NORTH DAKOTA GAME AND FISH DEPARTMENT

Final Report

Distribution of Richardson's Ground Squirrel Colonies in North Dakota and Burrowing Owl Use of the Ground Squirrel Colonies

Project T-3-1

December 1, 2003 – January 31, 2005

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Submitted by
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April 2005

DISTRIBUTION OF RICHARDSON'S GROUND SQUIRREL COLONIES IN NORTH DAKOTA AND BURROWING OWL USE OF THE GROUND SQUIRREL COLONIES

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Most native prairies in the Great Plains have been destroyed during the last century, largely as a result of conversion to cropland (Noss et al. 1995). In North Dakota, for example, 68% of the mixed-grass prairie has been converted to agricultural uses (Samson et al. 1998). Corresponding declines in species that depend on native prairie, such as the Dakota skipper (*Hesperia dacotae*), Baird's sparrow (*Ammodramus bairdii*), swift fox (*Vulpes velox),* and burrowing owl (*Athene cunicularia*), have been documented. Another species, the Richardson's ground squirrel (*Spermophilus richardsonii*) has received almost no attention, but likely suffered considerable declines in both distribution and abundance as native prairies were destroyed. This colonial burrowing rodent once was distributed over nearly the entire northern Great Plains region (Jones et al. 1983:138) and served as a critical link in the life histories of other vertebrate species. In North Dakota, Richardson's ground squirrels were once widespread east and north of the Missouri River. Bailey (1926), in his survey of North Dakota mammals, reported that the Richardson's ground squirrel, or "flickertail," had a continuous distribution across the prairie in large numbers. He further reported that one farmer killed approximately 4,000 of the animals on one 2.6-km^2 section of land. Anecdotal evidence from long-time residents of the state indicates that the ground squirrels were much more numerous and widespread in the past than they are presently. Many remember colonies that held "thousands" of squirrels.

In the contemporary prairie landscape, the Richardson's ground squirrel continues to be a key prey of many mammalian carnivores and raptors such as the American badger (*Taxidea taxus*) and ferruginous hawk (*Buteo regalis*), and it creates microhabitats important to other species such as the burrowing owl (Michener and Koeppl 1985). Regrettably, no data are available on distribution or long-term trends of Richardson's ground squirrel populations across North Dakota. Evidence clearly indicates that, in at least some areas of the state, the species range has contracted and numbers of colonies have declined partly due to loss of crucial habitats (heavily grazed, open rangeland), but the apparent decline cannot be entirely explained by habitat loss alone (Murphy et al. 2001).

The burrowing owl was once present and likely common throughout mixed-grass and shortgrass prairies of North America. There has been growing concern over the population status of this raptor; significant declines in breeding populations have been documented at the periphery of the species' range, particularly in Canada where it has been designated an endangered species. The owl is considered a species of special concern in many Great Plains states, including North Dakota, where breeding burrowing

owls are missing from about one-half of their former range (Marti and Marks 1989, Murphy et al. 2001). There likely are multiple reasons for this population decline, but primary reasons probably include the loss of prairie breeding habitat due to agricultural conversion and widespread elimination of burrowing rodents on most remaining prairies, notably Richardson's ground squirrels and prairie dogs (*Cynomys* spp.; Hjertaas 1996). Burrowing owls seem to select their breeding areas based primarily on availability of nest burrows, suitable vegetation structure, and nearby food resources (Green and Anthony 1997). They prefer open areas with sparse vegetation and a few elevated perch sites. The well grazed pastures typically occupied by Richardson's grounds squirrels (Hjertaas 1996, Green and Anthony 1997) are attractive to burrowing owls; the owls routinely nest in areas with high number of ground squirrel burrows (Schmutz 1997, Poulin 2003).

Knowledge of the contemporary distribution and changes from the historic distribution of Richardson's ground squirrel, and understanding the underlying factors influencing these changes are important for conserving the species and its ecologically unique, associated vertebrate community. Protocols for long-term monitoring are needed to facilitate detection of changes in the ground squirrel's distribution in the state and to help assess the value of related conservation initiatives. Our goal was to assess the current distribution of Richardson's ground squirrel in North Dakota and to assess occurrence of burrowing owls at the ground squirrel's colonies. Secondary goals were to try to develop models for predicting the occurrence of Richardson's ground squirrels, mainly by using remote sensing techniques, and to provide recommendations for monitoring protocols to periodically assess population trend of Richardson's ground squirrel in North Dakota.

