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DEPREDATIONS CONTROL RESEARCH OF THE U. S. FISH
AND WILDLIFE SERVICE, DENVER WILDLIFE RESEARCH CENTER

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(Presented at the Animal Damage Control Conference held
in Rapid City, South Dakota, November 30, 1977.)

Research to control predator depredations is one of three projects within the Section of Predator Damage. The project is directed from Denver, with several biologists and technicians at field stations located in Twin Falls, Idaho; Uvalde, Texas; and Rawlins, Wyoming, as well as in Denver. This is a brief summary of our efforts during the past 12 months and should be considered an informal progress report.

Before any of our field tests are initiated, preliminary work is necessary at our laboratory and pen facilities in Denver or Logan, Utah. For example, simulation of synthetic attractants is done in the laboratory at Denver by the Section of Supporting Sciences. These attractants are then tested in the field at various locations throughout the west.

TRANQUILIZER TRAP TAB (Denver - Logan)

More and more frequently, various interest groups are expressing opposition to use of the steel trap. In Ohio, a public referendum to ban the use of leg-hold traps was recently voted upon but defeated almost 2 to 1. A similar referendum is being considered in California. A tranquilizer trap tab has been fastened to the jaw of the steel trap. Coyotes caught in the trap chew the tab, are tranquilized, resulting in reduced trauma and foot injury.

Coated cheesecloth tabs containing 500 mg of Transvet have been found to tranquilize coyotes for at least 24 hours. Captive coyotes began to chew the tabs, which were fastened to the jaws of the trap, within 30 seconds after being caught. Addition of reserpine or other compounds to the Transvet extends the period of effectiveness to 48 hours. We plan to proceed with registration of the trap tab in 1978.

GUARD DOGS (Denver)

A pilot study was completed in 1978 with 4 Komondor guard dogs. Following a training session in Denver, the dogs were placed in pairs in fenced pastures with sheep flocks which had sustained recent losses to coyotes. Kills were documented for 60 days in each test--20 days before dogs were present; 20 days with dogs present, and 20 days after the dogs were removed. Sheep losses were 35 to 70 percent lower when the dogs were present. One pair of dogs harassed the sheep during one test. Additional work is planned in FY-1979.

ELECTRIC FENCING (Denver)

Pen tests at Denver were partly successful in keeping coyotes from killing tethered rabbits. Subsequently, field tests with electric fence were undertaken in North Dakota. Lambs were placed in 5-acre pens on 4 different ranches which historically have had coyote problems. The Gallagher (NZ) chargers were used. One enclosure was plain barbed wire; nearby was the electrically charged enclosure. Ten lambs were placed in the barbed wire enclosure and left until killing began. The electric fence was 30 inches high, 6 smooth wires, 5 inches apart. They were alternately charged, starting from the

bottom wire. Capsules containing an attractant were placed on the wires to entice coyotes to touch the wires with their noses. However, it could not be determined whether it worked. In two of the four tests coyotes killed 16 to 17 lambs in the barbed wire enclosure. The lambs were put inside the electric fence. In the first coyotes jumped the 30-inch fence and continued killing. The fence was raised to 66 inches and in each test killing stopped for 60 days, at which time the test was terminated.

TOXIC COLLARS (Twin Falls, Idaho)

Coyotes typically kill sheep by biting them on the neck and throat. This characteristic resulted in the development of a packet filled with a liquid toxicant that is placed on the neck of lambs on ranches where predation is occurring. Thus far, the most effective means of getting coyotes to kill collared lambs is to place the collars on a few target lambs and moving or confining the rest of the flock until the depredating coyote is taken. Until recently our field tests have not been effective because we lacked toxicants with the necessary characteristics. We are now initiating tests using 1080 as the toxicant and hopefully we will be able to demonstrate efficacy using this toxicant. Small radio transmitters will be used to monitor the activity and location of the collared lambs.

Another approach which has received rather limited attention is one of attaching a small bait attractive to coyotes to the ears of sheep being preyed upon by coyotes. This approach assumes that once a lamb is killed, the attractant in the ear-mounted bait is sufficiently enticing such that the coyote will consume the bait.

