

Candidate Conservation Agreement with Assurances for the Texas Kangaroo Rat (*Dipodomys elator*)



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Developed Cooperatively by:
U.S. Fish and Wildlife Service – Southwest Region
and
Texas Parks and Wildlife Department



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1.0 INTRODUCTION

This agreement between Texas Parks and Wildlife Department (TPWD) and the U.S. Fish and Wildlife Service (USFWS) is a programmatic Candidate Conservation Agreement with Assurances (CCAA) for the Texas kangaroo rat (*Dipodomys elator*) (TKR) and part of TPWD's application to the USFWS for an Enhancement of Survival Permit (Permit) under section 10(a)(1)(A) of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.). A CCAA is a voluntary agreement whereby landowners (including state, tribal, non-federal publicly owned, or privately owned lands) agree to manage their lands, or portion thereof, to both remove or reduce threats to affected covered species that may become listed under the ESA and, per Service' regulations, are expected to provide a net conservation benefit to affected covered species (50 C.F.R. 17.22). The Permit would authorize take of TKR, should it become listed as "endangered" or "threatened" under the ESA during the term of this CCAA. The permitted take would result from activities undertaken by eligible non-Federal landowners (Participants) who engage in voluntary conservation actions on their enrolled properties for TKR and abide by the terms and conditions of the Permit and CCAA. Under the Permit, TPWD will issue a Certificate of Inclusion (CI) (Appendix A) conveying incidental take coverage to each Participant. 50 CFR 17.22.

1.1 Benefits

Conservation activities described in this CCAA are expected to provide a net conservation benefit for the TKR by reducing fragmentation, increasing the connectivity of habitats, maintaining or increasing populations, and enhancing and restoring habitats. The restoration and management of habitat on enrolled lands is expected to help maintain and enhance existing populations of TKR and support the establishment of additional populations through natural dispersal, translocation of wild individuals, or release of captive-reared individuals.

1.2 Purpose

The purpose of the CCAA is for TPWD to join with USFWS to maintain, enhance, and establish self-sustaining populations of TKR in the wild through the implementation of specific conservation measures. The conservation measures that can be implemented by participating property owners are specified in this CCAA and are expected to manage, create, and restore TKR habitat and populations throughout the species' historical range in Texas. This is a programmatic CCAA that will facilitate landowner participation in the conservation of TKR. Landowners choosing to enroll in the CCAA will enter into a Cooperative Agreement via a wildlife management plan or other approved conservation plan (Section 5.0) with TPWD to implement the conservation measures described herein for the benefit of the TKR. Upon entering into a Cooperative Agreement, the Participant will be issued a CI under TPWD's Permit which will provide regulatory assurances that no further land, water, or resource-use restrictions beyond those agreed to in the Cooperative Agreement, and in compliance with this CCAA, will be imposed if the TKR becomes listed under the ESA in the future. Activities and procedures described in this document and the individual Cooperative Agreements directed toward the conservation of TKR and its habitat on enrolled properties will provide one or more of the following net conservations benefits to the TKR:

1. Currently occupied areas are maintained or improved to assist in increasing resilience of population units;
2. Resiliency of known TKR population units is increased through habitat management;
3. TKR redundancy is increased through habitat restoration or enhancement and natural dispersal of individuals;
4. Suitable TKR habitat is maintained, enhanced, restored, and/or created within the historical range;
5. Habitat connectivity is increased by habitat enhancement, restoration, and/or creation efforts;
6. New population units are established by translocation of wild individuals and/or captive reared TKR to increase redundancy.

2.0 COVERED SPECIES – Texas kangaroo rat

The TKR is a nocturnal rodent with long hind feet, long tail, and external cheek pouches. TKR's hind feet have four toes, and its laterally white-striped, thick tail has a conspicuous white tuft of hair on the tip and is about 160 percent of the length of the body. In comparison, Ord's kangaroo rat (*Dipodomys ordii*), the only other kangaroo rat in the TKR range, is smaller, lacks the long white hairs at the tip of the tail, has five toes on the hind feet, and lives in sandy soil uncharacteristic of TKR habitat.

Habitat that supports the TKR's life history generally includes an accumulation of loose, friable soil, usually associated with a minor topographic uplift (e.g., prairie mounds) or physical support, including woody vegetation (roots of shrubs and cacti) and other natural (e.g., rocks, upturned rootballs) or manmade structures. A common characteristic of TKR habitat is the presence of bare ground and short grasses, often expressed as a lack of dense vegetation. The TKR digs a subterranean tunnel, usually within loam/clay-loam/sandy-loam soils, with multiple chambers branching from the main tunnel, which are used for shelter, reproduction, and food storage. Resource needs for individual TKR generally include:

- Friable, loam/clay-loam soil for burrowing
- Predominately native grasses and forbs
- Short grass prairie with bare ground and limited woody cover
- Topographic relief not prone to flooding events

3.0 FACTORS AFFECTING SPECIES

Habitat loss appears to be a primary influence negatively affecting the TKR, and may largely be the result of anthropogenic factors. The TKR's primary habitat, stubble height grasses interspersed with areas of bare ground and minimal woody cover, is associated with disturbance (Goetze et al. 2007). Historically, disturbances from the presence of large numbers of bison and prairie dogs within the TKR range likely contributed to the availability of suitable TKR habitat (Stangl et al. 1992, Nelson et al. 2009, Ott et al. 2019). While modern cattle grazing can create

conditions preferred by TKR, cattle do not provide a complete replacement for the effects of bison and prairie dogs (Nelson et al. 2009, Stasey et al. 2010). Likewise, periodic naturally occurring fires have been shown to contribute to habitat conditions favored by other species of kangaroo rats (Price and Waser 1984, Price et al. 1995, Monroe et al. 2004). The absence of the southern bison herd since the 1870s, coupled with greatly diminished prairie dog populations, and modern fire suppression efforts within the historical range of the TKR may contribute to the limited the availability of suitable TKR habitats.

The conversion of native rangeland to row crops is a direct loss of habitat because the TKR is unable to utilize active farms for survival (Martin and Matocha 1972, Martin 2002, Goetze et al. 2007, Goetze et al. 2008, Nelson et al. 2009, Ott et al. 2019). The use of cropland for TKR foraging is not fully understood, and evidence suggests cropland has minimal or opportunistic use or is avoided by the TKR (Goetze et al. 2008). Some evidence suggests that TKR may utilize cropland adjacent to road edge habitat for foraging if factors are suitable (Chapman 1972, Price and Endo 1989, Veech et al. 2018). However, cropland also leads to increased habitat fragmentation and appears to prevent dispersal (Stangl et al. 1992, Goetze et al. 2008). Cropland acres increased greatly beginning in the 1920s with the mechanization of crop production (Dethloff and Nall 2010). Conservation Reserve Program (CRP) enrolled lands create dense grass that is generally incompatible with suitable TKR habitat under most conservation practice scenarios (Martin 2002, Nelson et al. 2013, Ott et al. 2019).

Unpaved roads and accompanying roadside edge account for a substantial proportion of all recently published TKR detections, likely due to the presence of bare ground and sparse grasses associated with these areas (Martin and Matocha 1972, Ott et al. 2019). Unpaved roads may fill an ecological void for TKR (high percentage of bare ground and short grasses) left by the reduction of wild bison and prairie dog colonies across the species' range (Stangl et al. 1992, Nelson et al. 2009). Paved roads generally provide a hard substrate assumed to be of limited use by TKR (Goetze et al. 2016). Although the species is able to cross paved roads, these roads may restrict movement, increase vehicle mortality, and fragment habitat (Adams and Geis 1983, Merriam et al. 1989, Brock and Kelt 2004).

Woody vegetation encroachment (e.g., mesquite) into grasslands can create dense canopy cover that is unsuitable for TKR use (Stangl et al. 1992) due to their preference for grassland dominated landscapes (Nelson et al. 2009). In North America, the increase in woody cover within grasslands ranges from 0.5% to 2% per year and is among the major land-cover changes that have occurred over the past 150 years (Sala and Maestre 2014). Climate change may exacerbate the rate of woody vegetation encroachment (Van Auken 2000).

Downscaled global climate models suggest an increasingly warmer, drier trend will occur in the TKR range (Jiang and Yang 2012). Based on recent studies, future conditions resulting in more arid conditions would increase woody cover percentage (White et al. 2011), leading to decreased

habitat availability for the TKR (Stangl et al. 1992). No substantial effect from predation or parasite pressure on TKR populations is known.

4.0 COVERED AREA

The area covered by the CCAA includes Montague, Clay, Wichita, Archer, Wilbarger, Baylor, Hardeman, Foard, Childress, Cottle, and Motley counties in Texas, which encompasses the known historical range of TKR in Texas; all non-Federal lands within this area are eligible. Within the covered area, there are numerous factors that influence the potential presence of TKR, its habitat, and availability of resources necessary to meet its life history needs (e.g., friable loam soils). To focus resources and enhance conservation for the species, TPWD and USFWS will prioritize properties for outreach and enrollment using the criteria in Section 8.0 of this agreement.

5.0 CONSERVATION STRATEGY

A conservation strategy will guide the implementation of the conservation measures described in this CCAA. The strategy sets goals (desired biological outcome for the species), objectives (conditions necessary for achieving the goal in terms of reduction or elimination of threats), and criteria (values for determining that the objectives have been met) (Table 1).

The biological goal of this CCAA is to provide a net conservation benefit to the TKR by stabilizing the population of TKR, increasing the number of individuals, or improving the TKR habitat through maintaining habitat through management activities, improving conditions of poor habitat, and/or creating or expanding habitat and reducing or eliminating threats on enrolled properties. The conservation strategy for TKR will primarily target working lands within the historical range of the species in Texas to improve incompatible land uses and reduce their impacts on TKR and its habitat.

