2007

Utah Prairie Dog Habitat Evaluation Guide

Natural Resources Conservation Service

Environmental Defense

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Contents

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Environmental Defense

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Introduction & Purpose

The Utah prairie dog (*Cynomys parvidens*) (UPD) is listed as a threatened species under the Endangered Species Act (ESA) and exists only in southwestern Utah. UPD numbers and range have declined dramatically since settlement of Utah because of conversion of rangeland to cropland, urban development, fire suppression, improper grazing, drought, and introduced sylvatic plague (*Yersina pestis*). As of this writing, approximately 75% of all Utah prairie dogs inhabit private lands. This fact highlights the need to encourage farmers and ranchers to manage UPD habitat on their property in order to move the species closer to recovery. This guide provides technical information to assist biologists, land managers, and others in evaluating current and potential prairie dog habitat. Please refer to the Utah Prairie Dog Habitat Evaluation and Management Guide, of which this guide is a part, for more information on how to develop habitat restoration and improvement projects beneficial to the species.

Appropriate incentives and regulatory assurances can greatly encourage the use of practices beneficial to the UPD and help lead to species recovery. The U.S. Fish and Wildlife Service (USFWS) can provide regulatory assurance to private landowners participating in habitat improvement projects for the UPD through the Safe Harbor Program. For more information about Safe Harbor, contact the Utah Field Office of the USFWS in Salt Lake City. The Natural Resources Conservation Service (NRCS), Utah Division of Wildlife Resources (UDWR), Utah State University Extension Service (USU), USFWS, and other agencies can help provide cost-share incentives and other types of payments and technical assistance to assist landowners in implementing habitat improvement work described in this HEG.

Purpose

The purpose of the HEG is to serve as a technical assistance tool for biologists, land managers, and others working with private landowners to improve UPD habitat in ways that will also benefit land health, other wildlife species, and agricultural productivity. It is not intended to replace consultations with the USFWS and other UPD experts, but rather to serve as a guideline for those working directly with private landowners who may be less familiar with the species and its habitat requirements.

As with any species listed under the ESA, it is essential to consult with the USFWS before undertaking a habitat improvement project. The USFWS can tell you what permits are required, what regulatory requirements and assurances are applicable, and what potential sources of funding are available for project work.

General Instructions

The following general steps should be followed when developing a UPD project.

Step 1

Determine the practicality of managing for UPDs on the property before developing a habitat project. Evaluate the land under consideration and the landowner's situation. Developing an understanding of the landowner's goals for agricultural production on the property is important. Use the list of preproject considerations in the following section to decide if a project is appropriate before proceeding. Discuss the feasibility of developing a project with the USFWS and other local UPD experts familiar with the species and its habitat requirements.

Step 2

Determine the quality of the existing habitat by completing the "before" column on the Habitat Evaluation Model (Appendix 1). Completing this form requires a site visit to the property. The "Habitat Model Components and Instructions" section of this guide has detailed instructions on how to complete this form.

Step 3

Assess what components of the current habitat might be limiting by using the total "before" score and individual scores from the Habitat Evaluation Model. Individual component scores below 0.5 can indicate that these factors are limiting. Use this assessment to develop a list of goals and objectives for habitat improvement.

Step 4

Develop management prescription alternatives that address the goals and objectives for the site with input from USFWS and other UPD experts. Use the Habitat Evaluation Model as a guideline.

Step 5

Use the Habitat Evaluation Model "after" column to assess how management prescription alternatives will hypothetically affect the habitat quality for the UPD over the term of the project. Give strongest consideration to alternatives that provide the greatest net conservation benefit. This will be reflected in projects that exhibit the greatest change in the Habitat Evaluation Model score (before column minus the after column). When choosing the best alternative, also give preference to projects that conserve more acres, establish longer contracts, and that work well with the producer's agricultural goals.

Step 6

Work with USFWS biologists and other UPD experts to refine and finalize the management plan.

Step 7

Help the landowner apply for cost-share incentives and other financial assistance.

Step 8

If possible, obtain final review and approval of the entire project from USFWS.

Preproject Considerations

Landowner's Agricultural Goals

- How is the land being used currently?
- What are the future (10-20 years) goals of the landowner with respect to production, land use, and wildlife?
- Is the current and future planned land use potentially compatible with UPD occupation?

