Behavioral Responses of Coyotes to the CLOD in Familiar and Unfamiliar Environments

Are R. Berentsen
Forest, Range, and Wildlife Sciences, and Jack H. Berryman Institute, Utah State University, Logan, Utah
Robert H. Schmidt
Environment and Society, and Jack H. Berryman Institute, Utah State University, Logan, Utah
Robert M. Timm
Hopland Research and Extension Center, University of California, Hopland, California

ABSTRACT: The Coyote Lure Operative Device (CLOD) is designed to deliver a variety of substances to coyotes. Field evaluations have demonstrated free-ranging coyotes will activate CLODs, but little is known about coyote behavior when encountering the device in familiar or unfamiliar environments, an essential consideration. Captive coyotes show neophobic behaviors toward novel objects in familiar territory, while responses to scent stations in similar scenarios have been mixed. Free-ranging coyotes are more likely to investigate novel items and are more vulnerable to capture while trespassing in adjacent territories than when "at home". We examined responses of captive coyotes toward CLODs in familiar and unfamiliar settings. We found no significant neophobic response toward CLODs with respect to territory familiarity, although captive coyotes spent significantly more time within 1 m of the device in a familiar environment. Relatively small sample sizes make broad inferences difficult, but our data suggest that territory familiarity might not be a strong factor in responses to the CLOD. However, more research is necessary.

KEY WORDS: *Canis latrans*, CLOD, coyote, coyote lure operative device, delivery system, neophobia, predator control

Proc. 21st Vertebr. Pest Conf. (R. M. Timm and W. P. Gorenzel, Eds.)
Published at Univ. of Calif., Davis. 2004. Pp. 58-63.

INTRODUCTION

Most mammals inhabit a home area and maintain familiarity with it by frequent exploration of that area (Sheppe 1966). Responses to novel stimuli can influence an animal's reaction to its environment (Mayeaux and Mason 1998). Neophobia has been defined as "the avoidance of unfamiliar (novel) objects in familiar surroundings" (Barnett 1958:195), "avoidance of a new food or flavor" (Reidinger and Mason 1983:21) and "fear of the new" (Conover 2002:253). This phenomenon is frequently exploited by wildlife managers who use fear-provoking stimuli to haze wildlife away from crops. Research suggests that novel stimuli invoke fear and exploratory behavior (Montgomery 1955), with the level of neophobia declining as objects become familiar (Sheppe 1966). Barnett (1958) showed wild rats (*Rattus norvegicus*) avoided unfamiliar objects while tame ones did not. Neophobic behavior may be related to foraging strategies (Webster and Lefebvre 2000, Mettke-Hofmann et al. 2002), with generalists being more likely to investigate novel items than species with more selective diets. Studies have demonstrated that herbivores avoid novel food items after such foods have caused malaise (Burritt and Provenza 1989). Research shows that captive primates readily investigate novel objects (Joubert and Vauclair 1986), but this could be a result of stimulus-impoverished captive environments. In familiar environments, captive coyotes (*Canis latrans*) exhibited neophobic responses to novel objects (Windberg 1996, Harris and Knowlton 2001, Heffernen 2001) and scent stations (Harris and Knowlton 2001).

Research has also demonstrated that coyotes are more likely to be captured on the periphery of their territory or while trespassing than when they are "at home" (Hibler 1977, Althoff 1978, Woodruff and Keller 1982, Windberg and Knowlton 1990). Studies in California suggest dominant, breeding coyotes are primarily responsible for sheep depredation, but are also the most difficult to remove (Sacks et al. 1999a, Blejwas et al. 2002). Sequin (2001) reported that juvenile coyotes were more vulnerable to photo-capture, while dominant animals watched where cameras were placed and avoided those locations. This implies that coyotes, particularly dominant animals holding territories, maintain intimate knowledge of their surroundings and avoid novel items.

