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Armadillo — Natural History and Management Fact Sheet

Michael T. Mengak, Professor, Warnell School of Forestry and Natural Resources

No other mammal in Georgia has bony skin plates or a "shell", which makes the armadillo easy to identify. Armadillos are common in central and southern Georgia and are moving northward. Their common name, armadillo, is derived from a Spanish word meaning "little armored one". They are considered both an exotic species and a pest. Because they are not protected in Georgia they can be hunted or trapped throughout the year. Armadillos have few natural predators. Many are killed while trying to cross roads or highways or when feeding along roadsides.

The nine-banded armadillo is about the size of an opossum or large house cat. They are 24 to 32 inches long of which 9 ½ to 14 ½ inches is tail. The larger adult males weigh between 12 and 17 pounds whereas the smaller females weigh between 8 and 13 pounds. They are brown to yellow-brown in color. Armadillos have a few sparse hairs on their belly. Long claws make them proficient diggers. They have four toes on each front foot and five on each back foot. The toes are spread so that a walking track looks somewhat like an opossum or raccoon. The ears are about an inch and a half long and the snout is pig-like.

At the start of the 20th century, the nine-banded armadillo was present in Texas. By the 1930's, they were in Louisiana and by 1954 they had crossed the Mississippi River heading east. In the 1950's, they were introduced into Florida and began heading north. Today, some maps show them to be restricted to South Georgia but, in fact, they are present as far north as Athens and Rome, Georgia. They occur throughout the South from Texas, Oklahoma, and Kansas through Missouri, eastern Tennessee and into South Carolina.

Armadillos dig their own burrows or use the burrow of another armadillo, tortoises or natural holes. They do not hibernate but neither can they tolerate high temperature (above about 85°). During the winter months they often are active during the warmer part of the day. During the hot summer, activity shifts to the cooler night hours. While they can remain in their burrows for several days, they do not store food or accumulate large stores of body fat. So they must eventually emerge to forage. In bad weather, they can freeze to death or starve if they are unable to locate food. Armadillos rely on a good sense of smell to locate food but they have poor eyesight. They eat insects and surrounding soil and plant litter while foraging so their droppings consist of undigested insect parts, soil, and litter fragments. Droppings are about the size and shape of marbles.

Armadillos spend most of their active time outside the burrow feeding. They move slowly — traveling between 0.15 and 0.65 miles per hour – often in an erratic, wandering pattern. Often grunting like a pig and with their snout to the ground, they forage by smell and, possibly, sound. They often use their sticky tongue to probe holes searching for food but they are also powerful diggers. Foraging pits are up to 5 inches deep and are often found in moist soil such as planting beds, gardens, and irrigated lawns.

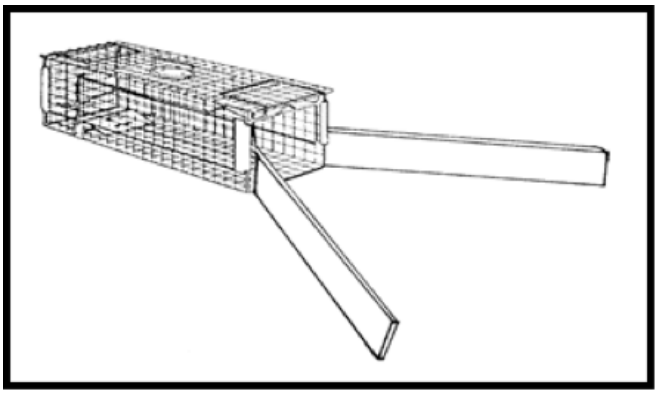
Armadillos prefer habitat near streams but avoid excessively wet or dry extremes. Soil type is important due to their burrowing. They prefer sandy or clay soils. Armadillo can be found in pine forests, hardwood woodlands, grass prairies, salt marsh and coastal dunes. Human created habitats such as pasture, cemeteries, parks, golf courses, plant nurseries and croplands also provide suitable habitat.

Armadillo may carry diseases transmissible to humans, but reports are rare. Armadillo can acquire leprosy and are used in medical research to study this disease. Only two cases are known in which a human contracted leprosy from wild armadillos. Both cases are from Texas. They risk to humans is considered extremely rare.