Objectives for achieving this goal include:

- Target outreach efforts to those landowners with properties that overlap with current populations of TKR.
- Retain and increase the amount of suitable habitat on the landscape that could support additional populations of TKR.
- Increase connectivity among current populations of TKR.

Table 1. Factors affecting TKR and the conservations measures that could be used to alleviate those impacts.			
Factors Affecting Species	Conservation Measures	Conservation Benefits	Monitoring
<i>Alteration of Ecosystem Function</i>			
Degraded TKR habitat not restored or reclaimed results in permanent loss of habitat quality and quantity.	Prescribed Grazing	Maintains habitat quality & quantity and reduces vulnerability to predation. Intensity and duration of livestock present will affect the extent of the effects. Cattle grazing may mimic historical bison grazing under certain conditions.	Describe any restoration projects and status in annual monitoring reports.
	Prescribed Fire	Prescribed burning could be used in the absence of regular prairie fires seen historically to maintain TKR habitat quantity and quality.	
	Prairie dog colony conservation	Prairie dog conservation would maintain habitat for TKR.	Describe management plan, actions taken to implement the plan, and monitoring to measure success. Describe restoration or reclamation plan, actions taken to implement the plan, and monitoring to measure success.
	Early Successional Habitat Maintenance/Development	Maintains TKR habitat	
	Range Planting/Reseeding	Would increase habitat suitability where non-native plant species have taken root.	
<i>Conversion to cropland</i>			
Interior cropland represents a reduction of TKR habitat quality and quantity.	Disturbed edge habitat	Increases the usefulness of an otherwise incompatible land use.	Describe disturbed edge habitat management and the number of miles managed.
<i>Road Development</i>			
TKR often inhabit road edges, however, paved road development increases direct mortality.	Maintenance of dirt roads	Maintains habitat that TKR may currently use.	Describe any unpaved road maintenance and the number of miles maintained.
<i>Woody Encroachment</i>			
Encroachment of dense woodland vegetation (e.g., mesquite) into TKR habitat can lead to a reduction in the amount of suitable habitat for TKR use.	Brush Management	Directly decreases the progression of woody encroachment and maintains TKR habitat.	Describe any treatment in areas with encroachment and the number of acres treated.

The CCAA primarily targets private working lands where the production of cattle, crops, and other agricultural products within TKR's historical range may impact the species. These working lands have the ability to contribute to conservation for the species by implementing measures that minimize negative impacts to TKR. The overall objective is to create a mosaic of habitat that can support TKR territories (occupied or unoccupied) as well as lands that may aid in dispersal of individuals. A Cooperative Agreement will be the primary method to deliver conservation measures that will provide a net conservation benefit to the TKR, while sustaining working lands. The Cooperative Agreements below will be used to prescribe conservation measures for TKR. Conservation plans developed by other ecologically based organizations (e.g., Natural Resource Conservation Service, The Nature Conservancy, etc.) that utilize the conservation strategy within this CCAA may be approved by both TPWD and USFWS on a case-by-case basis.

5.1 Wildlife Management Plan

TPWD's Private Lands and Habitat Program provides landowners and land managers with technical guidance and information for the conservation and development of wildlife habitat and management of the various wildlife utilizing that habitat. TPWD biologists are available to assist landowners in developing a wildlife management plan (WMP) specific to their property (Appendix B). WMPs address multiple aspects of wildlife habitat and populations. Components of a WMP include the objective, past and current land use practices, water and food availability for wildlife, recommendations for habitat management practices, and management of wildlife populations. TPWD biologists can assist landowners with incorporating practices into their WMP that benefit TKR and fulfill requirements for enrollment into the CCAA.

5.2 Partners for Fish and Wildlife

The USFWS's Partners for Fish and Wildlife (PFW) program was established to develop partnerships with private landowners (e.g., non-federal) for enhancing or restoring both federal trust and resident fish and wildlife species habitat through voluntary partnership agreements. These partnership agreements frequently contain certain land management practices that are compatible with TKR conservation (e.g., brush management, prescribed fire, prescribed grazing), even if that is not the stated intent. As such, a private landowner already in a voluntary partnership agreement can amend their agreement to adopt or incorporate these land management practices to benefit the TKR and to align with the goals of this CCAA.

6.0 CONSERVATION MEASURES

There is limited information on management applications specific to creating, restoring, or enhancing TKR habitat. However, based on habitat structure and historical information, some techniques may be effective in producing habitat conditions that favor TKR foraging, dispersal, and burrow construction. Research is needed to determine a range of effective prescriptions using the following management techniques that would best suit TKR management. The following are recommended conservation measures for TKR habitat conservation. The conservation measures may be amended in the future as new data becomes available through ongoing and future research efforts. Habitat management for the TKR should be directed at lands

that could support the species; these areas may be categorized as rangeland or pasturelands with loam/clay loam soil associations or lands that have the potential to act as dispersal corridors (i.e. edges of cropland) and are prioritized in section 8.0 below. Due to the small home range of TKRs, the application of these measures may not cover entire properties and may be limited to selected areas that have the greatest potential of benefiting the species.

6.1 Prescribed Grazing

Livestock grazing can maintain a mosaic of short herbaceous vegetation along with a patchwork of soil disturbance (i.e., bare soils), while limiting shrub mottes, which may benefit TKR habitat (Stangl 1992, Nelson et al. 2009, Stasey et al. 2010). A rotational grazing prescription may be necessary to promote a mosaic of habitat types and avoid overutilization by cattle (Martin 2002, Derner et al. 2009). Overutilization of native grasses (i.e., excessive or intensive grazing without sufficient recovery periods) reduces competition from grasses and could lead to an increase of woody vegetation that would be detrimental to TKR habitat (Archer et al. 2017, Stuhler et al. 2019). A grazing plan that meets site-specific objectives and addresses stocking rate, frequency of rotation and rest, and contains a plan for drought conditions should be developed and agreed upon by a resource specialist and the Participant. Highly utilized areas (e.g., supplemental feeding and watering areas) should be strategically dispersed across the site, allowing for interspersed patches of bare ground.

6.2 Prescribed Fire

Prescribed burns may be used in coordination with a grazing plan because the interactive effects of grazing and fire prevent the proliferation of dense stands of shrubs that are unfavorable to TKR (Brennan and Kuvlesky 2005, Stuhler et al. 2019). Applying fire to the landscape, in general, promotes healthier grasslands and deters woody vegetation encroachment. Fire can also maintain a shortgrass plant community and areas of bare ground. A prescribed burn plan should be developed and agreed upon by a resource specialist and the Participant. Plans must include measures that minimize impacts to known occupied TKR sites. Care should be taken to avoid active TKR burrows when creating fire breaks.

6.3 Brush Management

Brush management typically includes mechanical and chemical methods, or a combination of both of these treatments. Managing woody vegetation encroaching on grasslands, particularly mesquite, redberry juniper, and eastern red cedar, may help improve TKR habitat conditions. Slash piles should not be located near (≈ 50 m) TKR burrows known to be occupied. Where chemical control methods are used, standing dead timber (snags) may be left behind to avoid debris piles, but removal of snags is encouraged to reduce potential perches for aerial predators and screening cover for ground predators. If standing snags are undesirable for Participants, then snags could dry for a period of time and then be chained and burned in rapid succession.

6.4 Early Successional Habitat Maintenance/Development

TKR is an early successional habitat specialist so it may be beneficial to use early successional habitat development techniques to create or maintain TKR habitat. Shredding, mowing, and disking can be used to create and maintain the desirable plant structure (i.e. height) TKR

requires; disking of native range should be limited, follow a prescription outlined in a Cooperative Agreement, and must comply with cultural resource compliance rules. Care should be taken to minimize impacts to known occupied TKR sites and avoid burrows when possible.

6.5 Disturbed Edge Habitat

While TKR do not generally inhabit cropland, edges of fields that have bare ground and short grass/forb ground cover are frequently used, especially when an adjacent unimproved road is present. TKR may also use buffer/contour strips, field borders, center pivot corners and fence lines that contain short herbaceous cover and patches of bare ground. Early successional habitat management should be used to maintain optimal structure and habitat in these areas. Care should be taken to protect any TKR burrows. In some cases, seeding may be necessary to support or restore native grasses and forbs (See Section 6.6 *Range Planting/Reseeding*).

6.6 Range Planting/Reseeding

Seeding may be necessary to improve degraded TKR habitat or convert pastures dominated by exotic grasses to native grasslands. Seeding mixtures, rates, and techniques should be tailored to the ecological site.

6.7 Maintenance of Dirt Roads

TKR are known to use a variety of disturbed areas including dirt roads (Ott et al. 2019). TKR use the edges of roads for foraging and burrow construction in place of unavailable traditional habitat. Maintenance of the roads to limit tall vegetation and woody encroachment may help support TKR on private lands. Care should be taken to protect TKR burrows, and the timing of grading/disking of roads and mowing of bar ditches may be important to minimize disturbance of active burrows along the roadsides.

6.8 Prairie Dog Colony Conservation

Once numerous and expansive across the Great Plains, the historical range of the black-tailed prairie dog fully encompassed that of the TKR. Colonies of prairie dogs still exist in the TKR range, but on a substantially smaller scale, both in size and abundance. Prairie dog towns effectively keep herbaceous vegetation short and reduce woody vegetation encroachment. It is unclear what ecological relationship historically existed between prairie dogs and TKR; however, it is likely that prairie dog colonies facilitated TKR foraging and dispersal. Conservation of existing prairie dog colonies, including limited control or disease management, may help to maintain or improve TKR habitat is authorized. Reintroduction of new prairie dog colonies to suitable habitat may benefit TKR and is encouraged, but not required, on enrolled properties.