The coyote lure operative device (CLOD) was developed by Marsh et al. (1982) as a substance delivery system for coyotes. Potential active ingredients include vaccines, contraceptive agents, physiological markers, and toxicants (Ebbert and Fagre 1987). Design modifications were made by Ebbert (1988), and the current model consists of a 30-ml plastic vial with a rigid nylon core (unit head) (Figures 1, 2), attached to a steel anchor stake driven into the ground (Figure 3). The plastic vial contains a "carrier" solution highly palatable to coyotes and the active ingredient to be delivered. The outside of the unit head is smeared with an attractant designed to elicit a biting and chewing response. Upon chewing the CLOD, coyotes ingest the active ingredient along with the palatable carrier solution. A complete history of the development of the CLOD concept is provided in Fagre and Ebbert (1988). With the continued restriction of predator control methods available to wildlife managers, the CLOD offers a delivery system

with the potential to be highly selective with little risk to non-target species, characteristics that may be more acceptable to the public (Reiter et al. 1999).

We investigated whether captive coyotes exhibited neophobic responses toward CLODs in familiar and unfamiliar environments. Knowledge of how coyotes respond to CLODs in a captive setting, where variables can be controlled, can provide insight into how wild coyotes may respond. Previous research suggests that coyotes are more likely to exhibit neophobic responses to novel stimuli in familiar than in unfamiliar environments. The objective of this experiment was to ascertain whether responses to the CLOD as a novel object in familiar and unfamiliar environments are consistent with previous research. This has important implications for placement of CLODs during actual use.

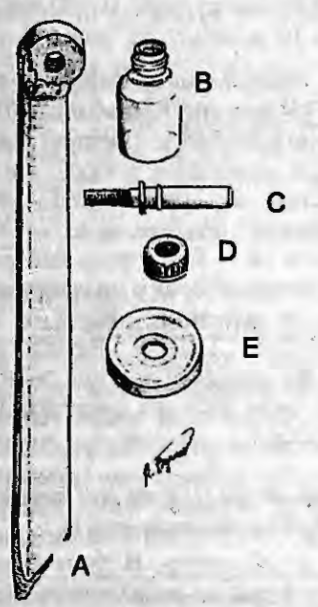

Figure 1. CLOD components include the steel anchor stake (A), 30-ml plastic vial (B), rigid nylon core (C), vial cap (D), and spill shield (E).

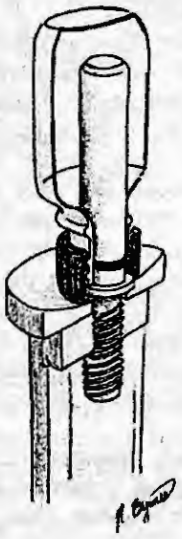

Figure 2. Cross-section of CLOD when fully assembled.

Figure 3. Fully-assembled CLOD as it appears anchored in the ground.

STUDY AREA

Experiments took place at the USDA APHIS National Wildlife Research Center Predator Ecology Center, located 8 km south of Logan, Utah. All experiments were conducted in the 1.0-ha enclosures. These enclosures consist of 4 wedge-shaped pens converging on a central observation building. Kennels for housing study subjects prior to observations are located at the base of the observation building, with 2 kennels opening directly into each of the experimental arenas. Each side of an individual wedge-shaped enclosure is defined as a "ray", and the back fence is defined as the fence arc furthest from the observation tower. The description of "left ray" and "right ray" refers to the fence as it is viewed from the observation tower toward the back fence arc. Vegetation in the experimental arena was mowed 1-7 days prior to starting experiments so devices could easily be seen from the observation building. A detailed description of this site was provided by Harris and Knowlton (2001).

METHODS

Study Subjects

Eighteen adult coyotes >1 year old were selected randomly from the captive colony, with an equal number of males and females. Ten animals were used for the unfamiliar territory tests and 8 for the familiar territory tests. All study subjects were naïve to the experimental arena and had not been used in previous studies involving lures.

