

Using the M-44 in Coyote Damage Control

Wyoming Department of Agriculture



PREFACE

This manual is intended to provide the necessary background information to allow potential applicators to become certified in the use of M-44's, and to effectively and safely utilize the M-44 device for predator control.

Although primarily designed to compliment the required attendance at the M-44 training school for initial applicator certification, this publication also serves as a source of reference material for those who have already passed their written examination, and are certified, either privately or commercially, in the use of M-44's.

The Environmental Protection Agency has implemented 26 use restrictions on M-44's. These restrictions are presented in this manual with brief explanations on how they are applied.

The M-44's EPA label restriction No. 3 requires that all applicators must receive specialized training in the use of M-44's before they can be certified. This training will only be provided by the Wyoming Department of Agriculture. Once the applicator has completed the Department of Agriculture's training course, and has successfully passed the written examination, they will be issued a license. A grade of seventy (70%) or better, is required to pass this test.

This manual was first published in 1977, when the Wyoming Department of Agriculture originally developed the M-44 program. Several revisions have occurred since 1977, with the latest revision in 2012.



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USING THE M-44 DEVICE
IN COYOTE CONTROL

TABLE OF CONTENTS

<u>PART ONE</u>	<u>PAGE</u>
Chapter 1 History of the M-44 Device	4
Chapter 2 Certification of Applicators	5
Chapter 3 Toxic Effects of Sodium Cyanide	8
Chapter 4 First Aid for Cyanide Poisoning	9
 <u>PART TWO</u>	
Chapter 5 Basic Coyote Information	11
Chapter 6 Appearance of Animals Killed by Predators	14
Chapter 7 Characteristics of Predatory Species	16
 <u>PART THREE</u>	
Chapter 8 EPA Use Restrictions	17
 <u>PART FOUR</u>	
Chapter 9 M-44 Parts and Their Use	23
Chapter 10 Suggestions Pertaining to the Use of M-44's	27
Chapter 11 Baits and Attractants	29
Chapter 12 Preparing the M-44 for Use	30
Chapter 13 Selecting the Site	31
Chapter 14 Setting the M-44	33
 <u>PART FIVE</u>	
Chapter 15 Reporting Requirements	37
Chapter 16 Purchasing M-44's	40
Chapter 17 Using the M-44 on State Lands	42
 <u>PART SIX</u>	
Chapter 18 Alternatives to M-44 Use	42

APPENDIX

Appendix A Labels and Signs	43
Appendix B Scent Formulas	46
Appendix C Definitions	48
Appendix E Acknowledgements	54

CHAPTER 1

HISTORY OF THE M-44 DEVICE

The M-44 device (Figure 1) was adopted by the U.S. Fish and Wildlife Service (USFWS) in 1967 as a replacement for the Coyote Getter. The M-44 operates similarly to the Coyote Getter except that the M-44 device is spring loaded, and when the top is pulled, a trigger is released, thereby ejecting cyanide powder into the coyote's mouth. The spring mechanism is considered a safer device for the operator, since the cartridge used with the Coyote Getter had sufficient thrust to break the skin, if accidentally discharged.

In 1972, President Nixon instituted his Executive Order 11643, which terminated the use of Coyote Getters and the M-44 in all Federal programs, and on all Federal lands. Following Nixon's Executive Order, the Environmental Protection Agency, (EPA), instituted PR 72-2, which prohibited the interstate shipment of both devices and canceled the registrations of sodium cyanide for these devices. The total effect of the Executive Order and PR 72-2 was to effectively prohibit the use of cyanide for coyote control in Wyoming.

In 1974 and 1975, EPA issued nine experimental use permits to conduct research on the use of the M-44 to control coyotes. Based on this new research with the M-44 and other prior data, EPA issued full registration to allow the use of cyanide in the M-44 by the USFWS and various states, including Wyoming in 1976. But in doing so, placed 26 restrictions on the use of the M-44. (See pages 17-20).

On May 28, 1976, President Ford issued Executive Order 11917 amending Executive Order 11643, which permits the use of the M-44 on Federal lands, by Federal Employees, when authorized by the head of the Land Management Agency.

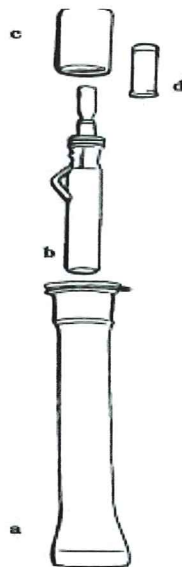


Figure 2

Figure 1. The M-44 device consists of the (a) base, (b) ejector, (c) capsule holder, and (d) cyanide-containing plastic capsule

CHAPTER 2


CERTIFICATION OF APPLICATORS

USE CLASSIFICATION:

The Federal Insecticide, Fungicide, & Rodenticide Act, (FIFRA), and the Wyoming Environmental Pesticide Control Act, (WEPCA), requires that all pesticide products be classified as either "GENERAL" or "RESTRICTED USE". General use pesticides may be used by the general public, while only applicators who are CERTIFIED may use RESTRICTED USE pesticides.

RESTRICTED USE pesticides are generally those products which pose a hazard to the applicator or which, if used improperly, could cause environmental damage. EPA and Wyoming recognize that even extremely toxic pesticides can be used safely if the applicator is trained in pesticide use and follows the label directions. Wyoming has a program designed to meet EPA requirements which will provide certification for anyone desiring to use a RESTRICTED USE pesticide product. The M-44 Sodium Cyanide Capsules are a RESTRICTED USE pesticide, and can only be applied by persons who are certified applicators. Correct use of the RESTRICTED USE pesticide is the responsibility of the applicator.

Figure 3
Wyoming M-44 Label

<p>PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS</p> <p>DANGER</p> <p>Sodium Cyanide may be fatal if swallowed or inhaled. Use only with adequate ventilation and do not breathe the gas or dust. When handling, setting or checking M-44 cyanide capsules, always have a least six pearls of Amyl Nitrite readily available in case sodium cyanide is swallowed or inhaled.</p> <p>While handling sodium cyanide capsules, protect hands with gloves and shield eyes to prevent burns and skin irritation. Wash thoroughly before eating or smoking.</p> <p>Do not use in areas frequented by humans or domestic dogs.</p> <p>ENVIRONMENTAL HAZARDS</p> <p>This pesticide is TOXIC TO WILDLIFE. Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of wastes. The M-44 ejector device may not be used in areas inhabited by endangered canids or felids.</p> <p>CHEMICAL HAZARDS</p> <p>Contact with acid liberates poisonous and flammable hydrogen cyanide gas.</p>	<p>RESTRICTED USE PESTICIDE</p> <p>DUE TO INHALATION HAZARD TO HUMANS AND THE NEED FOR HIGHLY SPECIALIZED APPLICATOR TRAINING</p> <p>For retail sale and distribution to and use only by Certified Applicators who have taken the required additional training, who are certified specifically to use M-44 Sodium Cyanide Capsules in M-44 ejector units, and for whom the Wyoming Department of Agriculture assumes a supervisory role with respect to the use of this product.</p> <p>M-44 CYANIDE CAPSULES</p> <p>For use in the M-44 ejector device to control coyotes (<i>Canis latrans</i>), red fox (<i>Vulpes vulpes</i>), gray fox (<i>Urocyon cinereoargenteus</i>) and wild dogs that (1) are suspected of preying on livestock and poultry, (2) are suspected of preying on federally designated threatened or endangered species, or (3) are vectors of a communicable disease.</p> <p>ACTIVE INGREDIENT: Sodium Cyanide 91.06% INERT INGREDIENTS: 8.94% TOTAL: 100.00% Capsules Net Weight grams</p>	<p>DIRECTIONS FOR USE</p> <p>It is a violation of Federal law to use this product in a manner inconsistent with its labeling.</p> <p>For use in specific situations to reduce canids (coyotes, red fox, gray fox and wild dogs) that (1) are suspected of preying on livestock and poultry, (2) are suspected of preying on federally designated threatened or endangered species, or (3) are vectors of a communicable disease. For use on pastures, range land and forest land only. Do not place in areas where food crops are planted.</p> <p>IMPORTANT</p> <p>Before handling or placing M-44 cyanide capsules or M-44 ejector devices, consult the Use Restriction Bulletin for specific use directions additional precautions information on endangered species, warning signs and antidotal measures.</p> <p>WARNING SIGNS</p> <p>Bilingual (Spanish/English) warning signs must be posted in the general area and at the application site.</p>
<p>DISTRIBUTED BY WYOMING DEPARTMENT OF AGRICULTURE 2219 Carey Avenue Cheyenne, Wyoming 82002 EPA REG. No. 35978-1 EPA EST. No. 56228-ID-1</p>	<p>KEEP OUT OF REACH OF CHILDREN</p> <p>DANGER  POISON</p> <p>STATEMENT OF PRACTICAL TREATMENT</p> <p>IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!</p> <p>IF SWALLOWED OR INHALED - Prompt treatment is of the utmost importance. Carry patient to fresh air, have him lie down. Patient should breathe the contents of an Amyl Nitrite pearl 15-30 seconds each minute if necessary, until five pearls have been used. Use artificial respiration if breathing has stopped. Remove contaminated clothing; but keep patient warm. CALL A PHYSICIAN IMMEDIATELY.</p> <p>IF ON SKIN - Immediately flush with plenty of water.</p> <p>IF IN EYES - Immediately flush with plenty of water and call a physician.</p> <p>SEE LEFT PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS</p>	<p>STORAGE & DISPOSAL</p> <p>Do not contaminate water, food, or feed by storage or disposal.</p> <p>PESTICIDE STORAGE: Store M-44 cyanide capsules under lock and key in a dry place away from food, domestic animals and acids.</p> <p>PESTICIDE DISPOSAL: Dispose of defective and used M-44 capsules by burial in a safe location in the field or at a proper landfill site. Incineration may be used instead of burial for disposal of used capsules. Place capsules in an incinerator or refuse hole and attend the burn until the contaminated material is completely consumed. If burned, stay out of smoke.</p> <p>CONTAINER DISPOSAL: Cardboard outer box: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. If recycling is not available, dispose of container by burial at a safe location in the field or at a proper landfill site. Styrofoam inner container: Nonrefillable container. Do not reuse or refill this container. Dispose of container by burial at a safe location in the field or proper landfill site. Contact Wyoming Department of Environmental Quality for guidance in disposing of containers at approved waste disposal facilities.</p>

Certified applicators are divided into two types or classes depending on their occupation: **PRIVATE APPLICATORS AND COMMERCIAL APPLICATORS.**

PRIVATE APPLICATORS:

Wyoming law defines a PRIVATE APPLICATOR as: "a certified applicator who uses ... any pesticide which is classified as RESTRICTED USE for the purposes of producing any agricultural commodity on property owned or rented by him, ... or (if applied without compensation other than trading of personal services between producers of agricultural commodities) on the property of another person."

A PRIVATE APPLICATOR is anyone treating pests on his/her own property. Private applicators are primarily farmers and ranchers, although homeowners and other people treating pests on their own property may also be PRIVATE APPLICATORS.

It is legal for a farmer or rancher who is certified, to use RESTRICTED USE pesticides on another person's property if they are not paid for their services, and only trade work with the other party. Written permission for using M-44's on another person's property must be obtained prior to their use, (see the Record of Livestock Losses, page 40). A private applicator cannot receive compensation for their application work.

LICENSE FEES FOR PRIVATE APPLICATORS:

There is no license fee for PRIVATE APPLICATORS.

LICENSING PERIODS FOR PRIVATE APPLICATORS:

PRIVATE APPLICATOR licenses are issued for that portion of the calendar year in which the license is issued or reviewed, plus fifty-two (52) months and shall expire on April 30 of the appropriate year. The Board of Certification shall require private certified applicators to attend a refresher training course every five (5) years, or be re-examined to maintain certification.

RE-CERTIFICATION FOR PRIVATE APPLICATORS:

All private applicators will need to be re-certified before a renewed license will be issued. For M-44's, the private applicator will be required to attend one of the Department of Agriculture's training courses. No re-examination is necessary unless more than five (5) years has elapsed and the license has expired.

COMMERCIAL APPLICATORS:

The Wyoming law defines a COMMERCIAL APPLICATOR as: "an applicator who uses ... any pesticide which is

classified for RESTRICTED USE for any purpose or on any other property other than as provided by the definition of private applicators."

In other words, if an applicator is not protecting his/her own crops, or livestock, then they are a COMMERCIAL APPLICATOR. This includes anyone who is using a RESTRICTED USE pesticide, and is charging someone to apply it, government employees using RESTRICTED USE pesticides as part of their job, and people doing demonstration or research work with RESTRICTED USE pesticides. Government employees, and county trappers are commercial applicators. In the simplest terms, a private applicator works their own property, while a commercial applicator works on someone else's property.

