UTAH DIVISION
OF WILDLIFE
RESOURCES

1594 West North Temple
Salt Lake City, Utah
84116

FINAL

Utah Prairie Dog (*Cynomys parvidens*) Conservation Strategy

January 2023

UTAH PRAIRIE DOG (*CYNOMYS PARVIDENS*) CONSERVATION STRATEGY

Utah Division of Wildlife Resources
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EXECUTIVE SUMMARY

When first listed under the Endangered Species Act in 1973, there was little doubt that the Utah prairie dog was threatened with extinction. Population distribution had declined by an estimated 87% over the proceeding 50 years and declines were ongoing. As with other prairie dog species, agricultural producers in southwestern Utah generally felt that the Utah prairie dog was a nuisance and with federal assistance worked towards its elimination. By 1971 there were only 48 colonies known with 6 colonies exterminated the previous year through poisoning with treated grain. Similar control was planned for 34% of the remaining population. At the time of listing that continued, unregulated effort to eradicate the Utah prairie dog was the greatest threat to its existence.

50 years since listing, the Utah prairie dog population has made extraordinary strides toward recovery. Conservation, management, monitoring, research, and public outreach actions by state and federal agencies, local governments, nonprofit organizations, and private landowners initiated in the 1970s and continuing today facilitated a rebound in the abundance and distribution of Utah prairie dogs. Long-term data demonstrate that the range-wide population of the Utah prairie dog, while variable year-to-year, has been stable or increasing over a period of nearly three decades. The total number of counted Utah prairie dogs has tripled from the levels reported when the species first received federal protection. Distribution has also expanded with Utah prairie dogs currently found in 391 occupied colonies throughout portions of 426 sections across the species' range in 2022. Whereas early recovery gains were concentrated on private lands with higher levels of conflict, around half of Utah prairie dogs are now found on public or protected lands. Moreover, citizens of southern Utah now recognize the need to co-exist with the Utah prairie dog. This Utah Prairie Dog Conservation Strategy (Conservation Strategy) and associated Utah Division of Wildlife Resources (UDWR) administrative rules afford protection to Utah prairie dogs while providing tools to prevent excessive depredation and allow landowners to manage prairie dogs as populations grow. While we continue to focus recovery efforts on public lands, the strategy acknowledges the conservation value of Utah prairie dogs on private lands.

Gains in abundance and distribution of the Utah prairie dog 1971-2022.

Population Metric	1971	3-year average (2020-2022)
Spring Count	2,190	5,760
Number of Colonies Occupied	48	391
Sections Occupied	96	389
Acres of Occupied Habitat	2357	11,004
Percent on Public/Protected	37%	47.6% (58% including SITLA)

Source: Collier (1975), UDWR (2021, 2022, 2023)

While old threats have receded, new threats have emerged. The Conservation Strategy establishes biological goals and objectives and an adaptive framework to implement conservation and management. It prescribes actions based on the best available science to maintain and grow Utah prairie dog populations. Through the signed Memorandums of Agreement, UDWR and partners commit to conservation actions in three management areas spread across the range of the species – the West Desert, Paunsaugunt, and Awapa Plateau. Each area will be managed at population levels that are both achievable and adequate to ensure long-term viability. The Conservation Strategy also prescribes ongoing monitoring

to inform annual adaptive management decisions and continues to build the existing datasets that track long-term trends.

Taken together, this will ensure Utah prairie dogs occur in multiple resilient populations found in a variety of environmental settings distributed across the historical range – and no longer meet the threshold for federal listing.

Management Concerns and Actions

Plague

Apply insecticidal dust to Utah prairie dog burrows
Continue to advance and implement new plague control methods
Translocate Utah prairie dogs to reestablish or supplement colonies affected by plague

Human-caused mortality

Protect Utah prairie dogs under Utah wildlife code on all lands
Investigate and prosecute illegal killing
Regulate agricultural take through a tiered system

Habitat loss

Provide tools to landowners to encourage coexistence
Establish and maintain colonies on public and protected lands
Conduct habitat treatments to improve conditions for Utah prairie dogs

Drought

Continue translocations and management actions on climate resilient sites, such as the higher elevation habitats of the Paunsaugunt and Awapa Plateau
Enhance water sources such as natural springs, wet meadows, or low-flow wells to provide succulent vegetation
In years without monsoonal moisture, provide supplemental food to translocation and/or other high-value colonies
Conduct habitat treatments to improve conditions for Utah prairie dogs

Genetic diversity

Maintain populations at levels sufficient to retain genetic variation
Conduct translocations between colonies to facilitate gene flow
Promote connectivity between colonies

The partners in Utah prairie dog management recognize that delisting does not equate to stepping away – rather stepping up. Much like many other species under the state's authority, Utah prairie dogs will remain management dependent. The duration of this Conservation Strategy and partnership is long term and will remain in place so long as active management is needed. The Conservation Strategy is also a living document, and UDWR and the conservation partners commit to review and update the plan and the

Memorandum of Agreement. Working with federal, local, and nonprofit partners, UDWR feels secure that the future for the Utah prairie dog continues to be bright. With adaptive management, monitoring, research, and coordination, this conservation strategy carries forward the effective program that led to the currently improved status. We expect that upon state management, not only will long-fought gains be maintained, but also without the stigma of Endangered Species Act listing, additional opportunities for collaborative conservation will be realized.

ACKNOWLEDGMENTS

In order to develop the Utah Prairie Dog Conservation Strategy and define goals, objectives, adaptive management triggers, and management actions and thresholds, the Utah Department of Natural Resources gathered input from numerous local entities to ensure cooperation and support for its implementation. Representatives from the groups listed below contributed greatly to the development of this conservation strategy.

Participants

Beaver County

Brigham Young University

Bureau of Land Management

Garfield County

Iron County

National Park Service

The Nature Conservancy

United States Fish and Wildlife Service

United States Forest Service

Utah Department of Natural Resources

Utah Division of Wildlife Resources

Utah School and Institutional Trust Lands Administration

Wayne County

DEFINITIONS

Agriculture areas – any property that is used or has been used in the previous two (2) years for production of a cultivated crop or irrigated pasture that is harvested or grazed.

Colonies – Groups of Utah prairie dogs with associated burrows, mounds, and food resources that are within calling distance of each other. Colonies are genetically similar and are vulnerable to local catastrophes, including sylvatic plague (*Yersinia pestis*) outbreaks.

Complexes – Groups of colonies that are generally within 2 miles of each other, exchange migrant prairie dogs every one to two generations, and are not separated by geographic barriers such as mountain ranges, towns, or major waterways.

Certificate of Registration – means a paper-based or electronic document issued under this title, or any rule or proclamation of the Wildlife Board granting authority to engage in activities not covered by a license, permit, or tag. For the purposes of this conservation strategy they are permits issued by the Utah Division of Wildlife Resources (UDWR) to allow lethal control of Utah prairie dogs.

Developable areas – Any area zoned by local governments for commercial, industrial, or residential uses that does not have structures or improvements on the surface of the property, excluding utilities.

Federal land – Land that is administered by federal land management agencies such as the BLM, the U.S. Forest Service, and the National Park Service.

General Conservation Plan – A streamlined habitat conservation plan process whereby the USFWS prepares a master conservation plan, completes National Environmental Policy Act (NEPA) requirements, and issues permits to individual developers or landowners (i.e., project proponents).

Habitat Conservation Plan – A planning document designed to accommodate economic development to the extent possible by authorizing the limited and unintentional take of listed species when it occurs incidental to otherwise lawful activities. The plan is designed not only to help landowners and communities but also to provide long-term benefits to species and their habitats.

Human health, safety, and welfare concern areas – 1) Public use areas, such as parks, golf courses, sports fields, playgrounds, airports, schools, churches, cemeteries, archaeological and historical sites, areas of cultural or religious significance, and improved roads; and 2) residential and commercial areas within 50 feet of an occupied establishment and beyond 50 feet on developed portions of ground around the occupied establishment, such as lawns, landscaping, gardens, driveways, etc.

Major development areas – Non-federal lands that are already developed, adjacent to built-out areas, in areas of dense human activity, or areas projected for development in the near future. The spatial extent of the major development areas are adopted from the 2018 *Range-Wide General Conservation Plan for the Utah Prairie Dog in Residential and Commercial Development Areas* (USFWS 2018) and maintained with periodic review by UDWR.

Management areas – Three independent areas of Utah prairie dogs that occur across the range of the species, represented by the three recovery units (West Desert, Paunsaugunt, and Awapa Plateau) defined in the 2012 U.S. Fish and Wildlife Service Recovery Plan.

Mapped habitat – All areas within the range of the Utah prairie dog with current or historic documentation of occupancy by Utah prairie dogs since 1972. The spatial extent of mapped habitat is maintained by UDWR and is updated annually.

Minor development areas – Non-federal lands that are less likely (when compared to major development areas) to experience large-scale development such that they are more likely to function as suitable habitat or to support population connectivity. The spatial extent of the minor development areas are adopted from the 2018 *Range-Wide General Conservation Plan for the Utah Prairie Dog in Residential and Commercial Development Areas* (USFWS 2018) and maintained with periodic review by UDWR..

Non-federal land – Land that is privately owned; state-administered lands; and county, municipal, and tribal lands.

Occupied habitat – Areas of known Utah prairie dog mapped habitat that, at the time of survey, support Utah prairie dogs. Occupied habitat is determined by surveys conducted according to UDWR (1999) and where visual or auditory detection of Utah prairie dog is documented. Occupied habitat includes the boundaries of the colony plus an additional area that represents the foraging distance of prairie dogs. For colonies within major development areas, a 100-foot foraging distance is applied, and for all other colonies a 250-foot foraging distance is applied (Wright-Smith 1978).

Populations – Groups of prairie dog complexes within a geographic area that are typically separated by distances greater than 2 miles but are not separated by a geographic feature or land use that reduces connectivity between prairie dog complexes.

Non-federal protected land – Non-federal property that is protected specifically or primarily for the purpose of conserving the Utah prairie dog. Protective mechanisms can include conservation easements, fee title purchases, regulatory designations, etc.

Recovery plan required habitat – Includes the boundaries of all occupied colonies plus a 730 ft. buffer which represents the best understood science of the foraging distance of prairie dogs at the time the Recovery Plan was developed. This acreage specifically references the 2012 USFWS Revised Recovery Plan's definition of occupied habitat.

Regulated control – Under UDWR management, the lethal and non-lethal control of Utah prairie dogs for human health, safety, and welfare concerns, and agricultural and rangeland conflicts.

Spring count – The total number of adult Utah prairie dogs observed on a colony basis across the range-wide distribution of species following the UDWR 1999 *Survey Protocol for Annual Spring Counts of Utah Prairie Dogs (*Cynomys parvidens*).*

Take – Defined under the Endangered Species Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

ABBREVIATIONS

BLM – Bureau of Land Management

COR- Certificate of registration

GCP – General conservation plan

HCP – Habitat conservation plan

RMP – Resource Management Plan

SHA – Safe Harbor Agreement

SITLA – Utah School and Institutional Trust Lands Administration

SUU – Southern Utah University

UPDOG – Utah Prairie Dog Oversight Group

UPDRIP – Utah Prairie Dog Recovery Implementation Program

UPDRIT – Utah Prairie Dog Recovery Implementation Team

UDWR – Utah Division of Wildlife Resources

USFS – United States Forest Service

USFWS – United States Fish and Wildlife Service

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CHAPTER 1. INTRODUCTION AND BACKGROUND

1.1 PURPOSE

The Utah prairie dog (*Cynomys parvidens*) is a rodent species endemic to Utah that has demonstrated resilience in the face of historic reductions in range and abundance. Populations have rebounded, and the current status of the species has been aided by decades of cooperative conservation efforts and management by state and federal agencies, local governments, nonprofit organizations, and private landowners. Continued conservation and management of the Utah prairie dog will be essential for maintaining prior conservation gains and to ensure that the status of the species remains secure into the future.

The purpose of this Utah Prairie Dog Conservation Strategy (Conservation Strategy) is to provide a clear plan of action for the parties that together have the authority, mission, resources, and technical knowledge to take effective action for the long-term conservation and management of the Utah prairie dog. The Conservation Strategy outlines a partner-supported, scientifically defensible framework for ongoing management and monitoring of Utah prairie dogs and their habitat, led by the Utah Division of Wildlife Resources (UDWR). The Conservation Strategy is based on the best available science and includes input from a variety of conservation partners to determine the best strategies for the conservation, management, and monitoring of the Utah prairie dog and its habitat. With the partner commitments to implement this Conservation Strategy, threats to Utah prairie dogs will be managed to the extent that the species will no longer meet the definitions of threatened or endangered, as defined by the Endangered Species Act (ESA), and therefore should be considered for delisting.

This Conservation Strategy 1) describes and summarizes manageable threats to the persistence of Utah prairie dog populations and habitats; 2) describes and summarizes the conservation strategies and actions to manage Utah prairie dog populations and habitats; 3) specifies the metrics and actions that will lead to the survival and viability of the Utah prairie dog for the foreseeable future; and 4) documents the commitment of the participating agencies and stakeholders toward managing the species.

1.2 HISTORY OF UTAH PRAIRIE DOG CONSERVATION AND MANAGEMENT

1.2.1 Regulatory History

Prior to European settlement of southwestern Utah, Utah prairie dogs were found in colonies scattered among the grasslands and shrublands of Beaver, Iron, Piute, Sevier, Garfield, Wayne, Sanpete, Millard, Kane, Washington, and Juab Counties (Collier 1975). Intensive direct control campaigns, disease (i.e., sylvatic plague [*Yersinia pestis*]), and loss of habitat to intensive agriculture and development contributed to extensive population declines by the 1960s (U.S. Fish and Wildlife Service [USFWS] 1991). By 1972, researchers estimated that only 3,300 Utah prairie dogs remained in 37 separate colonies, and the species was expected to be extinct by the year 2000 (Collier and Spillett 1972, 1973; USFWS 1991). In response to this steep population decline and dire outlook, the Utah prairie dog became the subject of federal and state regulatory protections and has been under such management for nearly 50 years.

Milestones in the regulatory history of the Utah prairie dog include the following:

- The USFWS listed the Utah prairie dog as an endangered species on June 4, 1973 (38 *Federal Register* [*FR*] 14678), pursuant to the Endangered Species Conservation Act of 1969.
- The USFWS listed the Utah prairie dog as an endangered species on January 7, 1974 (39 *FR* 1171), under the ESA of 1973 due to threats from habitat modification and destruction, disease, predation, and overexploitation.
- The USFWS downlisted the Utah prairie dog to threatened status on May 29, 1984, with a special rule to allow regulated take of the species in Cedar and Parowan Valleys (49 *FR* 22330). The special rule allowed for the annual lethal take of up to 5,000 animals from pasture lands or irrigated agriculture areas between June 1 and December 31 under a state permit system (Rule R657-19 Taking Nongame Mammals) administered by UDWR (49 *FR* 22330).
- The USFWS amended the special rule on June 14, 1991, to expand the area of lethal Utah prairie dog take to include all non-federal lands within the species' range and increased the amount of annual lethal take to 6,000 animals (56 *FR* 27438).
- Iron County and UDWR developed the *Habitat Conservation Plan for Utah Prairie Dogs in Iron County, Utah* in 1998 (amended in 2006) to address conflicts between the development of non-federal lands and Utah prairie dogs, requiring applicants to obtain a Section 10(a)(1)(B) Incidental Take Permit from the USFWS. The goal of the Iron County habitat conservation plan (HCP) was to allow continued economic growth and development in the county while conserving and recovering the Utah prairie dog on public lands (Iron County Commission and UDWR 2006).
- The USFWS again amended the special rule on August 1, 2012 (77 *FR* 46158). Revisions to the special rule consisted of restricting the annual amount of allowable lethal take to no more than 7% to 10% of the range-wide population (depending on the location of the take); limiting allowed lethal take to those Utah prairie dogs causing damage to agricultural lands, occurring within 0.5 mile of a Utah prairie dog conservation area, or disturbing the sanctity of significant human cultural or burial sites or causing serious human safety hazards; and exempting incidental take associated with normal agricultural practices.
- The U.S. District Court for the District of Utah ruled on November 5, 2014, that the Utah prairie dog (known only to occur within the state of Utah) could not be listed under the federal ESA, giving authority for management of the species on non-federal lands to the state of Utah (*People for the Ethical Treatment of Property Owners (PETPO) v. U.S. Fish & Wildlife Serv.*, 57 F. Supp. 3d 1337 [D. Utah 2014]).
- The U.S. Tenth Circuit Court of Appeals overturned the 2014 U.S. District Court opinion on March 29, 2017, reinstating federal regulation of the Utah prairie dog under the ESA (*PETPO v. U.S. Fish & Wildlife Serv.*, 852 F.3d 990, 1004 [10th Cir. 2017]) (USFWS 2017a). Today, the Utah prairie dog is listed as threatened under the ESA and the 2012 special rule remains effective.
- The USFWS approved the *Range-Wide General Conservation Plan for the Utah Prairie Dog in Residential and Commercial Development Areas* in 2018 (USFWS 2018). This range-wide general conservation plan (GCP), implemented by the USFWS and UDWR, replaced the previous HCPs that were at or nearing expiration and eliminated the need for individual developers to prepare HCPs for separate take permits for each project. Under the GCP, project proponents work with UDWR to determine project impacts, mitigation requirements, and appropriate conservation strategies.

1.2.1.1 *Conservation and Management History*

Regulation of the Utah prairie dog prompted the development and implementation of recovery and conservation plans to improve the status of the species. These planning efforts provided the strategic guidance and implementation framework for conservation, management, and monitoring actions by a variety of conservation partners that contributed to an increase in the range-wide Utah prairie dog population.

1.2.1.1.1 RECOVERY AND CONSERVATION PLANS

Utah Prairie Dog Recovery Plan

The initial 1991 *Utah Prairie Dog Recovery Plan* (Recovery Plan) established targets for Utah prairie dog populations on federal lands across three recovery units: West Desert, Paunsaugunt, and Awapa Plateau (USFWS 1991). The 1991 Recovery Plan set a minimum population abundance goal of 813 spring-counted adult prairie dogs on federal and other non-federal protected lands for each of the three recovery units and established a formal agreement for the future management of each population (USFWS 1991).

In 1997, the *Utah Prairie Dog Interim Conservation Strategy* (Interim Conservation Strategy) was completed to accompany the 1991 Recovery Plan. The Interim Conservation Strategy identified priority habitat improvement projects, translocation research topics, and education and public involvement activities (Utah Prairie Dog Recovery Implementation Team [UPDRIT] 1997). UPDRIT became part of the Utah Prairie Dog Recovery Team, a multi-agency and multi-organization team, in 2006.

The USFWS revised its Recovery Plan in 2012 with input from Utah Prairie Dog Recovery Team members and other agency participants (USFWS 2012). The 2012 Recovery Plan's delisting criteria are as follows:

- Protect in perpetuity at least 5,000 acres (2,023 hectares) of occupied habitat in each of the three recovery units. Protected occupied habitat is spatially distributed to provide sufficient connectivity and gene flow within each recovery unit.
- Each recovery unit contains at least 2,000 adult animals (i.e., corresponding to at least 1,000 spring-counted adults) occupying protected habitat for 5 consecutive years.
- Management strategies are established to prevent and respond to threats from disease.
- State and/or local regulations, public relations programs, and education and outreach efforts are in place to sufficiently minimize illegal take, promote habitat management, and manage post-delisting legal lethal control of the species.
- Adaptive management strategies are in place on federal and other non-federal protected lands to improve habitat in a way that addresses changing climatic conditions and other potential threats that are challenging to predict.

