools to heavy machinery. The machinery used could injure, kill, or destroy LEPC nests (if present) in the immediate area where planting is implemented. Noise and increased human presence associated with these activities could also temporarily displace LEPC in the general vicinity of activities from otherwise suitable habitat. Any range planting will be conducted using native vegetation.

2.3.7 Forage Harvest Management

Forest harvest management could be used on some HCP mitigation parcels to maintain LEPC habitat by removing forage at a particular time of year to promote vigorous plant regrowth, increase soil nutrient uptake, and control insects, weeds or diseased plants. Various types of equipment can be used to mechanically remove forage by bulldozing, chaining, roller-chopping, or grubbing targeted vegetation. Noise and increased human presence associated with these activities could temporarily displace LEPC in the general vicinity of activities from otherwise suitable habitat. In addition, the machinery used could injure, kill, or destroy LEPC nests (if present) in the immediate area where forage harvest management is implemented.

2.3.8 Fence Installation

New fencing could be installed on or around some HCP mitigation parcels to facilitate grazing management to improve LEPC habitat, or to secure parcels from unintended anthropogenic activities (i.e., trespassing). LEPC collisions with fences have not been observed directly, but are suspected based on mortality studies conducted along fence lines (Robinson et al. 2016, see Section 3.6.5).

3 ECOLOGY OF THE COVERED SPECIES

The LEPC is the only Covered Species addressed in this HCP. This chapter provides a concise review of pertinent information on the species, including a species description, status and occurrence, life history, habitat requirements, population trends, and threats.

3.1 Species Description

Hagen and Giesen (2005) describe the LEPC as a medium-sized grouse with a total body length of 15−16 in (38−41 cm). Plumage is generally similar for both sexes throughout the year, with alternating dark (brown) and light (buffy white) bands. The chin and throat are largely unmarked, and the tail is short, rounded, and brownish black. During courtship, males exhibit bright yellow eye-combs above the eye and dull red esophageal “air sacs” on the sides of the neck. Males also have a tuft of elongated feathers (pinnae) on each side of the neck that they hold erect during courtship displays. The pinnae in females are shorter. Immature birds are similar in appearance to adults. The weight of male LEPC averages 1.65 pounds (lbs; 0.75 kilograms [kg]), while that of females’ averages 1.57 lbs (0.71 kg; Robb and Schroeder 2005). The LEPC is similar in appearance to the greater prairie-chicken (GPCH; *Tympanuchus cupido*), which occurs primarily to the east of the LEPC range. Hybridization has been recorded where their ranges overlap.

3.2 Species Status and Occurrence

As described in Section 1.2 (Purpose and Need), on June 1, 2021 the USFWS published a proposed rule to list two distinct population segments (DPS) of the LEPC under the ESA (86 Federal Register (FR) 29432 [June 1, 2021]). The proposed rule includes listing the northern DPS as threatened, with a 4(d) rule, and the southern DPS as endangered (Figure 4).

The LEPC currently inhabits sand sagebrush (*Artemisia filifolia*), sand shinnery oak, and mixed grass vegetation communities within the southern Great Plains in portions of Colorado, Kansas, New Mexico, Oklahoma, and Texas (USFWS 2013, Van Pelt et al. 2013). The species’ current potential usable area is estimated at about 13,738,509 ac (5,559,777 ha), including 11,112,204 ac (4,496,949 ha) in the northern DPS and 2,626,305 (1,062,827 ha) in the southern DPS (86 FR 29432). Historical range estimates vary from about 64 to 115 million ac (26 to 47 million ha; USFWS 2021), but it is presumed that areas were not evenly occupied by LEPC and some areas may not have been suitable to regularly support LEPC populations (Boal and Haukos 2016). The estimated extent of reduction in the species’ range varies from greater than 90% reduction (Hagen and Giesen 2005) to approximately 83% reduction (Van Pelt et al. 2013). The causes for this reduction in range are primarily attributed to habitat loss, fragmentation, and degradation (USFWS

2014a, USFWS 2021). The USFWS (2021) summarized the primary habitat loss, fragmentation, and degradation factors as conversion of habitat to cropland; woody vegetation encroachment; petroleum production; wind energy development, transmission lines; and the installation of roads. Habitat loss and fragmentation, as well as other threats to the LEPC, are described in Section 3.6.

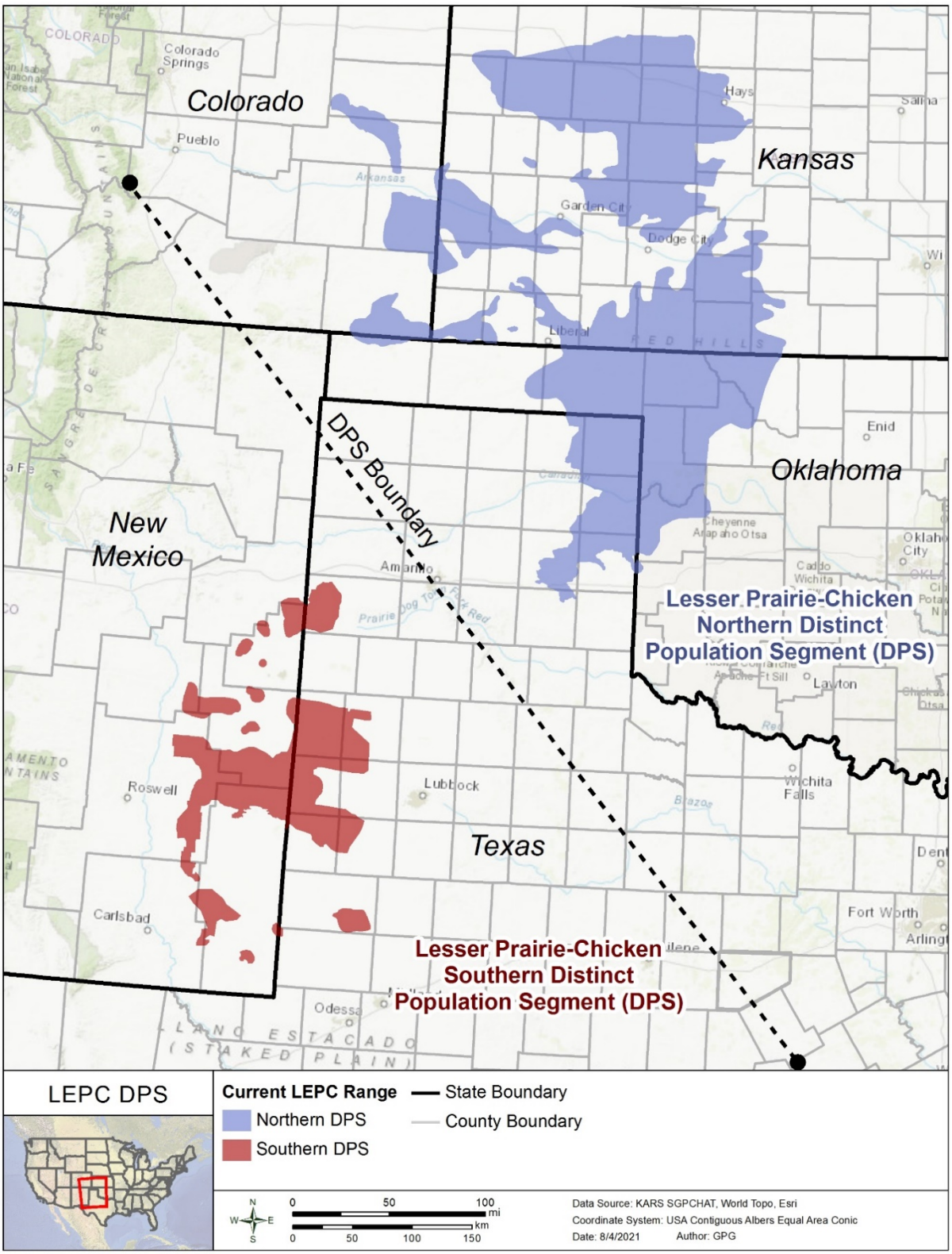

Figure 4. Lesser prairie-chicken (LEPC) distinct population segments (DPS) delineated in the US Fish and Wildlife Service's proposed rule to list the LEPC under the Endangered Species Act (86 Federal Register FR 29432 [June 1, 2021]).

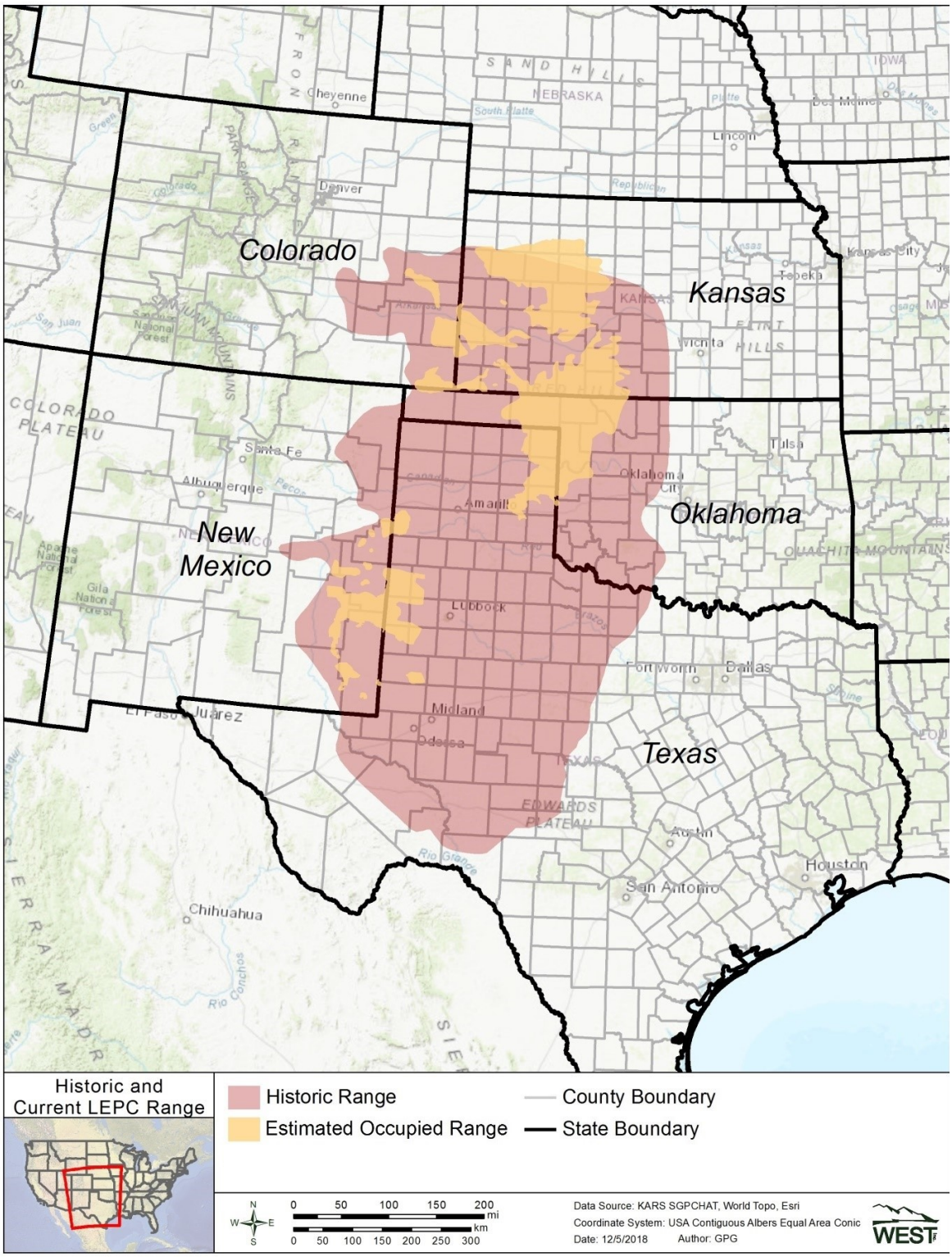

Figure 5. Historic and estimated current range of lesser prairie-chicken (LEPC; Thacker and Twidwell 2014).

3.3 Life History and Demographics

This section provides a summary of the life history and known demographic characteristics of the LEPC. For a more detailed description, please see Haukos and Boal (2016).

During the breeding season (generally mid-March through May), male LEPC congregate on lek sites (communal display grounds) and perform courtship displays to attract females for mating. Yearling males attend leks, but older males secure the majority of mating opportunities (Hagen and Giesen 2005). Males generally display during the first few hours of daylight. Displays involve some combination of erected feathers, exposed bare skin of bright colors, a dance, and bubbling or clucking vocalizations.

LEPC have relatively high fidelity to lek sites, with males primarily using established leks year after year, and females tending to select these traditional leks rather than newer or temporary leks (Haukos and Smith 1989). The number of males on leks and/or the density of leks are often used to evaluate population status (Hagen and Giesen 2005).

Females begin to breed the year after hatching and raise only one successful brood per season (Hagen and Giesen 2005). Nest initiation occurs from mid-April through late May, typically within two weeks of lek attendance and copulation (Bent 1932, Copelin 1963, Snyder 1967, Merchant 1982, Haukos 1988, Behney et al. 2010). Clutches size is commonly 10–12 eggs, but reduced for re-nesting females (Hagen and Giesen 2005). Hatching peaks in late May through mid-June throughout the range (Copelin 1963, Merchant 1982). If the first clutch is lost as a result of predation or abandonment, females can attempt to nest again, with chicks hatching mid-June through early July (Merchant 1982, see Pitman et al. 2006, Haukos and Boal 2016). Hatching success for the first clutch averages greater than 90% (Copelin 1963, Merchant 1982, Pitman 2003), but droughts and hot, dry weather can negatively affect hatching success (Merchant 1982). After hatching, chicks are brooded by the female until about mid-July (Van Pelt et al. 2013). Average brood size reported in various studies range from 3.5 to 7.8 (Hagen and Giesen 2020). The critical reproduction period for LEPC range-wide is from March 1 – July 15, with some latitudinal variation (Van Pelt et al. 2013).

Nest success and survival of chicks to the first breeding season has been identified as a key parameter affecting LEPC population growth rates (Hagen et al. 2009). Cooler spring temperatures and increased precipitation could enhance nest survival by increasing food and cover for LEPC (Grisham et al. 2013). Annual survival also affects LEPC population growth rates. Annual survival rates varies based on sex, age, season, and habitat type which ranges from 0.30 in New Mexico (Campbell 1972) and Kansas (Hagen et al. 2007) to 0.60 in Kansas (Hagen et al. 2005a; see Table 6.1 in Haukos and Zavaleta 2016).

LEPC are not known to migrate (Hagen and Giesen 2005); rather, in autumn and winter, the birds assemble in mixed-gender flocks. Therefore, LEPC annual habitat needs include breeding habitat, nesting habitat, brood-rearing habitat, and autumn/winter habitat all located relatively close to one another. Each of these habitat types have different vegetation compositions, which are described in Section 3.4.

3.4 Habitat Characteristics

LEPC are a landscape level species that use various habitats types to satisfy particular life requirements. LEPC use of habitats follow's Johnson (1980) order of habitat selection where the first order of selection is the extent of potentially available habitat within their range. The range of the LEPC is divided into four regions based on the dominant type of vegetation used by the birds in each region. These include: Shinnery Oak Prairie, Sand Sagebrush Prairie, Mixed Grass Prairie, and Shortgrass/Conservation Reserve Program (CRP) Mosaic (Figure 6). Within each of these regions, LEPC select areas to place their home ranges (e.g., second order of selection [Johnson 1980]). The extent of these home ranges incorporates the use of different habitats during various seasons; however, in general the species requires relatively large parcels of intact native grassland and shrubland, and it has been speculated at least 25,000 ac of contiguous high-quality habitat may be required to maintain self-sustaining populations (Bidwell 2002). Van Pelt et al. (2013) summarized research with a range of purposes and state that the minimum habitat patch size to support LEPC is not clear, but mention several studies that have speculated habitat mosaics ranging from 1,200–25,000 ac (486–10,118 ha) of continuous native rangelands could be capable of sustaining a viable population. More specifically in Kansas, 19,407 acres of habitat that contained 77% grassland were more likely to be used by LEPC than areas with less grassland (Sullins et al. 2019).

The habitats that LEPC select within individual home ranges (e.g., third order [Johnson 1980]) varies based on seasons and regions. Preferred habitat for the LEPC includes native short- and mixed-grass prairies with a shrub component dominated by sand sagebrush or shinnery oak (Taylor and Guthery 1980a, USFWS 2010) to provide summer shade, winter protection, and supplemental food (USFWS 2010). The absence of trees and other relatively tall woody vegetation is characteristic of these grassland ecosystems, with the exception of areas along watercourses (USFWS 201, Lautenbach et al. 2017). Habitats are characterized by grasses of short to medium stature, particularly sand bluestem (*Andropogon hallii*), little bluestem (*Schizachyrium scoparium*), buffalo grass (*Buchloe dactyloides*), various dropseeds (*Sporobolus* spp.), and various gramas (*Bouteloua* spp.).

At the site-specific scale or fourth order of selection (Johnson 1980), LEPC use of habitats is specific to the species' life history needs. Van Pelt et al. (2013) divided LEPC habitat into four components necessary to fulfill the species' life history needs. These components include leks (breeding habitat), nesting habitat, brood habitat, and autumn/winter habitat, which occur in close proximity to one another. Van Pelt et al. (2013) describe the following summaries of habitat components required by LEPC in detail.

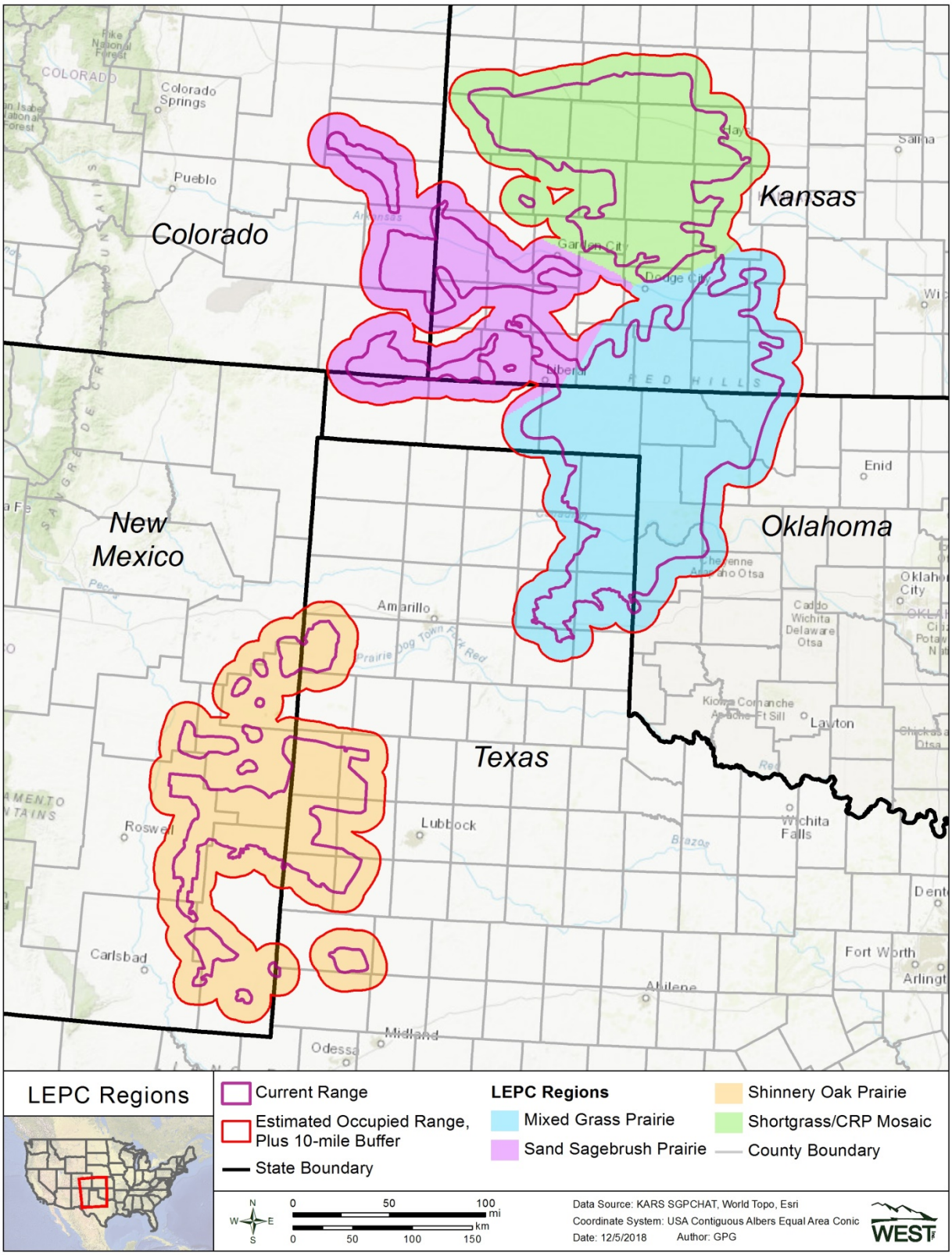

Figure 6. Regions delineated for the lesser prairie-chicken (LEPC) and currently estimated occupied range (Van Pelt et al. 2013).

3.4.1 Leks

Lek sites are characterized by relatively sparse vegetation generally less than four in (10 cm) in height, and are often located on a knoll, ridge, or grama flat. Disturbed areas can also be used, including roads, abandoned oil and gas well pads, areas around livestock watering facilities, and areas subjected to herbicide treatments. Generally, a landscape that supports LEPC contains sufficient lek habitat. Thus, lek habitat is not considered a limiting factor, and habitat management to provide for lek sites is not considered necessary.

LEPC exhibit site fidelity to lek sites, with the majority of use occurring within 5 km of leks (Winder et al. 2015). All existing population indices are derived from estimates of lek density and the number of males and females attending leks; therefore, monitoring leks is important for managing local populations. Traditional lek surveys can only provide a rough population index due to uncertainties in detections >1 mile from leks under certain conditions (Butler et al 2010, Holt and Butler 2019), and uncertainty in lek attendance rates by grouse (Wann et al 2019, Fremgen et al 2019). However, the presence of birds at a lek does not consistently correlate with the quality of surrounding habitat for nesting, brood-rearing, and wintering, unless the population trend is known, preferably over a 5–10 year period that captures annual fluctuations in response to drought and rainfall patterns. Evidence of a stable or increasing population at a lek or group of leks only reveals minimum habitat quality exists in the area (Van Pelt et al. 2013). However, recent evidence from a 4-year study conducted in Kansas and Colorado that quantified the amount and composition of habitat within 5 km of 62 lek sites found a positive correlation between lek attendance and the proportion of grassland in the surrounding landscape (Gehrt et al. 2020).

3.4.2 Nesting Habitat

LEPC nest and brood survival are generally considered the most critical population parameters for LEPC sustainability at a local level (Haukos and Zavaleta 2016). Thus, habitat conditions that promote nesting and brood-rearing success are key, specifically the vegetative composition and structure that provides visual obstruction to nesting and brooding birds (Gehrt et al. 2020). Increased vegetation height and cover density have been found to increase nest success in sand sagebrush, sand shinnery oak, and CRP grasslands. The management of vegetation height and density to provide visual obstruction could help increase the amount of suitable LEPC nesting habitat (Gehrt et al. 2020). While improving vegetation characteristics to support increased survival in local populations will help support persistence of existing LEPC, failure to couple these actions with efforts to address the scale of availability of total usable space will not address the primary threat of habitat loss and fragmentation (Fuhlendorf et al 2017).

A number of researchers have found most female LEPC nest within 2.0 mi (3.2 km) of leks (Haukos and Zavaleta 2016), although not necessarily the lek where mating occurred (Pitman et al. 2006). The majority of year round female space use occurs within 5 km of leks (Winder et al. 2015). Hagen et al. (2013) suggest vegetation management for nesting should be focused around 1.6 km from occupied leks. Thus, locations of leks can serve as an indicator of where existing nesting habitat is located and where improvements to nesting habitat could increase nesting success (Van Pelt et al. 2013).

3.4.3 Brood Habitat

Young broods have relatively limited mobility; therefore, quality brood habitat must occur in close proximity to nesting habitat. The interspersion of nesting and brood habitat is important for providing optimal habitat conditions (Van Pelt et al. 2013). Giesen (1998) suggested approximately 1,000 ft (305 m) represented the maximum distance for movement between nesting and brood habitat.

The preferred vegetation characteristics varies among regions but in general have a more dominate herbaceous component than nesting sites (Hagen et al. 2013). Van Pelt et al. (2013) cited various studies to assert that brood habitat typically has a higher amount of forb cover and less grass cover than nesting sites. This habitat is usually associated with higher levels of insect abundance and provided vegetation cover that allowed chicks to move comparatively easy on the ground. Active sand dunes, dunes that physically change size, shape or location due to the effects of wind, with shrubs, especially within sand shinnery oak or sand sagebrush vegetation types, are relatively common in brood-rearing habitat. Some studies suggest habitat disturbance by burning, grazing, and herbicide treatment could improve brood habitat. In addition, adults and broods have been found to use shrubs and shinnery oak for shade during the summer (Bell et al. 2010). Woodward et al. (2001) suggested that shrubland communities could provide year-round food and cover and are less influenced by climate and grazing than herbaceous-dominated communities.

3.4.4 Autumn/Winter Habitat

Van Pelt et al. (2013), citing Giesen (1998), state while individuals range across larger areas during the autumn and winter months, individual LEPC occupy the same general vegetation types used during nesting and brood rearing, and remain in close proximity to leks. Agricultural fields with waste grains were used if located close enough to mixed-grass, sand sagebrush, or sand shinnery oak utilized for resting and roosting locations (Taylor and Guthery 1980a). Van Pelt et al. (2013) suggested specific management for autumn and winter habitat was not necessary so long as nesting and brood habitat of comparatively high quality was present due to the overlap in habitat requirements.

3.5 Population Trends

The LEPC population has been estimated to have declined 97% since the 1800s (Crawford 1980, Taylor and Guthery 1980b), but how the historical population size was estimated was not described (Hagen and Giesen 2005). However, generalized trends indicate an overall range-wide population decline has been occurring since at least the early 1900s (Robb and Schroeder 2005). Prior to a large-scale range-wide survey effort beginning in 2012 (Nasman et al. 2020), the best available population estimates indicated the LEPC population size was approximately 45,000 individuals or fewer (USFWS 2014a). Recent range-wide population estimates derived from aerial survey data from 2015 – 2020 indicate a 5-year average (excluding 2019 when data was not collected) of approximately 27,000 individuals (Table 1; USFWS 2021). These surveys utilized equal probability sampling to estimate the population size of LEPC in the four defined LEPC habitat regions (Table 1), including: Shinnery Oak Prairie, Sand Sagebrush Prairie, Mixed Grass

Prairie, and Shortgrass/CRP Mosaic (Figure 6; see Section 3.4 [Habitat Characteristics]) that comprise the species' range.

Table 1. Range-wide and ecoregional estimated lesser prairie-chicken total population sizes averaged from 2015 to 2020 (no surveys were conducted in 2019), lower and upper 90% confidence intervals over the five years' of estimates, and percent of range-wide total for each ecoregion (USFWS 2021).

Ecoregion	5-year Average Estimate	5-year Minimum Lower CI	5-year Maximum Upper CI	Percent of Total
Short-Grass/CRP	16,957	13,605	35,350	62%
Mixed-Grass	6,135	1,719	11,847	22%
Sand Sagebrush	1,215	196	4,547	4%
Shinnery Oak	3,077	170	8,237	11%
Range-wide Totals	**27,384**	**15,690**	**59,981**	**100%**

CI = Confidence interval; CRP = Conservation Reserve Program

Data from the Species Status Assessment Report for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) (USFWS 2021) based on Nasman et al. (2020).

Most recently, the 2021 aerial surveys estimated a range-wide population size of 30,461 total birds (20,137; 41,923) with an estimated 1,571 birds (630; 2,678) in the Shinnery Oak Prairie, 440 birds (55; 963) in the Sand Sagebrush Prairie, 3,132 birds (1,688; 4,877) in the Mixed Grass Prairie, and 25,318 birds (15,092; 36,329) in the Shortgrass/CRP Mosaic (Nasman et al. 2021).

The North American Grouse Partnership (NAGP) also assessed the LEPC's population status in 2017 and determined numbers were below desired levels and unlikely to reach desired targets identified in the RWP without substantial increases in three of the four LEPC habitat regions (letter dated March 31, 2017, from S. R. Belinda, NAGP, to C. Nichols, USFWS).

3.6 Threats

The range of the LEPC has been reduced as a result of habitat loss, fragmentation, and degradation resulting from a variety of ongoing factors (see Section 3.6.1 and Figure 5). Estimates of the extent of range reduction varies from greater than 90% (Hagen and Giesen 2005) to 83% (Van Pelt et al. 2013). The species requires relatively large, intact, ecologically diverse grasslands to maintain healthy populations (Fuhlendorf et al. 2017). The life history of the species, primarily the lek breeding system and behavioral avoidance of vertical structures that increase predation risk, make LEPC especially vulnerable to ongoing impacts occurring on the landscape, particularly at the species' currently reduced range-wide population, estimated at 30,461 individuals (Nasman et al. 2021). Depending on the quality, availability, and intactness of habitat, the home range of individuals from a single lek can encompass between 12,000 ac (4,900 ha) to more than 50,000 ac (20,000 ha) (USFWS 2021). In the 2021 Species Status Assessment (SSA; USFWS 2021), the USFWS concluded that conservation efforts were inadequate to prevent continued declines in total habitat availability, placing populations at risk for local extirpation unless connected habitat for recolonization supports species redundancy. Furthermore, "[i]f entire ecoregions are extirpated in the future, then the LEPC will lose broad redundancy, putting it more at risk from species-wide extinction due to catastrophic events such as large-scale, extreme droughts that are predicted to increase in frequency due to climate change. In addition, the loss of ecoregions would

be expected to result in the decline in the species' capacity to adapt to future changes in environmental conditions, causing additional risks of species extinction in the future" (USFWS 2021).

