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# An evaluation of two traps and sets for trapping the plains pocket gopher

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***Abstract:*** We investigated the efficiency of DK-1 and Macabee® pocket gopher (*Geomys bursarius*) traps placed in lateral tunnels in both open and closed tunnel sets in rangeland and nonirrigated alfalfa fields in Nebraska. We observed no statistical difference between the traps in capture efficiency when used in open, versus closed, tunnel sets. Trapping of pocket gophers was more effective in rangeland (probability of capture in a single tunnel system using 3 traps; 63%) than nonirrigated alfalfa fields (26%). We did not determine whether this variance was due to behavioral differences between *Geomys bursarius* and *Geomys lutescens*. We found that trapping pocket gophers was species specific with only 1 nontarget animal harmed. We suggest modifications to the traps to improve gopher capture rate and lethality.

***Key words:*** alfalfa, *Geomys bursarius, Geomys lutescens,* human–wildlife conflicts, rangeland, rodent control, wildlife damage management

**Plains pocket gophers** (*Geomys bursarius;* Figure 1) are fossorial rodents that excavate tunnels in search of food (Andersen 1988). They excavate 2 kinds of tunnels: main tunnels, which run parallel to the ground surface and used to traverse their home ranges, and lateral tunnels, which connect the main tunnel to the surface, often at a 45° angle and allow for disposal of excavated soil (Andersen 1988). Excavated soil is deposited on the ground surface as a mound. Sparks and Anderson (1988) estimated that each mound covers 0.25 ± 0.01 $m^2$ of land. Each pocket gopher can build between 1.6 and 11.9 mounds per day for 10 weeks (Sparks and Anderson 1988). The economic impact of pocket gopher burrowing, feeding, and soil dispersal can be substantial. Burrows of pocket gophers can reduce the biomass above the main burrow by 33% (Reichman and Smith 1985). The total impact of pocket gopher activity can reduce forage yields on rangelands up to 49% (Foster and Stubbendieck 1980) and dry land alfalfa yields up to 46% (Case and Jasch 1994).

During a series of presentations on the control of pocket gophers in Nebraska in 2005, we discovered that some producers used DK-1 traps (P-W Manufacturing, Henryetta, Okla.; Figure 2) and others used Macabee® (Macabee Gopher Trap Co., Los Gatos, Calif.) traps (Figure 3) to catch pocket gophers. Both traps use spring-tensioned pincers to grasp or impale the pocket gopher when the pan is triggered by being pushed horizontally when the pocket gopher reinvestigates the lateral tunnel or attempts to refill it with soil (Reichman et al. 1982, Witmer et al. 1999). Some producers argued that lateral tunnels should be left open after setting traps (Crouch 1933, Whelan and Martley 1943). Others countered that the lateral tunnels should be closed (Witmer et al. 1999; Figure 4). Individuals of both persuasions claimed trapping success for their preferred method, with some being quite adamant that the alternative method was ineffective.

A review of the literature revealed that most research on the trapping of pocket gophers has focused on *Thomomys* spp. (Smeltz 1992,