The Utah Prairie Dog Recovery Implementation Program (UPDRIP) was established in 2010 as a partnership between public and private entities to recover the Utah prairie dog while balancing ongoing development. UPDRIP was restructured into the Utah Prairie Dog Oversight Group (UPDOG) in 2015. UPDOG is a more inclusive, multi-stakeholder partnership for coordinated implementation of the Recovery Plan. The UPDOG partnership consists of representatives from the Utah Department of Natural Resources, UDWR, the USFWS, the U.S. Forest Service (USFS), the Utah School and Institutional Trust Lands Administration (SITLA), the Bureau of Land Management (BLM), Utah State University, Garfield County, Iron County, The Nature Conservancy, Utah Farm Bureau, National Park Service (NPS), Southern Utah University (SUU), local municipalities, and environmental interests.

Other Conservation Strategies

In 2018 the Utah Prairie Dog Conservation Agreement and Strategy on Federal Lands in the Paunsaugunt Recovery Unit was finalized as a guide to manage the Utah prairie dog population on USFS and NPS lands in the species' Paunsaugunt Recovery Unit. The document identifies and implements land use and conservation measures to achieve and maintain recovery of the Utah prairie dog. This included a monitoring and adaptive management component to allow for changes or implementation of new conservation actions, based on best available information and agreement by the signatories.

Habitat Conservation Plans

Habitat Conservation Plans (HCPs) are planning documents under Section 10(a)(1)(B) of the ESA that accompany applications by non-federal entities for incidental take permits issued by the USFWS. An HCP identifies conservation actions that mitigate and minimize the impact of authorized take to the maximum extent practicable. The USFWS has approved a number of HCPs for the Utah prairie dog and issued corresponding incidental take permits.

The first Utah prairie dog HCPs were developed in 1995 for development projects in Iron County. Since then, the USFWS has approved multiple individual and county-wide HCPs. In 2018, the USFWS approved the *Range-Wide General Conservation Plan for the Utah Prairie Dog in Residential and Commercial Development Areas* (USFWS 2018). This range-wide GCP replaced the previous HCPs that had or were nearing expiration (USFWS 2018).

Under the 2018 GCP, the USFWS estimated a loss of up to 1,594 Utah prairie dogs associated with land development activities after minimization measures are applied over a 10-year plan duration based on historical averages (1,419 individuals in the West Desert Recovery Unit, 128 in the Paunsaugunt Recovery Unit, and 47 in the Awapa Plateau Recovery Unit) (USFWS 2018). Using a stepped-up estimate that accounts for increases above the historical take due to the potential increase in development projects, the USFWS estimated a loss of up to 7,152 Utah prairie dogs associated with land development activities after minimization measures are applied over a 10-year plan duration (6,366 individuals in the West Desert Recovery Unit, 589 in the Paunsaugunt Recovery Unit, and 197 in the Awapa Plateau Recovery Unit) (USFWS 2018). Under the GCP's program for translocations independent of development, the USFWS estimated 10,500 prairie dogs would be captured and translocated from the major development areas over the 10-year term of the GCP (USFWS 2018). The USFWS estimates that the incidental take from injury or mortality of translocated prairie dogs would be 9,045 prairie dogs over a 10-year period (90% of 10,050 prairie dogs) (USFWS 2018). The USFWS issues incidental take permits to master permittees (such as counties or cities, which then may enroll non-federal participants) or individual permittees. The UDWR; the BLM; the USFS; and Beaver, Garfield, Iron, and Wayne counties in Utah, are all signatories of the GCP Implementation Agreement.

The GCP contributes to the recovery of the species by minimizing the impacts of take through the translocation of animals, when feasible, from non-federal lands subject to development to federal or protected lands and by restoring occupied habitats subject to temporary impacts. Translocations authorized under the GCP, especially into vacant colonies, help offset the effects of plague by reinvigorating known colonies following large-scale die-offs. Funds generated through mitigation payments under the GCP can be used to purchase valuable Utah prairie dog habitat. Doing so will protect animals which would otherwise not be credited towards recovery, thus edging the species closer to meeting currently established goals. Also, as part of the GCP, UDWR has committed to funding recovery actions such as habitat treatments through the Watershed Restoration Initiative, as well as plague abatement and translocations to offset impacts from development.

Safe Harbor Agreements

Safe Harbor Agreements (SHAs) are voluntary agreements between the USFWS and private landowners to encourage the implementation of land use activities that improve the status of listed species on the enrolled property. In return, property owners receive an enhancement of survival permit from the USFWS that authorizes incidental take that could result from actions by the landowner under the SHA, including returning the property to the baseline conditions of the agreement. Through the voluntary restoration and enhancement of habitat and the management of farm and ranchlands, the SHA program promotes range-wide conservation of Utah prairie dogs.

As of 2017, five Utah prairie dog SHAs were in place, covering 1,230 acres of mapped habitat (USFWS 2017b). The USFWS has been working with SITLA to draft an SHA for Utah prairie dogs found on SITLA lands in the Awapa Plateau and Paunsaugunt Recovery Units. With a SHA in place, the USFWS would consider SITLA lands to be protected habitat, thereby allowing Utah prairie dogs on SITLA lands to be credited toward recovery (personal communication, Jessica Kinross, Biologist, UDWR, 2021).

Section 7 Consultations

Section 7 of the Endangered Species Act requires federal agencies to consult with the USFWS on any action they fund, permit, or carry out to assure that it does not jeopardize the existence of any listed species or adversely affect critical habitats. The process can vary depending on the scope of the project, but may contain steps such as an informal consultation, review, determination, formal consultation (if needed) and finally a biological opinion from the USFWS. Most development activities that occur throughout the range of the Utah prairie dog take place on private lands, and are therefore covered by the various mechanisms in place such as the GCP. When a project takes place on federal lands, or uses federal funds or permitting, a section 7 consultation is triggered.

Many such consultations have taken place since the Utah prairie dog was federally listed. Two such instances are noted below:

In 2010 the USFWS concluded a programmatic Section 7 consultation with the Federal Aviation Administration for the effects of airport maintenance and development activities on Utah prairie dogs until 2025. In 2013, the USFWS published a final programmatic biological opinion for impacts to the Utah prairie dog from the Utah Department of Transportation Highway Safety Improvement Program for sections of existing interstates and highways and their associated rights-of-way over 20 years (USFWS 2013). The USFWS Environmental Conservation Online System (ECOS) provides more information on ESA Section 7 consultation for the Utah prairie dog (USFWS 2021a).

State Management Plan

In response to the 2014 U.S. District Court opinion withdrawing the Utah prairie dog from federal ESA protection, UDWR developed a management plan for the species on non-federal lands. The goal of the management plan was "[t]o remove restrictions from private property through a timely and structured process while assisting in the conservation of populations on designated 'federal' and protected non-federal lands" (UDWR 2015). The 2015 state plan outlined management objectives and strategies to achieve this goal while also addressing regulated take of Utah prairie dogs for the purposes of development; agricultural and rangeland conflicts; and human safety, health, and welfare (UDWR 2015).

1.3 CONSERVATION, MANAGEMENT, AND MONITORING ACTIVITIES

The recovery and habitat conservation plans described in Section 1.2.1.1.1 apply a suite of conservation, management, and monitoring activities to conserve the Utah prairie dog. These activities consist of annual spring counts, translocations, plague prevention and management, habitat protection, education and public outreach, habitat management, and research and are discussed in more detail in the sections below.

1.3.1.1 *Annual Spring Counts*

Since 1976, UDWR, the BLM, NPS and the USFS have conducted annual counts of adult Utah prairie dogs at all accessible colony locations across all land ownerships. Count data show considerable fluctuations in Utah prairie dog populations from year to year but stable to increasing trends over the long term (UDWR 2016, 2017, 2018, 2019, 2020, 2021, 2022). Annual counts are conducted in the spring, before the young are above ground, by counting the number of adult prairie dogs observed at each colony. It is estimated that only 40%–60% of individual prairie dogs are above ground at any one time (Crocker-Bedford 1975). Spring population estimates (adults only) are calculated as two times the spring count (USFWS 2017b). Total population estimates are calculated using a formula that accounts for the spring count adult population estimate and the estimated reproduction:

Population estimate = [(2 × spring adult count) × 0.67 (proportion of adult females) × 0.97 (proportion of breeding females) × 4 (average number of young per breeding female)] + (2 × spring adult count).

For example, if a spring count on a particular colony is 35, then the total summer population estimate for that colony would equal [(2 × 35) × 0.67 × 0.97 × 4] + (2 × 35) = 252.

The spring counts and population estimates provide valuable information on long-term population trends. Figure 1-1 depicts the adult spring counts of Utah prairie dogs from 1976 to 2022.

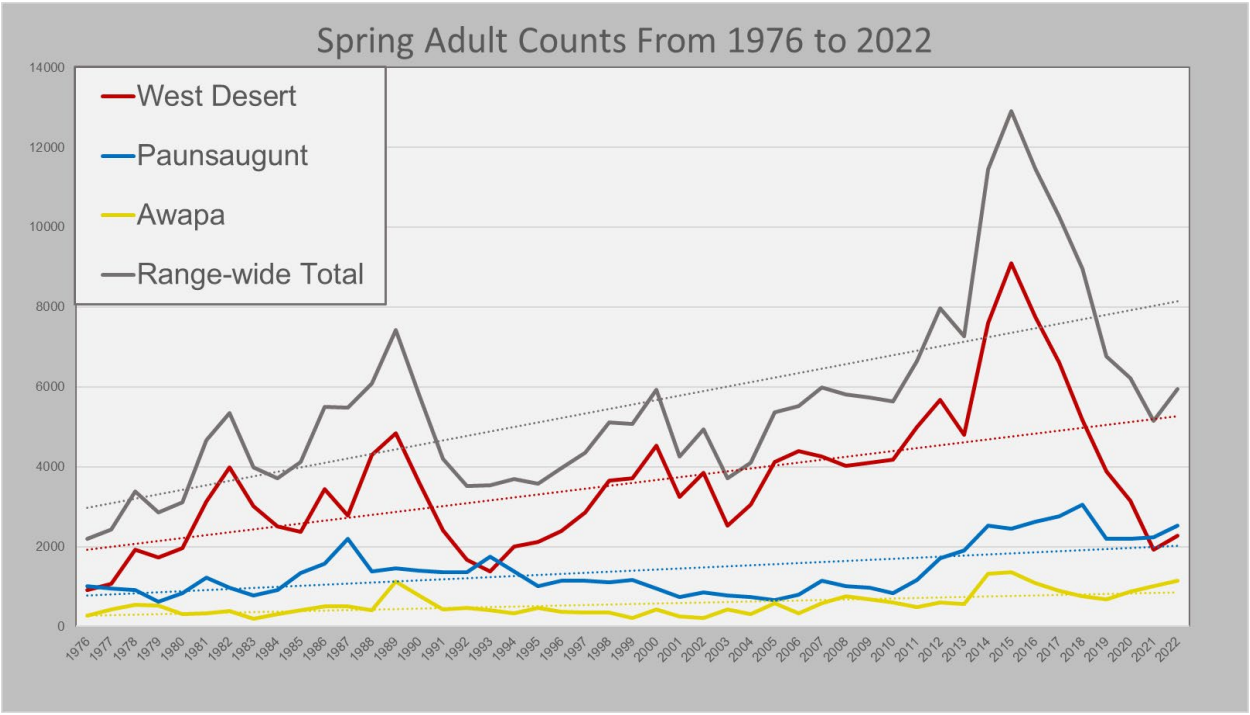

Figure 1-1. Utah Prairie Dog Adult Spring Counts 1976-2022.

1.3.1.2 *Translocations*

The Utah prairie dog translocation program was initiated by UDWR in 1972 with mixed success over the years (USFWS 2012). Translocation protocols have been improved through an adaptive management process since the early experimental efforts. Translocations have been used to establish new colonies in historically occupied parts of the species' range; to reduce or address conflicts with landowners in agricultural, urban, and developed areas; and to mitigate for urban expansion and land development activities. The 2011 *Recommended Translocation Procedures for Utah Prairie Dog*, updated in 2011, outlines the procedures for translocation site selection and preparation; the setting of traps; handling, transport, and releasing of prairie dogs; and translocation site management and prairie dog monitoring (USFWS 2011). From the inception of the program in 1972 to 2022, UDWR, the BLM, and the USFS have translocated 41,274 Utah prairie dogs to sites on federal and non-federal protected lands. Since 2012 a total of 15,499 Utah prairie dogs have been translocated to sites on federal and non-federal protected lands in the West Desert, Paunsaugunt, and Awapa Plateau Recovery Units (UDWR 2016, 2020, 2023).

1.3.1.3 *Plague Prevention and Management*

Plague is a threat to the Utah prairie dog, and the long-term management of plague outbreaks is a recovery priority (USFWS 2012). Deltamethrin and Pyraperm® insecticides have been used to manage plague outbreaks and increase Utah prairie dog survival on federally managed lands (USFWS 2017b). Annual plague abatement on federal and non-federal protected lands has been coordinated and jointly funded by UDWR and partner land management agencies (BLM, USFS, and NPS) (USFWS 2017b). Plague management has been prioritized at large colonies that are at a high risk and at colonies that experience plague outbreaks (USFWS 2017b).

A research project was initiated in 2009 by the U.S. Geological Survey National Wildlife Health Center in Madison, Wisconsin, to develop an oral sylvatic plague vaccine for prairie dogs. UDWR participated in field trials to test the efficacy of the vaccine in preventing plague outbreaks in prairie dog colonies. The field trials and other studies determined that the vaccine is somewhat effective at increasing resistance to plague and partially protects prairie dogs from plague outbreaks but is not as effective or cost effective compared to Deltamethrin and Pyraperm (Rocke et al. 2017; Roth 2018; UDWR 2019). New studies and plague management tools, such as edible fipronil pellets or FipBit pellets, could lead to additional effective plague management options in the future (personal communication, Adam Kavalunas, Biologist, UDWR, 2021).

1.3.1.4 *Habitat Protection*

Multiple types of land protection tools have been used for Utah prairie dog conservation efforts, including land use planning on federal lands, state-owned conservation lands, and conservation banking.

Certain federal lands have been designated for the conservation of the Utah prairie dog and are managed to promote the recovery of the species (USFWS 2012). Federal lands expressly contributing to the recovery of the Utah prairie dog are managed by the BLM, USFS, and NPS. Federal agency land management plans identify population focus areas and management units to provide the necessary habitat, populations, and connectivity to help sustain the species across its range (USFWS 2017c).

As of 2022, 3,930 acres of non-federal land have been secured as protected conservation areas for the Utah prairie dog. These acquisitions include those associated with conservation banks, the Utah Prairie Dog Credit Habitat Exchange, and other non-federal land easements or acquisitions (USFWS 2017a, 2017c; personal communication, Adam Kavalunas, Biologist, UDWR, 2021). Table 1-1 lists existing acquisitions and easements on non-federal lands supporting Utah prairie dog recovery.

Table 1-1. Non-Federal Lands Acquisitions Supporting Utah Prairie Dog Recovery

Purchase Name	Landowner	Easement Holder	Recovery Unit	Acres
Utah Prairie Dog Habitat Credit Exchange Program (four parcels)	Private	Resource Conservation and Development Council	Awapa Plateau (two parcels), Paunsaugunt (one parcel), West Desert (one parcel)	280
SITLA Conservation Banks (three parcels)	SITLA	UDWR	Awapa Plateau	761
Bryce Airport/Willis Draw	Garfield County	UDWR	Paunsaugunt	403
Johnson Bench (one parcel)	The Nature Conservancy	–	Paunsaugunt	803
Rollermill	Garfield County	UDWR	Paunsaugunt	645
The Nature Conservancy – Autumn Buttercup	The Nature Conservancy	–	Paunsaugunt	43
Parowan Valley Wildlife Management Area (one parcel)	UDWR	–	West Desert	181
Second Mound	Iron County	The Nature Conservancy	West Desert	291
Wild Pea Hollow, Little Horse Valley Conservation Banks (two parcels)	Iron County	UDWR	West Desert	524

Source: USFWS (2017c), (personal communication, Adam Kavalunas, Biologist, UDWR, 2021)

Conservation banks are a tool used to mitigate and offset the impacts of Utah prairie dog habitat loss by permanently protecting other important habitat across the species' range (USFWS 2012). To date, five Utah prairie dog conservation banks - the SITLA conservation banks (three parcels), and the Wild Pea Hollow and Little Horse Valley conservation banks (two parcels) - have been approved to offset incidental take (USFWS 2012, 2017c).

The Utah Prairie Dog Habitat Credits Exchange Program is a programmatic conservation mechanism, similar to conservation banking and recovery credit trading, whereby developers and others are able to offset negative impacts to Utah prairie dogs or their habitat by funding conservation and management actions on other private lands (USFWS 2012).

In 2001, UDWR and Iron County, with additional funds from the USFWS and The Nature Conservancy (TNC), purchased 181 acres to establish the Parowan Valley Wildlife Management Area for the protection of a large Utah prairie dog colony. To gain the support of neighboring landowners, the USFWS issued a Section 10(a)(1)(A) permit, authorizing the control of prairie dogs above the 2001 baseline number on properties within 0.5 miles of the Parowan Valley Wildlife Management Area (USFWS 2012).

The Rollermill Willis Draw UPD Conservation Easement comprises two properties totaling 1,040 acres purchased from SITLA in 2017. The Second Mound Conservation Easement, a 291-acre property with 15 acre feet of water in Iron County, Utah, was purchased by the county in 2018. The easement was purchased with funds from the USFWS, the State of Utah and TNC for the conservation of Utah prairie dogs.

1.3.1.5 *Education and Public Outreach*

The 1997 Interim Conservation Strategy and 2012 Recovery Plan identify the need for community involvement, education, and Extension offices to assist with the recovery of Utah prairie dogs. Beginning in 1995, SUU and UDWR have provided educational opportunities and field-based activities for students and civic groups using Utah prairie dog colonies near Cedar City. The purpose of this conservation

outreach program is to educate local residents about the Utah prairie dog and foster a more tolerant perception of the species (USFWS 2012). In 2007, the Utah Farm Bureau sponsored community meetings to educate landowners about conservation programs for Utah prairie dogs on non-federal lands. Bryce Canyon National Park hosted its first Utah Prairie Dog Day in 2010. During this and subsequent events, park rangers engaged the public about Utah prairie dogs and their role as a keystone species. The USFS has also conducted education and outreach efforts to teach people about Utah prairie dogs on the lands they manage. In recent years, community outreach and education efforts by UDWR have focused on changes in regulations, state management initiatives, and the range-wide GCP. UDWR personnel have made presentations and performed other outreach efforts to the Cedar City Lions Club, the Iron County Board of Realtors, the Iron County Homebuilders Association, Iron County, Garfield County, the St. George News, the UDWR Wild podcast series, and a local radio show. In addition, Bryce Canyon National Park had an exhibit for Utah prairie dogs at their visitors center, and regularly utilizes their prairie dog mascot uniforms at events.