7.0 COVERED ACTIVITIES

The term “covered activities” refers to those activities that may be carried out by Participants issued a CI on enrolled lands that may result in incidental take of TKR consistent with the CCAA and the Permit. Activities not covered under this CCAA include, but are not limited to, energy development and production, commercial mining, public transportation, or residential or commercial development. In addition to the activities described in this section, any of the

activities described in the Conservation Measures and Monitoring sections of this CCAA are included as covered activities.

7.1 Normal Agricultural Operations

In addition to the conservation measures and monitoring, the customary and generally accepted activities, practices, and procedures identified by Texas AgriLife Extension Service for adoption, use, or engagement in the annual production and preparation for market of crops, livestock, and livestock products and in the production and harvesting of agriculture, agronomic, horticulture, silviculture, and rangeland commodities are authorized. This includes on-site facilities and equipment necessary to carry out these practices, not limited to greenhouses, nurseries, barns, packing sheds, fences, pens, traps, windmills, water irrigation, and other structures or equipment used in implementing best management practices for planting, cultivating, producing, harvesting, processing, packaging, storing, marketing for wholesale or retail distribution of agricultural commodities, and management of agricultural waste.

7.2 Agritourism

Agritourism is defined as outdoor recreational activities occurring on land suitable for use in the production of fruit or crops grown for human or animal consumption, or plants grown for production of fibers, floriculture, viticulture, horticulture, or planting seed, or suitable for domestic or native farm or ranch animals to be kept for use or profit and engaged in educational or recreational activities. Those activities include hunting, fishing, swimming, boating, camping, picnicking, hiking, pleasure driving (including ATVs), nature study, cave exploration, water sports, biking, disc golf, walking dogs, radio control flying, and other activities associated with enjoying nature or the outdoors. Agritourism is authorized as a covered activity under this CCAA.

8.0 PRIORITIZATION OF ENROLLED LANDS

Lands to be enrolled under this CCAA will receive tiered priority of importance as follows:

- Tier 1 - Top priority will be given to those properties located within a known TKR population center (Appendix C).
- Tier 2 - Properties within 30 kilometers of known population centers (but within the historical range) or properties with documented TKR presence. Thirty kilometers is based on average distance between currently known population centers (Appendix C).
- Tier 3 - properties located within the “historical” TKR range (Appendix C).

Areas of potentially suitable habitat according to the Ott et al. 2019 model may also be used to prioritize enrollments within each tier.

The model from Ott et al. (2019) uses both soil and vegetation class to predict habitat, which have been identified as important habitat requirements. Additionally, the model also estimates habitat with a calculable area giving the ability to measure the amount of potentially suitable acres of TKR habitat on the landscape.

As new detections are made in the future, the “current” TKR range polygon and the size and shape of the population centers will be updated to best encompass all the data, thus potentially expanding the reach of some priority tiers. New data should be assessed every five (5) years and polygons will be updated accordingly.

9.0 INCIDENTAL TAKE

“Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. 16 U.S.C. § 1539. Under this CCAA, incidental take of TKR may result from the implementation of conservation measures or from normal, pre-existing land use practices as described in covered activities. Under a signed Cooperative Agreement, these forms of incidental take will be exempt from Section 9 take prohibitions by the associated Permit should the species be listed under the ESA in the future. Incidental take would be authorized on enrolled properties issued a CI and operating in good standing in accordance with the approved Cooperative Agreement, the CCAA, and associated Permit.

10.0 REGULATORY ASSURANCES

The assurances listed below apply to the Permit holder and are conveyed to enrolled Participants by a CI where the conservation measures specified in the Cooperative Agreement are being properly implemented as described. The assurances apply only with respect to species covered by the CCAA. Upon issuance of the Permit, the USFWS provides TPWD with the assurances that no additional conservation activities or additional land, water, or resource use restrictions for the covered species, beyond those voluntarily agreed to and described in section 6.0 *Conservation Measures* of this CCAA and in the associated Cooperative Agreement, will be required on enrolled properties throughout the 10-year life of the agreement, regardless of listing status of the covered species. These assurances, through the approval of the CCAA and issuance of the Permit, are transferred to Participants through a valid CI. These assurances will be authorized with the issuance of an Enhancement of Survival Permit under section 10(a)(1)(A) of the ESA.

10.1 Changed Circumstances

Changed circumstances are those circumstances affecting a species or its geographic area that can be reasonably anticipated and to which the parties can plan a response (50 CFR 17.22(d)(5)). If additional conservation measures are necessary to respond to changed circumstances and the measures were set forth in the CCAA’s operating conservation strategy, the enrolled Participant will implement the measures specified in the CCAA after consultation with TPWD or USFWS.

Circumstances that can be reasonably anticipated on enrolled properties include wildfire, drought, flooding, and other naturally occurring weather events. Participants can voluntarily follow the most recent approved response guidelines provided by USFWS for such events to reduce impacts to the TKR. Such guidelines would be non-binding and only used in circumstances following a wildfire or other naturally occurring weather event, where no immediate threats to human health and safety or further property damage would be expected to occur.

If additional conservation measures not provided for in the CCAA operating conservation strategy are necessary to respond to changed circumstances, the USFWS will not require any conservation measures in addition to those provided for in the CCAA without the consent of the enrolled Participant, provided the Cooperative Agreement and Permit are being properly implemented.

10.2 Unforeseen Circumstances

Unforeseen circumstances are those circumstances that are not “changed circumstances,” but that are changes affecting the species or its geographic areas covered by the CCAA that could not have been reasonably anticipated by the Parties at the time the CCAA was finalized and that results in a substantial and adverse change in the status of the species covered by the CCAA (50 CFR 17.22(d)(5)(iii)).

If additional conservation measures are necessary to respond to unforeseen circumstances, the USFWS may require additional measures of the enrolled Participant only if those measures maintain the original terms of the CCAA to the maximum extent possible. Additional conservation 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 available for development or use under the original terms of the CCAA and Cooperative Agreement without the consent of the enrolled Participant.

The USFWS will have the burden of demonstrating that 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 USFWS will consider, but not be limited to, the following factors:

- Size of the current range of the species;
- Percentage of range adversely affected by the CCAA;
- Percentage of range conserved by the CCAA;
- Ecological significance of that portion of the range affected by the CCAA;
- Level of knowledge about the affected species and the degree of specificity of the species’ conservation strategy under the CCAA; and,
- Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the TKR in the wild.

In the unlikely situation in which an unforeseen circumstance results in likely jeopardy to a species covered by this CCAA and Permit, the USFWS could revoke this CCAA and Permit as a last resort (50 CFR 17.22 (d)(7)).

11.0 MONITORING AND REPORTING

11.1 Biological Monitoring

Biological monitoring will be used to evaluate abundance trends in the TKR over the life of the CCAA and indirectly associate trends with the effectiveness of the CCAA.

Biological monitoring will be accomplished through nighttime spotlight surveys along unpaved roads, which will be used to review the effectiveness of the CCAA. This survey method has been used in previous research and surveys for the TKR (Martin and Matocha 1972; Jones et al. 1988; Martin 2002; Ott et al. 2019). Spotlight surveys will be conducted at a minimum of every other year by TPWD, USFWS, or other agreed upon parties. Prior to the monitoring implementation, a sub-committee of representatives of TPWD and USFWS will meet to develop survey protocols and locations based on current information. The monitoring subcommittee should meet every other year (on survey off-years) to evaluate current data, make modifications to survey methods through the adaptive management process, and coordinate any other survey issues.

11.2 Compliance Monitoring and Reporting

TPWD will be responsible for specified monitoring and reporting related to implementation of the CCAA and the associated individual CI and fulfillment of the provisions of both, including implementation of agreed upon conservation measures and incidental take authorized by the Permit should the species become listed as threatened or endangered. Each Participant will be required to submit a Landowner Reporting Form (LRF) to TPWD that describes the conservation measures that were implemented on their property from January 1st through December 31st (Appendix D). Photo points will be established and the landowner will provide at least 2 photos of each established point, one photo pointed down at the ground and one landscape photo of the surrounding area, taken from the same direction every year. Photos will be taken at least once a year at the end of the growing season (mid October-November) and will be provided with the LRF. The LRFs will be due to TPWD by February 1st each year. TPWD will review each LRF upon receipt for compliance and will report any non-compliance issues to USFWS. TPWD will send reminders and follow up emails to Participants as needed.

The CCAA will grant TPWD or their designated representatives the right to enter the enrolled lands at a mutually agreed upon time within 30 days' notice by TPWD, to ascertain compliance with the Cooperative Agreement and CI. TPWD will coordinate with their designated conservation partners to ensure visits are made to each enrolled property at a minimum of at least three times during the duration of the Cooperative Agreement. This will likely include one visit to initiate enrollment, one interim visit to monitor progress, and one visit towards the end of the Cooperative Agreement.