3.6.1 Habitat Loss, Fragmentation, and Degradation

The 2021 proposed rule to list the LEPC under the ESA (86 Federal Register (FR) 29432 [June 1, 2021]) presented a variety of factors contributing to habitat degradation, loss, and fragmentation, including the conversion of native grassland to cropland, petroleum production, wind energy development and transmission, woody vegetation encroachment, and roads and electrical distribution lines.

The decline in abundance and distribution of LEPC has been regularly attributed to the conversion of grassland into cultivated cropland (USFWS 2021). The 2021 SSA provides the history of cropland conversion in the species' range dating back to 1915. Defenders of Wildlife estimated that in the period from September 2015 and April 2017, at least 258,000 ac (104,409 ha) of the LEPC's range was disturbed or lost from agricultural conversion and energy development (Evans and Li 2017). In addition, the Lesser Prairie-Chicken Advisory Committee estimated that more than 160,000 ac of potential LEPC habitat impacted by industry in 2017 did not receive compensatory mitigation (LPC Advisory Committee 2019).

Impacts resulting in habitat loss can also lead to increased fragmentation of the remaining LEPC habitat on the landscape. Fragmentation as well as homogenization of grasslands is particularly detrimental for LEPC given the species requires a mosaic of successional stages of grassland or shrubland to meet its year-round habitat requirements (Van Pelt et al. 2013). Several life-history traits could influence the species' vulnerability to the effects of habitat loss and fragmentation, such as the need for a relatively large home range that includes fairly intact and functional grassland habitat, site fidelity, comparatively low mobility, relatively short lifespan, and relatively low nest success (USFWS 2012b). Where grassland patches currently remain, incompatible grazing, shrub control and eradication, pesticides, fire suppression, woody plant and exotic grass invasion, climate change (particularly drought), noise, and construction of various infrastructure can lead to habitat degradation (USFWS 2012b).

Livestock grazing is an integral part of the rangeland ecosystem, but incompatible grazing, where it occurs, can cause a long-term shift in the composition and structure of the vegetation community and become detrimental to the LEPC (USFWS 2012b). Overgrazing alters the composition and structure of grasslands, reducing the diversity of plants and cover types on the landscape that LEPC require to ensure nests are adequately concealed from predators (USFWS 2012b). By reducing the amount and diversity of cover available, overgrazing has a direct effect on survival, thermal refugia, nest success, and brood rearing success (USFWS 2012b). Other factors such as shrub control and eradication, pesticides, fire suppression, woody plant and exotic grass invasion, climate change can also affect the amount and diversity of cover available to LEPC and degrade remaining intact habitat. The invasion of grasslands by woody species can cause LEPC to no longer use otherwise suitable grassland habitat (Lautenbach 2017, Bragg and Hulbert 1976), but the principle method to control or preclude woody vegetation invasion, fire, is perceived

as a high-risk activity to some landowners and land managers, and relatively little prescribed burning occurs on private land (USFWS 2021). Recent research suggests habitat loss, fragmentation, and degradation likely compound with the effects of other threats, such as climate change (Ross et al. 2016), discussed in Section 3.6.2.

3.6.2 Climate Change

It is anticipated climate change will have a considerable effect on the LEPC (Grisham et al. 2016a). Climate-related changes in native grassland habitat could exacerbate impacts associated with ongoing habitat loss, degradation, and fragmentation, and other threats to the species (USFWS 2014a). Climate change in the Southern Great Plains where the LEPC occurs is expected to result in warmer, drier weather with more frequent and intense droughts (USFWS 2021). The USFWS anticipates the abundance and distribution of grassland bird species will be affected. For LEPC, these changes are likely to impact to the species' reproduction, survival rates, and possibly cause large-scale shifts in vegetation communities (USFWS 2021).

As evidence of the LEPC's vulnerability to climate change, Patten et al. (2005a), found LEPC avoided sites that were hotter, drier, and more exposed to the wind. In addition, warmer air and soil surface temperatures and the related decrease in soil moisture near nest sites has been correlated with lower survival and recruitment rates (Bell 2005). Nest survival probability has been observed to decrease by 10% for every half-hour when the temperature was greater than 93.2 °F (34 °C) and vapor pressure was less than -23 mmHg during daytime hours (Grisham et al. 2016b). Increased late spring temperatures, as project by climate change models, could lead to egg death or nest abandonment (Boal et al. 2010). Furthermore, as described in the 2021 proposed rule to list LEPC under the ESA (86 Federal Register (FR) 29432 [June 1, 2021]), based on an analysis of future climate projections, the species' range could experience a net loss of more than 35-50% (Salas et al. 2017). Climate change, in general, will likely be "a significant driver of future LEPC population persistence" (USFWS 2021). Although the entire range is likely to experience impacts from climate change, the southern DPS may be particularly vulnerable because the area is already warmer and drier than the northern portions of the species' range (Grisham et al. 2013, Grisham et al. 2016b, USFWS 2021)

If adjacent areas of potentially suitable habitat are present, the species' range could shift to new areas where the climate becomes suitable for LEPC. However, in order for changes in the species' range to occur, it is the view of this HCP that movement will depend on the availability of suitable habitat to allow north-south movements and will be reliant on the movement of individuals from strongholds that support viable LEPC populations at the time of movement. Any new areas colonized by LEPC will require suitable vegetation cover to support all life history requirements of the species (see Section 3.4), as well as sufficient insect prey to sustain a LEPC population. An additional concern presented by the USFWS is a potential change in the phenology and abundance of the LEPC's insect prey and a potential reduction in vegetation biomass that could reduce the carrying capacity of some LEPC habitats.

3.6.3 Renewable Energy Generation, Transmission, and Communication Towers

Few peer-reviewed studies have examined the relationship between wind energy development and grouse species in general (USFWS 2021). The current USFWS recommended impact distance for turbine towers and transmission lines on LEPC is 1.1 mi (1.8 km) and 0.4 mi (0.7 km), respectively (see Section 4.3). In addition to the species' tendency to avoid anthropogenic structures, noise may be a contributing factor to behavioral avoidance of wind turbines (USFWS 2021). Considering the scale of current and future wind development likely to occur within the LEPC range and the LEPC avoidance response, the 2021 SSA concluded wind energy development is a threat to the species, especially when considered in combination with other sources of habitat loss, degradation, and fragmentation activities. The SSA did not specifically highlight solar energy or communication tower development as a significant threat to LEPC, but these disturbances could also cause displacement similar to wind development and other vertical structures, respectively.

Areas of the occupied LEPC range, including areas of relatively high- and moderate-quality LEPC habitat, have been identified as having comparatively high suitability for the development of wind and solar energy facilities and power lines (Van Pelt et al. 2013). While limited empirical data on the effects of wind, solar energy, and power line development on LEPC are available, concerns exist about the impacts of this development on habitat suitability for LEPC (Robel et al. 2004; Pruett et al. 2009a, 2009b; Hagen 2010; Hagen et al. 2011; USFWS 2012b).

The state of the science related to the effects of wind energy facilities on prairie grouse is developing; thus, management recommendations for future wind power projects are limited. There are no studies specifically addressing the effects of wind energy development on LEPC, but some research has been conducted for three species of grouse within the US (GPCH, Columbian sharp-tailed grouse [*Tympanuchus phasianellus columbianus*], and greater sage-grouse [*Centrocercus urophasianus*]). Current evidence suggests that wind energy development may displace prairie grouse species to a similar extent and magnitude as other anthropogenic features that fragment the landscape (Winder et al. 2014a, LeBeau et al. 2017). The additional effects of moving shadows cast by turbines, compared to other tall structures on the landscape, is still unknown.

Several studies have evaluated the effects of transmission lines on LEPC. Pitman et al. (2005) found that LEPC nests rarely occurred within 1,312 ft (400 m) of transmission lines at a sand-sagebrush prairie site in southwestern Kansas; however, distance from transmission line was not predictive of apparent nesting success. Pruett et al. (2009a) used radio-tracking to study both LEPC and GPCH movement in relation to power lines and paved highways and concluded both species avoided power lines by at least 328 ft (100 m). Hagen et al. (2011) also used radio tracking to study the effect of anthropogenic features on LEPC ecology and concluded minimum avoidance distances of 2,172 and 2,382 ft (662 m and 726 m) from power lines for two different study areas. The authors also found collision with power lines accounted for 5% of the known LEPC mortality in their study areas (Hagen et al. 2011). The RWP (Van Pelt et al. 2013) suggests transmission line effects likely extend out to 1,312 ft and distribution line effects extend out to 33 ft (10 m) from the line.

Threats specific to LEPC from solar energy facilities and communication towers have not been evaluated in the published literature. Most of the studies addressing the effects of anthropogenic structures on LEPC have been for oil and gas development, roads, power lines, and buildings. Solar development, particularly in Texas (Electric Reliability Council of Texas [ERCOT] 2019), is expected to greatly increase in the near future. The distribution of new communication towers on the landscape is also expected to increase, but will be dependent on the industry's need to expand current coverage areas. The effects of solar and communication tower buildout on LEPC are expected to be similar to the effects of other man-made structures. For communication towers, research on the effects of tall vertical structures on prairie grouse species has been extensive, and indicated grouse species typically avoid vertical structures and could abandon nest site areas or leks in close proximity to towers (Manville 2016).

3.6.4 Oil and Gas Development - Threats Relating to Enrolled Projects

Oil and gas development is occurring over much of the estimated historical and occupied LEPC range. The 2021 SSA provides the history of oil and gas exploration and development within the species' range. Surface exploration, exploratory drilling, field development, facility construction, and operation and maintenance associated with oil and gas development could all lead to displacement of LEPC from otherwise suitable habitat. These activities may also result in habitat loss and fragmentation and could reduce local LEPC population numbers and viability. Habitat can be directly lost due to alteration, or indirectly lost as LEPC avoid areas surrounding roads and vertical structures (USFWS 2012b). The infrastructure and components typically associated with exploration and extraction of oil and gas activities have impacts that often extend beyond the actual physical structures (Section 4.3). Oil and gas activities, particularly drilling and road and highway construction, can lead to increased habitat fragmentation and loss. While well pad construction, seismic surveys, access road development, electrical distribution lines, and pipeline corridors can impact LEPC directly, the indirect effects of noise, gaseous emissions, and increased human presence are also a concern, all of which may negatively influence habitat quality and/or disrupt reproductive behavior (Hunt and Best 2004). In southeastern New Mexico, Hunt and Best (2004) found abandoned leks had more active wells, more total wells, and a greater number of roads than active leks, indicating that LEPC likely avoid these structures.

All five states within the LEPC range currently rank among the top 11 states in the nation for oil production and within the top 15 for gas production (US Energy Information Administration [USEIA] 2020b). Within these states, oil and gas activity is expected to remain steady or increase in the future even though commodity prices have fluctuated in recent years. With the ongoing oil and gas development and exploration in all five states within the LEPC range, the USFWS has expressed concern over the apparent incompatibility between oil and gas activities and the LEPC's life history (USFWS 2014a). Van Pelt et al. (2013) projected between 122,639 and 179,416 new wells could be developed within the LEPC's current EOR and surrounding 10-mi (16-km) buffer over the next 30 years, potentially affecting a million or more acres of LEPC habitat. Of the 258,000 ac (104,409 ha) of the LEPC's range estimated by the Defenders of Wildlife to have been disturbed or lost between September 2015 and April 2017, a minimum of 8,950 ac (3,622 ha) resulted from the construction of new oil and gas well pads (Evans and Li 2017). The

Lesser Prairie Chicken Advisory Committee estimated of the 656 wells drilled in the LEPC range in 2017, only 24.5% (161 wells) received compensatory mitigation (LPC Advisory Committee 2019). As of September 2019, 209,539 active and producing wells were reported in the Homeland Infrastructure Foundation-Level Database to exist within the Permit Area (Oak Ridge National Laboratory 2019). With the exception of Colorado, where LEPC is a Tier 1 "species of greatest conservation need" (CPW 2015) and the Colorado Oil and Gas Conservation Commission (COGCC; oil and gas well permit issuing authority) prohibits new ground disturbance within 1.25 miles of leks and requires a CPW-approved Wildlife Mitigation Plan or other CPW-approved conservation plan and compensatory mitigation for new development (including amendments to existing development plans) that cause the density of oil and gas locations to exceed one per square mile (COGCC 2021), no state-specific regulatory measures to address the impacts of oil and gas activities on LEPC are currently being implemented (Van Pelt et al. 2013). Impacts of oil and gas development, identified briefly in this section, are the principal focus of this HCP, and are discussed in detail in Chapter 4 of this document.

3.6.5 Other Threats

Other threats to LEPC could include predation, disease, hunting, nest parasitism and competition by ring-necked pheasants (*Phasianus colchicus*), hybridization with GPCH where ranges overlap in central and northwestern Kansas, and genetic risks associated with relatively small, isolated populations, such as reduced genetic diversity and potential decreases in reproductive success (79 FR 1993 [April 10, 2014]). In addition, anthropogenic structures, such as fencing and power lines, and increased human activity, including vehicle traffic, in LEPC habitat could lead to collision mortality. It is estimated that between 14% and 42% of adult mortality among LEPC is attributable to collision with human structures, including automobiles. This has been asserted to affect long-term population viability (Wolfe et al. 2007); however, fencing likely represents a relatively small proportion of collision-related mortality. Among surveys of more than 1,740 mi (2,800 km) of livestock fencing in the northern portion of the species' range in Kansas and Colorado, 15 suspected collision fatalities were discovered (Robinson et al. 2016). In addition, one of 146 (0.7%) mortalities of radio-tagged LEPC investigated as part of the same study were attributable to collision with fencing (Robinson et al. 2016). Due to the previously perceived threat of fence line collisions, federal agencies including the Natural Resources Conservation Service have in the past required and provided financial assistance to mark and/or remove fences as part of LEPC conservation management. However, the paper by Robinson et al. (2016) concluded that while fence density should remain low in grassland habitat, conservation resources should target improving both the quality and quantity of available LEPC habitat.

4 IMPACT ASSESSMENT AND TAKE PREDICTION

This chapter quantifies the amount of take coverage sought for the ITP, and in accordance with Section 10(a)(1)(B) of the ESA and 50 CFR 17.22(b), provides an analysis of the impacts of the taking.

Take of LEPC from implementation of Covered Activities could result from displacement from habitats that otherwise would have been used, resulting in loss of habitat or a reduction in habitat

quality. Displacement into lower quality habitat could result in direct impacts to fitness parameters (e.g., nest, brood, and individual mortality). Of these impacts, loss of suitable habitat and subsequent displacement of individuals is the principal reason for population declines (USFWS 2014a). Impacts to LEPC can occur throughout the species' annual cycle: wintering, spring breeding/lekking season, nesting, early brood rearing (summer), and late brood rearing (summer-fall). Indirect impacts could lead to take through decreased survivorship or fecundity due to compromised access to suitable foraging, nesting, sheltering, and wintering habitat, or from the introduction of barriers to movement and therefore reduced/altered access to essential habitat components of the LEPC annual cycle. Take can occur if indirect impacts meet the definition of harm (i.e., significant habitat alteration or reduction occurs to the degree that essential behavioral patterns are significantly impaired, resulting in death or injury of an individual). For LEPC, such habitat alterations may compromise the species' ability to complete the breeding/nesting cycle, meet bioenergetic demands, or expose individuals to other environmental stressors, such as predation, that lead to death or injury.

As described in Section 3.6.4, oil and gas activities can lead to increased habitat fragmentation and loss of suitable habitat, the effects of which are expected to extend beyond the boundaries of project footprints causing LEPC displacement or avoidance of otherwise suitable habitats. Take may occur where LEPC avoid or have limited access to otherwise suitable habitat due to the presence of oil and gas infrastructure or where potentially suitable LEPC habitat is removed. However, as described in Section 5.3.2, this HCP also provides minimization measures to address impacts to individuals. These measures include seasonal and location-specific practices that reduce the likelihood that individual LEPC could be directly injured or killed while occupying breeding, nesting, or brooding sites.

While the population-level implication of direct impacts leading to take of individuals is less well established than the loss of suitable habitat as described above, take of individual LEPC could also potentially occur through collision with anthropogenic structures when flying or running. Impacts to individual LEPC could also potentially result from crushing by livestock or vehicles or other motorized equipment during construction, operations or mitigation maintenance activities.

Construction, as well as some conservation activities implemented on mitigation parcels to improve or maintain LEPC habitat, could result in LEPC mortality if it caused the destruction of a nest or hatchling/pre-fledgling birds. Potential construction- or mitigation-related mortality of adult or juvenile LEPC is considered unlikely due to mobility of individuals; however suspected collisions by adult LEPC with livestock fencing have been documented, though mortality risk was expected to be insignificant (Robinson et. al. 2016, see Section 3.6.5). Impact minimization measures further reducing the risk of construction-related disturbance to brooding hens and chicks are described in Section 5.3.2 and mitigation-specific conservation plans will reduce risks to LEPC on mitigation parcels. Collision with vehicles or other motorized equipment by LEPC could potentially occur during any life stage. However, the generally minimal and infrequent traffic on roads directly related to projects and on mitigation parcels is not likely to present a substantial risk to LEPC.

In addition, as described in Section 5.3.2, this HCP provides seasonal and location-specific practices to reduce the likelihood that individual LEPC could be directly injured or killed while occupying breeding, nesting, or brooding sites. Impact avoidance and minimization measures reduce the risk of vehicle collision during construction are described in Sections 5.3.1 - 5.3.2 and mitigation-specific conservation plans will reduce risk on mitigation parcels. A project-specific Conservation Plan for Mitigation Parcels will be developed for all mitigation parcels that are not obtained through a USFWS-approved bank or in lieu fee program, to ensure all conservation management activities are appropriately executed and timed to minimize risks to any LEPC currently occupying a mitigation parcel and provide the intended long-term benefits (Section 9.2).

Though take resulting from maintenance of performance standards on mitigation parcels may occur, take of LEPC associated with grassland improvement and management activities on mitigation secured through a USFWS-approved bank or in-lieu fee program will be covered under the existing banking or in-lieu fee program agreement between the mitigation provider and the USFWS. Take associated with grassland improvement and management activities for all other sources of mitigation will be covered under this HCP pending approval by USFWS and USFWS-acceptance of a mitigation project-specific Conservation Plan for Mitigation Parcels (Section 9.2).

4.1 Impacts to Habitat as a Proxy for Take

The estimated potential take of, and impacts to LEPC that could result from Covered Activities will be measured using acres of suitable LEPC habitat (as defined in Section 4.4) affected by individual projects participating in the HCP as a surrogate for direct take of LEPC individuals. A surrogate is required for the following reasons: 1) it is difficult to determine LEPC numbers at a site and predict how many individuals would be taken by development of oil and gas projects within the Permit Area or implementation of grassland improvement and management activities; 2) the location and amount of suitable LEPC habitat can be readily quantified using geographic information systems (GIS) data; and 3) habitat loss and fragmentation is the primary threat affecting LEPC populations (79 FR 19973 [April 10, 2014]). Thus, because it is impracticable to express take or conservation benefits in terms of individuals, both the impacts of activities and the mitigation of those impacts are measured in acres of habitat.

There is a causal link between construction of features described in the Covered Activities that may rise to the level of take of LEPC, as these development activities result in habitat modification or degradation that significantly impairs the essential behavioral patterns of the LEPC. For instance, the infrastructure associated with the development of oil and gas, including roads and power lines, has been documented to result in avoidance of otherwise suitable habitat by grouse species (USFWS, 2021). Use of a surrogate for expressing take is consistent with current USFWS guidance that acknowledges that when the numerical amount of anticipated incidental take of individuals is difficult to determine, the acres of habitat affected may then be substituted for as a surrogate for take prediction, as provided in Section 8.2.2 of the HCP Handbook (USFWS and NMFS 2016).

4.2 Impacts to Lesser Prairie-chicken Habitat within the Plan Area

Some areas within the Plan Area are unsuitable for LEPC use (i.e., areas that are developed or have unsuitable vegetation composition); however, data necessary to accurately determine the amount of suitable LEPC habitat within the entire Plan Area, including a characterization of on-the-ground conditions, are not available at this time. To roughly estimate how many acres of potentially suitable LEPC habitat exist within the Plan Area that could be impacted by the Covered Activities, the ratio of potentially suitable land cover types to land cover types typically unsuitable for the LEPC were derived from 2016 National Land Cover Database (NLCD) data (Yang et al. 2018, Multi-Resolution Land Characteristics [MRLC] 2019). These data do not account for on-the-ground vegetation conditions or existing features on the landscape that could affect habitat suitability. As such, NLCD data were used only for the purpose of roughly estimating the amount of habitat that could be impacted by projected oil and gas buildout in the Permit Area. CI-holders will delineate potential habitat for the LEPC within and near project areas at a finer scale to more accurately estimate project-specific impacts using the methods described in Section 4.4, which account for on-the-ground conditions.

Potentially suitable land cover classes include the categories of herbaceous (i.e., grassland) and hay/pasture (Table 2); although portions of the land in these categories are likely unsuitable for the LEPC due to on-the-ground vegetation cover and current land management practices. In total, potentially suitable NLCD classes accounted for approximately 32% (30,178,084 ac; 12,212,637 ha) of the Plan Area.

Table 2. Land cover types, coverage, and composition within the Habitat Conservation Plan Area.

Land Cover Type	Acres	Hectares	% Composition
Potentially Suitable NLCD Classes			
Herbaceous	29,638,327	11,994,205	32.1
Hay/Pasture	539,758	218,432	0.6
Non-Suitable NLCD Classes			
Cultivated Crops	30,317,391	12,269,013	32.9
Shrub/Scrub	27,096,738	10,965,661	29.4
Developed, Open Space	2,230,501	902,652	2.4
Developed, Low Intensity	461,138	186,616	0.5
Open Water	380,398	153,942	0.4
Emergent Herbaceous Wetlands	321,583	130,141	0.4
Evergreen Forest	290,234	117,454	0.3
Deciduous Forest	289,509	117,161	0.3
Woody Wetlands	190,490	77,089	0.2
Barren Land	145,215	58,767	0.2
Developed, Medium Intensity	143,351	58,012	0.2
Mixed Forest	129,730	52,500	0.1
Developed, High Intensity	50,127	20,286	<0.1
Total[1]	**92,224,490**	**37,322,076**	**100**

[1] Totals may not equal values shown due to rounding.

Data from the 2016 National Land Cover Database (Yang et al. 2018, Multi-Resolution Land Characteristics 2019).

NLCD = National Land Cover Database (Yang et al. 2018, MRLC 2019)

4.3 Methods for Predicting Take over the 30-year Incidental Take Permit Term

This section describes how the acreage that will be impacted by projected oil and gas development and grassland improvement and management activities covered under the HCP within potentially suitable NLCD classes in the Permit Area was estimated. The process used to estimate the predicted overall area impacted by project construction is provided in Figure 7 and described below. While the analysis below provides a rough estimate of all oil and gas buildout within the Permit Area that may impact LEPC, it is infeasible to precisely determine the acreage of impacts that could occur from each type of project development in the Permit Area over the ITP term. In addition, it is infeasible to determine the total amount of mitigation that will be provided from sources other than a USFWS-approved bank or in-lieu fee program. However the requested authorized amount of take associated with this HCP is capped at 500,000 ac, to encompass 200,000 ac in the southern DPS and 300,000 ac in the northern DPS. Take associated with projects enrolled under this HCP will be calculated as impacts to potentially suitable LEPC habitat as defined through the project-specific Impact Assessment procedures described in Section 4.4, regardless of the specific project being constructed. Take associated with grassland improvement and management activities on mitigation parcels covered under the HCP will be calculated as the total acres of mitigation secured by means other than a USFWS-approved bank or in-lieu fee program.

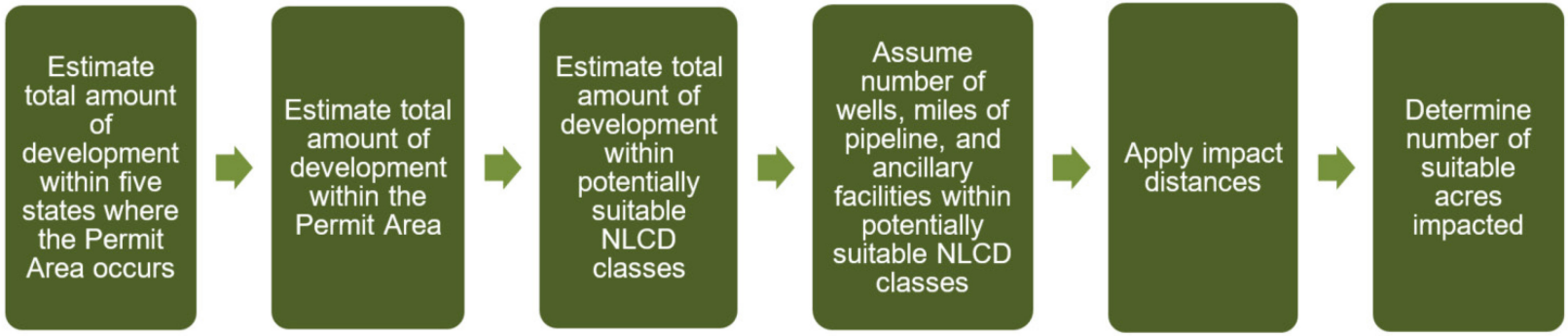

Figure 7. Process diagram for estimating the buildout of Covered Activities within the Permit Area.

As described in Section 3.6.4, project impacts are expected to extend beyond the boundary of a project's footprint due, in part, to LEPC avoidance of anthropogenic structures. Table 3 provides the USFWS' recommended impact distances for the most common anthropogenic features in LEPC habitat. Using these impact distances, the area of infrastructure buildout related to development of oil and gas projects was calculated for the 30-year ITP term (approximately 2020-2050). Within the buildout projection, an estimate of the number of wells, miles of pipeline, and area required for ancillary likely to be constructed within the Permit Area was made. Under the ITP, incidental take of LEPC resulting from Covered Activities leading to the loss of potentially suitable LEPC habitat associated with the buildout of infrastructure for the development of oil and gas projects and grassland improvement and management activities implemented by means other than a USFWS-approved bank or in-lieu fee program may be authorized.

Buildout estimates are provided for each LEPC habitat region (sand sagebrush prairie, shortgrass/CRP mosaic, mixed grass prairie, and shinnery oak prairie), as well as the expected amount of mitigation to be provided through sources other than a USFWS-approved bank or in-lieu fee program; however, cumulative impacts for all Covered Activities will be tracked against the total authorized take on the ITP, such that HCP/ITP coverage may be flexibly allocated among Covered Activities, regardless of the proportion of buildout predicted to occur in each habitat region. This will ensure the maximum benefit to LEPC is realized through the HCP by offering take coverage under this HCP and the associated ITP on a first-come-first serve bases. To address the uncertainty related to the overall projected buildout and the effects of oil and gas projects on LEPC, this HCP includes monitoring (Section 5.4), adaptive management (Section 5.5), and changed circumstances (Section 6.2) components.

It is difficult to accurately predict upstream and midstream development generally and within the Permit Area due to factors including fluctuating economic markets for oil and gas, resource availability, and potential technological advances. Information on current oil and gas production and projections through 2050 were obtained from the USEIA *Annual Energy Outlook 2020 with Projections to 2050*, State Profile and Energy Estimates, and US Energy Mapping System (USEIA 2020a, 2020c, 2020d). Based on continued development of tight oil and shale gas resources, natural gas plant liquids production is expected to reach approximately 6.6 million barrels per day by 2028 and plateau through 2050, considering improvements in technologies for production, delivery, and consumption, and economic and demographic trends (USEIA 2020a). This level of NGLs production is approximately 26% above the production observed in 2019 (USEIA 2020a). The Annual Energy Outlook 2020 (USEIA 2020a) projects US crude oil production is expected to increase to approximately 14 million barrels per day by 2022 and remain near this level until 2045, at which time well productivity declines and tight oil development is expected to move into less productive areas. This level of crude oil production is approximately 16% above the average production observed from January through October 2019 (USEIA 2020b).

Major oil and gas plays near the Permit Area are depicted on Figure 8. The portion of the Permit Area associated with the Sand Sagebrush Prairie and Shortgrass/CRP Mosaic regions are located outside of what are considered the major oil and shale gas plays; however, the Hugoton, Panoma, and Bradshaw Gas Areas are actively producing gas fields in southwestern Kansas.

Portions of the Permit Area associated with the Mixed Grass Prairie in Oklahoma and northern Texas are within areas where the Woodford play is active; in these areas, additional drilling for oil and gas are expected over the Permit term. The majority of the Permit Area associated with Shinnery Oak Prairie region is within the Permian Basin, where several oil plays (e.g., Woodford, Spraberry, Bone Spring, Wolfcamp, and Abo-Yeso) are expected to account for the largest proportion of increased oil production in the continental US in the coming years. This region, which includes a portion of Texas and New Mexico, is expected to see an increase of approximately one million barrels per day before plateauing in 2022 (USEIA 2020a). Natural gas in this general region is also expect to greatly increase until 2022 by approximately 700,000 million barrels per day, but then remain relatively flat through 2050 (USEIA 2020a). The majority of the increase in natural gas plant liquids productions is expected to occur in eastern US (USEIA 2020a), outside of the Permit Area.