Environment Descriptions

Unfamiliar Environment

Coyotes for this treatment were transported from the main colony to the kennels under the observation building and were given approximately 18 hours to acclimate to the kennels. They were released into the experimental arena the following morning prior to feeding and observations began immediately. Den boxes and shade shelters were available and water was provided ad libitum.

Familiar Environment

Subjects for this treatment were transported from the main colony to the kennels under the observation building and given 4 days to acclimate to the kennels and the experimental arena. Shade shelters and den boxes were available, and water was available ad libitum. Harris and Knowlton (2001) allowed 3 days for familiarization to the kennel and 17 days for familiarization to the experimental arena. Windberg (1996) used a 1-day familiarization period to the kennels, and a 5-day acclimation period before the experimental arena was considered "familiar". However, space-use patterns conducted by Windberg (1996) showed that coyotes explored the enclosure fully for 3 days, and then restricted their use to specific areas. A 4-day acclimation period was considered sufficient to become familiar with the kennels and experimental arena (D. Zemlicka, USDA APHIS National Wildlife Research Center, pers. commun.).

Device Placement

The side of the kennels facing the experimental arena was covered prior to device placement to prevent coyotes from watching where the device was placed. Devices were placed randomly 1 - 10 m from either the left or the right ray 20 - 100 m from the back fence, and 10 - 15 min prior to observations. Upon entering the experimental arena, one of us (ARB) paced the appropriate distance and drove the anchor stake into the ground with a hammer, attached the unit head, and applied the lure. After applying the lure, ARB used a varied walking pattern toward the exit gate prior to discourage leaving a second direct scent trail to the device. Unit heads were filled with 25 ml of a 19:1 mixture of non-toxic light corn syrup (Karo®, Best Foods, Englewood Cliffs, NJ) and powdered sugar ("Albertson's", Boise, ID) as recommended by Ebbert (1988). The unit head was smeared with 0.2 ml of Fatty Acid Scent (FAS; Pocatello Supply Depot, Pocatello, ID) and 0.2 ml of lubricating jelly ("Shopko", Green Bay, WI) to increase the lure's adhesive properties. Ebbert (1988) recommended using 0.5 ml of lure, but preliminary observations indicated this initiated a predominance of rub-rolling behavior, consistent with responses to excessive lure (S. Blom, Pocatello Supply Depot, Pocatello, ID, pers. commun.). For logistical purposes, 2 animals were tested concurrently in non-adjacent pens, reducing the risk of agonistic displays among study subjects. Experiments were approved by Institutional Animal Care and Use Committees at the National Wildlife Research Center in Ft. Collins, CO (QA-970), and Utah State University (IACUC # 1073).

Data Collection

Observations commenced at 06:30 and continued for 2 hours. Observations were video taped and transferred to Digital Video Disk (DVD) to facilitate later analysis. To compare the level of neophobic responses, we defined approach types based on previous studies by Harris and Knowlton (2001) and Windberg (1996). In addition, we collected data on time spent within 1 m of the device. The approach types are defined as follows:

1. Direct Approach: Unhesitating approach to within 1 m of the device, followed by visual and/or olfactory investigation.

2. Cautious Approach: Circular approach to ≤1 m of the device, with approach/retreat behaviors.

3. Neophobia/neophobic: Unwillingness to approach <1 m of the device after initial detection. We included the first approach toward the device in the data analysis. After the first approach, the device was no longer considered "novel".

4. Time spent within 1 meter: While previous research has analyzed time spent within 5 m of a novel object as a measurement of caution or neophobia (Harris and Knowlton 2001), we decided to use time spent within 1 m because we frequently observed study subjects passing within 1 - 5 m of the device without taking any apparent notice of it.