TPWD will provide USFWS with biological monitoring data, a summary of landowner enrollment, and a summary of the conservation measures implemented based on LRFs by March 15th of each year for the duration of the CCAA. All enrolled properties will have a property identification number and all Participant names, addresses, and ranch names will be removed from reports submitted to USFWS. TPWD will allow USFWS access to property parcel data and

the conservation measures implemented on the property via a password protected database maintained by TPWD and solely for the purpose of allowing TPWD and USFWS access to view particular information for monitoring, reporting, and evaluation of the species status as described herein. TPWD will not authorize anyone to download, possess, or distribute the information unless otherwise authorized in writing by the Participant. USFWS and TPWD shall take all reasonable steps to maintain the confidentiality of such information under the relevant public information laws, including instructing TPWD and USFWS employees accordingly, but shall not be responsible to the extent any information is ultimately subject to disclosure under the relevant public record laws.

12.0 ADAPTIVE MANAGEMENT

Adaptive management is an important component of any successful conservation agreement. Implementation of this CCAA will follow an adaptive management approach with collaborative and substantial involvement from both parties. The conservation measures described herein are designed to further refine our knowledge of the current status of the TKR within the covered area; avoid and minimize impacts to known populations of TKR; monitor TKR through time; provide additional information on habitat parameters and other life history requirements; and simultaneously monitor the effectiveness of the conservation measures within the covered area. The signatories to this CCAA agree and recognize that implementation of the conservation measures may change as new science emerges. The effectiveness of the conservation measures and monitoring methods will be reviewed as new science and technologies become available. As a result, modifications to the conservation measures, covered activities, or monitoring methods may be incorporated pursuant to the section 13.3 *Modifications and Amendments* of this document to further enhance the goals of this CCAA. Such modifications may also be incorporated into new CIs that take effect after the modifications have been made and to existing CIs with written agreement from the Participant. Additionally, research projects that are designed to determine the effectiveness of management practices will be encouraged and utilized to determine what adaptive management is necessary. To facilitate the adaptive management process, the following adaptive management procedure is proposed.

On an annual basis following submittal of each annual report, or upon the request of either party, the USFWS and TPWD will meet to discuss results from CCAA conservation measures that year and discuss any potential modifications to this CCAA. Several of the conservation measures will play an essential role in adaptive management discussions. New research and survey data will aid in evaluating the effectiveness of the conservation measures. Additionally, information on stressors or threats to the TKR may be considered in the context of the effectiveness of conservation measures.

13.0 PERMIT CONDITIONS

13.1 Permit Term

This CCAA will have a duration of 10 years from the date of the last signature. Both the CCAA and Permit may be extended in duration if agreed to in writing by USFWS and TPWD. The

CCAA will cover a Participant's enrolled property from the effective date of the CI until the CCAA or CI terminates, whichever occurs first.

Should the TKR be listed as "threatened" or "endangered," the Permit will become effective (50 CFR 17.22(d)(1)). The Permit shall remain in effect until the CCAA's expiration date or until surrender by the Permittee, unless it is suspended or revoked by USFWS, as provided in its permitting regulations (50 CFR 13.28).

So long as Participants remain in compliance with the terms of their CI and this CCAA, all Participants and their covered activities on the enrolled property will be covered by the Permit from its effective date until the CCAA's expiration date or the date on which a Participant terminates the CI for an enrolled property, whichever comes first.

Coverage under the Permit will only apply to covered activities on the enrolled properties in the CCAA through a CI. The Permit provides the assurances described in this CCAA and coverage for anticipated incidental take associated with the Participant's covered activities and conservation measures on an enrolled property as long as the Participant is in compliance with the relevant Cooperative Agreement.

13.2 Responsibilities of Each Party TPWD (Permit Holder)

TPWD staff will collaborate with additional partners to enact the terms of the Permit. TPWD responsibilities, with support from their partners, include the following.

- Coordinate with biologists from USFWS, and other conservation entities to identify, encourage, and enroll potential Participants.
- Develop Cooperative Agreements in coordination with each Participant and assess lands proposed to be enrolled in the CCAA to ensure consistency with the provisions of the CCAA, including conservation measure identification that will result in a net conservation benefit for the TKR and compliance with Section 106 of the National Historic Preservation Act to avoid impact to cultural and historic resources due to activities under the Cooperative Agreement.
- Maintain landowner confidentiality to the maximum extent practical for the Cooperative Agreements, CIs, and annual reports.
- Provide USFWS 15 business days to review the proposed Cooperative Agreements.
- Issue CIs to convey incidental take, should the species become listed, under section 10(a)(1)(A) of the ESA and regulatory assurances to Participants after a Cooperative Agreement has been signed by the Participant and TPWD and has been approved by USFWS.
- Provide USFWS 30 calendar days to review proposed changes to both the Cooperative Agreement and CI templates. Such changes will only be made following USFWS approval.

- Work with biologists from TPWD, USFWS, and other conservation partners to provide Participants with technical guidance and to aid in identifying potential landowner incentive funding to implement conservation measures and monitor effectiveness of those measures.
- Coordinate monitoring activities including the review of the LRFs submitted by Participants and coordinating with biologists from USFWS, and other conservation partners to ensure visits are made to each enrolled property as indicated in the *Monitoring and Reporting* section of this document.
- Provide annual enrollment summary and monitoring report to USFWS. TPWD will provide a copy of the monitoring report to USFWS as well as a summary of the landowners and acreage amounts enrolled with corresponding Cooperative Agreement reference numbers each year by the date indicated in the Permit. TPWD will review each LRF upon receipt for compliance and report any non-compliance issues to USFWS. TPWD will send reminders and follow-up letters to enrolled landowners, as needed.
- Provide USFWS access to a password-protected database to review geo-spatial data and Cooperative Agreements, including property locations, survey data, and other relevant information related to compliance and biological monitoring of the CCAA.
- Notify USFWS within 15 business days of a landowner's notification to transfer ownership of their enrolled property or cancel their Cooperative Agreement.

USFWS

The responsibilities of the USFWS include the following.

- Review draft Cooperative Agreements and provide comments or concurrence, when appropriate, within 15 business days. Review will include assuring a net conservation benefit for the TKR and compliance with Section 106 of the National Historic Preservation Act to avoid impact to cultural and historic resources due to activities under the Cooperative Agreement. If no comments are received within 15 business days, TPWD may proceed to finalize the applicable Cooperative Agreement.
- Provide information on Federal funding programs, technical assistance, and field support to TPWD when requested, as USFWS resources and priorities allow.
- Satisfy all other applicable legal requirements necessary to issue the Permit to TPWD in accordance with section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).
- Review annual reports on enrolled properties.

Participant

The responsibilities of each enrolled Participant include the following.

- Work cooperatively with TPWD (and, if acceptable, additional parties) to develop mutual agreement on the conservation measures to include in the Cooperative Agreement.
- Sign the Cooperative Agreement enrolling the identified land under this CCAA.
- Allow access by TPWD or other agreed-upon parties to the enrolled property at a mutually agreed-upon time within 30 days' notice by TPWD for purposes and activities related to the Cooperative Agreement, including but not limited to conservation measures, technical assistance, and/or conservation monitoring.
- Report to TPWD any dead, injured, or ill specimens of TKRs observed on the enrolled property within 7 calendar days (provide photo, if possible).
- Submit the completed annual LRF to TPWD by the February 1st deadline containing information related to the Cooperative Agreement implementation.
- Notify TPWD within 5 working days of any "take" on the enrolled lands. This includes incidental take that may result from conservation measures. Notifications may be by letter, e-mail, or phone to the contacts identified in the Cooperative Agreement.
- Notify TPWD no less than 60 days in advance of any transfer of land ownership so that TPWD can attempt to contact the new owner to explain the responsibilities and Cooperative Agreement applicable to the enrolled lands and invite the new owner to continue the existing Cooperative Agreement or enter into a new one that would benefit the TKR on the enrolled lands.

13.3 Modifications and Amendments

Any party to this CCAA may propose modifications or amendments to this CCAA by providing written notice to the other party. Such notice shall include a description of the proposed amendment, the justification for it, and its expected results. Upon issuance of the notice, the party proposing the amendment will coordinate a meeting or conference call between the other party to discuss and explain the proposal. The parties will respond in writing or electronic mail to proposed amendments within 60 days of receipt of such notice. After any National Environmental Policy Act (NEPA) requirements have been met, proposed amendments will become effective upon the parties' written concurrence. Approved amendments shall be dated and attached to the original CCAA. TPWD is responsible for ensuring any modifications are disseminated to all Participants. Amendments to the CCAA in effect at the time the Participant executes a CI may only be applied to the Participant upon their written consent; however, a CI may be amended to accommodate changes to applicable legal requirements, including but not limited to the ESA and the NEPA.

The Permit may be amended in accordance with all applicable legal requirements, including but not limited to the ESA, NEPA, and the USFWS permit regulations (50 CFR 13 and 50 CFR 17). In addition, any proposed changes to covered activities that increases or material changes the incidental take under the CCAA as approved would require an amendment to the permit according to applicable regulations at that time. Permit changes may need to be made to reflect

modifications to the CCAA as determined by the TPWD and the USFWS. If proposing an amendment, the TPWD or the USFWS shall provide a statement describing the proposed amendment and the reasons for it to the other Parties to the CCAA.

13.4 Dispute Resolution

The parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all parties.

13.5 Termination of CCAA and CI

As provided for in Part 8 of the USFWS CCAA Policy (64 FR 32726, June 17, 1999), a Participant may terminate implementation of a CI's voluntary management actions prior to the CI's expiration date, even if the expected benefits have not been realized. If a Participant terminates their CI, the Participant's take authorization (if the TKR has become listed) and assurances granted by the Permit are forfeited. The Participant is required to give 60 days written notice to TPWD of its intent to terminate the CI, and must give TPWD, the USFWS, or their agents the opportunity to potentially relocate affected TKRs within 60 days of the notice.

