

Appendix B: Proposed Approaches to Prairie Dog Management

This appendix is provided to clarify how the Forest Service intends to implement the proposed plan amendments for prairie dog management. The responsible official may choose to adopt these management approaches as part of the amended grassland plan, or may choose to retain the documented approaches without adoption into the grassland plan.

The 2012 Planning Rule allows for inclusion of optional content in the plan, such as potential management approaches or strategies and partnership opportunities or coordination activities (36 CFR 219.7(f)(2)). The planning rule does not require project consistency with optional content in the plan (36 CFR 219.15(d)). Optional content in the plan can be changed after public notification under the planning rule provision for administrative changes (36 CFR 219.13(c)).

- **Management Approach (MA)** - A management approach can describe the principal strategies and program priorities the responsible official intends to employ to carry out projects and activities developed under the land management plan. The management approaches are related to the desired conditions for the alternative. Management approaches can convey the management emphasis, relate to desired conditions and may indicate the future course or direction of change. These may discuss potential processes such as analysis, assessment, inventory, project planning, or monitoring.

Collaborative Stakeholder Group (all alternatives)

Interested parties have been working together for decades to improve management of prairie dog colonies on the Thunder Basin National Grassland. Since the most recent grassland plan amendment in 2009, stakeholders have come together to develop conservation agreements (2010), as part of an interdisciplinary planning team (2013-2014), to revise the prairie dog conservation assessment and management strategy (2015), to assess the situation surrounding prairie dog management (2015), and to develop recommendations for a new plan amendment (2018). During the 2020 planning process, a collaborative stakeholder group continues to discuss management challenges, provide recommendations for plan amendment, and consider the most effective ways for stakeholders to participate in prairie dog management.

Working with a third-party collaborative stakeholder group is the best way to achieve strategic long-term solutions and pragmatic short-term decisions for prairie dog colony management, and a grassland-wide objective is proposed for amendment in all action alternatives (Table B-1). The responsible official will actively work with and accept input on prairie dog management and monitoring decisions from the collaborative stakeholder group. Ideally, the responsible official will meet with the collaborative stakeholder group or representatives a minimum of one time per year, and often more frequently. The collaborative stakeholder group is expected to include a diverse group of stakeholders representing a wide range of perspectives that work together toward recommendations. Diverse stakeholders include state and local agencies, educational and research institutions, ranching groups, grazing association members, environmental organizations, individuals with expert knowledge on topics such as range and wildlife management, private landowners, and other interested parties.

Grassland personnel will work with members of the collaborative stakeholder group more frequently. They will likely discuss topics such as mapping and monitoring prairie dog colonies, lethal and non-lethal control work within 1 mile of residences and in boundary management zones, management considerations

for managing colonies toward the target acreage (including translocation and rodenticide use), lethal and non-lethal control work outside of the boundary management zone, sylvatic plague management, density control, and public outreach.

Table B-1. Proposed plan components relevant to working with a collaborative stakeholder group

Component Number	No Action Alternative	All Action Alternatives
Chapter 1, Goals and Objectives	Objective: Work in cooperation with federal, state, and county agencies, individuals, and nongovernment organizations for control of noxious weeds and invasive species and animal damage.	Objective: Work in cooperation with federal, state, and county agencies, individuals, and non-governmental organizations for control of noxious weeds and invasive species and for seeking collaborative solutions to prairie dog management.

Sylvatic Plague Management (all alternatives)

Sylvatic plague (*Yersinia pestis*) was first detected on the Grassland in the mid-1990s, and the first landscape-scale epizootic among the black-tailed prairie dog population began in 2001. Since that time, plague has likely been continuously active in prairie dog colonies on the Grassland. Two subsequent landscape-scale epizootics began in 2005 and 2017.

Plague dynamics in prairie dog colonies are not well understood, especially regarding the mechanisms for permanence of plague in a location after it first enters a colony. Several management tools to minimize the transmission of plague can help reduce the likelihood of epizootics, including insecticides to control vector flea populations and vaccines to inoculate prairie dogs and other susceptible species.