In many cases, for example with livestock operations with land in pasture or rangeland, agricultural production can be compatible with UPD occupation. This HEG will provide guidance on how to design projects to benefit both UPD and livestock production on grazing lands. UPD colonies may not be compatible with crops, however, unless the producer is considering switching the land use to grazing. Some producers may be willing to accept some UPD use of croplands, such as alfalfa, to benefit the species. Financial incentives can help encourage producers to do so.

Prairie Dogs

- Are prairie dogs currently present on the site?
- If so, will the planned treatments take place on the active colony or adjacent to it?
- If not, does an active colony exist within one mile of the treatment area, or does the conservation plan for the project include the reintroduction of prairie dogs at a later date?
- Will the planned treatments provide a net conservation benefit for prairie dogs by maintaining or increasing available habitat and future animal numbers?

Do not conduct prairie dog habitat treatments unless an active colony is present on the project site, within a short distance of the site, or will be reintroduced at a later date. If prairie dogs are present on the planned treatment area, consult with the USFWS on how to conduct treatments without negatively impacting these animals. Habitat treatments adjacent to an active colony can provide an opportunity for the colony to expand and increase its numbers. If planned treatments are not on or adjacent to a colony, they must be within approximately one mile of an

existing active colony so that there is potential for prairie dog use of the treatment area. Do not conduct treatments unless a net conservation benefit can be gained.

Other Species

- Will this project avoid negative impacts on any state or federally listed species or candidate species, or sensitive species (i.e., sage grouse, pygmy rabbit, and others)?

Consult the USFWS or UDWR on how to eliminate or reduce negative impacts to other listed species. Attempt to design projects that can provide benefits to other species in addition to prairie dogs.

Neighbors

- Is promotion of prairie dog habitat in this location likely to cause conflict with neighbors?
- Are the neighbors aware of the treatments planned and how they may increase prairie dog numbers in the area?

Plan treatments leaving a buffer of at least 200 meters from any adjacent private landowner if those landowners do not want prairie dogs on their property and have not entered into any type of agreement with the USFWS. If practical, discuss with all potentially affected adjacent landowners the opportunity to improve habitat conditions voluntarily and receive cost-share assistance and regulatory assurances (Safe Harbor or neighboring landowner agreements).

Habitat Conditions

- Is it necessary to remove sagebrush to improve habitat for prairie dogs?

Considerations: Consult with the USFWS, UDWR, NRCS, and other agencies to minimize the removal of sagebrush that could be important for sagebrush obligates (see "Other Species" above). To benefit prairie dogs and minimize neg-

ative impacts on sagebrush communities, use sagebrush thinning techniques and equipment approved by the Utah Prairie Dog Recovery Team and discussed in the Recommended Conservation Practices section of the Utah Prairie Dog Habitat Evaluation and Management Guide.

Livestock Grazing

- Are the planned treatments to occur on land grazed by livestock?
- If so, is the livestock grazing on the site facultative or competitive with prairie dogs?
- Is the current stocking rate compatible with long-term sustainability of the forage resource including the portion of forage that will be utilized by prairie dogs?
- Can livestock grazing be used to increase habitat by initiating prescribed grazing or altering the current grazing plan in some way?

Grazing is compatible with prairie dog activity as long as the amount of forage taken by livestock is not so high as to become competitive, or such that it alters the desired vegetation composition detrimentally. Grazing is most likely to become competitive in the summer and on sites with low productivity/moisture, like arid rangelands. Prairie dog nutritional requirements are most stringent following the emergence from hibernation in April through June, and avoiding competitive grazing during this time is especially important. Facultative grazing is most likely to occur on high moisture/productivity sites like irrigated pasture. On these sites, spring grazing can be beneficial to prairie dogs.

If livestock grazing occurs on the site, determine the current stocking rate. Compare this rate to the recommended rate for the type of forage on the site by consulting with the local NRCS rangeland conservationist. Factor in the estimated amount of forage consumed by prairie dogs (NRCS estimates .004 animal unit months per acre). Use this information to determine if this site's grazing levels are facultative or competitive. If facultative, develop a prescribed grazing plan that adjusts stocking rates and times to meet the model's height requirements and sustain the desired vegetation composition. If competitive, reduce stocking rates and adjust timing of livestock grazing to reduce the impact of livestock to levels that are no longer competitive and that sustain the model's desired vegetation composition. Consult USFWS, UDWR, USU, and the NRCS to develop an appropriate grazing plan.

