

PROJECT REPORT

Project Title: Field test of a bait delivery device for coyote management

Research Agency: Utah State University

Principal Investigator: R. Schmidt

Budget: \$80,825

Background: Predation by coyotes is a significant limiting factor for production of sheep and goats in the western United States. Environmental concerns and political actions typical of recent years have limited the tools and materials available to conduct effective coyote damage control. Specifically, Proposition 4 on California's 1998 ballot banned the use of leghold traps as well as the active ingredients registered for use in the Livestock Protection Collar (LPC) and the M-44 sodium cyanide ejector device.

Recent studies of coyote behavior and space use as related to livestock predation reveal that much of the damage is done by relatively few coyotes, who tend to be reproductive adults holding territories. It has also been shown that these "problem" coyotes are relatively difficult to control within their territories when using current predator control devices such as traps, snares, and the M-44 device.

The CLOD (Coyote Lure Operative Device), was developed by UCD researchers and tested at the UC Hopland Research Center in the 1980s. The device consists of an egg-sized plastic capsule, attached to a rigid epoxy core, anchored to a metal stake driven into the ground. The capsule typically contains up to 25 ml of liquid bait, which is readily taken by coyotes when it contains a sugar syrup. The CLOD also has potential for delivering a wide variety of materials including chemosterilants, biological markers, vaccines, or toxicants to coyotes. The CLOD can serve as a repeated reward stimulus to coyotes that ingest its non-toxic contents on a regular basis, which breaks down the fear and avoidance that coyotes routinely show to many standard control devices. Theoretically, this will make selective removal of problem coyotes not only possible but also quite efficient.

Unfortunately, no data are available on which coyotes within a pack will respond to the device in a wild setting. Understanding pack dynamics and establishing which pack members investigate and/or activate the device is a key element in targeting specific animals.

Objectives:

- 1) Determine the frequency at which resident coyotes encounter and activate the Coyote Lure Operative Device (CLOD) materials, thus dictating the required schedule for maintaining such devices in a future operational program.
- 2) Determine the social status of coyotes responding to the device and whether respondents change over time.
- 3) Determine whether the majority of coyotes utilizing a given property can be "marked" through their ingestion of materials from CLODs, and specifically, to determine if the majority of dominant, paired resident coyotes (those most likely to be involved in killing sheep and

lambs) can be so marked.

Summary:

Objective 1: Two study sites were used, one in Hopland, California, the second in Utah. At Hopland, CLOD activations were restricted to winter months, from December through March. In Utah activation began in November and continued until May. Factors that may have influenced the timing of activations include seasonal patterns of coyote movement, level of human disturbance, and type of attractant used. Fall and winter are typically seasons of coyote dispersal, which could have resulted in young and naive coyotes encountering the CLODs. The success of attractants is dependent upon the season and they are typically more successful during the cooler months of the year. Given the natural wariness of coyotes toward human disturbance, it is typically difficult to capture adult coyotes during the summer months. In addition, during the summer months, territories are well established and movement is restricted to territorial defense and foraging, probably reducing encounters with CLODs.

Objective 2: At Hopland 16 coyotes were captured, marked and released. Two marked coyotes died, leaving 14 animals that could potentially activate CLODs in addition to an unknown number of unmarked coyotes. We placed remote cameras next to CLODs to identify any coyotes investigating the CLODs.

Remote photography had limited success at Hopland in identifying coyotes, due to an inadequate number of cameras to monitor all CLOD locations and frequent camera malfunctions. Four photographs were obtained of coyotes investigating/chewing on CLODs. None of the coyotes photographed were marked. However, 3 individuals were identified based on pelage differences.

In Utah we fitted 19 coyotes with radio transmitters and tracked them during the summer months of 2004 and 2005. As above, remote cameras were set up next to CLODs. The radio telemetry provided information on which coyotes were resident, nonresident and transient. However, it was difficult to establish which animals were dominant or subordinate. Remote photography again was hindered by too few cameras and frequent camera failures. One adult female activated at least 10 of 28 CLODs, based on DNA analysis. This female is suspected to be the mate of a collared male, based on direct behavioral observation, and could be considered a dominant or breeding animal. This suggests that activation of CLODs by dominant breeding animals is achievable, but caution should be exercised in making broad extrapolations based on this data.

Objective 3: We filled CLODs with a carrier solution and colored glitter. We deployed 138 such CLODs at Hopland in Feb-Mar 2005. When a CLOD with glitter was activated, we checked nearby roads and trails for coyote scat. We collected and checked scat samples for glitter. Thirty-three CLODs with glitter were activated. Scats were recovered and examined for glitter, but glitter was not found in any sample. Our inability to find coyote scat with glitter is likely due to a limited search range. A more thorough search would require searching throughout coyote territories, which would be very labor intensive and increase human disturbance in the territories, possibly resulting in increased wariness by coyotes and decreased activation of the CLODs.

In conclusion, this project demonstrated that free-ranging coyotes will activate CLODs repeatedly and that CLOD activity is higher during fall and winter months than other times of year. The level of human disturbance associated with checking CLODs, lure type, and season of use all appear to be contributing factors to successful CLOD use. CLODs should be checked

from remote locations using binoculars and refreshed with new scent no more than once a month. Remote photography to document and identify coyotes activating CLODs met with limited success. We were unable to establish whether dominant coyotes can be marked through ingestion of CLODs containing glitter. Nontarget species investigated CLODs, but only opossums and mice appeared to have punctured them.

Final Update: 04/03/06