The Forest Service has used the insecticide deltamethrin to control plague on the Thunder Basin National Grassland. In the proposed plan direction (Table B-2), the use of available plague control tools is explicitly allowed. A more detailed strategy for the prioritization of plague control and choice of plague control tools based on input from the collaborative stakeholder group may be developed subsequent to and independent of the proposed plan amendment.

Table B-2. Proposed plan components relevant to plague management

Component Number	No Action Alternative	Proposed Action	Grassland-wide Alternative	Prairie Dog Emphasis Alternative
Chapter 1, F.XX	N/A	To mitigate the risk of epizootics caused by sylvatic plague, plague control tools such as deltamethrin or sylvatic plague vaccine may be used in prairie dog colonies. Guideline	To mitigate the risk of epizootics caused by sylvatic plague, plague control tools such as deltamethrin or sylvatic plague vaccine may be used in prairie dog colonies. Guideline	To mitigate the risk of epizootics caused by sylvatic plague, plague control tools such as deltamethrin or sylvatic plague vaccine may be used in prairie dog colonies. Guideline
Chapter 3, Management Area 3.67, Desired Condition	N/A	Prairie dog colonies vary in size and density. Intercolony distances of 4.5 miles or less are maintained where possible to develop colony complexes. Plant community composition varies over time on colonies. Colonies are managed to provide	Prairie dog colonies vary in size and density. Plant community composition varies over time on colonies. Colonies are managed to provide habitat for associated species such as mountain plover, burrowing owl, swift fox, and other grassland	While land uses and resource management activities are conducted in a manner that is compatible with maintaining large prairie dog complexes, colonies are also managed to prevent undesired encroachment onto

Component Number	No Action Alternative	Proposed Action	Grassland-wide Alternative	Prairie Dog Emphasis Alternative
		habitat for associated species such as mountain plover, burrowing owl, other grassland birds, and swift fox. Colonies are also managed to prevent undesired encroachment onto adjoining lands and to minimize occurrence of sylvatic plague.	birds. Colonies are also managed to prevent undesired encroachment onto adjoining lands and to minimize occurrence of sylvatic plague.	adjoining lands and to minimize occurrence of sylvatic plague.
Appendix G, Glossary, Prairie Dog Colony Conservation Tools	N/A	Prairie Dog Colony Conservation Tools – Actions used to promote the growth or prevent the shrinking of prairie dog colonies. Tools may include, but are not limited to: translocation of prairie dog coteries; plague control tools, such as deltamethrin or sylvatic plague vaccine; prohibitions on recreational shooting; and vegetation management, including prescribed fire.	Prairie Dog Colony Conservation Tools – Actions used to promote the growth or prevent the shrinking of prairie dog colonies. Tools may include, but are not limited to: translocation of prairie dog coteries; plague control tools, such as deltamethrin or sylvatic plague vaccine; prohibitions on recreational shooting; and vegetation management, including prescribed fire.	Prairie Dog Colony Conservation Tools – Actions used to promote the growth or prevent the shrinking of prairie dog colonies. Tools may include, but are not limited to: translocation of prairie dog coteries; plague control tools, such as deltamethrin or sylvatic plague vaccine; prohibitions on recreational shooting; and vegetation management, including prescribed fire.
Appendix N	Plague management tools (e.g., dusting and vaccination) will be used where practical and effective to control plague within prairie dog complexes.	N/A	N/A	N/A

Prairie Dog Density Control (Proposed Action and Grassland-wide Alternatives Only)

