

U.S. Fish & Wildlife Service Fact Sheet



Secondary Pentobarbital Poisoning of Wildlife

Euthanasia by sodium pentobarbital injection is a humane way to end the life of a suffering animal. This practice is recommended for many species by the American Veterinary Medical Association (AVMA) Panel on Euthanasia. Ironically, this compassionate act can sometimes have the unintended consequence of causing the premature death of other animals.



Bald eagle killed by scavenging the carcass of a euthanized cat in Florida. Photo courtesy of Special Agent John Rawls, U.S. Fish & Wildlife Service Law Enforcement (FWS-LE).

Each year, a number of bald and golden eagles, other wildlife, and domestic dogs are intoxicated or killed after ingestion of pentobarbital residues in the tissue of exposed euthanized carcasses. Exposure of these carcasses is almost always the result of improper disposal.

Eagle and other animal deaths have been reported in 16 different States throughout the United States as well as in Canada. In recent years, at least 50 poisoning incidents involving 139 eagles have been documented. These birds had scavenged carcasses of euthanized farm animals or horses left out in the field, or had fed on small animal carcasses that were left unburied or otherwise exposed at landfills.

Which Animals are Affected by Secondary Poisoning?

Reported accidental poisoning cases include bald and golden eagles, ravens, and magpies. In fact, a number of birds and mammals feed on carrion and are potentially susceptible to being poisoned.

In addition to eagles, scavenging birds include California condors, vultures, several hawk species, wood storks, crows, and gulls. Scavenging mammals include foxes, bears, martens and fishers, coyotes, lynx, bobcats, cougars, and otters. Domestic dogs have also been intoxicated or killed by scavenging poisoned carcasses, and the accidental feeding of tainted meat to animals held in captivity has resulted in the deaths of tigers, lions, and cougars in zoos.

How Does Secondary Poisoning Occur?

When an animal is euthanized via pentobarbital injection, the drug is quickly distributed throughout its body. Well-vascularized organs (such as the liver) will have especially high concentrations of pentobarbital, but other tissues will also contain residues.

When a scavenger feeds on the carcass, the degree of intoxication will depend on the amount and type of tissue ingested. A lethal dose for a bird would generally be much lower than the amount administered to euthanize the source carcass. In fact, large animal carcasses may contain enough accessible residues to kill at least two tiger-sized mammals.



Euthanized horse carcass left on open ground, scavenged by eagles and other carrion feeders. Photo courtesy of Special Agent Steve Magone, FWS-LE.

The ability of bald and golden eagles to move quickly on a fresh carcass and then aggressively fend off other potential scavengers, coupled with their preference for viscera, makes them particularly susceptible to secondary poisoning. Eagles may also be more sensitive to the effects of the drug compared to other species, as raptors have a relatively narrow tolerance for barbiturates. In one incident, 29 bald eagles were poisoned by feeding on a single cow carcass. Eagles, however, have also been killed by scavenging small animal carcasses, such as euthanized pets that were left exposed in landfills.

Many animals that ingest poisoned tissue are acutely intoxicated, become comatose, and are discovered lying dead beside the poisoned carcass. Others are able to walk or fly short distances and are found staggering around the field or landfill, in adjacent fields or woodlots, near roost trees, or in parking lots or other areas. Finally, some intoxicated victims may be killed by blunt trauma (wandering into traffic or falling from perches), predation, drowning, fatal mobbing attacks by other species, or electrocution when they contact power lines and poles.

How Do Animals Gain Access to Poisoned Carcasses?

Most incidents of secondary poisoning (excluding accidental feeding of tainted meat to zoo animals) have been caused by failure to properly dispose of a pentobarbital-tainted carcass. Carcasses are left exposed in the environment and available to animal scavengers.

In many instances, euthanized large animals (including sheep, goats, pigs, horses, mules, and cows) have been left out in the field to be scavenged. In most cases, the poisonings are inadvertent, resulting from poor communication between the attending veterinarian and the

livestock owner. Often, animal owners are unaware that a pentobarbital-ethanized carcass can be poisonous to carrion feeders and that such carcasses must be made inaccessible through rapid burial or other means of disposal. Tragically, in several past cases, well-intentioned farmers purposely left out carcasses because they thought that the local eagle population would benefit from this extra food.