Based on the projected growth described above, we anticipate development within the Permit Area will be associated with the production of oil and gas, as well as the movement of oil and gas products from regional plays where they are produced to markets along the Gulf Coast where demand is higher for both local use and export. Specific information on where oil and gas development in the Permit Area will occur is not well defined, and there are potentially thousands of locations where wells could be drilled, pipelines constructed, and/or ancillary facilities installed.

The Permit Area includes a portion of five states (Colorado, Kansas, New Mexico, Oklahoma, and Texas). These five states produced approximately 70% of US crude oil and 45% of US natural gas in October 2019 (USEIA 2020d). The approximate number of active and producing wells in the Permit Area accounted for approximately 30% of those reported across these five states in the HIFLD as of September 2019 (Oak Ridge National Laboratory 2019). Given the projected increase in production expected across the US, the projected increase in production in portions of Texas and New Mexico, and the known oil and gas plays near the Permit Area (Figure 8), as described above, this HCP assumes a baseline of 1,712 new oil and gas well pads and supporting infrastructure (e.g., gathering and distribution lines, access roads, storage facilities), as well as 3,408 mi (5,485 km) of pipelines and related ancillary facilities (e.g., compressor stations, meter stations, mainline valves, access roads) could potentially be constructed within the Permit Area during first few years of the ITP term, if the USEIA projected outlook of 14 million barrels of crude oil production per day in 2022 and 6.6 million barrels per day of natural gas by 2028 is realized.

Table 3. Impact distances of anthropogenic features used in this Habitat Conservation Plan.

Feature	Impact Distance (ft)	Impact Distance (m)	Reference
Oil and Gas Development			
Improved Paved Road	2,789	850	Hagen 2010
Pipelines[1]	2,789	850	Similar to Improved Paved Road
Gas Line Compressor Station[2]	2,641	805	Pitman et al. 2005
Transmission Line	2,297	700	Hagen et al. 2011
Communications Tower	2,188	667	Similar to Large Vertical Structure (> 45 m)

Oil or Gas Well[2]	984	300	Hagen et al. 2011
Small Compressor Station (<5 ac [2 ha])	656	200	Van Pelt et al. 2013
Meter Station[3]	656	200	Van Pelt et al. 2013
Mainline Valve	656	200	Similar to Vertical Structure (10−45 m)
Tanks and Storage Facilities	436	133	Similar to Residential Building
Improved Gravel Road	220	67	Van Pelt et al. 2013
Railroad Track	220	67	Similar to Improved Gravel Road
Access Road -–Unimproved Road	98	30	Robel et al. 2004
Gathering and Distribution Lines	33	10	Van Pelt et al. 2013
Other Anthropogenic Facilities			
Concentrated Solar Tower Plant	5,906	1,800	Similar to Wind Turbine
Wind Turbine	5,906	1,800	Hagen et al. 2011
Coal Fired Power Plant	5,279	1,609	Pitman et al. 2005
Commercial Building	3,281	1,000	Van Pelt et al. 2013
Large Vertical Structure (>45 m [148 ft])	2,188	667	Van Pelt et al. 2013
Photovoltaic Solar Plant	656	200	Similar to Residential Building
Residential Building	656	200	Van Pelt et al. 2013
Vertical Structure (10-45 m)	656	200	Similar to Residential Building
Railroad Track	98	30	Similar to Unimproved Road

[1] Temporal considerations (i.e., may only be applicable during the construction phase).

[2] Muffled or otherwise control exhaust noise from pump jacks and compressors so that operational noise will not exceed 49 dB measured at 30 ft from the source.

[3] Similar to small compressor stations that are less than 5.0 acres (2.0 hectares) and are muffled to less than 75 decibels at 30 feet (9.1 meters) as described by Van Pelt et al. 2013.

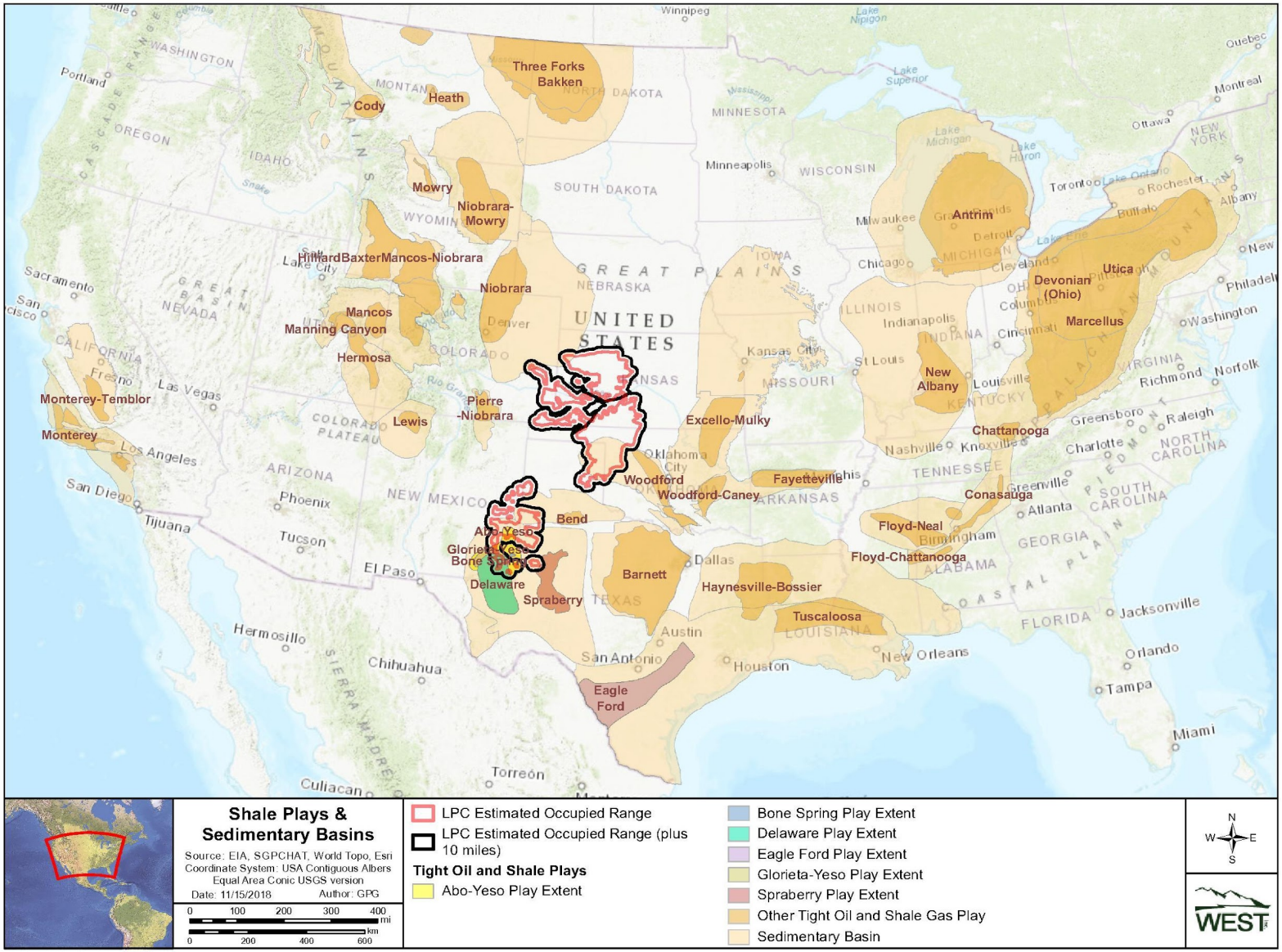

Figure 8. Active oil and shale gas plays in relation to the lesser prairie-chicken's estimated occupied range.

Production is expected to plateau early in the ITP term (2022 for oil and 2025 for natural gas), indicating the projected increase in production must be maintained despite the eventual decrease in output from existing wells nearing the end of their economically viable life. The typical lifespan of a well is commonly reported as 30 years, and depends on many factors, including, but not limited to, well location, well depth, resource availability, and financial feasibility of keeping the well active. Many wells, while nearing the end of their economically useful life, will continue to produce small volumes for long periods of time, and remain active on the landscape. Such wells were reported to have cumulatively produced approximately 10% of the oil and natural gas extracted in 2017 (USEIA 2019). It is uncertain how many additional wells will be constructed within the Permit Area over the ITP term to offset the decrease in production of the existing wells. At least 23% of wells (48,773 wells) in the Permit Area have been in operation for at least 30 years and 45% (94,916 wells) have been constructed since 1990, but the construction dates for the remaining 32% (65,850 wells) are unknown (Oak Ridge National Laboratory 2019). It is uncertain what the rate of decreased production for these existing wells will be, and, thus, how many new wells will be constructed to offset declining production. This HCP assumes the declining production of the existing wells in the Permit Area will be offset by the construction of additional wells during the ITP term. Emerging technological advances will likely improve the efficiency of resource extraction, leading to fewer wells needed to extract the same amount of resources. Therefore, in addition to the estimated 1,712 new oil and gas well pads and 3,408 mi of pipelines expected to be constructed to support the overall projected increase in production, it is assumed the declining production of at least 1% of existing wells will be offset by the construction of new wells that are 50% more efficient at extracting resources. As this level, roughly 3,000 new oil and gas well pads and supporting infrastructure and 5,000 mi (8,047 km) of pipelines and related ancillary facilities are expected to be constructed within the Permit Area over the ITP term.

Within each of the four LEPC regions, the percentage of potentially suitable NLCD classes for LEPC was estimated based on NLCD data (Yang et al. 2018, MRLC 2019); herbaceous and hay/pasture land use classifications were combined to determine the percentage of grassland/herbaceous habitat within each region. The percentage of potentially suitable NLCD classes was approximately 45% in the Mixed Grass Prairie region, 42% in the Sand Sagebrush Prairie, 38% in the Shortgrass/CRP Mosaic, and 13% in the Shinnery Oak Prairie regions.

Using the anticipated oil and gas development described above, the impact buffers associated with oil and gas infrastructure (Table 3), and the percentage of land within potentially suitable NLCD classes for each LEPC region described above, the estimated area of infrastructure buildout related to development of oil and gas projects in each of the LEPC regions was calculated for the ITP term (Table 4).

Table 4. Estimated buildout of oil and gas projects within the Permit Area over the 30-year Incidental Take Permit term.

Lesser Prairie-chicken Region	Collective Footprint[1] Acres (Hectares)	Collective Footprint within Potentially Suitable NLCD Classes[2] Acres (Hectares)
Sand Sagebrush Prairie	360,434 (145,862)	150,445 (60,883)
Shortgrass/CRP Mosaic	446,543 (180,710)	168,257 (68,091)
Mixed Grass Prairie	954,806 (386,396)	432,909 (175,192)
Shinnery Oak Prairie	2,289,418 (926,495)	303,806 (122,946)
Total	**4,051,201 (1,639,463)**	**1,055,417 (427,112)[3]**

1. Includes project footprints and the associated impact buffer distances as presented in Table 3.

2. Impacts within potentially suitable NLCD classes (Yang et al. 2018, Multi-Resolution Land Characteristics 2019); calculated based on the percentage of grassland/herbaceous and hay/pasture within each region.

3. An additional 50,000 ac of impacts to LEPC habitat is expected to occur from grassland improvement and management activities associated with mitigation implemented through sources other than a USFWS-approved bank or in-lieu fee program.

CRP = Conservation Reserve Program; NLCD = National Land Cover Database.

As summarized in Table 4, we anticipate development within the Sand Sagebrush Prairie and Shortgrass/CRP Mosaic regions will be associated with some gas production activities as well as the movement of oil and gas products, which may impact a predicted total of approximately 806,977 ac (326,573 ha). Of this, approximately 318,702 ac (128,974 ha) of land within potentially suitable NLCD classes could be impacted, including 150,455 ac (60,887 ha) within the Sand Sagebrush Prairie region and 168,257 ac (68,092 ha) within the Shortgrass/CRP Mosaic region over the ITP term.

Within the Mixed Grass Prairie and Shinnery Oak Prairie regions, we anticipate a substantial amount of development will occur associated with oil and gas production and infrastructure associated with the transport of oil and gas products to other markets. Collectively, these activities could impact approximately 3,244,224 ac (1,312,891 ha). Within this, approximately 736,715 ac (298,139 ha) of land within potentially suitable NLCD classes for the LEPC may be impacted, including 432,909 ac (175,193 ha) within the Mixed Grass Prairie in Oklahoma and Texas and 303,806 ac (122,946 ha) within the Shinnery Oak Prairie portion of the Permit Area.

Impacts from oil and gas development on potentially suitable LEPC habitat would likely be less than the estimates presented in Table 4, due to any avoidance or minimization resulting from projects enrolled in this HCP (Section 5.3). In addition, it is expected that some habitat within potentially suitable NLCD classes will not be suitable for LEPC, due to existing anthropogenic structures on the landscape and on-the-ground conditions. Projects enrolled in this HCP will calculate impacts based on site-specific conditions as described in Section 4.4, which will delineate suitable LEPC habitat in and near a project.

The total amount of grassland improvement and management activities that will be conducted on mitigation parcels secured by means other than a USFWS-approved bank or in-lieu fee program is unknown. Because conservation activities leading to temporary impacts to LEPC could occur anywhere on a mitigation parcel, the estimated impacts are assumed to be equal to the size of

the mitigation parcel (i.e., impacts could occur across 100% of the mitigation parcel). As will be discussed in Section 5.3.3, the Applicant anticipates 50,000 ac of mitigation from a source other than a USFWS-approved bank or in-lieu fee program is likely to be utilized during the ITP term. However, the 200,000-ac cap in the southern DPS and 300,000-ac cap in the northern DPS on requested take authorization can be flexibly allocated among all Covered Activities.

4.4 Project-specific Impact Assessment and Predicted Take

In the 2014 listing decision (79 FR 19973 [April 10, 2014]), the USFWS focused on the LEPC's vulnerability to habitat impacts as the species' prime threat. As explained below, LEPC habitat can be defined using GIS data, available data sources, and ground-truthing to characterize how habitat will be affected (i.e., lost or reduced in quality) by proposed individual oil and gas projects enrolled under this HCP. This assessment can also be used to determine the mitigation required to offset the impacts of take to LEPC associated with the removal of potentially suitable habitat.

LEPC biologists generally agree energy development contributes to LEPC declines, primarily through the effects of habitat loss and fragmentation due to the extent of development in the species' range. Across the LEPC's range, the larger the area of contiguously undisturbed landscape, the more likely a lek is to be present (Bartuszevige and Daniels 2016). This effect was observed at multiple spatial scales, but was strongest for habitats with less energy development or other anthropogenic disturbances within 1.9 mi (3.0 km) of leks. In southwestern Kansas, tracking of individual home ranges showed females avoided areas with oil and gas wells, roads, and transmission towers (Hagen et al. 2011). Furthermore, LEPC in southwestern Kansas were less likely to nest near anthropogenic structures, including buildings, improved roads, and transmission lines (Pitman et al. 2005).

The impact buffer distances associated with oil and gas projects can vary depending on the type of infrastructure necessary. Facilities with the greatest impacts on LEPC habitat include paved access roads, vertical structures, and facilities that generate substantial noise during operation. Paved access roads subject to relatively high levels of traffic can result in direct take due to collisions with automobiles or due to abandonment or reduction in attendance at leks (Crawford and Bolen 1976). Numerous studies have documented LEPC avoidance of vertical structures, such as oil and gas wells, transmission lines, and communications towers; this avoidance behavior is typically attributed to a behavioral response to minimize exposure to predation (USFWS 2014a).

At the recommendation of the USFWS, this HCP provides the following process to evaluate project-specific impacts to LEPC. The determination of whether an area has the ability to support LEPC will not be made based on one data set or a single piece of evidence, but instead will include an evaluation of available information as a whole to support making an informed decision. A six-step process has been created to standardize and support these efforts for proposed individual oil and gas projects under this HCP. This process includes: 1) deconstruction of the proposed project action, 2) initial desktop analysis of effects of the proposed action(s), 3) field assessment and verification, 4) desktop re-analysis (if necessary), 5) quantification of project impacts on LEPC, and 6) preparation and submission of the impact assessment and supporting

documentation to the USFWS. Each step is described below in detail. Table 5 provides a listing of data and sources that are considered useful in assessing potential impacts to LEPC. The data and sources provided in Table 5 are not exhaustive, and CI applicants will seek out all available information when preparing an impact assessment. In addition, the HCP Administrator can require CI applicants include new data sources that become available over the ITP term.

Table 5. Data and sources available[1] to assess potential impacts to lesser prairie-chickens.

Information Type	Data/Source
General Information	County boundaries State boundaries Topographic maps Aerial or satellite photography Ecoregion boundaries Major Land Resource Area boundaries US Fish and Wildlife Service (USFWS) lesser prairie-chicken (LEPC) Service Area boundaries LEPC Historical Occupied Range LEPC Estimated Occupied Range
General Land Use/Land Cover	National Land Cover Dataset Land Fire US Department of Agriculture CropScape Local or state datasets Soil Survey Geographic Database soils and ecological site descriptions
Wetland and Riparian Areas	National Hydrology Dataset National Wetland Inventory Play Lakes Joint Venture Playa datasets Federal Emergency Management Agency National Flood Hazard Layer
Canyon Lands	Digital elevation models LandFire slope datasets
Fragmenting Features	Homeland Infrastructure Foundation-Level Data Federal Aviation Administration Digital Obstruction File Power lines Oil and gas Roads
Conservation Targeted Landscapes/Protected Areas	US Geological Survey Protected Area Database
Service Analyses	Grassland Intactness Analysis (USFWS 2015c)
LEPC Occurrence	Western Association of Fish and Wildlife Agencies Southern Great Plains Crucial Habitat Assessment Tool eBird Breeding Bird Survey routes Natural Heritage Programs Global Biodiversity Information Facility (gbif.org) State Wildlife Agencies

[1.] Sources here do not constitute an exhaustive list of resources appropriate for the impact analysis.

Step 1: Deconstruct the proposed project into all activities necessary to complete the proposed project. This will include all proposed new activities associated with the siting, development, and operation of the facility. Because the primary purpose of an impact assessment is to account for all resources present and evaluate the potential impacts of a project and its actions on LEPC, this step requires a detailed deconstruction of all aspects of the proposed project into all of the individual actions and associated methods and tools required to complete the proposed project.

Step 2: Conduct an initial desktop analysis of effects of the proposed action(s). An analysis of a proposed project's impacts must include a relatively large spatial extent because of the LEPC's life history strategy (i.e., the general pattern of use of resources, time and space to facilitate survival and reproduction). For projects in or near the LEPC range, the USFWS recommend the Analysis Area include the project Impact Boundary and surrounding 6-mi (10-km) buffer of the project impact boundary. Within this Analysis Area, the following must be evaluated, as described in greater detail below:

- Direct impacts of the project actions
- Indirect impacts of the project actions
- Known LEPC occurrences within and near the project
- LEPC potential habitat suitability within the project
- Known LEPC conservation actions by state, federal agency, non-governmental organizations, or other groups, including actions on public land

All data digitization using imagery as a reference base layer will be completed at the same scale and detailed methods will be documented and included as part of the final submission to the USFWS (Step 6). To ensure accurate results, all geospatial data used will be processed and analyzed using the same datum and projection, as the coordinate system assigned to a set of spatial data (e.g., shapefile) communicate to the GIS mapping software (e.g., ArcMap, QGIS) the exact location of features on the surface of the earth. Many different coordinate systems exist, and each coordinate system models the surface of the earth differently. It is, therefore, vital all spatial data be analyzed and compared in the same coordinate system to ensure accuracy of the results. Per USFWS recommendation, the USA Contiguous Albers Equal Area Conic USGS version coordinate system will be used for all GIS analyses, which is a coordinate system based on a conic projection (to remove polar distortion) that is intended to minimize shape, distance, and direction distortion while standardizing coordinate reference over multi-state study areas within the continental US. Developed by the USGS, this coordinate system is the native projection for many nationwide datasets provided for distribution by government agencies such as USGS and the National Park Service. The HCP Permit Area encompasses portions of several states in the coterminous US, and is located near the central meridian (-96) of the USA Contiguous Albers Equal Area Conic USGS version, further minimizing distortion in distance and direction. This coordinate system is as follows:

USA_Contiguous_Albers_Equal_Area_Conic_USGS_version
WKID: 102039 Authority: ESRI

Projection: Albers
False_Easting: 0.0
False_Northing: 0.0
Central_Meridian: -96.0
Standard_Parallel_1: 29.5
Standard_Parallel_2: 45.5
Latitude_Of_Origin: 23.0
Linear Unit: Meter (1.0)

Geographic Coordinate System: GCS_North_American_1983
Angular Unit: Degree (0.0174532925199433)
Prime Meridian: Greenwich (0.0)
Datum: D_North_American_1983
Spheroid: GRS_1980
Semimajor Axis: 6378137.0
Semiminor Axis: 6356752.314140356
Inverse Flattening: 298.257222101

If an improved coordinate system or method for evaluating spatial data becomes available, the USFWS can recommend a coordinate system other than the USA Contiguous Albers Equal Area Conic USGS version be used for all spatial data processing and analyses.

Direct impacts of the project activities

Project proponents must characterize the direct impacts of a given project on LEPC by first spatially mapping the footprint of each activity identified in Step 1.

Indirect impacts of the project activities

Project proponents must also characterize the indirect impacts of a given project by applying an impact radius to all features of the project and spatially mapping the impact radius of each activity identified in Step 1. Specific impact radii to account for indirect impacts of project features commonly occurring in the range of the LEPC are provided in Table 3. These values were derived from scientific literature or other existing LEPC conservation approaches. As further research is completed regarding the implications of these features on the LEPC, the USFWS will reevaluate the appropriateness of the assigned impact radii based upon the best available science. If changes are made to USFWS-designated impact distances, the Applicant will meet with USFWS to determine if revised impact buffer radii will be applied for future CI enrollment. For projects that have not commenced Covered Activities, project impacts must be reevaluated using the revised impact distances and resubmitted to the USFWS for approval, unless commencement of the Covered Activities will occur within six months of the initial USFWS approval of the project. For specific features not represented in Table 3, the impact radius associated with the most similar feature will be used.

Known LEPC occurrences within and near the project

Applicants for a CI must describe known LEPC occurrence (current and historic), including survey history, within the Analysis Area. Occurrence records from the previous five years are considered current, while records older than five years will be considered historical. Sources for occurrence records of LEPC must include, but are not limited to, WAFWA Southern Great Plains (SGP) Crucial Habitat Assessment Tool (CHAT), eBird, Breeding Bird Survey routes, Natural Heritage Programs, Global Biodiversity Information Facility (gbif.org), and State Wildlife Agencies.

Due to the life history and physical appearance of the LEPC, nearly all current survey techniques revolve around surveying during the breeding period due to seasonal aggregation of birds on leks, increased vocalizations, and readily observable displays that result in increased audible and visual detections when compared to other times of the year. Other reliable survey methodologies do not currently exist. Additionally, relying upon lek survey information exclusively is not a scientifically valid way to determine impacts to the LEPC as current survey techniques have relatively poor detection probabilities. Thus, due to issues with survey effort and detectability, the absence of current records (within the previous five years) for known leks in the Analysis Area is NOT sufficient evidence to conclude the area does not have the ability to support LEPC. Therefore, while lek data provide one factor that can be useful in determining project impacts, lek surveys are not in and of themselves diagnostic in determining impacts to LEPC. If data show leks currently (i.e. present within the last five years) occur within 6 mi of the project, then it can be assumed that the project may provide suitable habitat and impacts to LEPC may occur, and the potential CI-holder may proceed immediately to defining LEPC habitat suitability within the project. If leks are not known to occur within the past 5 years, the potential CI-holder should assess the likelihood of LEPC occurrence in the context of physical and biological features of the landscape, as follows.

Context of physical and biological features of the existing landscape

Project proponents must document the proposed project in relation to the features of the landscape within and around the project that could contribute to, or detract from, the potential occurrence of LEPC. There is no single data set or metric that can be used to make this determination. CI applicants must use multiple sources of information in evaluations including, but not limited to:

- Location of the project relative to the EOR + 10-mi buffer
- CHAT categorization of the land within the project
- Location of the project relative to USFWS LEPC Service Areas
- Proximity to areas protected for LEPC conservation
- Presence/absence of grassland or shrubland occurring in a patch size of greater than 50,000 acres in a 6-mi buffer adjoining publicly available land use/land cover datasets
- Presence of canyon lands, wetland and riparian areas, croplands, urban areas, woodlands, and/or salt flats

- Presence of existing anthropogenic structures (e.g., buildings, roads, windmills) and their buffers as defined in Table 3
- Intact landscape with the project impact buffers (Table 3)

Examples of areas that would not support the LEPC include landscapes with no grassland/shrubland present, canyon lands, riparian areas, croplands, urban areas, woodlands, salt flats, and other areas with soil characteristics that will not support the vegetation community necessary to support the LEPC.

LEPC habitat suitability within the project

For the purposes of the initial desktop analysis, potentially suitable habitat for the LEPC is defined as all grasslands or shrublands that have the ability to support breeding, feeding, sheltering or movement of the species. Additional evaluation of site-specific habitat suitability will be documented during the field assessment and verification step (Step 3). CI applicants must document habitat suitability within and in proximity to the proposed project. Project proponents must use multiple sources of information including, but not limited to, the following:

- Soil Survey Geographic Database (SSURGO) soils and ecological site descriptions; usefulness may depend upon the size of proposed project and availability of remote imagery
- Remote sensed imagery or video
- Multiple land use/land cover datasets
- Tree and woody plant cover/occurrence
- Digital elevation models
- LandFire Slope dataset

Recent research has indicated that LEPC generally avoid landscapes with trees or other invasive woody vegetation, such as mesquite. To account for this avoidance, an indirect impact buffer radius of 1,080 ft (329 m) will be applied to trees and 800 ft (244 m) will be applied to mesquite.

Technical Considerations

The scale of all data that are digitized using imagery as a reference base layer here and in Step 4 (if applicable) will be documented, and detailed methods will be documented and included as part of the final submission to the USFWS (Step 6). In addition, to ensure accurate results, geospatial data will be processed and analyzed using the same datum and projection. Per USFWS recommendation, the USA Contiguous Albers Equal Area Conic USGS version coordinate system will be used for all GIS analyses. This coordinate system is as defined above.

At the conclusion of Step 2, the project proponent will be able to determine if the proposed project location overlaps with suitable LEPC habitat, and therefore if the project may lead to take of LEPC.

Once overall habitat suitability in the Analysis Area has been established, the following steps will be used to identify areas within the proposed project that do not provide suitable LEPC habitat, for example and as described above, areas that are covered by trees, water, anthropogenic structures, and/or possess a slope or elevation that is not suitable for habitation by LEPC. This will result in a map of both potentially suitable, and non-suitable LEPC habitat that may be impacted by the proposed project.

Step 3: Conduct a field assessment to verify the initial desktop analysis. The field assessment provides an opportunity to supplement and correct information compiled during the initial desktop analysis. The field assessment must be completed within one year prior to the submission of a CI application. The field assessment requires clear documentation of the on-the-ground conditions, including land use, land cover, physical and biological features, existing anthropogenic features, and incidental LEPC observations, as reported by desktop data compared to what is found during the field assessment. CI applicants may submit their desktop analysis to the HCP Administrator using the CI Application (Appendix B) for review prior to the field assessment, describing the methodology for completing the field assessment. The HCP Administrator will be responsible for reviewing and documenting the field methods are appropriate, and can coordinate with the USFWS in making this determination. Supporting information gathered during the field assessment will include pictures or video accompanied by associated geospatial coordinate information detailing the presence or absence of features. All data collected with Global Positioning System will be reported in decimal degrees, with a precision to at least five decimal places (i.e., DDD.DDDDD °).

In many cases, CI applicants may not have permission for access to all the lands within the Analysis Area. Data collection and verification will occur within all areas for which permission is granted, and from public access points, such as public roads, when direct access is not permitted.

Step 4: Desktop re-analysis (if necessary). Following completion of the field assessment and verification of the initial desktop analysis, any findings that conflict with the initial desktop analysis will require correction prior to submission of the CI Application for review and consideration.

Once this step is complete, questions that will be answered include, but are not limited to:

- Is the proposed action located within the EOR+10mi (16-km) buffer?
- Is the proposed action located within a USFWS Service Area?
- Is the proposed action located within a WAFWA SGP CHAT category?
- Is the proposed action located within any Conservation Targeted Landscape (i.e., area with multiple conservation efforts in progress on many acres [USFWS 2014c])?
- Is the proposed action located within a Service Grassland Intactness Analysis Patch or Proximity area (USFWS 2015c)?
- Are there features that fragment the landscape of the Analysis Area?

- What are the land use/land cover classes as described by LandFire, US Department of Agriculture's (USDA) CropScape, and NLCD?
- What are the soils as described by USDA's SSURGO?
- Are there documented occurrences of LEPC in the Analysis Area?

Step 5: Quantification of project impacts on LEPC. Once the desktop analysis has been verified, the total impacts of the project can be quantified. CI applicants will quantify the number of suitable acres of LEPC habitat located in areas impacted by the project, as determined though Steps 1-4. The appropriate mitigation ratio will be applied to determine the total number of units required to offset the given impact, as described in Section 5.3.3.1.