Prairie dog density control is a specific type of prairie dog control that reduces the density of prairie dogs within a colony rather than eliminating a colony or reducing the extent of a colony. Density control will likely most often occur using rodenticides, but could also occur as a result of translocation, or other physical disturbances to the soil that might cause prairie dogs to disperse away from an area or could act as a deterrent from re-occupying an area (levelling and filling in mounds). Density control may occur in different spatial patterns within a colony, and at different intensities. For example, the immediate goal of density control may be to reduce the number of prairie dogs by a specific proportion of the initial total, or to aim for a specific number of prairie dogs per acre. The objective of density control may vary from vegetation management to manipulation of the ways in which prairie dogs disperse within and away from a colony. Non-lethal density control may occur at any time in any location in each of the action

alternatives. Lethal density control is generally not allowed under the no-action and prairie dog emphasis alternatives, but there are no limits to the use of lethal density control when colony acreage targets have been exceeded in any of the action alternatives. Proposed plan direction has been developed to address the use of density control for the proposed action and grassland-wide alternatives (Table B-3).

The initial use of lethal density control would be limited to more productive ecological sites such as the loamy and lowland where the likelihood of achieving vegetation objectives is higher. Lethal density control would be considered when grass/forb ratios are shifting towards a community dominated by forbs and increased bare ground. This information should be recorded as pre-treatment monitoring data as required by the guideline listed below. Monitoring techniques may include, but would not be limited to: line point intercept, clipping by species, plant census, Daubenmire frames, and photopoints. Lethal density control would cease if post-treatment monitoring data collected during two years of implementation with 2 years of normal or above normal precipitation does not show a positive vegetation response.

In the proposed plan direction, the use of rodenticides for density control is less restricted than the use of rodenticides to eliminate or reduce the size of a colony. Some restrictions on density control are necessary. Unmanaged prairie dog colonies contribute to a mosaic of vegetation structure and composition across the landscape and help meet desired conditions for certain areas. For this reason, density control may not occur on more than 50% of a colony, if that colony is contributing to acreage targets. In addition, little is known about how different methods of density control affect prairie dog biology and vegetation response, with outcomes potentially being quite variable. As a result, monitoring of the outcomes of density control must occur to determine whether it is the appropriate method to meet a specific management objective or if adjustments need to be made.

Table B-3. Proposed plan components relevant to density control

Component Number	Proposed Action	Grassland-wide Alternative
Chapter 1, F.XX	N/A	Prairie dog colonies will be managed toward a target range of 10,000-15,000 acres across the Grassland. To work toward acreage targets, a variety of conservation and control tools may be used. When the total area of prairie dog colonies across the Grassland is less than 10,000 acres, lethal control is prohibited, except in the following situations: Lethal control in boundary management zones Density control. During drought conditions, to mitigate prairie dog colony expansion, manage toward the lower end of the range (10,000 acres) of prairie dog colonies across the Grassland. Standard
Chapter 1, F.XX	N/A	Density control (for example, using rodenticides, translocation, or collapsing of burrows) may be used to maintain desired vegetation conditions within a prairie dog colony. Desired vegetation structure and composition may vary by ecological site or colony. Where density control occurs, pretreatment data must be collected, and monitoring data must be collected for a minimum of two years after treatment. Guideline