Vultures and gulls scavenge an active landfill. Photo courtesy of Special Agent Andy Buhl, FWS-LE.

In other instances of poisoning, small animal carcasses from veterinary practices or humane shelters have been legally deposited in a landfill but then left exposed to scavengers because they were not covered over in a timely manner by the landfill workers. In these instances, problems with landfill regulations or management practices contributed to the poisonings.

Finally, there have been several cases involving animals poisoned by carcasses that were illegally dumped on public lands and deliberately left unburied.

Which Laws Have Been Violated when Bald Eagles or Other Wild Birds are Poisoned as a Result of Improper Carcass Disposal?

Such poisonings may violate several Federal laws, including the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (Eagle Act), and the Endangered Species Act (ESA). The MBTA protects virtually all wild avian species and their parts, eggs, and nests; only a few introduced species are excluded from its protections. The Eagle Act protects bald and golden eagles and their parts, eggs, and nests. The ESA protects all threatened and endangered plant and animal species as well as critical habitat areas.

The U.S. Fish and Wildlife Service (FWS) enforces these wildlife protection laws. FWS special agents investigate suspected violations, including all reported incidents of secondary poisoning. In such cases, they document the circumstances of the poisoning and the source of the tainted carcass. Scientists at the Service's National Fish and Wildlife Forensics Laboratory analyze tissue samples to confirm the presence of pentobarbital residues as well as the identity of the source carcass.

State and local governments generally pass and enforce laws governing the disposal of animal carcasses. State health and environmental agencies commonly regulate dead stock disposal time limits, available disposal methods, landfill treatment of solid waste (including animal carcasses), and specifics of carcass burial, if permissible. Additional laws may apply to livestock or horses

that are suspected carriers of a transmissible disease. Allowing scavengers (which can act as disease vectors) to have access to a potentially infectious carcass may also violate Federal and State agricultural regulations.

Some animal species affected by secondary poisoning – such as pet dogs – are not protected under Federal law. But if such animals die after feeding on poisoned carcasses, those responsible may be liable under State or local laws.

What Penalties May Apply Under Federal Law to the Livestock Owner and Attending Veterinarian?



To date, veterinarians and livestock owners have been fined under Federal law for the “involuntary killing” of eagles. Veterinarians have also been asked to write about the incidents in professional journals to make other practitioners more aware of the problem.

Penalties sought by the FWS are based on the circumstances surrounding a poisoning incident and vary from case to case. The laws impose substantial fines for criminal violations, along with imprisonment for the most egregious offenses. Under the Eagle Act, for example, penalties run as high as \$100,000 for an individual, \$200,000 for an organization, plus one year in prison. Those penalties increase to \$250,000, \$500,000, and two years in prison for a second offense.

Federal laws also provide for forfeiture of vehicles and equipment under some circumstances. In civil cases, maximum fines range from \$500 (for “any” violation) to \$25,000 (for a “knowing” violation) under ESA and up to \$5,000 for any violation of the Eagle Act.

Could the Veterinarian and/or Livestock Owner Really be Liable for an Accidental Poisoning?

The short answer is YES! Most FWS cases have involved euthanized large animal carcasses that were left out exposed to scavengers. In many instances, the attending veterinarian did not adequately inform the animal’s owner about the need to bury or dispose of the poisoned carcass. Misunderstanding, rather than malice, has been a primary cause of this problem.

The MBTA, however, is a “strict liability” criminal statute, meaning that a finding of intent is not required for a criminal conviction. Thus, an individual who causes a bird to be harmed, even unintentionally, may be held criminally liable under this law.

The ESA and Eagle Act also apply a “strict liability” standard for civil cases. Although only those who act “knowingly” or with “wanton disregard” for the consequences face criminal

prosecution under these laws, the individual who inadvertently commits a violation can be cited and fined for a civil offense.

The best way to avoid liability is to avoid an accidental poisoning! This advice applies not only to large animal veterinarians and their clients, but also to veterinarians working with pet owners who want to bury their animals at home. Putting a prominent warning about carcass disposal on the client's copy of the euthanasia consent form can provide a useful reminder.

How Can Secondary Pentobarbital Poisoning be Prevented?

1. Proper Disposal

- **Incineration/cremation**, if available, is the preferred method of disposal.
- **Immediate deep burial** will also prevent access to scavengers. Most regulations require at least 3-4 feet of cover. Beyond local statutory minimums, additional amounts or types of exclusionary cover may be required in certain habitat areas.