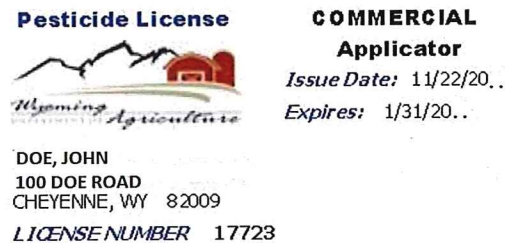


Figure 4
Wyoming Applicator
License

LICENSE FEES FOR COMMERCIAL APPLICATORS:

A license fee of \$25.00 shall be submitted with each application for a license. The \$25.00 license fee is good for the entire licensing period. Employees of a governmental entities are exempt from this license fee, providing the non-fee license is used only in the performance of his/her official duties.

LICENSING PERIODS FOR COMMERCIAL APPLICATORS:

The license for commercial applicators shall be issued for that portion of the calendar year in which the license is issued or reviewed, plus twenty-five (25) months, and shall expire on January 31 of the appropriate

year. The Board of Certification shall require commercial certified applicators to attend refresher training courses approved by the Board, or be re-examined to maintain certification.

RE-CERTIFICATION FOR COMMERCIAL APPLICATORS:

All commercial applicators will need to be re-certified before a renewed license will be issued. For M-44's, the commercial applicator will be required to attend one of the Department of Agriculture's training courses. No re-examination is necessary unless more than three (3) years has elapsed and the license has expired.

PURCHASES:

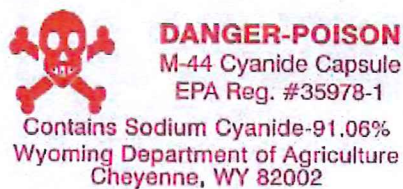


Figure 5
Wyoming Sodium Cyanide
Capsule Label

PURCHASING SODIUM CYANIDE RESTRICTED TO WYOMING DEPARTMENT OF AGRICULTURE AS SOLE DISTRIBUTOR

It is illegal for any dealer to provide a RESTRICTED USE pesticide to a non-certified applicator. For M-44's, the Wyoming Department of Agriculture is the sole distributor of M-44 cyanide capsules to private and commercial applicators in Wyoming, (see Figure 4) . A license will be issued by the Wyoming Department of Agriculture to every certified applicator. This license is required to purchase the M-44 cyanide capsules from the Department, and we encourage all applicators to keep their licenses with them at all times.

CHAPTER 3

TOXIC EFFECTS OF SODIUM CYANIDE

Sodium cyanide is highly toxic and dangerous if not handled properly. Toxic symptoms may occur if it is swallowed, inhaled as a dust, or absorbed through the skin. It is a skin irritant, and a solution of high concentration may also act as a corrosive agent. In the presence of acids, sodium cyanide liberates highly toxic acid gas. Water and other weak acids readily cause this reaction.

Sodium cyanide is rapidly absorbed in the bloodstream after being swallowed or inhaled as a dust. Skin absorption of sodium cyanide in amounts sufficient to cause poisoning is less common. However, in the

presence of perspiration it may react to form hydrogen cyanide, which is readily absorbed through the skin. In this manner it could produce cyanide intoxication. Toxic symptoms appear quickly due to the mechanism of poisoning. The time until death after taking a fatal dose is variable, but usually if death does not occur within an hour the patient recovers.

Sodium cyanide affects the cellular activities and functions of all tissues of the body by inactivating certain key cellular enzymes. As a chemical asphyxiate, it prevents the utilization of oxygen at the cellular level by inhibiting the activities of the tissue oxidative enzyme. Since the function of cellular respiration is necessary to life, any marked degree of interference with it quickly causes serious illness or death. Because of this interference oxygen cannot be absorbed from the arterial blood by the tissues. In severe poisoning, venous blood retains the bright red color of arterial blood due to the oxygen it carries.

Following ingestion of sodium cyanide, systemic effects appear quickly. After a large dose, the victim may become unconscious within a few seconds. The breathing is at first rapid, but soon becomes slow and gasping. Convulsions may occur but in cases of severe untreated cyanide poisoning, coma and death may occur within a few minutes without convulsions.

After smaller sub-lethal doses, one of the more prominent symptoms is weakness. This may be accompanied by dizziness, confusion, headache, and vomiting. These symptoms are rapidly followed by coma and occasionally by convulsions. The heartbeat is weak and irregular; breathing is initially rapid but soon becomes slow and shallow as the intoxication deepens. Milder forms of acute intoxication will result only in weakness, headache, dizziness, and nausea. The characteristic response to cyanide intoxication is the rapid loss of consciousness and cessation of breathing, except for the mildest of exposures.

CHAPTER 4

FIRST AID FOR CYANIDE POISONING



Figure 6
Cyanide Poisoning
First Aid Kit

Prompt treatment of sodium cyanide poisoning is of the utmost importance. If the patient has breathed sodium cyanide dust, they should be immediately removed to an area free from dust. If cyanide has contaminated the skin or clothing, the clothing should be immediately removed, but keep the patient warm.

A PHYSICIAN SHOULD BE CALLED IMMEDIATELY, and arrangements made for the immediate transport of the patient to medical facilities.

Maintenance of respiration is the most important initial first aid measure. If breathing has stopped, an effective means of artificial respiration or resuscitation should be started as soon as it is certain that the patient has a clear airway. This is done by examining the mouth to see if the tongue has dropped back. If it has, it should be pulled forward. False teeth, loose bridges, chewing gum, tobacco, etc., should be removed to prevent the patient from choking. Oxygen is recommended and may be administered by anyone properly trained. **Do not give alcohol in any form.**



Figures 7 & 8
Amyl nitrite pearls

If the victim is breathing unassisted, amyl nitrite may be administered. Break an amyl nitrite pearl in a cloth and hold lightly under the nose for fifteen seconds. Repeat five times at about fifteen second intervals. Those giving first aid should be careful to keep the broken pearls away from their own mouth and nose, because they may inhale the amyl nitrite, become dizzy, and be rendered incompetent to give proper aid to the poisoned patient. Amyl nitrite should not be used near any source of fire such as open flames, or lighted cigarettes. For further instructions, see the antidote package label.

Should cyanide granules be taken internally, the patient should be removed to fresh air. If the patient is conscious they should be made to vomit by giving warm salt water, (one teaspoon of salt for each cup of water). This should be repeated until the vomiting fluid is clear. To induce vomiting, the victim should be encouraged to stick a finger down their throat. If the victim continues to breathe unassisted, administer amyl nitrite pearls as previously described. In addition, for adults only: qualified medical personnel may prescribe discontinuation of the administration of amyl nitrite and inject intravenously 10cc of 3% sodium nitrite solution at the rate of 2.5cc to 5cc per minute, along with injection by the same needle and vein, 50cc of 25 sodium thiosulfate solution.

If sodium cyanide has entered the eyes, they should be irrigated immediately with large quantities of water for a minimum of fifteen minutes. The eyelids should be held apart during the irrigation to insure contact of water with all tissues of the surface of the eyes and lids. A physician, preferably an eye specialist, should be called into attendance. If a physician is not available, the eye irrigation should be continued for a second period of fifteen minutes. No eye wash should be used in the eyes unless ordered by a physician.

CHAPTER 5

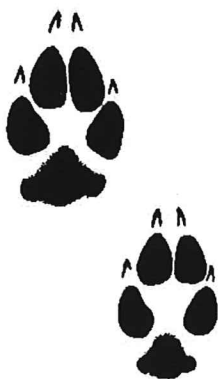
BASIC COYOTE INFORMATION

Experience has shown that coyotes are the principle predator of sheep. Coyote predation on other types of livestock has been documented, and although not of the magnitude of sheep losses, it can be serious in localized situations. There are a number of factors relating directly to livestock that can have an important bearing on predator loss. The relative importance of these factors will vary depending upon the type of livestock being considered.

Any device, tool, or method that is used continually over several years in any given area, will sooner or later not be as effective as when it was first introduced. With intense and continued use coyotes adapt to control measures. Producers are urged to use only one method at a time and to use the method sparingly. After removal of the coyote or coyotes responsible for the losses, it is suggested that the method employed be discontinued.

Coyotes tend to live in territories and it is highly likely that by removing coyotes from near the area where losses have been experienced, will result in removal of the coyotes responsible for those losses. In a short time other coyotes will move into that territory, but it is likely that those coyotes will not immediately kill those livestock, especially if changes in the handling of the young livestock is considered so as to try to avoid further losses.

Coyotes are members of the dog family, and resemble small German Shepherds. Both males and females are primarily gray-colored, with variations from nearly white, to reddish-brown, to nearly black; the underbelly is a lighter color. Color variations seem somewhat related to the type of habitat in which they live.



Figures 9 10, 11 Coyote prints and foot

Knowledge of coyotes is a very important factor when using any control device. To be successful in using the M-44 device, the applicator must possess some basic knowledge of coyote habits and behavior. Coyote tracks are good indicators of travel routes used by these animals, as coyotes tend to be animals of habit, (see Figures 9 and 10).

REPRODUCTIVE CAPACITY:

The percentage of female coyotes capable of breeding and successfully whelping is perhaps one of the most important variables in the reproductive capacity of local populations. Knowing litter size, age of maturity, and breeding capabilities of the animal is fundamental to wise management. In a study done in Kansas by Gier, 75 percent of the female coyotes were found to be sexually active under conditions with adequate food supplies, but less than 36 percent when conditions were less favorable.

Coyotes usually breed in February and March, and produce litters about nine weeks later, in April and May. Females sometimes breed the winter following their birth, at less than one year of age, particularly if the food supply is plentiful. Average litter size is five to seven pups, although up to thirteen in a litter have been reported. More than one litter from a single male parent may be found in a one den. Coyotes can cross-breed with dogs to produce the coy-dog hybrid. Hybrids are fertile, although their breeding seasons do not usually correspond to those of coyotes.



Figure 12

Distemper and the parvo virus, are the most common coyote diseases. Rabies and tularemia also occur, and may be transmitted to other animals and humans. Some parasites of coyotes are mites, ticks, fleas, worms, mange and flukes. Mortality is highest during the first year of life and few coyotes live more than ten years in the wild. Death by human activity is probably the greatest single cause of mortality.

HABITS:

Coyotes are found in nearly all states and terrain in this country, although populations are probably highest in the western states. Timber, brush, open prairie, and desert areas are favored habitat types, but coyotes are highly adaptable and are also found in farming areas, suburbs, and cities.



Figure 13

Coyotes are most active at night and during early morning hours, especially where human activity occurs, or during hot summer weather. With minimal human interference, or during cool, cloudy or foggy, rainy weather, they are active throughout the day. They bed in sheltered areas, but do not normally utilize dens except when raising young. They may seek temporary shelter underground in severe weather or when closely pursued. Dens are found in steep banks, rock crevices, sinkholes, and under brush, as well as open areas, but usually are in areas selected for protective concealment. Coyote dens are often holes that have been used by badgers, skunks, foxes or other animals, with entrances enlarged to about one foot in diameter. Dens vary in depth from four to five feet, to as deep as fifty feet. Dens usually have only one opening, but may have several openings.



Figure 14

Both parents hunt and bring food, usually regurgitating food for the pups until pups are several weeks old. Pups begin coming out of the den by three weeks of age, and within two months follow adults on short hunting trips or to feed on large prey. Pups are normally weaned by six weeks of age, and are frequently moved to find larger living quarters.

Extensive travel is common in hunting, although coyotes hunt the same areas regularly if plenty of food is available. An adult coyote can hold up to seven pounds of food in the stomach. They occasionally throw-up their stomach contents and bury the food remains for later use. The family usually remains together until late summer or fall, when pups become independent although occasionally they are found as groups until breeding season begins. Some coyotes will leave overpopulated home ranges and travel to less populated areas.

Their physical abilities include good eyesight, hearing, and an exceptionally keen sense of smell. Documented recoveries from severe injuries give testimony to great physical endurance. Although not as fleet as greyhounds, they have been measured at speeds up to forty miles per hour, and can sustain slower speeds for several miles.

FOOD HABITS:

As carnivores, 98 percent of the average coyote winter diet is animal matter, and two percent is vegetable matter. However coyotes feed heavily on cedar berries, prickly pear fruits, wild plums, cantaloupes, and watermelons in the summertime. Analyses of stomach contents of 8,263 coyotes from several western states indicated that approximately fifty percent of the diet was rodents and rabbits and twenty-five percent was carrion. Remains of domestic animals, deer, and birds amounted to 20.5 percent, and other food items including vegetable matter, amounted to four percent. However individual coyote diets often vary a great deal from the average.