5. Number of Approaches: The number of times a study subject approached to <1 m of the device.

6. Activation: Ingestion of at least some of a CLOD's contents.

7. Handling time: Time spent biting, licking or chewing a CLOD.

Data Analysis

Approach type data was analyzed using Pearson's chi-squared test and maximum likelihood ratio test using PROC FREQ (SAS Institute 2002) with the null hypothesis that the proportion of neophobic responses is the same in both environments. To analyze the time spent within 1 m (hereafter "time"), handling time, and the number of approaches, we fit a 2-way analysis of variance in a completely randomized design comparing least squares means (hereafter "means") using the GLM procedure (SAS Institute 2002). All statistical analyses were performed with $\alpha = 0.05$.

RESULTS

We disregarded rearing history as an influential factor based on previous research (Harris and Knowlton 2001). Movements of 3 subjects were limited to pacing a short section of fence for the entire observation period. These individuals never approached the device and were discarded as "poor test subjects" (Phillips et al. 1990). The remaining study subjects (n = 15) approached and interacted with the device through olfactory investigation, rubbing, rolling, handling, or activation. Eight of 15 study subjects (53%) activated CLODs. Results for activation were too meager for statistical analysis relative to territory familiarity, but these data are presented for informational purposes in Table 1.

Table 1. Number of CLOD activations by male and female coyotes in familiar and unfamiliar environments in Millville, Utah, 2002 - 2003.

	Environment	
Sex	**Familiar**	**Unfamiliar**
Male	3	2
Female	2	1
Total	***5***	***3***

Table 2. Contingency table depicting the total and expected number of neophobic and direct approaches by captive coyotes to CLODs in Millville, Utah, 2002 - 2003.

	Type of Approach		
Area familiarity	***n***	**Neophobic**	**Direct**
Familiar	7	2	5
Unfamiliar	8	3	5
Total	***15***	***5***	***10***

Because sample sizes were too small for individual statistical analysis, the categories "caution" and "neophobia" were combined under the heading "neophobia" in a 2 × 2 contingency table (Table 2). Chi-squared analysis revealed no differences in the number of neophobic approaches (males and females combined) in familiar or unfamiliar environments using either the Pearson's

Table 3. Least squares means (Standard Error) of response variables with respect to coyote sex and status.

Variable	Sex by Environment Status			
	Male		*Female*	
	Familiar ($n = 4$)	Unfamiliar ($n = 4$)	Familiar ($n = 3$)	Unfamiliar ($n = 4$)
Time spent (mins) <1 m	24.51 (4.56)	7.81 (4.56)	15.55 (5.27)	10.87 (4.56)
Handling time (mins)	12.64 (2.80)	3.05 (2.80)	8.51 (3.23)	2.61 (2.80)
Number of approaches	5.75 (2.00)	7.50 (2.00)	6.33 (2.31)	3.00 (2.00)

chi-squared ($\chi^2 = 0.1339$, 1 df, $P = 0.7144$) or maximum-likelihood ratio tests ($\chi^2 = 0.1346$, 1 df, $P = 0.7137$).

Analysis of variance of main effects (Table 3) averaged over the levels of other factors revealed significant differences ($P = 0.0458$) in time with respect to environmental familiarity (hereafter "status"). No significant differences in time were detected with respect to sex ($P = 0.5466$) or sex-by-status ($P = 0.2318$).

Analysis of variance of handling time revealed no differences with respect to sex ($P = 0.4495$), or sex-by-status ($P = 0.5407$). Differences in handling time with respect to status were significant ($P = 0.0223$).

Analysis of variance of main effects of the number of approaches did not differ with respect to sex ($P = 0.3676$), status ($P = 0.7113$), or sex-by-status ($P = 0.2481$).

