1.0 Introduction

This document was developed to guide best practices for determining suitable habitat and detecting the presence of federally proposed endangered and state-listed threatened Texas kangaroo rats (TKR; *Dipodomys elator*). As of the date of this document, TKR is proposed for federal protection as an endangered species. A critical habitat designation is also under consideration for this species. To determine the appropriate course of action, it is essential to evaluate the potential impacts on TKR. This evaluation may include a formal Section 7 conference or consultation with USFWS, contingent upon the species' listing status.

Additionally, due to TKR's statis as a threatened species in Texas, any direct field observations should be reported to the Texas Natural Diversity Database (TXNDD). Observations should be submitted using the TXNDD Reporting Form and must include a map indicating the precise location of the TKR sighting.

Appropriate personal protective equipment (PPE) should be worn to prevent injury to technicians working along roadsides. Additional PPE may be required based on project requirements.

- Hardhat
- Safety vest
- Protective footwear

A supplement to this guide provides more detailed information on the ecology of the species, more in-depth information for conducting surveys, alternative survey methods, and recommended protection measures and is available upon request from ENV-Bio@txdot.gov. Sample field data collection forms are included in Section 3 of this document.

Methods described in this guidance and the supplement include survey methodologies conducted at night. If any night surveys are conducted, the TxDOT district, Texas Parks and Wildlife Department game wardens, and local law enforcement must be notified once a schedule is developed and prior to any night surveys.

2.0 Methods

Desktop Habitat Assessment

A Desktop Habitat Assessment should be conducted to determine whether field-based presence/absence surveys are recommended. The Desktop Habitat Assessment considers the presence of critical habitat, historical species occurrence records, and habitat suitability (Figure 1). The protocol for conducting the desktop habitat assessment is thoroughly described in the supplement available upon request from ENV-Bio@txdot.gov. Broadly, field-based presence/absence surveys are recommended for projects occurring within any of the 11 Texas counties within the species range, and:

- Intersecting proposed or designated critical habitat, or
- Having species occurrence records within 0.8 km (0.5 mi) of the project in the last 25 years, or
- Having suitable habitat within the project area.

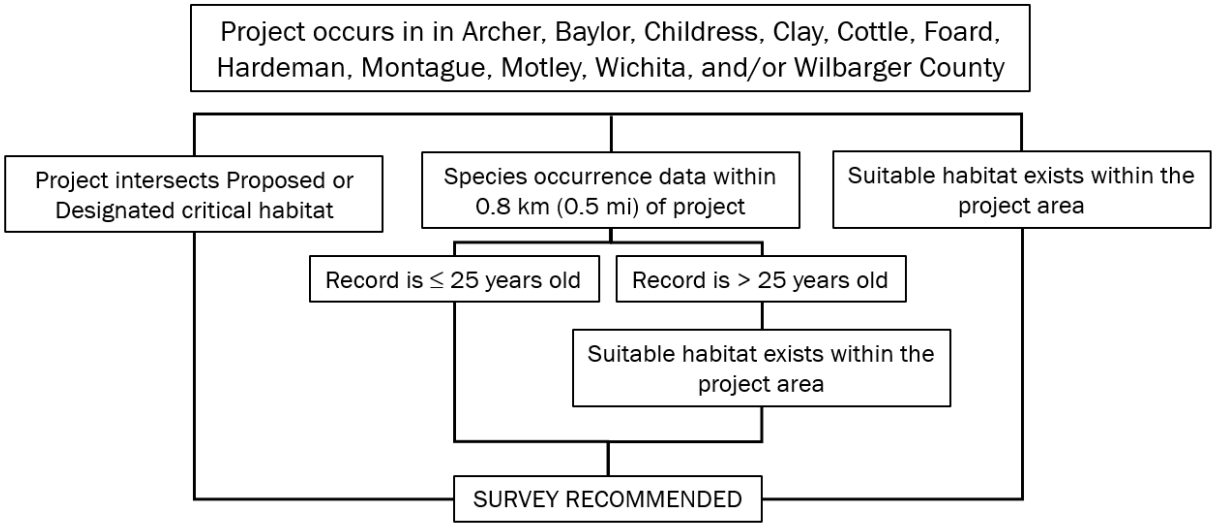

Figure 1. The Desktop Habitat Assessment considers several factors to determine if a field-based presence/absence survey is recommended for TKR.

Habitat Suitability

A field-based presence/absence survey is necessary if any part of the habitat within the project area can be considered suitable for TKR (Figure 2). Suitable habitat will have less than 50 percent woody vegetation cover and:

- At least 30 cm (12 in) of soil horizon consists of clay, clay-loam, or loam textured soils with no restrictive (impermeable) layer in the top 50 cm (20 in), or
- Landcover class is cropland, pastureland, or mix-grass/shortgrass prairie, or
- Project area is along an unpaved roadway with at least 2 m (6.5 ft) of unpaved roadsides strip of at least 2 m (6.5 ft) wide.