Habitat Requirements & Limiting Factors

Five primary factors influence the suitability of habitat for the UPD: soils, vegetative height and density, vegetative moisture availability, vegetation quantity, and vegetation quality.

Soils

Deep, well-drained soils promote UPD survival by preventing newborn and dormant animals from drowning and by allowing animals to avoid temperature extremes and predators (Crocker-Bedford and Spillett 1981). UPDs are generally found on flat or gently sloping sites. Site selection is also influenced by the ability of the soil to maintain a burrow structure and its suitability as a substrate for digging. UPD presence on a site obviously indicates that the soils are suitable. When considering translocation of UPD to a new site, refer to USFWS translocation guidelines.

Vegetative Height and Density

UPDs historically occurred in open, grassy habitats and swales within sagebrush communities (Crocker-Bedford 1976). Open habitats are important for foraging, for visual surveillance to escape predators, and for intraspecific interactions (Player and Urness 1982). Prairie dog colony expansion is restricted by the height and density of vegetation, primarily shrubs (Player and Urness 1982). Shrub height and density are negatively correlated with abundance of prairie dogs (Collier 1975). Vegetation that is low or sparse enough to see through enhances prairie dog survival (Crocker-Bedford and Spillett 1981). Management activities like prescribed grazing and brush management are sometimes necessary to maintain suitable vegetation height, especially in highly productive sites like irrigated pastures, sites where shrubs are dense and tall, or sites experiencing tree invasion.

Vegetative Moisture Availability

Prairie dogs do not require open water for drinking; they obtain water from moisture in the vegetation they eat. Crocker-Bedford (1976) and Hatch (1975) observed that UPDs invariably occur near succulent vegetation and historically occurred in moist, grassy swales within sagebrush communities. The presence of succulent vegetation throughout the summer promotes higher UPD densities and keeps animals alive during drought (Crocker-Bedford and Spillett 1981). Moisture in plants is highly correlated with Utah prairie dog abundance (Collier 1975). Rangeland vegetation usually has sufficient moisture in normal precipitation years; however, during drought, lack of moisture can cause death of significant numbers of animals (Crocker-Bedford and Spillett 1981). Since prairie dogs are known to travel up to 300 meters from their home burrow to forage, they may obtain moisture-rich vegetation from sites adjacent to the colony, rather than from within the colony (Crocker-Bedford and Spillett 1981).

Vegetation Quantity

Utah prairie dogs must obtain enough forage during the growing season to enter hibernation with sufficient fat reserves to survive this period, which usually lasts from early November through mid-February. The results of a simulated grazing study showed that prairie dog population growth can be food limited

(Ritchie and Cheng 1999). The UPD juvenile:adult ratio demonstrated a strong positive correlation with herbaceous plant productivity (and plant species richness), suggesting that more productive sites can raise UPD reproductive rates and help compensate for losses due to predation, plague, or other factors (Ritchie and Cheng 1999). Removing biomass from simulated grazing appears to reduce food availability and lead to lower weight gains, especially in adults (Ritchie and Cheng 1999). These negative effects are somewhat compensated for by increased nutritive quality of the vegetation, but not completely at 50% and 75% removal rates (Ritchie and Cheng 1999). On high productivity sites, grazing may not be competitive and may benefit UPDs by increasing the nutritive value of the forage and increasing vegetative openness for better visual surveillance (Cheng 2000). On low productivity sites, grazing may become competitive as available food is reduced (Cheng 2000). The effects of grazing on vegetation quality and quantity are important to consider when prescribing grazing for UPDs. Grazing recommendations vary greatly according to site specifics, stocking rate, season, weather, and other factors.