CHAPTER 6

APPEARANCE OF ANIMALS KILLED BY PREDATORS



Figure 15



Figure 16

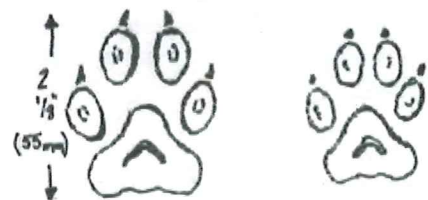
Positive identification of the predator causing the damage is the first step in a successful control program. Positive identification can be made by different factors such as tracks or scat, but the most readily observable indicator, other than seeing the predation in progress, is the appearance of the animals killed by predators. Much money and time can be wasted by the producer if control of the wrong predator takes place.

Coyotes normally kill smaller animals by biting the head or neck, but on older lambs and adult sheep kills are usually made by biting the throat just in back of the jaw and ear, (see Figure 15). The major cause of death is probably damage to the trachea and/or to nerves affecting respiration, blood pressure, and heart rate, rather than the loss of blood. Coyote kills usually have clean puncture wounds in the head or throat, although coyotes, especially inexperienced pups, occasionally attack the flank or hindquarters.

Dogs usually kill by attacking the hindquarters, flank, and head, and rarely kill as cleanly as coyotes. Badly torn and slashed animals with damage to head, ears, sides, are typical of dog predation.



Figure 17



Fore Print
2-1/8" Long

Hind Print
Slightly smaller
and narrower

Figure 18 Red Fox prints

Red foxes (Figure 17) kill and feed on small lambs much as coyotes do, but larger sheep often show many teeth marks in the throat. Occasionally foxes pull wool loose from flanks and hindquarters, or damage the head as dogs often do.

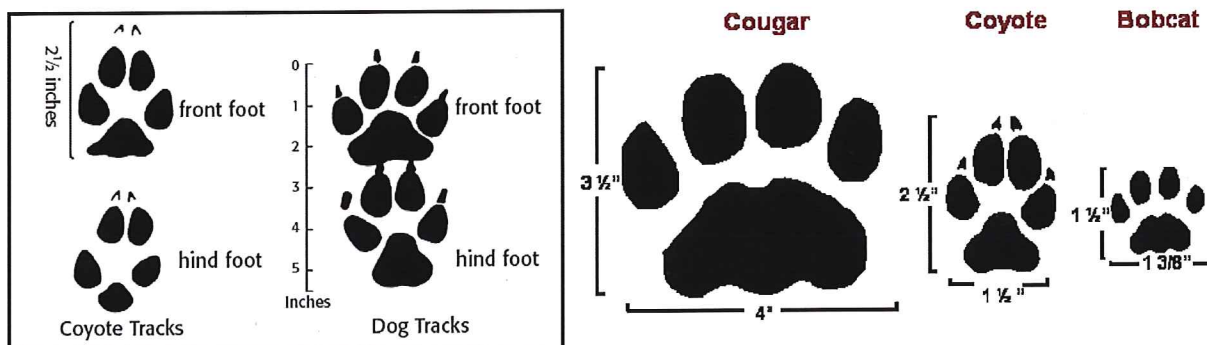
Bobcats kill much like coyotes, but victims may have claw marks on the skin of the neck, sides, and/or shoulders. Kills by mountain lions will have teeth marks that are larger, and further apart than those made by smaller animals. Larger animals killed by lions usually have claw marks on the neck and/or shoulders, and are often left partially or entirely covered by dirt, leaves, and twigs.

Black bear kills will have large teeth marks that are further apart than those made by coyotes, foxes, and bobcats, and usually are on the back of the head, neck, and shoulders. Bears also tend to "skin" the animal when feeding, leaving the inverted skin attached to the bones. Bruises to the back and flank areas would probably be caused by a bear. In addition, the udder of lactating female animals is often eaten first by black bears.

It is important to keep in mind that appearance of the prey animals is not always adequate to determine which species is responsible. Particularly in sheep, kills by coyotes, bobcats, dogs, lions, and bears, can be very similar in appearance depending on the method of attack by the individual animal. Many animals that were not killed by predators are fed on as carrion, and will not normally have marks on the neck and shoulders from teeth or claws. Also animals fed on as carrion usually do not bleed.

Feeding habits by various predators are often similar enough that it is difficult to determine the predator involved from the appearance of the carcass. Also, an animal may be killed by one species and fed on by one or more different species. Heavy feeding on sheep by coyotes usually results in substantial scattering of wool. When bears feed heavily, the hide is peeled back from the legs and the head, and wool scattered less than when coyotes feed. Attempts by lions to cover the carcass also help in determining predator species.

Similar appearance in kills and feeding habits point out that additional evidence is necessary to determine predator species. Fresh tracks, and droppings in the surrounding area are helpful. Coyote tracks are typically narrower and more compact than dog tracks, whereas cougar and bobcat tracks are round and show no claw marks. (See Figure 19).



Figures 19 Various prints

CHAPTER 7

CHARACTERISTICS OF PREDATORY SPECIES

<u>PREDATOR</u>	<u>AREA OF CONFLICT</u>	<u>COMMON PREY</u>	<u>ATTACK BEHAVIOR</u>	<u>FEEDING BEHAVIOR</u>
Wolf	Fringe of Settlement	Cattle Sheep Horses Dogs	Cattle: long chase, trails of blood, & hair, bites on hind quarters, flanks, shoulders, nose, tail.	Prefers viscera & hind limbs, preferential feeding not obvious in packs.
Coyote	State-wide	Sheep Calves Poultry	Sheep: Bites usually on the throat, & head. Calves: Bites on hind-quarters and flanks.	Enter through uppermost flank, consumes viscera and uppermost thigh first; leaves hides more or less in one piece.
Dog	Settled Areas	Sheep Calves Poultry	Harassment, Mutilation, bites on ears, shoulders, flanks, hindquarters, tail.	Feed lightly, or not at all.
Bear	Forested Areas	Cattle Sheep Swine	Blow to anterior, claw marks on face, and shoulders, bites on head, neck, and back, wounded prey common.	Drag prey to cover, flesh of hind limbs consumed first, skin and bones remain more or less intact. Grizzlies cover prey - Black Bears usually do not.
Cougar	Mountains and Foot-hills	Cattle Sheep	Leaps on back, and bites into neck and back vertebrae - teeth marks on upper neck, claw marks on shoulders.	Heart, lungs, liver, kidneys, then meat.

CHAPTER 8

M-44 CYANIDE CAPSULES M-44 EPA USE RESTRICTIONS EPA REGISTRATION NO. 35978-1

The EPA has placed 26 restrictions on the use of the M-44. These restrictions are part of the label, and must be followed completely. It is a violation of both Federal and State law to "use a pesticide in a manner inconsistent with its labeling." State law provides for \$500 fine, and one year in jail for subsequent offenses. Federal law provides for fines up to \$7,800 per count, and one year in jail. Following are the 26 EPA Use Restrictions, along with a brief explanation.

1. Use of the M-44 device shall conform to all applicable Federal, State, and local laws and regulations.

Annual inspections by the Wyoming Department of Agriculture will insure that applicators conform to all Federal, State, and local laws and regulations.

2. Applicators shall be subject to such other regulations and restrictions as may be prescribed from time-to-time by the U.S. Environmental Protection Agency (EPA).

Applicators will be notified by the Wyoming Department of Agriculture if other regulations or restrictions are prescribed.

3. Each applicator of the M-44 device shall be trained in: (1) safe handling of the capsules and device, (2) proper use of the antidote kit, (3) proper placement of the device, and (4) necessary recordkeeping.

This restriction requires that prior to using the M-44, the applicator must attend an approved training school, where these four issues will be discussed.

4. M-44 devices and sodium cyanide capsules shall not be sold or transferred to, or entrusted to the care of any person not supervised or monitored, by the Wyoming Department of Agriculture.

This restriction allows only the licensed applicator to have capsules, and prohibits them from giving or selling them to any unlicensed applicator. Licensed M-44 applicators will be monitored, as per restriction #1.

5. The M-44 device shall only be used to take wild canids: (1) suspected of preying on livestock, poultry, and Federally designated threatened or endangered species, or (2) that are vectors of a communicable disease.

This restriction prohibits the use of the M-44 to protect game animals.

6. The M-44 device shall not be used solely to take animals for the value of their fur.

The M-44 cannot be used only to take furs, as its use is for the protection of livestock, poultry, and Federally designated threatened or endangered species. It is legal to save the furs from coyotes and foxes taken by the M-44 coincidental to the protection of livestock.

7. The M-44 device shall only be used on or within 7 miles of a ranch unit or allotment where losses due to predation by wild canids are occurring or where losses can be reasonably expected to occur based upon recurrent prior experience of predation on the ranch unit or allotment. Full documentation of livestock depredation, including evidence that such losses were caused by wild canids, will be required before applications of the M-44 are undertaken.

The livestock owner will have to document his losses prior to any use of M-44 devices on his property. The Wyoming Department of Agriculture provides the necessary form for this documentation, (see Record of Livestock Losses, page 40). Each order of sodium cyanide capsules from the Wyoming Department of Agriculture is required to be accompanied by the Record of Livestock Losses. Failure to submit this form with the order, will result in delays, and the order will not be processed until the Record of Livestock Losses is on file.

8. The M-44 device shall not be used: (1) In areas within national forests or other Federal lands set aside for recreational use, (2) areas where exposure to the public and family pets is probable, (3) in prairie dog towns, or, (4) except for the protection of federally designated threatened or endangered species, in National and State Parks; National or State Monuments; federally designated wilderness areas; and wildlife refuge areas.

Areas set aside for recreational uses described in subsection (a) of this use restriction include areas where and when there are scheduled recreational events, areas identified on maps with "recreation" in the title, areas where developed or known camping occurs, areas near designated or known recreational trail heads, and designated or known vehicle access sites. Prior to M-44 deployment, applicators must determine whether this use restriction affects their intended M-44 use. For state lands in Wyoming, the Wyoming Department of Agriculture M-44 applicator supervisor will consult with the director, or his or her designee of the Wyoming State Office of Lands and Investments, regarding land management and licensed M-44 use.

Wyoming's label does not allow non-government use of the M-44 device on any Federal lands. The USDA/APHIS/Wildlife Services is the only authorized agency to use M-44s on Federal land. The prairie dog town restriction is designed to protect the Black-Footed Ferret. In many cases prairie dog towns would be ideal M-44 locations, however, coyotes will cross other areas to reach the prairie dog town, and suitable locations can be selected along coyote travel routes to and from their destination. Areas where there is known human recreation areas are prohibited for M-44 use.

9. The M-44 device shall not be used in areas where federally listed threatened or endangered animal species might be adversely affected. Each applicator shall be issued a map, prepared by or in consultation with the U.S. Fish and Wildlife Service, which clearly indicates such areas.

(1) Except as provided in paragraph (2) below, the M-44 device shall not be used in areas occupied by any federally listed threatened or endangered species or any federally listed experimental populations as set forth in the most current versions of maps that have been prepared or approved by the U.S. Fish and Wildlife Service (FWS). At the time of application, the applicator must be in possession of the most current map, if such map exists, that covers the application site. If maps covering the application site do not exist, then the M-44 applicator must, prior to the application, consult with FWS to determine whether the application site is in an

area occupied by listed animal species. Any use of the M-44 thereafter must be consistent with any conditions or limitations provided by FWS through such consultation.

(2) Notwithstanding paragraph (1), the M-44 device may be used in areas occupied by endangered, threatened, or experimental populations if use in such areas has a) been addressed by FWS in special regulations pursuant to section 4(d) of the Endangered Species Act (ESA), in requirements imposed through incidental take statements or incidental take permits, or in other applicable agreements with the FWS, and b) the applicator's use of the M-44 is consistent with any of the conditions or limitations provided by FWS for such use.

It is the applicator's responsibility to consult with the U.S. Fish and Wildlife Service regarding any areas where federally listed threatened or endangered animal species might be adversely affected.

10. One person other than the individual applicator shall have knowledge of the exact placement location of all M-44 devices in the field.

This person's name is required to be on the reporting forms in the space provided.

11. In areas where more than one governmental agency is authorized to place M-44 devices, the agencies shall exchange placement information and other relevant facts to ensure that the maximum number of M-44's allowed is not exceeded.

The Wyoming Department of Agriculture coordinates with USDA/APHIS/Wildlife Services in any area in which more than one agency is involved.

12. The M-44 device shall not be placed within 200 feet of any lake, stream, or other body of water, provided that natural depression areas which catch and hold rainfall only for short periods of time shall not be considered "bodies of water" for purposes of this restriction.