Study Area and Methods

Selection of areas for surveys

We systematically selected legal townships as our sample units from within the historic range of the Richardson's ground squirrel in North Dakota, which includes all of the area north and east of the Missouri River (Jones et al. 1983:132, Bailey 1926). We stratified our selection of townships among the three ecoregions of our study area: Agassiz Lake Plain, Glacial Drift Plain, and Missouri Coteau (the latter also included the adjoining Coteau Slope; Bluemle 1991). The number of townships surveyed in each ecoregion was based on the total area of rangeland present within. We focus on rangeland because Richardson's ground squirrels typically occupy open, short-stature grasslands with well-drained soils (Jones et al. 1983); they can be particularly abundant in grazed prairies. Maps specifically delineating rangeland in North Dakota were unavailable, so we estimated current rangeland by using the 2000 GAP analysis coverage of North Dakota grasslands, with planted grasslands under the Conservation Reserve Program (CRP) lands excluded (Strong et al. 2005). We recognize this approach was not completely accurate in identifying rangeland, but believe it provided a reasonable estimate for our site selection purposes. Landcover in the selected townships ultimately was verified with ground surveillance.

Then, within each ecoregion, we selected townships that were distributed throughout the region and that included a reasonable component of rangelands (Fig. 1). For example, most townships in the Agassiz Lake Plain had practically no rangelands

(see Fig. 1), so we focused on townships with rangeland and selected townships dispersed throughout the region. In contrast, rangelands were relatively well represented among townships in the Missouri Coteau, so we systematically sampled every third township in that ecoregion to achieve the identified proportion of townships to be surveyed therein.

Surveys

For each selected township, we gathered information by conducting (1) landowner questionnaire surveys via telephone during February-April 2004, and (2) field surveys during late spring through the summer 2004. Our phone survey targeted landowners and/or township supervisors in sampled townships. We enlisted the help of U.S. Fish and Wildlife Service, USDA-Wildlife Services, and Natural Resource Conservation Service employees to help identify landowners that were most likely to provide a historical perspective of ground squirrel distribution and population change in each sampled township. We developed a simple list of 6-8 questions (Appendix) that conveyed the interviewee's general familiarity with the "flickertail", especially its habitat and its relationship to the burrowing owl; its past and present occurrence in their respective area; and perceived reasons for changes (if any) in occurrence of the ground squirrel.

To gather information on current distribution and to validate information gathered with the phone surveys, we surveyed "plots" in each selected township during May and late-June 2004. A plot was 400 m X 800 m (32 ha), with the 800-m edge adjoining a section line. To select potential plots to be surveyed within townships, we first identified where rangelands were available along section lines. We used low altitude aerial photography of the townships in digitized format within a geographic information system (GIS; Map and Image Processing System; MicroImages, Version 6.9, Lincoln, Nebraska, USA) to delineate rangelands (from GAP analysis coverage). We also added digital road coverage to the aerial photographs. We overlaid potential plots on the aerial photographs of each township and pre-selected 15 to 20 of the plots within each township to be surveyed. In each township, we initially selected plots with the most rangeland coverage to be surveyed. This maximized our efficiency and our chances of detecting ground squirrels. We also included plots identified by landowners as having Richardson's ground squirrels present (>1 per township) in the sample. If there was no rangeland within a selected township, then random samples of at least 10 plots were selected and surveyed. We attempted to keep plots at least 800 m apart. Typically, we were able to survey most if not all potential plots within the time allowed (described below).

Plots within townships were surveyed by one observer from the best vantage point(s) on the section line that could be reached by vehicle or by walking. The observer used binoculars to scan for ground squirrels and their active burrow mounds, meanwhile listening for the squirrel's sharp, distinct call notes. We surveyed at least 10 plots per township and limited our search to 3 hrs in each township to avoid over- or under-sampling.

Upon arrival at a plot, observers estimated the proportion of the plot that could be observed. If that proportion was less than 50%, a substitute plot in the township was selected. Similarly, if more than 25% of the plot was covered by wetland (i.e., twice the average wetland coverage in the Missouri Coteau; U.S. Fish and Wildlife Service-Habitat Population and Evaluation Team, Bismarck, North Dakota, unpublished data), then a

substitute plot was chosen. For each plot where Richardson's ground squirrels were observed, we recorded and estimate of the area (ha) that encompassed the colony, the type of habitat in which the colony was located, and the proportion of the colony's area with ground squirrel activity. We tried to estimate the number of burrows, but found this not possible. A colony was defined as a group of burrow mounds encompassing >0.4ha (1 acre), and at which ground squirrels were detected.

In each plot (with or without ground squirrels), the proportion of each of four general habitat classes (rangeland, wetland, cropland, and planted grassland) was recorded. We categorized the rangeland condition by vegetation structure (i.e., height x density) of each rangeland area. Categories included (1) heavily grazed off, (2) moderately grazed, (3) lightly grazed, or (4) not grazed or otherwise defoliated. We did not measure vegetation structure on each plot, because that would have required written permission from each landowner and a level of effort beyond resources available for the project. However, to ensure that different observers categorized structure consistently, we "tested" their assessments of rangeland condition. Each observer separately selected 10 pastures that they identified for each of the 4 condition categories. They attained permission to access those pastures. For each pasture, they recorded visual obstruction readings (VORs) at 10 locations, 12 m apart along a 120-m transect, with methods described by Robel et al. (1970). We compared the results from the two observers and found no difference between the observer's categorizations of rangeland condition based on vegetation structure ($P = 0.56$; PROC GLM, SAS Institute 1997).