Armadillo may be controlled by trapping. Wire cage live traps measuring at least 10 x 12 x 32 inches are recommended. Use of wings, constructed of 1 x 6 inch lumber in various lengths and placed in a V-arrangement in front of the trap can help to "funnel" the armadillo into the trap. Setting traps along natural barriers like logs or the side of a building increases capture success. Placing the trap in front of a burrow entrance is better than random placement in the environment. No bait, lure or attractant has been shown to be effective in increasing capture success although there are numerous report of baits used with varying success.

We tested the effectiveness of several baits and lures, including:

- Live night crawlers
- Live crickets
- Rotten chicken feed
- Whole eggs
- Rotten eggs
- Bananas
- Marshmallows
- Sardines
- Vanilla wafers
- Moistened soil
- "Armor plate" a commercially available lure



In addition, we tested two types of unbaited traps: (1) an unbaited trap with "wings" consisting of two 2-inch x 6-inch boards and 6 feet long attached at one end of the trap to funnel the armadillo into the trap (Figure 1), and (2) an unbaited trap without wings. We caught only 10 armadillos in over 1,330 trap nights. It is unlikely that trapping is an effective method of quickly reducing local armadillo populations. Until an effective attractant can be found, lethal removal by shooting remains the most effective solution.

Additional information on the natural history of the armadillo can be found in the Warnell publication

http://www.warnell.uga.edu/outreach/pubs/pdf/wildlife/NHS%2005-04%20-%20Armadillo.pdf

and information on our trapping and baiting research can be found in the Warnell publication

http://www.warnell.uga.edu/outreach/pubs/pdf/wildlife/WDS%20No%203%20-%20Armadillo%20bait.pdf

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Keep deer out of your garden and plants.

Michael T. Mengak, Professor, Warnell School of Forestry and Natural Resources

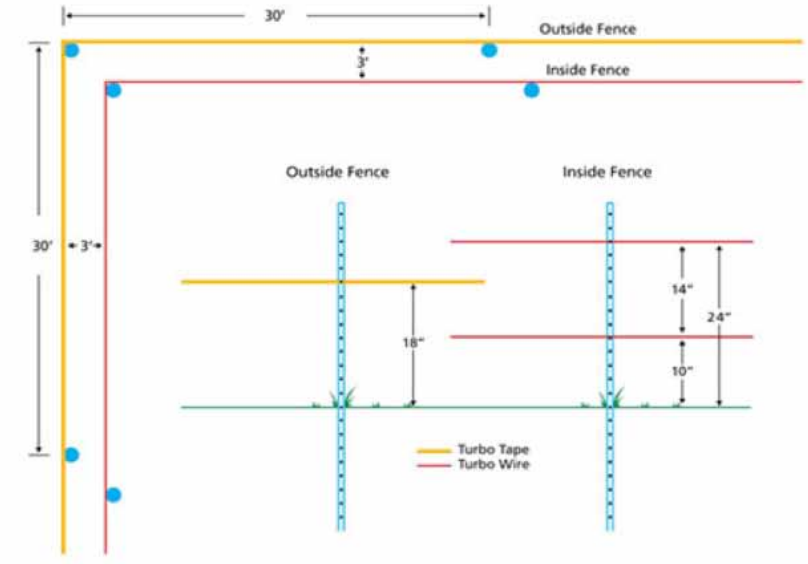
Warm-season food plots are an important tool for providing supplemental nutrition to white-tailed deer. Food plots represent a significant investment in time, materials, and equipment for many land managers. Gallagher® Animal Management Systems markets a 2-layer deer-exclusion fence design for the protection of food plots during establishment. We tested this fence design at two warm-season food plots. Our research indicated that Gallaher®'s 2-layer fence design could reduce browse damage to warm-season food plots and could keep deer out of your landscape and garden.

Deer can cause significant to gardens, flowers, lawns, young trees and landscape plants. You do not want deer to over browse your food plot before it is established and ready to hunt over.

We tested a fence design that could be easily installed around a food plot or home landscape. You can add electricity to the fence with a solar charger, battery-powered charge unit, or conventional 120-v outlet if you are using it close to your house. The fence design is very simple and inexpensive.