Two hundred feet is not very far. If a suitable location can be found near a waterhole, one can also be found two hundred feet away.

13. The M-44 device shall not be placed in areas where food crops are planted.

Food crops are grains, sugar beets, Pinto & Great Northern beans, and other crops which are planted for human consumption. The key words here are "planted" and "human consumption". Do not use M-44's in a wheat field unless the field has been harvested. They are allowable for use in a hay field.

14. The M-44 device shall be placed at least at a 50-foot distance or at such a greater distance from any public road or pathway as may be necessary to remove it from the sight of persons and domestic animals using any such public road or pathway.

Pertaining to this restriction, a public road or pathway in Wyoming is defined as any road which is fenced on both sides or dedicated to, or maintained by a Government agency. A pickup trail across private land is not a public road or pathway. Common sense must prevail, do not place M-44's where the public can see them.

15. The maximum density of M-44's placed in any 100 acre pastureland areas shall not exceed ten (10); and the density in any one (1) square mile of open range shall not exceed twelve (12).

In some instances, this will require coordination and cooperative efforts between neighbors. One well placed

M-44 will take coyotes and will be more successful than numerous poorly set devices.

16. No M-44 device shall be placed within 30 feet of a livestock carcass used as a draw station. No more than four M-44 devices shall be placed per draw station, and no more than five draw stations shall be operated per square mile.

Coyotes range over a large area and draw stations properly placed, will in many cases be effective. If the coyote is attracted to the draw station he will find the M-44. If the maximum number of five draw stations is used, then only two M-44's for 3 of the stations is allowed, and the two remaining stations will only be allowed to have 3 M-44's. (Refer back to EPA Use Restriction #15, maximum density per square mile = 12).

17. Supervisors of applicators shall check the records, warning signs, and M-44 devices of each applicator at least once a year to verify that all applicable laws, regulations, and restrictions are being strictly followed.

Each applicator is required to submit their records once a month, (See Chapter 15, Reporting Requirements, Monthly M-44 Report, pages 37-39). Inspections by the Wyoming Department of Agriculture will insure that applicators conform to all Federal, State, and Local laws and regulations.

18. Each M-44 device shall be inspected by the applicator at least once every week, weather permitting access, to check for interference or unusual conditions and shall be serviced as required.

If no access is able to be gained to a device for inspection, (i.e. device is buried under a snow drift), make this notation on the Monthly M-44 Report.

19. Damaged or nonfunctional M-44 devices shall be removed from the field.

Indicate on the Monthly M-44 Report form the number of damaged, non-functional, or missing devices, so an inventory can be maintained.

20. An M-44 device shall be removed from an area if, after 30 days, there is no sign that a target predator has visited the site.

If the problem has been solved, or if the target predator has not visited the site, the device shall be removed as required.

21. All persons authorized to possess and use sodium cyanide capsules and M-44 devices shall store such capsules and devices under lock and key.

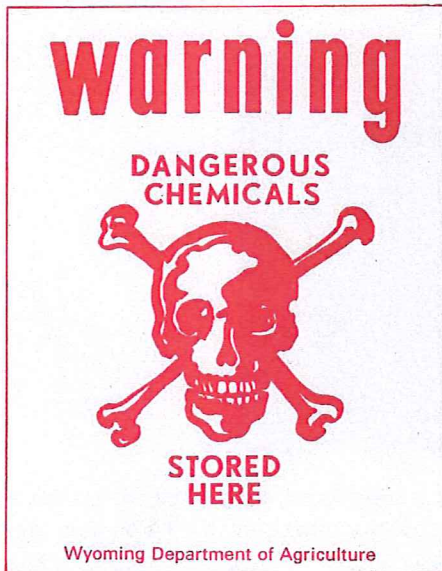


Figure 20 & 21 Required warning label and required lock box

PLEASE BE CAREFUL! Cyanide can, in the right circumstances, kill almost any animal. It is also advisable to placard the locked box with "Danger - Poison" signs. Be sure to store the capsules under lock and key, (See Figure 21).

22. Used sodium cyanide capsules shall be disposed of by deep burial, or at a proper landfill site.

Bury empty capsules in an isolated area two or three feet deep. Caked or faulty capsules should also be buried in an isolated area. Bury each capsule as soon as possible, do not collect them for later disposal.

23. Bilingual warning signs in English and Spanish shall be used in all areas containing M-44 devices. All such signs shall be removed when M-44 devices are removed.

a. Main entrances or commonly used access points to areas in which M-44 devices are set shall be posted with warning signs to alert the public to the toxic nature of the cyanide and to the danger to pets. Signs shall be inspected weekly to ensure their continued presence and ensure that they are conspicuous and legible.

b. An elevated sign shall be placed within 25 feet of each individual M-44 device warning persons not to handle the device.

Each shipment of capsules will contain some signs, additional signs can be purchased from the Wyoming Department of Agriculture. (See Warning Signs, Appendix A, pages 43-45). The public is usually uninformed about M-44 devices and the dangers of sodium cyanide, so the use of signs is the best way to prevent accidents.

24. Each authorized or licensed applicator shall carry an antidote kit on his person when placing and/or inspecting M-44 devices. The kit shall contain at least six pearls of amyl nitrite and instructions on their use.

Each authorized or licensed applicator shall also carry on his person instructions for obtaining medical assistance in the event of accidental exposure to sodium cyanide.



Figure 22 Required antidote in optional holster

At least one antidote kit containing six pearls of amyl nitrite is required to be purchased by the applicator when the first box of sodium cyanide capsules is ordered. The applicator must carry the kit on their person at all times while placing or inspecting M-44's. If an accidental discharge should occur while setting or inspecting the devices, it will be more convenient for the applicator to have the antidote kit in their pocket if needed. (See Figure 22). Keep in mind that the amyl nitrite carries a labeled expiration date, and should be replaced prior to the expiration date on each kit. (See also Figure 6, page 9).

25. In areas where the use of the M-44 device is anticipated, local medical people shall be notified of the intended use. The notification may be through a poison control center, local medical society, the Public Health Service, or directly to a doctor or hospital. They shall be advised of the antidotal and first-aid measures required for the treatment of cyanide poisoning. It shall be the responsibility of the supervisor to perform this function.

The Wyoming Department of Agriculture has contacted the appropriate agencies/facilities. However, M-44 applicators should also contact their local medical facilities/services and provide the necessary first aid information to their local physicians, as a means of assuring that appropriate first aid measures are available.

26. Each authorized M-44 applicator shall keep records dealing with the placement of the device and the results of each placement. Such records shall include, but need not be limited to:

- a. The number of devices placed.
- b. The location of each device placed.
- c. The date of each placement, as well as the date of each inspection.
- d. The number and location of devices which have been discharged and the apparent reason for each discharge.
- e. Species of animals taken.
- f. All accidents or injuries to humans or domestic animals.

These records are required to be kept. All of the above items are reported on the Monthly M-44 Report form, (See Chapter 15, Reporting Requirements, Monthly M-44 Report, pages 37-39). The Monthly M-44 Report form is self-carboning paper. The original is sent to the Wyoming Department of Agriculture, while the applicator retains the copy.

REGISTRATION OF THE M-44 DEVICE AND SODIUM CYANIDE CAPSULES IS DEPENDENT UPON ALL 26 RESTRICTIONS BEING FOLLOWED BY ALL PRIVATE AND COMMERCIAL M-44 APPLICATORS.

CHAPTER 9

M-44 PARTS AND THEIR USE

The Wyoming Department of Agriculture obtains the M-44 units from the USDA/APHIS/Wildlife Services Pocatello Supply Depot, Pocatello, Idaho, for distribution to certified private and commercial applicators. The principle difference between the two kinds of devices known as cyanide guns (which are no longer legal), and M-44's, is a substitution of a spring operated ejector for an explosive propellant. This is an M-44, not a coyote getter, cyanide gun, or gas gun, three terms used for the same device. Expulsion of the cyanide in the M-44 is accomplished by a 40 lb. spring and plunger.

The M-44 offers the following important features:

1. Safety - the danger from the propellant breaking the skin upon accidental "firing" of the unit is reduced.
2. Cyanide - load efficiency has been improved.
3. Initial alarm has been reduced, resulting in closer recovery of the animal.



Figure 23 The M-44 (Edstrom model) as manufactured at Pocatello Supply Depot from 1985 to 1992. From left: 6- inch stake, ejector, polyethylene M-44 cyanide capsule, and capsule holder.

THE M-44 EJECTOR:



Figure 24

The current M-44 ejector, (See Figure 24), designed by Pocatello Supply Depot (PSD) manager Paul Edstrom in 1984, was introduced in January 1985. The Edstrom ejector has a 3 1/3 inch long body with no bottleneck. A critical area of the ejector is that portion of the ground trigger that, when the trigger arm is depressed, releases the plunger with its full 40 pounds of thrust. After repeated firings, the sear contact wears and it becomes "hair-triggered" or there may be no contact at all. Do not use "hair-triggered" ejectors or any ejectors that are defective in any way. Failure of the bottom crimp has been a problem with certain lots of M-44 ejectors, particularly those made from January to June 1985. In July 1992, the M-44 ejector was modified to eliminate the bottom crimp.

Ejectors made since that date use a retaining pin rather than a bottom crimp to hold the ejector spring in place. This modification is expected to stop bottom blowouts.

THE M-44 CAPSULE:



Figure 25

The M-44 Capsule (See Figure 25), is semi-transparent to allow visual inspection of the capsule, and contains a mixture of sodium cyanide and inert ingredients. The amount of sodium cyanide mixture in each capsule is approximately 0.97 grams. This includes 0.88 grams of sodium cyanide (active ingredient) and 0.09 grams of inert ingredients.

One of the inert ingredients is a marking agent that can be detected in or around the mouths of animals killed by M-44 devices. The capsules distributed by the Wyoming Department of Agriculture contain a yellow Day-Glo marker. (Day-Glo is a registered trademark). If it is important to determine whether a particular animal was killed by an M-44, a short wave U-V light will be required as Day-Glo particles are not visible to the unaided eye. With the animal specimen in a dark place, Day-Glo particles will fluoresce under U-V light even if they aren't visible in the daylight.

The top of the capsule is sealed with a plastic cap and the sealant Scheel SC-100 Petroleum Hydrocarbon Wax. This sealant has proven to be better than beeswax, which was used prior to April, 1989. Beeswax capsules should no longer be used. When moisture has penetrated the capsule seal, the cyanide will have discharged the toxic gas, otherwise, the capsule is effective as long as the seal is intact and the cyanide is loose and not caked. If the seal is broken, or if the cyanide is solid, destroy the defective capsule and replace it with a capsule in which the cyanide is loose and free flowing. Capsules should fit into the capsule holders without removing the labels. **DO NOT REMOVE THE LABELS!** This is a violation of Federal and State law. If the capsules do not fit well, drill out the capsule holders with a 15/32" drill.

THE M-44 CAPSULE HOLDER:



Figure 26

The M-44 capsule holder, (See Figure 26), holds the sodium cyanide capsule in place for use above the ejector, and is wrapped by the applicator with an absorbent material. The absorbent material can be wool, yarn, cloth, or any material capable of holding the attractant scent bait. Prior to use, the capsule holder should be free of any burrs left over from the manufacturing process. Any burrs or projections found should be removed, and the holder fitted with a capsule prior to use. Proper ejection of the sodium cyanide requires that no wrapping extend over the top of the capsule holder.

THE M-44 STAKE:



Figure 27

The M-44 Stake, (See Figure 27), is a 6" long, rolled-top (swaged) stake, with an outside diameter of 3/4". The Edstrom-model ejectors are the only ejector intended for use with this stake.

With the M-44, mechanical thrust is up and a positive means of locking the ejector in the stake is required. The stake ring allows for this needed lock. The stake also has a hole drilled a couple of inches from its base to drain accumulated water. If soil is used inside the M-44 stake to prevent damage to it while driving the stake into the ground, make sure that the soil when packed remains below the drain hole. The trigger notch may be too shallow on some M-44 stakes manufactured since 1985. This creates a hazard because the ejector can fire when the operator attempts to close the lock ring, which will not close due to insufficient clearance over the trigger. To correct this, inspect the notch on all rolled top stakes and use a chain saw file to deepen any notches that are too shallow.

CHAPTER 10

SUGGESTIONS PERTAINING TO THE USE OF M-44's

GENERAL:

1. The most effective time period for using the M-44 is in the fall and winter.
2. Set M-44's should be lubricated and reset at least once a month if they haven't been pulled. When servicing undisturbed units, you may want to CAREFULLY test-pull some of them to confirm proper functioning.
3. When setting M-44's, never put yourself in a position to where cyanide will hit your face or eyes if the M-44 accidentally discharges. Stay upwind and do not stand or kneel over the device. Wearing a pair of goggles, a face shield, and/or safety glasses is advised when setting, inspecting, and maintaining the M-44.
4. Placing a small pill bottle, plastic bag, or the thumb from a leather glove over the capsule holder when servicing the device will help to confine the ejected cyanide if the unit accidentally discharges.