We assigned a VOR value to each of 4 vegetation structure categories, to provide a rough quantitative index of the amount of above-ground vegetation available, which we used for modeling purposes (see below). These VOR values were the means calculated from the measurements gathered by the observers' during the test for consistency between observers.

We searched all Richardson's ground squirrel colonies for presence of burrowing owls twice during the summer with techniques described by Shyry et al. (2001). The first search was in late June through mid-July and the second search was from mid-July through early August. Surveys were conducted from 0530 to 1030 when burrowing owls were most likely active (Poulin 2003). At each colony the observer scanned the rangeland and surrounding area for 15 minutes.

We attempted to develop predictive capabilities for management purposes for presence/absence of Richardson's ground squirrel colonies at the township level. That is, we searched for unique landscape signatures that characterize Richardson=s ground squirrel colonies. We used logistic regression techniques (Allison 1999) and SAS PROC LOGISTIC procedure (SAS 1999) following the model selection methods described by (Burnham and Anderson 2002). Landcover explanatory variables considered were the percentage hectares in grassland, cropland, wetlands, CRP, and "other areas" within each of the 118 townships surveyed. Summation of the percent acres was constrained 100 percent, so we did not include any intercept terms in the logistic regression models (Cornell 1990).

Results

Landowner surveys

During March and April 2004, we attempted to contact 1188 landowners; of these we interviewed 245 (20.6%). Most landowner we spoke with had lived in their respective township their entire life (mean years of residence = 54). Landowners identified locations of 158 active colonies (Table 2). However, we observed ground squirrels at only 42 (26.6%) of these.

The average length of time that landowners recalled colonies had been active was 40 years (range = 1-80). Landowners who thought ground squirrel numbers had declined and who conveyed a reason for the decline (n = 35), believed that loss of rangeland habitat (40%) and control (e.g., shooting or poisoning; 31%) were the primary causes of decline. A secondary cause identified was high water conditions in 1993 (23%).

Eight (3.3%) landowners said they remembered burrowing owls occurring on their land within the past year and 192 (78.4%) said they remembered seeing owls on their land sometime in the past. Of those who had seen the owls at some time, most had not observed them for at least 14 years. We did not observe burrowing owls in any area that landowners suggested we might find them.

Ground squirrel surveys

We selected 118 townships in the 37 counties to be surveyed (Fig.1, Table 1). Proportions of rangeland within individual ecoregions were 10% in the Agassiz Lake Plain, 29% in the Glacial Drift Plain, and 61% in the Missouri Coteau. Thus, numbers of townships surveyed by ecoregion were 11, 44, and 63, respectively. During May and June 2005, we surveyed 2143 plots on the townships (mean = 18.2, range = 9-24 plots/township). We detected Richardson(s ground squirrels at 281 distinct places on 271 (12.6%) of the plots. The ground squirrels occur in colonies (i.e., > 0.4 ha) at 213 (75.8%) of the locations they were observed; and they occurred as isolated to few individuals on small (< 0.4 ha) areas elsewhere (24.2% of locations). Occurrences of the ground squirrel among all plots surveyed by ecoregion were: 5.9% in the Agassiz Lake Plain, 9.7% in the Glacial Drift Plain, and 16.6% in the Missouri Coteau. Burke County (encompassing Missouri Coteau and Drift Plain ecoregions) in northwestern North Dakota was the county with the highest proportion of plots at which we detected Richardson's ground squirrels (38.3%; n = 47 plots surveyed). About 10 km south, Sorkness Township in Mountrail County (Missouri Coteau) was the township with the highest proportion of plots at which the ground squirrel was detected (60.9%; n = 24 plots surveyed).

Most (77.0%) Richardson's ground squirrel colonies we found were small, encompassing 4 ha or less. The mean colony size was only 3.2 ha (range = 0.4 - 32.4 ha, SE = 0.4), and only 11 (5.2%) of the colonies we observed exceeded 16 ha (40 acres). Many colonies tended to be associated with either small (<4 ha), closely grazed "home-site pastures" and/or winter feedlot-areas near farmsteads, or frequently mowed odd areas such farmyard lawns and rural cemeteries, although we did not quantify this.