TPWD has the right to cancel any CI where the Participant or their successor(s) is found to be in non-compliance with the terms and conditions of the CCAA. If a Participant is found to be in non-compliance, TPWD will issue a written letter of non-compliance to the Participant. The Participant shall have 60 days from receipt of the letter to rectify the non-compliance issue(s). If the issue(s) is not resolved to the satisfaction of TPWD and the Participant by mutual consent by the end of the 60-day period, the CI shall automatically terminate.

TPWD may terminate this CCAA prior to its expiration date by giving at least 90 days prior written notice to the USFWS and to all Participants holding a CI. During this notice period TPWD will make good faith efforts to locate a suitable transferee to assume the rights and responsibilities of TPWD under this CCAA and the Permit pursuant to 50 CFR 13.24(c), 13.25(c).

13.6 Suspension or Revocation of Permit

USFWS may suspend or revoke the Permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation. USFWS also, as a last resort, may revoke the Permit if continuation of permitted activities would likely result in jeopardy to the TKR (50 CFR 13.28). In such circumstances, USFWS will exercise all possible measures to avoid revoking the Permit.

14.0 AUTHORIZED SIGNATURES

Carter Smith

Executive Director

Texas Parks and Wildlife Department

Jonna E Polk

Assistant Regional Director, Ecological Services

U.S. Fish and Wildlife Service

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Appendix A. Certificate of Inclusion

CERTIFICATE OF INCLUSION

In the Candidate Conservation Agreement with Assurances for the Texas Kangaroo Rat (*Dipodomys elator*) between the Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service

This certifies that the Participating Landowner of the property described in the attached and referenced Cooperative Agreement (TPWD-approved Wildlife Management Plan or other approved conservation plan) [attach completed Plan] are included within the scope of the attached draft Permit No. _____ to be finalized and issued to the Texas Parks and Wildlife Department (TPWD) under the authority of Section 10(a)(1)(A) of the Endangered Species Act of 1973 (ESA), as amended 16 U.S.C. 1539(a)(1)(B). This Permit will become effective if the Texas kangaroo rat is listed as federally endangered or threatened under the ESA. Such Permit authorizes incidental take of Texas kangaroo rats by participating landowners, as part of a Candidate Conservation Agreement with Assurances (CCAA), to support TPWD’s ongoing and future efforts to manage, conserve, and recover Texas kangaroo rats. Pursuant to that Permit and this certificate, the participating landowner is authorized to cause incidental take of Texas kangaroo rats as a result of activities identified in sections *6.0 Conservation Measures* and *7.0 Covered Activities* of the CCAA on the enrolled lands identified in the Cooperative Agreement. Permit authorization is subject to carrying out conservation measures identified in the Cooperative Agreement, the terms and conditions of the Permit, and the terms and conditions of the CCAA, entered into pursuant thereto by TPWD and the U.S. Fish and Wildlife Service. By signing this Certificate of Inclusion, the participating landowner agrees to carry out the conservation measures described in the attached Cooperative Agreement.

TPWD Representative

Date

USFWS Representative

Date

Participating Landowner

Date

Appendix B: Cooperative Agreement (Wildlife Management Plan)



TEXAS KANGAROO RAT WILDLIFE MANAGEMENT PLAN

See the full wildlife management plan template at:

<http://www.tpwd.state.tx.us/publications/huntwild/forms/index.phtml>

PWD 1046-W7000 (12/20)

The Texas kangaroo rat (TKR) is a candidate species for listing under the Endangered Species Act (ESA). This Wildlife Management Plan (WMP) template is specific to conserving and improving TKR habitat. A pre-existing Texas Parks and Wildlife Department (TPWD) WMP may be amended to include the specific conservation activities identified in this template. Other acceptable WMP templates must include all of the following: 1) landowner contact information, including name and address; 2) location of the property; 3) legal description of the property; 4) total acres to be enrolled; 5) total conservation acres; 6) description of historic habitat conditions and land use history; 7) description of current habitat conditions and land use practices; 8) description of the conservation activities identified in this template that will be implemented to meet requirements under the Candidate Conservation Agreement with Assurances (CCAA). This WMP (or any qualifying WMP, as described previously) will serve as the Cooperative Agreement between the landowner and TPWD required for enrollment in a CCAA. After a WMP is completed and signed by the landowner and the enrolling TPWD biologist, a Certificate of Inclusion (CI) will be issued to the landowner from TPWD for the enrolled acreage. The CI provides assurances that a landowner is protected from future land use restrictions if and when the species is listed under the ESA.

This TKR WMP is a template designed to guide the development of the Cooperative Agreement in a manner that ensures consistency with the provisions of the CCAA, including identification of the conservation activities that will result in a net conservation benefit for the TKR following implementation. This template may be amended as appropriate or incorporated into an existing WMP. Please contact your local biologist to arrange a site visit if you have an interest in developing a WMP for your property. Contact information for TPWD biologists listed by county can be found on the CCAA Fact Sheet, or on our website using the following link:

http://www.tpwd.state.tx.us/landwater/land/technical_guidance/biologists/.



SECTION 1 – ADMINISTRATIVE INFORMATION

Property ID: _____	Primary _____
Landowner: _____	Agent/Manager: _____
Address: _____	Address: _____
_____	_____
Business _____	Business Phone: _____
Mobile Phone: _____	Mobile Phone: _____
Email: _____	Email: _____

1. **Location of Property** (Distance to nearest towns or roads):
2. **Legal Description of Property** (Survey, Block, Section Numbers): Attach legal descriptions
3. **Acres covered in the plan:**
 - Total Enrolled Acres:
 - Conservation Acres (Acres managed for TKR):
 - Rangeland:
 - Cropland:
 - CRP:
 - Other (describe):
 - Non-Conservation Acres:
 - Rangeland:
 - Cropland:
 - CRP:
 - Other (describe):

4. Wildlife Management Plan Version

Table 1. WMP Version Summary

Version	Date Approved
1	
2	
3	

SECTION 2 – PROPERTY, COVERED ACTIVITIES, HABITATS AND MANAGEMENT DESCRIPTION

- 1. Describe current status of property** (e.g. presence of house, barns, roads, fences, windmills, oil/gas, etc.)
- 2. Identify the Covered Activities that this plan will include** (normal agricultural operations, recreation, or nature tourism):
 - a.** The term “covered activities” refers to those activities that may be carried out by participants on enrolled acreage that may result in incidental take of TKR that are consistent with the CCAA and the Permit during the term of the CI. Activities not covered under the CCAA include but are not limited to energy development and production, commercial mining, public transportation, or residential or commercial development. In addition to the activities described in this section, any of the activities described under Recommended Practices in Section 3 and Section 4 of this WMP can be included as covered activities.
 - i.** Normal Agricultural Operations - In addition to the Recommended Practices and Monitoring, the customary and generally accepted activities, practices, and procedures identified by Texas AgriLife Extension Service for adoption, use, or engagement in the annual production and preparation for market of crops, livestock, and livestock products and in the production and harvesting of agriculture, agronomic, horticulture, silviculture, and rangeland commodities are authorized. This includes on-site facilities and equipment necessary to carry out these practices, not limited to greenhouses, nurseries, barns, packing sheds, fences, pens, traps, windmills, water irrigation, and other structures or equipment used in implementing best management practices for planting, cultivating, producing, harvesting, processing, packaging, storing, marketing for wholesale or retail distribution of agricultural commodities, and management of agricultural waste.
 - ii.** Agritourism - Outdoor recreational activities occurring on land suitable for use in the production of fruit or crops grown for human or animal consumption, or plants grown for production of fibers, floriculture, viticulture, horticulture, or planting seed, or suitable for domestic or native farm or ranch animals to be kept for use or profit and engaged in educational or recreational activities. Those activities include hunting, fishing, swimming, boating, camping, picnicking, hiking, pleasure driving (including ATVs), nature study, cave exploration, water sports, biking, disc golf, walking dogs, radio control flying, and other activities associated with enjoying nature or the outdoors.
 - b.** List the activities covered by this plan:
- 3. Describe historic habitat types** (e.g. shortgrass prairie), historic climax plant community for the dominant ecological site, and land use:
- 4. Describe current plant composition, land use, and any recent habitat manipulation** (e.g. dominant species of vegetation),

5. Livestock Management: Livestock and rangeland management go hand in hand. To provide healthy rangeland, livestock numbers must be balanced with forage production. To accomplish this balance, a forage inventory (using Web Soil Survey) is needed. This inventory provides information on pounds of available forage under current conditions. With forage production information, proper livestock numbers can be determined and from this a grazing scheme can be planned. Duration and intensity of grazing must be balanced to increase or maintain good wildlife habitat, in addition to creating planned patterns of highly disturbed patches of TKR habitat across the landscape. Light to moderate grazing (at least 50% of growth remaining) provides the basis for quality wildlife habitat across the property, but small patches of high-use areas such as water troughs and supplemental feed stations can provide TKR habitat. Diverse grazing pressure is desirable to create the needed patchwork of different vegetative heights, composition, interspersion and increased food plant production.