AVERSIVE CONDITIONING (Logan)

The Denver Wildlife Research Center is interested in determining whether or not lithium chloride or other aversive agents can be used to reduce coyote depredations on sheep. Although various news releases infer that the technique is successful, the data are inconclusive, and there are alternative explanations for some of the reported results. In our work at Logan, coyotes were seen to avoid LiCl by taste after they had eaten a bait and become "sick", but they continued to kill sheep. Not only were the coyotes not averted from killing, they were not even averted from the baits. They carefully ate those portions of the baits which did not contain LiCl. Our position at present is that extensive field tests are not justified unless we can demonstrate aversion under pen conditions, and additional pen work is planned.

PREDATOR ATTRACTANTS (Uvalde, Texas)

Many of the control methods presently used to control coyote depredation involves attracting animals to various devices, such as steel traps, M-44's, toxic baits, draw stations, etc. However, little research has been done to evaluate attractants in a systematic manner. Our Uvalde Field Station has been comparing different commercial, ADC program and synthetic attractants to determine which elicit the most visits and pulling behavior (for M-44's).

Sixty predator odor attractants have been field tested since January, 1976, using the standard scent-station technique. Most of the tests were made in South Texas. More than 30,500 scent capsules were exposed, yielding about 4,500 coyote visits and 3,700 behavioral responses. Many other species of predators and scavengers were also attracted. One of the most attractive

lures tested was DRC-6500, a synthetic fermented egg formula synthesized by Roger Bullard of the Denver Wildlife Research Center. (This was not the same as the compound used in the annual, west-wide predator survey.) The data at hand will identify those lures with the greatest potential for use on M-44's, traps, or other applications. Following replication tests in other parts of the west, attempts will be made to synthesize the best lures and to produce standardized products for distribution to FWS personnel through the Pocatello Supply Depot.

DEN FUMIGANTS (Denver and Rawlins)

The smoke cartridge sold by the Pocatello Supply Depot for many years as a predator and rodent fumigant is currently registered only for rodent use. The Pocatello cartridge, as well as alternate fumigants for coyote dens are being evaluated and compared in the laboratory at Denver and field tests are planned this coming spring by the Rawlins Station. We then plan to pursue EPA registration of the most promising fumigant.

MARKER STUDY (Rawlins and Denver)

The Rawlins Station has completed a study of two physiological markers for mammals and birds. Iophenoxic acid and Mirex were tested on coyotes, eagles, hawks, owls, red foxes, striped skunks, badgers, raccoons, ground squirrels, Mexican jays, magpies, white-footed deer mice, redwing blackbirds, crows, starlings and domestic cats. Iophenoxic acid marked all species except ground squirrels and birds for up to 8 weeks (coyotes to 200+ days). Ground squirrels and birds were marked for about 1 week. Mirex marked all species for at least 8 weeks when the test was terminated; it marked coyotes and golden eagles for more than 17 weeks.

PREDATOR BAITING TECHNIQUES (Rawlins and Denver)

This research is aimed at maximizing the effectiveness and selectivity of delivering both toxicants and non-toxic substances (chemosterilants; aversive agents) to coyotes. Two areas were selected for evaluating baiting techniques as used in the past years--one in Wyoming, the other in New Mexico. In Wyoming, draw stations composed of half a sheep carcass were placed at strategic locations. After one month they were baited with 20 small, fish-meal coated lard baits, followed by application of another 20 baits one week later. In New Mexico 20 baits were placed when the draw station, consisting of part of a cow, was set out, followed by another 20 baits one week later. Each bait contained 5 mg iophenoxic acid and 75 mg Mirex. One week after the second baiting in Wyoming and two weeks after in New Mexico, we started animal collections. Coyotes were collected by gunning from aircraft and other species were trapped or shot. Blood and tissue samples were taken from most animals; (blood only from an eagle); samples were analyzed in Denver. Collectively, 27 percent of the 67 coyotes showed the markers in their blood and so did some of the magpies, skunks, deer mice, 1 golden eagle, 1 swift fox, 1 great-horned owl, and grasshopper mice.

We are continuing this work evaluating synthetic draw stations and more attractive baits.

CONTRACT RESEARCH

The following contracts are or recently were active:

---Effectiveness of physiological aversive agents in suppressing predation on rabbits and domestic sheep by coyotes. Colo. State U. (Lehner, Horn) Follow-up by Ray Sterner at Denver.

---Selection and evaluation of chemicals for use in the toxic sheep collar. Univ. of Calif., Davis (Peoples)

---Use of the toxic collar for the control of coyotes in sheep and goat producing areas. Sul Ross State Univ. (McBride)

---Documentation of effects of aversive agents and predacies. Montana Coop. Wildl. Res. Unit (O'Gara)