Richardson's ground squirrels were prevalent in the west than east (Fig. 2a, 2b). In the Missouri Coteau, Richardson's ground squirrels were detected in 83% of townships that were surveyed; in the Glacial Drift Plain ground squirrels were detected in 51% of townships; and in the Agassiz Lake Plain they were detected in 45% of townships. The average estimated mean size of colonies was larger in the Agassiz Lake Plain (5.0 ha, SE 2.6) than in the Glacial Drift Plain (2.4 ha, SE <0.1) or Missouri Coteau

(2.5 ha, SE 0.4). However, the proportion of colony area that was active (i.e., being used by ground squirrels) was not similar among regions. The average of proportion of colony size (area of contiguous burrows) that was actively used by ground squirrels was substantially less in the Agassiz Lake Plain (36%) than that in the Glacial Drift Plain (76%) or Missouri Coteau (81%). The colonies in the Agassiz Lake Plain were mostly small (<1 ha), but 2 large colonies of about 25 ha each, elevate the mean size above that of the other ecoregions.

Rangeland composed an average of about three-fourths of the habitat in plots where we detected Richardson's ground squirrels, versus two-thirds of habitat at unoccupied plots (Fig. 3). Conversely, unoccupied plots had more planted grassland. The vegetation structure of rangeland on plots where we noted Richardson's ground squirrels generally was characterized by a lower height-density than that of rangeland on plots where the ground squirrel was not detected (Fig. 4). Nearly two-thirds of plots with ground squirrels had rangeland vegetation classified as heavily grazed off, corresponding to a mean VOR of 0.3 dm on our sample of plots where structure was classified then quantified. However, nearly one-third of plots where ground squirrels were not found also had rangeland vegetation structure that was classified as heavily grazed.

Our attempts at modeling indicate that models to predict occurrence of Richardson's ground squirrels may not be feasible. In fact, the ground squirrels seem to be randomly distributed across the landscape, but when colonies were observed, they nearly always were in short-stature grassland. We almost never observed Richardson's ground squirrel colonies in any habitat other than grazed or mowed grassland, or road ditches near agricultural lands. We are continuing to develop models and will provide results as they become available.

Burrowing owl surveys

Burrowing owls were only found in 2 (1.7%) townships, Strandahl (1 adult owl) and Mont (1 pair of adults with 3 young); both townships were in Williams County. The pair of owls in Mont Township had been observed while surveying for Richardson's ground squirrels and was observed again with young during the surveys for burrowing owls. The landscapes where owls were found was dominated by rangeland, both sites had greater than 500 ha of contiguous rangeland

Discussion

Most native prairie rangeland is gone from the contemporary North Dakota landscape and remaining tracts are fragmented, especially in the Agassiz Lake Plain and Glacial Drift Plain. Richardson's ground squirrels have been subject to a declining habitat base that once supported extensive colonies of the species. Thus, we were surprised to find the ground squirrel still distributed throughout much of the state east of the Missouri river, including eastern North Dakota where rangeland is particularly limited. Anecdotal information from long-time residents suggests that Richardson's ground squirrel colonies are more thinly scattered (i.e., fewer in number) and smaller than they were 25-50+ years ago. In addition to fragmentation and loss of rangelands, poisoning and other control measures also may have influenced populations, and could possibly interact with fragmentation to exacerbate population declines due to an "island

effect" (MacArthur and Wilson 1967) in which increasingly isolated colonies are more vulnerable, whether to disease or eradication by control measures.

Clearly in the eastern portion of the state, conversion of rangeland to cropland had an enormous impact on Richardson's ground squirrel distribution and numbers, but we have no definitive information that can explain the relatively recent loss of large colonies throughout the state, even from large rangeland areas in the west. We suspect that many colonies we observed were remnants of larger colonies that have contracted due to direct and indirect pressures from human activities.

Among three major ecoregions examined, we found Richardson's ground squirrels most prevalent on townships in the Missouri Coteau, where rangeland also comprised a larger proportion of the landscape compared to the Agassiz Lake Plain and Glacial Drift Plain. Results of our distribution survey suggest the southcentral and northwestern portions of the Missouri Coteau as most important areas for the ground squirrel in North Dakota, east and north of the Missouri River. These also appear to be most important areas for breeding burrowing owls (Murphy et al. 2001). The Missouri Coteau is a critical habitat resource for many species of breeding migratory birds in the northern Great Plains

Predictably, we found Richardson's ground squirrels in North Dakota to be most often associated with rangeland with the shortest vegetation structure available. Because vegetation structure, especially height, is strongly influenced by precipitation, we suspect that population levels of the ground squirrel may be strongly driven by precipitation cycles, and that populations may reach highest relative levels during years of widespread drought. Aside from burrowing owls, other grassland-dependent bird species that tend to be associated with heavily grazed, short-stature rangeland in North Dakota include the endemic chestnut-collared longspur (*Calcarius ornatus*) and ferruginous hawk (Kantrud and Koligiski 1983), both species of special concern in the United States (U.S. Fish and Wildlife Service 2002).