Unsuitable habitat is characterized by:

- Restrictive (impermeable) soil layer within the top 50 cm (20 in) of soil depth, or
- At least 30 cm (12 in) of sandy textured soil, or
- Greater than 50 percent woody vegetation cover, or
- A paved roadway with less than 1 hectare (2.5 acres) of other suitable habitat within 0.8 km (0.5 mi) of the road.

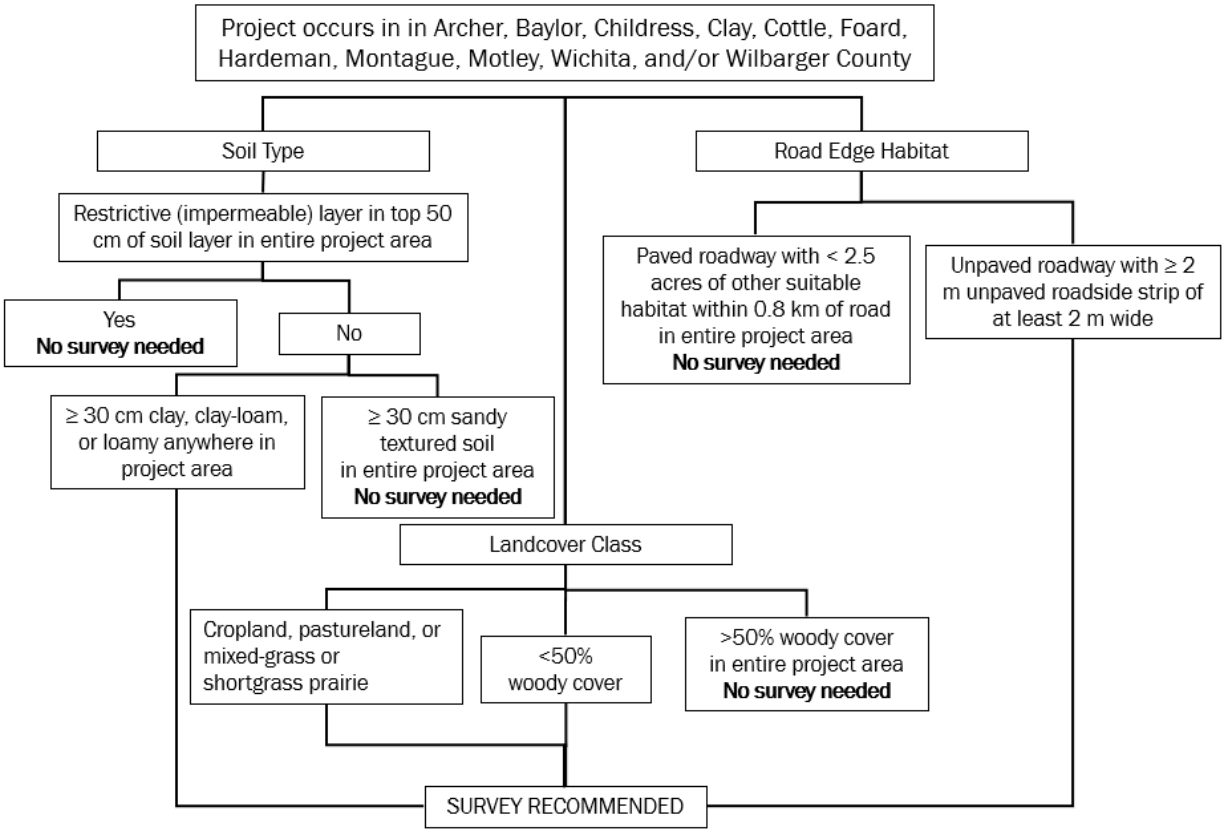

Figure 1. Habitat suitability factors used to determine if a field-based presence/absence survey is recommended.

Presence/Absence Surveys

If a field-based presence/absence survey is recommended due to the apparent presence of suitable habitat based on the desktop habitat assessment, the field-based survey should occur within the project area and an additional 500 ft buffer around the project area, when possible. If right-of-entry (ROE) is not granted, surveys can be restricted to the ROW. Field-based presence/absence surveys consist of habitat characterization, daytime burrow surveys, and nighttime camera trapping and/or spotlight surveys (spotlight surveys may require additional coordination with USFWS and are described in the supplemental document). The supplemental document provides additional information related to species identification, habitat features, and survey methodologies. Section 3 provides Example Field Data Collection Forms.

Nighttime survey timing must include consideration of weather conditions. TKR will remain in their burrows during inclement weather (i.e., temperatures below 40˚F [5˚C] and wind speeds greater than 20 miles per hour [mph] [32 km/h], and precipitation). If weather conditions exceed these minimum thresholds, spotlight surveys should be terminated and resumed when conditions have improved.

