Predator Management

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Unit Objective

After completing this module of instruction, the producer should be able to read and recognize the damage done to a goat operation by predators and to develop alternative approaches for management of predators. The producer should distinguish between management of predator by using lethal and non lethal tools. The producer should be able to score a minimum of 85% on the module test.

Specific Objectives

After completion of this instructional module the producer should be able to:

1. State the significance of predator damage to sheep and goats in Texas in 2003.
2. Select three points to consider when objectively evaluating the physical evidence of predation.
3. Distinguish between predator eradication and predator control.
4. State the meaning of predator management.
5. Identify the five basic components of integrated pest management.
6. Distinguish between lethal and non lethal tools for predator management alternatives.
7. State skills a goat producer should master when interpreting predator evidence.
8. Identify the mode of attach by certain predators.
9. Identify signs/symptoms that a predator issue may be by the coyote.
10. Identify signs/symptoms that a predator issue may be by the bobcat.
11. Identify signs/symptoms that a predator issue may be by the red fox.
12. Identify signs/symptoms that a predator issue may be by the feral hog.
13. Identify signs/symptoms that a predator issue may be by the domestic and feral dog.
14. Select acceptable control measures a producer may use for controlling the following category of predators:
    a. Coyotes
    b. Bobcats
    c. Red Foxes
    d. Feral Hogs
    e. Domestic and Feral Dogs

Preface

This curriculum is aimed at providing a sufficient level of awareness of the challenges and opportunities of predator management to allow goat producers to successfully operate in the face of predation threats. Critical thinking is a tool to enable one to know when to respond and how to respond to suspected predation. Knowing which tools to use and under what circumstances is

essential. Completing this module should enable the student to start down the road toward successful predator management.

Module Contents

- Introduction
  - The problem
  - Evolution of expectation and terminology
  - Development of strategies
- Approach
  - Integrated Pest Management
  - Pest versus beneficials
  - Scouting
  - Economic thresholds
  - Management alternatives
  - Environmental effects
- Interpreting Evidence
  - Tools needed
- Species Profiles
  - Coyotes
  - Bobcats
  - Mountain lions
  - Red foxes
  - Feral hogs
  - Domestic and feral dogs
- Concluding Comments
- Recommended References

Introduction

Successfully raising goats is a challenging enough endeavor in the absence of problems caused by predators. When predators are added to the mix it can become overwhelming and costly. Predators such as coyotes, bobcats, mountain lions, red foxes, feral hogs, and domestic or feral dogs are among the suspects when mortalities occur.

It is hoped that with this curriculum a sufficient level of awareness of the challenges and opportunities of predator management will be introduced to allow goat producers to successfully operate in the face of predation threats. This module will concentrate on instilling in the student the practice of objectively evaluating the physical evidence of predation in order to 1) accurately assign responsibility and 2) proceed with an integrated pest management approach which includes, in part, choosing the proper tools for a response if warranted. Possessing the critical thinking skills to enable one to know when and how to respond to suspected predation is paramount in the intention of this educational effort.

If the student finishes this module with the ability to analyze situations that may require corrective action, develop a strategy for predator management, and then implement it wisely, economically, and humanely, the module will have accomplished its most important objectives.

The problem

Predation on small livestock such as goats is a serious problem in many areas. The National Agricultural Statistics Service reported that in Texas in 2003, 110,000 sheep and goats, with a value of $10.9 million, were lost to predation. And these estimates are conservative since: 1) they are derived only from reported losses made at initial counts of lambs and kids; 2) losses have been shown to be 2 to 3 times higher in the absence of control programs like USDA/APHIS Wildlife Services (see http://www.aphis.usda.gov/ws/) which are in place; and 3) they only take into account direct losses to producers, not future value of animals and animal products, nor the multiplier effect on local economies.

Some predators such as coyotes are becoming increasingly a matter of concern because of their remarkable ability to adapt to the presence of humans-even to the point of entering back yards to kill pets. Dogs, both feral and domestic, are also a major source of loss especially in goat producing areas which are on the edge of cities or suburbs. Such un-restrained dogs are a major threat in some rural areas also.