We suggest periodic monitoring of the Richardson's ground squirrel in identified sites as well as efforts to locate additional large colonies. This would allow investigators to track long-term changes in distribution and population patterns. Systematic monitoring of squirrels and habitats would allow detection of changes (growth and decline) in the overall population and in colonies and perhaps contribute to a better understanding of the dynamics of this species. Surveys might be particularly important during years of severe and prolonged drought. There is general agreement that Richardson's ground squirrel populations flourish during periods of drought, yet no data are available to confirm this belief.

The burrowing owl was rare throughout our study area, though we noted that in some locales there seemed to be ample habitat for the owl. However, a paucity of extensive colonies of Richardson's ground squirrel may limit the burrowing owl distribution in North Dakota. Research on relationships between burrowing owls and black-tailed prairie dogs (*Cynomys ludovicianus*) suggest that the owl needs large colonies for breeding (Toombs 1997, Pezzilosi 1994). Colonies occupied by burrowing owl had larger area, greater burrow density, and greater prairie dog activity than unoccupied sites (Toombs 1997). The owl tended to occur in the most active parts of prairie dog colonies, selecting vacant burrows there (Toombs 1997). Perhaps similar relationships hold for burrowing owls in colonies of Richardson's ground squirrels.

Many of our colonies were small or had low ground squirrel activity, possibly making them less attractive to burrowing owls. Currently, the owl appears extirpated from the eastern portion of the state (Murphy et al. 2001, this study). Future surveys for the owl north and east of the Missouri river should focus on the northwestern and southcentral counties.

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Table 1. North Dakota counties east and north of the Missouri River, by ecoregion. In each county, surveys for Richardson's ground squirrel were conducted in selected townships and landowners from many of the same townships were interviewed about the status of the ground squirrel in their respective areas. Numbers in parentheses indicate number of townships where ground squirrel surveys were conducted, and numbers of landowners contacted.

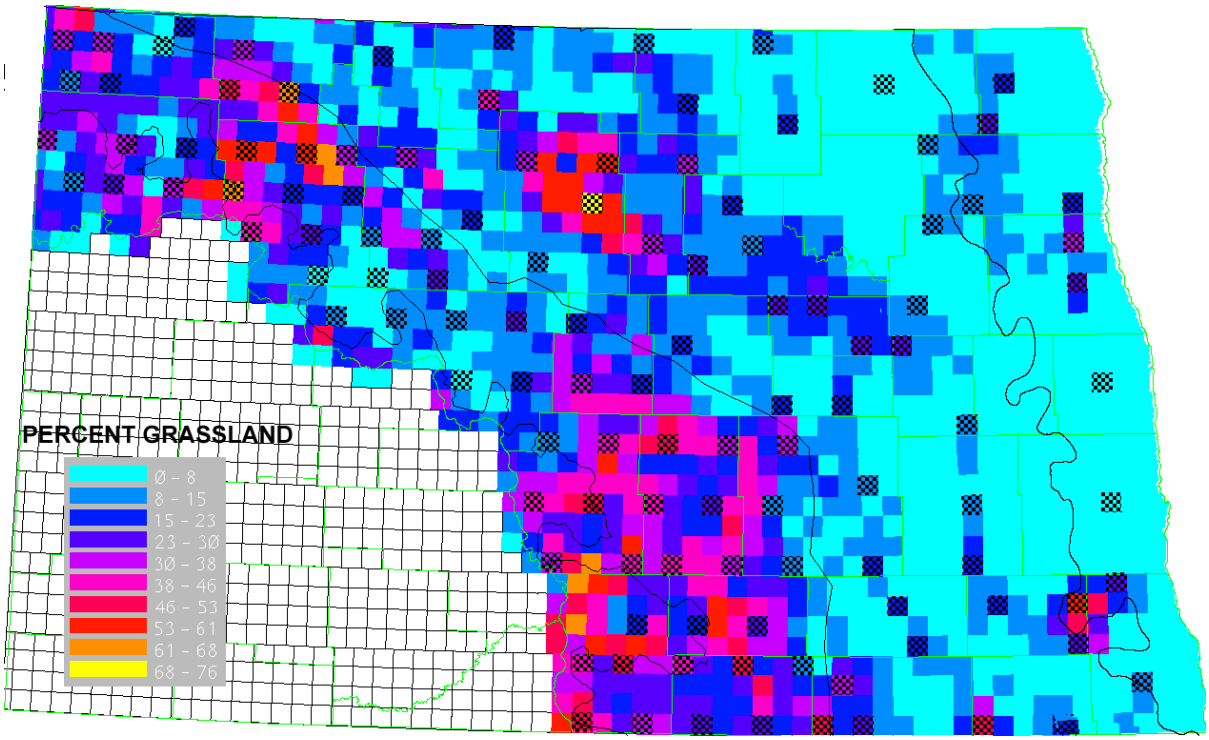
Red River Valley	**Drift Plain**	**Missouri Coteau**
Cass (1 : 2)	Barnes (2 : 0)	Burke* (3 : 8)
Grand Forks (2 : 5)	Benson (3 : 5)	Burleigh (6 : 8)
Pembina (2 : 7)	Bottineau (2 : 3)	Divide* (6 : 13)
Richland (2 : 7)	Cavalier (1 : 2)	Emmons (5 : 6)
Traill (1 : 4)	Dickey* (3 : 3)	Kidder (6 : 16)
	Eddy (3 : 2)	Logan (2 : 3)
	Foster (2 : 3)	McIntosh (5 : 17)
	Griggs (2 : 3)	McLean (6 : 10)
	Lamoure (2 : 8)	Mountrail (9 : 26)
	McHenry (4 : 6)	Sheridan (3 : 3)
	Nelson (2 : 6)	Stutsman* (5 : 13)
	Pierce (2 : 2)	Williams (6 : 20)
	Ransom* (3 : 6)	
	Renville (1 : 2)	
	Rolette (2 : 2)	
	Sargent (2 : 4)	
	Towner (2 : 5)	
	Walsh* (3 : 1)	
	Ward (6 : 10)	
	Wells (1 : 0)	