1.3.1.6 *Habitat Management*

Ongoing habitat management is important on federal and non-federal protected lands to support the conservation of the Utah prairie dog. Habitat management and enhancement of occupied and suitable habitat can benefit Utah prairie dogs on both federal and non-federal protected lands. Habitat management tools include: sagebrush removal or thinning, seeding, weed removal, landscape-scale habitat treatments, prescribed fire treatments, and grazing management. These strategies can provide increased forage quantity, quality, and availability as well as improve visual surveillance capability. Federal lands are managed according to their land use plans and include the BLM *Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah* (BLM 1997), and USFS *Land and Resource Management Plan for the Dixie National Forest* (USDA 1986a) and rangeland management handbooks (USFS 2005). Habitat management practices such as planting and seeding, prescribed grazing, and brush management are employed to increase plant species' richness and ground cover, reduce canopy cover and noxious weeds, and remove vegetation barriers. Over the past several decades, a total of 20,500 acres of habitat treatment projects have been conducted on federal and non-federal lands, often in collaboration with the Watershed Restoration Initiative. Of this total, 4,478 acres of habitat enhancement projects were conducted in Utah prairie dog colonies - 2,302 acres on BLM-administered lands, 2,206 acres on USFS-administered lands, 262 acres on TNC administered lands, 209 acres on non-federal lands, and 30 acres on state lands. In addition to Watershed Restoration Initiative projects, habitat treatment projects have been conducted on approximately 400 acres of USFS-administered lands in the Dixie National Forest and 140 acres of NPS-administered lands.

1.4 STAKEHOLDER COORDINATION

Without the contributions from federal partners under their respective mandates and authorities, success in Utah prairie dog conservation and recovery would not be possible. Federal partners (USFS, BLM, NPS, USFWS) have made significant contributions through collaborative planning and adaptive management, habitat restoration and enhancement, plague abatement, translocations and site development, research and monitoring, conflict resolution, and public outreach and education. Section 7(a)(1) of the Endangered Species Act mandates that "[a]ll federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species. . ." For the recovery of the threatened Utah prairie dog, federal partners have invested considerable funding and effort in fulfilling their obligation under Section 7(a)(1).

The state's perspective that federal protection under the ESA is no longer necessary for Utah prairie dog fostered the development of this Conservation Strategy intended to guide conservation efforts in a post-delisting environment under the umbrella of the Utah Wildlife Action Plan. With delisting the state would regain management authority over Utah prairie dog; and, as a result, federally mandated safeguards provided through Section 7(a)(1) would no longer apply.

The state has no authority to mandate that federal agencies continue to proactively contribute to Utah prairie dog conservation once it becomes delisted. There are, however, several conservation efforts for state-managed species (i.e. not federally listed), managed under the umbrella of the Utah Wildlife Action Plan, where UDWR has partnered with federal agencies on the implementation of species-specific conservation strategies intended to maintain the viability of target species such that protection under ESA is unnecessary. Through these voluntary efforts, federal partners have made significant contributions to species' conservation under their respective authorities in the absence of ESA mandates. These efforts represent a model for voluntary collaboration in conservation of state-managed species that sets the stage for how Utah prairie dogs would be managed in a post-delisting environment.

Although the delisting of Utah prairie dog would be a huge milestone demonstrating that partner contributions to recovery have not been in vain, delisting by no means represents a finish line in species conservation. Once delisted, Utah prairie dog would be managed as a Species of Greatest Conservation Need (SGCN) under the umbrella of the Utah Wildlife Action Plan. The intent of the UWAP is to guide partnership-driven, landscape-scale conservation work to help maintain the full array of Utah's wildlife, and also improve habitat health with the ultimate goal of reducing the number of federally listed species in Utah. Utah prairie dog conservation would be specifically driven using this Conservation Strategy as a guiding document.

Although UDWR would be the lead agency for managing Utah prairie dog after they are delisted, this Conservation Strategy is not a single-agency strategy. UDWR does not bear the sole responsibility for its successful implementation. Ultimately, success in preserving and managing Utah prairie dog and their habitat depends on the many partners that have contributed to the successful track record of recovery under ESA listing. It is the intent of UDWR under this Conservation Strategy to continue to foster this successful collaboration and partnership.

Recognizing the continued need to work with stakeholders, UDWR engaged with members of UPDOG to participate in the development of this Conservation Strategy. UDWR solicited input, review, and comment from these stakeholders on specific questions related to each task, as outlined in Table 1-2. The questions listed under each task were the primary drivers of the agendas for the stakeholder coordination meetings. Table 1-2 also outlines the topics discussed, number of work sessions, and approximate number of hours spent to address tasks and meeting topics.

Table 1-2. Stakeholder Topic Engagement

Task and Questions/ Meeting Topics	Subtopics	Number of Work Sessions and Approximate Total Number of Hours Spent
Task 1—Reviewing the Status of the Species	• Status and Regulatory Actions	1 session, 2 hours
Task 2—Prioritizing Future Conservation Actions for Maintaining Recovery	• Disease Management • Translocation • Habitat Protections • Habitat Management • Education and Outreach	3 sessions, 6 hours

Task 3—Monitoring and Adaptive Management	• Monitoring Protocols, Data Synthesis, and Reporting • Biological Goals and Objectives / Adaptive Management Triggers • Adaptive Management Process and Responses • Research Program	4 sessions, 7 hours
Task 4—Securing Commitments and Planning for Implementation	• Coordination • Funding • Agreements	1 session, 1 hour
Task 5—Consistency with Regulatory and Policy Standards	• Status and Regulatory Actions	1 session, 1 hour

CHAPTER 2. SPECIES ECOLOGY AND STATUS

2.1 LIFE HISTORY

The Utah prairie dog is one of five species of prairie dogs in North America, most closely related to white-tailed prairie dog (*Cynomys leucurus*) and Gunnison prairie dog (*Cynomys gunnisoni*) and is the westernmost member of the genus *Cynomys*. This burrowing member of the squirrel (*Sciuridae*) family occurs only in arid grasslands in southwestern Utah (UDWR 2015).

Utah prairie dogs spend 4 to 6 months underground during harsh winter months and emerge in late February or early March. Temperature is thought to trigger emergence from hibernation. Mating occurs soon after emergence, generally mid-March to mid-April (USFWS 2012). Adult males typically cease surface activity during August and September, although weather conditions influence timing. Adult females cease surface activity several weeks later (Hoogland 2003; McDonald 1993). Juvenile prairie dogs remain active as late as November.

Approximately 67% of the Utah prairie dog adult population is female (Wright-Smith 1978). Each female produces an average of 3.88 pups that are born in April after a 30-day gestation period (Hoogland 2001; Mackley et al. 1988; Pizzimenti and Collier 1975; Wright-Smith 1978). Young Utah prairie dogs appear above ground at 5 to 7 weeks of age; juveniles are full grown by October of their first year and reach sexual maturity at 1 year. Less than 50% of male and female Utah prairie dogs survive the first year. and only about 20% of females and less than 10% of males survive to age 4 (Hoogland 2001). Due to their limited reproductive rates, short lifespan, and high mortality rate, numbers of individuals within a colony fluctuates throughout the year, with population peaks in early summer, when adults and pups are above ground (USFWS 2012).

Young male Utah prairie dogs disperse in late summer; average dispersal events range from 0.35 mile to 0.75 mile, with unusually long-distance dispersals of 4 miles (Brown et al. 2011; Mackley et al. 1988). In the summer of 2014, UDWR documented a recently translocated individual traveling upwards of 10 miles (USFWS 2012); although unusual, this finding may indicate the dispersal potential of the species.

Utah prairie dogs are organized into social groups called clans (sometimes called coteries), consisting of an adult male, several females, and their young (Wright-Smith 1978). Geographic boundaries of clans remain constant within a colony, and young prairie dogs are the only ones to regularly cross clan boundaries. Prairie dog colonies are formed of one or more clans. Social behaviors, especially vigilance and warning vocalizations, are important to the survival of individuals and to the colony. The adult females play the primary role in caring for young and typically provide warning to the colony of danger (Wright-Smith 1978).

Mean foraging distances for Utah prairie dogs (adults and juveniles) are inversely related to their density (Wright-Smith 1978). Higher density sites have smaller foraging ranges (100 feet), and lower density sites have larger foraging ranges (250 feet) (USFWS 2018; Wright-Smith 1978). Foraging distances are applied radially to Utah prairie dog colony boundaries (USFWS 2018). The retrospective analysis conducted by Larsen et al. (2021), and described in Section 3.1, found that the mean colony count increased when suitable habitat or irrigated lands were present within a 250-foot (76-meter [m]) radius (average foraging distance) of the colony (Wright-Smith 1978). Conversely, the presence of development (e.g., housing, and other infrastructure such as roads) within the foraging buffer was negatively associated with occupancy.

2.2 HABITAT CHARACTERISTICS

Utah prairie dogs occur in semiarid shrub-steppe and grassland habitats (Bonzo and Day 2003; McDonald 1993; Roberts et al. 2000). Within these habitats, they prefer swale-type formations where moist herbaceous vegetation is available even during drought periods (Collier 1975; Crocker-Bedford 1976; Crocker-Bedford and Spillett 1981). Plentiful high-quality food found in swales enables prairie dogs to attain a large body mass, thus enhancing survival and increasing litter sizes and juvenile growth rates (Hoogland 2001). Utah prairie dogs are also commonly found in developed urban or disturbed habitats such as golf courses, cemeteries, residential areas, and irrigated agricultural fields (USFWS 2012).

Utah prairie dogs forage primarily on grasses and forbs and tend to select those with higher moisture content (Crocker-Bedford 1976). Vegetation must be of short stature to allow the prairie dogs to see approaching predators and to maintain visual contact with other prairie dogs in the colony (Collier 1975; Crocker-Bedford and Spillett 1981). Prairie dogs will avoid areas where brushy species dominate and will eventually decline or disappear from areas invaded by brush (Collier 1975; Player and Urness 1982; USFWS 2017b).

A suitable habitat model described by Ikeda (2010) found that Utah prairie dog occurrences coincide with habitats found in valleys, plateaus, and terraces. Tree or shrub height above 1.5 feet (0.5 m) correlated with unsuitable habitats. Suitable habitat contained a higher percentage of sand in the soil, as opposed to silt or clay, as well as deeper soils (Ikeda 2010). Soil characteristics are an important factor in the location of Utah prairie dog colonies. Well-drained soils are required to support burrow systems with deep burrows (at least 3.3 feet [1 m]) to protect prairie dogs from predators and temperature extremes (USFWS 2012).

2.3 DISTRIBUTION AND ABUNDANCE

2.3.1 Recovery Units

Utah prairie dogs occur in three geographic areas within southwestern Utah, associated with the West Desert, Paunsaugunt, and Awapa Plateau Recovery Units (USFWS 2012). Within their current range, Utah prairie dogs are found at elevations from 1,646 m on valley floors, and up to 2,896 m elevation in mountain habitats (USFWS 2012) (see Figure 2-1).

The West Desert Recovery Unit is primarily within Iron County but extends into southern Beaver County and northern Washington County, Utah. However, no Utah prairie dogs currently occur in Washington County. Prairie dog habitat on federal and state lands in the West Desert Recovery Unit is primarily managed by the BLM Cedar City Field Office (FO) and SITLA. UDWR manages prairie dog habitat on non-federal lands, which is considerable in the West Desert Recovery Unit. The West Desert Recovery Unit includes habitats from 1,500 m to 1,800 m in elevation and consists of arid, low-productivity habitats

on federal lands as well as extensive agriculture and urban development around Cedar City and Parowan. Mean minimum temperatures in this recovery unit average 2.2 degrees Celsius (°C) (range 2.4°C–5.1°C), with maximum temperatures averaging 18.6°C (range 11.4°C–21.2 °C) (Thornton et al. 2016). Average annual precipitation was estimated at 366.2 millimeters (mm) (range 131.0 mm–880.0 mm) (Thornton et al. 2016). Prairie dog colonies in the West Desert Recovery Unit primarily occur on non-federal lands, where irrigated agricultural lands provide increased water and forage in comparison to federal lands (Larsen et al 2021).

The Paunsaugunt Recovery Unit is primarily within Garfield County, with small areas in Piute and Kane Counties, Utah. Prairie dog habitat on public lands in the Paunsaugunt Recovery Unit is primarily managed by the Dixie National Forest (NF), the BLM Kanab FO, and Bryce Canyon National Park. The Paunsaugunt Recovery Unit includes habitats from 1,800-2,400 m in elevation and is primarily composed of high-desert habitats. Compared to the West Desert Recovery Unit, the Paunsaugunt Recovery Unit experiences shorter and cooler summers due to the high elevation. Mean minimum temperatures in this recovery unit averages -1.1 °C (range -3.1 to 1.5 °C) with maximum temperatures averaging 15.9 °C (range 10.9 to 20.1 °C) (Thornton et al. 2016). Average annual precipitation was estimated at 360.1 mm (range 153.0 to 820.0 mm) (Thornton et al. 2016). The majority of prairie dog colonies in the Paunsaugunt Recovery Unit occur on federal lands managed by the USFS (Larsen et al. 2021).

The Awapa Plateau Recovery Unit is within portions of Garfield, Piute, Sevier, and Wayne Counties. Prairie dog habitat in the Awapa Plateau Recovery Unit is primarily managed by the Fishlake and Dixie NFs, the BLM Richfield FO, and SITLA. The Awapa Plateau Recovery Unit includes habitats from 2,100 to 3,000 m in elevation and is composed of high-elevation grasses and short shrubs. The Awapa Plateau Recovery Unit experiences the coolest temperatures in comparison to the other recovery units and has the shortest growing season due to the elevation of the plateau. Mean minimum temperatures in this recovery unit average -1.4 °C (range -4.0°C–to 2.3°C), with maximum temperatures averaging 13.4°C (range 9.5°C–18.6°C) (Thornton et al. 2016). Average annual precipitation was estimated at 438.5 mm (range 282.2mm–658.0 mm) (Thornton et al. 2016). Prairie dog colonies in the Awapa Plateau Recovery Unit primarily occur on lands administered by the BLM and USFS, with some colonies on private and SITLA lands.

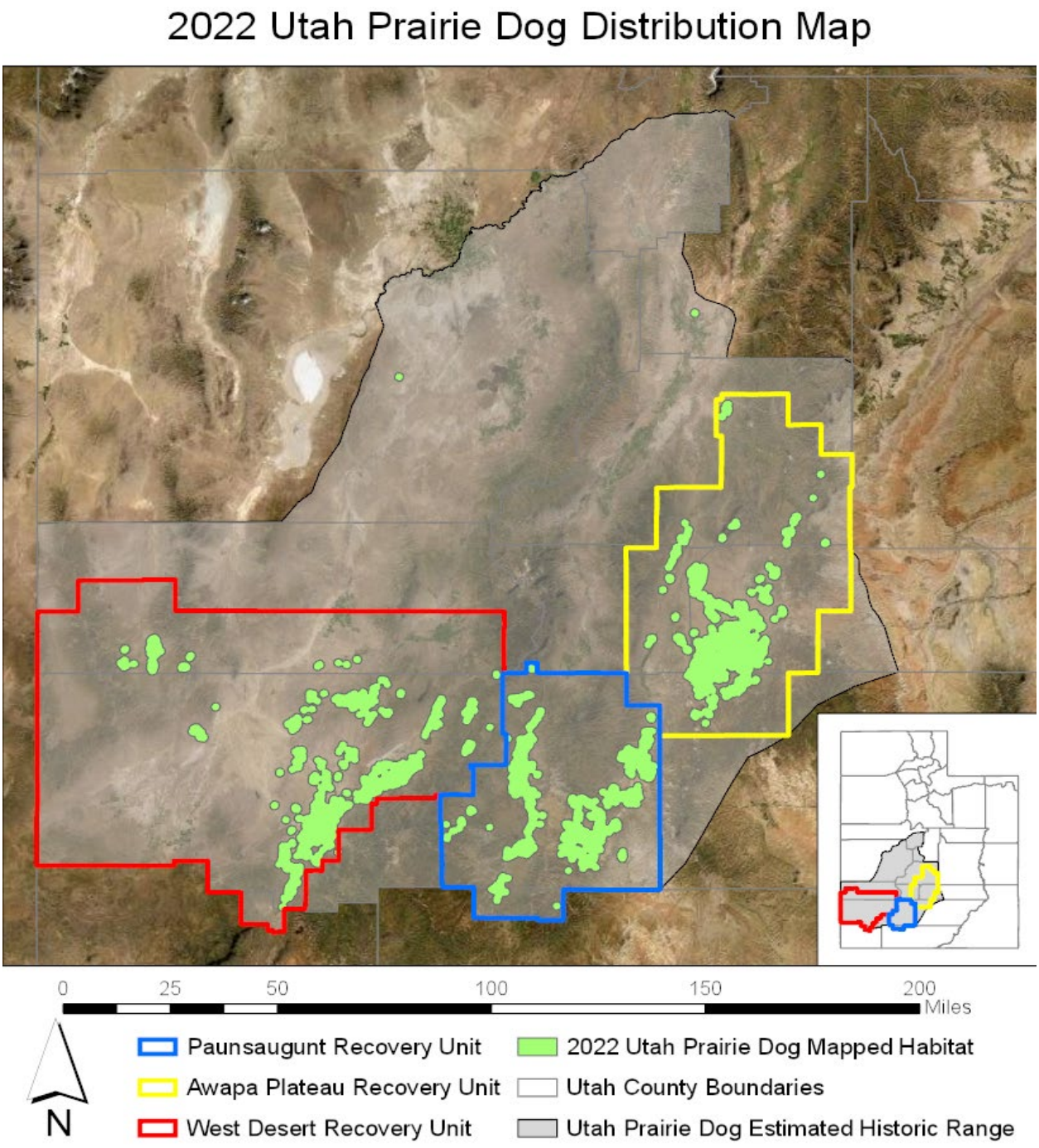

Figure 2-1. The estimated historic range and the 2022 mapped habitat (buffered to protect exact locations) of the Utah prairie dog.[1]

[1] Utah prairie dog historic range is estimated based on Allen (1905), Kelson (1951), Hardy (1937), and Pizzimenti and Collier (1975). It should be noted that not all areas within the historic range were likely occupied at all times and likely experienced population variability and population shifts over time (see Figure 2-1).

2.3.2 Mapped and Occupied Habitats

Habitat mapping and Utah prairie dog counts were first initiated by UDWR in 1972 and 1976, respectively. All habitat occupied by Utah prairie dogs since 1972 is referred to as "mapped habitat." Maps are updated annually to document colony expansions and the establishment of new colonies. However, lands associated with abandoned or historic colonies are not removed from the database. In 2022, UDWR identified 66,569.6 acres as mapped habitat for the Utah prairie dog (UDWR 2023).