Total coverage should always reflect the ability of local scavenging wildlife to access buried carcasses. All burials should also address the required distance above groundwater table, appropriate soil type, and permitted locations for burial pits.

If frozen ground prevents immediate burial, the carcass must be covered or stored so that access by animal scavengers is prevented. Some regulations specify that a wooden or metal lid designed to exclude scavengers may be used in burial pits that are not immediately covered over with the required amount of soil.

- **Double bagging with “heavy duty” sacks and clear labeling of poison carcasses** should be the minimum acceptable standard at every small animal veterinary clinic, humane shelter, or animal control facility that sends out carcasses for third party disposal.
- Local landfill regulations and management practices must be reviewed and revised if they currently give scavengers easy access to poisoned animal carcasses.

Rendering is not an acceptable way to dispose of a pentobarbital-tainted carcass. The drug residues are not destroyed in the rendering process, so the tissues and by-products may contain poison and must not be used for animal feed.

Note on Carcass Disposal Regulations: Carcass disposal regulations and requirements vary substantially among cities, counties, and States, as do the agencies that administer and enforce them. If clients have questions, advise them to check with Federal, State, and local agricultural, environmental, and public health authorities.

Agricultural regulators include the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service at the Federal level and your State Department of Agriculture.

Environmental regulators that deal with solid waste disposal include the federal Environmental Protection Agency and State and local Departments of Ecology, Environmental Health, Environmental Management, Solid Waste Management, or other similar agency.

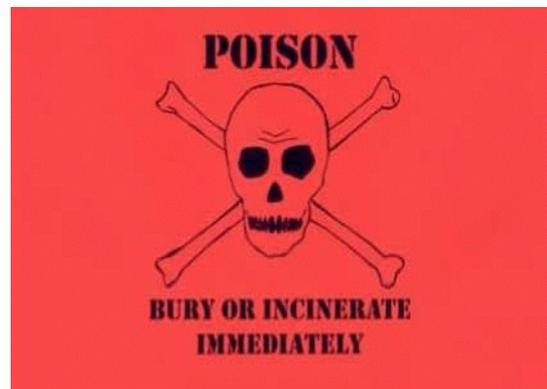
Your State veterinarian and public health regulators, such as the Department of Health or Public Health and the Board of Animal Health, will be able to advise on the public and animal health aspects of carcass disposal and burial.

Many State and local codes can be accessed online. Also, university cooperative extension services may have information on carcass disposal methods approved for your area.

Remember that regulations may change as lawmakers seek to balance growing concerns over biosecurity and transmissible spongiform encephalopathies with the ongoing need for environmental protection.

2. Better Communication

- **Veterinarian-client communication is paramount.** The veterinarian must clearly inform the client that a pentobarbital-ethanized animal carcass in his custody can poison and kill a scavenging animal, including federally protected species, other wildlife, and domestic dogs. The veterinarian must be certain each client understands the requirement for rapid burial, incineration, or other approved disposal. Livestock owners must be informed that any “temporary storage” that leaves a carcass exposed to scavenging is unacceptable.
- **All pentobarbital-ethanized carcasses should be prominently tagged with one or more highly visible “POISON” warning labels.** Bagged animals should have a label affixed to the carcass itself and also attached to the outside of the bag.
- **A prominent carcass disposal warning on the client and practice copies of the euthanasia consent form** would serve as an additional reminder to both the veterinarian and the client.
- Small animal practices and humane shelters that lack on-site cremation facilities and pay third parties to handle carcass removal should be sure to employ a reputable, licensed disposal company.



Sample warning tag for use on a pentobarbital-ethanized carcass. Tag courtesy of Habitat and Animal Health Concern, Inc.

3. Alternate Euthanasia Methods for Free-ranging Wildlife

Pentobarbital injection is the preferred method of humane euthanasia when wildlife management personnel must end the lives of free-ranging wildlife. In some instances, however, carcasses must be left exposed (for example, when frozen ground prevents burial). According to the 2000 Report of the AVMA Panel on Euthanasia, “a gunshot to the head, penetrating captive bolt, or injectable agents that are non-toxic (potassium chloride in combination with a non-toxic general anesthetic) should be used [in these situations] so that the potential for scavenger or predator toxicity is lessened” (J Am Vet Med Assoc 2001; 218: 669-696). Such euthanasia methods represent last resort procedures for use only by trained authorized personnel when no other options exist.