In years past goat production was centered in regions such as the Edwards Plateau of Texas in which ranchers shared the burden of predator management and were successful on a large scale, practically ridding the region of livestock killing predators. When predation occurred, the reaction on the part of ranchers was swift and effective. Populations were maintained at a level which allowed survival of livestock operations. The trend in the past few decades has been smaller scale goat production in these and other areas and a corresponding reduction in the shared effort to control predators. The producers that remain find themselves with basically no community or region wide support in the battle against livestock losses to predators. The situation warrants increased awareness of all aspects of predator management so that the struggle to maintain meat goat production enterprise viability can be successful.

Though challenging, predator management can be effective if adequate awareness, knowledge, and some essential skills are acquired. Of utmost importance is a thorough understanding of Integrated Pest Management which will be detailed later.

Evolution of expectation and terminology

The evolution of thought regarding how we approach the reduction of losses by predators to livestock, in this case goats, has in some ways mirrored the changes in mindset relative to handling the problem of invasive brush on rangelands. As with efforts to address brush encroachment, there was a time when "predator eradication" was the terminology associated with dealing with livestock losses to predators. With the passage of time, it was realized that "eradication" might have been a rather overly ambitious objective. Individual predators were being removed, population levels were being reduced, but the goal of eradication was not

achieved. Though much lessened at times, predation continued at some level even under the most motivated strategies.

Next, "predator control" became the order of the day. At least, it was thought, predators can be "controlled". Again, an unacceptable level of predation remained in many instances, even after concerted control efforts.

"Predator management" has become a more accurate portrayal of current efforts at reducing predation. The concept of "coping with" predators has emerged as an even more suitable moniker for the situation in which producers often find themselves today. Embodied in the idea is acknowledgement that 1) predators have a positive role in the ecosystem, 2) some reduction in predator numbers may be necessary for livestock producers to co-exist with them, and 3) an integrated pest management approach is essential. A variety of practices might be implemented including non-lethal and lethal means to accomplish the objective of reducing predator-related losses to a level that can be tolerated. The ideal aim would be the selective removal of only the offending animal(s) when feasible. Texas Cooperative Extension has utilized the idea in the production of several educational products dealing with predation: Coping with Bobcats, Coping with Coyotes, and Coping with Feral Hogs (visit http://tcebookstore.org for details). Heretofore in this module the term predator management will be utilized with the intention that it includes the spirit of "coping".

Development of strategies

Much like the changes in the way we have come to refer to predator management activities the methods that have been used have changed. Early on, toxicant-laced baits were utilized to effectively remove problem predators. However, collateral damage in the form of non-target wildlife mortalities was extensive. Public disfavor eventually culminated in a presidential executive order in 1972 which banned the use of the most commonly used poison, sodium monofluoroacetate (Compound 1080), in such practices. Today there are only two toxicants available for predator management, none for indiscriminate placement.

Available to predator managers today is an array of tools and techniques, some non-lethal, some lethal, from which the proper ones for a given situation can be selected. Non-target mortalities have been greatly reduced, even in some instances to the point of removing only the offending individual animal.

Approach

Integrated Pest Management

In order for farmers to effectively wage war on insect threats the concept of Integrated Pest Management (IPM) has been employed for many years. It utilizes five basic components which provide for a systematic approach to the formulation of strategies for addressing pest concerns of various kinds, including the predators confronted by meat goat producers. These components are:

1. Identifying pests versus beneficial organisms
2. Active scouting - knowing what is going on
3. Determining economic thresholds
4. Considering management alternatives
5. Weighing environmental concerns

Pests versus beneficials

Being able to recognize when a predator is detrimental (a Pest) or beneficial in a particular situation is an important skill for predator managers to possess. Obviously, when a predator is killing goats it has earned the name Pest. Other animals which may serve as prey for predators can perform a valuable service as they provide a buffer for the effect on livestock that would be realized in their absence. Predators are generally opportunistic in their feeding habits. A density of rabbits and/or rodents providing a ready food source for predators which would otherwise be preying on goats is a beneficial situation, lessening to some degree the amount of predation that might take place if rabbit numbers were low.