* County has townships in more than one ecoregion; most prevalent ecoregion is indicated.

Table 2. Summary of landowner responses to phone survey, April and May 2004.

	Red River Valley (n=25)	Drift Plain (n=82)	Missouri Coteau (n=137)
Richardson's Ground Squirrels			
Landowner was aware of past/present colonies (Positive response)	3	51	104
If yes, how many years do you remember the colony to be present (Average number of years)	10 (n=1)	39.1 (n=29)	41.9 (n=54)
If not aware of currently occupied colonies, how many years since last seen (Average number of years)	no information	17.2 (n=6)	10.5 (n=2)
Average years landowner lived in township	55 (n=21)	51.4 (n=30)	56.2 (n=53)
Reason for decline in numbers of squirrels			
Predators	1	0	1
High water	2	1	1
Habitat loss	4	2	8
Control (poison, shooting)	0	5	4
Burrowing Owl			
Present	0	2	6
Absent	16	64	112
Average number of years since burrowing owl was last seen	no information	17.5 (n=18)	13.9 (n=53)

Figure 1. Townships selected (checkered pattern) for surveys of Richardson's Ground Squirrels and burrowing owls and percent grassland (from GAP analysis) in townships in the sampled area (i.e., west of the Missouri River).



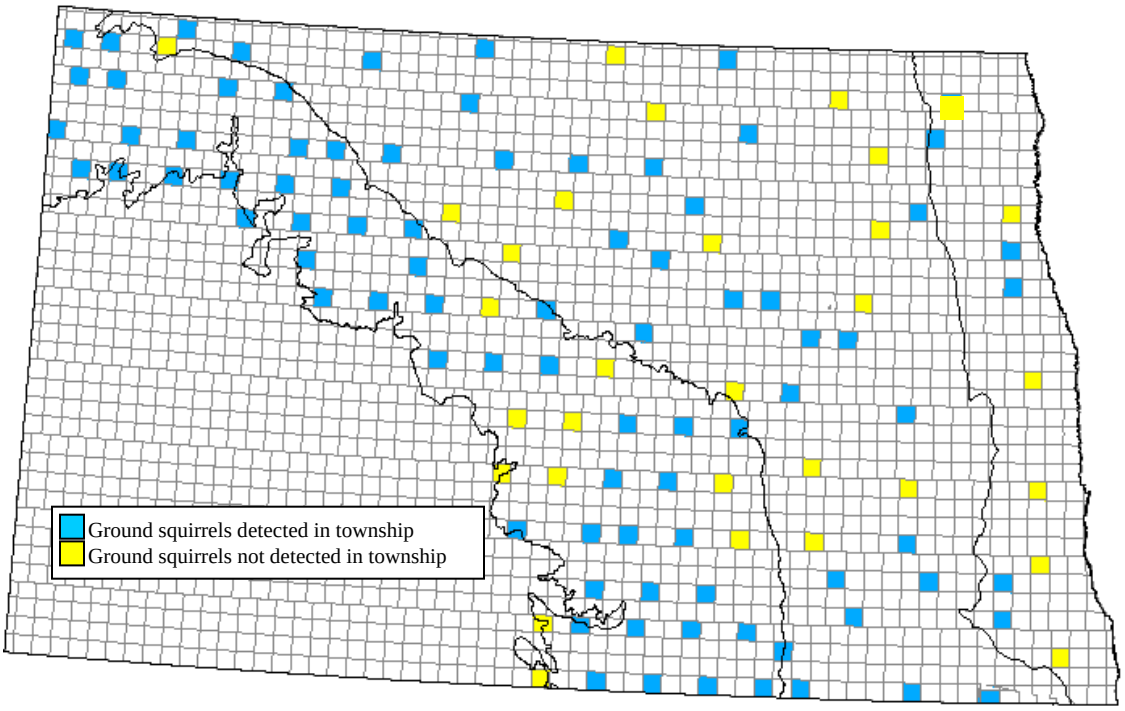


Figure 2a. Occurrence of Richardson's ground squirrels in surveyed townships.