The results of our testing on food plots showed that this fence design is effective in reducing deer damage. We planted cowpeas and LabLab and tested the fence for keeping deer out of the food plant until plants were established and they could withstand some browsing. We also use this fence design on landscape beds planted with daylilies and hostas. We established our food plots in the last week of July and measured them throughout the summer. At the end of our measurement period on 10 September (about 45 days after planting) the plants in the plots protected by the fence were 3 ½ to 4 inches taller that plants growing in the plots not protected by the fence.

Our fence design is shown in the diagram shown at the right. The fence consists of three separate strands of wire. The first strand (yellow in the diagram) is 18 inches above the ground. The next two strands (red in the diagram) are located 3 feet inside the first strand. One is located 10-inches above the ground and the second strand is located 14-inches above the first or 24-inches above the ground.



Using deer repellents.

Many homeowners maintain gardens and landscapes around their homes. Deer can damage personal property, agronomic crops, landscape plantings, food plots, and serve as a host diseases common to livestock and humans. Unlike other nuisance animals, deer cannot be casually eliminated when human conflicts arise, nor can landowners be expected to carry the entire burden of support for this public resource. Scare devices, repellents, and shooting are all considered effective strategies to control deer damage. Repellents are used intensively in orchards, gardens, ornamental plants, and agronomic crops. New repellants are continuing to enter the market, but their efficacy varies greatly. Success is determined on the reduction of damage not total elimination. No repellent or scare tactic will completely eliminate damage from browsing — not even most fences!

- We tested the efficacy of a repellent called Milorganite® on ornamental plants. The specific objective of our study was to determine the effectiveness of Milorganite as a temporary deer repellent when applied to established ornamental plants during the summer.

- Milorganite has been available as a lawn fertilizer for over 80 years. In 1913, the state legislature of Wisconsin passed an act to create a sewage commission responsible for cleaning up the waterways. The trade name, Milorganite®, was derived from **MIL**wakee **ORG**Anic **NIT**rog**E**n.

- This product is often used for soil amendment purposes rather than a fertilizer because of the low Nitrogen-Phosphorus-Potassium (N-P-K) values of 6-2-0. The cost per 40 pound bag usually runs from $10.00 to $15.00. Milorganite is commercially sold by fertilizer dealers and garden supply stores throughout the United States.

- Georgia Wildlife Resource Division suggested that Milorganite might be an effective deer repellent as early as the 1980's. We tested Milorganite as a repellent on soybeans and ornamental plants (Chrysanthemums).

- We applied Milorganite at a rate of 240 pounds per acre to the food plot containing soybeans and at a rate of 4 ounces per planting bed for the mums. Each planting bed measured 8 feet by 10 feet.

- We found that it was effective at keeping deer out of our soybean patch for up to 21 days.

- Mums treated with this repellent had an average plant height after 35 days was consistently higher for the Milorganite treated mums (about 7 ½ inches tall) as compared to the untreated plants (about 6 inches tall). Mums in the treated beds had 75% more terminal buds that the mums in the untreated beds.

More information can be found on the Warnell Publication Library http://www.warnell.uga.edu/outreach/pubs/wildlife.php

Publications WDS-05-01 and WDS-05-02 for Milorganite, and

Publication WDS-08-09 for the Gallagher 2-layer deer fence.

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Managing Wildlife Damage — Feral Pigs

Michael T. Mengak, Professor, Warnell School of Forestry and Natural Resources

Feral hogs occur throughout the world. Many of these wild populations are descended from domestic animals that escaped from captivity or were released for hunting purposes. In the United States, wild pigs are found throughout California, the Southeast from Texas to North Carolina, and scattered areas across the rest of the country. In Georgia, they inhabit nearly every county, excluding the metro Atlanta area. Illegal transportation, high reproductive rates, and high survival in the wild have contributed to their spread into new parts of the country.

These animals interbred with feral pigs to create the animals we see today in some areas.

Feral hogs are non-native invasive pests that are responsible for a great deal of damage to agricultural crops, native vegetation and wildlife.

In Georgia, there is no closed season and no limit on harvesting feral swine on private land.