Likewise, situations can exist in which one potentially threatening predator population in effect can control or limit the population density of another. If raccoons are the predator of concern, killing or maiming young kid goats for example, coyotes can actually be beneficial to a degree because they are considered by many to limit raccoon numbers since they are a food source for coyotes. Far-fetched, certainly, since coyotes themselves are usually a threat to goat production. The point is, by lowering one population you may inadvertently enhance another which might also be damaging to your operation. The interrelationships of predators and their prey is a fascinating subject. An understanding of them is crucial to the realization of the desired results from your predator management efforts. An awareness of the complexities of these relationships should temper, to some degree, any tendency to oversimplify by carrying out a vendetta on all predators.

Scouting

First, the presence or absence of predators which might prey on goats must be ascertained. Roads and sandy draws can be monitored for droppings (scats) and tracks. Look for scrapes where animals mark their territory. Net-wire fences provide the opportunity to check for hair left behind as animals cross over or under. Digs or slides under fences can be indicative of the passage of predators. Scent stations (Figure 1) made by clearing all of the vegetation off a portion of ground about 1 yard in diameter along a roadside, with some sort of track bearing surface like flour or slacked lime generously dusted over it and an attractant like bobcat urine (available from trapping suppliers) placed on a cotton swab in the center, can provide a means of discovering which predators are present in an area. Monitor the stations daily for at least three consecutive nights and record the number of scent station nights on which the tracks of each species of interest appear.

Next, the population trend of potential predators is important. If population density information is gathered the same way every season or year-using the same roads, the same methods, objectively gathered-it will be useful for planning your predator management strategy. By keeping track (no pun intended) of the information gathered-number of scats and/or sets of tracks on a given route which is monitored the same way every season or year, scent station nights in which various species occur, and accumulating the information over several years and across areas-you can begin to see what trend might be apparent in various predator populations and adjust your management accordingly.

Trouble spots might become evident as you monitor predator numbers. Whether by virtue of goat losses having occurred or the presence of an unusually high density of predators you may choose to initially aim your efforts in those areas. You may also delay placing animals in a problem pasture or ranch until after the threat is reduced or eliminated.

Figure 1. Scent stations should be placed along roads for monitoring convenience and because predators frequent them.

Economic thresholds

Economic feasibility understandably drives much of what is done in agricultural operations, just as it does in other business ventures. With regard to predator management, feasibility can be determined by identifying the economic threshold involved, specifically that point at which the level of damage incurred is sufficient to justify the cost of the control practice. Before undertaking any predator management activities, many of which can be rather expensive, be sure that the end justifies the means. It makes no sense to expend thousands of dollars to reduce losses amounting to hundreds unless there are long-term goals that justify the action. At least attempt to utilize economically appropriate measures. Balance the "control" expense with the value of the loss. A relatively minor loss (monetarily) to predation will warrant a different response than a more extensive loss. Let the degree of loss dictate the response.

Management alternatives

A key element of IPM is the development of an array of management alternatives-a toolbox, so to speak-from which to select the appropriate approach to a particular situation. Both non-lethal and lethal techniques are available. Non-lethal means might be considered first, then lethal ones if necessary.

Often a predation problem can be effectively thwarted by non-lethal measures such as:

1. Shed kidding or year-round night penning.
2. Guard animals such as donkeys (jennies, usually), llamas, or dogs.
3. Fencing type and configuration can limit predation, or at least provide for more effective application of some types of lethal techniques such as snares which can be placed in digs

under net-wire fences. Electrified offset (~8 inches) wires can be placed on fences at about 8 inches off the ground and again at about 30 inches to deter fence climbing by cats. Overhanging outward-leaning top portions of fences can also help. A buried lateral apron of net wire can deter digging under fences.

4. Noise-making devices, especially around pens where animals are kept overnight can help ward off predators, though eventually the predators will likely grow accustomed to the sound and ignore it.
5. Aversive taste conditioning of predators has met with only limited success so far, but remains a possibility in the future.