Vegetation Quality

The UPD diet consists mostly of grasses and forbs, with grasses usually being the preferred food item. As with quantity, vegetation quality is important in helping UPDs survive hibernation, lactation, and other high nutrient demand times. Plant species richness is correlated with increased weight gain, higher juvenile:adult ratios, and higher animal densities (Ritchie and Cheng 1999, Crocker-Bedford and Spillett 1981). This effect may be caused by the animals having a longer time span with the nutritious green growth that resulted from overlapping growth of different plants. UPD transplants have been less successful on monocultures of crested wheatgrass because of the plant's low nutritive quality in summer and the reduction in visual surveillance potential (Turner 1979). Early cool-season grasses are especially important for lactating females (March-June), since they require twice as much energy at this time than normal (Crocker-Bedford 1976). Grazing can increase vegetation quality, but this positive gain is more than offset by a lack of forage quantity at 50% and 75% removal rates (Cheng 2000).

Habitat Evaluation Model Components & Instructions

Utah prairie dogs can be found on rangelands, pasturelands, and croplands. The Habitat Evaluation Model components were developed primarily for rangelands and pasturelands harvested by grazing animals. This model will be less useful for grass hay or alfalfa harvested mostly by mechanical means. The term rangeland generally refers to larger, less intensively managed, dryland sites harvested by grazing animals. Pastureland refers primarily to smaller, intensively managed, irrigated sites planted primarily to non-native pasture grasses and forbs and harvested by grazing animals.

The Habitat Evaluation Model is divided into three sections: general, rangelands, and pasturelands. Complete the general section for all projects on all land types. This section includes habitat elements that all UPD require, regardless of land type. For UPD habitat on rangelands or pasturelands, complete only the section corresponding to the land type on which the habitat treatments will occur. Complete one Habitat Evaluation Model form for each ecological site involved in the project. Use the examples of percent area covered (Appendix 2) to help estimate percent cover for those applicable components.

The Habitat Evaluation Model is designed to provide an index of current habitat quality and to estimate the level of habitat improvement resulting from the implementation of a management prescription. A score of 0.5 represents the minimum habitat condition level that can sustainably support UPD on the site. Management prescriptions should score 0.5 or greater to be considered beneficial for the species. A score of 0.5 or higher indicates that the field, farm, or ranch meets NRCS-quality criteria for wildlife habitat. A score of 1.0 represents the best habitat conditions possible. The greater the difference between the "before" score and the projected "after" score, the greater the likely net gain in habitat improvement for the species.

Definitions of each habitat model component of the Habitat Evaluation Model follow below.

General Components

- **Percent brush canopy cover**—percentage of canopy cover, measured by line intercept method.
- **Brush height**—the maximum height of dominant shrub species on the site.
- **Average maximum height of all herbaceous vegetation (either residual or green growth) during the growing season**—the maximum height of all grasses and forbs at the peak of their growing season; does not include shrub height.
- **Distance from existing active colony**—straight line distance from nearest active colony.
- **Access to moisture-rich vegetation during July and August**—straight line distance from nearest source of moisture-rich vegetation. "Moisture-rich" includes all edible vegetation that is green and growing during July and August.
- **Tree invasion of site**—presence of conifers (i.e., juniper, pinyon, or ponderosa pine) or other trees on or within 200 meters of the colony.

Rangeland Components

- **Perennial cool-season grass cover**—percentage ground cover of grasses that "green-up" and do most of their growing during the cool spring months.

- **Perennial cool-season grass species richness**—number of species of grasses that "green-up" and do most of their growing during the cool spring months.
- **Perennial warm-season grass cover**—percentage ground cover of grasses that "green-up" and do most of their growing during the warm summer months.
- **Perennial warm-season grass species richness**—number of species of grasses that "green-up" and do most of their growing during the warm summer months.
- **Perennial forb cover**—percentage of ground cover of herbaceous plants other than grasses (*Poacae*) that are palatable and of nutritive value to prairie dogs.
- **Perennial forb species richness**—number of species of herbaceous plants other than grasses (*Poacae*) that are palatable and of nutritive value to prairie dogs.

Pastureland Components

- **Vegetation diversity**—total number of all plant species, including cool- and warm-season grasses, and forbs, but excluding any shrubs, if present.
- **Irrigation type**—type of irrigation system in use. "Managed" refers to measures used to limit flow amounts to benefit prairie dogs.
- **Potential for burrow flooding**—degree of flow management and monitoring in use by producer.