Occupied habitat includes areas where Utah prairie dog surveys confirmed visual observations of Utah prairie dogs. With recent advances in technology, UDWR began mapping active portions of colonies beginning in 2018. Prior to that, only colony counts were recorded. In some instances, colonies that were historically very large may only contain prairie dogs in small portions of the mapped colony today. These discrepancies often created difficulty in determining the amount of mapped habitat the animals were actually using from year to year. By documenting the occupied portions of each colony, management agencies are better able to quantify the amount of habitat prairie dogs are using in any given year. UDWR occupied habitat equates to active colony areas buffered by a 100-foot foraging distance buffer in the major development zone and a 250-foot foraging distance buffer in the minor development zone. The major and minor development zones are adopted from and described in the 2018 *Range-Wide General Conservation Plan for the Utah Prairie Dog in Residential and Commercial Development Areas* (USFWS 2018).

One of the goals set forth in the Recovery Plan is 5,000 acres of occupied habitat on federal and protected lands in each of the three management areas. As originally defined in the Recovery Plan, occupied habitat included the active colonies buffered by a 730-foot foraging distance buffer (USFWS 2012). This habitat calculation is no longer the best available science; however, it is practical for comparing the current habitat calculations to the habitat criteria stipulated in the 2012 USFWS Recovery Plan concerning species recovery.

The breakdown of mapped, occupied, and Recovery Plan required habitat by management area and land ownership is summarized in Table 2-1.

Table 2-1. 2022 Utah Prairie Dog Mapped and Occupied Habitat by Land Ownership

Land Ownership and Location	West Desert Management Area (acres)	Paunsaugunt Management Area (acres)	Awapa Plateau Management Area (acres)	Total (acres)
Mapped Habitat				
Federal lands	7,157.8	6,939.8	15,882.6	**29,980.2**
Non-federal protected lands	496.1	819.7	567.4	**1,883.2**
Non-federal unprotected lands	13,697.9	12,023.2	8,985.1	**34,706.2**
Subtotal mapped habitat	**21,351.8**	**19,782.7**	**25,435.1**	**66,569.6**

Occupied Habitat*				
Federal lands	817.4	3,695.2	2,678.7	**7,191.3**
Non-federal protected lands	398.3	297.3	167.2	**862.8**
Non-federal unprotected lands	1,388.8	1,450.3	1,152.2	**3,991.3**
Subtotal occupied habitat	**2,604.5**	**5,442.8**	**3,998.1**	**12,045.4**
Recovery Plan Required Habitat**				
Federal lands	8,280.4	11,802.4	22,603.8	**42,686.6**
Non-federal protected lands	742.9	1,347.2	709.6	**2,799.7**
Non-federal unprotected lands	21,399.4	15,799.5	10,239.0	**47,437.9**
Subtotal occupied habitat	**30,422.7**	**28,949.1**	**33,552.4**	**92,924.2**

Source: UDWR (2023)

* UDWR Occupied acreage equates to mapped active areas buffered by 100 feet in the major development zone and 250 feet outside the major development zone.

** USFWS Occupied acreage equated to mapped active areas buffered by 730 feet rangewide.

In 2022, mapped habitat, occupied habitat, and Recovery Plan required habitat on federal and non-federal protected lands totals 31,863.4 acres, 8,054.1 acres, and 45,486.3 acres, respectively. These mapped habitat, occupied habitat, and Recovery Plan required habitat areas on federal and non-federal protected lands, represent 47.9%, 66.9%, and 48.9% of the respective totals, and are either fully protected or receive management benefiting Utah prairie dogs in ways that actively support the long-term conservation of the species. These areas are distributed across the three management areas, such that each management area contains a substantial share of the total. According to the 2012 USFWS Recovery Plan, the 2022 total Recovery Plan required habitat acreage of 45,486.3 acres exceeds the recovery goal of 15,000 acres of the Recovery Plan's required rangewide total. In addition, the West Desert, Paunsaugunt, and Awapa Plateau management areas each had federal and non-federal protected lands totaling more than 5,000 acres for the Recovery Plan required habitat, specifically 9,023.3 acres, 13,149.6 acres, and 23,313.4 acres, respectively.

2.3.3 Abundance and Density

The range-wide, average annual Utah prairie dog spring count between 2020 and 2022 was 5,760 (ranging from 5,161 in 2021 to 6,173 in 2020) (UDWR 2023). Although Utah prairie dog counts have slightly declined from 2020 to 2022, annual variability is typical of the species, and long-term trends since 1972 are stable to increasing (Larsen et al. 2021). Utah prairie dog spring counts in 2022 and 3-year averages across land ownership and recovery unit are presented in Table 2-2.

From 2019 to 2022 (2018 data was incomplete), the average density of prairie dogs in occupied habitat was approximately 0.507 prairie dog per acre (i.e., 0.783 prairie dog per acre in the West Desert Recovery Unit, 0.434 prairie dog per acre in the Paunsaugunt Recovery Unit, and 0.318 prairie dog per acre in the Awapa Plateau Recovery Unit) (UDWR 2023). The average density of Utah prairie dogs per acre within occupied habitat was calculated using mapped active habitat plus a 250-foot buffer representing the average foraging distance when in the minor development area and 100-foot buffer when in the major development area (Wright-Smith 1978).

Table 2-2. 2022 Spring Counts of Utah Prairie Dogs and 3-Year Averages

Land Ownership and Location	West Desert Recovery Unit		Paunsaugunt Recovery Unit		Awapa Plateau Recovery Unit		Total counts	
	2022 spring count	3-year average	2022 spring count	3-year average	2022 spring count	3-year average	2022 spring count	3-year average
Federal lands	516	414	1,167	1,269	545	520	2,228	2,203
Non-federal protected lands	302	289	200	179	82	72	584	540
Non-federal unprotected lands	1,463	1,743	1,153	868	518	406	3,134	3,017
Total counts	**2,281**	**2,446**	**2,520**	**2,316**	**1,145**	**998**	**5,946**	**5,760**

Source: UDWR 2023.

Note: Reported values include the 2022 spring count of adults and the 3-year average between 2020 and 2022. Non-federal lands include state, county, municipal, private, and tribal lands.

The number of small, medium, and large colonies varies from year to year. Large colonies have a high conservation value and tracking colonies that are large can inform management practices moving forward. Table 2-3 below shows the number of colonies that have greater than 50 Utah prairie dogs, greater than 23 Utah prairie dogs, and greater than 15 Utah prairie dogs between 2020 and 2022 (UDWR 2021, 2022, 2023).

Table 2-3. Number of Utah Prairie Dog Colonies with Greater Than 50, 23, and 15 Spring Counts of Utah Prairie Dogs Between 2020 and 2022, Along With a 3-year Average

Utah Prairie Dogs Within the Colony	Number of Colonies			
	2020	**2021**	**2022**	**3-year average**
> 50	24	19	19	21
> 23	60	60	65	62
> 15	100	89	101	97

Source: UDWR 2021, 2022, 2023.

2.4 RETROSPECTIVE ANALYSIS OF COUNT DATA

Larsen et al.'s (2021) *A Retrospective Analysis of 28 Years of Count Data for Utah Prairie Dogs: Influences of Climate, Land Use, and Management Actions* analyzed historical data collected over nearly three decades to evaluate the influence of colony size, climatic conditions, urban development, and management actions on annual counts of Utah prairie dogs. That effort was undertaken to help managers understand the relative role of factors influencing Utah prairie dog populations, and consequently inform conservation decisions. The annual count data demonstrates that the range-wide population of Utah prairie dogs has increased over the last 30 years, with each recovery unit demonstrating stable or increasing long-term population trends. Figure 2-2 shows the number of colonies counted each year steadily increased from under 200 per recovery unit in 1992 to between 240 and nearly 500 in 2019, depending on the recovery unit (Larsen et al. 2021).

Furthermore, the data suggest that the increases in Utah prairie dogs and the number of colonies over the last 30 years was not only a function of increased survey effort (i.e., surveying more small colonies), but that the mean number of Utah prairie dogs within surveyed colonies has also increased or remained steady over time (Figure 2-2). Mean count was steady to increasing for the Awapa Plateau Recovery Unit and the Paunsaugunt Recovery Unit irrespective of the increase in colonies counted, while the West Desert Recovery Unit experienced a recent decrease in the mean count from 2016-2021 during a period of extreme drought. Mean lambda, or transition (i.e., a representation of year-to-year changes in counts), across units was consistently above 1.0 between 1992 and 2019 and averaged between 1.2 during the early years and around 1.0 toward the end of the years counted (Figure 2-3). The mean occupancy rate of individual colonies varied between units and fluctuated between 0.65 and 0.85 across years (see Figure 2-3).

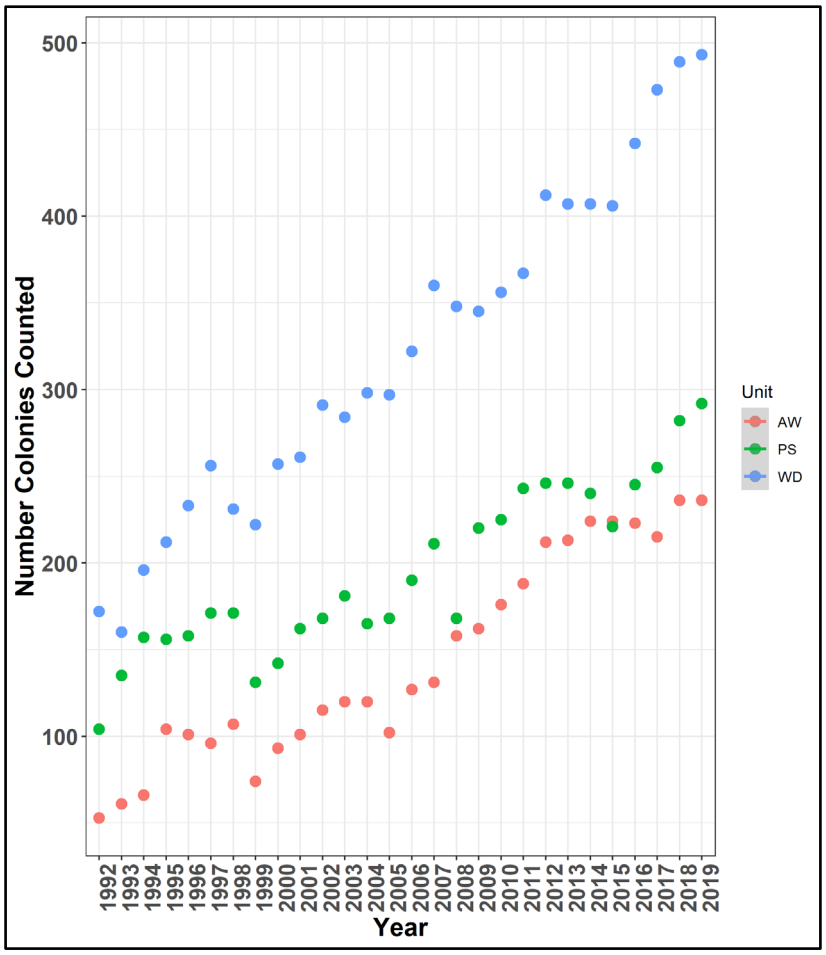

Figure 2-2. Number of Utah prairie dog (*Cynomys parvidens*) colonies counted between 1992 and 2019 in Utah. AW = Awapa Plateau Recovery Unit; PS = Paunsaugunt Recovery Unit; WD = West Desert Recovery Unit (Larsen et al. 2021).

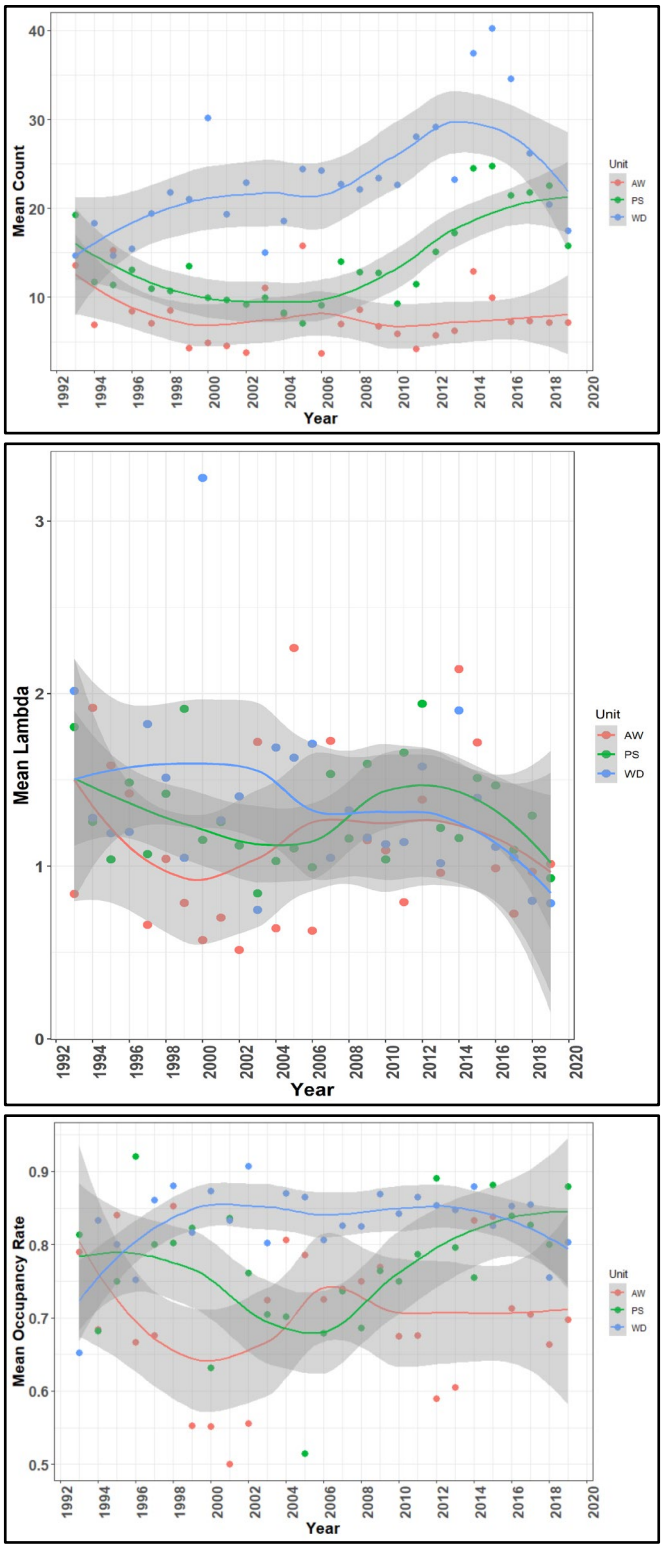

Figure 2-3. Mean count, mean lambda, and mean occupancy for Utah prairie dog (*Cynomys parvidens*) colonies within each of the three recovery units in southern Utah, 1992–2019 (Larsen et al. 2021).

A 1995 analysis of count data (Ritchie 1995) suggested that colonies and complexes of Utah prairie dogs experience population fluctuations and extirpations that are not related to colony size, but Brown and Ritchie (2011) later found that large colonies had a high probability of long-term persistence. Colonies exhibit frequent extinctions that appear to be primarily deterministic rather than occurring at random (UDWR 2019). Larsen et al. (2021) found that colony size influenced the likelihood of colony extirpation. When a median colony count was ≥ 15, the colony had a 95% probability of being occupied in a given year, and colonies with a mean count of ≥ 23 had a 99% probability of being occupied in a given year. This reinforces the concept that colonies of ≥ 15 counted individuals are more persistent and resilient in the face of deterministic conditions.

The retrospective analysis also evaluated the effects of climate conditions, urban development, and management activities on Utah prairie dog populations. Larsen et al. (2021) found that certain landscapes and management activities had a measurable influence on colony occupancy and colony size. For instance, "dusting" (applying deltamethrin to active burrows), translocation into a colony, percentage of suitable habitat (within 750 m and 1,500 m), and colony proximity to irrigated lands (76 m [250 feet]) positively influenced colony occupancy and counts, while percentage of developed lands, translocation out of a colony, and control permits (i.e., authorized direct lethal take) negatively influenced occupancy and counts.

Habitat treatments were not found to influence occupancy and counts, a finding that may be a result of limited data from habitat treatments within occupied Utah prairie dog colonies. However, much other research has stressed the importance of succulent vegetation to Utah prairie dogs and that increased plant diversity at the colony level dramatically decreases the frequency of extinction events (Ritchie 1999). UDWR and its partners realize the importance of maintaining suitable habitat for Utah prairie dogs and will continue to sustain and restore such habitats.

Precipitation had a positive influence on counts and occupancy, whereas increased temperatures associated with drought conditions had a negative influence (Larsen et al. 2021). Summer monsoonal moisture was found to be of particular importance. Forage production increases with precipitation and elevation and leads to better body condition, reproduction, and population growth (Biggins et al. 2021). Declines in the West Desert from 2016-2021 corresponded to a period of historic summer drought whereas the populations in the higher elevations and wetter habitats of the Paunsaugunt and Awapa Plateau were more resilient through that period. Other findings (Biggins et al. 2021) suggest that during wetter years, flea abundance is also greater, potentially setting the stage for large-scale plague outbreaks. Therefore, plague management remains important even during periods of favorable climate conditions.

The spatial distribution of Utah prairie dogs is also of importance. Analyses showed that colonies within 3,000 meters tended to show similar growth rates and thus likely had some level of connectivity. That is also consistent with documented dispersal distances. USFWS analysis found colonies in the Paunsaugunt management unit were spatially configured to provide connectivity. In isolated colonies, translocation can be used to provide genetic mixing. Marxan software can be used to inform spatial decisions related to conservation and adaptive management strategies for Utah prairie dogs. The goal of a Marxan analysis is based on optimization and works to target priority prairie dog colonies for management actions that meet conservation objectives for the species at the lowest cost and lowest risk. The analysis uses inputs from spring counts and colonies, with each colony quantified by the number of individuals contained, the probability of its survival, and the total area or size of the colony. A series of targets is established, including the number of counted individuals to conserve and cost estimates for conserving colonies. The Marxan analysis accounts for potential risks by identifying a set of colonies that would result in a 95% chance of maintaining the targeted number of counted individuals going forward (Hammill n.d. [2021]) and will also be used to prioritize the location conservation actions.

CHAPTER 3. MANAGEMENT CONCERNS

Threats to Utah prairie dog are identified and described in *Utah Prairie Dog* (Cynomys parvidens) *Final Revised Recovery Plan* (USFWS 2012) and *Utah Prairie Dog* (Cynomys parvidens) *Status of the Species* (USFWS 2017b). Since the Utah prairie dog was federally listed in 1973, mean counts have been steady to increasing through 2022, lending support to the effectiveness of conservation actions for this species. However, conservation actions have not eliminated some of these threats, and continued implementation of certain actions to address manageable threats is necessary. The Utah prairie dog is likely to remain a conservation-reliant species in the future (Larsen et al. 2021). The retrospective analysis by Larsen et al. (2021) suggested that management actions aimed to address plague concerns, drought, and habitat loss or control may minimize or alleviate threats to the Utah prairie dog. Public support, predation, and genetic diversity are additional management concerns for the species and are described below.