If non-lethal practices are not feasible or effective, lethal measures might then be necessary. The toolbox most commonly includes:

1. Foothold or leghold traps- generally buried alongside travel-ways and baited with an attractant like a scat sprayed with predator urine (for coyotes), and/or a visual lure like an over-hanging feather or tuft of hair (for bobcats), or blind-set in known paths; can be fairly selective depending on placement, bait, and overall operator skill.
2. Live traps or cage traps (Figures 2, 3, and 4)- fairly selective depending on size, bait, and trigger mechanism, but some predators like coyotes avoid them.

Figure 2. Feral hog trap made of stock panel showing simple one-way entrance.

Figure 3. Live trap for feral hogs, using drop-type gate.

Figure 4. Rooter-type gate for feral hog trap (on display without remainder of trap).

3. Snares (Figure 5)- suspended loops of cable with a one-way slide that tightens on the animal and restrains or kills it as it passes through; most often placed at a dig under a net-wire fence; selectivity depends on skillful placement in known passage-ways of offending animals and frequent monitoring.

Figure 5. Snare placed in a crawl under net-wire fence.

4. M-44s (sodium cyanide delivery devices), and Livestock Protection Collars (LPCs) (containing sodium monofluoroacetate- or Compound 1080)- available in some states; canine specific for M-44s and specific for individual offending animal for LPCs; strict compliance with governmental regulations regarding their use, and training and licensing is required for applicators. Contact your state wildlife officials and state agriculture officials for more information. For licensing in Texas contact the Texas Department of Agriculture.
5. Aerial gunning- effective and selective; approval and/or permit(s) required. Check with your state wildlife officials for pertinent regulations and permits. For further assistance contact USDA/APHIS Wildlife Services office in your state.
6. Calling- various manual or electronic audio devices which mimic the sound of a prey animal; used to lure predators within gunshot range.

Environmental effects

An IPM approach always includes evaluation of potential environmental impacts. The manipulation of wildlife populations can involve numerous ramifications. Be aware of the effect that reducing the population density of one species may have on population levels of others. Lowering the numbers of coyotes for the sake of livestock protection, for example, may simultaneously enhance white-tailed deer survival and therefore their population density. Be prepared to harvest added numbers of deer if necessary in order to keep the population from exceeding the level which can be supported by the existing habitat without degradation. If M-44s or LPCs are used make sure that all label requirements are followed in order to protect persons using them, avoid exposure to non-target animals, and to safeguard against environmental contamination. When used properly these tools are safe and pose minimal threat to the environment.

Interpreting Evidence

Tools needed

The basic skills needed to address suspected predation incidents are similar to those required for a crime scene investigator. Among these are: an inquiring mind, critical thinking skills, knowledge of the habits of potential culprits, objectivity, and of course a strong stomach. Often a kill site is discovered well after decomposition has begun.

Various "sign" can be sought out as evidence. The presence of tracks, scats, and hair left nearby (on fences, e.g.) are tell-tale signs of visitation by a particular animal. However, generally more conclusive evidence is required to rule out whether that animal was just passing through or was indeed the perpetrator.

The mode of attack can be indicative of certain predators. Likewise the type and extent of damage suffered can point to one predator or another. For example, canine teeth puncture spacing (Figures 6 and 7), number of bites, location of damage (throat area vs. back of head or back), presence or absence of hemorrhage under the skin, and the location of the carcass and its general condition. If the carcass of a kid goat is found bearing soft hooves which appear never to have been walked on, there is a chance that the animal was still-born or died of neglect and subsequent exposure. Look for milk in the stomach to see if it ever nursed, and signs of dehydration such as sunken eyes. Also look for bites by skinning the throat area and the back of the neck, or any other areas that appear to be affected. It there is an absence of hemorrhage under the skin, even if bite punctures are present the animal was likely dead before being bitten. On the other hand if hemorrhage is present the animal was still alive when bitten, pointing toward predation.

Figure 6. Skulls of coyote (left) and bobcat.