Appendix 1: Habitat Evaluation Model for Utah Prairie Dog

Owner/Operator:	Field Office:	
County:	Ecological Site:	
Assisted By:	Acres:	Date:
Location (Township, Range, Section):		

Instructions: Review the preproject considerations before using this form. Complete one form for each ecological site involved. Fill out this form to estimate the degree to which the habitat will be improved by implementing the management plan. Enter the value corresponding to the current habitat conditions in the "before" box. Then enter the expected value corresponding to the condition of the habitat expected after the treatments in the "after" box. Calculate the total scores for before and after by summing the values and dividing by the number of factors rated. Subtract the after score from the before score to calculate the degree of habitat enhancement. Greater differences in before and after scores represent higher degrees of habitat enhancement.

General Information: The model was developed based on the best available information on the habitat requirements of the Utah Prairie Dog for rangeland and pastureland. This model is not applicable to other land use types. Managing for this species may provide benefits to other species, including some "at-risk" species. This model can be applied to rangeland or pastureland with soils that can support prairie dogs (all soils other than those with a high percentage of coarse material, too sandy or rocky to support burrow structures, or high water table).

Habitat Components	Values	Before	After
1) Habitat Components – General (rate these factors for all habitat types)			
Percentage of brush canopy cover			
a) 0 – 3 %	2.0		
b) 4 – 9 %	1.4		
c) 10 – 15 %	0.6		
d) > 16 %	0.0		
Brush height			
a) < 12 inches	1.0		
b) 12 - 18 inches	0.5		
c) > 18 inches	0.0		
Average maximum height of herbaceous vegetation (either residual or green growth) during growing season			
a) 4 - 8 inches	1.0		
b) 2-4", or 8-12"	0.7		
c) < 2 inches	0.3		
d) > 12 inches	0.0		
Distance from existing active colony			
a) < 0.5 mile	1.0		
b) 0.5 - 1.5 mile	0.5		
c) > 1.5 mile	0.0		
Access to moisture-rich vegetation during July and August			
a) High; on-site moisture-rich vegetation with no physical barriers	1.0		
b) Medium; within 300 m of nearest burrow and no physical barriers	0.5		
c) Low; > 300 m or significant physical barrier to access	0.0		
Tree invasion of site			
a) No tree invasion	1.0		
b) Slight tree invasion (trees on fringe of site)	0.5		
c) Moderate tree invasion (trees scattered throughout site)	0.3		
d) Heavy tree invasion (trees dense throughout site)	0.0		