Step 6: Prepare and submit the impact assessment and supporting documentation, along with the CI Application and all Attachments to the HCP Administrator. CI applicants will prepare and submit the impact assessment, including digital copies of geospatial data, pictures, videos and any other supporting materials, and the CI application to the HCP Administrator. Geospatial data will include the original data for the entire Analysis Area, buffered versions of the original data, data corrected following field assessments, complete data supporting the conclusions of the impact assessment, and documentation of all data and sources utilized in the impact assessment and associated analyses. The HCP Administrator and CI applicant will provide the CI Application and all completed attachments (Appendix B), including the impact assessment and supporting materials to the USFWS and work together to reach concurrence. The USFWS will be responsible for reviewing the CI Application and attachments for completeness and compliance with impact assessment process, and will approve the CI Application (Appendix B) if the HCP Administrator and USFWS agree that the application meets the criteria described in this HCP. Section 8.2 provides a description of the review process that be used to ensure concurrence between the HCP Administrator, CI applicants, and the USFWS. This 6-step process is designed to assist the HCP Administrator and CI applicants with individual oil and gas projects to evaluate project impacts and determine the appropriate conservation measures (Section 5.3) and required amount of mitigation necessary (Section 5.3.3) to offset those impacts.

5 CONSERVATION PROGRAM

5.1 Introduction

When the USFWS listed the LEPC as threatened, it did so based on its standard analysis of five threat factors, which are: 1) damage to, or destruction of, a species' habitat; 2) overutilization of the species for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) inadequacy of existing protection; and 5) other natural or manmade factors that affect the continued existence of the species. In the listing decision (USFWS 2014a; 79 FR 19973 [April 10, 2014]), the USFWS analysis focused on the species' vulnerability to habitat impacts, especially at the species currently reduced numbers. This vulnerability was related to the species' lek breeding system, which requires males and females to be able to hear and see each other over relatively wide distances, the need for relatively large patches of habitat that includes several

types of microhabitats, and a behavioral avoidance of anthropogenic structures, which causes the species' habitat to be more fragmented. Conservation measures, such as those associated with this HCP, could assist in precluding reenlistment of the LEPC under the ESA in the future. As stated in the HCP Handbook, "Covering species likely to be listed within the term of the permit can benefit the permittee by ensuring the terms of an HCP will not need to be changed over time with subsequent species listings. It can also provide early protection for many species and, ideally, prevent subsequent declines and in some cases the need to list such species." (USFWS and NMFS 2016, pg. 1-2).

This HCP emphasizes conservation measures that address the LEPC's vulnerability to habitat impacts, and mitigation provided through the HCP focuses on the creation of strongholds as set forth in the technical white paper issued by the USFWS in July 2012, *USFWS Conservation Needs of the Lesser Prairie Chicken* (USFWS 2012a). All mitigation implemented to meet the obligation of this HCP will be approved by the USFWS. Static mitigation, including restoration (the conversion of non-habitat into suitable habitat) and preservation (maintenance or enhancement of existing habitat) of LEPC habitat, will meet all requirements set forth in the LEPC Mitigation Guidelines (USFWS 2014c). Dynamic mitigation, including restoration and preservation of LEPC habitat, will meet all requirements defined by the LEPC Mitigation Guidelines (USFWS 2014c) except for those relating to permanent conservation easement and components thereof. By utilizing the USFWS' LEPC Mitigation Guidelines while focusing on the creation of strongholds for the LEPC, the HCP will provide ecologically effective mitigation offsets for impacts and will also provide quantifiable progress toward securing additional strongholds for the LEPC. CI-holders will follow the conservation measures to ensure that habitat impacts are offset in a way that increases the likelihood of long-term population perseverance, especially if habitat resources continue to decline or become increasingly fragmented by projects not participating in the HCP and not permitted under the ITP.

Furthermore, the HCP is structured to provide a minimum of one acre of restoration for every acre of potentially suitable LEPC habitat impacted by enrolled projects after the fifth year of the ITP term, provided preservation and restoration credits already approved by the USFWS (50,000 ac; see Biological Objective 1c, Section 5.2) have been sold. Restoration parcels must meet USFWS standards before they can be used to offset impacts; therefore, this 5-year time lag will allow mitigation entities to begin restoring parcels early in the ITP term, that will become available for use later in the ITP term. By offsetting oil and gas impacts with restoration credits, there is a potential for strongholds to increase in size. Restored acres provided through permanent mitigation credits, will lead to a substantial net increase in protected suitable habitat, with assurances this habitat will remain in strongholds as described above.

5.2 Biological Goals and Objectives for the Conservation Measures

The purpose of this HCP is to minimize and fully offset the impact to LEPC from the development and operation of oil and gas projects. This is primarily accomplished through contributions towards the establishment of strongholds in the form of habitat conservation banks throughout the LEPC range to reduce the threat of habitat loss and fragmentation. Oil and gas development in the Permit Area will drive the establishment and protection of strongholds through the Implementation

of USFWS-approved mitigation. As described above, the establishment of strongholds is necessary to meet the goals and objectives of LEPC conservation throughout the species' range (USFWS 2012a). The goals of the stronghold concept are outlined in the USFWS' *Conservation Needs of the Lesser Prairie-Chicken* (USFWS 2012a) and include:

1. Establishing strongholds to ameliorate effects from current and future fragmentation and to increase the chances for long-term survival.
2. Ensuring connectivity between strongholds in order to facilitate movement and allow for gene flow.
3. Committing to implementation of management strategies to avoid or reduce ongoing habitat fragmentation in conjunction with the establishment of strongholds and connectivity between strongholds.
4. Providing long-term certainty that mechanisms will be in place to achieve and sustain the necessary habitat for the creation, maintenance, and conservation of strongholds and connectivity in the long term.

The USFWS defines strongholds as parcels of relatively high-quality habitat with multiple leks, long-term protection, and a minimum size of 25,000 ac (10,117 ha), though larger parcels of up to 50,000 ac or more may be needed to account for the amount and distribution of non-LEPC habitat (e.g., irrigated croplands) and otherwise suitable habitat located within the buffer distances associated with anthropogenic features (e.g., areas surrounding vertical structures, which are avoided by LEPC; USFWS 2012a). In order to meet the long-term goal of ensuring connectivity between strongholds to allow seasonal movements and gene flow, management strategies should include: 1) development of a strategic and collaborative system to target and prioritize appropriate areas for the establishment of strongholds that will maximizes connectivity; 2) incentives for new oil and gas developments to mitigate for impacts in areas outside of, but would provide connectivity with, existing strongholds; 3) habitat improvement and restoration, which could include removal of vertical structures causing structural fragmentation and/or conversion of croplands to native grasslands in areas where doing so would reduce spatial fragmentation; and 4) monitoring of LEPC populations and habitat as a basis for adaptive management.

Biological Goal 1: Establish, protect, expand, and enhance strongholds and habitat corridors between strongholds to increase the chances for the long-term survival of the LEPC through compensatory mitigation provided to offset the loss of potential LEPC habitat as a result of oil and gas development covered under this HCP. The creation of strongholds is among the most important steps that can be taken to secure the conservation of LEPC (USFWS 2012a).

> **Biological Objective 1a:** Establish one or more permanent LEPC strongholds more than 25,000 ac in size in each of the four LEPC habitat regions (i.e., mixed grass prairie, sand sagebrush prairie, and shortgrass/CRP mosaic) over the ITP term, if practicable based on

availability of suitable land, landowner willingness to participate in LEPC conservation, and cost to ensure mitigation standards will be met.

Biological Objective 1b: Prioritize the protection of existing suitable LEPC habitat that has been approved for preservation and restoration by the USFWS (50,000 ac) by flexibly placing these acres, if available, into strongholds or connectivity corridors supporting the same DPS where impacts will occur but not limited to occurring in the same ecoregion, prior to other potentially available mitigation parcels.

Biological Objective 1c: Secure one acre of restoration for every acre of potentially suitable LEPC habitat impacted after the fifth year of the ITP term. As feasible, restored acres will be contiguous with or connected to established LEPC strongholds to expand the size of strongholds and connectivity corridors.

Biological Goal 2: Minimize impacts to LEPC populations by reducing habitat loss, habitat fragmentation, and LEPC avoidance of otherwise suitable habitat as a result of oil and gas development covered under this HCP.

Biological Objective 2a: Implement mitigation ratios (Section 5.3.3.1) that increase the mitigation obligations for projects sited on higher value (i.e., higher CHAT category) LEPC habitat to monetarily incentivize siting projects on lands of marginal LEPC habitat value and produce a net reduction in the average per project impact to suitable LEPC habitat as compared between initial and final project layouts over the ITP term.

Biological Objective 2b: Restrict project-related activities involving human presence during the LEPC breeding season (March 1 – July 15) based on time of day and distance to leks recorded as active within the previous five years (Section 5.3.2.2) and require self-certification of implemented minimization measures for projects occurring with three miles of leks recorded as active within the previous five years.

In summary, the Biological Goals and Objectives of this HCP seek to mitigate the loss or fragmentation of up to 200,000 ac in the southern DPS and 300,000 ac in the northern DPS of potentially suitable LEPC habitat as a result of oil and gas development throughout the Permit Area. This will be accomplished through the preservation of stronghold LEPC habitat, to fully offset impacts from projects enrolled in the HCP, and implementation of mitigation ratios intended to minimize the siting of projects within suitable LEPC habitat. For impacts that are not or cannot be avoided, this HCP will channel mitigation dollars into the creation of permanent LEPC strongholds and expand those strongholds as defined in USFWS guidance (USFWS 2012a, 2014c). As explained in Section 5.3.4 (Expected Benefits of the Conservation Program), the conservation value of permanently protected strongholds is greater than the conservation value of land lost to development because stronghold habitat will be of comparatively high quality, will have a USFWS-approved management plan and dedicated 3rd party endowment, will be at a landscape scale located in a strategic manner, will conserve genetic resources necessary to maintain and conserve the species, and will improve LEPC resilience to climate change. Once

initial portions of strongholds are preserved, suboptimal habitats in the surrounding landscape will be restored and incorporated in order to expand the strongholds. Measures that will be used to meet these goals and objectives, and the criteria that will be used to evaluate their success, are described in the following sections.

5.3 Measures to Avoid, or Minimize and Mitigate the Impacts of the Taking

5.3.1 Impact Avoidance through Project Design and Planning

Oil and gas projects can avoid impacts and the cost of mitigation by siting projects in areas where impacts to LEPC will not occur. Avoiding impacts can be accomplished by siting a project such that the Impact Boundary is entirely within areas that do not meet the conditions of potentially suitable LEPC habitat, as evaluated during each project's Impact Assessment as described in Section 4.4.

5.3.2 Measures to Minimize the Impacts of the Taking

5.3.2.1 Siting Projects in Low-Impact Areas

Potentially suitable LEPC habitat can be physically lost (i.e. land conversion) or functionally lost (i.e., degraded resources; infrastructure that leads to LEPC avoidance of an otherwise suitable area) and result in fragmentation of the remaining LEPC habitat on the landscape. Potentially suitable LEPC habitat is likely to be present within the Impact Boundary of many projects within the Permit Area. In those cases, the cost per unit of mitigation and mitigation ratios that increase for impacts to higher quality LEPC habitat (Section 5.3.3.1) compels developers to consider siting projects in areas where impacts from project footprints (physical habitat loss) and associated Impact Boundaries (function habitat loss) are minimized and/or occur within less suitable habitat. Mitigation ratios and credits are valued to create an incentive for minimizing impacts. Smaller project impacts require fewer mitigation credits to offset those impacts, and thus pose less of a financial burden on the project. Minimization measures that project proponents can implement to reduce the amount of required mitigation offset include:

- Locating new project infrastructure and its impact buffers (Table 3) outside of suitable habitat, or within spaces which already have existing impacts, as evaluated during each project-specific Impact Assessment, to the extent possible (see Section 4.4)
- Co-locating new infrastructure, such access roads and power lines, within the impact buffers of existing features on the landscape or within the impact buffers of other new features (Table 3)
- Burying linear facilities, such as power lines and transmission lines, where practicable given geographic, geotechnical, and engineering constraints

5.3.2.2 Conservation Measures during the Lesser Prairie-chicken Breeding Season

While habitat loss, fragmentation, and degradation are considered the primary threat to LEPC, increased noise disturbance could adversely impact the integrity of habitat that currently exists for the species (USFWS 2012b). As such, during the LEPC breeding season (March 1 – July 15), noise and blasting, traffic volume and speed, and access points will be minimized to reduce LEPC

disturbance. In addition, off-road travel will be avoided, where feasible, within three mi (five km) of leks that have been recorded as active within the previous five years. These measures will reduce impacts to breeding, nesting, and brooding LEPC (Winder et al. 2014b) that may occur in the vicinity of a project.

During construction, operations, and routine maintenance activities where humans are present, non-emergency activities during the breeding season will be avoided between the hours of 3:00 am and 9:00 am in areas within three mi of known leks recorded as active within the previous five years.

5.3.3 Measures to Mitigate the Impact of Taking

Impacts that cannot be completely avoided and remain after minimization measures have been implemented will be mitigated to fully offset the impacts of the take. Impacts are assumed to be permanent, therefore mitigation will be provided in perpetuity. Due to the inherent uncertainties associated with compensatory mitigation (e.g., lag time before restoration parcels become fully functional), in alignment with standard practices (Castelle et al. 1992, King and Price 2004, 81 Federal Register [FR] 95316 [December 27, 2016]), the HCP will provide mitigation at a ratio that is greater than 1:1 (Section 5.3.3.1). This will ensure the HCP fully offsets the impact of the taking in accordance with the HCP Handbook, which states, "(f)ully offset means the biological value that will be lost from covered activities will be fully replaced through implementation of conservation measures with equivalent biological value." As discussed in Section 4.1, because it is impracticable to express take or conservation benefits in terms of individuals, both the impacts of activities and the mitigation of those impacts are measured using a surrogate: acres of potentially suitable LEPC habitat. Use of acres of habitat impacted as a surrogate for exact numerical amounts of anticipated take of LEPC individual is consistent with current ESA regulation (80 FR 26832 [May 11, 2015]). Impacts to suitable habitat that cannot be avoided or remain after minimization measures will be offset by CI-holders through the purchase of mitigation from an LEPC mitigation bank or other USFWS-approved mitigation. Mitigation costs, such as mitigation bank credits, will be determined by the free-market prices established by mitigation entities at the time the impact occurs, which could fluctuate over the ITP term. In addition to Enrollment and Administration Fees, which will be paid by CI-holders (see Chapter 8), mitigation fees will cover the conservation and management of mitigation lands to fully offset the impacts of CI-holder enrolled projects on LEPC in perpetuity. Conservation efforts will focus on LEPC, though other species could benefit. Under this HCP, a primary mitigation strategy is to create LEPC strongholds that will be funded, in part, from the mitigation purchased by HCP CI-holders. Mitigation will follow the USFWS LEPC Mitigation Guidance (USFWS 2014c). However, whereas the LEPC Mitigation Guidelines indicate a preference for mitigation to occur on contiguous properties of at least 9,000 ac within a landscape meeting specific criteria, mitigation under this HCP can occur on any USFWS-approved mitigation project within the HCP Plan Area at the requisite size of the mitigation transaction, even if less than 9,000 ac.

LEPC Mitigation Guidance (USFWS 2014c) will be used to determine siting of conservation lands to be used in mitigation. All lands used to provide mitigation for impacts from Covered Activities will be under an USFWS-approved mitigation plan selected by the HCP Administrator.

The determination of impacts to suitable LEPC habitat and calculation of required mitigation to offset impacts (see Section 4.4) will be provided by the CI applicant to the HCP Administrator, and subsequently to the USFWS for approval prior to project enrollment (see Section 8.1). As described below, mitigation to fully offset project impacts can be provided by either static or dynamic LEPC mitigation that has been approved by USFWS. Static mitigation includes land parcels (typically banking parcels) that will be managed for LEPC and protected in perpetuity through a conservation easement. Static mitigation remains in the same geographic location on the landscape and can include management activities to preserve (preservation) or restore (restoration) LEPC habitat. At least 50% of the mitigation offset for impacts to LEPC habitat covered under this HCP will be provided through static LEPC mitigation; however, the Applicant anticipates 95% of all mitigation provided under the HCP will be static. Dynamic mitigation can also serve to preserve or restore LEPC habitat in perpetuity, however, unlike static mitigation, land utilized for dynamic mitigation can be moved within the landscape. Dynamic mitigation includes lands contracted with a mitigation entity to be managed for LEPC for a specified amount of time (e.g., 15, 25, 50, or other number of years). Dynamic mitigation parcels are managed for LEPC conservation until the expiration of the mitigation contract, at which time the land owner will choose whether or not to renew the contract and continue managing the parcel for LEPC. If a landowner does not renew the contract for a dynamic mitigation parcel, the funds that would have been used to renew that contract are instead utilized to secure another dynamic mitigation parcel on the landscape in an area that will provide equivalent or greater conservation value to the LEPC compared to the original parcel. In this way, the total mitigation offset for dynamic mitigation is retained in perpetuity, though the physical location of mitigation sites may shift within the landscape over time. Because of this, lands managed to provide dynamic LEPC mitigation can move within the Plan Area, but the total offset value (total acreage) does not diminish over time or with relocation. It is expected that the overall price of dynamic mitigation will be equivalent to, or higher, than the price of static mitigation because dynamic mitigation must sequentially be replaced or renewed upon contract expiration in perpetuity, and land values are expected to increase over time. Any dynamic mitigation used to offset impacts resulting from enrolled projects, including future parcels secured to replace dynamic mitigation upon contract expiration will be approved by the USFWS, unless the parcel has already been approved under a banking agreement. Dynamic mitigation will have assured funding (Section 7.3.2) that allows for mitigation credit to be converted to static mitigation credit at any time. Up to 50% of the mitigation offset could occur on dynamic mitigation parcels that have a remaining contract of no less than 15 years; however the Applicant anticipates dynamic mitigation will be utilized for 5% or less of the total mitigation provided under the HCP. It is expected the management of the majority of dynamic mitigation parcels will involve habitat restoration. Restoration activities are described below.

This HCP will provide habitat preservation, the protection of currently suitable habitat (as defined by the USFWS 2014 LEPC Mitigation Guidelines LEPC performance standards), and habitat restoration, the conversion of non-usable space (i.e., areas that lack any potentially suitable vegetation cover to support LEPC populations) into potentially suitable LEPC habitat. Typical restoration activities include:

- Removal of mesquite (*Prosopis spp.*), eastern red cedar (*Juniperus virginiana*), redberry or Pinchot juniper (*Juniperus pinchotii*), black locust (*Robinia pseudoacacia*), Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*), or other invasive woody species
- Removal of infrastructure (e.g., windmills, old buildings or barns, non-used roads)
- Conversion of agricultural land into native grassland
- Additional restoration activities as approved by the USFWS on a case by case basis

Mitigation will initially be preferentially provided through the protection of existing LEPC habitat at a landscape scale that meet the LEPC Mitigation Guidelines (USFWS 2014c). The HCP Administrator will work with USFWS to first meet the goal of protecting habitat that has been approved for preservation or restoration by the USFWS (50,000 ac) by placing these ac, if available, into strongholds or connectivity corridors prior to other potentially available mitigation parcels (Biological Objective 1b, Section 5.2), within the constraints of the landscape operation (i.e., on the ground conditions). The intent is to allow flexibility in the use these 50,000 ac of mitigation across ecoregions, with the exception that impacts and associated mitigation must occur within the same DPS.

Once the initial 50,000 ac of USFWS-approved stronghold habitat has been secured through this HCP or other means, the HCP Administrator will work with the USFWS to balance preservation and restoration activities, such that a minimum of one ac of restoration will occur for every one ac of potential LEPC habitat impacted after the fifth year of the ITP term (Biological Objective 1c, Section 5.2). The HCP Administrator will work with the USFWS, in good faith, to determine the best available locations for restoration to occur within the context of the stronghold habitat. The most current science, knowledge, and expertise will be used to implement restoration projects. Restoration credits will not be released for use as mitigation until performance standards, as defined in the USFWS 2014 LEPC Mitigation Guidelines, are met and the USFWS has approved release of the credit. As such, it could take several years of management before the condition of a restoration Bank Parcel meets performance standards and becomes available for mitigation use. Therefore, it is expected that initially mitigation will primarily occur using habitat preservation, with a goal of implementing a minimum of one acre of restoration for every acre of impacts beginning no later than the fifth year of the ITP term.

The take of LEPC that may occur as a result of the temporary loss of habitat or impacts to individual LEPC that may be occupying mitigation parcels during efforts used to improve or maintain LEPC habitat on mitigation parcels (e.g. controlled burning, erosion control, mechanical brush control, herbicide treatment, grazing management, range planting, forage harvest management, and/or fence installation) are relatively minor on a landscape level and will be more than mitigated by the net benefit to the species provided by these activities. As such, additional mitigation to offset take of LEPC that could occur on mitigation parcels during grassland improvement and management activities is not required.

5.3.3.1 Mitigation Offset Ratio Requirements

Mitigation will offset both the direct and indirect impacts to LEPC that could occur in suitable habitat within a project footprint as well as the project Impact Boundary (Section 4.4). As described above, both protection of existing suitable LEPC habitat and habitat restoration are anticipated under this HCP. Mitigation offset requirements will follow a prioritization of the value of impacted habitat, such that offsets to impacts in higher priority areas are greater than impacts within relatively lower priority areas. Overall, this approach will ensure that impacts to LEPC, measured in ac of potentially suitable habitat of varying quality, will be fully offset by replacing impacted acres with comparatively high-value suitable habitat.

To value habitat for determining mitigation offsets, the SGP CHAT (version 3.0; http://wafwaprojects.maps.arcgis.com/apps/webappviewer/index.html?id=d16dac45cfba4abeab91c1df97370121, accessed May 10, 2021) will be used to define categorical mitigation offset requirements (maps provided in Appendix C). CHAT categories are:

Category 1 (Focal Areas): This category is composed of the focal areas for LEPC conservation. The focal areas were designated by teams in each state that prioritized and identified intact LEPC habitat. SPG CHAT Category 1 habitat was defined using GIS layers, including landscape integrity models, aerial photos, soil maps, anthropogenic disturbances, and land cover, as well as expert opinion.

Category 2 (Connectivity Zones): Habitat that provides connectivity for LEPC among focal areas, to allow for genetic and demographic stability and movement among populations. This category is composed of the connectivity zones targeted for LEPC conservation. The connectivity zones were designated to prioritize identified intact, suitable LEPC habitat. As with SPG CHAT Category 1, Category 2 habitat was defined using landscape integrity models, aerial photos, soil maps, anthropogenic disturbances, land cover type, and expert opinion.

Category 3 (Modeled Habitat): Areas within the EOR (plus 10 mi) that is modeled as potential LEPC habitat. The model used base layers, such as leks, nests, CRP, land cover, and site conditions, to characterize potential habitat on the landscape. This category is derived from the lek maximum entropy (Maxent) ecological niche model used to describe suitable LEPC habitat and where it occurs on the landscape. Model inputs include lek occurrence, nests, land cover type, and abiotic site conditions.

Category 4 (Estimated Occupied Range, Plus 10 mi): This category comprises the EOR for the LEPC plus a surrounding buffer of 10 mi. The EOR is derived using expert opinion, and the 10-mi buffer is provided to consider areas potentially suitable for future LEPC range expansion and conservation planning.

Category 5 (Outside Estimated Occupied Range, Plus 10 mi): Areas that are more than 10 mi from the LEPC EOR.

Impacts to potentially suitable LEPC habitat, as determined by the project impact assessment (Section 4.4) will be offset at a mitigation ratio determined according to the CHAT category in which the impact occurs, as follows:

CHAT Category	Impact Acre	Mitigation Acre
CHAT 1	1	2.50
CHAT 2	1	2.25
CHAT 3	1	2.00
CHAT 4	1	1.25

Mitigation provided to offset impacts will be of equivalent or higher CHAT category. If an updated version of the CHAT is developed during the ITP term, it may be adopted into the HCP if mutually agreed upon by the HCP Administrator and the USFWS (Section 6.2.12). If mitigation is unavailable within an equivalent or higher CHAT category and cannot be secured, a Changed Circumstance will be triggered and the HCP Administrator with coordinate with the USFWS to determine an agreed upon solution (Section 6.2.11).

5.3.3.2 Provision of Mitigation to Offset Impacts of the Take

CI-holders of projects that enroll in this HCP will provide mitigation following the project-specific impact assessment described in Section 4.4, and the mitigation offset requirements described in Section 5.3.3.1. These credits will permanently offset impacts resulting from potential habitat loss or degradation from the development identified in this HCP. The required mitigation offset will be determined based on the amount of potentially suitable LEPC habitat that would be impacted after the application of avoidance (Section 5.3.1) and minimization measures (Section 5.3.2).

5.3.4 Expected Benefits of the Conservation Program

The principal expected benefit of this HCP is the protection and expansion of LEPC strongholds on private lands throughout the Plan Area. These strongholds will meet USFWS criteria, as defined in USFWS (2014c). This increase in protected stronghold habitat will occur as a direct result of the conservation measures, specifically compensatory mitigation that will be provided by CI-holders enrolled under the HCP.

Under the HCP, impacts of the loss or fragmentation of potentially suitable LEPC habitat that cannot be avoided by oil and gas development must be mitigated, and the cost of purchasing mitigation credits is expected to provide a strong incentive for developers to reconsider their site plans in order to reduce impacts to LEPC habitat, in order to reduce the mitigation burden to a CI-holder. In other words, oil and gas developers who enroll projects in the HCP are incentivized to reduce mitigation burdens by siting projects in areas where LEPC habitat quality is lower, and provide in exchange the protection and creation of comparatively higher-quality LEPC habitat.

Under this HCP, the conservation value of the mitigation is expected to fully offset the lost value of the impacted habitat by mitigating overall project impacts at ratio greater than 1:1 (Section 5.3.3.1), with increasing mitigation required for impacts to higher quality LEPC habitat. In addition, an objective of this HCP is to provide one ac of restoration for every acre of impacted habitat after the fifth year of the ITP term (Biological Objective 1c, Section 5.2). This will ensure adequate time for mitigation entities to develop restoration parcels that fully meet USFWS standards, and ensure restoration parcels are of equal or higher quality compared to the habitat lost to oil and gas development for which a particular restoration parcel is used to offset impacts.

Developers will offset habitat losses by purchasing mitigation credits that consolidate or expand LEPC strongholds within the Plan Area. To provide mitigation in accordance with the USFWS LEPC Mitigation Guidelines (2014c), LPC Conservation LLC has secured approximately 70,000 ac of land options for conservation easements and long-term management plans backed by non-wasting endowments in three of the four LEPC habitat regions (Section 3.4, Figure 6). The sale of credits will first be applied to secure at least 50,000 ac of LEPC stronghold habitat within the LEPC range (Biological Objective 1b, Section 5.2), but later the sale of mitigation credits will be used to expand strongholds by restoring additional adjacent habitat to a natural condition that favors LEPC and meets USFWS LEPC mitigation bank standards (USFWS 2014).

The USFWS (2012a, 2012b) has identified the creation of strongholds as the primary method for securing LEPC population viability. On balance, strongholds have a conservation value considerably greater than land at risk of development, conserved under term-based conservation programs, or self-proclaimed stronghold acres by other parties not approved by the USFWS. In contrast to the typically small, sporadically located, and/or temporarily protected conservation land investments, stronghold acres are strategically consolidated into blocks of habitat large enough to maintain LEPC numbers and genetic diversity. Because strongholds have long-term protection, and are, when feasible, connected to other strongholds, in aggregate strongholds promote resilience to habitat degradation and climate change by providing opportunities for the LEPC to adjust its range. Protecting known LEPC populations and strategically restoring private properties around geographically stable, well-established, and relatively large LEPC populations allows future range expansion and genetic diversification as populations could move over time in response to changing environmental conditions. In contrast, habitat where oil and gas projects will be developed under this HCP is expected to be fragmented by cropland, overgrazing, and existing anthropogenic features because incentives for developers to reduce mitigation burdens will have pushed projects to less suitable lands from a LEPC conservation perspective. Thus, LEPC habitat consolidated into strongholds will increase in conservation value, while at least some of the acres lost to development are expected to have had marginal conservation value in the first place.

This HCP will also channel funding into habitat restoration adjacent to strongholds. This restoration will not occur, however, until the initial goal of protecting habitat that has been approved for preservation and restoration by the USFWS (50,000 ac) has been placed into strongholds or connectivity corridors (Biological Objective 1b, Section 5.2). Restored habitat will compensate for the loss of habitat to development, but it will also have a net increase in conservation value when it is consolidated in a strategic manner into strongholds. The adequacy and location of restored habitats on proposed new bank parcels will be reviewed by the USFWS prior to submission.

It is necessary for conservation investors to secure parcels early in the planning process in order to meet conservation objectives. This is accomplished by negotiating purchasing options and easements on key parcels with private landowners prior to the forecasted impacts in geographic areas that are of the highest conservation value to the LEPC. This ensures that conservation investors are prepared to provide mitigation parcels when they are needed. For this reason, all

existing conservation bank or mitigation parcel credits submitted to the USFWS prior to the approval of this HCP, will remain intact and eligible for use under this HCP (Section 1.1), whether classified as preservation or restoration credits, unless such credits have already been used to implement LEPC mitigation for project impacts prior to the approval of this HCP.

5.4 Monitoring and Reporting

Project enrollment under the HCP through the issuance of CIs is expected to occur throughout the ITP permit term. As described in Section 4.4, each CI applicant will follow the specific impact assessment process that has been approved by the USFWS for project enrollment. The HCP Administrator, CI applicants, and USFWS will undertake a rolling review process (Section 8.2) for CIs proposed throughout the ITP term. This review process will allow the USFWS to evaluate and comment on impact assessments and conservation measures incorporated into each CI prior to implementation of measures described in this HCP. The review process will also allow any necessary modifications to the impact evaluation and proposed conservation measures for a specific project to be determined prior to issuance of a CI and project enrollment under the HCP. The HCP Administrator and USFWS will work together to determine whether a project qualifies for enrollment under the HCP. The application process for enrollment under the HCP and participation in the CI Program is detailed in Chapter 8.