3.1 PLAGUE

Utah prairie dog populations are susceptible to sylvatic plague, a bacterium introduced to the North American continent in the late 1800's (Cully 1993). Plague presents a severe threat that occurs across the entire range of the Utah prairie dog, both as enzootic and epizootic events, and has the potential to result in severe reduction or complete loss of colonies (USFWS 2012). Fleas, the most common vector for plague (Biggins and Kosoy 2001) are brought into the vicinity of a prairie dog colony by a suite of mammals and may survive for over a year after their hosts have died off (Gage and Kosoy 2005).

Occurrence of epizootic plague outbreaks may be dependent on the density of the host population (i.e., prairie dogs) or flea density (Barnes 1993; Biggins et al. 2021a; USFWS 2012). Continued existence of chronic enzootic plague within colonies can result in long colony recovery periods—up to 10 years—following plague outbreaks (Cully and Williams 2001). High population densities also make colonies susceptible to plague epizootics due to increased opportunities for the exchange of fleas, which affects the rate plague can move through a colony (Barnes 1993).

Plague abatement efforts by UDWR, USFS, BLM, and NPS have increased, and in 2021 a total of 4,267 acres of occupied Utah prairie dog habitat was dusted range-wide (UDWR 2022). Larsen et al. (2021) found that dusting has had a positive and cumulative effect on both the count response and occupancy response and supporting data show that dusting leads to increased Utah prairie dog survival up to 2 years after treatment (Biggins et al. 2021a; Larsen et al. 2021). Disease management and disease monitoring is discussed further in Sections 5.3.1 and 6.1.3.

3.2 DROUGHT

Natural drought cycles have continued to be a threat for the Utah prairie dog, particularly regarding the potential for increased and prolonged drought cycles and heavy precipitation and flooding events (USFWS 2012; Karl et al. 2009). Shifts in vegetation associated with climate change may result in a reduction or changes in the distribution of prairie dog habitat quantity and quality.

Compared to a 1960–1979 baseline period, the average temperature in the Southwest (including the range of the Utah prairie dog) has increased roughly 1.5 degrees Fahrenheit (°F) (0.8°C). By 2100, the average annual temperature is projected to rise approximately 4°F to 10°F (2.2°C to 5.6°C) above the historical baseline, averaged over the Southwest region. Extreme heat events are projected to occur more frequently, and some lower elevation portions of southern Utah are projected to have up to 105 days above 90°F by 2100 (U.S. Global Change Research Program 2009; USFWS 2012). The Southwest is projected to experience a 10%–20% reduction in precipitation in mid-latitude western North America by

mid-century (Milly et al. 2005; USFWS 2012). Spring precipitation in southern Utah is projected to decline by 25%–35% by 2100 under the higher emissions scenario that was analyzed in *Global Climate Change Impacts in the United* States (Karl et al. 2009).

The retrospective analysis conducted by Larsen et al. (2021) found that climatic factors, specifically drought conditions and higher minimum air temperatures, had a negative influence on Utah prairie dog counts. Indirect impacts to Utah prairie dog from drought include the reduction of quality forage leading to reduced prairie dog abundance and reductions in prairie dog distribution, particularly at lower elevations (Collier and Spillett 1975; Crocker-Bedford and Spillett 1981). Likewise, on the Awapa Management Unit, adult body condition, reproduction, and population growth increased with elevation and precipitation (Eads and Biggins 2021). Larsen et al. (2021) supports this finding by detecting a positive influence in prairie dog colony size from proximity to irrigated land. Provisions of supplemental food and water at translocation sites (USFWS 2011) works to manage stressors on newly translocated prairie dogs in particularly dry conditions. Complimentary management actions, such as provision of supplemental food and water, are described in Section 5.3.6.

3.3 HABITAT LOSS

Vast amounts of federal land are found within the range of Utah prairie dog, and these lands offer protection and management opportunities for the species through resource management planning (Section 7.3.1). An average of 52% of Utah prairie dogs occur on private or SITLA (non-federal) lands based on the range-wide prairie dog counts from 2020 through 2022. Non-federal lands are or may be subject to development or conversion to intensive agricultural use. Such land uses can permanently reduce the amount of habitat available to the species and fragment remaining habitats. Habitat fragmentation diminishes the species' ability to disperse and exchange genetic material, thereby reducing genetic variation, all of which are critical factors to maintain viable populations (Brown et al. 2016; Ritchie and Brown 2005). The threat of habitat loss from development and intensive agriculture is regional and is more prevalent in the West Desert Management Area, where a substantial portion of the population occurs on non-federal lands. The range-wide GCP predicted a loss of occupied habitat from land development activities in each management area over a 10-year period. The GCP estimated there would be between 256 to 1,278 acres of occupied habitat lost from development in the West Desert Management Area, 49 to 244 acres of lost occupied habitat in the Paunsaugunt Management Area, and 45 to 228 acres of occupied habitat lost to development in the Awapa Plateau Management Area (USFWS 2018).

Multiple land protection tools have been used for Utah prairie dog conservation efforts, including land use planning on federal lands, state-owned conservation lands, and conservation banking. As described in Section 1.2.2.4., nearly 4,000 acres of non-federal land have been secured as protected conservation areas for the Utah prairie dog. Alteration of Utah prairie dog habitat due to agricultural activities is another cause of the species' reduced historic range (USFWS 2012). Approximately 70% of mapped Utah prairie dog habitat occurs on non-federal lands, and many of these lands are in or adjacent to agricultural production and irrigated fields (USFWS 2012). Utah prairie dogs prefer areas with deep soils and moist vegetation, which coincide with irrigated fields and areas preferred for agricultural production (USFWS 2012).

Prairie dogs in agricultural fields can cause conflicts for farmers, and prairie dogs can be subject to negative impacts, including increased mortality from vehicles, urban predators, legal and illegal control measures, and habitat fragmentation from fences and roads (Elmore and Messmer 2006a, 2006b; Seglund and Schnurr 2010; USFWS 2012). Conversely, agricultural areas can benefit Utah prairie dogs by providing accessible and highly nutritious forage (Crocker-Bedford 1976; Seglund and Schnurr 2010). Larsen et al. (2021) found that mean counts increased for colonies within 250 feet of irrigated lands,

where colonies without irrigated lands within 250 remained steady. Irrigated lands become increasingly important to the conservation of Utah prairie dogs during periods of drought (Larsen et al. 2021).

Habitat loss can also occur through natural vegetation succession. Utah prairie dogs forage on grasses and forbs and prefer habitats with vegetation that is low or sparse, which enhances prairie dog survival due to increased visibility for vigilance (Collier 1975; Crocker-Bedford and Spillett 1981). Vegetation community changes can be attributed to the lack of, or suppression of, naturally ignited fires and use of fire as a vegetation management tool. Historically, wildfires and fire management have served to maintain open, grassy areas within the shrub-steppe ecosystem and control the expansion of Utah juniper and two-needle pinyon into shrub-steppe vegetation communities (USFWS 2012).

Habitat management, including vegetation treatments, fire, weed treatments, and seeding, works to enhance habitat suitability for Utah prairie dogs. Further, the percentage of suitable habitat surrounding a colony has been found to have a positive influence on the subsequent year's spring count (Larsen et al. 2021). Sections 5.3.3 and 6.1.4 describe habitat management and monitoring efforts.

3.4 DIRECT TAKE UNDER THE 4(D) RULE AND REGULATED CONTROL

Lethal control of Utah prairie dogs (i.e., shooting or other lethal control practices that directly remove individuals from the population) is managed to help resolve conflicts with agricultural and rangeland uses and development on non-federal land by issuing control permits or Certificates of Registration (CORs) (Section 5.3.4 and Section 5.3.5). Under the ESA, the term *take* means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (USFWS 2018). To minimize conflicts between cultivated agricultural land use and Utah prairie dog conservation, the USFWS established a special 4(d) rule in 1984 that allows regulated take of Utah prairie dogs on privately owned agricultural lands where damage from prairie dogs has occurred and where prairie dogs create serious human safety hazards or disturb human cultural or human burial sites (49 *FR* 22330, May 29, 1984). The 4(d) rule was amended in 1991 and again in 2012 (56 *FR* 27438, June 14, 1991; 77 *FR* 46158, August 2, 2012). The 2012 amended 4(d) rule states that UDWR or other approved entities can allow the take of up to 6,000 animals annually, from June 15 to December 31, with restrictions on the methods of allowed take on agricultural lands (77 *FR* 46158, August 2, 2012). From 1985 to 2021, a total of 2,074 take permits were issued, resulting in a total reported take of 46,468 individuals. From 2019 to 2021, 104 take permits were issued, resulting in a total reported take of 2,122 individuals (1,327 in the West Desert Management Area, 771 in the Paunsaugunt Management Area, and 24 in the Awapa Plateau Management Area) (UDWR 2023).

With the introduction of the 4(d) rule and regulated take, Utah prairie dog conflicts in agricultural and range lands have been successfully managed. Under state management of the regulated control of Utah prairie dogs, discussed in Section 5.3.5, control allowances are based on management scenarios where Utah prairie dog spring counts are below, at, or above target numbers. Management of control is closely tied to translocations, and where staff and time allow, translocation will continue to be used to move prairie dogs out of conflict to areas where they are desired on federal and non-federal protected lands.

3.5 PUBLIC SUPPORT

Public concern and opinion toward Utah prairie dogs pose a threat to conservation of the species, and conflicts have resulted in illegal or unauthorized control or poaching, both of which are challenging to quantify and monitor. Conflicts arise when prairie dogs are present in agricultural fields, obstructing farming operations, and when occupying residential, commercial, or developable properties (USFWS 2017c). The existence of adequate regulatory mechanisms to authorize legal killing of Utah prairie dogs

in certain situations, such as conflicts with agricultural land uses and development, has likely decreased the incidence of poaching of Utah prairie dog.

The *Utah Prairie Dog Issues Status Report* (UPDRIP 2012) was developed in response to a senatorial request for status updates on a compiled list of "Utah prairie dog issues" gathered from various constituents. In 2010, UPDOG, formerly UPDRIP, created a document to describe public concerns and UDWR and its conservation partners' progress in addressing these concerns. Concerns included Utah prairie dogs posing public health and safety concerns and Utah prairie dogs occupying non-federal lands and potentially impeding private land development. Public concerns were largely resolved with implementation of the *Range-Wide General Conservation Plan for the Utah Prairie Dog in Residential and Commercial Development Areas* (USFWS 2018) and other management actions and county-specific HCPs (UPDRIP 2012).

3.6 PREDATION

Normal levels of predation are not considered a threat to healthy Utah prairie dog colonies; however, in fragmented colonies or at new translocation sites where an established social system or burrow system is not yet present, predation can impact Utah prairie dog populations (USFWS 2012). Predators of Utah prairie dogs include badger (*Taxidea taxus*), coyote (*Canis latrans*), raptors (e.g., *Buteo* spp. [*Aquila chrysaetos*]), red fox (*Vulpes vulpes*), and snakes (*Crotalus* spp., *Pituophus* spp.). Effective predator control programs can manage the threat of predation but require timely response and action. UDWR, working with the U.S. Department of Agriculture, coordinates predator control for translocation sites. Risk of predation will likely decrease as translocation procedures are developed and implemented to actively manage predators that pose a threat to newly translocated Utah prairie dogs and colonies. Predator control and translocation site preparation have been adopted as a management action to reduce impacts to prairie dogs from predation and are described in Sections 5.3.6.1 and 5.3.2.

3.7 GENETIC DIVERSITY

Genetic viability is a concern for the persistence of species, with small populations at greater risk of extinction. The Utah prairie dog likely evolved from an isolated population of the white-tailed prairie dog, and thus has lower levels of diversity than the more wide-ranging abundant species. Additionally, there is evidence of genetic bottlenecks, suggesting small founder populations (Brown et al. 2016, Giglio et al. 2021). Because of those concerns, recovery goals have focused on maintaining Utah prairie dog populations at levels that will maintain genetic diversity and long-term adaptive potential.

Effective population size is a measure of the number of individuals in a population that contribute genetic material to the next generation. For Utah prairie dogs, 4 adult prairie dogs roughly contribute one animal towards the effective population. In conservation planning, a goal is to maintain an effective population size large enough to prevent inbreeding and the loss of genetic diversity. A commonly applied genetic guideline is to maintain an effective population size greater than 500 to maintain evolutionary potential. Brown and Ritchie (2011) also applied several methods to determine a minimum viable population needed to retain genetic diversity in Utah prairie dogs and determined 1000 spring-counted prairie dogs would be sufficient to avoid deleterious genetic consequences. Additional conservation actions that facilitate the retention of genetic diversity in Utah prairie dogs include configuring colonies to provide connectivity and translocations to isolated colonies and between recovery areas.

CHAPTER 4. UTAH PRAIRIE DOG CONSERVATION STRATEGY

Herein, UDWR outlines a conservation strategy for the Utah prairie dog that incorporates concepts and findings from the 2012 Recovery Plan, the retrospective analysis by Larsen et al. (n.d. [2021]), the USFWS framework for Species Status Assessments, and the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE) (68 *FR* 15100, March 28, 2003). PECE "applies to conservation efforts identified in conservation agreements, conservation plans, or similar documents developed by federal agencies, state and local governments, tribal governments, businesses, organizations, and individuals." Under PECE, whether or not the USFWS may consider the benefits of ongoing or future conservation efforts for listed species depends on 1) certainty that the conservation effort will be implemented, and 2) certainty that the conservation effort will be effective.

This Conservation Strategy is based on the following understandings of the best available science and application of policies related to species status (in particular, the concepts of representation, redundancy, and resilience) and the reliability and effectiveness of future conservation actions. The key tenets of this Conservation Strategy are as follows:

- Conservation actions, including limiting lethal control, habitat protection and management, plague management, translocations, resource supplementation, community education and outreach, and research increased the number of Utah prairie dogs substantially since the species was listed as endangered in 1973 (i.e., an approximate doubling of the range-wide population by 1990 and continuing maintenance of a steady to increasing population [USFWS 2012]). These conservation actions alleviated or minimized many of the originally identified threats to the species described in the listing rule.
- Three presumably independent populations of Utah prairie dogs occur across the range of the species, represented by the three recovery units defined in the 2012 Recovery Plan. Stable to increasing long-term trends in total abundance and the number of active colonies have been reported for each of these populations (herein, management areas), as documented by the retrospective analysis. The long-term data indicate that each management area contains a robust population that creates redundancy across the range.
- The 2012 Recovery Plan set recovery thresholds at levels to ensure population viability and the retention of genetic variability. For the plan, Ritchie and Brown (2011) determined that 1,000 spring-counted Utah prairie dogs would equate to an effective population size of 500 and be sufficient to maintain genetic diversity. That population goal was replicated across the recovery areas to provide redundancy and representation. The three year average count in the West Desert and Paunsaugunt management areas more than doubles that goal, and the Awapa Plateau has reached that threshold.
- The retrospective analysis by Larsen et al. (2021) indicates that individual prairie dog colonies with a median count of at least 15 individuals had a 95% probability of being occupied in any given year. Likewise, colonies with a median count of at least 23 individuals had a 99% probability of being occupied. Similarly, Ritchie and Brown (2011) determined a single colony with greater than 50 spring-counted Utah prairie dogs has a 95% probability of persisting for 200 years. Colony sizes meeting or exceeding these long-term abundance metrics have proven resilient to stressors and can be reasonably expected to remain so in the future. Resilient colonies occur on federal or non-federal protected lands in each of the management areas.
- Stressors on the Utah prairie dog remain and warrant continued monitoring and management to maintain and secure for the foreseeable future the significant conservation gains realized since protections were first established in 1973. The retrospective analysis by Larsen et al. (2021) indicates that plague management, translocation, and resource supplementation (such as nearby

irrigated lands) have beneficial effects on the abundance of the species and help maintain resilient colonies. Other habitat management activities, such as vegetation management to maintain or restore grassland conditions or predator management at translocation sites, are also believed to be important management actions. The population trend data reviewed in the retrospective analysis demonstrate that management activities are effective at conserving the Utah prairie dog.

- Under ESA listing, federal and state land management agencies, local communities, nonprofit organizations, and academic institutions have demonstrated commitments to the conservation and management of the Utah prairie dog, resulting in decades of coordinated planning and implementation of conservation activities with positive outcomes for the species. These commitments persisted across a period of state management on non-federal lands from November 2014 to August 2017, when federal protections under the ESA lapsed, further demonstrating the reliability of conservation partnerships for the Utah prairie dog and what can be expected to continue in a post-delisting environment.

This Conservation Strategy for the Utah prairie dog builds on the gains achieved during the prior decades of a) federal protection and multi-stakeholder management, with defined biological goals and objectives, b) adaptive management with quantifiable decision triggers, c) monitoring to demonstrate effectiveness and support decision-making, and d) support and secured commitments from conservation partners to implement the strategy. This Conservation Strategy will be implemented primarily by the state under Utah Code Title 23, Wildlife Resources Code of Utah, and with support from its conservation partners.

CHAPTER 5. CONSERVATION STRATEGY

5.1 BIOLOGICAL GOAL AND OBJECTIVES

Biological Goal

The biological goal of the Utah Prairie Dog Conservation Strategy is to secure viable Utah prairie dog populations that will persist into the foreseeable future. The following management and monitoring activities will be conducted by UDWR and its conservation partners:

Objectives

- Manage Utah prairie dog populations through commitments by UDWR and its conservation partners to address ongoing concerns on federal and non-federal lands.
- Monitor key population metrics at a level of intensity and frequency to allow for detection of changes outside the normal range of Utah prairie dog population variability and to inform adaptive management.
- Implement an adaptive management program to maintain the number of Utah prairie dogs occupying each management area within a target range by adjusting the management focus and level of effort in response to new information, as dictated by yearly monitoring efforts.

5.2 ADAPTIVE MANAGEMENT TRIGGERS

The selected metric for triggering adaptive management in each management area is spring-counted individuals. Utah prairie dog spring counts are conducted annually, on federal and non-federal lands where possible, and the 3-year average of spring-counted Utah prairie dogs are used in trend analysis. The actual springtime population of Utah prairie dog is estimated by multiplying spring-counted dogs by a factor of 2 to account for the Crocker and Bedford (1976) finding that only 40%–60% of Utah prairie dogs are above ground at any one time (see Section 1.2.2.1 for the total population estimate equation). For

convenience, the Utah prairie dog population is described herein in terms of spring-counted individuals and not the estimated actual springtime population size.

UDWR set spring count minimums and objectives based on the 3-year average of spring-counted Utah prairie dogs within each management area for use in triggering management actions described in Section 5.2. The 3-year average as a population metric is supported by the retrospective analysis conducted by Larsen et al. (2021) (see Section 3.1). The target values set for each management area take into consideration USFWS (2012) recovery plan objectives (i.e., 1,000 spring-counted individuals within each population), long-term observations of relative abundance among the management areas, recent 3-year average population sizes (see Table 2-2), the distribution of individuals among land ownership types (see Table 2-2), and the total population size. The USFWS (2012) recovery plan objective of 1,000 spring-counted individuals within each management area is a target based on numbers believed necessary for maintaining genetic viability but excluded gene flow and genetic viability within non-federal lands. Utah prairie dogs occupying non-federal lands will contribute to the spring-count objectives as protection will be provided in the form of state regulations regardless of land ownership.