Natural History

- They can range in color solid black, brown, blonde, white or red. They can also be spotted or banded with the same variety of colors. The size of feral hogs can vary greatly as well. Feral swine can range between 100 and 500+ pounds and males can reach 3 feet at the shoulder.

- They generally prefer thick brush for protection and cover but they can also be found in open woodlands and grasslands. During the summer months they can be found near swamps, river, stream, and ponds that have thick adjacent cover.

- They are capable of breeding as young as six months of age. Hogs often have multiple litters per year. Each litter can contain up to twelve offspring.

- Hogs also have an excellent ability to survive in the wild. Of all domestic animals, none have the ability to become feral like hogs. Pigs are omnivores, meaning they eat vegetation, insects, small mammals, reptiles, eggs and, occasionally, deer fawns.

- Feral hogs carry diseases, such as brucellosis, pseudorabies and trichinella that can be transmitted to domestic animals and humans. Pseudorabies does not affect humans but can be contracted by domestic animals. There is concern that feral hogs may pass these diseases to domestic hogs that are raised for human consumption. If this were to happen on a hog farm, the infected animals would have to be destroyed, an economic loss to the farmer.

Because feral hogs are popular animals for sport hunting, they have been illegally transported to other parts of the country. While feral hogs may provide excellent hunting opportunities, they create many problems as well. Damage includes rooting up agricultural fields and food plots, destroying tree seedlings, and carrying diseases that can be transmitted to domestic animals and humans. They will root up peanuts, knock over corn stalks, and flatten soybeans.

• Feral hogs also compete with native species such as deer and turkey for food and territory. Hogs, being more aggressive, will drive deer and turkeys from feeders, food plots and natural food sources, such as acorns.

• Feral hogs may cause problems for individuals trying to establish longleaf pine seedlings on their property. In certain cases hogs have been documented rooting up entire rows of seedlings causing entire plantations to fail. Hogs will root up slash, longleaf, pitch pine, and possibly loblolly and eat the cambium layer from the roots.

• Feral hogs can cause significant economic losses. In other states, damages can exceed 1.7 million dollars in one county alone. There are no reliable estimates of the economic losses due to feral hogs in Georgia.

Controlling Damage

• Fencing can be a way to prevent hogs from entering crop fields; however, this method can be very expensive and time consuming. It is generally not practical except in small areas such as around gardens.

• Hunting hogs with firearms and dogs is another way to control these animals. There is no closed season or limit on them on private land. They can be hunted any time of the year with a Georgia hunting license on private lands.

• Live trapping can be the most effective method of removing hogs. Traps can be constructed from wood, metal, and hog wire fencing. Traps should be at least five feet tall to prevent hogs from climbing out. There are many designs of hog traps, but one of the most popular is a wooden trap with a guillotine style door. Traps can also be constructed of heavy gauge wire livestock panels.

• Because of their destructive nature, the introduction of hogs into new areas should be discouraged and controlled as best possible. The best method of controlling feral hogs is to prevent them from being introduced to your property. If hogs do appear, they should be killed and hunted in every legal way possible.

Additional information is available on the Warnell Outreach Publication Library

http://www.warnell.uga.edu/outreach/pubs/pdf/wildlife/WDS%20No%206%20-%20Feral%20hogs.pdf

Also, Publication ANRE-1397, Alabama Cooperative Extension Service, or visit www.berrymaninstitute.org/publications and download an electronic copy of the monograph: Managing Wild Pigs.

For the Envirothon wildlife competition, you should learn preferred habitat, food, and how to identify the following wildlife from mounts and photos, as well as skins, skulls, and tracks for mammals. For plants, learn their wildlife value and how to identify them. There is a wealth of information about the plants on the Internet. Learn the calls for the listed birds. Biologists and birders use calls to census birds. Birdcalls are no longer being provided on tape because of copyright restrictions. There are many CDs available, as well as the Internet. For Game Animals marked with an asterisk (*), age and sex criteria should be studied.