Component Number	Proposed Action	Grassland-wide Alternative
Chapter 1, F.XX	N/A	When the total area of prairie dogs across the Grassland is less than 10,000 acres, density control will not occur in more than 50% of the area of any colony. Standard
Chapter 1, F.XX	<p>In prairie dog colonies designated as satellite colonies:</p> <p>Recreational shooting of prairie dogs is prohibited February 1-August 15.</p> <p>Lethal prairie dog control is prohibited with the following exceptions:</p> <p>Lethal control may be used to prevent a satellite colony from exceeding the area it occupied at the time it was designated as a satellite colony.</p> <p>Density control may occur in no greater than 50% of the area of a satellite colony.</p> <p>The designation of satellite colony will be removed only when the total acreage of prairie dog colonies within Management Area 3.67 has reached 7,500 acres. Standard</p>	N/A
Chapter 3, Management Area 3.67, Fish and Wildlife, XX	<p>Prairie dog colonies within Management Area 3.67 will be managed toward a target of 10,000 acres to support associated species such as mountain plover, burrowing owl, and swift fox. Management that adapts to fluctuations of colony acreage may occur while managing toward the 10,000 acre target. All prairie dog colony management tools not otherwise restricted by this plan will be available for use when the colony acreage in Management Area 3.67 is greater than 7,500 acres, and during drought, to mitigate colony expansion, the total acreage may be managed toward a temporary alternate target of 7,500 acres. When the acreage of colonies within Management Area 3.67 is less than 7,500 acres, lethal control tools will not be used except in the following situations:</p> <p>Use in boundary management zones.</p> <p>Density Control</p> <p>If the responsible official determines that lethal control beyond density control is warranted and the total area of prairie dog colonies is less than 7,500 acres within Management Area 3.67, then satellite colonies may be identified outside of Management Area 3.67 to temporarily allow lethal control within Management Area 3.67. The sum of satellite colony acres and colony acres in Management Area 3.67 should be greater than 7,500 acres before allowing lethal control within Management Area 3.67, so that at least 7,500 acres remain following control. Standard</p>	N/A
Chapter 3, Management Area 3.67, Fish	Density control (for example, using rodenticides, translocation, or collapsing of burrows) may be used to maintain desired vegetation conditions within a prairie dog	N/A

Component Number	Proposed Action	Grassland-wide Alternative
and Wildlife, XX	colony. Desired vegetation structure and composition may vary by ecological site or colony. Where density control occurs, pretreatment data must be collected, and monitoring data must be collected for a minimum of two years after treatment. Guideline	
Chapter 3, Management Area 3.67, Fish and Wildlife, XX	When the total area of prairie dogs in Management Area 3.67 and satellite colonies is less than 7,500 acres, density control will not occur in more than 50% of the area of any colony. Standard	N/A
Appendix G, Glossary, Prairie Dog Density Control	Prairie Dog Density Control – A management action or set of management actions implemented with the intent to reduce the number of live prairie dogs within a prairie dog colony or some portion of a colony without reducing the total area of the colony. Such management actions would occur most often via the use of rodenticides but other control tools may be used.	Prairie Dog Density Control – A management action or set of management actions implemented with the intent to reduce the number of live prairie dogs within a prairie dog colony or some portion of a colony without reducing the total area of the colony. Such management actions would occur most often via the use of rodenticides but other control tools may be used.

Satellite Prairie Dog Colonies (Proposed Action only)

A satellite prairie dog colony is a temporary designation that can be applied to prairie dog colonies occurring anywhere on the Grassland outside of management area 3.67. The satellite colony designation allows for lethal control of prairie dog colonies inside of management area 3.67 when the total area of colonies within management area 3.67 is lower than the minimum threshold for lethal control (7,500 acres). If the Forest Service receives a request for lethal control of a colony within management area 3.67 when the total area of colonies within management area 3.67 is less than 7,500 acres, satellite colonies must be identified and designated before the lethal control within management area 3.67 may occur. Plan components have been developed to address designation and management of satellite colonies (Table B-4). These and other management approaches include:

- Potential satellite colonies must be of sufficient size that the total area of satellite colonies and colonies remaining in management area 3.67 after lethal control has occurred is at least 7,500 acres.
- Once a colony is designated as a satellite colony, restrictions on lethal control that would result in a reduction in colony size or exterminate the colony would apply. The colony must remain a satellite colony until the total area of colonies within management area 3.67 is at least 7,500 acres.
- The satellite colony designation is automatically removed from a colony when the total area of colonies within management area 3.67 is at least 7,500 acres and no further lethal control is requested within management area 3.67.
- If a satellite colony grows, lethal control may occur on that colony’s perimeter, if requested, to reduce the colony to the size it was at the time of designation.