The spring count minimums and objectives were selected based on the desire to retain viable Utah prairie dog populations across the species' range. In contrast to the Recovery Plan, objectives vary between the management areas based on historical counts, available habitat, and anticipated future management concerns. The combined spring count minimum and objective exceed the Recovery Plan targets by approximately 25% and 40% respectively.

The West Desert has supported the greatest number of Utah prairie dogs through the ESA-listed period. However, that was not the case historically and much of the population growth has occurred on human-altered landscapes. This management area also faces greater long-term threats from habitat loss and drought. The objectives reflect ongoing conservation actions on BLM and protected lands as well as the management of Utah prairie dogs on private lands.

Through the efforts of partners in Utah prairie dog conservation, especially the USFS and Garfield County, the Utah prairie dog population in the Paunsaugunt management area has grown over the last decade and is largely found on public lands. Additionally, populations have remained largely stable through a period of historic drought. Population minimums and objectives for the area reflect the goal of maintaining stable to increasing populations.

The Awapa Plateau has had the smallest counted population through the ESA-recovery period. However, surveys likely undercount Utah prairie dogs relative to the other management areas due to limitations in our survey techniques. Surveyor access to habitats is limited due to few roads, the dominance of sagebrush communities makes observation of Utah prairie dogs difficult, and spring snow cover and wind result in reduced accessibility and reduced survey suitability for spring counts. With the high elevation of the management unit, the population is more susceptible to over-winter mortality and higher variation in counts. Although populations have grown over recent years, it is still unknown if those levels can be sustained through hard winters. Conversely, the majority of Utah prairie dogs in the unit are on public and protected lands and face fewer threats from habitat loss and drought.

Table 5-1 identifies the spring count population minimums and objectives for triggering management actions within each management area on all lands. These spring count minimums and objectives will inform management actions, as outlined in the sections below.

Table 5-1. Spring Counted Utah Prairie Dog Minimums and Objectives by Management Area

Management Area	Spring Count Minimums	Spring Count Objectives
West Desert	2,500	3,000
Paunsaugunt	1,250	1,500
Awapa Plateau	625	750
Total	**4,375**	**5,250**

5.3 MANAGEMENT ACTIONS AND THRESHOLDS

The retrospective analysis by Larsen et al. (2021) indicates that management actions such as plague management and translocation have beneficial effects on the abundance of Utah prairie dogs and help maintain resilient colonies. The population trends described in the retrospective analysis demonstrate that management activities are effective at conserving the Utah prairie dog and are important to continue so a secure and viable population may persist into the foreseeable future.

The actions described below will guide the management of Utah prairie dogs across the three management areas. UDWR and its conservation partners propose a tiered approach to adaptive management wherein spring counts of Utah prairie dogs specific to each management area determine the level of management action necessary in the respective management area. The tiered approach was proposed due to the many aspects of prairie dog management that are needed to maintain populations at sufficient levels. Managing a conservation-reliant species based on only one objective would not provide the level of adaptivity needed for both proactive and reactive strategies. By using a tiered approach, management agencies will have the flexibility to tailor their efforts relative to fluctuations across specific management areas and tiers.

Management activities include a set of core activities (i.e., disease management, translocation, habitat protection and management, regulated control, public outreach and education, and research) intended to maintain current population trends and a set of additional complementary activities (i.e., predator control and provision of supplemental food or water) intended to boost populations if trends decline. Specific thresholds for adjusting management actions within each management area are as follows:

- At Tier 1,[2] the annual spring count indicates that the population is below the minimum value. Core management activities are implemented to their fullest, and complementary management actions are implemented to address the relevant stressors.
- At Tier 2, the annual spring count indicates that the population is between the minimum and objective values. Core management activities are implemented at their fullest.
- At Tiers 3, 4, and 5, the 3-year average spring count indicates that the spring count objective is exceeded, and core management activities may be scaled back.

[2] At Tiers 1 and 2, the annual spring count indicates a management area is below the minimum and objective values, rather than a 3-year average, to proactively apply management actions.

- When there are three successive years with a 10% annual decrease in spring count, complementary management actions are implemented to address the relevant stressors.
- When the 3-year average spring counts are at Tier 5, complimentary management actions may not be necessary, and core management activities can be scaled back.

Table 5-2. Spring Count Thresholds for Each Management Area and Associated Adaptive Management Tier

Tier	West Desert Management Area	Paunsaugunt Management Area	Awapa Plateau Management Area
1	< 2,500	< 1,250	< 625
2	2,500–3,000	1,250–1,500	625–750
3	3,000–4,000	1,500–2,000	750–1,000
4	4,000–5,000	2,000–2,500	1,000–1,250
5	> 5,000	> 2,500	> 1,250

The following subsections describe the application of specific management activities for each management tier.

5.3.1 Disease Management

Sylvatic plague outbreaks associated with bacterial infection from *Yersinia pestis* have been associated with declines of Utah prairie dog colonies. Insecticides such as Deltamethrin and Pyraperm have been used to manage sylvatic plague and increase Utah prairie dog survival for over a decade (USFWS 2017b). Use of a 0.05% Deltamethrin dust has been shown to improve survival of prairie dogs. A study by Biggins et al. (2021b) within plague-affected colonies found that the mean change in population increased by 88% in dusted plots, whereas non-dusted plots showed a 97% decline in mean population change. The study found that epizootics occurred on prairie dog colonies with low prairie dog count densities as well as higher count densities (Biggins et al. 2021b). Between 1996 and 2008, Utah prairie dog colony dusting efforts were limited to colonies following plague events but dusting efforts range-wide have increased in recent years as a proactive strategy to limit the occurrence of plague outbreaks. In 2021, a total of 4,267 acres of Utah prairie dog habitat, or approximately 41.6% of occupied acres, were dusted by UDWR, the BLM, and the USFS on federal and non-federal lands with conservation easements.

The retrospective analysis by Larsen et al. (2021) indicates that dusting has a positive and cumulative effect on counts and occupancy and supporting data show that dusting leads to increased Utah prairie dog survival up to 2 years after treatment (Biggins et al. 2021a; Larsen et al. 2021). UDWR and its conservation partners will continue to manage plague on all accessible federal and non-federal lands in each management area using Deltamethrin, or other approved methods (i.e., vaccine, insecticide baits, fipronil), and will continue to coordinate plague abatement activities based on the tiered approach outlined in Table 5-3. In Tiers 1 and 2, efforts will be made to treat all colonies on accessible federal and non-federal lands each year. In Tier 3, colonies on non-federal protected lands that contain ≥ 15 spring-counted animals will be treated each year. In Tier 4, colonies on non-federal protected lands that contain ≥ 23 spring-counted animals will be treated each year. When a management area is in Tier 5, plague abatement efforts will be made at a 2-year interval within protected colonies ≥ 23 spring-counted animals.

Table 5-3. Plague Thresholds for Management Actions

Tier	Plague Abatement Management Action Thresholds
1	All protected colonies
2	All protected colonies
3	All protected colonies ≥ 15 animals
4	All protected colonies ≥ 23 animals
5	Two-year interval at protected colonies ≥ 23 animals

If continued research and field studies indicate that other plague prevention methods are effective at increasing resistance to plague and protecting prairie dogs from outbreaks, they may be used in addition to or as an alternative to dusting. Use of other plague abatement techniques by UDWR and its conservation partners will be employed, as determined by supported research.

5.3.2 Translocation

Since 1972, UDWR has implemented a translocation program to move Utah prairie dogs from non-federal lands to occupied or historically occupied colonies on non-federal protected lands and to new translocation sites on federal lands. From 2020 through 2022, a total of 3,509 Utah prairie dogs were translocated to approved translocation sites from private and federal lands (UDWR 2021, 2022, 2023). Larsen et al. (2021) found support for translocation as an effective management action that had a positive influence on the following year's spring count.

Translocation of Utah prairie dogs is a management action used to 1) relocate Utah prairie dogs from areas with conflicting health and safety issues and land use issues (agriculture and development) to areas where they are afforded more protections and contribute to the long-term recovery goal of increasing numbers on non-federal protected lands; 2) create new colonies or recolonize areas that have experienced plague die-off (after at least one winter has elapsed and following dusting of translocated Utah prairie dogs); and 3) manage genetic viability and effective population size across management areas. UDWR and its partners will apply the best available science when using translocation as a tool to potentially limit density-related plague die-offs. While a variety of factors play a role in the occurrence and extent of plague events, such as host density, flea abundance, and climatic conditions, plague is more likely to occur and spread more easily in large colonies compared to small colonies (Cully et al. 2010, Eads 2014; Cully and Williams 2001; Collinge et al. 2005). The BLM is currently conducting a study in which Utah prairie dogs from large colonies are translocated to unoccupied areas on BLM-administered lands. That work is being done in the hope of preventing plague die-offs in densely populated colonies (personal communication, Derek Christensen, Wildlife Biologist, and Dustin Schaible, Wildlife Biologist, BLM Cedar City Field Office, 2021). In this study, translocation actions are triggered within a 20% range of the recommended threshold number.

Within residential and commercial development areas, trapping and translocation is preferred and encouraged as a resolution for land use conflicts. The 2018 GCP (USFWS 2018) categorizes development activities into major and minor development areas, a concept that has been adapted for use in this Conservation Strategy. Major development areas are non-federal lands that are already developed, adjacent to already developed areas, within city boundaries, or areas that have been identified in city planning for future development. Minor development areas are non-federal lands that are less likely (when compared to major development areas) to experience large-scale development such that they are more likely to function as suitable habitat or to support habitat connectivity. To ensure the continued effectiveness of this plan's minimization and mitigation strategy, the boundaries of the Major and Minor

Development Areas will be maintained by UDWR and evaluated periodically by UDWR and its conservation partners to determine if any adjustments are necessary.

When the annual spring counts in a management area are within Tiers 1 and 2, trapping and translocation efforts will be a priority only within major development areas (Table 5-4). When the 3-year average spring counts in a management area are within Tiers 3 and 4, translocation will occur as needed, new translocation sites on non-federal protected land will be identified, and existing translocation sites will be rejuvenated. New translocation sites will be selected, prepared, and maintained in accordance with *Recommended Translocation Procedures for Utah Prairie Dog* (USFWS 2011) by UDWR and its conservation partners. In Tier 5, and when the 3-year average spring counts exceed the objectives within a management area, trapping and translocating efforts will be employed at as many sources as are available (staff capacity dependent), especially within development areas, to increase distribution, maintain genetic diversity, and bolster Utah prairie dog populations range-wide, especially on non-federal protected lands.

Table 5-4. Translocation Thresholds for Management Actions

Tier	Translocation Management Action Thresholds
1	Translocate only from conflict and development within major development areas using supplemental translocation sites
2	Translocate only from conflict and development within major development areas using supplemental translocation sites
3	Translocate as needed and prepare new sites
4	Translocate as needed and prepare new sites
5	Trap as many sources as available

Translocation in response to development (see Section 5.3.2) and regulated control (see Section 5.3.5) are based on thresholds specific to each management area.

5.3.3 Habitat Management

Habitat management activities, such as two-needle pinyon/juniper removal, sagebrush thinning, grass/forb seeding, and landscape-scale habitat treatments are important management tools that benefit Utah prairie dogs. The retrospective analysis (Larsen et al. 2021) found that the percentage of suitable habitat in proximity of a colony (at the 750-m and 1,500-m extent) had a positive influence on the subsequent year's spring count, whereas development at and adjacent to Utah prairie dog colonies had a negative influence. Improving, maintaining, and expanding suitable habitat within and between Utah prairie dog colonies secures habitat and habitat connectivity on the landscape. Habitat management activities are required as follows:

- When in Tier 1, and when vegetation objectives as defined in translocation procedures (USFWS 2011) are not met within a translocation site or within colonies on non-federal protected lands with ≥ 15 animals, every reasonable effort will be made by UDWR, in coordination with conservation partners, to actively manage and manipulate habitat to enhance suitability for Utah prairie dog.
- When in Tier 2, and when vegetation objectives as defined in translocation procedures (USFWS 2011) are not met within a translocation site or within colonies on non-federal protected lands with ≥ 23 animals, every reasonable effort will be made by UDWR, in coordination with conservation partners, to actively manage and manipulate habitat to enhance suitability for Utah prairie dog.
- When in Tiers 3 and 4, new translocation sites will be prepared on federal lands, and every reasonable effort will be made by UDWR, in coordination with conservation partners, to actively

manage and manipulate habitat to meet vegetation objectives, as defined in translocation procedures (USFWS 2011) (see Table 5-4).

- When in Tier 5, habitat management activities outside of translocation sites are not required.

Habitat manipulation includes removal and/or thinning of shrubs and other woody vegetation, treatment of weed species, and/or seeding of herbaceous vegetation. It can also include the manipulation of water to create mesic areas.

5.3.4 Development

Loss of habitat because of development (e.g., commercial development, energy projects, residential housing) within Utah prairie dog colonies was found to negatively influence the subsequent year's Utah prairie dog spring counts (Larsen et al. 2021). Pre-disturbance surveys are required within development areas, as outlined in Table 5-5. Pre-development surveys for Utah prairie dog will follow the *Utah Prairie Dog General Conservation Plan Clearance Area Survey Protocol* (USFWS 2021b), which is subject to revision as new information becomes available.

In developable areas (commercial/industrial and residential development), UDWR and its conservation partners will conduct an occupancy survey prior to commencement of ground-disturbing activities according to the thresholds outlined in Table 5-5. If no Utah prairie dogs are found during the survey, UDWR will issue the project an approval letter. If Utah prairie dogs are observed during the occupancy survey, UDWR will perform an impact assessment, and the project proponent will receive a Certificate of Registration (COR) (UDWR 2015). Following issuance of the COR, the project proponent may begin construction. If UDWR staff are available, and the project time frame allows for it, UDWR and its conservation partners will trap and translocate Utah prairie dogs out of development project areas during the approved trapping season. UDWR and its conservation partners will work with willing landowners and developers to identify where trapping and translocation efforts are to take place during the impact assessment.

In Tiers 1 through 4, Utah prairie dog surveys are required in major development areas and/or minor development areas prior to development activities that may result in the loss of Utah prairie dogs and their habitat. In Tier 5, no pre-disturbance surveys are required, and impacts to Utah prairie dog will be tracked using spring count data from the subsequent year (see Table 5-5).

Table 5-5. Development Thresholds for Management Actions

Tier	Loss of Habitat/Development Management Action Thresholds
1	Surveys required for all projects within major and minor development areas
2	Surveys required for all projects within major and minor development areas
3	Surveys required for all projects within minor development areas
4	Surveys required for all projects within minor development areas
5	No surveys required; development impacts will be tracked using spring count data

5.3.5 Regulated Control

UDWR will manage lethal and non-lethal control of Utah prairie dogs to help resolve conflicts with agricultural and rangeland uses on non-federal land by issuing control permits or CORs, as outlined in

Table 5-6. UDWR's authority for regulating control of Utah prairie dogs arises from UDWR Rule R657-70 Taking Nongame Mammals. If annual spring counts for a management area are below the established population minimum (i.e., Tier 1 conditions), UDWR will first be given the opportunity for live-capture before lethal control will be authorized, and Utah prairie dogs will be translocated to approved translocation sites on federal or other non-federal lands to help abate the conflicting land use activity. In Tiers 2 through 5, when Utah prairie dog counts meet or exceed the population minimums, the amount of lethal control allowed within a management area will be calculated as a percentage of Utah prairie dog productivity.

Table 5-6. Control Allowances for Permits Per Colony

Tier	Amount of Control Allowed*
1	Up to 25% productivity
2	Up to 50% productivity*
3	Up to 75% productivity
4	Up to 100% productivity
5	Up to 100% productivity + 50% adults

* Calculation of productivity = spring count × 2 (sightability) × 6.7(% of females) × 9.7(% of females that breed) × 4 (average litter size) = spring count × 7.2.

In circumstances where Utah prairie dogs create hazards for human health, safety, and welfare, Utah prairie dogs can be controlled using any legal method without first acquiring a COR. In these circumstances, UDWR must be notified prior to removal of Utah prairie dogs. Control of Utah prairie dogs for human health, safety, and welfare hazards will not be limited based on the thresholds identified in Table 5-6. UDWR will target trapping and translocation efforts in areas where Utah prairie dogs have the potential to create human health, safety, and welfare concerns.

In agriculture and rangeland areas, a COR may be issued for the lethal control of Utah prairie dogs, and no minimum number of Utah prairie dogs is required to pursue a COR. Lethal control allotments for CORs will be calculated according to the sliding scale for Tiers 2 through 5, and authorized control will be deducted from the control allotment for each colony/parcel. Trapping can occur during the approved trapping season if UDWR time and personnel permits, and the number of Utah prairie dogs trapped will not be deducted from the yearly control allotment or the individual COR control limit for each respective management area (UDWR 2015).

5.3.6 Complementary Management Actions

When the annual spring count in a management area declines to Tier 1 or Tier 2 thresholds corresponding to the spring count minimums, complimentary management actions, described below, will be employed by UDWR and its conservation partners. Specific complementary management actions will be determined based on monitoring data indicating which stressor(s) is driving the need for additional management actions. Complimentary management actions include predator control and providing supplemental food and water but may be expanded to include additional management actions if deemed necessary in the future.

5.3.6.1 *Predator Control*

While translocation procedures have been established to minimize predation on Utah prairie dogs in newly established colonies using nest boxes and tubes, predation remains a threat to Utah prairie dog (Section 4.6), especially within newly translocated colonies. Predator control is a complimentary

management action to be implemented by UDWR and its conservation partners at translocation sites (see Section 6.1.2) and at protected colonies as follows:

- When in Tier 1, perform predator control at approved translocation sites and at protected colonies with ≥ 15 animals.
- When in Tier 2, perform predator control at approved translocation sites.
- When in Tiers 3, 4, and 5, predator control is not required.

Predator control at translocation sites follows the *Recommended Translocation Procedures for Utah Prairie Dog* (USFWS 2011), which recommends that sites are visited weekly from April 1 to September 30, if possible (see Section 6.1.2). Predator control for management areas in Tiers 1 and 2 will follow recommendations for translocated colonies.

5.3.6.2 *Supplemental Food and Water*

Truett et al. (2001) found that supplemental food and water increased survival rate at translocation sites, likely because prairie dogs experience stress when they are trapped, transported, and introduced into a new environment and social structure. Some declines in spring counts may also be attributed to natural drought cycles during years with below-average precipitation, resulting in a strain on resources available to Utah prairie dogs.

To provide resource support for prairie dog colonies, supplemental food and water will be provided by UDWR and its conservation partners to Utah prairie dogs at translocation sites (see Section 6.1.2) and at protected colonies based on range conditions and food availability as follows:

- When in Tier 1, provide supplemental food and water at approved translocation sites and at protected colonies with ≥ 15 animals.
- When in Tier 2, provide supplemental food and water at approved translocation sites and at protected colonies with ≥ 23 animals.
- When in Tiers 3, 4, and 5, supplemental food and water provisions are not required.

5.3.7 Public Outreach and Education

Public outreach opportunities will be evaluated annually by UDWR and its outreach program manager. Public education and outreach needs will be high, especially in the early stages of the implementation of the Conservation Strategy. Public outreach efforts may be adapted to address specific concerns that arise but should generally be pursued based on the following tier thresholds.