EJECTORS:

1. The ejector will rattle in the stake, which could possibly deter the target animal, if the ejector is not padded with wool or other material. Several layers of electrical tape wrapped around the ejector works also.
2. The new ejectors require a stronger pull to discharge than the pre-1985 models. This stronger pull is the result of a new, stronger spring. Several things can be done to reduce the trigger pull:
 - a. When cocking the trigger, set it at a right angle to the ejector center line, or by feel to avoid excessive sear engagement.
 - b. Lubrication of the trigger and plunger.
 - c. New ejectors should be cocked and fired about 6 times. When dry firing ejectors, hold them against a block of wood to avoid internal damage. Excessive repeated dry firing of the ejector will render the unit worthless.
 - d. Reshape the trigger in a vise to a vertical position.
3. M-44 ejectors need to be cleaned and serviced to work properly. Lubricate the trigger and plunger whenever you set the device. Silicone spray, petroleum jelly, mineral oil, and light greases, (food machinery lubricant), work well. Glycerine is not recommended.
4. Cyanide is the chief cause of corrosion to the ejector. Clean all cyanide off the ejector using a wire brush, then lubricate.
5. On the new ejectors with the retaining pin, the pin can be removed to take the unit apart for cleaning. Compress the spring from the bottom of the ejector with a small screwdriver and remove the pin with a pair of needle-nose pliers.
6. Do not expect ejectors to last forever, and never use an ejector if there is doubt that it is functioning properly.

CAPSULES:

1. Store all capsules in a locked, marked box at room temperature or where the temperature remains relatively constant. Repeated heating and cooling deteriorate the capsules faster. DO NOT STORE THE CAPSULES WITH HUMAN OR LIVESTOCK FOOD.
2. Using a desiccant such as silica gel in the storage container aids in keeping moisture to a minimum.

3. Do not carry large numbers of capsules in your vehicle. Only take what you expect to use that day. Keep the capsules out of the sunlight and away from heat. Do not carry the capsules in the glove box, on the dash, or in tool boxes where excessive temperatures occur.

4. Whenever you receive new capsules or use capsules that have been in storage, inspect them for the following:

a. Caking - Tip a few capsules back and forth, or listen while shaking them to see if the contents is free flowing. Any sticking or clumping means the sodium cyanide has started to cake. Do not use these capsules.

b. Overfull - When filled, the capsules have about 1/10" of air space below the top seal. Cyanide will expand when it absorbs water and if the capsule looks too full, moisture has gotten in through the seal, even though the seal looks good. If the capsule looks too full, check for caking.

c. Age - Check the date of manufacture marked on each box of capsules. A date of "01 12", means the capsules were made in January of 2012. Try to use the capsules within 6 months from the date of manufacture. Older capsules are likely to be caked or defective.

d. Flare - Flare or swelling of capsule mouths is caused by a chemical reaction between wax ingredients and plastic. Flare is accelerated by heat. Flare can be checked for by inserting the capsule into a capsule holder. If it does not slide in easily the capsule is flared and should not be used.

5. When capsules have been exposed to wet weather for several days or weeks it is advisable to remove the capsule and determine if the sodium cyanide is still in powder form, and not caked.

STAKES:

1. Never hammer directly on M-44 stakes as that will break or deform the tops. Use a driving rod, (wood dowel, bolt, engine valve) inside the stake to prevent damage. In hard or frozen ground, make a pilot hole first then drive the stake.

2. Always put gravel or dirt in the stake before driving it into the ground. This helps to prevent damage to the bottom of the stake. Be sure the dirt when packed, is below the drain hole. For the current 6" rolled top stakes, 5/8" diameter wood dowels cut to 7/8" long will work just as well to protect the stake while driving.

3. A "dirt skirt" can be used to keep sand or soil from entering the stake and interfering with the ejector. Use a 2" - 3" round piece of inner tube, cloth, or plastic with a 1/2" hole in the center. Place the cocked ejector in the stake, set the lock ring and place the "skirt" on the ejector before the capsule holder is screwed on. Cover the "skirt" with soil to keep it in place.

4. To prevent damage if pliers are used to remove the stake from the ground, grip the stake, not the top.

CAPSULE HOLDERS:

1. Once the capsule holder has been wrapped with the absorbent material, coat the wrapping with a couple of thin layers of wax. Remove any extra wax that will interfere with the ejection of the sodium cyanide.

2. Never dip a capsule holder into hot wax with a sodium cyanide capsule installed.

CHAPTER 11

BAITS AND ATTRACTANTS

The scent bait or attractant used on M-44 capsule holders, should be of such a nature that the coyote is encouraged to pull the top with his mouth. Some lures and scents designed for use with traps may work well on M-44's; however, many trap lures and scents will not work at all with M-44's because the coyote may want to urinate on the set, rub on it, or bury it. Also, the use of too much of any scent bait may act as a deterrent and not as an attractant. Use the scent baits sparingly.

It is a good idea to change scent baits or attractants often. Coyotes may become accustomed to certain baits and therefore are not attracted to the device, while other baits work better in some seasons of the year. Use a new capsule holder and new wrapping when changing baits, never mix baits.

Experimentation with different kinds of scent baits may be necessary to achieve success in controlling the target animal. The applicator can make their own baits, using some of the bait formulas located in Appendix B, pages 51-52, or purchase pre-mixed commercial baits.

An example of suppliers of relevant scents and trapping/snare supplies are:

O'Gorman Enterprises, Inc. (406)436-2234
Box 491
Broadus, MT 59317

High Plains Professional Lures, Inc. (307) 630-4675
PO Box 70
Hillsdale, WY 82060

Fur Country Lures (307) 334-9930
Box 312
Lusk, WY 82225

Minnesota Trapline Products, Inc. (320) 599-4176
7444 County Road 27 N.W.
Pennock, MN 56279

CHAPTER 12

PREPARING THE M-44 FOR USE

The M-44 when properly prepared and properly set in the right location will control canid predation. Coyote pups and young adults are generally those animals which will be the most readily controlled with the use of the M-44. If the applicator is already experienced with coyote trapping the results will be greater than for someone who is inexperienced.

Before using the M-44, the applicator will need to prepare the equipment for use. Time spent preparing the units properly before using them, will give better results, and will save time in setting them in the field. Taking short cuts in preparing and using the M-44, will only decrease the effectiveness of the devices and may place the applicator in the position of violating the label restrictions.

The stake should be allowed to slightly rust, and then boiled in a solution to dye the shiny metal a dark color, and then waxed with paraffin or beeswax. To dye the tubes, logwood crystals can be purchased from trapping supply companies, or the bark and cambium layer of oak trees and sagebrush will provide the desired effect. Inspect all the M-44 parts to assure they are working properly. Wrap and wax the capsule holders. Lubricate the ejector units as necessary, and set the ejector with the setting tool, again dry firing it a couple of times against a block of wood. Be sure to clean any excess lubricants or waxes from the devices. All of these items carry an odor, which might deter the coyote away from the M-44. Assemble the units, (without the capsules), to assure that the parts all fit together and work properly. Never assemble the units with a cyanide capsule installed until the device has been set for use in the field.



Figure 28

CHAPTER 13

SELECTING THE SITE

In all uses of the M-44, the applicator should be thoroughly familiar with restrictions on use as outlined on the product label, and in this manual. In setting the device, first mark the pasture in which the devices will be set. Warning signs indicating the nature of the materials being used are required to ensure that anyone entering the pasture will realize that the devices with toxicants are present. (See Gate Sign and Stake Sign, pages 44-45).

Once the pasture has been marked, the applicator selects site locations for the devices. Knowledge of coyotes' habits increases the chances of success. As mentioned on page 29, the bait is a fetid material which attracts the coyote in the same manner as a small piece of spoiled meat. Therefore, M-44 devices should be set where coyotes travel and forage for food. These baits are more effective when used during the cooler seasons.

Coyotes when traveling, will use the easiest and most convenient route available to them, such as livestock trails and road- ways. When using the M-44, these trails and roadways are usually one of the best places to select sites for setting. When selecting a site along livestock trails, the device should never be set directly in the trail, but off to the side that the prevailing wind is coming from. The device should be set one to two feet off the trail in the open, with a level approach for the coyote. The device can be a recessed set, (top of device level with the ground, or just below the surface), which will reduce the possibility of accidental discharge by livestock.

When using the recessed set, there should be room enough (three inch minimum) for the coyote to get his mouth down over the entire top of the device. The recessed set should not be used in rainy weather. This type of set is somewhat safer to use, and will also help to insure that when pulled, the coyote will get the full charge of sodium cyanide directly in the mouth. (See Figure 29). Covering the recessed set with a cow chip is advisable.



Photograph / Copyright - Guy Connolly,
U.S. Department of Agriculture
National Wildlife Research Center

Figure 29

If a recessed set cannot be made, usually a set can be made using small rocks placed around the device; or place the device between bunches of grass or other plants, dried cow bones, (See Figure 28, page 30), or cactus. These sets will provide similar results as a recessed set.

Coyotes have an acute sense of smell, and are highly suspicious of unnatural odors. Extreme care should be taken to insure against any foreign odors on gloves, boots, clothing, or the M-44 devices. After a site has been

selected for placement, approach the area in a direct route that leads back to your vehicle. Do not walk around the area, or leave any foreign odor. The person who is with you to witness the location of the device should not be allowed to walk around the area, as this will leave twice as much human odor. When checking the device, repeat the same procedures as above.

Information concerning placement locations indicate M-44's successfully attracted coyotes when set along travel trails and kill site locations. M-44's placed back from draw stations also proved to be successful placement locations. Placement of M-44's in locations, (See Figure 30), such as old bone piles and fence corners should be done according to the availability of these site locations, and in an area that shows the activity patterns of coyotes. The user of M-44's should check for signs, particularly tracks, after periods of snow and rain storms to determine coyote travel habits and areas. M-44's can then be placed relative to these findings.

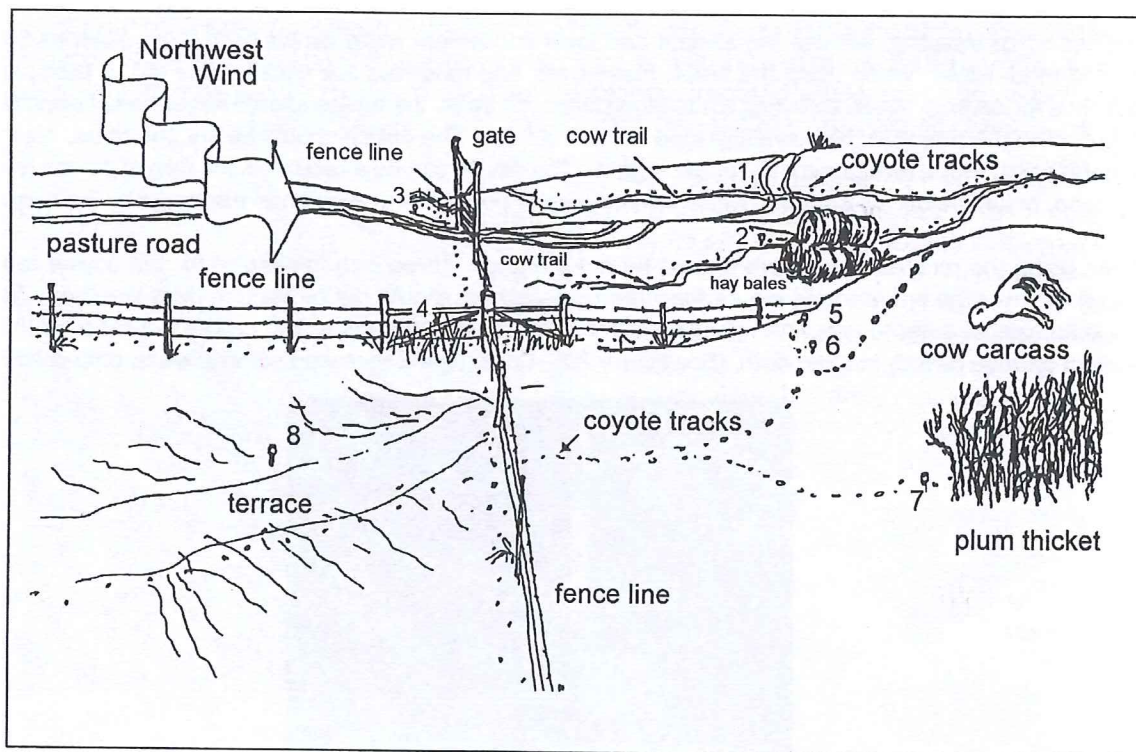


Figure 30

Remember, whatever placement location is decided upon, M-44's must be placed according to the EPA Use Restrictions listed on pages 17-23 of this manual.