The process for the designation of satellite colonies is intended to be collaborative among affected parties and the Forest Service. For example, permittees using any pastures where a potential satellite colony is located should be fully aware that the colony could become temporarily protected from lethal control because lethal control has been requested in management area 3.67. The Forest Service intends to involve

the third party collaborative stakeholder group in the satellite colony designation process to facilitate identification of colonies eligible to become satellite colonies and mediate prioritization of lethal control among colonies within and external to management area 3.67.

The satellite colony designation differentiates satellite colonies from other colonies outside of management area 3.67. While all colonies on the Grassland are additive for habitat conservation value, not all colonies contribute to management targets under the proposed action. Colonies outside of management area 3.67 can be subject to lethal control at any time (in accordance with restrictions on rodenticide use contained in Chapter 1, Section H), unless designated as a satellite colony. The satellite colony designation allows a colony to contribute to long-term habitat availability for prairie dogs and associated species and may help reduce the risk of epizootics in some instances.

Table B-4. Proposed plan components relevant to management of satellite colonies

Component Number	Proposed Action
Chapter 1, F.XX	In prairie dog colonies designated as satellite colonies: <ul style="list-style-type: none"> • Recreational shooting of prairie dogs is prohibited February 1-August 15. • Lethal prairie dog control is prohibited with the following exceptions: • Lethal control may be used to prevent a satellite colony from exceeding the area it occupied at the time it was designated as a satellite colony. • Density control may occur in no greater than 50% of the area of a satellite colony. • The designation of satellite colony will be removed only when the total acreage of prairie dog colonies within Management Area 3.67 has reached 7,500 acres. Standard
Chapter 3, Management Area 3.67, Fish and Wildlife, XX	Prairie dog colonies within Management Area 3.67 will be managed toward a target of 10,000 acres to support associated species such as mountain plover, burrowing owl, and swift fox. Management that adapts to fluctuations of colony acreage may occur while managing toward the 10,000 acre target. All prairie dog colony management tools not otherwise restricted by this plan will be available for use when the colony acreage in Management Area 3.67 is greater than 7,500 acres, and during drought, to mitigate colony expansion, the total acreage may be managed toward a temporary alternate target of 7,500 acres. When the acreage of colonies within Management Area 3.67 is less than 7,500 acres, lethal control tools will not be used except in the following situations: <ul style="list-style-type: none"> • Use in boundary management zones. • Density Control • If the responsible official determines that lethal control beyond density control is warranted and the total area of prairie dog colonies is less than 7,500 acres within Management Area 3.67, then satellite colonies may be identified outside of Management Area 3.67 to temporarily allow lethal control within Management Area 3.67. The sum of satellite colony acres and colony acres in Management Area 3.67 should be greater than 7,500 acres before allowing lethal control within Management Area 3.67, so that at least 7,500 acres remain following control. Standard
Chapter 3, Management Area 3.67, Fish and Wildlife, XX	When the total area of prairie dogs in Management Area 3.67 and satellite colonies is less than 7,500 acres, density control will not occur in more than 50% of the area of any colony. Standard
Appendix G, Glossary, Satellite Prairie Dog Colony	Prairie Dog Colony, Satellite – A prairie dog colony that occupies National Forest System lands outside of Management Area 3.67 and has been temporarily designated for the purpose of meeting colony acreage targets.

2019 Prairie Dog Colony Mapping Protocols: Active Areas

WATCH FOR RATTLESNAKES, ETC., DO NOT REACH INTO BURROWS, DO NOT PICK UP DEAD

ANIMALS, NO PETS (risk of transfer of infected fleas).

*PLEASE REPORT ALL SIGHTINGS OF BURROWING OWLS, MOUNTAIN PLOVERS, AND SWIFT FOX TO [REDACTED] (provide UTM coordinates [NAD83] for your location and general direction/distance of sighting from there).