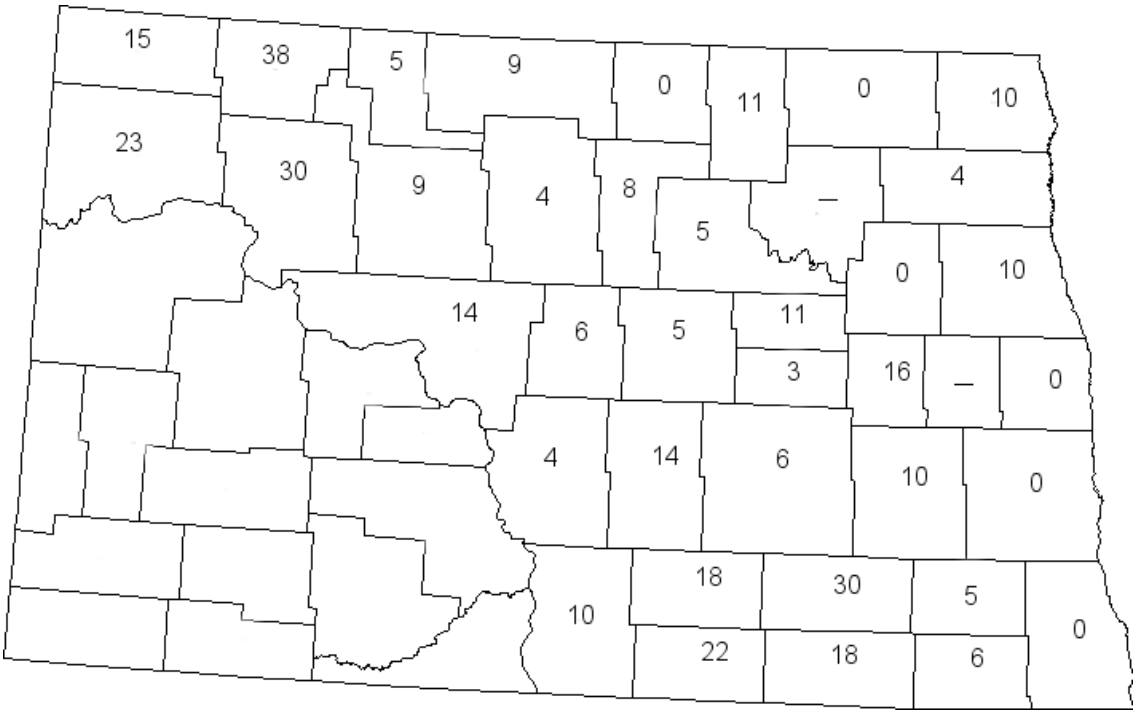


Figure 2b. Proportion of all surveyed plots in which Richardson's ground squirrels were detected