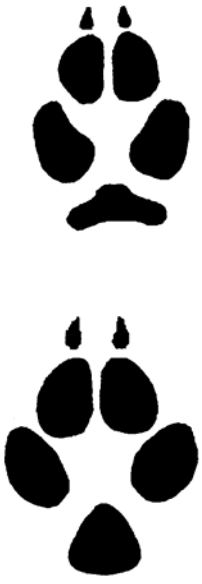
Figure 7. Feral hog (young sow).

Species Profiles

Factors relevant to the objective scrutiny of goat losses or damage will be presented here for several of the common predators. More detailed information about the life history of each can be found in The Mammals of Texas, by Schmidly, and Predator Control as a Tool in Wildlife Management, by Rollins, et al. (See the Reference Material section at the end of the module.)

Coyotes

Typically, and there are some exceptions as with all predators, a coyote will kill goats by attacking the throat region, biting and collapsing the trachea (windpipe). Death occurs by suffocation, sometimes after a rather prolonged struggle leaving considerable hemorrhage beneath the skin. Coyotes will at times bite the side of the head or even the back of the head. A young, inexperienced coyote may bite wherever it can catch the animal. Eventually, with maturity, the throat attack seems to be the mode most often adopted.



Coyote track drawing courtesy of D. Rollins.

Coyote tracks (Figures 8 and 9) are rather slender and elongated. Particularly distinguishing characteristics include visible nail marks (often the middle two toes only) and bi-lobed heal pad. Their travel is usually deliberate, resulting in a straight path with hind feet often falling in the track of the front feet.

Scats (Figures 9 and 10) are usually cylindrical and cigar-shaped with minor strictures apparent and blunt or pointed ends. The texture varies according to the current diet, whether primarily vegetation (seeds from fruits) or animal (hair and bone).

An integrated approach using a variety of control measures is most effective. Non-lethal means include net-wire fencing and guard animals. Also consider trapping (No. 4 with chain and drag hook), snaring, aerial hunting, calling, M-44s, or LPCs. Be careful to avoid "educating" coyotes with unsuccessful attempts at trapping, snaring, or calling, especially. Coyotes are intelligent animals that become more wary of management attempts with each failure-often to the point of being almost impossible to catch. Make your first "shot" count.

Figure 8. Coyote track.

Figure 9. Coyote scat and tracks (at arrows).

Figure 10. Coyote scat.

Bobcats

Bobcats, with few exceptions, attack goats by biting the back of the neck at the base of the skull or on the side of the head. Or they may bite the back of the jaw and lower part of the skull, while restraining by embedding their claws in the goat's side or flank. Death is usually caused by crushing the spine and/or skull. After the kill the carcass may be fed upon immediately or it may be cached-dragged to another location and partially covered with debris-to be fed upon later (Figure 11). If the meat spoils before consumption it may be abandoned for another fresher kill. Often hair will be plucked from the carcass in a few spots giving it a scruffy appearance (Figure 12).

Tracks (Figure 13) are more rounded in appearance than those of a coyote, and are larger. Nail marks are usually not apparent since cats typically keep claws retracted until needed for defense or capture of prey. The heel pad is tri-lobed (Figure 14). On especially soft surfaces the track may appear to be "tented" or "peaked" between the toes owing to the shorter hair between them compared to coyotes.

Bobcat track drawing courtesy of D. Rollins.

Bobcat scats (Figure 15) are cylindrical and are segmented with prominent strictures and usually have elongated pointed ends, often with protruding hair on the end last expelled.

Non-lethal methods include electrified offset wires on fences and fence over-hangs, both to deter climbing. Cage traps have been successfully used with a rear, protected compartment containing a live chicken to serve as a visual, audible, and scent lure.

Previously mentioned lethal means are effective for bobcats also.

Figure 11. White-tailed doe killed and cached by bobcat. Note debris partially covering carcass. Photo by W. Klussman.

Figure 12. White-tailed deer killed by bobcat. Note areas which have been plucked of hair and left scruffy in appearance. Photo by W. Klussman.

Figure 13. Bobcat tracks. Typically claw marks are absent.