- a. **Current System** (Include the number of pastures and describe the system of managed grazing, if one exists; also describe the current stocking rate (ac/AU):

SECTION 3 – TKR HABITAT MANAGEMENT

1. Description of Desired Habitat Condition: Ideally, TKR CCAA enrolled properties should be a grass-dominated landscape with few shrubs and multiple small patches of highly disturbed areas interspersed across the grassland; however, TKR are also known to occupy non-traditional habitats, such as bar ditches or county road rights-of-way, where they may use adjacent habitats such as cropland. Optimum TKR habitat consists of small patches (1 – 20 ac) of native shortgrass prairie on clay or clay-loam soils in early plant succession. These small patches of TKR habitat should provide adequate bare ground (20 – 50%) dominated by native short grasses (< 6" tall), weeds, and scattered low growing shrub cover (1-15%). TKR have a relatively small average home range of 800 sq meters (0.2 acres), but ranges from 100 – 1,900 sq meters (0.02 – 0.5 acres). The property should have varying degrees of grass, weed, and shrub cover across the landscape to meet the diverse habitat requirements of all native wildlife. TKR habitat types include areas for burrows, movement corridors (dust bathing/movement/dispersal), and foraging.

- a. **Burrows:** TKR typically use a complex of 2 – 6 burrows in friable soils within 200 meters of each other, but are commonly found within a tight, 1-meter cluster of each other. The burrow system, averaging 2.5-meters deep and 46 cm under the surface, is typically an interconnected system with a single nest chamber at the bottom of the system and multiple food storage chambers. Satellite burrow systems > 50 m from an individual TKR's main burrow complex may be used intermittently for days at time. Burrows are often associated with some type of structure (plant roots, old brush piles, fence rows, caliche pad, large rocks, etc.) that helps stabilize the burrow and on a sloped surface (presumably to reduce burrow flooding) presumably mimicking prairie mounds, but may also be found on bare, flat ground. Burrows are used as escape and loafing cover, food (seed) caches, mating, and dens for raising young. Since TKR is nocturnal, they spend all day and up to 80% of the night in their burrow system.

- b. Movement corridors:** Kangaroo rat body size and locomotion requires bare ground and short vegetation for them to move throughout their home range. Trails, or movement corridors, are often found leading from TKR burrow entrances to foraging areas and often contain areas where dustbathing occurs, which is important to rodent health. Additionally, these movement corridors may be important for dispersal and dustbathing sites may play a role in communicating breeding receptivity via pheromone transmission.
 - c. Foraging:** TKR primarily eat seeds from forbs and grasses, but may also eat plant parts such as leaves, flowers, or fruit when they are new and tender; cultivated oat, Johnsongrass, stork's bill, broomweed, and bladderpod seeds were considered preferred by one study. Seeds and plant materials are transported inside TKR's cheek pouches from foraging areas to burrows via movement corridors. Shortgrass species (buffalograss, blue grama, etc.) and forbs provide screening cover to aid them in retreating to their burrow system to avoid nocturnal predators such as rattlesnakes and owls; any nocturnal predator, such as coyotes, foxes, feral dogs or cats, bobcats, or snakes, may predate on TKR. TKR foraging habitat should be dominated by seed-producing forbs (weeds) with adequate bare ground to facilitate TKR movement throughout the area, but still contain adequate screening cover in the form of short grasses; too much shrub cover (>15%) may increase their risk of predation. Within the TKR range, good quail brood-rearing habitat is probably also good TKR and Texas horned lizard habitat.
- 2. Recommended Practices:** The recommended practices below must comply with Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act. Consult with your biologist prior to implementing these practices for assistance.
- a. Prescribed Grazing** (CP 528, CP 382, CP 614, etc.): Livestock grazing can maintain a mosaic of short herbaceous vegetation along with a patchwork of soil disturbance (i.e., bare soils), while limiting shrub mottes, which may benefit TKR habitat (Stangl 1992, Nelson et al. 2009, Stasey et al. 2010). A rotational grazing prescription may be necessary to promote a mosaic of habitat types and avoid overutilization by cattle (Martin 2002, Derner et al. 2009). Overutilization of native grasses (i.e., excessive or intensive grazing without sufficient recovery periods) reduces competition from grasses and could lead an increase of woody vegetation that would be detrimental to TKR habitat (Archer et al. 2017, Stuhler et al. 2019). A grazing plan that meets site-specific objectives and addresses stocking rate, frequency of rotation, and contains a plan for drought conditions should be developed and agreed upon by a resource specialist and the landowner. Highly utilized areas (e.g., supplemental feeding and watering areas) should be strategically dispersed across the site, allowing for interspersed patches of bare ground. For best results, a forage inventory, including livestock water and supplemental feed locations, should be conducted to obtain a baseline of forage production as a starting point for developing stocking rates. The type of grazing system, forage production, landowner's objectives and water availability will help determine initial stocking rates to achieve goals. High-intensity, low-duration or patch-burn grazing systems are recommended, but any grazing system that can produce suitable TKR habitat is authorized. Livestock management

- tools, such as feed supplements, can be a valuable tool for creating or maintaining the small patches of desired TKR habitat if they are utilized properly. Installation of grazing enclosures is strongly recommended for properties currently exhibiting heavy grazing pressure. Also, describe any agreed upon adjustments to the current stocking rate.
- i. To Date –
 - ii. Agreed to Implement –
 - b. Prescribed Burning (CP 338 & CP 394):** Prescribed burns may also be used in coordination with a grazing plan because the interactive effects of grazing and fire prevent the proliferation of dense stands of shrubs that are unfavorable to TKR (Brennan and Kuvlesky 2005, Stuhler et al. 2019). Applying fire to the landscape, in general, promotes healthier grasslands and deters woody vegetation encroachment. Fire can also maintain a shortgrass plant community and areas of bare ground. A prescribed burn plan should be developed and agreed upon by a resource specialist and the landowner. Plans must include measures that minimize impacts to known occupied TKR sites. Care should be taken to avoid active TKR burrows when creating fire breaks. Prescribed burns must be planned and applied using an approved burn plan (developed with the assistance of qualified professionals).
 - i. To Date – None
 - ii. Agreed to Implement –
 - c. Brush management/manipulation (CP 314):** Brush management typically includes mechanical and chemical methods, or a combination of both of these treatments. Managing woody vegetation encroaching on grasslands, particularly mesquite, redberry juniper, and eastern red cedar, may help improve TKR habitat conditions. Slash piles should not be located near (≈ 50 m) TKR burrows known to be occupied. Where chemical control methods are used, standing dead timber (snags) may be left behind to avoid debris piles, but removal of snags is encouraged to reduce potential perches for aerial predators and screening cover for ground predators. If standing snags are undesirable for landowners, then snags could dry for a period of time and then be chained and burned in rapid succession. Use of herbicides should be limited on habitat recovery sites on enrolled acres. Long-term maintenance of brush can be accomplished through prescribed grazing and prescribed fire. Upland trees, including eastern red cedar and windbreaks, should be removed as they create hunting perches for nocturnal predators such as owls.
 - i. To Date – None
 - ii. Agreed to Implement –
 - d. Early Successional Habitat Maintenance/Development (CP 647):** TKR is an early successional habitat specialist so it may be beneficial to use early successional habitat development techniques to create or maintain TKR habitat. Shredding, mowing, and disking can be used to create and maintain the desirable plant structure (i.e. height) and cover (% bare ground, forb, grass, and shrub) TKR requires; disking of native range should be limited, follow a prescription outlined in a conservation plan, and must comply with cultural resource compliance rules. Disking may be done at most

times during the dormant season but fall is recommended. Disking should be in a mosaic pattern and no more than 5-15% of the conservation acre area annually. Follow up disking should take place as needed to maintain suitable TKR habitat conditions. Care should be taken to minimize impacts to known occupied TKR sites and avoid burrows when possible.

- i. To Date – None
- ii. Agreed to Implement –

e. Disturbed Edge Habitat Management (CP 332 & CP 386): While cropland may not provide all the necessary habitat types year-round, it is well documented that TKR use the edges of crop fields that have bare ground and short grass/forb ground cover, especially when an adjacent unimproved road is present. TKR may also use buffer/contour strips, field borders, center pivot corners and fence lines that contain short herbaceous cover and patches of bare ground. Early successional habitat management should be used to maintain optimal structure and habitat in these areas. Care should be taken to protect any TKR burrows. In some cases, seeding may be necessary to restore native grasses and forbs (See Native Grassland Restoration). Minimum tillage farming practices, such as leaving grain stubble and waste grain on the soil surface, may lead to additional supplemental food supplies. Including crops such as alfalfa, wheat, grain sorghum, cotton, and oats may provide food resources when seeds are available.

- i. To Date – None
- ii. Agreed to Implement –

f. Native Grassland Restoration (CP 550): Seeding may be necessary to improve degraded TKR habitat and convert cropland or pastures dominated by exotic grasses to native grasslands. Seeding mixtures, rates, and techniques should be tailored to the ecological site. Once established native grassland will need to be maintained which can be accomplished through prescribed grazing and/or prescribed burning.

- i. To Date – None
- ii. Agreed to Implement –

g. Dirt Road Maintenance: TKR are known to use a variety of disturbed areas including dirt roads (Ott et al. 2019, in press). TKR use the edges of roads for foraging and burrow construction in place of unavailable traditional habitat. Continued maintenance of internal roads to limit tall vegetation and woody encroachment may help support TKR on private lands. Care should be taken to protect TKR burrows and the timing of grading/disking of roads and mowing of bar ditches may be important to minimize disturbance of active burrows along the roadsides

- i. To Date – None
- ii. Agreed to Implement –

h. Prairie Dog Colony Conservation: Once numerous and expansive across the Great Plains, the historical range of the black-tailed prairie dog fully encompassed that of the TKR. Colonies of prairie dogs still exist in the TKR range, but on a substantially

smaller scale, both in size and abundance. Prairie dog towns effectively keep herbaceous vegetation short and reduce woody vegetation encroachment. It is unclear what ecological relationship historically existed between prairie dogs and TKR; however, it is likely that prairie dog colonies facilitated TKR foraging and dispersal. Conservation of existing prairie dog colonies, including limited control or disease management, may help to maintain or improve TKR habitat is authorized. Reintroduction of new prairie dog colonies to suitable habitat may benefit TKR and is encouraged, but not required, on enrolled properties.