2019 Mapping Target Areas

- Active colonies and additional sightings (50m buffer) mapped in 2018 and located within the proposed USFS 3.63 revised boundary.
- Colonies mapped on National Forest Service (NFS) lands in previous years (1997-2012, 2014, 2015).
- Active grid points and additional sightings noted during grid sampling but located outside 2018 targeted mapping areas (i.e., 2018 active grid points not revisited during mapping efforts).
- Additional areas of interest:
 - ◆ Spring Creek Unit, Inyan Kara, ARS nested exclosures, etc.
 - ◆ Other areas outside proposed 3.63 area with confirmed mountain plovers.
- Initial mapping efforts will target outlier areas, then shift to focus on 3.63 area later in summer so mapping information reflects most current 3.63 status.
- Map at time of initial visit to each site (vs. preliminary check and later mapping).
- Complete mapping efforts late August/early September to meet various interests' needs.

Protocols – Mapping Active Colony Boundaries

- Map on foot (small colonies) or using ATV-UTV (larger, clearly active colonies); may be most efficient to work as a team in most cases.
- Do not map on private surface unless access is confirmed. Just map a straight line along the boundary (e.g., fence line) until the colony pulls away from the boundary again and make a note that the straight line mapped represents a boundary between NFS and private surface.
- Base Level Mapping:
 - ◆ Visit all assigned colonies and additional active areas.
 - ◆ Larger colonies: Take 10-15 minutes to criss-cross colony and gauge activity to:
 - Help gauge the level of accuracy needed during mapping (examine each burrow or map with 10-m leeway around active perimeter).
 - Determine if islands of inactivity are present that need to be mapped around (i.e., ONLY map active burrows).
 - Remember to keep yourself oriented in the colony while mapping to avoid back-tracking over previously mapped areas; watch GPS screen to prevent overlap.

- Keep at least 10 meters between parallel mapping paths to ensure that tracks are clearly discernable.
- ◆ Smaller colonies:
 - Check every burrow within 50m of each designated grid or additional sighting point to determine .
- ◆ Watch for and record a waypoint for, or map, additional active burrows or colonies, respectively, encountered within target area(s) when moving among points.
- Scan each colony area with binoculars upon arrival prior to exploring the area to scout for prairie dogs, burrowing owls, swift fox, and mountain plovers. Report all sightings of the latter three species to [REDACTED] with UTM coordinates, date, number of individuals, etc.
- Map all active burrows/areas within and overlapping each target area boundary.
 - ◆ Use 2018 grid sampling protocols to determine activity at each burrow (i.e., dogs seen/heard and/or fresh sign) (see end of document).
- Map areas identified as “colonies” using handheld or Trimble GPS unit by driving around perimeter of ACTIVE burrows (larger colonies) or marking each active burrow with a pin flag or other method and walking around the outer perimeter of the flags (smaller colonies): TRIMBLE DATA MAY NEED TO BE CORRECTED PRIOR TO SUBMITTAL TO THE COORDINATOR.
 - ◆ Focus mapping on the outer boundary of confirmed active burrows and minimize mapping of inactive burrows.
 - ◆ Record all data in Universal Transverse Mercator (UTM) coordinates in North American Datum (NAD) 83 only.
 - ◆ GPS units should be set to automatically record waypoints at 10-meter intervals (for consistency with recent [2016-2018] previous mapping efforts).
 - ◆ Make sure GPS unit has connected with enough satellites to have at least 8-meter accuracy (5m or less is better).
 - ◆ Make sure GPS unit has antenna always facing sky to remain connected to satellites; keep screen visible during tracks to follow progress and avoid overlaps.
 - ◆ Maintain at least 10m separation between parallel tracks in the field to avoid overlap.
 - ◆ REMEMBER to turn off the “Record,” “Go To,” and other mapping functions between colonies or you will create a line connecting them that will have to be eliminated during data management later.
 - Map an area with multiple active burrows found within 50m of each other as a single active area (including those extending outside the target boundary perimeter); consistent with 2016/2017 mapping. To count as a colony, an area with multiple active burrows must have either:
 - a) 5 or more live prairie dogs seen or heard in that location on the day of mapping, or
 - b) At least 5 active burrows (i.e., fresh scat, etc.) within 50 m of one another (5 is arbitrary, but 5 active burrows suggests at least 1 and most likely 2 or more prairie dogs inhabiting the locality).