CHAPTER 14

SETTING THE M-44

The following are the recommended procedures for providing the greatest safety, and effectiveness in setting the M-44.

Always think safety!! Stay upwind, keep your mouth closed, wear gloves and face and eye protection, and cup your hand over the capsule holder so as to deflect cyanide away from your face, and eyes in case of an accidental discharge.

Place a few pebbles or some soil in the bottom of the stake prior to driving it into the ground. In hard or frozen ground, drive a bolt into the ground and remove it to provide a pilot hole in which to drive the stake. Another alternative method is necessary when the device is placed on rocky ground, where the stake cannot be driven deeply. In this set, rocks can be piled around the device to keep it in an upright position. It is desirable to anchor the stake with a piece of wire to a nearby rock or bush. This prevents the coyote from carrying off the device. In all types of sets it is important to be sure the device is firmly in place to prevent this occurrence. In sandy ground, modified stakes with an extension attached is advisable. Place a driving tool inside the stake, and drive it into the pilot hole in the ground so the top of the stake is (1) about two inches above the surface for above ground sets, (2) even or slightly below the ground for recessed sets.



Figure 31



Figure 32

The ejector is then placed in the setting tool, (See Figure 33, page 34) to compress the plunger. Once the plunger has been compressed, raise the trigger arm as far as it will go, then back it off to the desired setting. The trigger should not be adjusted to such a light tension that the device could accidentally discharge during placement. Do not use ejectors that have worn triggers, or that have become "hair triggered". The desired pull force is 3 to 4 pounds, and any unit that does not eject at pull forces under 8 pounds, should be considered defective.



Figure 33

While wearing gloves, place the capsule containing the sodium cyanide into the capsule holder. Grasp the base of the capsule, and insert it into the threaded end of the holder. From this point on, keep your gloved hand cupped over the end of the capsule holder.



Figure 34

One of two methods can be used to attach the capsule holder onto the ejector. The holder can be screwed onto the ejector prior to inserting it into the stake, or insert the ejector into the stake, and then screw on the holder. The different types of set, (recessed, above ground, etc.), will determine what works best for the applicator. Be sure to stay upwind, keeping your face turned away from the device.



Figure 35

Place the ejector into the stake so the trigger lines up with the slot, (See Figure 35). Using the handle of the setting tool or the stake driving rod turn the lock ring on the side of the stake so the ring is directly over the trigger, (See Figure 35). Again, exercise caution to protect yourself in case of accidental discharge.



Figure 36

The device is now ready for baiting. Apply the bait to the sides of the capsule holder with a small brush, keeping as much as possible off the top seal of the capsule. Never apply bait to the top of the holder over the exposed capsule.

Once the set is completed, it is required that the location be marked clearly. Place a stake sign within 25 feet of the M-44, with the arrow on the sign pointing towards the device. The sign can be mounted on a wire frame or a wooden stake driven into the ground. The stake sign indicates the location of the device and the fact that it contains sodium cyanide. (See Appendix A, page 45)

ADDITIONAL SUGGESTIONS:

1. Maintain prepared capsule holders, ejectors and stakes, in separate containers. Dirt and bait from the stakes and capsule holders will gum up the ejector units if they are stored together.
2. Use one pair of gloves for use when setting the M-44 and a another pair to use when baiting the M-44. Gloves used when doing other ranch duties may pick up foreign odors and repel coyotes.
3. Make sure your field boots or overshoes are clean and not carrying foreign odors. Oil and grease from shops may be transported to the field while walking to and from the set M-44.
4. Avoid spitting, discarding cigarette butts, littering, or just plain loitering around the M-44 site.
5. In cattle pastures, the use of the recessed set is advised. Set and cover the M-44 device with a cow chip. This will help to eliminate the pawing and licking of the M-44 by cattle. Coyotes, with their acute sense of smell will find the M-44 and uncover it.
6. Coyotes will often visit an M-44 site, roll on the device, and return again before pulling it.
7. If the coyote has not frequented an M-44 site for 30 days and livestock losses continue, remove the device and either change baits, or relocate the M-44 to another site. If losses have stopped discontinue the use of the M-44.
8. Only maintain an inventory of sodium cyanide capsules on hand to fulfill the application needs. Any capsules 6 months old even under the best storage conditions may begin to cake.
9. When the M-44 device has been set off, check to see the location of the capsule plastic cap. If the cap (See Figure 25, page 37), is located near the base of the M-44, chances are good that a coyote received a direct hit and will be found nearby. Also look for teeth marks on the capsule holder wrapping.
10. The average recovery distance of a coyote from a discharged M-44 is about 50 yards.
11. If the M-44 applicator will be using M-44's on property where there are dogs, dog training capsules (pepper capsules), are available for training the dogs to avoid M-44's. Refer to the M-44 Order Form, page 43. When training dogs, be sure to use each type bait that will be used in the field.
12. Always keep the antidote kit in your pocket when setting and inspecting M-44's.

REMOVING M-44's FROM THE FIELD:

To disarm the capsule holder from the ejector, cup the gloved hand over the capsule holder, push down and unscrew the capsule holder from the ejector. Always work from the upwind side, keeping your head back and away from the device. Remember, always push down on the capsule holder, never pull upwards. Remove the stake signs and gate signs when you remove the M-44's.

CHAPTER 15

REPORTING REQUIREMENTS

The certified applicator is required to report to the Wyoming Department of Agriculture by the fifth day of each month for the preceding month. The EPA Use Restrictions #17 & #26 require the applicator to keep certain records. By using the Wyoming Department of Agriculture's Monthly M-44 Report, (Examples 1 & 2, pages 40-41), the applicator has adhered to the EPA Use Restrictions, and the Department's requirements. Send the original report (White copy), to the Wyoming Department of Agriculture, the Applicator retains the yellow copy. The examples in this manual have been reduced to fit on the page.

By following Example 1, the following information is required on each report.

1. The complete name of the Certified Applicator.
2. Complete mailing, and physical address.
3. The Certified Applicator's License Number.
4. The month and year that is being reported.
5. County, or Counties that the M-44's are placed in.
6. Telephone number of the Certified Applicator.
7. Number of devices in the field at the beginning of the month. This number is carried over from the previous month, (column #21).
8. Where the device is placed: Landowner, or Lessee.
9. Check box if the M-44 is on state land.
10. Date the device was placed.
11. Land Description where the device was placed: Legal and

- common pasture name.
12. Indicate number of devices placed.
 13. Write in the date, (month/day), that the devices were checked. They are required to be checked once a week.
 14. Indicate number of capsules discharged, and the cause of the discharge.
 15. Indicate number of capsules that you removed, and were not discharged, and the reason they were removed.
 16. Indicate number of capsules that were replaced, either by being discharged (#14), or removed (#15).
 17. Total number of capsules used in the month at this land description.
 18. Indicate the number and type of species recovered.
 19. Indicate number and species of any other animal taken by the M-44.
 20. Indicate number of devices you removed from the field.
 21. Number of devices in the field at the beginning of the month (#7) -plus- number of devices placed (#12) -minus- number of capsules discharged and/or removed (#14 & #15) - plus- number of capsules replaced (#16) -minus- number of devices removed from the field (#20) -equals = #21, number of devices in the field at the end of the month.
 22. Check box if any accidents occurred during the reporting period to humans, or domestic animals.
 23. Name, complete address, and telephone number of the individual who knows the exact location of each device, other than the certified applicator.
 24. Signature of the Certified Applicator.

EPA Registration #35978-1

Name _____ Telephone Number _____

Complete Address _____

Signature of Certified Applicator _____

(Mail completed form to the Department of Agriculture, Cheyenne, Wyoming 82002 by the fifth of each month for the preceding month.)

CHAPTER 16

PURCHASING M-44's

To purchase M-44 hardware and sodium cyanide capsules from the Wyoming Department of Agriculture, contact the Wyoming Department of Agriculture for a current order form. Each order of sodium cyanide capsules is **required** to be accompanied by the Record of Livestock Losses, pages 40 & 41. Without documentation of livestock losses, (historical loss, or current predation), the Wyoming Department of Agriculture cannot release sodium cyanide capsules to the Applicator. Commercial Applicators will need to complete a Record of Livestock Loss for each producer; for which control work will be conducted. Private Applicators will need to complete the Record for their own land, and if placing M-44's on a neighboring landowner's property, the Private Applicator will need to receive written permission from that landowner prior to use, (See page 41).

When ordering M-44 supplies, the order form needs to be completed in its entirety, signed and dated. The Department will return any requests for orders if the form is incomplete or no Record of Livestock Losses is attached. After placing your order, you will be sent your ordered equipment that includes an invoice that is payable upon receipt..

The Department also cannot release the sodium cyanide capsules to anyone but a certified applicator. The M-44 hardware, pepper capsules, and the gate/stake signs can be mailed directly to you.

It is _____

Record of Livestock Losses

Name of Producer: _____ Telephone: _____

Address: _____

DATE	LEGAL LAND DESCRIPTION			KIND OF LIVESTOCK	NUMBER OF LIVESTOCK	CAUSE OF LOSS
	Township	Range	Section			

I hereby certify that this is a true and accurate description of my losses.

DATE SIGNED _____

SIGNATURE OF LIVESTOCK PRODUCER _____

M-44 LICENSE NUMBER _____

COMMERCIAL APPLICATORS ONLY

NAME: _____

M-44 LICENSE NUMBER: _____

Send original to the WY Dept. of Agriculture.
Retain copy for your records.

advisable to make
of these forms for
Permission
Form

Adjoining Landowner Permission Form

additional copies
future use.

NAME OF ADJOINING LANDOWNER: _____
ADDRESS: _____
TELEPHONE: _____

I have no livestock losses, but I have no objection to _____
(name of private applicator) placing M-44 devices on my lands to control canid predators.

SIGNATURE

DATE SIGNED

Order Form



Wyoming
DEPARTMENT OF Agriculture

Matthew H. Mead, Governor
Jason Fearneyhough, Director
2219 Carey Ave. • Cheyenne, WY 82002
Phone: (307) 777-7321 • Fax: (307) 777-6593
Web: agriculture.wy.gov • Email: wda1@state.wy.us

The Wyoming Department of Agriculture is dedicated to the promotion and enhancement of Wyoming's agriculture, natural resources and quality of life.

M-44 Order Form (EPA Reg. #35978-1)

Name of Certified Applicator _____
Applicator License Number _____ Expiration Date _____
Street Address _____ Phone # _____
Mailing Address (if different) _____
City _____ WY, Zip _____

I have read, understand, and agree to comply with all the restrictions on the use of sodium cyanide as listed on the pesticide label and in the study guide titled "Using the M-44 in Coyote Damage Control", published by the Wyoming Department of Agriculture.

I hereby agree to submit all records required by the Wyoming Department of Agriculture and will allow the periodic inspection of all in-use M-44 devices.

I have the required antidote kit, or am ordering the required antidote kit below, which will be in my possession during placement and inspection of all M-44 devices, and am familiar with the use of this kit.

I will be responsible for any and all legal action that may result from my failure to comply with the restrictions on the M-44 devices or sodium cyanide capsules.

Signature of Certified Applicator (required)			Date		
08.07.12					
Antidote kits six (6) pearls of Amyle Nitrite	Quantity	Cost Total	Vinyl Stake Signs	Quantity	Cost Total
	x \$25.00/ea			x \$ 0.80/ea	
Sodium Cyanide Capsules (50/box)	x \$26.00/box		Vinyl Gate Signs	x \$ 0.70/ea	
Sodium Cyanide Capsules (25/box)	x \$19.00/box		Plastic Gate Signs	x \$ 2.25/ea	
Sodium Cyanide Capsules (10/box)	x \$15.00/box		>> SIGNS FROM WDA ONLY - SALES TAX APPLIES <<		
Pepper Dog-Training Capsules (50/box)	x \$15.00/box		M-44 Leather Belt Pouch	x \$21.00/ea	
Replacement parts					
Capsule Holders	x \$ 2.00/ea		Plungers	x \$ 3.00/ea	
Ejectors	x \$14.00/ea		O-rings	x \$ 4.00/ea	
Triggers	x \$ 5.00/ea		Stake Rings	x \$ 1.00/ea	
Springs	x \$ 1.00/ea		Setting Pliers	x \$26.00/ea	
Bottom Pin	x \$ 1.00/ea		Stakes (John Peter, solid bottom 6")	x \$ 9.00/ea	

Do Not Send Payment With This Form. You Will Be Billed Direct By
Pocatello Supply Depot

****This Form **MUST** Be Completely Filled
Out, Otherwise Orders Will Not Be Approved****
Prices Listed Are For Reference Only And Are Subject
To Change

Column 2 Total \$ _____

+
Column 1 Total \$ _____

Balance \$ _____

Shipping Costs Will Apply

WDA APPROVAL _____

DATE _____

STATE DIRECTOR, WILDLIFE SERVICES APPROVAL _____

DATE _____

CHAPTER 17

USING THE M-44 ON STATE LANDS

If a Certified Applicator wishes to place M-44 devices on state owned land, the applicator must contact the lessee of record, and obtain a letter from him stating that he has no objection to the use and placement of M-44 devices on that land.