- i. To Date – None
- ii. Agreed to Implement –

SECTION 4 -COMPLIANCE MONITORING AND REPORTING AND ADAPTIVE MANAGEMENT

- 1. Monitoring and Reporting** - The landowner/manager will be responsible for specified monitoring and reporting related to implementation of this plan and the associated individual CI as well as fulfillment of its provisions. Each landowner will be required to submit a Landowner Reporting Form (LRF) to TPWD that describes the conservation measures that were implemented on his or her property each year the property is enrolled. (Appendix D). Photo points will be established and the landowner will provide at least 2 photos of each established point, one photo pointed down at the ground and one landscape photo of the surrounding area, taken from the same direction every year. Photos will be taken at least once a year at the end of the growing season (mid October-November) and will be provided with the LRF. The LRF will be due to TPWD by February 1st each year. TPWD will review each LRF upon receipt for compliance and will report any non-compliance issues to USFWS. TPWD will send reminders and follow up emails to enrolled landowners as needed. This agreement will grant TPWD or their designated representatives the right to enter the enrolled lands at a mutually agreed upon time, and within 30 calendar days notice, to ascertain compliance with the Cooperative Agreement and CI. TPWD will coordinate with their designated conservation partners to ensure visits are made to each enrolled property to include a minimum of at least three times during the duration of the Cooperative Agreement to assess range conditions and update the WMP per the Adaptive Management paragraph below. The purpose of these visits is to document or verify 1) changes to acres enrolled (acres bought/sold and update maps), 2) habitat management activities implemented since the last WMP update, and 3) evaluate the effectiveness of the habitat management activities in terms of providing suitable TKR habitat. This will likely include one visit to initiate enrollment, one interim visit to monitor progress, and one visit towards the end of the Cooperative Agreement. TPWD will provide USFWS with a summary of landowner enrollment and LRFs by March 1st of each year for the duration of the agreement.

2. Adaptive Management – Adaptive management is an important component of any successful WMP. Implementation of this plan will follow an Adaptive Management approach with collaborative and substantial involvement from both parties. The Recommended Practices described above are designed to further refine our knowledge of the current status of the TKR; avoid and minimize impacts to known populations of TKR; monitor TKR through time; provide additional information on habitat parameters and other life history requirements; and simultaneously monitor the effectiveness of the recommended practices. The signatories to this WMP agree and recognize that implementation of the recommended practices may change as new science emerges. The effectiveness of the recommended practices and monitoring methods will be reviewed as new science and technologies become available. As a result, modifications to the recommended practices, covered activities, or monitoring methods may be incorporated if mutually agreed upon by both parties via updated versions of the CCAA and/or WMP to further enhance the goals of this plan; failure to agree on required changes may result in termination of this agreement. Additionally, research projects that are designed to determine the effectiveness of management practices will be encouraged and utilized to determine what Adaptive Management is necessary.

SECTION 5 – PLAN PREPARATION

1. Individual Preparing Plan:

Name: _____ Title: _____
Address: _____
Phone(s): _____

2. Individual preparing the plan: Landowner Manager Resource Management Professional
 Consultant Certified Wildlife Biologist

3. Landowner/Agent Affidavit

By my signature below, I certify that I am the landowner of the above described property or a specifically authorized agent for the landowner. Authorized agent is defined as any person with verbal or written authorization to make decisions on behalf of the landowner. I also certify that the above information is true and correct to the best of my knowledge.

Landowner/Agent Signature

Printed Name

Date Signed

	<i>TEXAS PARKS AND WILDLIFE DEPARTMENT CERTIFICATION</i>	
	Circle One: <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
_____ Authorized TPWD Signature		
_____ Date		
Name: _____ Title: _____		
<i>Certification provides that this Wildlife Management Plan was reviewed and is found to be biologically and technically sound with regard to management of wildlife populations and habitats.</i>		

SECTION 6 – Cultural and Natural Resource Compliance

TPWD is required to protect our natural and cultural resources as decreed by law (the National Historic Preservation Act (PL 89-665 as amended & the Endangered Species Act of 1973 (PL 93-205 as amended)) anytime federal funds are spent, clearances for cultural and natural resources must be obtained. The Texas Kangaroo Rat Candidate Conservation Agreement with Assurances is a federally authorized and permitted program

1. Section 106 of the National Historic Preservation Act:

*In the interest of protecting significant cultural resources, through section 106 of the National Historic Preservation Act, the use of federal authorization carries obligations for conducting limited consultation with the Texas Historic Commission (THC) regarding cultural resource concerns. In the case of the CCAA, consultation covers the entire enrolled property and all recommended practices that may be adversely affect cultural resources during implementation of a specific practice within the property; however, many areas and practices fall under categorical exclusions authorized through agreements with the State Historic Preservation Office (SHPO) with the Texas Historical Commission (THC). This consultation carries with it the obligation to report culturally significant findings (archaeological sites) for recording in the Texas Archeological Research Laboratory (TARL) where a state of Texas archeological site number will be assigned. Records, archaeological site locations and content held by TARL are **not** subject to the Freedom of Information Act requests for public information access. Recording is restricted to cultural resource site-specific locations and nature of the archeological site. If archaeological sites are present, federal law requires consultation be made with the SHPO/THC when under federal authorization. Upon receipt of concurrence from the SHPO/THC that sites are not significant, the project work may proceed. But if important or significant archaeological sites are found, then recommendations may be made to avoid or minimize damage to the site perhaps by altering methods during implementation of the practice.*

2. Section 7 of the Endangered Species Act (ESA):

In the interest of protecting listed & candidate species, through Section 7 of the Endangered Species Act, the use of federal authorization carries obligations for conducting limited consultation with the U.S. Fish and Wildlife Service regarding listed and candidate species impacts. In the case of the CCAA, consultation covers the entire enrolled property and all recommended practices that may be adversely affect ESA listed and candidate species present during implementation of a specific practice within the property.

(Submitting TPWD or USFWS Biologist
Signature)

(Date)

(Submitting Landowner's Signature)

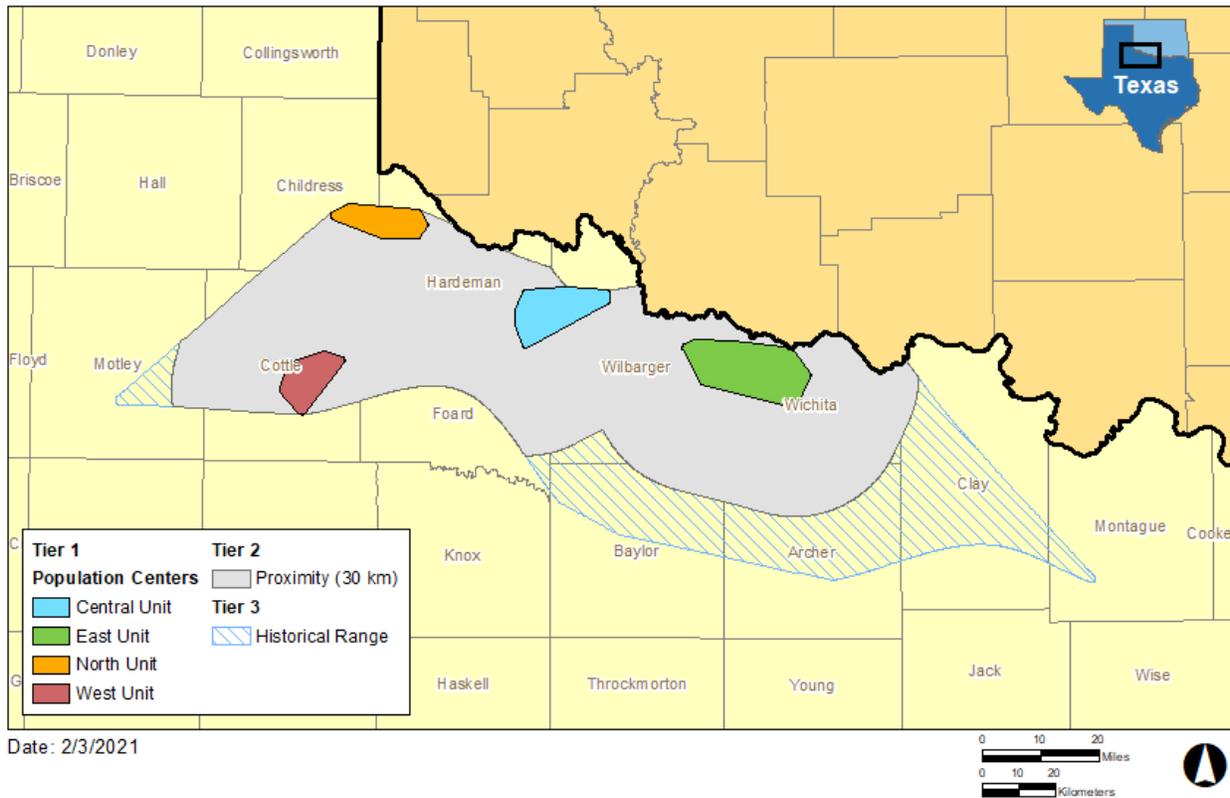
(Date)

Appendix C: Prioritization of Enrolled Lands

Prioritization of Enrolled Lands

Lands to be enrolled under this CCAA will receive tiered priority of importance as follows:

- Tier 1 - Top priority will be given to those properties located within a known TKR population center*.
- Tier 2 - Properties within 30 kilometers of known population centers (but within the historical range) or properties with documented TKR presence. 30 kilometers is based on average distance between currently known population centers.
- Tier 3 - properties located within the historical TKR range.