**Figure 1**. Plains pocket gopher after trapping. (*Photo by Stephen M. Vantassel*)

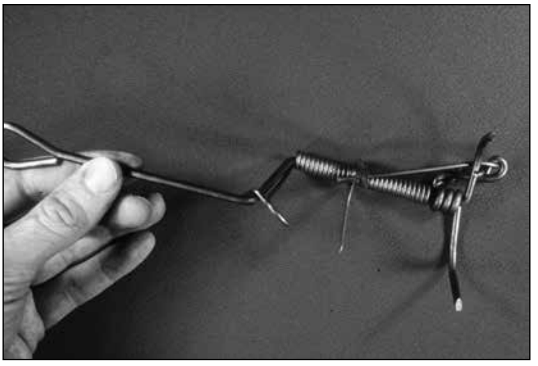

**Figure 2**. DK-1 trap in set position. *(Photo courtesy University of Nebraska–Lincoln)*

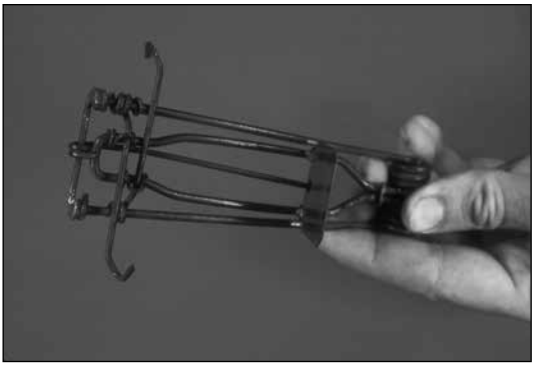

**Figure 3**. Macabee trap in set position. *(Photo courtesy University of Nebraska–Lincoln)*

Proulx 1997, Witmer et al. 1999, Pipas et al. 2000). Because systematic investigation of trapping larger plains pocket gophers has not been performed (Jones et al. 1983), we decided to investigate the effectiveness of open- versus closed-tunnel trapping using 2 kill traps commonly used in Nebraska, the DK-1 and the Macabee Gopher Trap.

Our first objective was to determine which of the 2 types of traps (DK-1 or Macabee) is more efficient in capturing plains pocket gophers. We use "efficient" in the sense of the probability of capturing the occupant of a tunnel system in 1 night of trapping using a particular choice of trap and set type. Traps misfiring (triggered, but no gopher captured) or being buried by gophers lead to noncapture, so we do not specifically discuss these types of events. Our second objective was to determine which of the 2 set types (open or closed) is more efficient for capturing plains pocket gophers. We also made observations regarding the efficacy of the traps to capture and kill plains pocket gophers in rangeland as defined by the Forage and Grazing Terminology Committee (1991) as predominately indigenous grassland (climax or natural potential) and that includes grass-like plants, forbs, or shrubs that are managed as a natural ecosystem, as well as nonirrigated alfalfa fields.

## Methods

We asked University of Nebraska–Lincoln Extension educators to refer us to landowners in need of pocket gopher control on their land. Research sites were limited to nonirrigated alfalfa fields ($n$ = 10; all located in southeastern Nebraska) and rangeland ($n$ = 1; Barta Brothers Ranch in Rock County, Nebraska), where pocket gophers were active, as identified by the presence of fresh mounds (Sparks and Andersen 1988). Fresh mounds were identified by color, granularity of soil, and size, for each tunnel system. We needed only 1 rangeland site because the size of Barta Brother's Ranch (2,428 ha) was sufficient for our study. To reduce the risk of trap avoidance, we restricted

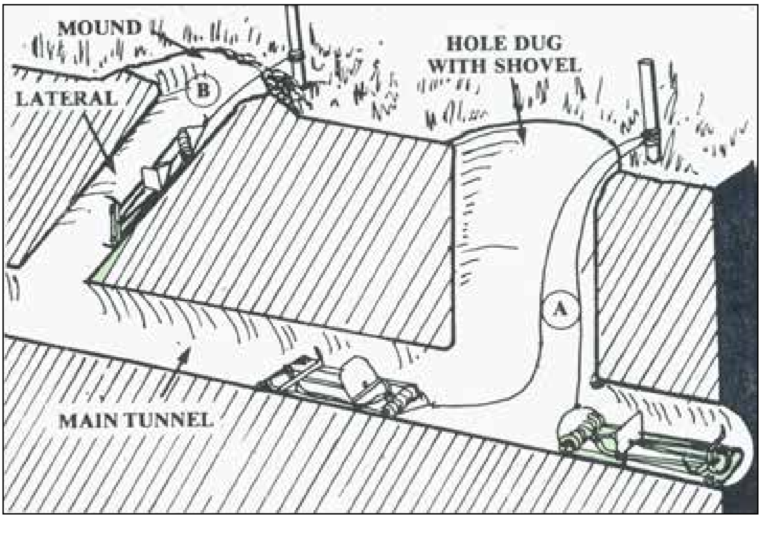


**Figure 4.** Pocket gopher trapping using main tunnel (A) and lateral tunnel (B). *(Illustration courtesy University of Nebraska–Lincoln)*