When in Tiers 1 and 2, and Utah prairie dog spring counts within management areas are below spring count objectives, public outreach and education efforts are important for conserving Utah prairie dogs on the landscape. The following are public outreach and education efforts UDWR and its conservation partners will employ when management areas are in Tiers 1 and 2:

- Increase public awareness of species status and continued protections through the distribution of fact sheets and the increased availability of accurate, clear, and consistent messaging about state management of the species.
- Encourage the public to work with stakeholders on conserving the species into the future and take ownership of the solutions, including fostering habitat management practices.
- Provide counties with printed materials for use in public outreach.
- Post signage at colonies easily accessible to the public.

When in Tiers 3, 4, and 5, and Utah prairie dog spring counts within management areas meet or exceed the spring count objectives, the following efforts will be employed:

- Increase public awareness of species status and continued protections through the distribution of fact sheets and the increased availability of accurate, clear, and consistent messaging about state management of the species.
- Post signage at colonies easily accessible to the public.
- Work with developers to coordinate protections and conservation options for resolving conflicts.
- Coordinate with private landowners and facilitate public input on Utah prairie dog management.

UDWR and its conservation partners will continue to seek opportunities to employ the public outreach and education efforts listed above.

CHAPTER 6. MONITORING PROGRAM

Utah prairie dog conservation is predicated on a long-term adaptive management approach to ensure the species continues to persist. Management actions and thresholds identified in Chapter 5 require targeted monitoring to trigger management responses, evaluate the effectiveness of management actions, and identify stressors that should be addressed.

The Utah prairie dog conservation monitoring program as defined here has the following primary objectives:

- Monitor range-wide population trends as well as population trends in each management area
- Monitor residual or emerging threats that could affect the sustainability of the recovery of Utah prairie dogs
- Monitor the effectiveness of translocation and other conservation efforts
- Inventory and monitor the extent of suitable habitat throughout the range
- Identify threats requiring complimentary management action

6.1 MONITORING METHODS

Various agencies, including the Natural Resources Conservation Service, the USFWS, the BLM, the USFS, and UDWR, have developed and implement monitoring protocols for the Utah prairie dog, and this Conservation Strategy will continue to use these methods going forward, as appropriate. However, the purpose and need for the monitoring protocols has shifted to prioritize data for the intent of evaluating status related to management thresholds. This is an active monitoring approach where data points trigger specific response(s); therefore, the methods used must ensure that adequate information is collected to inform decisions related to management actions and thresholds. Monitoring protocol documents and methods are subject to revision as new information becomes available.

6.1.1 Spring Counts for Adaptive Management and Population Trend Monitoring

Utah prairie dog spring counts are currently conducted annually by UDWR, the BLM, the USFS, and the NPS within the lands that they manage, and UDWR also conducts spring counts on non-federal lands for the purpose of monitoring Utah prairie dog colony numbers and track spring count trends. The methodology for conducting spring counts is well established and has proven effective over many years of monitoring. Spring-count efforts will continue and will occur for all known Utah prairie dog colonies annually and every sixth year at vacant colonies (UDWR 1999). However, these range-wide efforts are labor intensive. Effective ways of monitoring population for future long-term adaptive management will concentrate on efficient sampling of representative colonies within management areas.

In the first 5 years after implementation, UDWR will analyze a subset of the annual spring count data to determine if data from a sample of colonies can accurately predict the total population. If the subset analysis proves successful in estimating Utah prairie dog population, a scaled-back approach to conducting spring counts will be implemented by counting a sample of colonies when management areas are in Tiers 3, 4, and 5; however, annual spring counts are required for all colonies when management areas are in Tiers 1 and 2 to best apply management actions.

Spring counts are the most effective approach to monitoring population trends, but the nature of the spring count methodology also allows biologists to collect data regarding new or recurrent threats to the

populations, identify the drivers of population changes, and assess the effectiveness of management actions intended to address threats. Increasing population numbers would inherently indicate effective management actions, while decreasing population numbers would indicate threats to colonies. Additional data could identify threats such as habitat suitability, predation, disease, or habitat loss and would trigger appropriate management actions to address these threats. Disease monitoring and habitat monitoring are specific tools required to evaluate status of thresholds associated with each of those management actions and are described below.

6.1.2 Translocation Monitoring

Utah prairie dog translocations conducted by UDWR and its partners follow the *Recommended Translocation Procedures for Utah Prairie Dog* (USFWS 2011, or as revised) for site selection and preparation as well as transport and release of Utah prairie dogs (USFWS 2011). Establishing a colony at a new translocation site is often a multi-year process and requires adequate disease, predator, and vegetation management.

Due to the tenuous nature of translocations, post-release monitoring will be conducted as defined in the translocation procedures (USFWS 2011) and in addition to the spring count monitoring described above. The site visits will also record observations of predator activity and signs of disease. The existing protocol describes the methods by which these observations will occur with the intent of identifying any threats to active translocation sites quickly so that the appropriate corrective actions (dusting, predator control, habitat manipulation) can be implemented to support protection and establishment of the translocation site.

UDWR and its conservation partners will rely on monitoring data to determine the need for complementary management actions such as predator control, supplemental feeding and watering, and disease management. These actions will be undertaken by UDWR and its conservation partners, as determined by the extent of support needed and the number of colonies requiring support. UDWR and its conservation partners will establish roles, responsibilities, and dedicated funding, as indicated by monitoring data.

Predator control is a specific management action defined in Chapter 5 to address the ongoing threat of predation at newly translocated colonies. Monitoring of predation is a feature of the USFWS (2011) translocation procedures. Annual reports describing translocation success will evaluate the need for and recommend adjustments to procedures monitoring predation at translocated colonies if it is determined that existing procedures are not sufficient to capture predation trends.

Translocation monitoring procedures will remain consistent with existing methods of translocation and will remain in place as long as translocations continue and unless UDWR and its cooperators determine an adjustment to the methodology, frequency, or duration of the monitoring is necessary.

6.1.3 Disease Monitoring

Plague control effectiveness at dusted colonies on non-federal protected lands will be monitored using trends in spring count data. UDWR and its conservation partners will continue researching and monitoring plague control techniques and apply the best strategies for controlling plague (e.g., dusting, sylvatic plague vaccine, fipronil) based on emerging science.

6.1.4 Habitat Monitoring

Habitat monitoring is a multi-factor evaluation of habitat suitability, availability, and connectivity throughout the Utah prairie dog's range. These three factors taken together provide the necessary data to determine appropriate management actions identified in Section 5.3.3.

6.1.4.1 *Habitat Management*

Habitat suitability monitoring will occur within occupied habitat. Vegetation composition and landscape disturbance data will be collected during base year one using the methodology for monitoring habitat suitability within translocation sites (USFWS 2011). "Base year one" serves as the evaluation point against which subsequent annual monitoring data will be compared. Monitoring of habitat suitability is a preemptive approach to ensuring habitat suitability is maintained where landscape conditions may change over time. Arid landscapes in Utah have been subject to shrub and two-needle pinyon-juniper encroachment, often shifting vegetation community composition over brief periods of time and reducing habitat viability for species such as Utah prairie dog. Outside of specifically designated translocation sites, habitat suitability monitoring serves to identify and document existing conditions at both the local and macro scales. Early identification of landscape succession, including juniper and shrub encroachment within suitable habitat, indicates the need for active vegetation management, as discussed in Section 5.3.3.

Monitoring will be accomplished efficiently by adding a vegetation rating system and photograph fields to the prairie dog spring count data collection methods. Spring counts occur at known prairie dog colonies annually. Data collection on non-federal protected lands will occur within predetermined habitat locations and be repeated using established plots and transects to evaluate change over a multi-year period. Adding photograph collection and vegetation rating to the spring count protocol allows annual monitoring of habitat suitability and documentation of potential impacts to suitability, including hydrologic change, shrub encroachment, and shifts in vegetation composition. Documentation of changes in habitat suitability will be addressed by the management actions described in Section 5.3.3 as well as future management actions as new approaches to habitat management are developed.

Vegetation composition objectives are as follows:

- Warm season grasses: 1%–20% ground cover
- Cool season grasses: 12%–40% ground cover
- Forbs: 1%–10% ground cover (perennial, non-noxious)
- Shrubs: 0%–8% ground cover and < 10% canopy cover
- Minimum number of plant species: 10 (> 20 plant species preferred)

6.1.4.2 *Habitat Availability*

Through the half-century-long effort to protect and conserve Utah prairie dogs, federal and state land and wildlife management agencies mapped habitat throughout the species' range. Long-term monitoring of habitat availability should utilize the existing mapped habitat database, including maintenance of this database to track where mapped habitat is no longer available for use by Utah prairie dogs (i.e., no longer suitable due to development, shrub encroachment). This database provides a tool by which UDWR and other land managers are able to identify landscape-level changes in habitat suitability that trigger habitat protection and management and complementary management actions needed to address any negative trends observed in the data evaluation.

6.2 DATA EVALUATION AND REPORTING

UDWR will evaluate the monitoring results each year to determine if changes to the monitoring protocols are necessary. Following monitoring events, UDWR will compile and evaluate the monitoring results and prepare an annual monitoring report. The monitoring report will include monitoring methods and results and will determine whether changes to the data collection protocols are needed and if any threats warrant further evaluation.

CHAPTER 7. IMPLEMENTATION OF THE CONSERVATION STRATEGY

7.1 CONSERVATION PARTNER COORDINATION

Implementation of this Conservation Strategy is the responsibility of the Conservation Strategy partners in accordance with the authorities granted to each. This Conservation Strategy and the conservation efforts described herein will be closely coordinated among Utah prairie dog Conservation Strategy partners in the form of UPDOG, or a similar group, that is composed of federal, state, and county partners for the purpose of effectively coordinating Utah prairie dog conservation efforts. The Utah prairie dog Conservation Strategy partners will continue to meet on an annual basis, and the structure and collaboration of the working group will remain in place during implementation of this Conservation Strategy. Meeting frequency may increase on an as-needed basis. UDWR will facilitate Conservation Strategy partner coordination for the duration of this plan.

The Conservation Strategy partners are:

- Utah Division of Wildlife Resources
- U.S. Fish and Wildlife Service
- Bureau of Land Management
- U.S. Forest Service
- Beaver County, Utah
- Garfield County, Utah
- Iron County, Utah
- Kane County, Utah
- Piute County, Utah
- Sevier County, Utah
- Wayne County, Utah
- National Park Service
- Utah School and Institutional Trust Lands Administration
- The Nature Conservancy

7.2 CONSERVATION PARTNER ROLES, RESPONSIBILITIES, AND AUTHORITIES

The Conservation Strategy partners are listed in Table 7-1 and are committed to work cooperatively to conserve the Utah prairie dog throughout its range. The primary role of each Conservation Strategy partner is to participate in a coordinated effort alongside UDWR in implementing their responsibilities within the scope of their management authorities. The secondary role for each Conservation Strategy partner is to support other conservation partners in implementing their primary role. Table 7-1 and Section 7.2.1 summarize the responsibilities and authorities under which the Conservation Strategy partners contribute to the biological goals and objectives of this Conservation Strategy. Specific details regarding authorities and assurances for each Conservation Strategy partner occurs throughout this document and in the sections below.

Table 7-1. Utah Prairie Dog Conservation Partners, Responsibilities, and Programs

Conservation Partners	Conservation Strategy Roles and Responsibilities	Programs and Actions in Place
Utah Division of Wildlife Resources (UDWR)	Implement this Conservation Strategy to guide species-specific management Implement and oversee the Wildlife Action Plan Dedicate resources and staff, including technical biologists, for implementation of this Conservation Strategy Coordinate management actions and monitoring with conservation partners	Utah Wildlife Action Plan Conservation easement holder in West Desert Management Area, Paunsaugunt Management Area, and Awapa Plateau Management Area
U.S. Fish and Wildlife Service (USFWS)	Conduct a Species Status Assessment and determine if Utah prairie dog can be considered for a change in regulatory status Engage in appropriate NEPA analysis for Utah prairie dog habitat projects, when needed	General Conservation Plan (USFWS 2018) *Utah Prairie Dog (*Cynomys parvidens*) Final Revised Recovery Plan* (USFWS 2012) Endangered Species Act
Bureau of Land Management (BLM)	Maintain Utah prairie dog as a BLM special status species (SSS) Maintain enough Utah prairie dog suitable habitat to support the population goals and objectives Manage BLM-administered land for uses compatible with Utah prairie dog Coordinate management actions and monitoring with conservation partners Engage in appropriate NEPA analysis for Utah prairie dog habitat projects, when needed	Signatory on Wildlife Action Plan Approved resource management plans (refer to Table 7-2) Maintains SSS list
U.S. Forest Service (USFS)	Maintain Utah prairie dog as a USFS SSS Maintain enough Utah prairie dog suitable habitat to support the population goals and objectives Manage USFS-administered lands for uses compatible with Utah prairie dog Coordinate management actions and monitoring with conservation partners Engage in appropriate NEPA analysis for Utah prairie dog habitat projects, when needed	Signatory on Wildlife Action Plan Maintains SSS list *Land and Resource Management Plan for the Dixie National Forest* (refer to Table 7-2) *Fishlake National Forest Land and Resource Management Plan* (refer to Table 7-2)
County governments	Manage conservation easement properties per the management action thresholds outlined in Section 5.3. in coordination with UDWR Require Utah prairie dog consideration prior to issuing building and development permits per Table 5-5	County resource management plans (various) Conservation easements (various)
National Park Service (NPS)	Coordinate with UDWR on NPS-owned land occupied by Utah prairie dog within management areas Support population monitoring and dusting efforts	*Foundation Document Bryce Canyon National Park Utah* (NPS 2014) and *Final Environmental Impact Statement, General Management Plan, Development Concept Plan: Capitol Reef National Park* (NPS 1998)
School and Institutional Trust Lands Administration (SITLA)	Coordinate with UDWR on SITLA-owned land occupied by Utah prairie dog within management areas	Conservation easements on Parker Mountain, Awapa Plateau Management Area
The Nature Conservancy (TNC)	Coordinate with UDWR on TNC-owned land occupied by Utah prairie dog within management areas	Conservation easements in Paunsaugunt Management Area and West Desert Management Area

7.2.1 Authorities

The Conservation Strategy is subject to and is intended to be consistent with all applicable state and federal laws. Under their respective authorities, the Conservation Strategy partners below have some ability to influence the occurrence and intensity of threats to the Utah prairie dog and its habitat. The authorities, legislations, directives, and plans for involved Conservation Strategy partners are outlined below.

Utah Division of Wildlife Resources

UDWR's mission is "to serve the people of Utah as trustee and guardian of the State's wildlife, and to ensure its future and values through management, protection, conservation, and education." As the trustee and custodian of wildlife within its borders, Utah has a sovereign interest in the regulation and management of the Utah prairie dog under the Wildlife Resources Code of Utah, Utah Code Title 23-13-3 and 23-14-1. Under Utah Code Title 23, UDWR, as the wildlife authority for Utah, is authorized to "protect, propagate, manage, conserve, and distribute protected wildlife throughout the state." The State of Utah, in cooperation and in coordination with federal agencies, has implemented cooperative agreements for a variety of fish and wildlife programs on federal lands, as applicable under Title 23-22-1 of the Utah Code. Title 23-22-1 states that the "Utah Division of Wildlife Resources may enter into cooperative agreements and programs with other state agencies, federal agencies, states, educational institutions, municipalities, counties, corporations, organized clubs, landowners, associations, and individuals for purposes of wildlife conservation." Utah Code Title 23-13-2 does not designate land ownership or location requirement for a protected species to be considered "protected."

U.S. Fish and Wildlife Service

The mission of the USFWS is "Working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people." The ESA of 1973 provides a framework to conserve and protect endangered and threatened fish, wildlife, and plant species and their habitats. Section 6 of the ESA provides for the cooperation with states in conserving endangered species, including delegation of permitting authority and matching federal funding.

Bureau of Land Management

The BLM is a federal land management agency responsible for the management of federal lands in accordance with the Federal Land Policy and Management Act of 1976. The BLM's mission is "to sustain the health, diversity, and productivity of federal lands for the use and enjoyment of present and future generations." The BLM manages sensitive species, designated by the BLM state director, and their habitats to minimize or eliminate threats affecting the status of the species or to improve the conditions of the species' habitat on BLM-administered lands under BLM Manual 6840 (BLM 2008a).

U.S. Forest Service

The USFS was established in 1905 and 193 million acres of federal lands in the form of NFs and grasslands. The mission of the USFS is to "sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations." The National Forest Management Act of 1976 was designed to protect biodiversity in NFs while ensuring federal involvement in forest planning and management. The National Forest Management Act requires the USFS to manage and protect natural resources on USFS-administered lands and manage habitats to maintain viable populations of plants and animals.

Counties

Each county in Utah maintains and enforces a Code of Ordinances and has the authority to enact policies and procedures that are lawful, accessible, and subject to periodic and consistent review. Counties may propose policies for review and approval prior to implementation. Under county management, buildings, construction, subdivisions, use, and zoning are among the activities that are subject to the Code of Ordinances. Countywide policies may vary across Beaver, Garfield, Iron, Kane, Piute, Sevier, and Wayne Counties, Utah.

National Park Service

The NPS was established under the Organic Act of 1916 with a mission to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations" in areas under their jurisdiction. Under NPS Management Policy 4.1.4, parks are encouraged to pursue cooperative conservation with federal agencies, tribes, and private landowners to improve natural resource management within parks. As such, parks will develop agreements with federal, state, tribal, and local governments and organizations, and private landowners, when appropriate, to coordinate plant, animal, water, and other natural resources management activities in ways that protect and maintain park resources and values.

School and Institutional Trust Lands Administration

In 1994, the Utah Legislature created SITLA as an independent agency to manage and develop trust land assets. SITLA's duty includes the responsibility to preserve these resources for the long-term support of trust beneficiaries, primarily Utah's schoolchildren of today and tomorrow. SITLA works to ensure that agencies and businesses working on trust lands comply with the Utah Code. The SITLA Board of Trustees, created by Title 53C of the Utah Code, is authorized to make policies for the benefit of the trust beneficiaries (Utah Code 53-C-1-102-2d). Since 1998, SITLA has been involved in transactions and projects to preserve and protect more than 560,000 acres of Utah lands, including lands that support Utah prairie dogs.

The Nature Conservancy

TNC was officially formed in 1954, and its mission is to "conserve the lands and waters on which all life depends." TNC works with landowners, communities, cooperatives, and businesses to establish local groups that can protect land. Some of the main tools used to achieve these goals are land trusts, conservation easements, private reserves, and incentives. TNC has authority to guide the conservation and management of the lands it owns.

7.3 ASSURANCES

The Conservation Strategy partners provide assurances that this Conservation Strategy will be implemented by signing the Memorandum of Agreement (MOA) (Section 7.6), thus providing certainty that the adaptive management and monitoring activities described in this Conservation Strategy will be implemented. The long-term track record of coordination and collaboration among the Conservation Strategy partners implementing actions consistent with those described in this Conservation Strategy demonstrates that these assurances are reliable. Long-term population trends and analyses indicate that the conservation and management actions described in this Conservation Strategy are likely to be effective at maintaining or improving the status of the Utah prairie dog. Adaptive management, monitoring, and ongoing coordination provide further assurance that this Conservation Strategy is likely to achieve the biological goal. Funding mechanisms are discussed in Section 7.3.2.