DISCUSSION

Previous research on responses to novel stimuli by captive and wild coyotes suggested that coyotes are more likely to investigate novel objects in unfamiliar environments where all stimuli are considered "novel" (Windberg 1996, Harris and Knowlton 2001). This phenomenon may explain why free-ranging coyotes are captured more frequently on the periphery or outside their home areas (Hibler 1977, Althoff 1978, Woodruff and Keller 1982, Windberg and Knowlton 1990). While neophobic responses to scent stations have been mixed, Windberg (1996) suggested that coyotes are more neophobic toward visual than olfactory stimuli, and less neophobic toward smaller items than larger ones. Previous studies have found that captive coyotes exhibit fewer neophobic responses to smaller items. Heffernen (2001) demonstrated that coyotes investigated small (10 cm) traffic cones more frequently than large (90 cm) ones. Size of the CLOD unit head may be small enough to overcome potential neophobic reactions. This implies that successful use of CLODs in wild populations may be more dependent upon the qualities of the olfactory attractant than perhaps size or placement location.

The results of this study concur with Windberg's (1996) findings regarding scent stations and suggest that neophobic responses to the CLOD may be based more on olfactory than visual cues. Phillips et al. (1990) also described olfaction as the primary cue in responses to various lures. Mason et al. (1999) found that color played a role in the frequency of M-44 activation, and Mason and Burns (1997) found that wooden dowels that contrasted with the color of the background were pulled more often than were those with more cryptic colors. This suggests that a lack of response could be due to poor detectibility. However, detection of the device did not appear to be an issue in this study. The 3 "poor test subjects" (described previously) who did not approach CLODs restricted their movements to a small section of the experimental arena and did not have the opportunity to encounter or smell CLODs.

The overall low activation rate, 53%, may be a function of lure strength. While FAS is designed to elicit a bite, lick, and chew response, high concentrations can result in a predominance of rub-roll behavior (S. Blom, Pocatello Supply Depot, Pocatello, ID, pers. commun.). This is supported by observations in which all coyotes that approached CLODs exhibited rubbing and rolling, but did not necessarily activate CLODs. Lure strength could also account for approach and retreat behavior, as well as a reluctance to approach closer than 1 m. Studies with CLODs in California revealed that use of highly concentrated lures resulted in avoidance behavior (RHS, pers. observation). While rub-rolling is not the desired response, Phillips et al. (1990) suggested this behavior could hold animals at a site and provide opportunities for activation later.

Repeated visits during the observation period by coyotes initially exhibiting neophobia frequently resulted in the downgrading of approach type to "direct", as well as eventual activation of the device. Thus, it is possible that decreasing the concentration of lure could have enhanced activation rates. On 3 occasions when the device was approached but not activated during the 2-hour observation period, activation did occur when study subjects were exposed to the device for up to 24 hours. This suggests if CLODs are available for a longer period of time, activation may be more likely.

Not all coyotes in this study located CLODs, nor did all coyotes that did locate CLODs activate them. This phenomenon implies that not only is it important to use an attractant that is detectable over longer distances, but to place CLODs in areas where coyotes are more likely to encounter them during regular movements within territories.

Coyotes spent more time within 1 m of the device with more handling time in familiar than in unfamiliar environments. While this could be explained by a higher number of activations in familiar than unfamiliar environments, it runs contrary to the expectation that novel objects in familiar surroundings would be avoided. Montgomery (1955) noted that novelty often elicits both neophobic and exploratory behavior and the strength of the stimulus can determine which behavior predominates. In this case, it appears the stimulus was sufficient to elicit exploration more frequently than neophobia. It is also possible that the lack of neophobic responses was the result of a stimulus-impoverished captive environment.

The captive study subjects are frequently in contact with human-induced stimuli and might not respond in the same manner as wild coyotes subjected to human exploitation.

MANAGEMENT IMPLICATIONS

Our data provides evidence that male and female coyotes will activate CLODs when encountering them, regardless of familiarity with the environment. These results suggest that coyotes may activate CLODs placed within their home range and increase the probability of targeting specific individuals. Research has demonstrated that livestock depredation by coyotes is the result of relatively few dominant animals (Connolly et al. 1976, Timm and Connolly 1977, Jaeger et al. 2001), and by those whose territories overlap livestock enclosures or pastures (Sacks et al. 1999b). Because coyotes frequently are difficult to capture within their home ranges using traditional methods, it is possible the lack of neophobic responses to the CLOD could be turned to the advantage of the livestock producer, wildlife manager, or Wildlife Services officer. While caution must be exercised in extrapolating results from captive to wild settings, these results suggest that placing CLODs within coyote home ranges potentially could target the animals occupying those home ranges, increasing the ability to target individual animals. In addition, methods that improve the selective potential of removal methods may be more accepted by the public and make implementation of such techniques subject to less opposition (Andelt et al. 1999, Reiter et al. 1999).