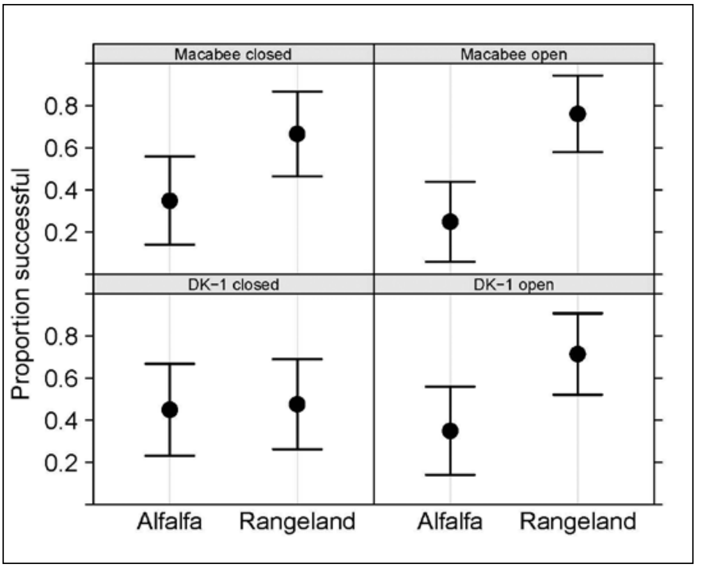


**Figure 5**. Observed proportion of sets with ≥1 capture in a night by trap and set type when capturing plains pocket gophers in Nebraska, 2006 to 2009. Error bars are 95% confidence limits.

our activities to sites that had experienced no control of pocket gophers during the previous 12 months. There were 16 trapping occasions between April 2006 and October 2009.

While researchers dispute whether pocket gopher tunnel systems vary in size according to food availability and gender (Reichman et al. 1982, Sparks and Andersen 1988, Romanach et al. 2005), Klaas et al. (2000) observed that mound activity by an individual pocket gopher tends to be clustered in small areas (<8 m in diameter) for a 1- to 2-week period. Therefore, we selected tunnel systems containing ≥3 fresh mounds that could be considered connected to the same tunnel system, typically within 8 m of another mound. To reduce the likelihood of trapping the same tunnel system, we considered active mound clusters separated by ≥27 m to be unconnected and, therefore, different tunnel systems (Scheffer 1940, Smith 1948). We assumed that each tunnel system was occupied by a single pocket gopher, but set 3 traps of the same brand and set type (open or closed) in each system to increase the likelihood of capture in a single night. A site had to have ≥4 active tunnel systems to permit all 4 combinations of open-sets with DK-1, closed-sets with DK-1, open-sets with Macabees, and closed-sets with Macabees. We had 84 tunnel systems in rangeland and 80 tunnel systems in alfalfa.

Before initial use, all traps, both new and used, were boiled with baking soda and placed outside to dry to remove odors. We used asphalt roofing tiles to cover closed-sets. Both sides of selected tiles were rinsed with a garden hose and left outside to dry. We attached a flexible metal wire with a loop on 1 end to each trap to anchor traps to a surveyor's flag. Traps that caught pocket gophers were rinsed and dried before reuse.

After randomly selecting the set type for that tunnel system, we used the following trapping procedure when setting a trap at a lateral tunnel identified by a fresh mound (Case and Jasch 1994). While wearing gloves, we probed the mound with 20-cm-long screw driver to locate the lateral tunnel. Then, we excavated the lateral tunnel down to the main tunnel using a narrow trowel. Finally, the trap was set and placed (pincer end first) into the lateral tunnel. The trap was positioned to be in close proximity to the main tunnel while remaining outside the main tunnel area. Traps were anchored by securing the attached wire to a surveyor's flag or to a loop in the trap itself. Trappers wore gloves during the setting process. The excavated tunnels would be left uncovered in systems designated as open-sets. The excavated tunnels chosen for closed sets were covered with asphalt shingles and secured with soil to prevent light from entering the tunnel.