<u>On-site Habitat Characterization</u>

The first step in the presence/absence survey process is to characterize the habitat within the project area and an additional 500 ft buffer (when ROE is granted). Surveyors should record features that may represent barriers to dispersal (i.e., water features, paved roads, rail roads, etc.) as well as areas of unsuitable habitat on field data collection form. Representative photos of each habitat characteristic should be documented, and areas of unsuitable habitat should be mapped. Other survey area

characteristics that may be recorded include the level of habitat connectivity and/or fragmentation, overall habitat patch size(s), and the existing level of human disturbance.

General habitat characteristics to identify during assessment include, but are not limited to:

- soil type
- dominant vegetation types
- average vegetation height
- percent woody cover
- percent bare ground

Daytime Burrow Surveys

1. Survey coverage includes the proposed project limits and a 500 ft (152 m) buffer when right-of-entry has been secured on adjacent lands, otherwise only survey within the ROW
    - Surveys involve walking line transects at regular 15 m (50 ft) intervals to identify potential TKR burrows and document their characteristics as follows:
2. Dipodomys burrow entrances are baseball sized (approximately 7.2 to 7.5 cm [2.8 to 3 in] in diameter)
    - Below ground tunnels descend at an angle no greater than 45˚
    - Trails and runways to burrow entrances should be apparent

Nighttime Camera Trapping

Determinations of presence rely on a visual confirmation of the species which may be determined by camera trapping. The supplemental document provides details important to camera trapping methodology, which should follow these general guidelines:

- Notify TxDOT district, TPWD game wardens, and local law enforcement prior to conducting nighttime surveys.
- Motion-sensitive cameras, utilizing an infrared flash, should be used to monitor suspected TKR burrow entrances for a minimum of three days.
- To the extent possible, position cameras so that they are not in sight of major roads or human trails.
- Cameras can be attached to rebar with zip ties approximately 1.5 – 3 m (5 – 10 ft) from burrow entrances.
- Place each camera at a 90-degree angle to the path of travel, approximately two feet above the ground and angled slightly downward with a clear view of the entrance and runway.
- Set cameras to deploy beginning 30 minutes after sunset and ending 30 minutes before sunrise.
- Cameras should be set to capture a single still photo when triggered with a 30-second delay between triggers.

Data Collection and Reporting

When encountered, data collection on identified Dipodomys burrows should include all of the information indicated in the example Daytime Burrow Survey Data Collection Form in Section 3. This includes locality

information, a survey of the surrounding area for other burrows, and specific information pertaining to the morphology of the burrow itself.

When positive identification of the species is made, data collection should include the following:

- Location of observation
- Time of observation
- Distance from burrow
- Bait type, if used
- Notes on habitat use, if apparent

3.0 Example Field Data Collection Forms

Daytime Burrow Survey Data Collection Form

The table below provides an example of data recommended for recording suspected TKR burrow locations and characteristics. Use a new sheet for each observation. Be sure to indicate if a camera trap was placed at this location. Example text in blue.

Daytime Burrow Surveys	**Burrow Data**
Site Location Name	Boggy Creek at CR 114
Date	Jan 9
Weather Conditions	High Winds >20 mph, 48˚F
Suspected Burrow Characteristic's	
Burrow ID (Surveyor initials and a number)	EKB_01
Location (coordinates)	34.221352, -99.410821
Number of burrows in close proximity	1
Burrow entrance diameter (cm)	7.6
Angle of Burrow Tunnel	<20˚
Runway to Burrow apparent (yes/no)?	yes
Photo of surrounding habitat included (yes/no)?	Yes
Photo of burrow entrance included (yes/no)?	yes
Camera Trap placed at this location (yes/no)	yes

Nighttime Spotlight Surveys Data Collection Form

The table below provides an example of data recommended for recording survey details and any positive identifications of TKR. Example text in blue.

Nighttime Burrow Surveys	**Day 1**	**Day 2**	**Day 3**
Site Location Name	Boggy Creek at CR 114		
Date	Jan 10		
Weather Conditions	Moderate Winds >15 mph, 55˚F		
Survey Details			
Surveyor Initials	EKB		
Survey Type	Driving Spotlight Survey		
Extent of Survey	Unpaved road within assessment area ~ 1500 linear meters		
Time of total darkness	6:48 p.m.		
Time of first survey	7:15 p.m.		
Total number of surveys performed	5		
Time surveys ended	9:11 p.m.		
Were TKR observed (yes/no)?	no		
If yes, how many individuals?	n/a		
List the approximate coordinates for each positive ID	n/a		
Other species observed	3 non-*Dipodomys* rodent species, 2 rabbits (*Sylvilagus* spp.), and 1 grey fox (*Urocyon cinereoargenteus*)		
Other notes	Surveys ended early due to inclement weather. Wind speeds increased to > 20 mph		

Appendix A: Revision History

The following table shows the revision history for this guidance document.

Revision History	
Effective Date Month, Year	**Reason for and Description of Change**
January 2025	Version 2 was released. Weather considerations for nighttime surveys added to Presence/Absence Survey section.
September 2024	Version 1 was released.