ACKNOWLEDGEMENTS

Funding was provided by the University of California Division of Agriculture and Natural Resources Competitive Grants Program, the Jack H. Berryman Institute (Wildlife Services Agreement #03-7401-0470 CA), and Utah State University. Some equipment and supplies were provided by the University of California Hopland Research and Extension Center. Special thanks to Doris Zemlicka, Stacey Brummer, Jared Hedelius, Patrick Darrow, John Shivik, and Michael Jaeger at the USDA APHIS National Wildlife Research Center Predator Ecology Center. Technical advice was provided by Dr. Frederick Knowlton and Dr. Carl Cheney. We are grateful to Jeremy Bruskotter for his field assistance, Nicole Byrnes for CLOD drawings, and Kim Sullivan for providing laboratory space. A final note of thanks to the coyotes.

LITERATURE CITED

ALTHOFF, D. P. 1978. Social and spatial relationships of coyote families and neighboring coyotes. M.S. thesis, University of Nebraska, Lincoln, NE.

ANDELT, W. F., R. L. PHILLIPS, R. H. SCHMIDT, AND R. B. GILL. 1999. Trapping furbearers: an overview of the biological and social issues surrounding a public controversy. Wildl. Soc. Bull. 27:53-64.

BARNETT, S. A. 1958. Experiments on "neophobia" in wild and laboratory rats. J. Compar. Physiol. Psych. 49:195-201.

BLEJWAS, K. M., B. N. SACKS, M. M. JAEGER, AND D. R. MCCULLOUGH. 2002. The effectiveness of selective removal of breeding coyotes in sheep predation. J. Wildl. Manage. 66:451-462.

BURRITT, E. A., AND F. D. PROVENZA. 1989. Food aversion learning: ability of lambs to distinguish safe from harmful foods. J. An. Sci. 67:1732-1739.

CONNOLLY, G. E., R. M. TIMM, W. E. HOWARD, AND W. M. LONGHURST. 1976. Sheep-killing behavior of captive coyotes. J. Wildl. Manage. 40:400-407.

CONOVER, M. R. 2002. Resolving human-wildlife conflicts: the science of wildlife damage management. Lewis Publishers, CRC Press, Boca Raton, FL. 418 pp.

EBBERT, S. M. 1988. Field evaluation and improvement of a new system for delivering substances to coyotes. M.S. thesis, Texas A & M University, College Station, TX.

EBBERT, S. M., AND D. B. FAGRE. 1987. Importance of attractant qualities for improving a new coyote delivery system. Proc. Gt. Plains Wildl. Damage Cont. Workshop 8: 189-194.

FAGRE, D. B., AND S. M. EBBERT. 1988. Development and testing of the coyote lure operative device. Proc. Vertebr. Pest Conf. 13:235-240.

HARRIS, C. E., AND F. F. KNOWLTON. 2001. Differential response of coyotes to novel stimuli in familiar and unfamiliar settings. Can. J. Zool. 79:2005-2013.

HEFFERNEN, D. J. 2001. Evaluation of multiple cues for increasing attraction of coyotes. M.S. thesis, Colorado State University, Ft. Collins, CO.

HIBLER, S. J. 1977. Coyote movement patters with emphasis on home range characteristics. M.S. thesis, Utah State University, Logan, UT.

JAEGER, M. M., K. M. BLEJWAS, B. N. SACKS, J. C. C. NEALE, M. M. CONNER, AND D. R. MCCULLOUGH. 2001. Targeting alphas can make coyote control more effective and socially acceptable. Calif. Agric. 55:32-36.