We checked each trap within 24 hours, and removed equipment regardless of trapping success. No tunnel system was trapped longer than 24 hours. This protocol, designated as Protocol 1, was approved by the University of Nebraska–Lincoln (UNL) Institutional Animal Care and Use Committee (IACUC #05-08-050E). In September 2008, UNL IACUC modified our protocol to reduce the time animals could remain in traps (IACUC #08-042E) due to the concern regarding the number of pocket gophers we found alive during our trap checks. The second protocol, designated as Protocol 2, required traps to be set no earlier than noon of

**Table 1.** Parameter estimates, standard errors and Z statistics for the models for trapping efficiency for plains pocket gophers in Nebraska, 2006 to 2009.

| Final model from backwards selection | | | | |
|---|---|---|---|---|
| | Estimate | SE | Z value | Pr (>\|z\|) |
| (Intercept) | -0.62 | 0.23 | -2.64 | 0.008 |
| Land use | 1.26 | 0.33 | 3.84 | <0.001 |
| **Model after outlier removal and adding protocol covariate** | | | | |
| | Estimate | SE | Z value | Pr (>\|z\|) |
| (Intercept) | -1.05 | 0.35 | -3.04 | 0.0024 |
| Land use | 1.57 | 0.35 | 4.48 | <0.001 |
| Protocol | 0.64 | 0.36 | 1.77 | 0.0768 |

day 1, followed by a check the next morning on day 2.

Initially, we evaluated capture probability using the number of captures within a set as a Bernoulli response variable (0, ≥1 captures) in 1 night at a single tunnel system ($n$ = 164 tunnel systems; Figure 5). Subsequently we combined tunnel systems with the same trap and set type within a single trapping occasion into a single binomial observation with between 1 and 6 trials per observation ($n$ = 4 treatments × 16 occasions = 64). This allowed us to evaluate the assumption that the capture data were binomially distributed. Model selection results were identical, although there are small differences in the estimated coefficients.

We began the analysis with a model involving all 3 explanatory variables in the design (trap type, set type, and land use) and all their interactions. We also included trapping protocol as a dummy variable to represent the effects of the change requested by UNL IACUC midway through the study. We did not include interactions among protocol variables and the other 3 variables. Initially, we fit generalized linear mixed models using date or site as random effects using the lme4 (Bates et al. 2013) package. Estimated variance parameters were zero, however; so, we carried out the final analysis using generalized linear models. We used backward selection with likelihood ratio tests to simplify the model. Finally, we checked the model for overdispersion using a global goodness-of-fit test and graphical plots of the residuals against time. Following the removal of extreme outliers, we fit a final model that included the trapping protocol, which had noticeable effects on the residuals. All analyses were carried out using R 2.15.0 (R Development Core Team 2012).

## Results

Within 164 tunnel systems, we captured 87 plains pocket gophers. Only 4 tunnel systems had 2 captures in a night, and none had three. Both trap types were equally effective in capturing pocket gophers. Type of trap and set did not affect results significantly. There was no evidence that either trap was more efficient or that the type of set mattered. The proportion of sets with ≥1 captures (Figure 5) showed large differences between land uses, except in closed sets with the DK-1 trap. However, following backward selection, the only variable retained in the model was land use (Table 1). This model showed some evidence of over-dispersion ($\chi^2$ = 89.2; df = 62; $P$ = 0.01), so 2 observations with deviance residuals >2 were removed (both were 0 captures from 3 tunnel systems using DK-1 closed sets in rangeland). The exclusion of these data points did not affect model selection and resulted in only small changes to the estimated coefficients of the model. In addition, examination of residuals plotted against time showed evidence that the protocol change between 2008 and 2009 negatively affected capture rates; so, this variable was reinserted into the model. The final model showed no signs of overdispersion ($\chi^2$ = 72.9; df =59; $P$ = 0.11) and marginally significant effects of the protocol change (Table 1). Capture rates were much higher in rangeland than in alfalfa fields, and the change in trapping protocol reduced capture rates (Table 2). Marginal captures

**Table 2.** Predicted capture rates and 95% CI for the final model for trapping plains pocket gophers in Nebraska, 2006 to 2009.

| Protocol | Habitat | *P* | Lower 95% CI | Upper 95% CI |
|---|---|---|---|---|
| Old | Alfalfa | 0.40 | 0.28 | 0.52 |
| Old | Rangeland | 0.76 | 0.64 | 0.85 |
| New | Alfalfa | 0.26 | 0.15 | 0.41 |
| New | Rangeland | 0.63 | 0.48 | 0.76 |