This letter must be sent to the Commissioner of State Land & Farm Loan Office, Herschler Building, 3 West, 122 W. 25th, Cheyenne, Wyoming, 82002.

If the applicator is also the lessee of record, a letter should still be sent to the Commissioner of State Lands, stating the intent to use M-44's on State Land.

CHAPTER 18

ALTERNATIVES TO M-44 USE

Alternatives to the use of M-44's and sodium cyanide capsules include changing livestock management practices, shooting, fumigants, the livestock protection collar, leg-hold traps, snares, denning, guard dogs, trail hounds, sight hounds, annoying sounds, conventional and/or electrical fencing. All of these techniques have proven economical and practical in some situations. Although more costly, aerial hunting is allowed in Wyoming.

Knowing the habitat of the coyotes for which the control is to be conducted, can allow the use of several of these techniques into one management system of integrated control. As with any form of control, the use of too much of one technique repeatedly proves to be ineffective with time.

APPENDIX A

LABELS AND SIGNS

EPA APPROVED WYOMING LABEL

<p style="text-align: center;">PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS</p> <p style="text-align: center;">DANGER</p> <p>Sodium Cyanide may be fatal if swallowed or inhaled. Use only with adequate ventilation and do not breathe the gas or dust. When handling, setting or checking M-44 cyanide capsules, always have a least six pearls of Amyl Nitrite readily available in case sodium cyanide is swallowed or inhaled.</p> <p>While handling sodium cyanide capsules, protect hands with gloves and shield eyes to prevent burns and skin irritation. Wash thoroughly before eating or smoking.</p> <p>Do not use in areas frequented by humans or domestic dogs.</p> <p style="text-align: center;">ENVIRONMENTAL HAZARDS</p> <p>This pesticide is TOXIC TO WILDLIFE. Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of wastes. The M-44 ejector device may not be used in areas inhabited by endangered canids or felids.</p> <p style="text-align: center;">CHEMICAL HAZARDS</p> <p>Contact with acid liberates poisonous and flammable hydrogen cyanide gas.</p>	<p style="text-align: center;">RESTRICTED USE PESTICIDE</p> <p style="text-align: center;">DUE TO INHALATION HAZARD TO HUMANS AND THE NEED FOR HIGHLY SPECIALIZED APPLICATOR TRAINING</p> <p>For retail sale and distribution to and use only by Certified Applicators who have taken the required additional training, who are certified specifically to use M-44 Sodium Cyanide Capsules in M-44 ejector units, and for whom the Wyoming Department of Agriculture assumes a supervisory role with respect to the use of this product.</p> <p style="text-align: center;">M-44 CYANIDE CAPSULES</p> <p>For use in the M-44 ejector device to control coyotes (<i>Canis latrans</i>), red fox (<i>Vulpes vulpes</i>), gray fox (<i>Urocyon cinereoargenteus</i>) and wild dogs that (1) are suspected of preying on livestock and poultry, (2) are suspected of preying on federally designated threatened or endangered species, or (3) are vectors of a communicable disease.</p> <p>ACTIVE INGREDIENT: Sodium Cyanide 91.06% INERT INGREDIENTS: 8.94% TOTAL: 100.00%</p> <p>Capsules Net Weight grams</p>	<p style="text-align: center;">DIRECTIONS FOR USE</p> <p>It is a violation of Federal law to use this product in a manner inconsistent with its labeling.</p> <p>For use in specific situations to reduce canids (coyotes, red fox, gray fox and wild dogs) that (1) are suspected of preying on livestock and poultry, (2) are suspected of preying on federally designated threatened or endangered species, or (3) are vectors of a communicable disease. For use on pastures, range land and forest land only. Do not place in areas where food crops are planted.</p> <p style="text-align: center;">IMPORTANT</p> <p>Before handling or placing M-44 cyanide capsules or M-44 ejector devices, consult the Use Restriction Bulletin for specific use directions additional precautions information on endangered species, warning signs and antidotal measures.</p> <p style="text-align: center;">WARNING SIGNS</p> <p>Bilingual (Spanish/English) warning signs must be posted in the general area and at the application site.</p>
<p style="text-align: center;">KEEP OUT OF REACH OF CHILDREN</p> <p style="text-align: center;">DANGER POISON</p> <p style="text-align: center;">STATEMENT OF PRACTICAL TREATMENT</p> <p style="text-align: center;">IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!</p> <p>IF SWALLOWED OR INHALED - Prompt treatment is of the utmost importance. Carry patient to fresh air, have him lie down. Patient should breathe the contents of an Amyl Nitrite pearl 15-30 seconds each minute if necessary, until five pearls have been used. Use artificial respiration if breathing has stopped. Remove contaminated clothing, but keep patient warm. CALL A PHYSICIAN IMMEDIATELY.</p> <p>IF ON SKIN - Immediately flush with plenty of water.</p> <p>IF IN EYES - Immediately flush with plenty of water and call a physician.</p> <p style="text-align: center;">SEE LEFT PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS</p>		
<p style="text-align: center;">STORAGE & DISPOSAL</p> <p>Do not contaminate water, food, or feed by storage or disposal.</p> <p>PESTICIDE STORAGE: Store M-44 cyanide capsules under lock and key in a dry place away from food, domestic animals and acids.</p> <p>PESTICIDE DISPOSAL: Dispose of defective and used M-44 capsules by burial in a safe location in the field or at a proper landfill site. Incineration may be used instead of burial for disposal of used capsules. Place capsules in an incinerator or refuse hole and attend the burn until the contaminated material is completely consumed. If burned, stay out of smoke.</p> <p>CONTAINER DISPOSAL: Cardboard outer box: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. If recycling is not available, dispose of container by burial at a safe location in the field or at a proper landfill site. Styrofoam inner container: Nonrefillable container. Do not reuse or refill this container. Dispose of container by burial at a safe location in the field or proper landfill site. Contact Wyoming Department of Environmental Quality for guidance in disposing of containers at approved waste disposal facilities.</p>		

DISTRIBUTED BY
WYOMING DEPARTMENT
OF AGRICULTURE
2219 Carey Avenue
Cheyenne, Wyoming 82002
EPA REG. No. 35978-1
EPA EST. No. 56228-ID-1

GATE SIGN

DANGER!

POISON DEVICES IN THE AREA!

**THESE DEVICES ARE DANGEROUS
THEY CONTAIN DEADLY CYANIDE.
STAY AWAY AND KEEP YOUR
DOGS AWAY.**



ACTUAL SIZE

THESE DEVICES HAVE BEEN PLACED IN THIS AREA TO CONTROL ANIMAL DAMAGE TO LIVESTOCK, GAME ANIMALS AND CROPS. YOU ARE WARNED TO STAY AWAY FROM THESE DEVICES AND KEEP YOUR PETS AWAY.

¡PELIGRO!

¡ARTIFICO VENENOSOS EN ESTA LOCALIDAD!



DIMENSIÓN REAL

**ESTOS ARTIFICO SON PELIGROSOS.
CONTIENEN CIANURO, UN VENENO FATAL.
PERSONAS CON PERROS FUERA DE ESTA
ZONA.**

WYOMING DEPARTMENT OF AGRICULTURE

STAKE SIGN

DANGER



POISON



**CONTAINS
CYANIDE
DO NOT
TOUCH**

ANTIDOTE: Carry victim to fresh air. Have him lie down. Remove contaminated clothing but keep victim warm. Start treatment immediately. Call a Physician immediately!

If inhaled. Break an amyl nitrite pearl in a cloth and hold lightly under nose for 15 seconds. Repeat five times at about 15 second intervals. Give artificial respiration if breathing has stopped.

If swallowed. Break an amyl nitrite pearl in a cloth and hold lightly under nose for 15 seconds. If victim is conscious or when consciousness returns, give a tablespoonful of salt in a glass of warm water and repeat until vomit fluid is clear. Repeat inhalation of amyl nitrite five times at 15 second intervals. Give artificial respiration if breathing has stopped.

Never give anything by mouth to an unconscious person!

**SEEK MEDICAL ATTENTION
AMYL NITRITE IS ANTIDOTE
WYOMING DEPARTMENT
OF AGRICULTURE**

ANTIDOTE: If Sodium Cyanide accidentally comes into contact with the skin or eyes, wash thoroughly. Remain calm. Seek medical attention. Amyl Nitrite is antidote.
PENALTY for removal of signs, equipment or predatory animal caught.

¡PELIGRO!



VENENO



**CONTIENE
CIANURO
NO TOQUE**

ANTIDOTO: Levante el victimo al aire fresco. Que se acueste. Quite la ropa contaminada pero mantenga al victimo caliente. Emplee tratamiento inmediatamente. Llame a un medico inmediatamente!

Si lo inhalo. Quebre una capsula de amyl nitrato en un trapo y detengaselo debajo de la narise por 15 segundos. Repete cinco veces cada 15 segundos. Dele respiración artificial se el resuello se a parado.

Si lo trago. Quebre una capsula de amyl nitrato en un trapo y detengaselo debajo de la narise por 15 segundos. Si el victimo esta consciente o cuando consciencia devuelve, dele una cucharita de sal en un vaso con agua caliente y repete hasta el vomito esta claro. Repete inhalar amyl nitrato cinco veces cada 15 segundos. Dele respiración artificial se el resuello se a parado.

¡Nunca de nada por voca a una persona inconsciente!

RECIBA ATENCION DE MEDICO

**DEPARTAMENTO DE AGRI-
CULTURA DE WYOMING**

APPENDIX B

SCENT FORMULAS

Many scent formulas can be obtained from a number of sources. Some of these formulas may call for ingredients which may be illegal for use in Wyoming.

Chapter 23-3-304, of the Wyoming Game and Fish statutes state: "No person shall take a game animal, game bird, or game fish, and use any parts thereof, for bait to trap or poison any wildlife of Wyoming."

The following observations are important when making your own scent:

1. Strong artificials such as artificial musk, beaver castor, skunk musk, zinc valerate, etc., are used very, very sparingly, if at all.
2. Most Jerky preparations, made pasty or thinned by the addition of comparatively fresh blood, brains, liver, oils, etc., are more acceptable to coyotes than are the more decomposed preparations.
3. Mild odors work best in warmer weather.
4. The scent bait preparation set-up is usually in the vicinity of the home or camp, managing it so as to prevent unnecessary odors. This refers to the area around the applicator's home, or to a camp on someone else's property.

Rough fish are best for making the fish base. Prairie dog flesh, hamburger, and horse meat, are used extensively in making meat type bases. Other meats occasionally used incorporate the use of dog foods and mice, along with canned fish (sardines, salmon) from the grocery.

TO PREPARE THE SCENT BAIT:

1. Scale, gut and cut off heads and tails of fish, remove flesh from the other animals that are employed.
2. When using fish, dry for part of a day to remove some of the water from the flesh; this is not necessary with meat from mammals.
3. Grind fish or meat to a hamburger like consistency to speed up decomposition.
4. All the ground preparations to age for a month or more in glass jars that are covered to prevent fly-strike and loss of scent quality. Do not mix fish and meat at this stage in the preparation. One of the best ways to age these preparations is underground, with the jars covered by cloth, then with a board with soil piled over the top to a depth of 3 or 4 inches. The jars must be vented in this fashion to prevent explosions from gas formed as decomposition takes place. Aging should not be done during freezing weather.
5. When gas is no longer formed, the material will be broken down into a paste like form and decomposition is complete. At this stage, an antibiotic may be used to prevent bacterial destruction of the scent base. Streptomycin or aureomycin can be added at a rate of 500mg to ten pounds of base. These bases are

then used to prepare the various types of scent desired or can be used without adding musks.

Example Scent Formulas: (These should be mixed thoroughly before use.)