Once projects have been approved and issued a CI, implementation of the HCP requires both compliance and effectiveness monitoring. Compliance monitoring will be undertaken to ensure accordance with the terms of the CIs, HCP and ITP, including the impacts resulting from the Covered Activities. Effectiveness monitoring will include an assessment of the effectiveness of the minimization and mitigation measures, by evaluating progress towards meeting the biological goals and objectives described in the HCP.

Specific project enrollment review, compliance and effectiveness monitoring, and reporting requirements are described below.

5.4.1 Habitat Conservation Plan Enrollment Monitoring and Review

During the first 12 months of the ITP term, the USFWS will work in good faith with the HCP Administrator and CI applicants to finalize the project impact assessment and conservation measures described in the CI Application (Appendix B) within 30 days of receipt of a draft CI Application (submitted by the HCP Administrator and CI applicant to the USFWS, Appendix B). This review process is intended to ensure the CI Application meets USFWS approval for fully evaluating project impacts and conservation measures prior to enrollment of a project under the HCP. The HCP Administrator can bundle projects for USFWS review to increase efficiency of the review by gathering projects that are temporally or geographically similar, or otherwise have a similar scope of evaluation, as long as the CI applicants agree to the timing of the review.

After the initial 12 months of the ITP term, the HCP Administrator will confer with the USFWS and if agreed to by both Parties, schedule enrollment review periods with USFWS at 6-month milestones during the second year of the ITP term, then annually for the remaining ITP term. If

this schedule is not agreed to, the USFWS and HCP Administrator will collaboratively determine a different review schedule, with a default of continued review as during the first 12 months.

5.4.2 Certificate of Inclusion, Habitat Conservation Plan and Incidental Take Permit Compliance Monitoring and Reporting

The HCP Administrator shall be responsible for monitoring and reporting CI, HCP, and ITP compliance throughout the ITP term. The HCP Administrator will submit a draft annual compliance monitoring report to the USFWS, in hard copy and in editable electronic format, on or before March 15 of each year following ITP issuance. Each annual report shall cover the period from January 1 to December 31 of the preceding year (the "Reporting Period"). The first annual report will only cover the period from ITP issuance to December 31. The HCP Administrator will work with the USFWS prior to submission of the first annual report to finalize the report's contents and ensure all pertinent information will be included. Each year, the submitted draft annual report will be reviewed by the USFWS. Within 30 days of receiving the USFWS' completed review, the HCP Administrator will finalize the annual report and submit the final version to the USFWS.

While the HCP Administrator will be responsible for monitoring and reporting compliance pursuant to the terms of CIs, the HCP and the ITP, it will be the obligation of CI-holders to provide compliance documentation to the HCP Administrator for all project-specific impacts and mitigation offsets related to enrolled projects. Specifically, CI-holders will provide the HCP Administrator with: 1) documentation of the final on-the-ground impacts ("as-built") to suitable LEPC habitat that occurred during Covered Activities (to be submitted within 30 days of completing construction); 2) a written statement that the CI-holder will enforce all minimization measures during the upcoming LEPC breeding season presented in Section 5.3.2.2, if such measures are applicable the project based on proximity to LEPC leks (to be submitted annually to the HCP Administrator no later than February 15 of each year); and 3) documentation that confirms the type, amount, location, and acquisition date for mitigation secured to compensate for the final project-specific impacts to suitable LEPC habitat, as determined through the Impact Assessment process described in Section 4.4, including all mitigation originally secured prior to project construction (to be submitted before implementing Covered Activities) and any additional mitigation secured within six months of construction that was required to true-up deficiencies that may have occurred as a result of the finalization of the as-built layout of the project (to be submitted no later than six months of completing construction). The HCP Administrator will review data provided by each participating CI-holder to verify CI-holder compliance with the CI and HCP. The HCP Administrator will then compile and summarize data provided by participating CI-holders for the Reporting Period and ITP term to provide the USFWS with a program-level assessment of compliance with the ITP.

The HCP Administrator will monitor and report compliance annually both on a per-project basis and aggregated across all enrolled projects. Specifically, the following will be tallied within the Plan Area both annually and cumulatively over the ITP term and provided in the annual compliance monitoring report:

- The location and number of acres of potentially suitable LEPC habitat impacted by oil and gas projects enrolled under CIs
- The total number of acres inclusive of all project footprints and impact radii of surrounding project structures for enrolled projects
- The number of acres of mitigation habitat (a) preserved, and (b) restored, to offset impacts to potentially suitable LEPC habitat
- If applicable, the numerical disparity between on-the-ground impacts to suitable LEPC habitat from enrolled projects and implemented mitigation to fully offset those impacts
- The total impact acreage, to demonstrate compliance with the 200,000-ac cap in the southern DPS and 300,000-ac cap in the northern DPS on impacts to potentially suitable habitat
- The rate of enrolled project impacts, to predict if the 200,000-ac cap in the southern DPS and 300,000-ac cap in the northern DPS is likely to be reached before the end of the ITP term
- The location and area (in acres) of mitigation stronghold habitat provided under the HCP
- Impact minimization measures implemented during project construction and operations
- All non-compliance issues and resolutions

In addition, the compliance monitoring report will include a forecast of if and when the 200,000-ac cap in the southern DPS and 300,000-ac cap in the northern DPS impact threshold is expected to be met during the ITP term and appended CI-holder reports submitted to the HCP Administrator during the Reporting Period.

As projects enrolled under the HCP through a CI conduct Covered Activities, impacts to suitable LEPC habitat will be measured against purchased mitigation to evaluate CI-holder compliance with the CI and overall compliance with the ITP. The HCP Administrator will maintain a ledger of project impacts and mitigation offsets, and the amount of dynamic mitigation (i.e., where take of LEPC through grassland improvement and management activities covered under the HCP could occur) that has been implemented. A copy of the current ledger or electronic access will be provided to the USFWS with the annual report, and made available to the USFWS upon request at any time during the ITP term. The primary purpose of the ledger is to provide documentation of the habitat impacts and mitigation that has occurred, as reviewed and approved by the USFWS, to track whether sufficient mitigation is in place to offset the impacts of the take of LEPC as measured by impacts to suitable habitat, and track the estimated take associated with dynamic mitigation.

This HCP allows for project enrollment throughout the ITP term, and the rate of mitigation credit purchases may indicate interest and need for increasing the 200,000-ac cap in the southern DPS and/or 300,000-ac cap in the northern DPS. Such indication will trigger adaptive management and consultation with the USFWS (see Section 5.5), and likely an amendment of the HCP and ITP (Section 9.8) to accommodate additional project enrollment. Adaptive management (Section

5.5) in response to results of compliance monitoring will also be described in the annual compliance report if applicable to the Reporting Period.

5.4.3 Habitat Conservation Plan Effectiveness Monitoring

The HCP Administrator shall be responsible for monitoring and reporting the progress made towards achieving the HCP's Biological Goals and Objectives. The HCP Administrator will submit an annual effectiveness monitoring report to the USFWS using the same reporting timeline and general reporting methods as the annual compliance monitoring report (Section 5.4.2). It will be the obligation of CI-holders to provide documentation to the HCP Administrator for all project-specific minimization measures resulting from project siting (Section 5.3.2.1). Specifically, each CI-holder will provide the HCP Administrator with a written description and applicable maps to illustrate any project specific layout modifications implemented during the project planning phase (which could have occurred prior to submission of the CI application) to reduce the overall impacts to suitable LEPC habitat, if such minimization measures were implemented by a CI-holder. The HCP Administrator will compile data provided by each CI-holder on a Minimization Measures Report (Appendix D), to be submitted with annual effectiveness monitoring report, and calculate the total reduction in impacts to suitable LEPC habitat for the Reporting Period and cumulatively over the ITP term. CI-holder provided maps and descriptions of minimization efforts will be appended to the Minimization Measures Report.

In addition, the effectiveness monitoring report will include a summary of the types (static and dynamic) and category (preservation and restoration) of mitigation implemented for the Reporting Period and cumulatively over the ITP term. This summary will allow progress toward the HCP's Biological Goals and Objectives (Section 5.2) to be tracked annually over the ITP term.

5.4.4 Mitigation Monitoring and Reporting

Mitigation monitoring will be the responsibility of the provider of the mitigation (i.e., through a bank, in-lieu fee program, or permittee-responsible mitigation) for projects enrolled under this HCP.

The requirements for mitigation monitoring as stipulated under the USFWS LEPC Mitigation Guidelines (2014c) and this HCP includes interim and long-term management and monitoring, as well as reporting. The management agreement between mitigation providers and landowners for each Bank Parcel or other mitigation property will provide the HCP Administrator with the rights and interests necessary for implementing the interim and long-term management obligations under the HCP. The requirements associated with these obligations are described below.

5.4.4.1 Interim Management and Monitoring

Mitigation providers shall be responsible for conducting management and monitoring activities according to the Interim Management Plan developed for a Bank Parcel or mitigation project, in accordance with the USFWS LEPC Mitigation Guidelines (USFWS 2014c). The mitigation provider will implement the Interim Management Plan until all USFWS LEPC Mitigation Guidelines performance standards are met with respect to that Bank Parcel or mitigation project.

5.4.4.2 Long-term Management and Monitoring

Once the performance standards have been met per USFWS LEPC Mitigation Guidelines (USFWS 2014c), the mitigation provider shall implement long-term management and monitoring of the Bank Parcel or mitigation project according to the Long-term Management Plan as described in the USFWS LEPC Mitigation Guidelines.

The mitigation provider shall be obligated to manage and monitor its Bank Parcel or mitigation project in perpetuity to preserve its habitat and conservation values in accordance with the Long-term Management Plan. With the HCP Administrator, mitigation providers and the USFWS shall meet and confer upon the request of the other to consider revisions to the Long-term Management Plan that might be necessary or appropriate to better conserve the habitat and conservation values provided by the Bank Parcel or mitigation project. During long-term management, the mitigation provider shall be responsible for submitting annual reports to the HCP Administrator, who will in turn be responsible for submitting reports to the USFWS.

5.4.4.3 Mitigation Monitoring Reporting

Mitigation monitoring reports will be submitted by the mitigation entities to the HCP Administrator. Each report shall cover the prior calendar year activities, January 1 to December 31 of the preceding year (the “Reporting Period”). The first report will cover the period from the date of mitigation implementation through December 31 of the same year.

Goals for documenting the expected conservation benefit of the mitigation include demonstration of the conservation of relatively large tracts of un-fragmented habitat. Mitigation monitoring will examine the implemented mitigation to evaluate performance relative to the criteria established in the HCP and the Performance Standards set forth in the LEPC Mitigation Guidance (USFWS 2014c). These reports will also describe any deficiencies in attaining and maintaining standards set by this HCP, and any remedial action proposed, approved, or performed. If remedial action has been completed, the report shall also evaluate the effectiveness of that action. Mitigation monitoring reports will also allow mitigation entities to identify necessary adjustments to the price of mitigation credits.

Each annual report submitted by mitigation entities to the HCP Administrator shall contain an itemized account of the management tasks conducted during the reporting period in accordance with the Interim Management or Long-term Management Plan specific to the mitigation contract, including the following:

a. The time period covered; i.e., the dates “from” and “to”
b. A description of each management task conducted
c. The dollar amount expended per management task and the time required for implementation
d. The total dollar amount expended for management tasks conducted during the reporting period

e. The results of mitigation effectiveness monitoring, as stipulated in the Interim or Long-term Management Plan

The HCP Administrator will compile the mitigation monitoring reports received by mitigation providers and submit the reports together with the draft annual compliance and HCP effectiveness monitoring reports to the USFWS, summarized in hard copy and in an editable electronic format, on or before March 15 of each year following ITP issuance.

5.4.5 Compliance and Mitigation Monitoring Audit

No later than the third year after the HCP is implemented and the ITP is issued, a third-party audit of the compliance and mitigation monitoring and financial accounting will be conducted. Thereafter, audits will continue annually for each year in which new projects are enrolled under the HCP for the remainder of the ITP term. The HCP Administrator will provide the audit report to the USFWS for review. If an audit reveals a discrepancy between the total cumulative impacts and the amount of mitigation implemented to fully offset impacts, within 30 days the HCP Administrator will review project-specific documentation to identify the source of the discrepancy and present the USFWS with a written explanation for the discrepancy and proposed corrective action to be taken. Depending on the source of the discrepancy, dispute resolution between the HCP Administrator and the offending CI-holder (Section 8.11) or the Applicant and the USFWS could be initiated (Section 9.6). Discrepancies resulting from clerical errors will be corrected and written documentation of the correction will be provided to the USFWS by the HCP Administrator to be placed in the HCP file. If the audit reveals HCP funding is not sufficient to support administration of the HCP through the end of the ITP term, the HCP administrator will coordinate with the USFWS to determine a plan for remedial action.

5.5 Adaptive Management

This HCP incorporates adaptive management principles and processes as defined in the HCP Handbook (USFWS and NMFS 2016). Monitoring data will provide information about the need for, and type of, adjustments that should be made to the minimization and mitigation measures conformant with the assurances of this HCP. The mitigation entity will provide monitoring results per requirements of the mitigation contract, and will provide a statement along with those data indicating the potential need for such adjustments. Should changes in the HCP be potentially warranted to address significant uncertainty related to the LEPC or the effect of the conservation measures, the mitigation entity will indicate this and meet with the USFWS to discuss possible changes to the conservation measures. Monitoring will determine if the revised approach is effective in progressing toward the goals and objectives described in the HCP, and in this way establish the feedback loop that ultimately refines minimization and mitigation measures in the HCP.

As noted, LEPC take is assessed by proxy as determined by acres of potentially suitable LEPC habitat impacted. There is uncertainty in the extent of take by Covered Activities because risk (exposure to threats) can change over time due to changes in the availability and/or quality of habitat. This, in turn, could affect the distribution and/or number of LEPC individuals within the

Permit Area. Changes in conservation measures will be evaluated in relation to impacts to habitat, and, as needed, addressed through adaptive management responses as described below.

Uncertainty related to the potential change in the amount of available LEPC habitat, and therefore the percentage of habitat affected by the proposed buildout, will be addressed through adaptive management. If the total amount of land within potentially suitable NLCD classes (i.e. grassland/herbaceous or hay/pasture) decreases such that the buildout increases to affect greater than 40% of land within potentially suitable NLCD classes, as measured at the time of ITP issuance (see Section 4.2), then mitigation requirements will increase to bring the total ratio of buildout to available land within potentially suitable NLCD classes to 40%. To achieve this, all new projects enrolling for a CI will provide 1.5 times the estimated mitigation requirement as determined in Section 4.4, until such time that total land within potentially suitable NLCD classes increases such that the realized buildout affects less than 40%, at which time mitigation burdens will decrease to maintain the overall ratio (40% impacted area) as described in the take estimation.

The cumulative impacts of the projects are not well understood, but the addition of multiple projects added in close proximity to each other across the landscape could increase the magnitude of impacts to the species. If a threshold or density of projects is found to be detrimental to the species through new research, then the HCP will restrict enrollment of new projects that would exceed such threshold or density across the landscape.

In addition, as new science emerges, the HCP will re-evaluate the impact radii of project features used to assess project impacts and update accordingly. This could increase or decrease the mitigation burden for new projects, and any adjustments made to the impact analysis will be reflected throughout the HCP. The 2021 *Species Status Assessment for the Lesser Prairie-Chicken (Tympanuchus pallidicinctus)* summarizes the most relevant information regarding LEPC life history, biology, and considerations of current and future risk factors, including impacts resulting from anthropogenic structures on the landscape (USFWS 2021).

Annual monitoring will evaluate how effective incentives were for reducing the loss, degradation, and fragmentation of potentially suitable LEPC habitat (Section 5.4), both on a per-project and cumulative basis. This will be assessed through the avoidance and minimization measure reported by CI-holders for their enrolled projects. If it is found that the majority (65%) of land cover within enrolled project footprints are intact grassland/shrubland cover, then adaptive management will be triggered to further disincentivize habitat fragmentation by increasing mitigation ratios. The HCP Administrator and the USFWS will work together to evaluate mitigation ratio and revised mitigation ratios will be adopted into the HCP if mutually agreed upon by the HCP Administrator and the USFWS.

It will be the HCP Administrator's responsibility to track the changes in amount of land within potentially suitable NLCD classes within the Permit Area. Changes will be evaluated using the most current NLCD data available in Year 5, Year 10, Year 15, Year 20, and Year 25 of the 30-year ITP term. If updated NLCD data are not publicly available at these times, it will be assumed

changes have not occurred during the evaluation period, and no adaptive changes will be made to the monitoring program.

6 NO SURPRISES ASSURANCES, CHANGES AND UNFORESEEN CIRCUMSTANCES

6.1 No Surprises Assurances

This HCP is subject to the federal "No Surprises" Assurances Rule, as published in the FR on February 23, 1998 (63 FR 8859) and codified at 50 CFR Part 17.22(b)(5) and 17.32(b)(5). As detailed, the rule “provides regulatory assurances to the holder of a Habitat Conservation Plan (HCP) incidental take permit issued under Section 10(a) of the ESA that no additional land use restrictions or financial compensation will be required of the permit holder with respect to species covered by the permit, even if unforeseen circumstances arise after the permit is issued indicating that additional mitigation is needed for a given species covered by a permit”. If the USFWS determines that additional conservation and mitigation measures are necessary, but they were not provided for in the HCP, such conservation and mitigation measures will not be required of the Applicant or CI-holders. The No Surprises Rule does not limit or constrain the USFWS, any federal, state, local, or tribal government agency, or a private entity, from taking additional actions at its own expense to protect or conserve a species included in a conservation plan.

The No Surprises Assurances provided by the No Surprises Rule are effective upon USFWS issuance of the ITP. CI-holders and their projects added to the ITP by the process described in Chapter 8 will be covered under the No Surprises Assurances provided by the HCP as of the date of issuance of the CI.

No Surprises Assurances apply to species (listed and future listed) "adequately covered" under an HCP. Species are considered to be "adequately covered" if the USFWS determines the HCP satisfied the ITP issuance criteria contained in ESA Section 10(a)(2)(B) with respect to that species. The LEPC is the only species covered under this HCP and therefore the only species covered by No Surprises Assurances.

The No Surprises Rule recognizes that the Applicant, potential CI-holders, and the USFWS can reasonably anticipate and plan for some changes in circumstances affecting a Covered Species or other species occurring in the Permit Area, or in the geographic region described as the Permit or Plan Area. To the extent such Changed Circumstances are provided for in the HCP (Section 6.2), a CI-holder must implement the measures in response to the Changed Circumstances as described in the HCP. Circumstances that could arise but are unknown or cannot be planned for are considered Unforeseen Circumstances for purposes of the HCP, and are addressed in Section 6.3.

The USFWS provides regulatory assurances to the Applicant and all CI-holders who are compliant with this HCP. Under this HCP, there are 200,000 ac in the southern DPS and 300,000 ac in the northern DPS of potentially suitable LEPC habitat that can be impacted; however, the

HCP Administrator may approach the USFWS with a request to amend this HCP and the associated ITP to allow an increase in the number of total impacted acres permitted.

6.2 Changed Circumstances

Under 50 CFR 17.3, Changed Circumstances are defined as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the Service [USFWS] and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events)." If the Director of the USFWS determines that additional conservation measures are necessary to respond to Changed Circumstances and these measures were set forth in the HCP/ITP Agreement, the Applicant is obligated to implement the measures specified in this HCP (50 CFR 17.22(d)(5)(i) and 17.32(d)(5)(i)). The Applicant and the USFWS believe the following changed circumstances warrant inclusion in this HCP:

6.2.1 The US Fish and Wildlife Service's Policy on Valuing, Restoration, and Preservation of Habitat for Mitigation Changes

If the mitigation value ascribed to habitat restoration and preservation or other mitigation measures changes, the HCP can be amended, as mutually agreeable by the Applicant and the USFWS, to allow these new mitigation measures with according mitigation offset values. Such changes shall only apply to new projects enrolled under the HCP for which mitigation has not yet been fully implemented. As the USFWS' conservation banking policy evolves, and it approves new mitigation options, the Applicant will explore expanding its offerings accordingly to provide the best possible conservation outcomes and remain competitive and current.

6.2.2 New Mitigation Techniques Become Available

Should new mitigation technologies become available, the Applicant can evaluate these for use in this HCP. Should such technologies be applicable and mutually agreeable to both the Applicant and the USFWS, these technologies could be incorporated in the conservation measures and used as mitigation to offset project impacts as agreed upon by the Applicant and the USFWS.

6.2.3 New Methods for Determining Lesser Prairie-chicken Occupancy Become Available.

If methods for more accurate determination of habitat occupancy become available, the Applicant can evaluate the use of these methods, and, if agreed to by the USFWS, use these methods in place of impact assessments using habitat as a proxy for impacts to individuals as described in this HCP.

6.2.4 Impact Distances for Anthropogenic Structures Are Revised

If the impact distances for anthropogenic structures (see Table 3) are changed based on best available science, the new distances will be used in the calculation of new project impacts if agreed to by both the Applicant and the USFWS. Such changes shall only apply to new projects enrolled under the HCP for which mitigation has not yet been fully implemented. If revised impact distances affect the amount of incidental take calculated, the Applicant can seek an ITP amendment to increase the amount of permitted take.

6.2.5 Geographic Information System-defined Suitable Habitat Data Layers Are Revised

If the USFWS Proximity Model (USFWS 2015b) or designation of NLCD grassland/herbaceous lands (Yang et al. 2018, MRLC 2019) change, these modified layers will be used to define potentially suitable LEPC habitat under this HCP.

6.2.6 Change in the Lesser Prairie-chicken Estimated Occupied Range

If the USFWS-defined LEPC EOR is expanded or shifted on the landscape during the ITP term, the HCP Plan Area and Permit Area may be expanded to include the new EOR and surrounding 10-mi buffer through an HCP amendment (Section 9.8.2). At no time will the HCP Plan Area and Permit Area be contracted.

6.2.7 LPC Conservation LLC Wishes to Reassign the Role of Habitat Conservation Plan Administrator to another entity

Should the Applicant elect to transfer the HCP Administrator function to another Party, the Applicant can do so with the agreement of the USFWS. CI-holders will be notified of such change.

6.2.8 Change in the Lesser Prairie-chicken Listing Status after initial Endangered Species Act listing

If the LEPC is listed under the ESA as threatened or endangered and the listing status is subsequently changed over the ITP term, CI-holders will continue to implement the measures described in this HCP for currently enrolled projects. Should the LEPC be listed as threatened with an ESA 4(d) rule, or as endangered, CI-holders can continue to use this HCP as a mechanism for ESA compliance so long as CI-holders have and continue to maintain compliance with all HCP and ITP terms and conditions.

6.2.9 The US Fish and Wildlife Service determines listing the Lesser Prairie-chicken under the Endangered Species Act is not warranted or warranted but precluded

If the USFWS determines listing the LEPC under the ESA is not warranted or is warranted but precluded, CI-holders can exercise their option to surrender their CI, subject to the terms and conditions of the CI, and as consistent with any contractual obligations to the HCP Administrator; however, doing so will forfeit CI-holder status and automatically void all regulatory assurances and ITP authorization should the LEPC be listed at a future date during the ITP term. If a CI-holder instead chooses to maintain enrollment status by continuing to pay Administration Fees and implementing the conservation measures and terms of this HCP and the associated ITP after a "not warranted" determination by the USFWS, regulatory assurances and ITP authorization will continue to apply to the CI-holder in the event the LEPC is subsequently listed at a future date during the ITP term.

6.2.10 Fire Negatively Impacts Conservation Lands

If fire negatively impacts conservation lands, the Applicant will consult with the USFWS to determine the appropriate course of action for habitat restoration within the conservation lands, pursuant to Section XII(A)(3) of the LEPC PCBA, or similar provisions in existing mitigation agreements.

6.2.11 Mitigation Parcels of Equal or Higher Crucial Habitat Assessment Tool Category Are Not Available When Needed to Offset Impacts

If mitigation parcels of equal or higher CHAT category cannot be secured to offset impacts for a particular enrolled project, the HCP Administrator will work with the USFWS to reach an agreed upon solution. Priorities for the solution will include assurances for funding to provide mitigation costs estimated at the time of desired enrollment, and/or establishing a process for recognizing release of mitigation credits established through restoration (in designated CHAT 3 or 4 habitat) that achieve CHAT 1 or 2 performance standards and be credited at this higher CHAT category.

6.2.12 The Crucial Habitat Assessment Tool is Revised

If the CHAT is revised during the ITP term, the HCP Administrator and the USFWS will review the revised CHAT data. The revised version of the CHAT may be adopted into the HCP in place of version 3.0 (Section 5.3.3.1) if agreed upon by both the HCP Administrator and the USFWS. Such changes shall only apply to new projects enrolled under the HCP for which mitigation has not yet been fully implemented. Changes affecting mitigation parcels will be addressed as described in Section 6.2.13.

6.2.13 Crucial Habitat Assessment Tool Categories Change such that Lands Used for Dynamic Mitigation through Restoration are Reassigned to a Lower Crucial Habitat Assessment Tool Category.

If mitigation parcels currently under a land control contract for mitigation are reassigned to a lower CHAT category during the ITP term and an updated CHAT is adopted into the HCP (Section 6.2.12), the original CHAT category value will be retained for that mitigation. Mitigation values will be retained in perpetuity if the mitigation is static and/or permanent. If the mitigation is dynamic and provides restoration credit, the value of the mitigation parcel will change to the newly defined value at the time that the dynamic mitigation term is concluded, unless that mitigation parcel is at that time switched to permanent mitigation (Section 5.3.3), in which case it will retain its original CHAT categorization.

6.2.14 A Programmatic Agreement for National Historic Preservation Act compliance is Developed

If a programmatic agreement is developed for NHPA compliance during the ITP term, the HCP Administrator will coordinate with the USFWS to evaluate if the programmatic agreement should be adopted into the HCP. If both the HCP Administrator and the USFWS agree the programmatic language and agreement are appropriate for inclusion in the HCP/ITP, the programmatic agreement will be adopted into the CI-application process (Worksheet 8, Appendix B).

6.2.15 Changed Circumstances Not Provided for in the Habitat Conservation Plan

If the USFWS determines additional conservation and mitigation measures are deemed necessary to respond to Changed Circumstances and such measures were not provided for in the HCP, the USFWS will not require any conservation and mitigation measures in addition to those provided for in the HCP without consent of the Applicant, provided the HCP is being properly implemented.

6.3 Unforeseen Circumstances

Unforeseen circumstances are "changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers or the USFWS at the time of the conservation plan's negotiation and development, and that result in a substantial and adverse change in the status of the covered species" (50 CFR 17.3 [1975]).

From 50 CFR 17.22 (b)(5) (iii) *Unforeseen circumstances.*

(A) In negotiating unforeseen circumstances, the Director will not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan without the consent of the permittee.

(B) If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, the Director can require additional measures of the permittee where the conservation plan is being properly implemented, but only if such measures are limited to modifications within conserved habitat areas, if any, or to the conservation plan's operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible. Additional conservation and mitigation measures will not involve the commitment of additional land, water or financial compensation or additional restrictions on the use of land, water, or other natural resources otherwise available for development or use under the original terms of the conservation plan without the consent of the permittee.

(C) The Director will have the burden of demonstrating unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. The Director will consider, but not be limited to, the following factors:

(1) Size of the current range of the affected species;

(2) Percentage of range adversely affected by the conservation plan;

(3) Percentage of range conserved by the conservation plan;

(4) Ecological significance of that portion of the range affected by the conservation plan;

(5) Level of knowledge about the affected species and the degree of specificity of the species' conservation program under the conservation plan; and

(6) Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

In the case of an unforeseen circumstance, the USFWS, any federal, state, or local government agency, nongovernment organization, or private entity can take any actions necessary in order to conserve a species, as long as the actions are at the expense of that entity.

In the event of an unforeseen circumstance, the USFWS will provide at least a 30-day notice of a proposed finding of unforeseen circumstances to Applicant and CI-holders and will work with the Applicant to develop an appropriate response to the new conditions. The Applicant will have the opportunity to submit information to rebut the proposed finding, if deemed necessary.

7 FUNDING

7.1 Overview

Under the ESA, an Applicant's HCP must specify "the funding that will be available to implement" the steps the Applicant will take to minimize and mitigate impacts of the taking (ESA Section 10(a)(2)(A)(ii); see also 50 CFR 17.22(b)(1)(iii)(B)). USFWS must issue an ITP if it finds that the Applicant, among meeting other criteria, "will ensure that adequate funding for the plan will be provided," including funding that will be available to implement steps to "monitor, minimize and mitigate the impacts of the taking." (ESA Section 10(a)(2)(B)(iii); see also 50 CFR 17.22(b)(2)(i)(C)). This chapter describes the funding sources and assurances that will be provided to the USFWS under this HCP to satisfy these obligations.

Each CI-holder must provide funding assurances to the HCP Administrator sufficient to fund the costs of implementing the individual CI-holder's requirements as described throughout the HCP. This HCP will be a "pay-as-you-go" HCP; that is, CI-holders will pay Enrollment and Administrative Fees to enroll projects in the HCP and separately provide Mitigation Fees as described below (with appropriate assurances for both) before initiating Covered Activities. Therefore, funding for mitigation is assured prior to the commencement of Covered Activities. CI-holders must demonstrate adequate funding sources to fully implement the actions described in this HCP and the terms and conditions of the CI prior to CI approval. Expenses related to these activities are the sole responsibility of the CI-holder. Failure to demonstrate appropriate funding prior to CI approval may be grounds for denying enrollment. Project LLCs interested in enrolling a project but unable to provide the financial assurances described here will not meet the qualifications for approval of a CI and should contact the HCP Administrator for additional guidance or potential approval of alternative funding mechanisms. Failure to follow through on CI funding commitments after enrollment is complete will invalidate ITP coverage and assurances for the CI-holder. Future enrollment for the Project LLC and parent company will be at the discretion of the HCP Administrator.