**Table 3.** Number of marginal captures[1] by trap, set, and land use for trapping plains pocket gophers in Nebraska, 2006 to 2009.

| | Rangeland (58 total) | Rangleand protocol change | Alfalfa (29 total) | Alfalfa protocol change |
|---|---|---|---|---|
| DK 1 open | 0 | 2 | 2 | 0 |
| DK-1 closed | 0 | 1 | 2 | 0 |
| Macabee open | 1 | 2 | 1 | 0 |
| Macabee closed | 2 | 2 | 0 | 0 |

[1] Marginal captures included feet or skin, rather than ideal locations of neck, thorax, or abdomen

occurred with both types of traps and sets (Table 3).

## Discussion

We found no effect of trap or set type on the probability of capturing a pocket gopher. Land use did affect the probability of capturing a pocket gopher. In our study, pocket gophers buried both types of traps being tested. Proulx (1997) criticized the effectiveness of the Victor® Easyset® (Litiz, Pa.) a trap similar in design to the Macabee. He suggested that the trap's base being 1 cm above the tunnel floor may account for the pocket gopher's tendency to bury the trap. We did not identify any specific problem with the Macabee that resulted in a statistically different capture rate from the DK-1. We suspect that the similar capture rate between the traps may be due to the fact that pocket gophers must climb onto the frames of both types of traps to become caught. However, Baldwin et al. (2013) noted that the upward pressure of the trigger arm could be a primary cause for misfires with the Macabee, as the upward force could help the pocket gopher avoid the tines.

It is unclear why pocket gopher trapping was more effective in rangelands than in alfalfa fields. We began our study on the assumption that *Geomys bursarius* was the only species of pocket gopher present in all test locations. Recent genetic evidence, however, confirms 2 species of pocket gophers within our study area. *Geomys lutescens* resides in the Nebraska Sandhills and *Geomys bursarius majusculus* resides in the eastern portion of Nebraska (Genoways et al. 2008). It is possible that these 2 species react differently to disturbances to their respective tunnel systems. It also is possible that pocket gophers in the grasslands must feed more often (Andersen 1988, Andersen 1990) and extend their burrow system farther than pocket gophers in alfalfa fields because the availability of food resources in grassland is lower (Reichman et al. 1982).

Although all sets were supervised by the same person, we cannot rule out the role that land use may have had on trapper effort and motivation. The rangeland site was situated in the Nebraska Sandhills. Excavation of lateral tunnels in the Sandhills was significantly less strenuous than the silty and clayey soils characteristic of the alfalfa fields in the eastern part of the state (Kuzila 1990). Nor can we rule out the effect of trapper preferences on the selection of mounds and tunnel systems. The rangeland research area held an abundance of pocket gopher tunnel systems, which allowed us to be more selective in choosing tunnel systems to trap than was available in alfalfa fields. We had difficulty finding alfalfa fields containing enough tunnel systems to apply our experimental design. Between 2005 and 2009, total land area under dry land alfalfa production declined from 331,831 ha to 250,897 ha (USDA National Agricultural Statistics Service 2012). This change in land use likely occurred due to the rise in Nebraska corn prices from an average of $1.92 per bushel in 2005 to $5.09 per bushel in 2010 (USDA National Agricultural Statistics Service 2012) leading many landowners to convert alfalfa fields to corn. Therefore, we were forced to make sets in less than ideal locations to complete the study. In addition, P. Freeman (Professor of mammology, University of Nebraska–Lincoln, personal communication, 2012) stated that pocket gophers in the eastern portion of Nebraska had experienced significantly higher trapping pressure than those in the Sandhills region. Therefore, those pocket gophers that were behaviorally less susceptible to trapping were more likely to survive and pass that trait to their young. In contrast, pocket gophers in the Sandhills would be comparably naïve and possibly easier to trap.

The change in trapping protocol reduced our capture rate (Table 1). Our experience aligns with the claims of Vaughan and Hansen (1961) that increased capture rates depended on length of time that traps were set and that certain times of day did not increase capture rate.