STUDY LIST

Fish
Channel catfish
Brown bullhead
White Crappie
Black Crappie
Bluegill
Redbreast Sunfish
Redear Sunfish
Largemouth bass
White Bass
Striped Bass
Hybrid Bass
Rainbow Trout
Brown Trout
Brook Trout

Big Game Animals
White-tailed Deer *
Black Bear
Wild Turkey *

Small Game Animals
Alligator
Gray squirrel
Cottontail Rabbit
Bobcat
Red fox
Gray fox
Raccoon
Opossum

Other Mammals
Armadillo
Beaver
Coyote
Groundhog
River Otter
Mink

Nongame Birds
Northern mockingbird
Brown thrasher
Eastern bluebird
Song Sparrow
Blue Jay
Carolina wren
Tufted Titmouse
Carolina Chickadee
Northern Cardinal
Red-tailed Hawk
Red Shouldered Hawk
Screech owl
Barred Owl
Great Horned Owl

Game Birds
Northern Bobwhite *
Woodcock
Canada Goose
Wood Duck *
Mallard
Pintail
Mourning Dove *

Exotics
Flathead catfish
Feral Hog
European Starling
Common carp
House Sparrow
Kudzu
Chinese Privet
Japanese Honeysuckle

Plants
Ragweed
Beggarweed
Partridge Pea
Greenbrier
Pokeweed
American Beautyberry
Muscadine
Strawberry Bush
Blackberry
Clover
Lespedeza spp.

Trees
Persimmon
Flowering Dogwood
White Oak
Northern Red Oak
Southern Red Oak

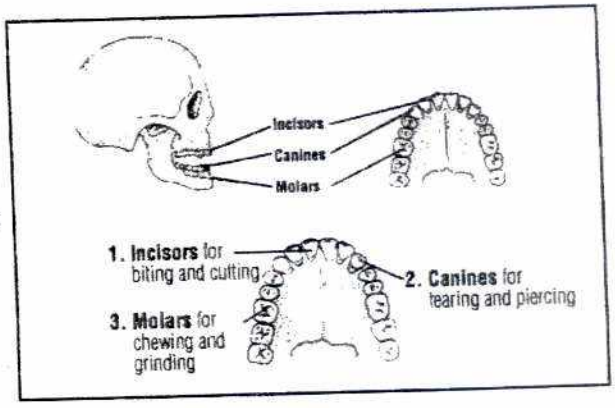
Reptiles
Black Rat Snake
Red Rat Snake (Corn snake)
Eastern Box turtle
Common Snapping Turtle
Eastern Fence lizard
Green Anole
Eastern King Snake
Eastern Garter Snake
Copperhead

Amphibians
Bullfrog
Green tree frog
American Toad
Spotted Salamander
Marbled Salamander

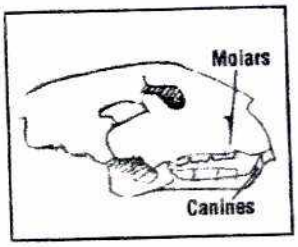
Observing Animals' Teeth

If you look in your mouth, you should find three different kinds of teeth - **incisors** for biting and cutting, **canines** for tearing and piercing, and **molars** for chewing and grinding.

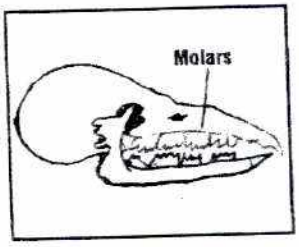
Like you, some animals have several different kinds of teeth. Others have only one kind. Others don't have any teeth at all. Different types of food require different teeth because food must be broken down into smaller pieces so it can be digested. Animals' teeth give you clues about what they eat.

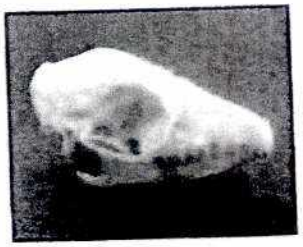


OMNIVORES
These animals eat a variety of food, including meat and plants. In some animals the canine teeth are not so prominent and the back molars are more flat than jagged.

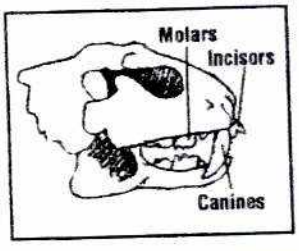


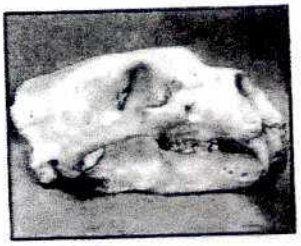
INSECTIVORES
The most noticeable feature that characterizes the teeth of insect eating animals is the structure of the molars. They are squarish, with sharp points that are excellent for tearing up the bodies of insects.