Who Can Provide Additional Information on Secondary Pentobarbital Poisoning?

- For information on medical treatment of poisoning victims, the National Animal Poison Control Center of the American Society for the Prevention of Cruelty to Animals runs a fee-based service for emergencies and other cases: 1-888-426-4435.
- To determine whether a case falls under FWS jurisdiction, for information on law enforcement and liability issues, or if you have found a dead animal, contact a regional FWS Law Enforcement Office or visit the FWS web site at www.fws.gov.

Contact information for regional FWS Law Enforcement Offices appears below:

Pacific Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
911 NE 11th Avenue
Portland, OR 97232-4181
Phone: 503-231-6125
CA, HI, ID, NV, OR, WA, and Pacific
Trust Territories

Great Lakes-Big Rivers Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
P.O. Box 45, Federal Bldg.
Fort Snelling, MN 55111-0045
Phone: 612-713-5320
IL, IN, IA, MI, MN, MO, OH, WI

Southwest Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
P.O. Box 329
Albuquerque, NM 87103
Phone: 505-248-7889
AZ, NM, OK, TX

Southeast Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
P.O. Box 49226
Atlanta, GA 30359
Phone: 404-679-7057
AL, AR, FL, GA, KY, LA, MS, NC, SC,
TN, PR, USVI

Northeast Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
300 Westgate Center Drive
Hadley, MA 01035
Phone: 413-253-8274
CT, DE, ME, MD, MA, NH, NJ, NY, PA
RI, VT, VA, WV

Alaska Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
1011 E. Tudor Road, Suite 155
Anchorage, AK 99503-6199
Phone: 907-786-3311
AK

Mountain-Prairie Region

U.S. Fish & Wildlife Service
Office of Law Enforcement
P.O. Box 25486-DFC
Denver, CO 80225
Phone: 303-236-7540
CO, KS, MT, NE, ND, SD, UT, WY

National Headquarters

U.S. Fish & Wildlife Service
Office of Law Enforcement
4401 N. Fairfax Dr., MS-LE-3000
Arlington, VA 22203
Phone: 703-358-1949

- To determine whether a case falls under the jurisdiction of your State wildlife agency and for State and local assistance with dead wildlife, carcass issues, or other wildlife-related questions, contact your nearest office of the Department of Fish and Wildlife, Fish and Game, or other wildlife agency in your State. Links to many State wildlife agencies can be found at <http://www.tc.umn.edu/~devo0028/gov.htm>.
- For non-wildlife poisonings, contact your local law enforcement, animal control, or Humane Society office.
- The U.S. Geological Survey (USGS) National Wildlife Health Center, Madison, Wisconsin, (www.nwhc.usgs.gov) maintains a partial database of secondary pentobarbital poisoning cases (National Wildlife Health Center, 6006 Schroeder Road, Madison, WI 53711, phone: 608-270-2400).

Acknowledgments

The following individuals contributed data or referrals to data sources: Dr. Dick Stroud, FWS National Fish & Wildlife Forensics Laboratory; Drs. Grace McLaughlin and Kathryn Converse, USGS National Wildlife Health Center; Dr. Mark Pokras, Tufts University School of Veterinary Medicine; Dr. Bob Poppenga, Pennsylvania Animal Diagnostic Laboratory System-New Bolton Center; FWS Special Agents Roger Gephart, Gary Mowad, Andy Buhl, Philip Knudsen, Roger Parker, John Rawls, Tim Santel, Frank Solis, Steve Magone, Bill Talkin, Terry Jorgensen, Stephen Tuttle, and Ed Spoon; Mr. Bob Hosea, California Dept. of Fish and Game; Mr. Sean Strom, Wisconsin Dept. of Natural Resources; Dr. John Huckabee, Progressive Animal Welfare Society; Dr. Ken Langelier, Island Veterinary Hospital; and Dr. Cynthia Johnson, National Fish and Wildlife Foundation.

Fact sheet prepared for FWS by Betsy W. Krueger, DVM, and Kirsten A. Krueger, Ph.D., Habitat and Animal Health Concern, Inc., 26 Shawnee Way, Stafford, VA 22556.