Trapping of the plains pocket gopher was remarkably species specific. Only 1 nontarget animal was known to have been harmed in the process of our study, a toad (Bufo spp.), which was killed accidently during mound excavation. We did not see it because it had buried itself in the loose soil of the gopher mound. We also lost 1 trap, likely to a pocket gopher, due to inadequate anchoring. The targeted nature of pocket gopher trapping likely stems from the subterranean placement of traps, the absence of bait, and the lower diversity of animals present in agricultural settings. Our findings were in direct contrast to Smeltz (1992) who noted a significant number of nontarget catches, including ground squirrels (*Spermophilus* spp.), chipmunks (*Eutamias* spp.), and long-tailed weasels (*Mustela frenata*).

Systematic research regarding how quickly the DK-1 and the Macabee kill the plains pocket gopher has not been done (Proulx 1999). Both the DK-1 and the Macabee can kill pocket gophers by impalement, though the tines of the DK-1 usually confine and crush the pocket gopher by envelopment. We found 15 pocket gophers (Table 3) alive during the course of the study out of a total of 87 captures (19%), indicating that these traps cannot be relied upon to kill quickly. Both traps in the study had marginal captures, such as the foot (DK-1) or skin (Macabee). Marginal captures increase the risk that the pocket gopher may escape. Pipas et al. (2000) observed marginal captures (foot and tail) by the Macabee trap, and Proulx (1999) also observed that pocket gophers escaped from the trap. Both traps under investigation, likewise, failed to capture pocket gophers, as signified by the presence of hair remnants, suggesting that pocket gophers escaped or that the traps were unable to penetrate the skin.

We believe that the efficacy of both traps can be enhanced with some modifications to their designs. For the DK-1, we suggest adding a second pair of jaws positioned 2.5 cm closer to the trigger. Further, the jaws should be sharpened to a finer point similar to that of the Macabee to enhance their ability to penetrate the thoracic cavity if the animal was not positioned properly for constriction. It appears that the difficulty in killing large species of pocket gophers with the Macabee has been known since 1933 (Crouch 1933). We believe that the Macabee also would benefit from another pair of jaws, however, greater emphasis should be placed on increasing the length and spread of the jaws to ensure that they are long enough to penetrate the chest cavity consistently.

## Management implications

Trapping is an important method for the control of plains pocket gophers, particularly for those who want to use nontoxic methods. Our research has shown that closed sets are not necessary. The extra effort required to close the excavated tunnels may be worthwhile, however, where safety concerns are predominant. Further research is needed to better understand spatial and temporal heterogeneity in trapping success and whether species differ in their reaction to traps.

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## Literature cited

Andersen, D. C. 1988. Tunnel-construction methods and foraging path of a fossorial herbivore, *Geomys bursarius*. Journal of Mammalogy 69:565–582.

Andersen, D. C. 1990. Search path of a fossorial herbivore, *Geomys bursarius*, foraging in structurally complex plant communities. Journal of Mammalogy 71:177–187.

Baldwin, R. A., D. B. Marcum, S. B. Orloff, S. J. Vasquez, C. A. Wilen, and R. M. Engeman. 2013. The influence of trap type and cover status on capture rates of pocket gophers in California. Crop Protection 46:7–12.

Bates, D., M. Maechler, B. Bolker, and S. Walker. 2013. lme4: linear mixed-effects models using Eigen and S4. R package, version 1.0-4, <http://CRAN.R-project.org/package=lme4>. Accessed January 16, 2014.

Case, R. M., and B. A. Jasch. 1994. Pocket gophers. Pages B-17–29 *in* S. R. Hygnstrom, R. M. Timm, and G. E. Larson, editors. Prevention and control of wildlife damage. University of Nebraska Press, Lincoln, Nebraska, USA.

Crouch, W. E. 1933. Pocket gopher control. U.S. Department of Agriculture Farmers' Bulletin 1709. U.S. Department of Agriculture, Washington, D.C., USA.

Forage and Grazing Terminology Committee. 1991. Terminology for grazing lands and grazing animals. Commonwealth Press, Radford, Virginia, USA.

Foster, M. A., and J. Stubbendieck. 1980. Effects of the plains pocket gopher (*Geomys bursarius*) on rangeland. Journal of Range Management 33:74–78.