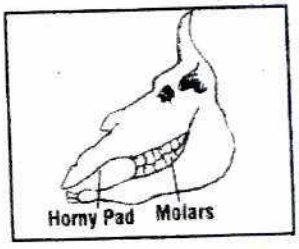


CARNIVORES
Flesh eating animals have three kinds of teeth. The incisors, located in the front of the mouth, are used for biting and holding. Next to the incisors come the long, sharp canines, used for fighting their enemy or killing prey. Behind the canines are jagged molard, used for cutting up food.





HERBIVORES
Some plant eaters have no incisor teeth in the upper jaw. The incisors are replaced by a horny pad. When feeding, the animal grinds the plants between the lower theeth and the upper teeth by moving its jaw in a circular motion. Most rodents are herbivores. Their molars are broad and flat with ridges for grinding. They also have long chisel-like incisors for gnawing grass and twigs.



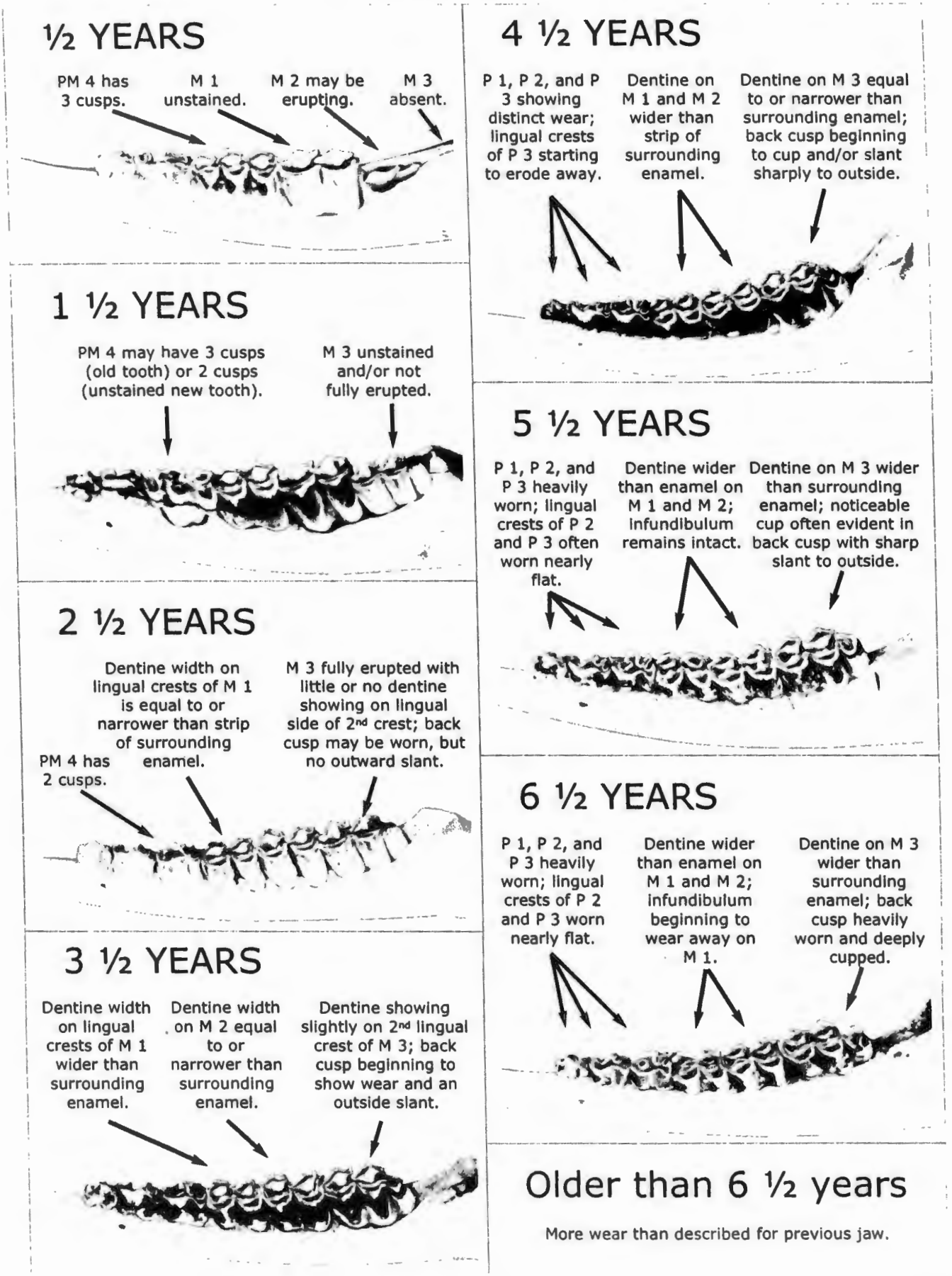


Fig. 19. Progressive age-related wear on premolars and molars (PM 2–4 and M 1–3 left-to-right) of lower left jaw (facing the check side) of white-tailed deer (Severinghaus 1949, Godin 1960, Dimmick and Pelton 1994).

What kind of track is it?

How do I tell the difference between cat (cougar, bobcat, domestic cat) and dog (coyote, wolf, fox, domestic dog) tracks?

The most commonly found tracks can sometimes be confusing. How do you tell the difference between the tracks of dogs and cats? Was that track you found on the trail left by a mountain lion or a big dog? There are some clues that will help you tell the difference between dog and cat tracks. Dogs include such species as red and gray foxes, coyotes, wolves and domestic