*Population centers may be revised every 5 years based on new information.

Appendix D: Landowner Reporting Form



Annual Landowner Reporting Form for the Texas Kangaroo Rat CCAA

Thank you for completing the annual report. Please provide the following information with required photos to _____ . All responses will be compiled, and landowner names, addresses, and ranch names will be removed from reports submitted to the United States Fish and Wildlife Service.

Reporting year (Jan.-Dec.) Total # enrolled acres Property Identification Number

County/counties where enrolled property is located

Please check all activities completed during the reporting year on the enrolled acreage for which you are reporting and please indicate location of activities on a map to be included with the annual report.

Brush control _____ acres Disking/shredding/mowing _____ acres

Prescribed fire _____ acres Wildfire _____ acres

Native grassland restoration (reseeding) _____ acres

Prescribed grazing

What was your ranch-wide stocking rate for the reporting year? _____ Circle reporting unit:
cows/section ac/AU stockers/section/6mo total cows

Disturbed edge habitat management _____ miles

Dirt road maintenance (internal roads) _____ miles

Prairie dog colony maintenance/reintroduction (Describe) _____

Optional: Please describe any incidental observation data for TKR (Jan-Dec) (e.g. total TKR observed, TKR burrows, locations, etc.)

Photo documentation of range/pasture condition:

Landowner(s) will provide at least 2 photos of each established photo point, one photo pointed down at the ground and one landscape photo taken from the same direction every year of the surrounding area. Photos will be taken at least once a year at the end of the growing season (mid October-November) and will be provided with this reporting form annually.

Required photos provided.

Thank you for completing the Annual Report!

Please email your completed report before February 1st to _____

Periodic spot-check site visits at mutually agreed upon times will be conducted to monitor habitat condition and implementation of the practices agreed upon in your wildlife management plan.

Appendix E: Compliance with Section 106 of the National Historic Preservation Act

Compliance with Section 106 of the National Historic Preservation Act

Conservation measures described in this CCAA are expected to provide a net conservation benefit for the TKR. Due to the small home range of TKRs, the application of these measures may not cover entire properties and may be limited to selected areas that have the greatest potential of benefiting the species. Compliance with Section 106 for the purposes of this CCAA apply only to those conservation measures described in a Participant's Cooperative Agreement. Compliance with Section 106 does not apply to those activities not specified in a Participant's Cooperative Agreement.

This protocol outlines the process for compliance with Section 106 of the National Historic Preservation Act (NHPA) while conducting conservation measures as specified in Participants Cooperative Agreements.

Most of the conservation measures described in the Agreement do not have the potential to cause effects on historic properties as defined by the NHPA:

Historic property (or **historic resource**) is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places, including artifacts, records and material remains related to such a property or resource. (NHPA 54 U.S.C. § 300308). For the purposes of this protocol, *historic property* also includes sites considered as traditional cultural properties (TCP).

In this appendix, we specify activities that, for the purposes of implementing this Agreement:

- Do not have the potential to affect historic properties, or
- Require consultation with the Texas State Historic Preservation Officer (SHPO) and Tribal Historic Preservation Officer (THPO)

Step 1: Does the conservation measure occur within a known historical site?

Due to their sensitivity to interested parties, any activity located within any previously known cultural site, including an archaeological site, traditional cultural property, and especially any identified or suspected religious/sacred site such as a platted or unplatted cemetery (includes prehistoric earthen burial mounds) must be reviewed further.

A reasonable and good faith effort will be made to learn if any known cultural sites are within the Area of Potential Effect (APE). Efforts to identify known sites can include walking over the entire direct APE, talking with the landowner, THPOs and others, checking the SHPO's known sites/surveys database, and reviewing historic documents, such as old plat maps and aerial photos. Cultural sites may have been identified as "historic properties" through prior consultations, or through verbal or written communications with Federal, Tribal, or State historic preservation offices. The project site may also be cross referenced to State and Federal cultural resource databases within the SHPO and/or the THPO to determine if the site is a known historic property. TPWD shall determine whether the activity would occur in a known cultural site or within 100 feet of the boundary of a known cultural site and maintain documentation of their

conclusions for their records. TPWD will make the documentation available to the Service upon request.

If the conservation measure does not occur within known cultural site or within 100 feet of the boundaries of a known cultural site proceed to Step 2.

If the conservation measure occurs within a known cultural site or cannot be modified to avoid boundaries of a known cultural site, the conservation measure has potential to affect historic properties and a full Section 106 consultation is required. Proceed to Step 3.

Step 2: Does the conservation measure have the potential to affect a historic property?

The Service considers the activities listed below as having no potential to cause effects on any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places provided they a) do not occur within 150 feet of a known cultural site, and b) do not result in soil disturbance beyond the extent or depth of previously disturbed land. If an activity will result in soil disturbance then evidence of previous soil disturbance must be documented and can include aerial imagery analysis, photographs and maps of previous disturbance, or a signed affidavit from the landowner. The activities listed below that meet these criteria are exempted from further Section 106 review as consistent with 36 CFR Part 800.3(a)(1).

- 1) **Prescribed Grazing** – use of prescribed grazing to maintain early successional habitats.
- 2) **Fencing** – fencing which does not involve blading or heavy equipment-assisted brush clearing or does not lead to concentrations of livestock in a confined area (corrals) or create ruts along the fence line.
- 3) **Prescribed Fire** – use of prescribed burning to control herbaceous and woody surface vegetation and installation of fore breaks without disturbance of soil below the lowest levels of previous disturbance.
- 4) **Brush Removal** – removal of dense brush using forestry mulching, chainsaws, or other non-ground disturbing mechanical methods.
- 5) **Herbicide Application** – use of equipment or vehicles to apply herbicides to control invasive plants including brush
- 6) **Mowing, Shredding or Haying** – mechanical mowing shredding or haying of vegetative material to sustain early successional habitats
- 7) **Seeding and Planting** – seeding and planting techniques such as broadcast seeding, use of a no-till drill, or disking without disturbance of soil below the lowest level of previous disturbance.

If the proposed activity fits within one or more of these exemptions and the due diligence review indicates that no historic property would be affected, then the Service considers it to have no potential to cause effects on a historic property and the activity can be considered exempted from SHPO and THPO review. TPWD shall maintain documentation of those conclusions for their records and make them available to the Service upon request. This would conclude the Service's Section 106 compliance for this activity.

If the proposed activity does not fit within one or more of these exemptions, it is considered to have potential to affect a historic property. Proceed to Step 3.

Step 3: Formal Section 106 consultation for a conservation measure that has the potential to affect a historic property.

For a conservation measure that has the potential to affect a historic property, TPWD will assist the Service in their Section 106 compliance obligations by completing consultation. For each project area, TPWD will initiate procedures outlined in regulations 36 CFR Part 800 working directly with the other consulting parties (e.g. SHPO, THPO etc.).

The full protocol for consulting on a conservation measure that has the potential to affect a Historic Property includes:

- 1) Define the project site and parameters (APE and timing of activities).
- 2) Cross-reference the project site to State and Federal cultural resource databases within the SHPO and/or the THPO, if applicable, to see if any potential impacts to known cultural sites can be identified (if not done already).
- 3) Project information resulting from the review and consultation above will be submitted to the Texas SHPO and any other consulting parties identified as having an interest in the APE (e.g. THPOs/tribes). TPWD should clearly state to the consulting parties that this is a Service undertaking. The SHPO review form can be used, or correspondence with equivalent information, with the supporting documentation including maps and database searches can be sent to the SHPO/THPO for review. The SHPO or THPO may choose to engage the Service directly, rather than TPWD, and, if so, the review process and timing may be different.
- 4) The SHPO should review the project within 30 calendar days and the THPO or tribe within 45 days from the date the project is submitted for review. Either party may request a field visit or “survey”. If no response is given or no survey is requested, activities can begin as planned and the TPWD shall document this for their records, to provide to the Service on request. This would conclude the Service’s Section 106 compliance for this activity.
- 5) If the SHPO or THPO determine a survey is required but the Participant does not agree to a survey, TPWD will work with the Participant to determine if the Participant’s Cooperative Agreement can be modified to avoid the need for a survey. If a survey cannot be avoided the Participant can either agree to the survey or choose to terminate their Cooperative Agreement

- 6) If the SHPO or THPO determine a survey is required and the Participant agrees to the survey, a cultural resources professional that meets the Secretary of Interior's Professional Qualifications Standards (36 CFR Part 61) must conduct the survey.
 - a. If cultural sites are not found, TPWD will notify the consulting parties, receive concurrence, and document this for their records. TPWD will provide the documentation to the Service upon request.
 - b. If cultural sites are found, the Partner, in consultation with the consulting parties, will develop a plan, if necessary (most times it is not necessary if the site(s) can be avoided), to evaluate whether or not the site is eligible for inclusion on the National Register of Historic Places (NRHP) and what effect the project, if any, will have on the site. TPWD and the Participant will work with the consulting parties and follow the Section 106 process to the end. TPWD shall maintain documentation for their records, which will be available to the Service on request. This would conclude the Service's Section 106 compliance.
 - c. If during the implementation of any ground disturbing activities included in a participant's Cooperative Agreement result in the discovery of archeological deposits, then all activities in the immediate vicinity of the find shall cease and the TPWD Cultural Resources Coordinator shall be notified in accordance with 36 CFR Part 800.13.