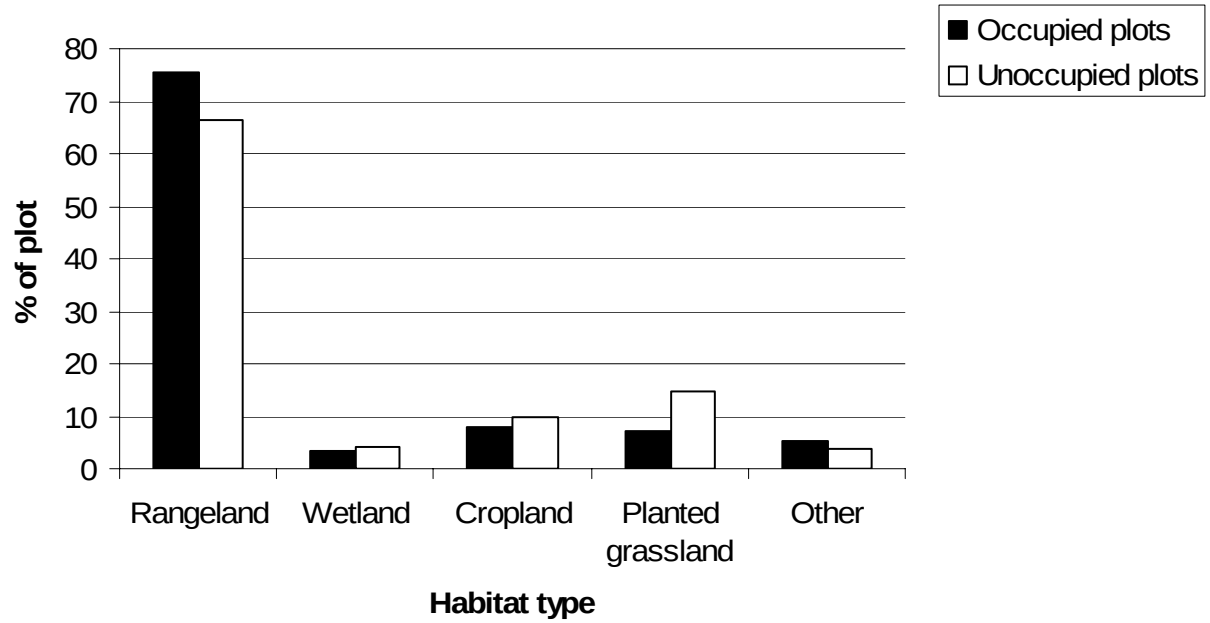


Figure 3. General habitat composition at 271 0.4 x 0.8-km survey plots where Richardson's ground squirrels were detected ("occupied") and at 1872 survey plots where ground squirrels were not detected ("unoccupied"), east and north of the Missouri River in North Dakota, May and June 2004.

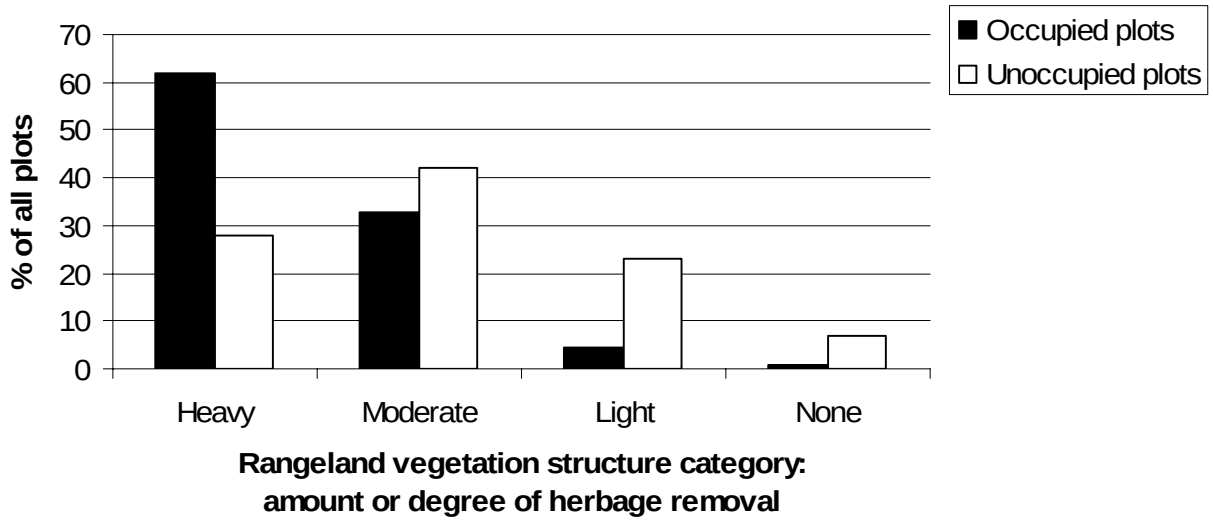


Figure 4. Distribution of structural characterizations of rangeland vegetation at 271 0.4 x 0.8-km survey plots where Richardson's ground squirrels were detected ("occupied") and at 1872 survey plots where ground squirrels were not detected ("unoccupied"), east and north of the Missouri River in North Dakota, May and June 2004.

LAND OWNER SURVEY

Name _____ Occupation _____
Landowner, NRCS, FWS, etc

Township Name _____ County _____

Hello, my name is _____ and I am a student working on a study to gather information about the flickertail gopher, also called the Richardson's ground squirrel. Are you familiar with this animal? (If yes skip explanation)

They are very often found living in colonies in pastures—they look like little prairie dogs. Would you mind answering about 5 or 6 questions?

1) In the township in which you live, are you aware of any flickertail colonies with flickertails using the holes last summer?

2a) If yes:

How long do you remember the colony to be active? 10 years, 20 years, 30 plus years (longer). _____

_____

2b) If no:

Do you remember colonies that had been occupied by flickertails in the township?

How long ago was the colony occupied by squirrels? _____

_____

3) Could you describe where in the township both active and old colonies are located?

_____

_____

If we sent you a map, with a stamped return envelope, would you mark on the map old and active colonies and mail it back to me? (Get address)

_____

4) Were you ever aware of little ground burrowing owls living in the ground squirrel holes?

_____

_____

How long ago do you remember seeing burrowing owls? _____

_____

5) Do you have any ideas as to why the ground squirrel colonies are no longer active?

_____

_____

_____

Do you think it is mostly because of grassland being converted to cropland, or poisoning of the flickertails, or something else?

_____

_____

_____

6) How long have you lived in the township? _____