- ◆ For areas where fewer than 5 prairie dogs and active burrows are detected or identified, map as a single waypoint and make a notation to buffer the point by 50m via GIS rather than attempting to map a polygon (because 1 prairie dog is not a colony).
- Map burrows greater than 50m apart but within or overlapping each target boundary perimeter as separate active areas within perimeter.
- Do not map active burrows greater than 50m beyond target boundary perimeters unless they are connected (within 50m) to burrows within the boundary.
- Record exactly what was seen at each sample point and whether or not the area was mapped or should be buffered by 50m via GIS either in field notes or directly into a Trimble unit (in the comments section for that point).
- Wait at least 1 hour following rain to allow prairie dogs to resurface, assuming ground conditions allow for travel.

Other Important Factors

- Plan check-in schedules/locations for the work area each day prior to heading out.
- Perform walk-around on all vehicles to check for flat/low tires, gas supplies, oil, etc. prior to heading out each day.
- Check for prairie dog shooters or other potential conflict activities prior to beginning work in each area.
 - ◆ If no shooters present, proceed with work plan
 - ◆ If shooters are present:
 - Approach from a safe direction
 - Explain your activity and politely ask about their timeframe for being there (# days, etc.)
 - Work somewhere else if possible until they leave; coordinate with supervisor if unsure what to do
 - ◆ Do not drive off road during muddy conditions; change target area or walk to points.
 - ◆ USFS teams will only work on NFS lands; others may work on NFS or private/state lands (Project Coordinator will assist with assignments).

Determining Presence/Absence of Prairie Dogs

Note that prairie dogs may be less active during cooler temperatures or immediately following precipitation, and generally are most active in early morning and later afternoon (especially on hot days).

- Look and listen for prairie dogs, or fresh sign (make complete circle):
- If prairie dogs are seen and/or heard, proceed with mapping.
- If prairie dogs are not seen or heard:
 - ◆ Examine burrows within 50 meters of each other or the former grid point for evidence of recent use (i.e., look at as many burrows as possible for about 5 minutes). (Predetermine 50m spacing via GPS or paces/steps (i.e., identify # steps/paces prior to field work); refine distance as needed based on burrow spacing.

- ◆ Examine burrow entrances and nearby vegetation for the following (2 signs preferable):
 - Fresh digging (loose dirt) at or near burrow entrance
 - Scat color/condition: darker brown and moister (i.e., fresh) = Present
 - Scat color/condition: lighter brown or whitish and drier = Likely Absent (*Note that recent rain can affect scat color/condition)
 - Clipped vegetation, especially with fresh digging of roots = Present
 - Vegetation growing in the burrow entrance = Likely Absent
 - Multiple spider webs (i.e., defined, denser web vs. just 1-2 thin lines across entrance) = Absent
- Complete the data sheet for that site and move to the next area
- Watch for and record Waypoint and UTMs of prairie dogs and/or fresh sign encountered while traveling to/from target area. Map colony upon discovery or ASAP afterward.
- **PLEASE DO NOT work in areas not assigned to you to avoid duplication.**
 - ◆ Complete “Additional Sightings” portion of data sheet for each observation outside of target area
 - ◆ Use your initials in waypoint number to help identify for duplicate numbers among GPS units
 - ◆ Include a reference point (e.g., nearest grid point) in “Comments” to help identify the new point location
 - ◆ Note areas with continuous activity throughout grid area in “Comments” section of data sheet (e.g., “pdogs present between point P-X and point P-XX”)
- At the end of each day, check memory on GPS to determine whether you will need to download any newly added tracks or waypoints.
- At the end of each week, submit the following data to the project coordinator via email:
 - ◆ Scanned field data sheets or updated Excel file for that week (preferably)
 - Name files as follows: TBNG-PDC_Track (or Wpt)_mmddyyyy_XX (your initials)
 - ◆ A shapefile containing a download of all new tracks and waypoints recorded in the field (get guidance for downloading from individual GPS units from supervisor, as needed).
 - Save the file as follows: Recorder’s initials_2019TBNG-PDC_Date_Waypoints (or _Tracks).
 - Use the following format for date: mmddyyyy (e.g., 06042019).