The costs for each element of the HCP presented below were calculated based on 2020 estimates adjusted for inflation over the ITP term using the Consumer Price Index over the past 35 years (2.7%; US Department of Labor 2018). Funding requirements and funding assurances for the HCP are summarized in Table 6 and are described in detail in the sections that follow. Details of cost derivations are provided in Appendix E.

Table 6. Estimated costs for implementing the Habitat Conservation Plan (HCP). See Appendix E for cost details.

Budget Item	Average Annual Cost	Funding Assurance
Administration Costs		
Habitat Conservation Plan (HCP) Administration (includes Application[1], Enrollment[1], and Administration Fees)	$1,237,089	HCP Administration costs to be funded as a "pay-as-you-go" approach though Application Fees, Enrollment Fees, and annual Administration Fees to be paid by the Certificate of Inclusion (CI)-holders at project application and enrollment and prior to CI issuance.
Conservation Program Costs		
Per Project Impact Assessment (including design modification for avoidance and minimization)	not applicable: paid prior to ITP enrollment	Self-paid by each CI-holder prior to CI issuance; there are no costs associated with the project impact assessment after approval of a CI application.
Avoidance and Minimization Measures	not applicable: paid prior to ITP enrollment	Self-paid by each potential CI-holder prior to CI issuance; there are no costs associated with avoidance and minimization measures after submittal of CI application.
Mitigation[1, 2]	$75,000,000	Costs to fully implement mitigation paid by CI-holder to the mitigation entity at project enrollment and prior to CI issuance and implementation of Covered Activities.
Adaptive Management	Not applicable; factored into mitigation price	Costs factored into mitigation credit price.
Changed Circumstances and Contingency Fund	$3,750,000	Funded by CI-holders through a third-party guarantor; 5% of mitigation price.
Total	**$79,987,089**	

[1]Assumes steady enrollment of approximately 33 projects per year; 1,000 projects over the Incidental Take Permit (ITP) term.

[2]Assumes impacts lesser prairie-chicken (LEPC) habitat are equally distributed among Crucial Habitat Assessment Tool (CHAT) categories (i.e., mitigation ratio) and over ITP years. Mitigation will be paid at the free-market mitigation credit price. Response to adaptive management or changed circumstances may further affect mitigation credit price.

7.2 Habitat Conservation Plan Administration Cost Funding

HCP overhead and administration tasks such as preparing and submitting reports, communicating HCP compliance to USFWS, scheduling meetings, coordinating monitoring measures by the HCP Administrator and CI-holders are estimated to cost $1,237,089 in ITP Year 1, and $56,076,337 over the ITP term. Administrative Costs (Table 6; see Appendix E for detailed breakdown) will include the labor costs required for the HCP Administrator and any Administrative Staff to fulfill their stated duties related to implementation of the HCP (Section 9.1.1).

In addition, Administrative Costs will include an annual third-party audit (Sections 5.4.5) of the HCP compliance and mitigation monitoring, to begin no later than the third year after the HCP is

implemented. Other Administrative Costs include typical costs associated with running an organization, including, but not limited to:

- Employee travel
- Maintaining an office space
- Insurance (general liability, errors and omissions, worker's compensation, other)
- Payroll and processing fees
- Equipment

Over the ITP term, Administrative costs will be met through the collection of Application Fees, Enrollment Fees, and Administration Fees. Each of these are described below.

7.2.1 Application Fees

The HCP Administrator will collect a $500 Application Fee from each prospective CI-holder to fund the initial review of CI-application plans and materials (Section 8.2). The HCP Administrator can revise the Application Fee schedule during the ITP term. Funding assurances are based on a predicted average Application Fee of $500 per enrolled project and are estimated to cost $16,667 in ITP Year 1, and $755,488 over the ITP term (Appendix E). The Application Fee will be non-refundable if a prospective CI-holder decides to not proceed in the enrollment process. Mitigation offset lands will not be set aside or "held" based upon submittal of an Application Fee.

7.2.2 Enrollment Fees

HCP Administrative Costs will be met in part by an Enrollment Fee for each project enrolled in the program to cover costs incurred by the HCP Administrator and Administrative Staff to enroll a project (see Section 9.1 for cost requirements). The Enrollment Fee will be based upon an hourly rate (estimated in Table 6 and Appendix E) plus a 10% fee. The HCP Administrator can determine the amount of the hourly rate on a case-by-case basis, taking into account the level of effort required by the HCP Administrator or its consultants or staff to process the application, inflation, labor shortages, or other factors. The HCP Administrator will set the Enrollment fee amount following coordination with the CI applicant (as a work product in return for the Application Fee) for each enrolled project. While the HCP Administrator can adjust the Enrollment Fee during the ITP term, any increases would only apply to CIs issued for projects initiated after the adjustment is made (i.e., new CI-holders or new projects enrolled by existing CI-holders). Enrollment fee funding assurances are based on a predicted average Enrollment Fee of $13,200 per enrolled project and are estimated to cost $440,000 in ITP Year 1, and $19,944,875 over the ITP term (Appendix E).

7.2.3 Administration Fees

In addition, once a project has been issued a CI, the CI-holder will also be required to pay annual Administration Fees to cover the ongoing operations of the HCP Administrator and Administration Staff. Similar to Enrollment Fees, which will vary depending upon the time remaining to the end of the ITP term. The HCP Administrator can adjust the Administration Fee during the ITP term,

but any increases would only apply to projects issued CIs after the adjustment is made, with the exception of any adjustments for inflation that are included in the CI terms and conditions. Administration Fee adjustments could be driven by inflation, number of applications submitted, Adaptive Management triggers (Section 5.5), Changed Circumstances (Section 6.2), or other factors. Funding assurances are based on an estimated cost of $780,423 in ITP Year 1, and $35,375,975 over the ITP term (Appendix E). The average annual Administration Fee per enrolled project will vary depending on total number of projects enrolled under the HCP.

7.3 Conservation Program Funding

CI-holders must demonstrate funding assurances for full implementation of the HCP, including implementation of minimization, mitigation and changed circumstances. Funding required under ESA Section 10(a)(2)(B)(iii) can be assured through one of the following options:

- Financial test and Corporate Guarantee
- Letter of Credit
- Trust Fund
- Surety Bond
- Performance Bond
- Insurance

Funding requirement mechanisms are summarized in Table 6, described in detail below, and in Appendix E.

7.3.1 Avoidance and Minimization

Funding for project avoidance and minimization measures will be provided through each CI-holder's Impact Assessment implementation costs and each project's construction and operation budgets. Costs for project avoidance and minimization measures are estimated and provided in Table 6 and Appendix E; however, precise costs will be project-dependent. It is expected the specific cost of mitigation, as determined during each project's Impact Assessment, will drive project layout modifications to avoid and minimize impacts to potentially suitable LEPC habitat (Section 4.4). As such, the costs associated with identifying specific avoidance and minimization measures related to project siting will be part of the cost prospective CI-holders will pay their staff or third-part contractors to develop a project-specific Impact Assessment. Implementing project layout modifications (Section 5.3.2.1) are expected to result in a reduced mitigation obligation and thus some degree of cost savings compared to initial project development plans; however, some project layout modifications could result in additional costs compared to initial development plans, for example a larger distance of direction boring required to avoid surface disturbance of suitable habitat. Avoidance and minimization measures associated with project siting will be project-specific and accommodated by each project's construction budget. The costs associated with the seasonal and time-of-day restrictions intended to minimize disturbance to LEPC near a project during the breeding season (Section 5.3.2.2) are expected to primarily result in some form of lost

revenue and will be accommodated by each project's construction and/or operation budget. CI-holders will be required to adhere to the seasonal and time-of-day restrictions outlined in this HCP (Section 5.3.2.2) in order to maintain compliance with the CI. No monetary transfer of funds will be made from the CI-holder to the HCP Administrator for the avoidance or minimization measures defined in this HCP; rather, all costs associated with avoidance and minimization measures will be incorporated into the CI-holder's Impact Assessment implementation costs and each project's construction and operations budgets.

7.3.2 Mitigation

Mitigation Fees will be paid by CI-holders prior to the commencement of Covered Activities. The cost of mitigation credits could vary between static and dynamic mitigation. The purchase price of each Mitigation Credit will be set by the mitigation provider and will include all costs incurred by the mitigation provider including the qualifying acreage, all long-term operations and maintenance costs, performance monitoring and reporting (by the mitigation entity), and a non-wasting endowment to ensure mitigation is in place and meeting performance criteria in perpetuity. Static mitigation funding will be established and paid in full by the prospective CI-holder at the time of Project enrollment. To identify funding assurances, dynamic mitigation costs are assumed to equal that of static mitigation (Section 5.3.3). Because dynamic mitigation may be provided by multiple mitigation entities over time and costs for mitigation may vary over time, costs will be assured by use of one of the following mechanisms:

- Establishment of a non-wasting endowment established at the time of Project enrollment, in the amount of 100% of the cost of static mitigation, with an annual escalator of 2.7%, or
- Agreement by the CI-holder to translate the dynamic mitigation to static mitigation by the end of the ITP term, and fully pay the costs to do so.

Payment for the above will be held by the HCP Administrator. At the end of the ITP term, the Administrator, who will remain in place for at least two years after the ITP term concludes (Section 9.1.1), will either remain in place or set up a trust or other organization to manage dynamic mitigation funds, or will ensure that all remaining dynamic mitigation is restructured to static mitigation.

7.3.3 Mitigation Price Adjustment

To avoid Mitigation price becoming outdated, insufficient at carrying out the conservation needs of the LEPC, or mitigation entities being unable to meet market prices necessary to secure strategic conservation locations with private landowners, Mitigation price adjustments could be proposed by a mitigation provider. If a Mitigation price adjustment is warranted, the mitigation provider will review its actual cost experience, as well as other indicators of cost changes, such as other land transaction data. Once the revised cost estimates are determined, the Mitigation Fees will be recalculated to set the fee level necessary to cover mitigation costs and ensure sufficient funding is available to meet the mitigation obligations, including Changed Circumstances funding. The HCP Administrator will then adjust the price of mitigation, but any increases would only apply to projects that commence Covered Activities after the adjustment is made.

7.3.4 Changed Circumstances and Contingency Fund

Changed Circumstances are provided in Section 6.2. A Changed Circumstances and Contingency Fund (see Table 6) will assure funding sufficient to address the reasonably foreseeable Changed Circumstances responses triggered under a CI, and to provide a funding contingency buffer in the event that costs are underestimated. A sum of money (equal to 5% of the total required CI mitigation funding) sufficient to cover these contingencies will be accounted for through a guarantee held through a third-party guarantor. Evidence of this assurance will be provided to the HCP Administrator. This should reasonably provide funds to implement responses required under a CI should funds be needed. This funding will be secured at the time of project enrollment under the CI. CI-holder Changed Circumstances and Contingency Fund costs are estimated to cost $3,750,000 in ITP Year 1, and $169,984,726 over the ITP term (Appendix E). If a project for which a CI is held does not implement changed circumstance responses or require contingency funding during the ITP term, the CI-holder for that project will be released from the 5% changed circumstance and contingency funding assurance, and any held fees will be returned to that CI-holder according to the vehicle through which funding was assured.

8 CERTIFICATE OF INCLUSION PROGRAM PARTICIPATION AND ADMINISTRATION

8.1 Purpose and Applicability

The purpose of the issuance of a CI is to provide oil and gas companies the option and benefits of complying with the terms of the ITP. Companies who desire to participate in the HCP and undertake projects within the Permit Area that involve Covered Activities can apply for a CI to enroll their project under the HCP and ITP. A summary of the process for participation of a project under a CI is shown in Figure 9 and described in detail below. A CI will provide incidental take coverage to the individual CI-holders should the LEPC be listed and project Covered Activities lead to incidental take of LEPC within the Permit Area pursuant to the terms of the Permit and this Agreement.

The CI program applies to individual companies or associated project LLCs, and a CI can be issued only by the Administrator of the ESA Section 10(a)(1)(A) Permit.

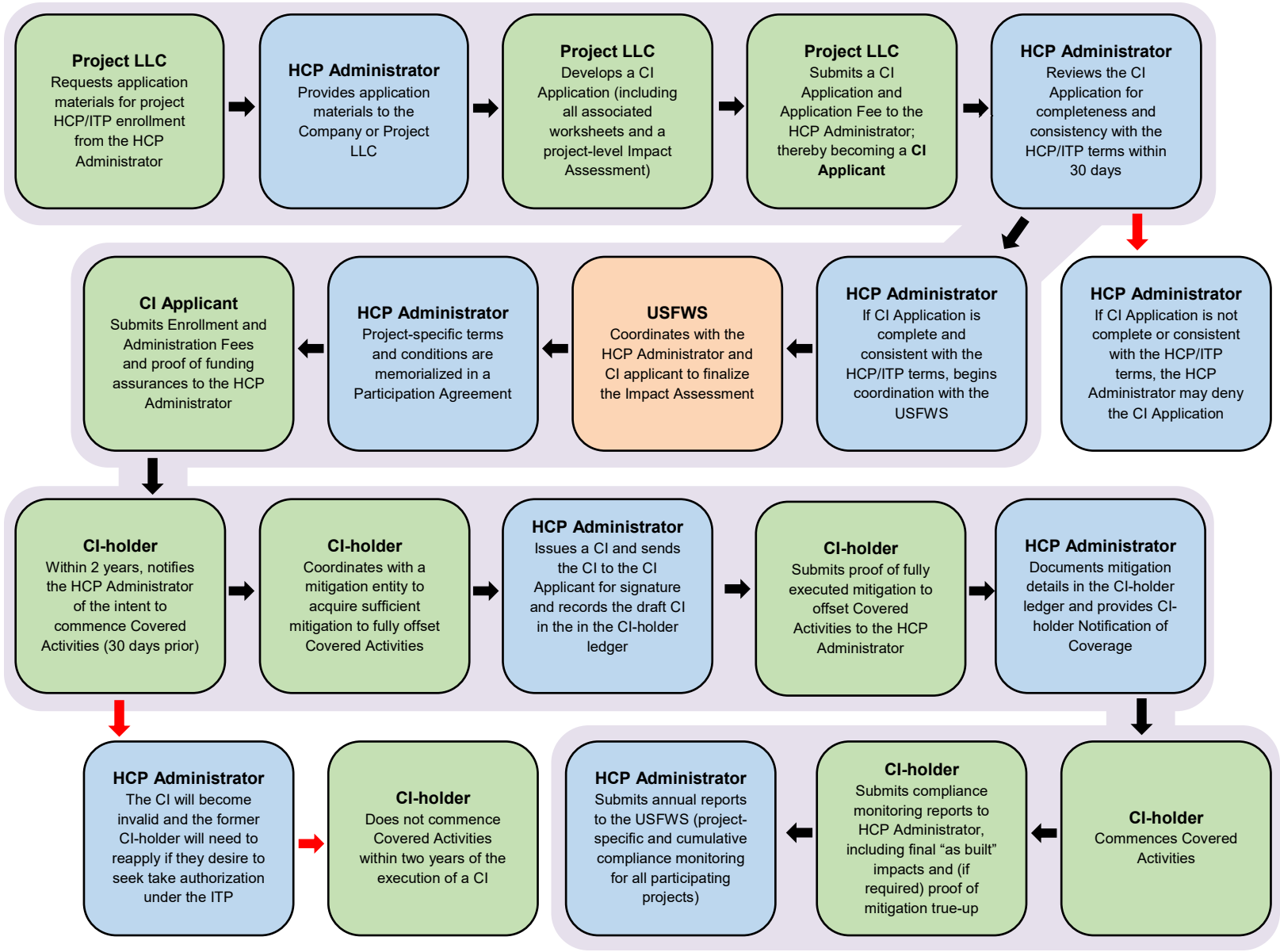

Figure 9. Summary of the process for participation of a project under a Certificate of Inclusion (CI).

8.2 Eligibility

The HCP Administrator will determine whether projects qualify for enrollment under the HCP and ITP through the application process described in Section 8.2. To be eligible for enrolment, Covered Activities must occur within the Permit Area. Projects sited completely within areas that do not meet the conditions of potentially suitable LEPC habitat, as described in Section 4.4, can enroll in the HCP to receive regulatory assurances in the event that land management on or near their projects improve habitat conditions, leading to the potential for future impacts to LEPC.

8.3 Development of Standards and Procedures

The HCP Administrator will accept applications for the issuance of CIs and will issue such certificates only after the HCP Administrator determines the Application and supporting materials are consistent with the terms of the HCP and the ITP, and the USFWS will provide review and appropriate comments or concurrence. The standards and procedures will be consistent with this HCP and other applicable provisions.

8.4 Application Process

An oil and gas company or associated project LLC seeking to obtain incidental take coverage under this HCP and the associated ITP will first need to contact the HCP Administer to request the current application materials. An example CI Enrollment Application is provided in Appendix B; however, the application will evolve over time to meet the needs of the HCP Administrator and USFWS in order to streamline the application process. General information provided in each CI application will include:

- a detailed description of the proposed activity
- a map indicating the proposed final location of the activity
- maps and detailed descriptions of any layout modifications made to minimize the potential impacts to LEPC
- an analysis of the potential impacts to the LEPC (as described in Section 4.4 of this HCP) for the proposed final location of the activity
- documentation of the funding assured to implement the CI and HCP terms and conditions;
- an Information, Planning and Consultation (IPaC) assessment of ESA-listed species likely to occur within the project footprint and, if applicable, documentation of the project-specific approach for compliance with ESA for species not covered under this HCP, BGEPA and NHPA
- any additional information requested by the HCP Administrator (refer to Appendix B for examples of the types of additional information that will be requested)

CI applicants will submit a completed application for the proposed activity, supporting materials, and the application fee indicated on the application materials to the HCP Administrator. The HCP Administrator will make best faith efforts to, within 30 calendar days of receiving the application for a CI and application fee, review the application and supporting documents to determine if the application is complete and in compliance with the terms of the HCP and ITP. If the application is incomplete or not in compliance with the terms of HCP and ITP, the CI applicant may revise the original Ci application. The initial application fee will cover one round of review for a revised CI application, so long as the revised application is received within 90 days of the original CI application submission. The HCP Administrator may deny an application for a CI if the HCP Administrator determines, in its sole discretion, that the proposed inclusion is not consistent with the ITP Permit or this Agreement. If the HCP Administrator determines the application is complete and in compliance with the requirements of the Permit, the HCP Administrator will forward the Application to the USFWS for a consistency review. The USFWS will provide comments and work collaboratively with the HCP Administrator and CI applicant to finalize the project impact assessment and conservation measures described in the CI Application (Appendix B). The USFWS will work in good faith with the HCP Administrator and CI applicant to complete the review within a target of 30 days from receiving the draft CI Application (submitted by the HCP Administrator and CI applicant, Appendix B). If the USFWS will be unable to complete the review within 30 calendar days, the USFWS will notify the HCP Administrator and CI applicant of the anticipated delay at least 15 days prior to the previously agreed upon completion date to discuss a mutually agreed upon extension. Once the USFWS determines the application and supporting materials are consistent with the terms of the Permit, project-specific terms and conditions will be memorialized with a Participation Agreement and the CI applicant will be required to submit the applicable Enrollment Fee (Section 7.2.2) and Administration Fees (Section 7.2.3) and proof of funding assurances consistent with the requirements of the Conservation Plan (Chapter 5). After receipt of applicable fees and documentation of funding assurances, the HCP Administrator will issue a CI as described below.

8.5 Issuance of a Certificate of Inclusion

Upon a finding by the HCP Administrator that the applicant for a CI has: (i) complied with the HCP Administrator's application requirements, standards and procedures; (ii) has received a determination by the USFWS that the application and supporting materials are consistent with the Permit, (iii) submitted funding to complete assurances consistent with the requirements of the Conservation Plan (Chapter 5); and (iv) demonstrated, to the HCP Administrator's satisfaction, that the proposed activity complies with all terms and requirements of the CI (Section 8.6), and issuance of the CI will not compromise the Biological Goals and Objectives described in Section 5.2, the HCP Administrator can approve the application and issue a signed CI to the prospective CI-holder. The CI will be signed by the prospective CI-holder and the HCP Administrator. By signing the CI, the prospective CI-holder agrees to be bound by and comply with the terms of the CI, the HCP Administrator's standards and procedures, and all applicable terms of the Program Documents. Upon obtaining the required signatures, the HCP Administrator will record the fully executed CI in the CI-holder ledger. The CI-holder will be provided with incidental take coverage under the ITP provided Covered Activities commence within two years of the CI issuance and the CI-holder provides the HCP Administrator proof of fully executed

mitigation to offset the Covered Activities, purchased at the free-market price at the time impacts will occur. If the CI-holder does not commence Covered Activities within two years of the CI being issued, the CI will become invalid and the former CI-holder will need to reapply should they desire to seek take authorization.

8.6 Terms of Certificate of Inclusion

Incidental take coverage for any oil and gas company or associated project LLC provided with incidental take coverage pursuant to a CI will be available only to the extent the company or associated project LLC is in full compliance with all relevant requirements of the CI, the standards and procedures adopted by the HCP Administrator issuing the CI, and all other applicable legal requirements. The HCP Administrator will include as part of any CI, among other provisions:

1. a condition requiring compliance with the CI, HCP and ITP;
2. a specific designation of the land or property to which the CI applies;
3. a description of the Covered Activity for which the CI was issued, including the anticipated project footprint (impacts);
4. a requirement that the CI-holder pay the mitigation fee calculated for enrollment;
5. a requirement that the CI-holder pay an Enrollment Fee (Section 7.2.2) and annual Administration Fee (Section 7.2.3) to cover the ongoing operations of the HCP Administrator;
6. a requirement that the CI-holder will grant the HCP Administrator and/or USFWS access to the land or property to which the CI applies to verify site-specific details, pending reasonable notice (full access may be limited due to constraints associated with underlying leases, rights-of-way, or other landowner agreements);
7. in the event of a breach of the CI, and if after reasonable notice by the HCP Administrator and an opportunity to cure, the individual oil and gas company or associated project LLC provided with incidental take coverage pursuant to a CI fails to cure, remedy, rectify, or adequately mitigate the effects of the breach, the HCP Administrator will suspend or revoke the CI. Each CI will contain a contractual agreement between the HCP Administrator and the CI-holder that should the CI be revoked or suspended, the CI-holder will pay to the HCP Administrator financial damages at an amount equal to $250,000 plus all damages as specified by the HCP Administrator required to remedy the breach, to include, but not be limited to, payment of any outstanding enrollment fees and obligated mitigation fees plus recovery of attorney's fees if legal action becomes necessary;
8. that the CI is valid for a specific term, not to exceed the 30-year term of the Permit;
9. a requirement that the CI-holder notify the HCP Administrator at least 30 calendar days prior to the commencement of Covered Activities;
10. a requirement that a copy of the recorded CI will be made available to the public upon request (within five business days to allow for the HCP Administrator to respond to the

request) for the period of time Covered Activities are being conducted by the CI-holder and, if applicable and requested, that the holder provide notice of the CI to any purchaser of its services or goods that are sold or used within the Permit Area;

11. that the CI is not transferable unless approved by the HCP Administrator, and the HCP Administrator will not approve a transfer unless the HCP Administrator determines, to its satisfaction, that the transferee will comply with all terms and conditions of the CI and that the transferee will not cause any deviation from any Covered Activity described in the CI; and
12. that CI-holders work with the Applicant, USFWS, State Historic Preservation Offices, and Tribal Historic Preservation Officers to assist the USFWS in fulfilling the requirements of Section 106 of the National Historic Preservation Act of 1966, 16 USC 470f (1966), and its implementing regulations at 36 CFR 800 (2000).

8.7 Notice Required After Issuance of Certificate of Inclusion

The HCP Administrator will promptly notify, and within 30 days of issuance, will provide a copy of the CI to the USFWS and the CI-holder. The HCP Administrator will also notify such persons of any suspension, revocation, transfer, or renewal of the CI.

8.8 Term of the Habitat Conservation Plan

These provisions will govern the implementation of the CI Program for the 30-year ITP term unless and until they are revoked, replaced, or modified through Changed Circumstances (Section 6.2) or Adaptive Management (Section 5.5).

8.9 Amendments to a Certificate of Inclusion

A CI can be amended at the request of the CI-holder and agreement from each of the affected Parties. The HCP Administrator will process CI amendment requests in a timely manner. CI amendments to expand project footprints beyond the limits originally analyzed in the CI Application will be subject to upholding the conditions set forth in any HCP/ITP amendments in place at the time the CI amendment is approved, including any and all conditions that result in an increased cost of mitigation that exceeds the cost per credit agreed upon at the initial execution of the CI.

A CI can also be amended to accommodate changes to applicable legal requirements, including but not limited to the ESA, the National Environmental Policy Act of 1969 (NEPA), and the USFWS' permit regulations at 50 CFR 13 (1974) and 50 CFR 17 (1975). The Party proposing the amendment shall provide a statement describing the proposed amendment and the reasons for the amendment.

8.10 Transfer of a Certificate of Inclusion

This HCP shall be binding and is to the benefit of the CI-holders enrolled via CIs and any successors or transferees (i.e., new owners). The rights and obligations under CIs shall run with the enrolled project and must be transferred to subsequent non-federal owners. The CI-holder

shall notify the HCP Administrator of any transfer of an enrolled project or project LLC, and provide the HCP Administrator with a letter from the prior owner and the new owner indicating both Parties' consent to transfer the CI. The HCP Administrator will approve the proposed transfer of the CI, provided the HCP Administrator determines the proposed transferee agrees to fully implement the actions described in this HCP and maintains compliance with all terms and conditions of the CI, including providing adequate written assurances that the transferee will provide sufficient funding for the remaining annual Administration Fees for the remainder of the CI term. The HCP Administrator or the USFWS will add no new conditions to the CI, if the CI is fully implemented at the time of the transfer. The regulatory assurances provided by the CI shall extend to the new owner(s), including the incidental take authorization and assurances it provides. As a Party to the HCP and ITP, the new owner(s) would have the same rights and obligations with respect to the enrolled project as the original owner. This will be considered a transfer of the CI, and not a new CI subject to any amendments that have occurred to the HCP and ITP since the CI was originally issued.

Transfer of the CI will be documented by the HCP Administrator in the enrolled project's file and the HCP Administrator will update its ledger for the respective CI-holders to reflect the current project ownership. The USFWS can review this ledger upon request. Additionally, annual reports to USFWS will identify CI-holder project transfers during the applicable reporting period. No changes to the ITP will be required for such transfers among CI-holders.

8.11 Noncompliance Dispute Resolution for a Certificate of Inclusion

The Applicant and the USFWS agree to work together with CI-holders, and when appropriate Property Owners, in good faith to resolve any disputes using dispute resolution procedures agreed upon by all Parties.

8.12 Termination of a Certificate of Inclusion

The duration of a CI-holder's participation in the HCP can be the full duration of the HCP if the CI-holder wishes coverage under the ITP, or the CI-holder can terminate the CI if the CI-holder has remitted all Application, Enrollment, and Administrative Fees in accordance with the terms and conditions of the CI, and the CI-holder has complied with (and fully funded) all minimization and mitigation requirements set forth in the HCP.

The HCP Administrator will have full rights to enforce the terms of the HCP and ITP against any and all CI-holders that violate CI or HCP terms and conditions, including but not limited to avoidance or separate take authorization, as necessary, for all federally protected species that occur within respective project area(s). The failure of a CI-holder to carry out its obligations in accordance with the HCP shall not be a basis for revocation, termination, or suspension of the authorization of the Covered Activities for other CI-holders or the Applicant, unless the USFWS finds the Applicant to be negligent in pursuing corrective action towards a non-compliant CI-holder. By acceptance of this HCP and issuance of the ITP, the HCP Administrator agrees it will use its rights of enforcement in such a manner as to not adversely affect the rights and benefits under the ITP of CI-holders who remain in compliance with the terms of the HCP, ITP, and CI agreements.

The HCP Administrator and the USFWS expect if any failure of CI-holders to comply with the terms of the HCP is not resolved, an appropriate action will be to terminate the CI. If termination of a CI is decided, the HCP Administrator will notify the CI-holder in writing by providing a Notice of Termination by certified or registered mail, as well as a copy by electronic mail. This notice shall identify the CI for which enrollment under the HCP and ITP will be terminated, the effective termination date, and the reason(s) for the termination.

8.13 Certificate of Inclusion Renewal

In the event that the HCP and ITP are renewed pursuant to 50 CFR 13.22 (Section 9.10) and a CI-holder wishes to continue receiving regulatory assurances through participation in the HCP, the CI-holder can submit a written request to the HCP Administrator at least 10 days prior to the CI expiration. This renewal request must certify that the information in the original CI Application is still correct and the CI-holders commitment to continue providing annual Administration Fees.

9 HABITAT CONSERVATION PLAN ADMINISTRATION

As described in Section 1.3, this HCP is a programmatic HCP with a single permit. In addition to serving as the Permit Holder, the Applicant will also serve as the HCP Administrator. Administrative Costs (Section 7.2) will be funded through the collection of CI-holder Application Fees as well as annual Administrative Fees to be paid by the CI-holder. These fees will ensure that the HCP Administrator remains solvent and maintains adequate resources to timely and fully carry out the administrative duties under this HCP and the associated ITP.