Genoways, H. H., M. J. Hamilton, D. M. Bell, R. R. Chambers, and R. D. Bradley. 2008. Hybrid zones, genetic isolation, and systematics of pocket gophers (Genus *Geomys*) in Nebraska. Journal of Mammalogy 89:826–836.

Jones, J. K., Jr., D. M. Armstrong, R. S. Hoffman, and C. Jones. 1983. Mammals of the northern Great Plains. University of Nebraska Press, Lincoln, Nebraska, USA.

Klaas, B. A., K. A. Moloney, and B. J. Danielson. 2000. The tempo and mode of gopher mound production in a tall grass prairie remnant. Ecography 23:246–156.

Kuzila, M. S. 1990. General soil map of Nebraska (1:1,000,000) (SM-4). Conservation and Survey Division, University of Nebraska, Lincoln, Nebraska, USA.

Pipas, M. J., G. H. Matschke, and G. R. McCann. 2000. Evaluation of the efficiency of three types of traps for capturing pocket gophers. Proceedings of the Vertebrate Pest Conference 19:385–388.

Proulx, G. 1997. A preliminary evaluation of four types of traps to capture northern pocket gophers, *Thomomys talpoides*. Canadian Field-Naturalist 111:640–643.

Proulx, G. 1999. Evaluation of the experimental PG Trap to effectively kill northern pocket gophers. Pages 89–93 *in* G. Proulx, editor. Mammal trapping. Alpha Wildlife Research and Management, Ltd., Sherwood Park, Alberta, Canada.

R Development Core Team. 2012. R: a language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Reichman, O. J., and S. C. Smith. 1985. Impact of pocket gopher burrows on overlying vegetation. Journal of Mammalogy 66:720–725.

Reichman, O. J., T. G. Whitham, and G. A. Ruffner. 1982. Adaptive geometry of burrow spacing in two pocket gopher populations. Ecology 63:687–695.

Romanach, S. S., E. W. Seabloom, O. J. Reichman, W. E. Rogers, and G. N. Cameron. 2005. Effects of species, sex, age, and habitat on geometry of pocket gopher foraging tunnels. Journal of Mammalogy 86:750–756.

Scheffer, T. H. 1940. Excavation of a runway of the pocket gopher (*Geomys bursarius*). Transactions of the Kansas Academy of Science 43:473-478.

Smeltz, M. D. 1992. Summary of a USDA Forest Service pocket gopher trapping contract. Proceedings of the Vertebrate Pest Conference 15:296–298.

Smith, C. F. 1948. A burrow of the pocket gopher

(*Geomys bursarius*) in eastern Kansas. Transactions of the Kansas Academy of Science 51:313–315.

Sparks, D. W., and D. C. Andersen. 1988. The relationship between habitat quality and mound building by a fossorial rodent, *Geomys bursarius*. Journal of Mammalogy 69:583–587.

U.S. Department of Agriculture: National Agriculture Statistics Service (2008). 2007 census of agriculture: organic production survey (2008). Volume 3, Special Studies Part 2. AC-07-SS-2. Issued February 2010, updated July 2010, U.S. Department of Agriculture. Washington, D.C., USA, <http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Organics/ORGANICS.pdf>. Accessed January 6, 2013.

U.S. Department of Agriculture: National Agriculture Statistics Service. 2012. Quick stats: commodity. Washington, D.C., USA, <http://quickstats.nass.usda.gov>. Accessed January 6, 2013.

Vaughan, T. A., and R. M. Hansen. 1961. Activity rhythm of the plains pocket gopher. Journal of Mammalogy 42:541–543.

Whelan, D. B., and J. H. Martley. 1943. Pocket gopher control increases crop production. Nebraska Cooperative Extension Work in Agriculture and Home Economics. University of Nebraska College of Agriculture and U.S. Department of Agriculture Cooperating. Lincoln, Nebraska, USA.

Witmer, G. W., R. E. Marsh, and G. H. Matschke. 1999. Trapping considerations for the fossorial pocket gopher. Pages 131–139 *in* G. Proulx, editor. Mammal trapping. Alpha Wildlife Research and Management Ltd., Sherwood Park, Alberta, Canada.

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