Figure 14. Front and rear feet of bobcat. Note tri-lobed rear portion of heel pads.

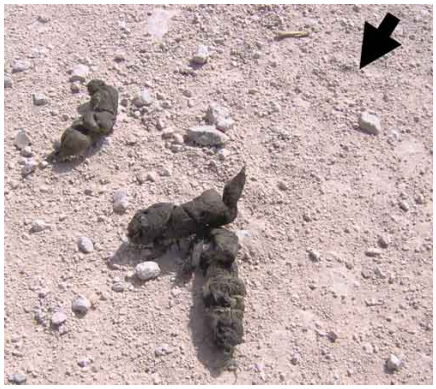


Figure 15. Bobcat scat. Note faint track at arrow.

Mountain lions

Though rare compared to other predators which threaten goat operations, mountain lions can cause extensive loss. Their diet is mostly deer in many areas, but includes livestock at times. They are known to kill a deer every 3-14 days, depending on how quickly the meat spoils and the number of deer available. Like bobcats they drag and then cache their dead prey, sometimes urinating and defecating on top of the debris that has been kicked upon it. Scrapes created by pushing and kicking debris up on to the carcass will sometimes point to the eventual direction of travel. Lion tracks and scat are similar to those of a bobcat, but considerably larger.

Mountain lion track drawing courtesy of D. Rollins.

The most effective and selective means of lion capture is by trained dogs. Foothold traps (No. 4 ½ with chain and drag hook) and foothold snares can be effective, also. Considerable skill is required to minimize non-target captures.

Red foxes

The red fox is an introduced species which is often confused with the smaller gray fox, and is responsible for goat losses in some locales. The white-tipped tail is a distinguishing characteristic.

Tracks are coyote-like, though smaller, but in contrast all marks from all four claws on each foot are likely to be visible. Scats are generally non-segmented, bearing pointed ends with protruding hair.

Red fox track drawing courtesy of D. Rollins.

Red fox in snare.

Predation is typically characterized by multiple bites on the back of the prey animal. Due to the relatively small size of red foxes, young animals such as kid goats are most at risk to red foxes.

For control consider trapping, snaring, and hunting. Red foxes can often be called up with the use of prey-mimicking audio devices (calls).

Feral hogs

To date, at least 30 states have reported the presence of feral hogs-hogs which are either domestic hogs gone wild or descendants of free-roaming hogs first brought to North America by early explorers centuries ago. Livestock predation is one of the many negative impacts they have caused. Young animals such as lambs and kid goats are particularly vulnerable.

Often no evidence of predation is found when feral hogs are the culprit because the entire prey animal is consumed. A bloody patch of ground, a hoof or two, or an inverted skin with hooves and maybe the skull attached, is likely to be all that remains. Sometimes the only indication may be circumstantial-missing young, dams with distended udders, and the known presence of feral hogs in the area.

Feral hog track drawing courtesy of D. Rollins.

Signs of their presence include: rubs on trees and utility poles (Figure 16), wallows in mud (Figures 16 and 17), and rooted-up soil, rocks, and debris (Figure 18) where they have searched for food items.

Being a cloven-footed animal their tracks (Figure 19) are similar to deer and goats, but with more blunt tips and dew claw marks are often present. Scats (Figure 20) are large and resemble a pile more often than a cylindrical mass, especially when fruits and other plant items are being consumed.

Aerial hunting is the most efficient and effective control means for feral hogs. Also use portable cage traps or funnel traps built on-site with t-posts and welded wire hog panels. With either setup use a one-way gate and pre-bait the trap with the gate open for several days until hogs grow accustomed to entry, then set for capture.

Figure 16. Feral hog wallow and rub on utility pole. Feral hogs seem to have an affinity for creosote.

Figure 17. Feral hog wallow.

Figure 18. Evidence of rooting activity by feral hogs in sandy loam soil.

Figure 19. Feral hog tracks.

Figure 20. Feral hog scat.