9.1 The Habitat Conservation Plan Administrator and Administration Staff

The purpose of the HCP Administrator is to administer the HCP, the ITP, and amendments thereto. At the end of the ITP term, in the event the ITP is not renewed (Section 9.7), the HCP Administrator will remain in existence until two years after the expiration of the ITP to ensure all remaining mitigation provider commitments are legally in place, including securing the management of any dynamic mitigation implemented over the ITP term in perpetuity.

9.1.1 Habitat Conservation Plan Administrator Roles and Responsibilities

The HCP Administrator's responsibilities are defined throughout the HCP; the following is a non-exhaustive summary list of those activities:

- Be a primary point of contact with the USFWS for all matters related to the HCP
- Hire and oversee HCP Administrator staff and consultants
- Track and prepare HCP Administrator budgets, and handle HCP Administrator finances (e.g., preparing, sending, and collecting Administration Assessments, paying bills)
- Administer the project enrollment process, create and maintain the project ledger

- Seek out, evaluate, and recommend mitigation credits or projects as needed to assist CI-holders and assist with mitigation reviews and any needed adjustments in the amount of mitigation provided; determine if mitigation is being completed in accordance with the HCP/ITP
- Coordinate Monitoring, Adaptive Management, and Changed Circumstances implementation to ensure it is being completed in accordance with the HCP/ITP
- Make payments from funding assurance instruments in accordance with the HCP/ITP
- Prepare annual reports; the HCP Administrator will compile CI-holder's report(s) into a single, briefly summarized document for each annual reporting event
- Communicate status of HCP compliance to USFWS through reporting requirements and notify the USFWS of any instances of a noncompliance by a CI-holder with the terms of the HCP
- Initiate and respond to any requests for amendments to the HCP or ITP
- Direct and oversee third-party audits of HCP compliance and mitigation effectiveness monitoring
- Remain in place for a minimum of two years past the conclusion of the ITP term, including any amendments that may extend this term

The personnel needs of the HCP Administrator could vary over the Permit term due to fluctuations in demand associated with changing enrollment, permitting, and compliance needs. The HCP Administrator staff will comprise a mix of full-time employees and consultants, as determined by the HCP Administrator. Some of the responsibilities described above could require additional consultants or full-time staff if demand increases beyond what the full-time position staff can cover. Additional full-time staff and/or consultants could be required in the following areas, depending on needs of the administration of this HCP and ITP:

- Finance
- Impact/field verification/mitigation management
- HCP/ITP compliance evaluation
- Outreach and communications (including reporting)
- Legal
- Technical support

9.1.2 Habitat Conservation Plan Advisory Board

The HCP Administrator will develop, within six months of ITP issuance, an Advisory Board to assist with oversight and implementation of the HCP. The Advisory Board is intended to consist of voluntary representation from non-government wildlife management groups such as the NAGP, Pheasants Forever, and The Nature Conservancy; species resource experts from academia from land-grant universities; USFWS LEPC biologists; state wildlife departments; and industry

members. Implementation of guidance from the Advisory Board will be discretionary on the part of the HCP Administrator, and is meant to provide feedback, notification, and other helpful communication with these entities. The Board will meet as directed by the HCP Administrator, likely at 3-month intervals for the first two years post-ITP issuance and at 2-year intervals thereafter.

9.2 Mitigation Entity

All mitigation implemented in association with this HCP will be provided by a USFWS-approved mitigation bank, in-lieu fee program, or permittee-responsible mitigation project. Any commitment provided under a conservation banking agreement or other documentation of USFWS-mitigation agreement can be used by developers or other project proponents who need to compensate for the adverse impacts their projects have on LEPC. As described in Sections 1.1 and 5.3.3, compensatory mitigation will conserve and protect LEPC by means of preserving or restoring LEPC habitat, which will be managed and maintained in perpetuity through static and dynamic mitigation implemented to fully offset the impacts of Covered Activities to the species. As an example of USFWS-approved mitigation that could be utilize to offset impacts from project enrolled in the HCP, the Final LPC PCBA is publicly available to view on the Regulatory in-lieu Fee and Bank Information Tracking System (https://ribits.usace.army.mil/ribits_apex/f?p=107:278:1298467796166::NO:RP,278:P278_BANK_ID:3214; other USFWS-approved mitigation consistent with the requirements set forth in this HCP may also be utilized by enrolled projects.

As described in this HCP, for enrollment under the ITP a potential CI-holder will conduct an assessment of project impacts to LEPC. Working with the HCP Administrator, the potential CI-holder will identify mitigation needs by the process described in Sections 4.4 and 5.3.3. Identifying appropriate mitigation for the impacts of the take will be the responsibility of the potential CI-holder working with the HCP Administrator and mitigation entities. Project-specific mitigation requirements will be documented in the CI application (Appendix B). As described throughout this HCP, proposed mitigation for project impacts must be approved by the HCP Administrator and the USFWS before issuance of a CI for that project and the CI-holder will fund/implement that mitigation (as agreed to by USFWS) before initiating any Covered Activity for a particular project.

Mitigation entities will be responsible via contract with the HCP Administrator for ensuring that the mitigation for which a CI-holder has paid is implemented in accordance with the CI. If a mitigation entity anticipates that there may be a failure to meet mitigation requirements for any project enrolled under a CI, the mitigation entity will notify and coordinate with the affected CI-holder, the HCP Administrator, and the USFWS to identify, adopt, and implement measures that will avoid a failure to meet mitigation requirements.

Mitigation parcels for which there is no formalized process for USFWS approval (e.g. dynamic mitigation) will self-certify that any take of LEPC that is likely to occur because of implementation of grassland improvement and management activities (Section 2.3) will be fully offset by the long-term benefits provided through mitigation management activities. This will be included as a clause in the mitigation contract between the HCP Administrator and the mitigation entity. The clause will

include preparation of a Conservation Plan for Mitigation Parcels to be made available (with redaction of confidential business information) to the USFWS upon request and provided as a requirement of annual reporting (Section 5.4.4.3).

Take of LEPC through management of a mitigation parcel by means not described as a Covered Activity of this HCP (i.e., other than fire management, erosion control, mechanical brush control, and grazing management) are not covered by this HCP/ITP, and must be addressed by a separate compliance mechanism.

Contracts between a mitigation entity and the HCP Administrator for project-specific mitigation will incorporate standards provided by a pre-approved mitigation bank, in-lieu fee program, or permittee-responsible mitigation project and will include, but not be limited to providing the following information, which will be made available (with redaction of confidential business information) to the USFWS upon request and provided with the annual report (Section 5.4.4.3).

- Introduction and background describing projected Covered Activities.
- Determination of mitigation needs to offset impact of take from Covered Activities
    - Project impacts: calculation of the impact of the predicted taking of Covered Species
    - Calculation of mitigation requirements to offset the impacts of the taking of Covered Species
    - Determination of offsets using HCP mitigation strategies
    - Documentation that the proposed mitigation site meets all HCP/ITP criteria
- Mitigation implementation (i.e., Conservation Plan for Mitigation Parcels)
    - Performance standards
    - Land control mechanisms (e.g. conservation easement, management endowment)
    - Maintenance requirements and plan
    - Monitoring program design (e.g., effectiveness monitoring, adaptive management-triggered monitoring)
        - Monitoring requirements
        - Protocol
        - Implementation schedule
    - Adaptive management
- Reporting requirements (e.g. data management, analysis and reporting requirements)
- Any other information requested by the HCP Administrator

9.3 Third-party Beneficiaries

This HCP does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not a Party to this HCP to maintain a suit for personal injuries or damages pursuant to the provisions of this HCP. The duties, obligations, and responsibilities of the Parties to this HCP with respect to third parties shall remain as imposed under existing law.

9.4 Certificate of Inclusion Severability and Enforcement

The Parties to the HCP (the Applicant and the USFWS) recognize events could occur whereby CIs can be suspended or revoked (Section 8.12). Liability under the ITP is severable among the CI-holders. Under this several liability approach, a CI-holder's failure to comply with the HCP or ITP will not be attributed to or otherwise adversely affect the other CI-holders' rights, privileges, and benefits under the ITP. The USFWS and HCP Administrator will have full rights under applicable regulations to enforce the terms of the HCP and ITP against any and all CI-holders that violate such terms. The USFWS and HCP Administrator will use its rights of enforcement in such a manner that one CI-holder's HCP or ITP violations will not be a basis for revocation, termination, or suspension of the ITP for other CI-holders. By acceptance of the HCP and issuance of the ITP, the USFWS agrees it will use its best efforts in such a manner as to not adversely affect the rights and benefits under the ITP of CI-holders who remain in compliance with the terms of the HCP, ITP, and CI agreements.

Consistent with the several liability structure, the HCP's design ensures, through individual CI-holder efforts, the CI-holder will satisfy all ITP issuance criteria and HCP obligations, including requirements to minimize and mitigate the impacts of the take of the Covered Species and to provide adequate and assured funding to implement their responsibilities under the HCP. For example, as part of the project enrollment process described in Chapter 8, before a CI-holder can enroll a project in the HCP/ITP, the HCP Administrator must provide the CI-holder written notice, in the form of the Participation Agreement, confirming the CI-holder has identified the appropriate take allocation for a project. Prepayment requirements for CI-holder mitigation and HCP Administrator costs similarly operate to secure CI-holder compliance with mitigation and funding requirements.

9.5 Remedies

Each Party to this HCP shall have all remedies otherwise available to enforce the terms of this HCP and the ITP. No Party shall be liable in monetary damages for any breach of this HCP or ITP, any performance or failure to perform a mandatory or discretionary obligation imposed by the HCP or ITP, or any other cause of action arising from the HCP or ITP.

9.6 Dispute Resolution

The Applicant and the USFWS agree to work together, and with CI-holders when appropriate, in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all Parties, and when appropriate, the Property Owners.

9.7 Suspension, Revocation, or Surrender of the Permit and Habitat Conservation Plan

The Parties to the HCP (the Applicant and the USFWS) recognize events could occur whereby the HCP and ITP can be suspended or revoked. The failure of a CI-holder to carry out its obligations in accordance with the HCP shall not be a basis for suspension or revocation of the authorization of the Covered Activities for other CI-holders or the Applicant. Pursuant to the terms of the ITP, the USFWS will have direct rights of enforcement against the Applicant as the Permit Holder, and could construe a failure by the Applicant to implement the full and timely actions agreed upon in the HCP's conservation efforts as a breach of the ITP terms, except when the breach is the direct result of only CI-holder non-compliance. The Parties to the HCP, however, recognize suspension or revocation of this HCP is a severe and dramatic action limited to unusual circumstances after all efforts to address noncompliance have been exhausted.

If suspension or revocation of the HCP and proposed ITP occurs, the USFWS will notify the HCP Administrator in writing, with a copy by electronic mail, of a proposed suspension or termination by certified or registered mail. This notice shall identify the reason(s) for the suspension or revocation, and inform the HCP Administrator of the right to object to the proposed suspension or revocation. Upon receipt of a notice of proposed suspension or revocation, the HCP Administrator can file with the USFWS a written objection to the proposed action within 45 calendar days of the date the HCP Administrator received the notice of proposed suspension or revocation. The objection must state the reasons why the HCP Administrator objects to the proposed suspension or revocation and include supporting documentation. The USFWS will review the written objection and all documentation, and will issue a recommendation on the proposed suspension or revocation.

Conversely, the Applicant can choose to surrender the HCP and relinquish the associated ITP. In this case the Applicant must ensure that the mitigation required under the HCP for Covered Activities implemented in the Permit Area have been fully carried out, including any ongoing conservation funding and implementation assurances. The USFWS will not cancel the ITP until it has determined all outstanding mitigation requirements for past take have been fully implemented (50 CFR 17.22(b)(7) and 17.32(b)(7)). The Applicant will provide written notice to all CI-holders of its intent to surrender the HCP at least 90 days prior.

9.8 Habitat Conservation Plan/Incidental Take Permit Amendments

Changes in the implementation of this HCP could require an amendment to the HCP and/or Permit. The HCP Handbook indicates amendments can be initiated by the Permittee (i.e., the Applicant) or the USFWS; however, it is up to the USFWS to determine the level of review required to satisfy ESA statutory and regulatory requirements for the amendment.

Any Party to this HCP, including the Applicant, USFWS, and/or CI-Holders, can propose an amendment to this HCP by providing written notice to the HCP Administrator. Such requests shall include a description of the proposed modification, the justification for it, and its expected results. The HCP Administrator will then forward copies to the affected CI-holders quarterly following receipt of the notice. Upon issuance of the notice, the Party proposing the modification will

coordinate a meeting or conference call between the other affected Parties within 30 days to discuss and explain the proposal. The Parties will use their best efforts to respond in writing or electronic mail to the proposed modification within 60 days of the meeting or conference call. Upon all Parties' written concurrence, the Applicant will initiate the appropriate amendment process with the USFWS as described in the following sections. Approved amendments shall be dated and attached to the original HCP and implemented by the Applicant.

For projects which mitigation has been fulfilled prior to an HCP amendment, CI-holders will not be required to the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon in the HCP prior to the amendment. For new projects implemented by an existing CI-holder or for projects that have not fully fulfilled mitigation requirements after a HCP amendment, CI-holders will be required to uphold all requirements set forth by the HCP/ITP amendment, including changes to mitigation ratios, impact distances, or other factors that could increase the per unit cost of mitigation credits. Any new CI-holders after an amendment to the HCP or Permit would have to meet any additional requirements in amendment effective prior to final signatures approving their CI.

9.8.1 Changes Made Without a Formal Request

Some changes or corrections to this HCP or the ITP may be agreed upon between the Applicant and the USFWS without a formal amendment request. These changes are primarily corrective revisions where the amount of take authorized by the ITP and the Covered Activities are not substantively altered. Examples include: correcting insignificant mapping errors, modifying avoidance and minimization measures to a small degree, modifying annual reporting protocols, making small changes to monitoring protocols, making changes to funding sources, and changing the names or addresses of responsible officials (USFWS and NMFS 2016). These changes may be made through an exchange of written correspondence between the Applicant and the USFWS. For example, the Applicant may submit a letter to the USFWS explaining a proposed change, and the USFWS may respond with a letter approving of the change. USFWS approved changes will be documented in a note to the HCP file.

9.8.2 Formal Amendments

Some amendments may constitute an exchange of formal correspondence between the USFWS and the Applicant, including addenda to this HCP, revisions to this HCP, or ITP amendments, and may require additional analyses and public notice. Any permit amendment must satisfy ESA Section 10 review requirements; as the scale and scope of an amendment increases, other responsibilities, such as additional NEPA or ESA Section 7 review, may be triggered (USFWS and NMFS 2016). The extent of NEPA and ESA Section 7 analyses and public notice processes accompanying an amendment will be determined by the USFWS.

9.8.3 Changes Due to Adaptive Management or Changed Circumstances

As described in Section 5.5 of this HCP (Adaptive Management), the effectiveness of the conservation measures in the HCP will be reviewed by the Applicant and the USFWS periodically over the life of the HCP. The need for and type of amendment to deal with adaptive management

measures or Changed Circumstances will be determined by the USFWS, in coordination with the Applicant, at the time such responses are triggered. Any changes to this HCP or the ITP needed to implement an adaptive management or Changed Circumstances response may be made without a formal request. However, a substantial change to the adaptive management or Changed Circumstances sections of this HCP (Section 5.5 and Section 6.2) would require a formal amendment.

9.9 Incidental Take Permit Assignment and Transfer

Assignment or other transfer of the ITP shall be governed by the federal regulations located at 50 CFR 13. In accordance with 50 CFR 13.25, the ITP may be transferred in whole or in part to a new Party through a joint submission by the Applicant and the new Party to the USFWS field office responsible for administering the ITP describing: 1) each Party's role and responsibility in implementing the HCP, 2) each Party's role in funding the implementation of the HCP, and 3) any proposed changes to the HCP reasonably necessary to effectuate the transfer and implement the ITP.

The USFWS may approve a proposed transfer of the ITP in whole or in part to a new Party, which approval shall not be unreasonably withheld or delayed, provided the USFWS field office responsible for administering the ITP determines the proposed transferee meets the certification requirements of 50 CFR 13.25 by: 1) meeting all of the qualifications to hold an ITP under 50 CFR 13.21; 2) providing adequate written assurances it will provide sufficient funding for the HCP, and the proposed transferee will implement the terms and conditions of the ITP, including any outstanding minimization or mitigation requirements; and 3) the proposed transferee has provided such other information the USFWS determines is relevant to the processing of the submission. No new conditions will be added to the HCP or the ITP by the USFWS if the proposed transferee meets these conditions for transfer.

9.10 Incidental Take Permit Renewal

The Applicant requests the ITP associated with this HCP be renewable pursuant to 50 CFR 13.22. In the event the Applicant plans to continue the program after the ITP term and the cumulative take is less than the take level authorized by the ITP, the Applicant will file, in writing, a renewal request at least 30 days prior to the permit expiration. This renewal request must certify the information in the original application is still correct, and if not, provide a list of changes, including any amendments implemented. Per the HCP Handbook, the USFWS will honor the No Surprises assurances as much as practicable, but a renewed permit must satisfy applicable statutory and regulatory requirements in force as of the date of the approval of the renewal request. Permit renewals must be published in the FR before the USFWS issues a decision, even if there are no revisions (USFWS and NMFS 2016, pg. 17-8).

10 ACRONYMS AND ABBREVIATION

Acronym	Definition
§	Section
ABB	American burying beetle
ac	Acre
Applicant	LPC Conservation LLC
CCAA	Candidate Conservation Agreement with Assurances
CFR	Code of Federal Regulations
CGC	Common Ground Capital
CHAT	Crucial Habitat Assessment Tool
CI	Certificate of Inclusion
CI-holders	Oil and gas companies or Project LLCs
cm	Centimeter
CRP	Conservation Reserve Program
EOR	Estimated Occupied Range
ERCOT	Electric Reliability Council of Texas
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FR	Federal Register
ft	Foot
GIS	Geographical Information System
GPCH	greater prairie-chicken
ha	Hectare
HCP	Habitat Conservation Plan
HCP Administrator	LPC Conservation LLC
HCP Handbook	*Habitat Conservation Planning and Incidental Take Permit Processing Handbook*
HDD	Horizontal directional drilling
HIFLD	Homeland Infrastructure Foundation-Level
ICP	Industry Conservation Plan
in	Inch
ITP	Incidental Take Permit
kg	kilogram
km	Kilometer
km^2	square kilometer
lb	Pound
LEPC	lesser prairie-chicken
LEPC Mitigation Guidelines	*Guidelines for the Establishment, Management, and Operation of Permanent Lesser Prairie-Chicken Mitigation Lands*
LPC PCBA	Lesser Prairie-Chicken Programmatic Conservation Bank Agreement
m	Meter
mi	Mile
mi^2	square mile
MRLC	Multi-Resolution Land Characteristics
NAGP	North American Grouse Partnership
NEPA	National Environmental Policy Act

Acronym	Definition
NGL	natural gas liquid
NLCD	National Land Cover Database
NMFS	National Marine Fisheries Service
Parties	LPC Conservation LLC and the US Fish and Wildlife Service
PCB	Programmatic Conservation Bank
PCBA	Programmatic Conservation Bank Agreement
Permit	Incidental Take Permit
Permit Holder	LPC Conservation LLC (for this HCP)
ROW	rights-of-way
RWP	Range-wide Plan (Van Pelt et al. 2013)
SGP	Southern Great Plains
SSURGO	Soil Survey Geographic Database
US	United States
USC	United States Code
USDA	US Department of Agriculture
USEIA	US Energy Information Administration
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WAFWA	Western Association of Fish and Wildlife Agencies

11 LITERATURE CITED

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Appendix A. Final Lesser Prairie-chicken Programmatic Conservation Bank Agreement
Exhibit D - Service Area Map

Exhibit D
Service Area Maps and Descriptions

Refer to the narrative description of the Service Areas set forth in the 2014 USFWS Guidelines for the Establishment, Management, and Operation of Lesser prairie-chicken Conservation Banks and Mitigation Lands.

Source: US Fish and Wildlife Service (USFWS). 2014. Guidelines for the Establishment, Management, and Operation of Permanent Lesser Prairie-Chicken Mitigation Lands. Available online: https://www.fws.gov/southwest/ es/Documents/R2ES/LPC_Guidelines_for_LPC_Mitigation_Lands_Dec2014.pdf

Appendix B. Example Certificate of Inclusion Application

CERTIFICATE OF INCLUSION APPLICATION
OIL AND GAS
CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES
FOR THE LESSER PRAIRIE-CHICKEN

I. Prospective Certificate of Inclusion (CI-holder) Name:

II. Primary Point of Contact (POC; name, address, phone, email):

III. Project Location (State, County, Township):

IV. Total proposed/installed number of well pads and linear miles of pipelines:

a. Start Construction Date:
b. Commercial Operation Date (COD):

Submit with Application Fee ($_____) and applicable worksheets (as detailed below).

If approved, CI-holder will pay applicable fees according to the following schedule and provide assurance of mitigation payment:

_____
_____
_____
_____

CI-HOLDER APPLICATION ADMINISTRATIVE TRACKING

_____ _____

Signature of Prospective CI-holder POC (as named in II.) Date

To be completed by the HCP Administrator

_____ _____

Application number Date assigned

_____ _____

Signature of HCP Administrator certifying Application Completeness Date

Notes:

_____

_____

_____

Date Submitted to USFWS: _____

Primary USFWS Representative (name, address of USFWS office, phone, email):

_____

_____

_____

_____ _____

Signature of USFWS Representative Date

ATTACHMENTS TO THE APPLICATION

The following seven worksheets must be completed in their entirety and submitted with the Certificate of Inclusion Application. In addition, all associated GIS layers and data must be submitted with the Certificate of Inclusion Application.

Worksheet 1 – Project description and deconstructed project actions, pursuant to Step 1 in Section 4.4.

Worksheet 2 – Combined results of the initial desktop analysis, field assessment(s), and desktop re-analysis (if necessary), pursuant to Steps 2-4 in Section 4.44.4.

Worksheet 3 – Take Assessment Worksheet (stepwise calculation to determine the estimated take for which the prospective CI-holder seeks coverage, pursuant to Step 5 in Section 4.4).

Worksheet 4 – Mitigation Requirements and Mitigation Fee Worksheet, pursuant to Step 5 in Section 4.4.

Worksheet 5 - Avoidance and minimization measures that the prospective CI-holder will implement on-site.

Worksheet 6 – Monitoring that the prospective CI-holder will implement on-site.

Worksheet 7 – Adaptive Management that the prospective CI-holder may implement for the project.

Worksheet 8 – IPaC assessment for ESA-listed species within the Project boundary, and brief description of compliance approach for any non-covered listed species, BGEPA, and NHPA.

Worksheet 9 – Project layout modifications to minimize the potential impacts to LEPC.

WORKSHEET 1

Project description and deconstructed project actions, pursuant to Step 1 in Section 4.4.

I. Project Location

A. Legal Description of Project Boundary/location.

B. GPS coordinates/points/shapefiles/kmz - GPS coordinates shall be reported in decimal degrees with a precision of at least 5 decimal places (i.e., DDD.DDDDD °).

C. Project acreage.

D. Map of the Project Boundary.

II. Description of lands within the Project Boundary at time of application.

A. Ownership type.

B. Land use.

III. Description of prospective CI-holder's proposed Covered Activities, including acreage of limit of construction (any area within which any type of construction or land disturbance will occur).

IV. Detailed deconstruction of the project actions into all individual actions and associated methods and tools required to complete the proposed project.
Individual action. Description.

Individual action. Description.

WORKSHEET 2

Combined results of the initial desktop analysis, field assessment(s), and desktop re-analysis (if necessary), pursuant to Steps 2-4 in Section 4.4.

I. List of field assessments conducted.

- *Date* – Description.
- *Date* – Description.

II. Direct impacts of the project.

A. Map(s) showing the footprint of each individual project action identified in Worksheet 1.

B. Description of the direct impacts of each individual project action on LEPC.

III. Indirect impacts of the project.

A. Map showing the Impact Boundary associated with the project; to be determined by placing the appropriate impact radius (defined in Table 3 of the HCP) around each project feature. *For features not listed in Table 3, the impact radius associated with the most similar feature shall be used and documented in the description of the indirect impacts (III. B.).*

B. Description of the indirect impacts of the project actions on LEPC.

IV. Analysis Area to be used for Steps V – VII of Worksheet 2.

A. Description of the Analysis Area. The Analysis Area shall include all areas within a 6 mile buffer surrounding the Impact Boundary identified in Step III of Worksheet 2.

B. Map of the Analysis Area in relation to the Impact Boundary and project boundary.

V. LEPC occurrence within the Analysis Area.

A. List of current (within the previous 5 years) and historical (greater than 5 years) occurrences of LEPC within the Analysis Area.

Record Type	**Date**	**Location**	**Reference**
Current or Historical	mm/dd/yyyy	DDD.DDDDD °	e.g., eBird (yyyy)

B. Map of LEPC occurrences identified in the Analysis Area in relation to the project boundary.

VI. Physical and biological features existing within the Analysis Area that may contribute to, or detract from, the potential occurrence of LEPC.

A. Map(s) showing the location of physical and/or biological features (e.g., estimated occupied range + 10 mile buffer, USFWS LEPC Service Areas, average annual precipitation, land cover/land use, existing anthropogenic structures, etc.) within the Analysis Area.

B. Description and estimated acreage of each identified physical and/or biological feature within the Analysis Area.

C. Supporting photographs or aerial imagery (if applicable).

VII. Potentially suitable LEPC habitat within the Analysis Area.

A. Map of potentially suitable LEPC habitat (i.e., grassland/shrubland with the ability to support breeding, feeding, sheltering, and/or movement of LEPC) within the Analysis Area. *LEPC avoidance of trees and mesquite shall be accounted for by placing avoidance buffer of 329 m (1,080 ft) around trees and 244 m (800 ft) around mesquite or similar invasive woody vegetation.*

B. Description and total acreage of potentially suitable LEPC habitat within the Analysis Area.

C. Supporting photographs or aerial imagery (if applicable).

WORKSHEET 3

Take Assessment Worksheet (stepwise calculation to determine the estimated take for which the prospective CI-holder seeks coverage, pursuant to Step 5 in Section 4.4).

A. Total acres of grassland/shrubland (i.e., potentially suitable LEPC habitat) within the Impact Boundary	A. _____
B. Acres of grassland/shrubland excluded from potentially suitable LEPC habitat due to:	n/a
B1. LEPC avoidance buffer around trees (329 m [1,080 ft])	B1. _____
B2. LEPC avoidance buffer around mesquite or other invasive woody vegetation (244 m [800 ft])	B2. _____
B3. Impacts of existing (i.e., non-project related) infrastructure/features on the landscape (refer to Table 3 for impact radii of common features)	B3. _____
B4. Presence of canyon lands, riparian areas, croplands, urban areas, woodlands, salt flats, and/or areas with soil characteristics that will not support the vegetation community necessary for LEPC	B4. _____
C. Total acres of grassland/shrubland excluded (sum of lines B1 through B4)	C. _____
D. Total acres of potentially suitable LEPC habitat impacted by the project (Line A minus line C)	D. _____

WORKSHEET 4

Mitigation Requirements and Mitigation Fee Worksheet, pursuant to Step 5 in Section 4.4.

Step 1: Calculate the number of acres identified as requiring off-site mitigation.

A. Total acres of potentially suitable LEPC habitat impact by the project (Line D of Worksheet 3)	A. _____
B. Total acres from line A within SGP CHAT 1: Focal Areas	B. _____
C. Off-site mitigation required for acres within SGP CHAT 1 (Line B multiplied by 2.50	C. _____
D. Total acres from Line A within SGP CHAT 2: Connectivity Zone	D. _____
E. Off-site mitigation required for acres within SGP CHAT 2 (Line B multiplied by 2.25	E. _____
F. Total acres from line A within SGP CHAT 3: Modeled Habitat	F. _____
G. Off-site mitigation required for acres within SGP CHAT 3 (Line B multiplied by 2.00	G. _____
H. Total acres from line A within SGP CHAT 4: Modeled Non-Habitat	H. _____
I. Off-site mitigation required for acres within SGP CHAT 4 (Line B multiplied by 1.25	I. _____
J. Total acres of off-site mitigation required to offset project impacts (Sum of lines C, E, G, and I)	J. _____

Step 2: Calculate the mitigation fee required for off-site mitigation

A. Total acres of off-site mitigation required to offset project impacts (Line J in Worksheet 3)	K. _____
B. Cost per acre of off-site mitigation estimated at time of enrollment. *Subject to change.*	L. _____
C. Total cost for required off-site mitigation (Line K multiplied by Line M)	M. _____

Step 3: Describe how mitigation funding (for the amount identified in Line M) will be secured.

WORKSHEET 5

Avoidance and minimization measures that the prospective CI-holder will implement on-site.

Describe the specific avoidance and minimization measures that will be implemented on-site at the Project. Include all site plan modifications or decisions made to avoid or minimize impacts to potentially suitable LEPC habitat. Supplementary maps and photographs may be included as necessary to demonstrate avoidance and/or minimization.

WORKSHEET 6

Monitoring that the prospective CI-holder will implement on-site.

Describe the specific monitoring that will be implemented on-site to ensure compliance with the Project's enrollment in the HCP.

WORKSHEET 7

Adaptive Management that the prospective CI-holder may implement for the project.

Describe the stepwise approach to Adaptive Management as applicable to the Project.

WORKSHEET 8

Endangered Species Act

Complete an IPaC assessment for ESA-listed species within the Project boundary and attach to the Application for the Certificate of Inclusion.