In addition to the extensive conservation actions undertaken by UDWR and its Conservation Strategy partners (discussed in Chapter 1), implemented actions that demonstrate the long-term track record of coordination and collaboration among UDWR and its Conservation Strategy partners are outlined below.

- UDWR has implemented a Wildlife Action Plan since 2005 to manage wildlife species and their habitats and continue to participate in the State Wildlife Grants program. Under state management, Utah prairie dog will be managed as a SGCN under the Wildlife Action Plan into the foreseeable future.
- The BLM and USFS have readily engaged in necessary NEPA analysis for habitat improvement projects and will continue to do so for Utah prairie dog as a special status species (SSS). They also perform NEPA analysis to assess impacts outside development projects may have on wildlife, including Utah prairie dogs. These federal agencies have implemented translocation programs, dusting programs, and spring counting efforts. The BLM and USFS will continue to manage lands for multiple and compatible land uses according to the land protections in their existing Resource Management Plans (RMPs) and land and resource management plans (Section 7.3.1).
- SITLA, TNC, and Garfield and Iron counties in Utah all hold conservation easements for properties which they own or manage. State, county, and federal land managers have worked with the Watershed Restoration Initiative for habitat improvement projects that benefit Utah prairie dog. These habitat improvement projects prioritize SGCNs and include projects that benefit greater sage-grouse habitat, and grazing land uses (when effectively managed), both of which can be beneficial to Utah prairie dog habitat throughout its range.
- Acquisition of non-federal lands for protection and conservation easements is not the priority of the habitat management action but will continue as an opportunistic management tool that conservation partners will pursue when practicable (grant opportunities, willing sellers, etc.). Section 1.2.1.1.1 details the history of non-federal land acquisitions that work to support Utah prairie dog recovery by conserving and protecting lands within each management area.

7.3.1 Federal Land Protections

Land use planning guidance for BLM and USFS-managed lands include avoidance and minimization measures for Utah prairie dog (Table 7-2). RMPs for the USFS and BLM, as they are amended in the future, will continue to include measures to conserve and protect Utah prairie dog as an SSS to prevent the species from listing under the ESA.

Table 7-2. Utah Prairie Dog Avoidance and Minimization Measures on Federal Lands

Federal Agency	Land Planning Document Reference*	Excerpt of Resource-Specific Language
BLM Cedar City FO	*Cedar Beaver Garfield Antimony Resource Management Plan (*BLM 1984), page 52	Program coordination will be required with the wildlife and watershed programs in assessing the effects of the [off-road vehicle] ORV limitation on riparian areas, crucial deer winter range, Utah prairie dog sites, and raptor nesting areas.
BLM Cedar City FO	*Cedar Beaver Garfield Antimony Resource Management Plan* (BLM 1984), pages 1.7–1.8	Threatened, endangered, sensitive, status review, and other protected plant and animal species would continue to receive protection under the law and application of special restrictions for oil, gas, and geothermal leasing and ORV use. Transplant programs leading to the delisting of the Utah prairie dog would be continued.
BLM Cedar City FO	*Cedar Beaver Garfield Antimony Resource Management Plan* (BLM 1984), page 5.15	Long-term productivity of sensitive species such as Utah prairie dog, golden and bald eagles, and sage grouse would be protected by implementing the oil, gas, and geothermal leasing systems.

Federal Agency	Land Planning Document Reference*	Excerpt of Resource-Specific Language
BLM Cedar City FO	*Cedar City Field Office Resource Management Plan: Analysis of the Management Situation* (BLM 2019), page 258	Management Opportunities to be Considered in Land Use Plan Alternatives: Year-round stipulation for rights-of-way for electrical transmission lines on BLM lands within Utah prairie dog town sites.
BLM Cedar City FO	*Cedar City Field Office Resource Management Plan: Analysis of the Management Situation* (BLM 2019), page 276	Management Opportunities to be Considered in Land Use Plan Alternatives: Consider the identification of core habitat areas for the Utah prairie dog and connectivity corridors.
BLM Cedar City FO	*Cedar City Field Office Resource Management Plan: Analysis of the Management Situation* (BLM 2019), page 288	Management Opportunities to be Considered in Land Use Plan Alternatives: Implement Utah prairie dog terms and conditions on all grazing allotments with Utah Prairie Dog habitat in accordance with the USFWS-issued biological opinion (08-F0248) issued on October 8, 2008, to ensure consistency across all grazing allotments that are in Utah prairie dog habitat.
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), pages 22–23	Permit no surface disturbing activities or surface occupancy within ½ mile of active, suitable (currently inactive), or potential reintroduction (BLM 2002b) Utah prairie dog habitats/sites.
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-22: Implement conservation measures (Appendix 9) on actions affecting Utah prairie dogs or their habitat.
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-23: Permit no surface disturbing activities or surface occupancy within ½ mile of active, suitable (currently inactive), or potential reintroduction (BLM 2002b) Utah prairie dog habitats/sites. Seismic activities would avoid these areas, particularly during the active season (April 1 to September 30).
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-24: Allow introduction, augmentation, restocking, translocations, transplantation, and/or reestablishments of special status species in cooperation and collaboration with USFWS, UDWR, and other agencies as necessary, subject to guidance provided by BLM's 6840 policy and by existing or future memoranda of understanding (MOU[s]).
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-25: Require deterrent devices designed to prevent raptors from perching on powerline structures on all new construction (including upgrades and reconstruction) to discourage predation on Utah prairie dogs.).
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-26: Reroute renewed or amended ROWs on federal land that have the potential to disturb active and inactive Utah prairie dog colonies.
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-27: Preclude cross-country OHV use in occupied or inactive Utah prairie dog colonies.
BLM Kanab FO	*Kanab Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008b), page 62	SSS-28: Allow for the treatment of plague and other diseases that may impact Utah prairie dogs.
BLM Richfield FO	*Richfield Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008c), page 44	Management actions such as prohibiting the destruction, adverse modification, or fragmentation of listed species habitat, maintaining the integrity of SSS habitat, and habitat improvements will benefit SSS. The decision to limit surface-disturbing activities in sage-grouse habitat will benefit sage-grouse, prairie dogs, and pygmy rabbits. Additional strategies (such as utilizing seasonal and spatial buffers for surface-disturbing activities and complying with raptor protection guidelines for power line construction) will be employed to protect raptors and their habitat. These actions will minimize or eliminate impacts to the SSS relevant and important values.

Federal Agency	Land Planning Document Reference*	Excerpt of Resource-Specific Language
BLM Richfield FO	*Richfield Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008c), page 90	Allow translocations of listed and non-listed SSS to aid in conservation and recovery efforts. Implement necessary habitat manipulations and monitoring in translocation plans and allow identification and manipulation of Utah prairie dog translocation sites to achieve suitable conditions for successful translocations.
BLM Richfield FO	*Richfield Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008c), page 91	Monitoring of known populations of SSS and their habitats (e.g., Mexican spotted owls, Utah prairie dogs, greater sage grouse, Wright fishhook cactus) would continue in conjunction with federal, state and private agencies or organizations.
BLM Utah State Office	*Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015), page 2-3	Manage activities that result in habitat loss and degradation to provide a net conservation gain of greater sage-grouse habitat. Exceptions to net conservation gain for greater sage-grouse will be made for vegetation treatments to benefit Utah prairie dogs.
BLM Utah State Office	*Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015), pages 2-5–2-6	Areas where Priority Habitat Management Areas (PHMAs) and General Habitat Management Areas (GHMAs) overlap mapped Utah prairie dog habitat will be managed for both species, developing conservation and recovery objectives that will benefit both greater sage-grouse and Utah prairie dogs.
BLM Utah State Office	*Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015), page 2-6	Within PHMAs, maintain or increase sagebrush and perennial grasslands to meet the habitat objectives for greater sage-grouse unless there is a conflict with Utah prairie dogs.
BLM Utah State Office	*Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015), page 2-9	For actions that result in greater sage-grouse habitat loss and degradation, the BLM will require mitigation that provides a net conservation gain to greater sage-grouse. Exceptions to the net conservation gain for greater sage-grouse will be made for vegetation treatments to benefit Utah prairie dogs.
BLM Utah State Office	*Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015), pages 2-12–2-20	Vegetation treatments, including prescribed fire, and maintaining, improving, and restoring habitat will be conducted to meet greater sage-grouse habitat objectives unless there is a conflict with Utah prairie dog, in which case the landscape will be managed for both species.
Dixie NF RMP	*Land and Resource Management Plan for the Dixie National Forest* (USDA 1986a), page II-20	The Forest is presently cooperating with UDWR and other federal agencies in an effort to re-establish sufficient populations of prairie dogs on federal land so that the species can be delisted in sites for prairie dogs. Some of these sites are currently occupied; the others are historic prairie dog towns.
Dixie NF RMP	*Land and Resource Management Plan for the Dixie National Forest* (USDA 1986a), page IV-6	Goal No. 17: Manage classified species bald eagle (E), peregrine falcon (E), Utah prairie dog (T), *Astragalus perianus* (E), Bonneville cutthroat trout (S), Colorado River cutthroat trout (S) (E = Endangered, T = Threatened, S = Sensitive) habitat to maintain or enhance their status through direct habitat improvement and agency cooperation.
Fishlake NF	*Fishlake National Forest Land and Resource Management Plan* (USDA 1986b), page II-33	The Utah prairie dog has been reestablished on two sites on the Forest. These relocations are part of an effort to establish viable populations in accordance with the recovery plan for this species. Recent efforts have resulted in a downlisting of the species from endangered to threatened. The Forest will continue to cooperate in providing and enhancing habitat for this species.
Bryce Canyon National Park	*Foundation Document Bryce Canyon National Park Utah* (NPS 2014), page 14	High-quality meadow habitat supports an abundance of native fauna, including the federally threatened Utah prairie dog. As a keystone species, the Utah prairie dog creates habitat for and supports other animal and plant species at a variety of levels through soil aeration, vegetation modification, and burrow engineering.
Bryce Canyon National Park	*Foundation Document Bryce Canyon National Park Utah* (NPS 2014), page 49	Utah prairie dog population stability is variable given the limited number of colonies, susceptibility to nonindigenous disease, and overall small number of animals. These factors, coupled with habitat fragmentation, yield a declining trend.

Federal Agency	Land Planning Document Reference*	Excerpt of Resource-Specific Language
Bryce Canyon National Park	*Foundation Document Bryce Canyon National Park Utah* (NPS 2014), page 50	Loss of habitat for keystone species, such as the Utah prairie dog, due to climatic shifts and drought events, nonnative diseases, and habitat fragmentation.
Bryce Canyon National Park	*Foundation Document Bryce Canyon National Park Utah* (NPS 2014), page 50	Cooperative management of Utah prairie dogs and their habitat across jurisdictions through planning with U.S. Forest Service, Garfield County, Bryce Canyon City, Utah Division of Wildlife Resources, and U.S. Fish and Wildlife Service. Identify and designate Utah prairie dog habitat in the park. Utah prairie dog population and disease monitoring Utah prairie dog stewardship plan
Bryce Canyon National Park	*Foundation Document Bryce Canyon National Park Utah* (NPS 2014), page 56	Identification of Key Parkwide or Major Issues: Utah prairie dog management

* The Cedar City FO RMP is in draft form and will be incorporated into Utah prairie dog planning once released.

7.3.2 Funding Conservation Actions

Funding to implement this Conservation Strategy will be provided from a variety of sources and will include in-kind contributions from the Conservation Strategy partners, such as personnel, field equipment, and supplies. The Conservation Strategy partners will also seek other sources of assistance for implementing this Conservation Strategy through engagement of other partners. UDWR and the Conservation Strategy partners have a solid track record of funding Utah prairie dog recovery efforts and each have existing funding sources for use in management of Utah prairie dogs and new funding sources will be accessed as applicable. For example, funding for Utah prairie dog recovery through Utah's Endangered Species Mitigation Fund, administered by UDWR, exceeded $1.8M over the past 5 years (state FY18-22). Utah prairie dog conservation will continue to be a high priority for funding through the Endangered Species Mitigation Fund post-delisting.

7.4 CONSERVATION SCHEDULE AND PROGRESS ASSESSMENT

The coordination and implementation of conservation activities and progress assessments will be conducted according to the process outlined below.

7.4.1 Coordinating Conservation Activities

Administration of this Conservation Strategy will be conducted by UDWR, with help from its Conservation Strategy partners. UDWR and its Conservation Strategy partners will meet annually at a minimum to review progress reports (consisting of annual monitoring data, spring counts, translocations, plague prevention, and regulated control), the effectiveness of implementation of this Conservation Strategy, and yearly conservation schedules and budgets, and help develop funding as necessary.

7.4.2 Implementing the Schedule

Conservation actions and monitoring activities will be scheduled and reviewed on an annual basis by the Conservation Strategy partners based on recommendations from UDWR. UDWR will be responsible for coordinating the review of conservation actions and monitoring activities conducted by the Conservation Strategy partners to determine if all actions are in accordance with this Conservation Strategy and the annual schedule. This Conservation Strategy will be a flexible document and can be revised through adaptive management to incorporate new information as it becomes available.

7.4.3 Progress Reports and Assessment

Annual progress reports and 5-year assessments will be prepared by UDWR and provided to the Conservation Strategy partners. The 5-year assessments will evaluate the effectiveness of the conservation actions in reducing threats to ensure the long-term persistence of the Utah prairie dog and whether revisions to this Conservation Strategy are warranted. Conservation partners will contribute their respective data needed to complete reports and assessments.

7.5 CONSERVATION STRATEGY DURATION

This Conservation Strategy shall be effective as of the date of the last signature in the attached Agreement and will remain in force into the foreseeable future as a living document that can be revised through adaptive management to incorporate new information as it becomes available. The Conservation Strategy partners shall undertake a review of this Conservation Strategy on a 10-year cycle from the date of the last signature. Revisions to this Conservation Strategy would be agreed upon by all Conservation Strategy partners and a commitment to renew the term for another 10 years upon expiration of the original term. Prior to renewal of the Agreement, the signatories will review monitoring data collected as part of this Conservation Strategy and other best available scientific and commercial information to assess the status of the Utah prairie dog against the biological goal and objectives of this Conservation Strategy. The Agreement will remain in place until the species is evaluated for and included in the 2035 revision of the Wildlife Action Plan.

7.6 MEMORANDUM OF AGREEMENT

UDWR and its Conservation Strategy partners agree to implement this Conservation Strategy, consistent with available resources and funding sources. The MOA attached to this Conservation Strategy (see Appendix A) provides written assurances of the involved Conservation Strategy partners that have agreed to use their authorities and work cooperatively and collaboratively to conserve the Utah prairie dog across its range. This will be implemented through the regulatory mechanisms, conservation actions, adaptive management, monitoring, and other provisions of this Conservation Strategy per the details and responsibilities outlined in the MOA. The Conservation Strategy partners are composed of both Signatory and non-signatory partners. The signatories to this Conservation Strategy are the Conservation Strategy partners with the authority to administer the conservation actions described herein within the lands in which they manage.

The MOA signatories are as follows:

- Utah Division of Wildlife Resources
- Bureau of Land Management
- U.S. Forest Service
- Garfield County, Utah
- Iron County, Utah
- Kane County, Utah
- National Park Service
- Utah School and Institutional Trust Lands Administration
- The Nature Conservancy

CHAPTER 8. LITERATURE CITED

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APPENDIX A

Memorandum of Agreement

Appendix B. Utah Prairie Dog Conservation and Management Timeline

Poisoning, sylvatic plague, drought, and habitat alteration induced by agricultural and grazing activities

1971 — **Drastic decline**
UPD numbers drop to < 3,000;
Population distribution reduced by an estimated 87%;
Only 48 remaining colonies

1972 — **Colony mapping & translocations begin**
by UDWR

1974 — **Listed as an Endangered species**
under the Endangered Species Act

1976 — **Annual spring counts**
started by UDWR

1984 — **Downlisted to Threatened species**
Special 4(d) agriculture rule enacted

1991 — **First UPD Recovery Plan established**
Special rule amended expand to include all non-federal lands

1997 — **Interim Conservation Strategy**

1998 — **Iron County Habitat Conservation Plan**

2006 — **Habitat Conservation Plan amended**
Utah Prairie Dog Recovery Implementation Team (UPDRIT) joins UPD Recovery Team

2010 — **Utah Prairie Dog Recovery Implementation Program (UPDRIP) established**
Public and private partnership

2012 — **4(d) Rule and Recovery Plan revised**
to cover human safety hazards, protect burial sites, and exempt normal agricultural practices

2013 — **Iron County Low effect HCP**

2014 — **Court ruling**
PETPO vs. USFWS;
State Management begins

2015 — **State Management Plan**
UPDRIP restructured into the Utah Prairie Dog Oversight Group (UPDOG)

2017 — **Federal regulation reinstated**
Iron County HCP restored

2018 — **Range-wide GCP**
Iron County HCP expired;
Colony active area mapping begins;
Conservation Agreement & Strategy on Federal Lands in the Paunsaugunt RU drafted

2020 — **Conservation Strategy**
drafted by UDWR and partners

2022 — **Paunsaugunt Recovery Unit**
reaches recovery goal for 9th consecutive year

Appendix C. Utah Prairie Dog Tier Spring Count and Management Actions Handout, Page 1

	SPRING COUNT		
Tier	**West Desert**	**Paunsaugunt**	**Awapa**
1	< 2,500	< 1,250	< 625
2	2,500 - 3,000	1,250 - 1,500	625 - 750
3	3,000 - 4,000	1,500 - 2,000	750 - 1,000
4	4,000 - 5,000	2,000 - 2,5000	1,000 - 1,250
5	> 5,000	> 2,500	> 1,250

	MANAGEMENT ACTIONS					
Tier	**Plague Control**	**Translocation**	**Regulated Control**	**Development**	**Predator Control**	**Habitat Management**
1	All protected colonies	Only conflict and development within major development areas	Up to 25% productivity	Surveys required for projects within major and minor development areas	Translocation sites and protected colonies with ≥ 15 animals	Translocation sites and protected colonies with ≥ 15 animals
2	All protected colonies	Only conflict and development within major development areas	Up to 50% productivity	Surveys required for projects within major and minor development areas	Translocation sites	Translocation sites and protected colonies with ≥ 23 animals
3	All protected colonies ≥ 15 animals	Translocate as needed and prepare new sites	Up to 75% productivity	Surveys required for projects within minor development areas	Not required	New translocation sites
4	All protected colonies ≥ 23 animals	Translocate as needed and prepare new sites	Up to 100% productivity	Surveys required for projects within minor development areas	Not required	New translocation sites
5	Two-year interval at protected colonies ≥ 23 animals	Trap as many sources as available	Up to 100% productivity plus 50% adults	No surveys required	Not required	Not required
Management under GCP and 4(d) rule	Protected colonies as funding allows	Development, independent of development, 4(d) agriculture, and 4(d) safety	4(d) control permits of up to 50% productivity and 4(d) safety where fencing is installed	Surveys required in major and minor, required mitigation fees for impacts to occupied habitats	Only at translocation sites as needed	As funding and project proposals are made