Domestic and feral dogs

Though "wildlife predators" claim more of the immediate attention when predation of goats is known or suspected, free-roaming domestic dogs, some of which are more accurately described as wild or feral, are serious contenders for the top spot on the list of suspects. Since breeds vary extensively in size and conformation track evidence often resembles wild canines or cats. Typical characteristics of tracks, like coyotes, include bi-lobed rear of heel pads and a more sloppily-placed print, i.e. less deliberate, straight-line travel.

Dog track drawing courtesy of D. Rollins.

Kills by dogs are often characterized by multiple bites on the hind quarters and flaps of skin pulled away from the animal due to the dog's attempts to restrain the fleeing. Several animals might be attacked at once by a single dog or a pack of dogs, sometimes with little if any feeding on the carcasses.

Non-lethal measures include guard animals and net wire fencing. Otherwise use foothold traps, cage traps, snares, aerial and ground hunting, and M-44s (only if dogs are known to be killing livestock- Check local laws and regulations).

Concluding Comments

Conscientious predator management involves objectivity, skill, sound judgment, and integrity. Dr. Robert H. Schmidt, professor at Utah State University, drafted in 1991 a suggested "Code of Ethics for Wildlife Damage Management Professionals." It has been subsequently published in many venues for the consideration of and, hopefully, the adoption by those involved in predator management, professional or amateur. It is submitted here for your consideration with the same intent.

As a wildlife damage management professional,...

- I affirm my strict adherence to all laws and regulations pertaining to wildlife damage management.
- I ascribe to a professional code of conduct that embodies the traits of honesty, sincerity, and dedication.
- I will show exceptionally high levels of concern and respect for people, property, and wildlife.
- I will promote the understanding of, and appreciation for, the numerous values of wildlife and biological diversity, as well as an appreciation for the economic and health concerns of humans adversely affected by wildlife activity.
- I will be sensitive to various viewpoints on wildlife damage management.
- I will provide expertise on managing wildlife damage to all people upon request, within the limits of my experience and ability.
- I will promote competence and present an image worthy of the profession by supporting high standards of education, employment, and performance.
- I will strive to broaden my knowledge, skills, and abilities to advance the practice of wildlife damage management.
- I will require good-faith efforts of clients, co-workers, and myself in resolving wildlife damage conflicts with the most humane, selective, practical, and effective management techniques available.
- I will encourage, through word and through deed, all wildlife damage managers to adhere to this code.

The author of this module wishes you well in all of your encounters with predators, be they conflicts or harmony.

Recommended References

Internet Center for Wildlife Damage Management

Texas Cooperative Extension publications

USDA/APHIS Wildlife Services

Coping with Bobcats. VHS video by Dale Rollins. 2000. Available from Sheep and Goat Predator Management Board, San Angelo, Texas. 23 min.

Coping with Coyotes. By Dale Rollins. 1997. Texas Cooperative Extension public. No. B-1664. 16 pp. View or order at http://tcebookstore.org.

Coping with Coyotes. VHS video by Kenneth A. Cearley. 2002. Available from Sheep and Goat Predator Management Board, San Angelo, Texas. 29 min.

Coping with Feral Hogs. DVD and VHS video by Kenneth A. Cearley. 2005. Texas Cooperative Extension publication nos. SP-210 and SP-209. 32 min. Order at http://tcebookstore.org

The Mammals of Texas. By David J. Schmidly. 1994. University of Texas Press, Austin. 501 pp. View at http://www.nsrl.ttu.edu/tmot1

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Prevention and Control of Wildlife Damage. Editors, Scott E. Hygnstrom, Robert M. Timm, Gary E. Larson. 1994. University of Nebraska-Lincoln. 2 vols. View or order at http://icwdm.org/handbook/index.asp

Procedures for Evaluating Predation on Livestock and Wildlife. By Dale A. Wade and James E. Bowns. 1982. 42 pp. Order at http://tcebookstore.org

Information contained in this document is part of a web-based training and certification program for meat goat producers (http://www2.luresext.edu/goats/training/qa.html) that was developed with funding received by Langston University from USDA/FSIS/OPHS project #FSIS-C-10-2004 entitled "Development of a Web-based Training and Certification Program for Meat Goat Producers."

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