- | | |
|----------------------|-----------------|
| 1. Fish Base | 1 quart |
| Ground beaver castor | 1 Tbs. |
| Musk amberette | 1 teaspoon |
| 2. Fish Base | 1 quart |
| Hog brain base | 1 quart |
| Ground beaver castor | 2 teaspoons |
| 3. Fresh beef brains | 1 pint |
| Egg yolks | 12 each |
| Beef blood | 1 cup (8 oz.) |
| Fish base | 1/2 cup (4 oz.) |
| Ground beaver castor | 1/2 teaspoon |

Mix thoroughly, and allow to age in a vented glass jar. When aged, add musk and mix before use. Tonquin musk may be substituted for ground beaver musk. Use 1/4 teaspoon. Keep in mind that the aging process may take up to a month or more.

Scents can be quickly prepared with the following ingredients:

- | | |
|-------------------------------|--------------|
| 4. Canned Dog Food (98% meat) | 1 pound |
| Beef brains | 1 pound |
| Beaver castor | 1/2 teaspoon |

Allow brains to rot, then mix with dog food and then add beaver castor.

- | | |
|--------------------------------|----------|
| 5. Beef liver (baby food) | 5 cans |
| Cream or tuna fish (baby food) | 2 cans |
| Sardines | 1 can |
| Artificial musk | trace |
| Eggs | 4 |
| Calf brains | 2 pounds |

Mash together liver, tuna fish, sardines (including oil), and musk. Whip eggs and mix in well. Place in jar. Mash brains and pour on top of ingredients, but do not blend. Cover jar with cheese cloth and bury. Five weeks later take up jar and mix contents well.

- | | |
|--------------------------------------|--------|
| 6. Red Heart dog food - fish flavor | 8 oz. |
| Mink musk | 1 oz. |
| Mineral oil | 3 oz. |
| 7. Red Heart dog food - liver flavor | 16 oz. |
| Glycerine | 3 oz. |

APPENDIX C

DEFINITIONS

Acceptance:

Refers to the palatability of baits and toxicants.

Acclimation:

Process of adaptation by an individual organism to a new situation.

Adult:

Sexually Mature; an animal that has or is capable of contributing new individuals to a population.

Age Composition:

The arrangement of age classes in a population, which describes the relative strengths of the age classes. Syn, age structure.

Aggressive Behavior:

Includes both combat and aggressive display to drive the stimulus object away or otherwise modify it by intimidating, injuring, or even killing it.

Agonistic Behavior:

Aggressive behavior associated with conflict or fighting between two individuals.

Animal Unit:

A measure for converting types of animals to the forage resources, based on the equivalent of the forage required by a mature cow of about 1,000 pounds.

Bait Extender:

An edible or non-edible material added to increase the bait's bulk to dilute the concentration, or make the bait easier to handle.

Balance of Nature:

The relationship of the population densities of the diverse species of organisms that make up an ecologic community.

Biological Control of Vertebrates:

An attempt to reduce the population density of a pest species (i.e. increase mortality, reduce natality, or cause a significant emigration), either by increasing predation, manipulating the conditions of the habitat, introducing or stimulating epizootics (diseases), or by the application of antifertility agents.

Buffer Crops:

Crops deliberately planted to take the feeding pressure of vertebrate pests off more valuable crops.

Buffer Species:

An animal species constituting food for predators to the benefit of game or domestic stock; a comparatively undesirable animal species that lessens or neutralizes the effects of predators on a desirable species.

Carrying Capacity:

The maximum density of a particular species of animal that can be maintained in a given ecosystem on a sustained basis without deteriorating the habitat, i.e., the number of individuals that a habitat can maintain in a healthy condition.

Chemical Toxicant:

Any chemical substance, which, when ingested, inhaled, or absorbed, or when applied to, or injected into the body in relatively small amounts, may cause significant bodily malfunction, injury or death to animals or man by its chemical action.

Chemosterilant:

A chemical substance that causes sterilization or prevents effective production.

Conservation:

The perpetuation (not preservation per se), and wise use of natural resources and conservative use of non-renewable resources, such as natural gas, oil, and minerals.

Cyclic:

A population with great variation between high and low densities, (excluding seasonal fluctuations), that occur with cyclic regularity.

Deprivation:

Withholding food, water, sexual contact, etc.

Ecology:

Derived from the Greek oikos, meaning house or place to live. A branch of biology that is concerned with organisms in relation to environment.

Economic Control:

The reduction or maintenance of a pest density below the economic-injury level, or any attempt to reduce a pest population to the economic threshold.

Economic Threshold:

The density at which control measures should be determined to provide the necessary time to initiate control to prevent an increasing pest population from reaching the economic-injury level.

Ecosystem:

It includes an ecological community (of organisms) together with its habitat (climate and physical features of the environment).

Endangered Species:

A species whose prospects for survival and reproduction are in immediate jeopardy due to loss of habitat, change in habitat, over-exploitation, predation, competition, or disease.

Endemic:

A disease caused by an indigenous pathogen.

Environment:

All the organic and inorganic features that surround and affect a particular organism or group of organisms, i.e., both the biotic and physical factors of the habitat.

Eradicate:

Often used to imply the local extermination of a species, (best stated as local eradication).

Exotic:

An organism that is not native to the region in which it is found.

Extinction:

The disappearance of a species, due to the remaining individuals of that species being incapable of maintaining a viable population.

Feral:

An organism that has escaped from cultivation or domestication and is established in a wild state.

Food Chain:

A sequence of species within a community, each member of which serves as food for the species next higher in the chain.

Fur Bearer:

Any animal sought for its fur.

Game Management:

The art of making land produce a sustained crop of wild game for recreational purposes.

Graminivorous:

An animal that eats grass.

Habitat:

It is the environmental situation (usually only climate and physical features of the environment) in which or on which any community, species, or individual lives.

Home Range:

The area over which an individual animal habitually travels while engaged in its daily activities.

Immunity:

Following repeated exposures to pesticides, drugs, or pathogens, the organism acquires the ability to resist the agent or infection.

Indicators:

Indicator species of plants or animals often recur again and again in widely separated ecosystems of similar types and serve as an indicator of certain general characteristics of the environment.

Integrated Control:

Is a management system which, within the area of associated environments and population dynamics of the pest species, uses all suitable techniques and methods in as compatible a manner as possible to maintain pest populations at levels below those causing economic injury.

Invasions:

Spread of a species into a community where it was not formerly represented.

LD₅₀:

The amount of a chemical necessary to kill 50% of a population. Usually expressed in milligrams of toxicant per kilogram of body weight, (mg/kg).

LD₁₀₀:

The amount of toxicant needed to kill 100% of a population. Usually expressed in milligrams of toxicant per kilogram of body weight, (mg/kg). LD₁₀₀ means that a chemical is highly toxic.

Learning:

The process that produces change in individual behavior as the result of experience.

Life Cycle:

The stages an organism passes through from the fertilized egg to death.

Limiting Factors:

Any environmental factor that limits the distribution and/or the size of a population.

Marginal Habitat:

Where individuals or populations live a tenuous existence and seldom successfully reproduce.

Multiple Use:

Harmonious use of land for more than one of the following purposes: grazing of livestock, wildlife production, recreation, watershed, and timber production; but not necessarily the combination of uses that will yield the highest economic return or unit output.

Natality:

Birth Rate.

Natural Control:

The maintenance of a more or less fluctuating population density with certain definable upper and lower limits over a period of time by the combined actions of abiotic and biotic elements of the environment.

Overpopulation:

A population level that the habitat cannot sustain indefinitely.

Pesticide:

A substance or mixture of substances intended for destroying, repelling, or mitigating any vertebrate or invertebrate pest or preventing the species from becoming a pest.

Placebo:

An inactive substance; in a test bait that contains all the same ingredients except the toxic or test material.

Plague:

1. A drastic increase in the population and "outbreak" as a plague of mice or locusts.
2. Commonly used in reference to the disease, bubonic plague, caused by *Yersinia (Pasteurella) pestis*.

Pollution:

Environmental (air, water, land, cities, etc.) contamination.

Polyandry:

The mating of a single female with several males.

Polygamy:

The mating of one male with several females.

Predacide:

Chemical substance used to poison predators.

Predatory Animal:

Any mammal, bird, or reptile that habitually preys on other animals.

Rodenticide:

A pesticide applied as a bait, dust, or fumigant, to destroy or repel rodents and other animals, such as moles, rabbits, and hares.

Secondary Poisoning Effect:

The result attributable to a chemical toxicant which, after being ingested, inhaled, or absorbed by or into, or when applied to or injected into a mammal, bird, or reptile, is retained in its tissue, or otherwise retained in such a manner and quantity that the tissue itself or retaining part, if thereafter ingested by man or animal, produces the effects of a chemical toxicant.

Selective Pesticide:

A pesticide which, while killing the pest individuals, spares much or most of the other fauna, including beneficial species, either through differential toxic action or through the manner in which the pesticide is used, (formulation, dosage, timing, etc.).

Social Behavior:

Activities elicited by other members of the same species, but in some cases of another species, that have some effect on other individuals.

Species:

A group of interbreeding populations (actually or potentially) reproductively isolated from other such groups.

Succession:

The replacement of one community by another.

Synergistic Effects:

Where the degree of control achieved by a combination of methods exceeds the sum of the independent effects of each method.

Territory:

That portion of a home range that is defended against trespass by other members of the same species.

Trap Night:

Used to express the ratio of individuals captured, depending on the number of traps and length of time they were set. One trap night equals one trap set for one night.

Vertebrate Control Objectives:

To accomplish the desired effect with a maximum of safety to man and to forms of life useful or of neutral value to him, and that it be carried out with a minimum of disturbance to the biotic community. It is the alleviation of the problem to a tolerable level, not the destruction of vertebrates.

Vertebrate Pest:

Any native or introduced, wild, or feral species of vertebrate animal that is currently troublesome locally or over a wide area, to one or more persons, either by being a health hazard, a general nuisance, or by destroying food, fiber, or natural resources. A pest to one person may at the same time have aesthetic or recreational value to others.

APPENDIX D

ACKNOWLEDGEMENTS

Material and sources used for completion of this manual is based on information from the following sources: "Using the M-44 Device in Coyote Control", 1990 edition, Wyoming Department of Agriculture; "The M-44 in Coyote Damage Control", October 1984 edition, Cooperative Extension Service, Kansas State University, Manhattan, Kansas; and ADC TECH NOTES, USDA/APHIS/Animal Damage Control/Denver Wildlife Research Center, Technical Note #1, M-44 User Tips, August, 1992 edition.

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Figure 1: www.icwdm.org website image

Figure 2: www.texasbowhunter.org website image

Figure 3: Wyoming M-44 Label, Wyoming Department of Agriculture

Figure 4: Example license card, Wyoming Department of Agriculture

Figure 5: Wyoming Sodium Cyanide Capsule Label, Wyoming Department of Agriculture

Figure 6: Cyanide Poisoning First Aid Kit, Kent Drake photo

Figure 7: Drugline.org website photo

Figure 8: www.biana.gr/EN/Nbc_protection.html website photo

Figure 9: camping-field-guide.com website image

Figure 10: www.cryptomundo.com website image

Figure 11: Scott Diesel article, survivalmagazine.org website photo

Figure 12: Coyote, Michael S. Quinton, National Geographic, photo

Figure 13: Judith Wilson, eHow contributor website article

Figure 14: Lynn Anders, eHow contributor website article

Figure 15: www.sheepusa.org website photo

Figure 16: www.sheepusa.org website photo

Figure 17: website image, no known location

Figure 18: www.fandm.edu website image

Figure 19: www3.ag.purdue.edu website image

Figure 20: Warning Label for M-44 Storage Equipment, Wyoming Department of Agriculture

Figure 21: Locked Storage Box, Kent Drake photo

Figure 22: Antidote Storage holster, Kent Drake photo

Figure 23: Parts of M-44 device, Kent Drake photo

Figure 24: M-44 ejector, Kent Drake photo

Figure 25: M-44 capsule, sSade Franklin photo

Figure 26: M-44 capsule holder, Kent Drake photo

Figure 27: M-44 stake, Kent Drake photo

Figure 28: Above ground M-44 set, Kent Drake photo

Figure 29: Recessed M-44 set, Guy Connolly photo, U.S.D. A. National Wildlife Research Center

Figure 30: Using the M-44 Device for Coyote Control manual image, 1990, Wy. Dept. of Agriculture

Figure 31: Setting M-44 stake, Kent Drake photo

Figure 32: M-44 stake in ground, Kent Drake photo

Figure 33: Setting M-44 plunger, Kent Drake photo

Figure 34: Placing M-44 capsule in capsule holder, Kent Drake photo

Figure 35: Placing M-44 capsule in capsule holder, Kent Drake photo

Figure 36: Attaching capsule holder to M-44 device, Kent Drake photo

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