dogs. Cats include mountain lions, bobcats, lynx, and domestic cats. Lynx tracks have some unique features of their own, so are not treated here. What is said here should apply to bobcats, mountain lions and domestic cats. If you look closely, you can sometimes even tell the difference between right and left tracks, as well as front and hind tracks.

Here are some things that help identify this as a canine track.

A: The claw marks. Dogs usually show claw marks in their tracks. However, it is possible to see claw marks in cat tracks, but this is usually when the animal is running or pouncing.

B: The lack of a third lobe on the hind edge of the heel pad. See cat tracks below for the difference. Although it is visible in some dog tracks, the third lobe is located higher, not aligned with the other two as it is in cats.

C: The shape of the leading edge of the heel pad is a single lobe. See cat tracks for difference.

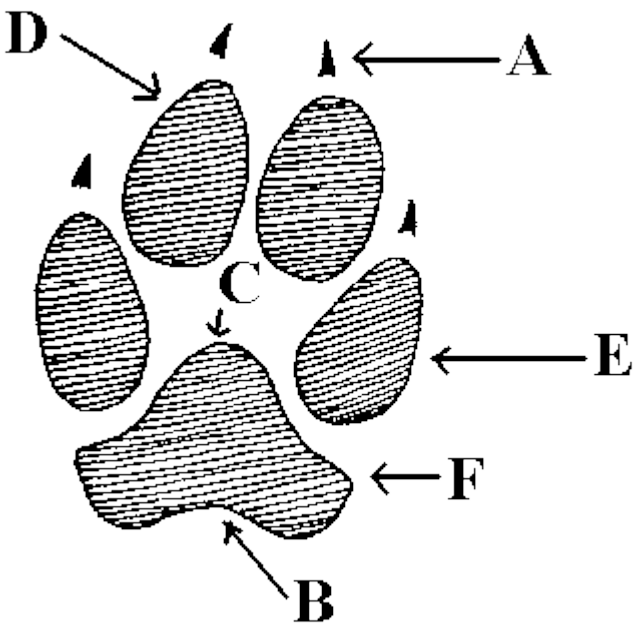
D: The alignment of the front two toes. They are side-by-side, or very close to it, in dogs tracks. There are exceptions, such as when the animal is making a turn or walking on a slope.

E: The almost triangular shape of the pads of the outer two toes. Take a look at the photo to see this more clearly as my drawing is not the best for indicating this feature.

F: Dogs have a little point where the heel pad turns. Cats share this feature.

Front tracks are usually larger than hind tracks. This is true for both dogs and cats.

What makes this a dog track?