JOUBERT, A., AND J. VAUCLAIR. 1986. Reaction to novel objects in a troop of Guinea baboons: approach and manipulation. Behaviour 96:92-104.

MARSH, R. E., W. E. HOWARD, S. M. MCKENNA, B. BUTLER, AND D. A. BARNUM. 1982. A new system for delivery of predacides or other active ingredients for coyote management. Proc. Vertebr. Pest Conf. 10:229-233.

MASON, J. R., J. BELANT, A. E. BARRAS, AND J. W. GUTHRIE. 1999. Effectiveness of color as an M-44 attractant for coyotes. Wildl. Soc. Bull. 27:86-90.

MASON, J. R., AND R. J. BURNS. 1997. Coyote responsiveness to novel visual stimuli. J. Wildl. Res. 2:6-8.

MAYEAUX, D. J., AND W. A. MASON. 1998. Development of responses to novel objects in the titi monkey, *Callicebus moloch*. Primates 39:419-431.

METTKE-HOFMANN, C., H. WINKLER, AND B. LEISLER. 2002. The significance of ecological factors for exploration and neophobia in parrots. Ethology 108:249-272.

MONTGOMERY, K. C. 1955. The relation between fear induced by novel stimulation and exploratory behavior. J. Compar. Physiol. Psych. 48:285-290.

PHILLIPS, R. L., F. S. BLOM, AND R. M. ENGEMAN. 1990. Response of captive coyotes to chemical attractants. Proc. Vertebr. Pest Conf. 14:285-290.

REIDINGER, R. F., AND J. R. MASON. 1983. Exploitable characteristics of neophobia and food aversions for improvements in rodent and bird control. Pp. 20-39 *in*: D. E. Kaukeinen (Ed.), Vertebrate Pest Control and Management Materials: Fourth Symposium. ASTM STP-817, American Society for Testing and Materials, Philadelphia, PA.

REITER, D. K., M. W. BRUNSON, AND R. H. SCHMIDT. 1999. Public attitudes toward wildlife damage management and

policy. Wildl. Soc. Bull. 27:746-758.
SACKS, B. N., K. M. BLEJWAS, AND M. M. JAEGER. 1999a. Relative vulnerability of coyotes to removal on a northern California sheep ranch. J. Wildl. Manage. 63:939-949.
SACKS, B. N., M. M. JAEGER, J. C. C. NEALE, AND D. R. MCCULLOUGH. 1999b. Territoriality and breeding status of coyotes relative to sheep predation. J. Wildl. Manage. 63: 593-605.
SAS INSTITUTE. 2002. SAS/STAT User's Guide, Version 9.0. SAS Institute, Cary, NC.
SEQUIN, E. S. 2001. The influence of social status on coyote vulnerability to photo capture. M.S. thesis, University of Nevada, Reno, NV.
SHEPPE, W. 1966. Exploration by the deer mouse, *Peromyscus leucopus*. Am. Midl. Nat. 76:257-276.
TIMM, R. M., AND G. E. CONNOLLY. 1977. How coyotes kill sheep. Rangeman's J. 4:106-107.
WEBSTER, S. J., AND L. LEFEBVRE. 2000. Neophobia by the lesser Antillean bullfinch, a foraging generalist, and the bananquit, a nectar specialist. Wilson Bull. 3:424-427.
WINDBERG, L. A. 1996. Coyote response to visual and olfactory stimuli related to familiarity with an area. Can. J. Zool. 74:2248-2253.
WINDBERG, L. A., AND F. F. KNOWLTON. 1990. Relative vulnerability of coyotes to some capture procedures. Wildl. Soc. Bull. 18:282-290.
WOODRUFF, R. A., AND B. L. KELLER. 1982. Dispersal, daily activity, and home range of coyotes in southeastern Idaho. Northwest Sci. 56:199-207.