Describe the specific measures that will be implemented avoid the unlawful take of ESA-listed species not covered under this HCP that may occur in within the Project boundary (if any), or justification for why take of the ESA-listed species identified in the IPaC assessment is not reasonably certain to occur.

Bald and Golden Eagle Protection Act

Briefly describe the planned compliance approach.

National Historic Preservation Act

USFWS issuance of an ITP under ESA Section 10(a)(1)(B) is considered an "undertaking" covered by the Advisory Council on Historic Preservation and must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA; 16 USC 470, et seq. [1966]) and its implementing regulations, 36 CFR Part 800 (2000). Advisory Council on Historic Preservation regulations define an undertaking as a “project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval” (36 CFR §800.16(y)). In this context, the federal undertaking is issuance of an ITP, which approves or approves with conditions the applicant-proposed HCP, when ESA-section 10 permit issuance criteria are met. The executed HCP and ITP would be binding on the applicant and any CI-holder.

Prospective CI-holders under this HCP will work with a cultural resources professional that meets the Secretary of Interior’s Professional Qualifications Standards (36 CFR Part 61), to assist the USFWS in fulfilling the requirements of Section 106 of the NHPA and its implementing regulations. NHPA requires that the area of potential effects (APE) be identified for each project for purposes of analysis. The APE is the geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. For projects enrolling in this HCP, the APE would be limited to those portions of projects seeking authorization under the HCP and necessary to meet the ITP conditions once issued.

Prior to approval of a CI by the Administrator, prospective CI-holders, with assistance from their cultural resource professional, will follow the process below:

- Utilize State and/or Tribal cultural resource databases, e.g., databases maintained by the State Historic Preservation Office (SHPO) and/or the Tribal Historic Preservation Office

(THPO), in identifying a proposed APE and assessing any potential impacts to known historic/cultural sites within the proposed APE.

- Coordinate with the appropriate USFWS Ecological Services Field Office (ESFO) (based on the location of their project activities) to define the APE and timing of activities for their proposed project. The proposed APE and timing of activities covered by the proposed CI will be submitted by the prospective CI-holder to the USFWS' Regional Office in Albuquerque (U.S. Fish and Wildlife Service, Region 2, Branch of Environmental Review, P.O. Box 1306, Room 6034, Albuquerque, New Mexico 87103; FW2_HCP_Permits@fws.gov) for distribution to the appropriate ESFO for review prior to commencing the steps outlined below.
- After receiving the above information from the USFWS' Regional Office, the USFWS ESFO will make best faith efforts to, within 14 calendar days of receiving information from the prospective CI-holder, review the information and provide a written concurrence or non-concurrence with the proposed APE. Failure to respond in 14 calendar days does not constituted an automatic concurrence with the APE from the USFWS.
- If the USFWS does not concur with the proposed APE, the USFWS and the prospective CI-holder, with assistance from their cultural resource professional, will coordinate to identify the proposed APE for the proposed activity. The steps below will be conducted after the USFWS has concurred, in writing, with the proposed APE for the prospective CI-holder's activity.
- Submit project information resulting from the review and consultation with the USFWS above to the relevant SHPO and any other consulting parties identified as having an interest in the APE (e.g., THPOs/tribes). A specific SHPO's review form can be used, or correspondence with equivalent information, and the supporting documentation including maps and database searches will be compiled by the prospective CI-holder and submitted to the USFWS. The USFWS will submit the information from the prospective CI-holder to the appropriate SHPO/THPO for review. The information submitted will include, but may not be limited to, the following: information from the pre-project review; information from any cultural/historical resources field studies; and the procedure that will be followed to address inadvertent discoveries of human remains, burials, funerary items, sacred objects, or objects of cultural patrimony found during project implementation.
- The SHPO and the other consulting parties will review the submitted project information within timeframes established by law. The SHPO/THPO may request a field survey. The SHPO/THPO should respond to both the Service and the prospective CI-holder. If no response is given or no survey is requested by the SHPO/THPO, the USFWS and prospective CI-holder will document this for their records and will provide that information to the Administrator. This would conclude the USFWS' Section 106 compliance related to the prospective CI-holder.
- If a field survey is requested by the SHPO and/or THPO, a cultural resources professional, meeting the above-referenced standards in the academic discipline needed, will perform the survey consistent with the recommendations provided by the SHPO/THPO.

- The prospective CI-holder will provide the USFWS and SHPO with results of the requested surveys within 30 days of completion, and the USFWS shall promptly provide the THPO, if involved, with the survey results.
- If the USFWS/SHPO/THPO concur with the results, in writing, the USFWS' Section 106 compliance would be concluded.
- If a historic property (listed or possibly eligible for listing on the National Register of Historic Places) is identified within the APE, the prospective CI-holder, USFWS, and SHPO (and THPO if involved) representatives will collaborate on methods to avoid, minimize or mitigate the effects so that a no-effect determination on the proposed undertaking may be reached, or collaborate on the creation of a Memorandum of Agreement (MOA) to resolve adverse effects, prior to the initiation of the project activities with the potential to affect the historic property.
- In the event of any post-review discovery of historic/cultural resources, unmarked cemeteries, human remains, and funerary objects during the implementation of a CI-holder's activities, all activities will be immediately suspended. The CI-holder will immediately contact the appropriate USFWS Ecological Services Field Office (based on the location of their project activities), SHPO (and THPO if involved), and local law enforcement. No activities will continue until an appropriate buffer to the area of discovery is identified with concurrence from the USFWS, SHPO (and THPO if involved).

Please note, at any point in the 106 process the SHPOs/THPOs may choose to engage the USFWS directly, rather than the prospective CI-holder's cultural resource professional.

WORKSHEET 9

Project layout modifications to minimize the potential impacts to LEPC.

Initial Project Layout: Calculate the number of acres identified as requiring off-site mitigation.

A. Total acreage within the initial Project layout	A. _____
B. Total acres within SGP CHAT 1: Focal Areas	B. _____
C. Total acres within SGP CHAT 2: Connectivity Zone	C. _____
D. Total acres within SGP CHAT 3: Modeled Habitat	D. _____
E. Total acres within SGP CHAT 4: Modeled Non-Habitat	E. _____
F. Total acres of potentially suitable LEPC habitat impact by the initial Project layout (Sum of lines B, C, D, and E)	F. _____

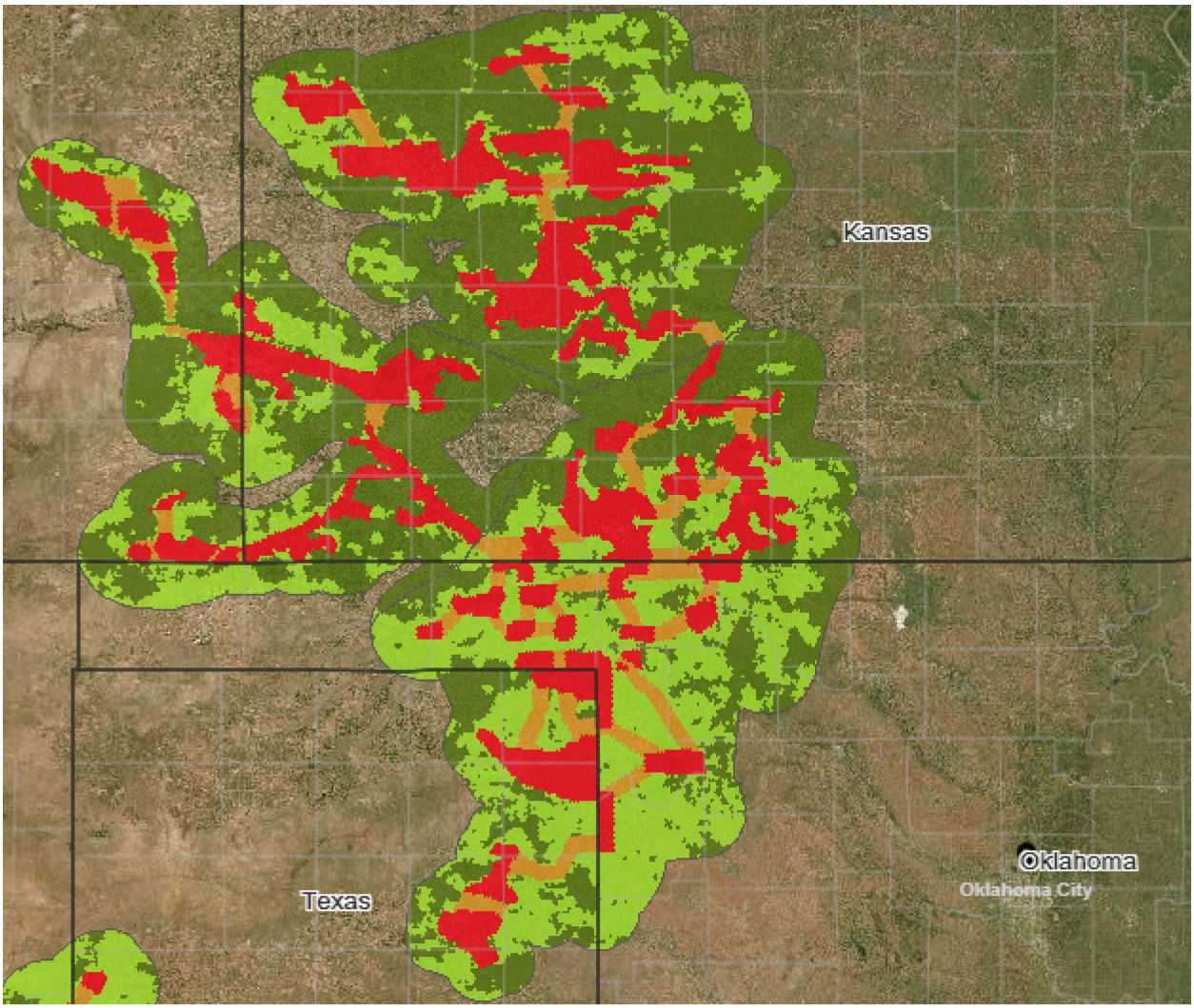
Revised Project Layout: Calculate the number of acres identified as requiring off-site mitigation.

G. Total acreage within the revised Project layout	G. _____
H. Total acres within SGP CHAT 1: Focal Areas	H. _____
I. Total acres within SGP CHAT 2: Connectivity Zone	I. _____
J. Total acres within SGP CHAT 3: Modeled Habitat	J. _____
K. Total acres within SGP CHAT 4: Modeled Non-Habitat	K. _____
L. Total acres of potentially suitable LEPC habitat impact by the revised Project layout (Sum of lines H, I, J, and K)	L. _____

Describe how project layout modifications minimized the potential impacts to LEPC.

Attach maps to illustrate where layout modifications avoided or minimized the amount of potentially suitable LEPC habitat impacted by the Project.

Appendix C. Southern Great Plains Crucial Habitat Assessment Tool (SGP CHAT v 3.0) Maps



SGP CHAT Categories

Covered Area (EOR+10)

Southern Great Plains CHAT - Covered Area (EOR+10)

SGP CHAT Categories

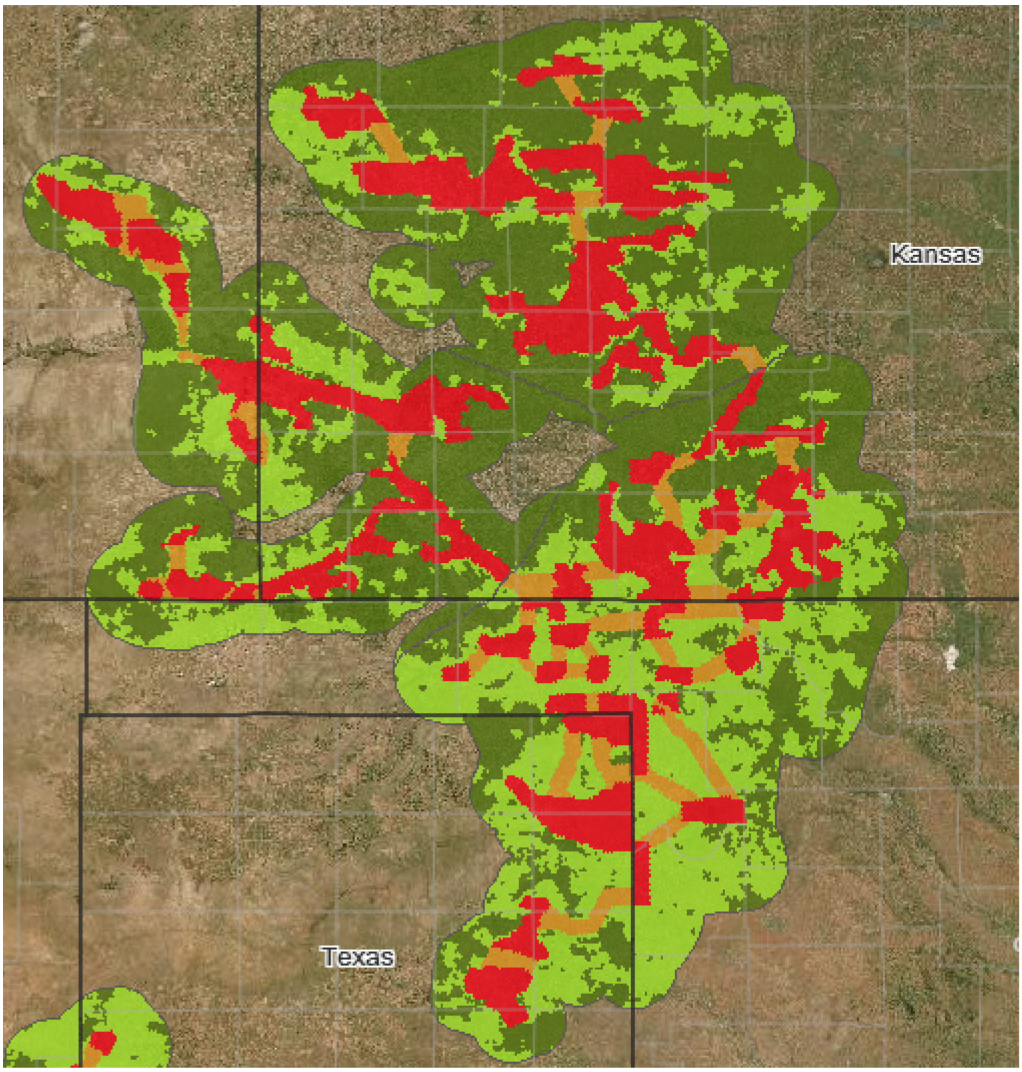
CHAT 1: Focal Areas

CHAT 2: Connectivity Zones

CHAT 3: Modeled Habitat

CHAT 4: Modeled Non-Habitat

SGP CHAT (version 3.0; http://wafwaprojects.maps.arcgis.com/apps/webappviewer/index.html?id=d16dac45cfba4abeab91c1df97370121, accessed October 2, 2020.



SGP CHAT Categories

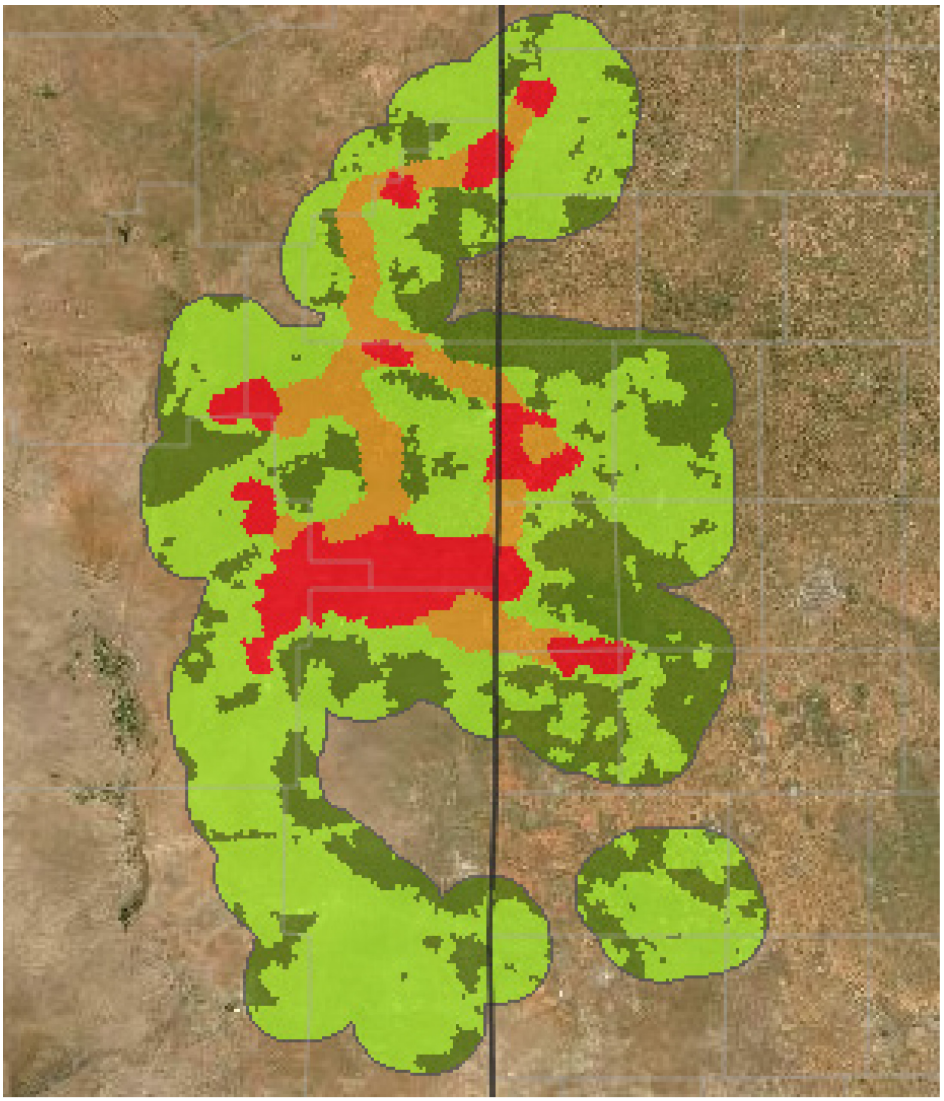
Covered Area (EOR+10)

- Southern Great Plains CHAT - Covered Area (EOR+10)

SGP CHAT Categories

- CHAT 1: Focal Areas
- CHAT 2: Connectivity Zones
- CHAT 3: Modeled Habitat
- CHAT 4: Modeled Non-Habitat

SGP CHAT (version 3.0; http://wafwaprojects.maps.arcgis.com/apps/webappviewer/index.html?id=d16dac45cfba4abeab91c1df97370121, accessed October 2, 2020.



SGP CHAT Categories

Covered Area (EOR+10)

- Southern Great Plains CHAT - Covered Area (EOR+10)

SGP CHAT Categories

- CHAT 1: Focal Areas
- CHAT 2: Connectivity Zones
- CHAT 3: Modeled Habitat
- CHAT 4: Modeled Non-Habitat

SGP CHAT (version 3.0; http://wafwaprojects.maps.arcgis.com/apps/webappviewer/index.html?id=d16dac45cfba4abeab91c1df97370121, accessed October 2, 2020.

Appendix D. Minimization Effectiveness Monitoring Report Form

Minimization Effectiveness Monitoring Report Form

Reporting Dates: _____

		Initial Project Layout (habitat acres)					Revised Project Layout (habitat acres)					
Project	**CI-holder**	**CHAT 1**	**CHAT 2**	**CHAT 3**	**CHAT 4**	**Total habitat**	**CHAT 1**	**CHAT 2**	**CHAT 3**	**CHAT 4**	**Total habitat**	**Total Minimization**
Reporting Date Total:												
ITP Term Total (all years):												

Appendix E. Habitat Conservation Plan Administrative Costs

Table E1. Summary of Habitat Conservation Plan (HCP) Commitments for Financial Resources.

Commitment	Estimated Year 1 Cost[1]	Funding Schedule	Justification	Details	Cost Estimation Calculations
Administration					
HCP Application Fees	$16,667	annually, 2021 − 2050	Covers labor costs required for the HCP Administrator and Staff to begin coordination with a prospective Certificate of Inclusion-(CI-) holder conduct an initial review of the CI-application plans and materials described in Section 8.2.	Cost includes administrative tasks to conduct a high-level review of the proposed project for consistency with the HCP and CI terms and conditions prior to finalization of CI application and US Fish and Wildlife Service (USFWS) approval. Costs are estimated to be $500 per proposed CI application starting in 2021 and then escalated by 2.7% per year for the Incidental Take Permit (ITP) term. Cost may vary by project depending on project complexity and the level of review required by the HCP Administrator and Staff.	$500 per proposed application * approximately 33 applications per year * 30 years, with a 2.7% annual escalator = $755,488 over ITP term. See Table E2.
HCP Enrollment Fees	$440,000	annually, 2021 − 2050	Covers the labor costs for the HCP Administrator and Staff to enroll a project under the HCP.	Cost includes administrative tasks to undertake coordination with the USFWS, enroll a project under the HCP, and issue a CI. Costs starting in 2021 are estimated to be 80 hours of work billed at a rate of $150/hour plus a 10% fee ($13,200) and then escalated by 2.7% per year for the ITP term. Cost may vary by project depending on project complexity and the time required by the HCP Administrator and Staff to complete necessary tasks.	$13,200 per application * approximately 33 applications per year * 30 years, with a 2.7% annual escalator = $19,944,875. See Table E2.
HCP Administration Fees	$780,423	annually, 2021 − 2050	Covers labor costs required for the HCP Administrator and Staff to fulfill the duties described in Section 7.2.	Costs include overhead and administrative tasks such as preparing reports, scheduling meetings, external legal or consultant tasks, office space, and travel. Costs are estimated to be $780,423 per year starting in 2021 and then escalated by 2.7% per year for the ITP term. Costs may vary annually, primarily depending on the level of project enrollment under the HCP/ITP.	$780,423 per year*30 years, with 2.7% annual escalator = $35,375,975 over ITP term. See Table E2.

Table E1. Summary of Habitat Conservation Plan (HCP) Commitments for Financial Resources.

Commitment	Estimated Year 1 Cost[1]	Funding Schedule	Justification	Details	Cost Estimation Calculations
Project Impact Assessment					
Impact Assessment	not applicable	self-paid by each CI-holder prior to CI issuance	Costs associated with developing a project Impact Assessment.	Costs to develop a project impact assessment (Section 4.4, Appendix B). Costs will vary based on project complexity and the initial siting location.	Not applicable; there are no costs associated with avoidance and minimization measures after approval of CI application.
Avoidance and Minimization					
Avoidance and Minimization Measures	not applicable	self-paid by each CI-holder prior to CI issuance	Costs associated with avoidance and minimization related to project siting, including seasonal restrictions due to proximity to lesser prairie-chicken (LEPC) lekking sites.	Costs will be identified during each project's Impact Assessment (Section 4.4; Appendix B) and resolved prior to issuance of a CI. Costs will vary based on the initial siting location for each proposed project.	Not applicable; there are no costs associated with avoidance and minimization measures after submittal of CI application.
Mitigation					
Mitigation[2]	$75,000,000	annually, 2021-2050	Covers the costs required to secure mitigation to fully offset the impacts of a project.	Cost includes the price of securing mitigation credits from a USFWS-approved LEPC Conservation Bank. Costs are estimated to be $2,500 per credit starting in year 2021 and then escalated by 2.7% per year for the ITP term. Total cost will vary by project depending on the total mitigation required to fully offset project impacts (e.g., mitigation for projects with 500 acres (202 hectares) of impacts with an average mitigation ratio of 2.0 (Section 5.3.3.1) would be expected to cost $2,500,000.	$75,000,000 per year * 30 years, with a 2.7% annual escalator = $3,399,634,529 over ITP term. See Table E2.
Adaptive Management					
Adaptive Management	not applicable	annually, 2021 − 2050 (if triggered)	Covers costs associated with Adaptive Management that may be triggered over the ITP term.	The Adaptive Management program is intended to address uncertainties related to the potential change in the amount of available LEPC habitat and, therefore, the percentage of habitat affected by impacts from enrolled projects (Section 5.5) to ensure the HCP meets the biological objectives for conservation of the LEPC.	Not applicable; adaptive management costs will be reflected in mitigation credit prices for subsequent mitigation transactions if triggered.

Table E1. Summary of Habitat Conservation Plan (HCP) Commitments for Financial Resources.

Commitment	Estimated Year 1 Cost[1]	Funding Schedule	Justification	Details	Cost Estimation Calculations
Changed Circumstances and Contingency					
Changed Circumstances and Contingency fund	$3,750,000	annually, 2021 – 2050 (if triggered)	Funding to address changed circumstances and to address contingencies, such as under-estimated costs.	The HCP Administrator may draw upon funds when necessary to address Changed Circumstances and contingencies as they arise. Costs are calculated as 5.0% of the total mitigation requirement established at project enrolment starting in 2021 (e.g., mitigation for projects with 1,000 acres of impacts would be expected to cost $250,000, dependent on the quality of habitat impacted) and then escalated by 2.7% per year for the ITP term. CI-holders will be release from any remaining changed circumstance and contingency funding assurances at the end of the ITP term.	$3,750,000 per year * 30 years, with a 2.7% annual escalator = $169,984,726 over ITP term. See Table E2.

[1] Estimated costs for Year 1 assume steady project enrollment over the ITP term, or approximately 33 projects enrolled annually, for a total enrollment of 1,000 projects by the end of the ITP term.

[2] Mitigation estimates assume an equal distribution of project impacts among Crucial Habitat Assessment Tool (CHAT) 1−4 categories. The overall amount of mitigation implemented through the HCP will vary based on the actual impacts from enrolled projects in each CHAT category.

Table E2. Habitat Conservation Plan/Incidental Take Permit (ITP) Implementation costs over the ITP term, including annual inflation rate of 2.7% after Year 1 over the 30-year ITP term.

Year	Calendar Year	Application Fees	Enrollment Fees	Administration Fees	Mitigation Cost[2]	Changed Circumstances and Contingency (5% of mitigation cost)	Total
1[1]	2021	$16,667	$440,000	$780,423	$75,000,000	$3,750,000	$79,987,089
2	2022	17,117	451,880	801,494	77,025,000	3,851,250	82,146,741
3	2023	17,579	464,081	823,134	79,104,675	3,955,234	84,364,703
4	2024	18,053	476,611	845,359	81,240,501	4,062,025	86,642,550
5	2025	18,541	489,479	868,184	83,433,995	4,171,700	88,981,898
6	2026	19,041	502,695	891,625	85,686,713	4,284,336	91,384,410
7	2027	19,556	516,268	915,698	88,000,254	4,400,013	93,851,789
8	2028	20,084	530,207	940,422	90,376,261	4,518,813	96,385,787
9	2029	20,626	544,523	965,814	92,816,420	4,640,821	98,988,203
10	2030	21,183	559,225	991,891	95,322,463	4,766,123	101,660,885
11	2031	21,755	574,324	1,018,672	97,896,170	4,894,808	104,405,729
12	2032	22,342	589,831	1,046,176	100,539,366	5,026,968	107,224,683
13	2033	22,945	605,756	1,074,423	103,253,929	5,162,696	110,119,750
14	2034	23,565	622,112	1,103,432	106,041,785	5,302,089	113,092,983
15	2035	24,201	638,909	1,133,225	108,904,913	5,445,246	116,146,494
16	2036	24,855	656,159	1,163,822	111,845,346	5,592,267	119,282,449
17	2037	25,526	673,876	1,195,245	114,865,170	5,743,259	122,503,075
18	2038	26,215	692,070	1,227,516	117,966,530	5,898,326	125,810,658
19	2039	26,923	710,756	1,260,659	121,151,626	6,057,581	129,207,546
20	2040	27,649	729,947	1,294,697	124,422,720	6,221,136	132,696,149
21	2041	28,396	749,655	1,329,654	127,782,134	6,389,107	136,278,946
22	2042	29,163	769,896	1,365,555	131,232,251	6,561,613	139,958,477
23	2043	29,950	790,683	1,402,425	134,775,522	6,738,776	143,737,356
24	2044	30,759	812,032	1,440,290	138,414,461	6,920,723	147,618,265
25	2045	31,589	833,956	1,479,178	142,151,652	7,107,583	151,603,958
26	2046	32,442	856,473	1,519,116	145,989,746	7,299,487	155,697,265
27	2047	33,318	879,598	1,560,132	149,931,469	7,496,573	159,901,091
28	2048	34,218	903,347	1,602,255	153,979,619	7,698,981	164,218,420
29	2049	35,142	927,737	1,645,516	158,137,069	7,906,853	168,652,317

Table E2. Habitat Conservation Plan/Incidental Take Permit (ITP) Implementation costs over the ITP term, including annual inflation rate of 2.7% after Year 1 over the 30-year ITP term.

30	2050	36,090	952,786	1,689,945	162,406,770	8,120,338	173,205,930
	Totals	**$755,488**	**$19,944,875**	**$35,375,975**	**$3,399,694,529**	**$169,984,726**	**$3,625,755,592**

[1] Estimated costs for Year 1 assume steady project enrollment over the ITP term, or approximately 33 projects enrolled annually, for a total enrollment of 1,000 projects by the end of the ITP term.

[2] Mitigation estimates assume an equal distribution of project impacts among Crucial Habitat Assessment Tool (CHAT) 1−4 categories and a total of 500,000 ac to include 200,000 ac in the southern DPS and 300,000 ac in the northern DPS of impacts will be offset by the end of the ITP term. The overall amount of mitigation implemented through the HCP will vary based on the actual impacts from enrolled projects in each CHAT category.