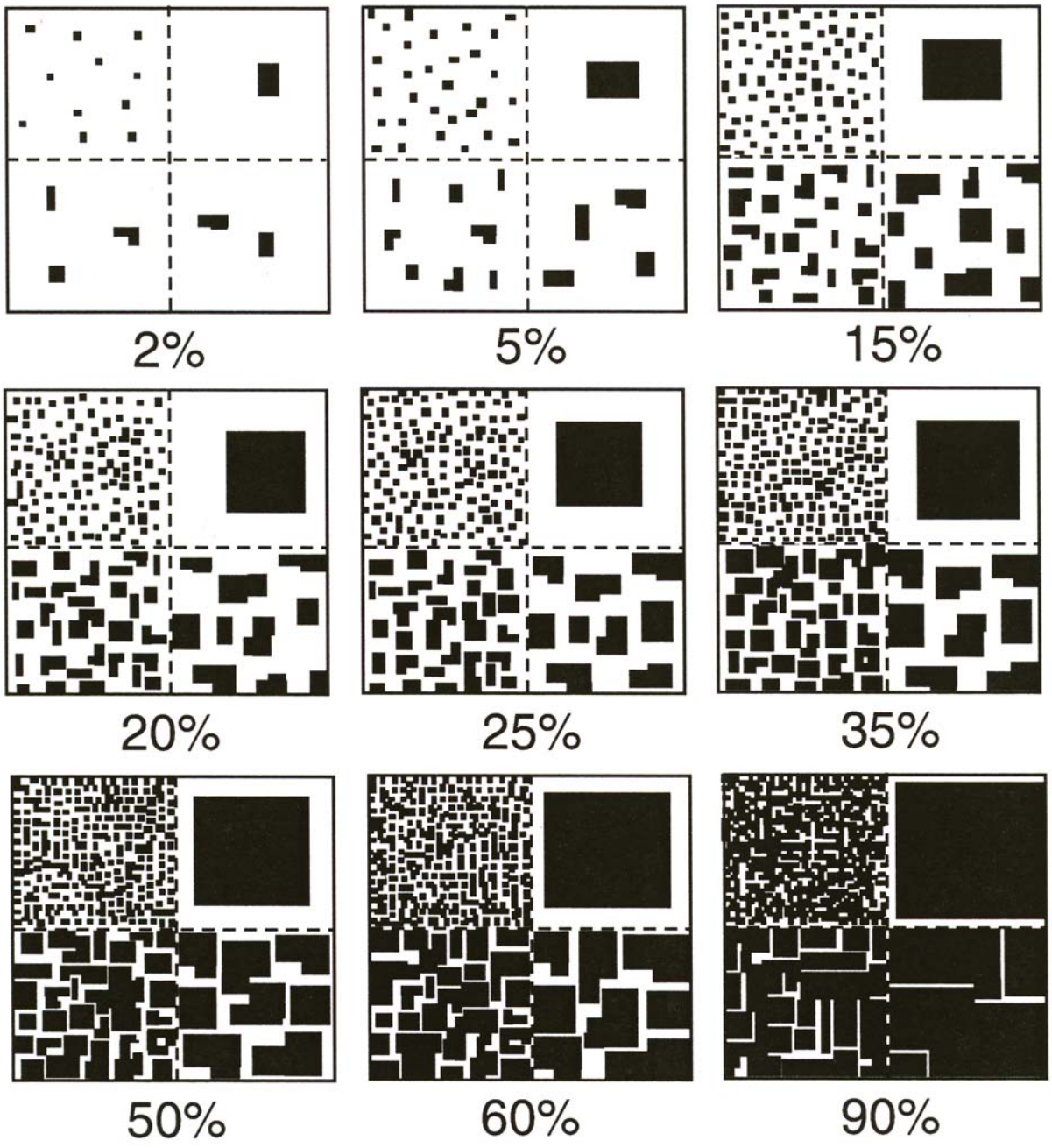
Habitat Components	Values	Before	After
2) Habitat Components – Rangeland			
Perennial cool-season grass cover			
a) 12 - 40 %	1.0		
b) > 40 %	0.7		
c) < 12 %	0.3		
d) ≤ 2 %	0.0		
Perennial cool-season grass species richness			
a) > 3 native species	1.0		
b) ≥ 3 species (at least 2 natives)	0.7		
c) 1 - 2 species	0.3		
d) None	0.0		
Perennial warm-season grass cover			
a) 3 – 10 %	1.0		
b) > 10 %	0.5		
c) < 3 %	0.0		
Perennial warm-season grass species richness			
a) ≥ 3 species	1.0		
b) 2 species	0.7		
c) 1 species	0.3		
d) None	0.0		
Perennial forb cover			
a) 1 – 10 %	1.0		
b) 11 – 20 %	0.5 – 0.9		
c) > 20 %	0.1 – 0.4		
d) < 1 %	0.0		
Perennial forb species richness			
a) > 10, including some legumes and composites	1.0		
b) 6 – 9, including some legumes and composites	0.7		
c) 3 – 5, or more without legumes and composites	0.3		
d) < 3	0.0		

3) Habitat Components – Pastureland			
Vegetation diversity			
a) High: > 6 species, including 3 forbs with at least 1 leguminous	1.0		
b) Medium: 3 - 6 species, including at least 2 forbs	0.5		
c) Low: < 3 species	0.0		
Irrigation Type			
a) Managed sprinkler	1.0		
b) Controlled flood or unmanaged sprinkler	0.5		
c) Uncontrolled flood	0.0		
Potential for burrow flooding			
a) Low: low, even flows; producer monitors water flow	1.0		
b) Medium: even flows; producer does not monitor	0.5		
c) High: uneven flows, excessive water or gullies; producer does not monitor	0.0		
SUM			
Final Habitat Model Score = SUM / Number of factors rated			

Appendix 2: Examples of Percent of Area Covered

The following graphic can be used to estimate percent cover.

NOTE: Within any given box, each quadrant contains the same total area covered, just differently sized objects.
Source: USDA NRCS.



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