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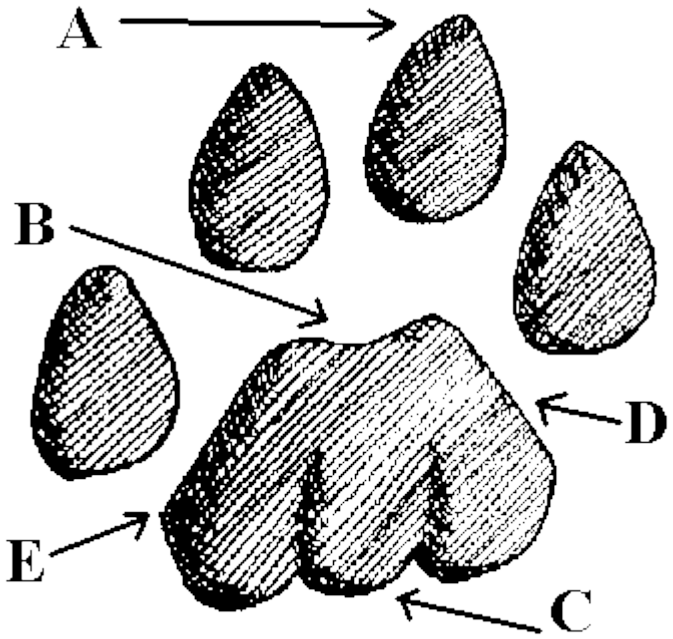
What makes these cat tracks?



This is the track made by the front left foot of a cougar.

A: Note that the front two toes are not lined up side-by-side as the dog prints were. The toe that is further forward is analogous to a human middle finger (your longest finger). The alignment of this toe will tell you whether you have a left or right track. This toe is the inner toe of the leading pair.

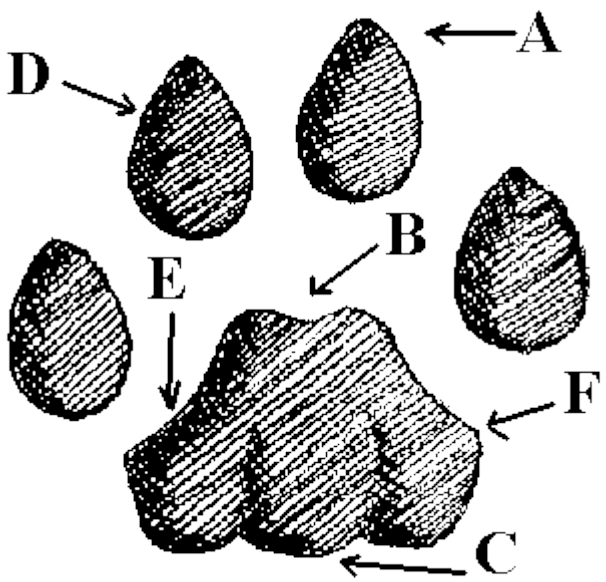
B: The leading edge of the heel pad has two parts, or lobes.

C: The hind edge of the heel pad has three parts, or lobes. They are aligned with each other.

D: This is the front track. One clue that tells you this is that the edge of the heel pad is relatively straight. See hind track for difference.

E: Cats have a little point where the heel pad turns. Dogs share this feature.

Front tracks are usually larger than hind tracks. This is true for both dogs and cats.



This is the track made by the hind left foot of a cougar.

A: Note that the front two toes are not lined up side-by-side as the dog prints were. The toe that is further forward is analogous to a human middle finger (your longest finger). The alignment of this toe will tell you whether you have a left or right track. This toe is the inner toe of the leading pair.

B: The leading edge of the heel pad has two parts, or lobes.

C: The hind edge of the heel pad has three parts, or lobes. They are aligned with each other.

D: The toe pads of cats are more teardrop-shaped than those of dogs. The outer toes of cats are not triangular in shape. Also note that claw marks don't usually show in cat tracks, although there are exceptions, such as when the animal is pouncing.

E: This is the hind track. One clue that tells you this is that the edge of the heel pad is curved inward. See front track for difference.

F: Cats have a little point where the heel pad turns. Dogs share this feature.

Written by Kim A. Cabrera
Beartracker's Animal Tracks Den
www.bear-tracker.com