At the end of each assigned area, drop original completed field sheets at

Tips for Mapping Colonies

- Place 2 pin flags at the start point when mapping large colonies to help ensure that you end at the same point to CLOSE THE POLYGON.

- If two people map the same colony, start at the same point and move in opposite directions until you meet.
- If mapping at a given colony had to be conducted over multiple days due to weather or timing issues, record a waypoint at the temporary stop point and place 2 pin flags to ensure that efforts resume at exactly the same location.
- Keep burrows on the same side of the surveyor/ATV/UTV while mapping individual colonies.
- Shift view from side to side while mapping to watch for burrows and to help stay oriented within colony while mapping.
- In areas where burrows extend into adjacent shrubland habitats, map by walking through the shrubs and outlining the boundary with pin flags prior to mapping with the GPS via the ATV or on foot. Collect flags as the ATV follows the flagged boundary through the shrubland area.
- A threshold of 50 meters is used to determine whether clusters of intact burrows are proximate enough to be included within the same colony boundary.
 - ◆ Burrows beyond that threshold are considered as part of a separate colony.
 - ◆ In some instances, burrows are investigated on foot to determine their condition and/or whether the spacing met this threshold prior to traveling toward them with the GPS to avoid exaggerating boundary edges (i.e., leave GPS behind when exploring!).
- When fence lines without gates are encountered, pause the GPS or leave at the fence until access to the same spot on the other side of the fence is acquired and mapping can resume. Fence points and/or the GPS are FLAGGED to ensure that the same spot is identified to resume mapping on the opposite side of the fence once a gate opening is found.
- Colony perimeters are delineated by proceeding from each burrow to the next closest active burrow on the outermost edge of the colony. If a series of active burrows terminates without any clear presence of additional active burrows in that same direction, immediately turn 90 degrees back into the interior of the colony until an active burrow is recognized and the perimeter can again be followed.
- When drainages are encountered, they are only crossed if burrows are present in the channel bottom OR on both immediate sides of the channel AND the banks of the drainage are less than 4 feet high and SAFE to cross on an ATV.
 - ◆ IF burrows are in the channel or clearly connected on both sides but banks are more than 4 feet high or less than 4 feet but TOO STEEP to safely cross with an ATV, personnel SHOULD WALK the GPS unit across and leave it in a visible spot (i.e., flagged) on the opposite bank, then drive around the drainage to pick up the GPS and resume mapping, just like the process for fences when gates are not present at the crossing point.
 - ◆ IF burrows are NOT in the channel OR the banks are impassable, map along the edge of the drainage to a point where crossing is safe, then map along the opposite side of the channel (i.e., map both sides of the channel boundary, excluding the deeper channel itself).
- Note that, when deciding to cross drainages, the next burrow in sequence across or in the drainage may not always be the next closest burrow. Always consider that the primary objective in crossing the drainage is to maintain the outer perimeter of the active colony based on the next nearest burrow versus mapping “islands” within it.

Required Equipment

- Ear plugs, gloves, sturdy boots, sunglasses or other protective eye-ware, hat, other appropriate field attire (helmets optional)
- Florescent safety vest (for safety and public awareness for authorized off-road travel)
- Off-road travel authorization from USFS and corresponding permit
- Clipboard, pencils, field maps, data sheets
- Binoculars
- Cell phone (fully charged) and/or two-way radio or satellite phone for emergency contacts
- Spare batteries for GPS
- Backpack, water, snacks, small fuel can (optional), sunscreen and bug spray, etc. (standard field gear)
- Pin flags