

Wildlife Services

Protecting People
Protecting Agriculture
Protecting Wildlife

Wildlife Services (WS), a program within the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS), provides Federal leadership and expertise to resolve wildlife damage that threatens the Nation's agricultural and natural resources, human health and safety, and property.

Using an integrated approach that combines a variety of science-based methods, the program assists agricultural producers and others experiencing damage from predators.

The M-44 ejector device consists of a capsule holder wrapped with soft material, a small plastic container holding sodium cyanide, a spring-activated ejector, and a stake. Bilingual warning signs mark the placement of each device.

Factsheet

May 2010

M-44 Device for Local Predator Control



The M-44 ejector device is an effective and environmentally sound wildlife damage management tool. The spring-activated device delivers a dose of cyanide powder to targeted animals. It uses a cyanide capsule that is registered as a restricted-use pesticide by the Environmental Protection Agency (EPA). The device can be used only by trained certified applicators.

WS is authorized to use M-44 cyanide capsules to control coyotes, wild (feral) dogs, and red, gray, and arctic foxes which are: suspected of preying upon livestock, poultry, or federally designated threatened and endangered species; or are vectors of communicable disease. The program's use of M-44 devices strictly conforms to EPA label instructions, directions, and use-restrictions; applicable Federal, State, and local laws and regulations; and agency and program directives and policies.

WS personnel do not use M-44s on any property unless requested by the land's owner or manager; a valid written cooperative agreement, agreement for control, Memoranda of Agreement, or other applicable document must be in place.

How an M-44 Works

The M-44 ejector device consists of four components: a capsule holder wrapped with cloth, wool, or other soft material; a cyanide capsule (small plastic container holding sodium cyanide); a spring-activated ejector; and a 5 to 7 inch stake. In the field, the stake is inserted with the top flush with the ground's surface. With the ejector cocked and set, the capsule is inserted into its holder and screwed onto the ejector. The ejector is secured into the stake. Specially formulated fetid bait or other scent material, which elicits a "bite and pull" response by the target animal, is smeared on the wrapped capsule holder.



The M-44 device is triggered when a canid (i.e. coyote or wild dog) tugs on the baited capsule holder, releasing the plunger and ejecting sodium cyanide powder into the animal's mouth. The sodium cyanide quickly reacts with moisture in the animal's mouth, releasing hydrogen cyanide gas. Unconsciousness, followed by death, is very quick, normally within 1 to 5 minutes after the device is triggered. Animals killed by sodium cyanide appear to show no overt signs of distress or pain.

WS personnel place M-44s along game and livestock trails, ridges, fence lines, seldom-used ranch roads, coyote and fox natural travel ways, rendezvous sites, and territorial marking sites/locations. Bilingual signs (Spanish/English) mark the general area and placement location of each M-44. Trained personnel inspect each M-44 at least weekly. Used mostly in the winter and spring, M-44s may be used year-round in some locations. When not in use, they are stored in secured, locked locations.

Use-Restrictions

In addition to the main product label instructions and directions, EPA mandates 26 use-restrictions, which provide guidance for the application, storage, disposal, and training requirements; safety; and necessary recordkeeping. Individual State pesticide regulatory agencies also can require additional restrictions on the use of M-44s in their jurisdiction.

Agricultural and Ecological Damage

Coyotes, foxes, and feral dogs cause substantial damage to livestock and poultry producers, particularly



A Wildlife Services biologist places a warning sign near an M-44 device. The devices are checked at least weekly.

those with sheep and goats. In a 2004 survey of producers, the National Agricultural Statistics Service (NASS) found that coyotes nationwide killed an estimated 135,600 sheep and lambs worth a total of \$10.7 million. Dogs and foxes accounted for an additional 34,000 lamb and sheep deaths worth \$3.1 million. According to the same NASS survey, an estimated 155,000 goats were killed by predators (of all kinds). Based on the survey's data, WS estimates that the number of goats in the survey killed by canids could total approximately 117,000 animals, valued at about \$12.1 million.

Coyotes and dogs also attack and kill cattle and calves. A 2005 NASS survey found that coyotes killed an estimated 97,000 head worth \$43.9 million; dogs killed an estimated 21,900 cattle and calves valued at nearly \$10.8 million. Canids also kill thousands of swine, pet dogs and cats, equines, chickens, turkeys, ducks, geese, and other birds every year.

After studying a petition to ban the M-44, EPA determined that predation accounts for a significant portion of premature livestock losses. EPA found that the use of M-44s have significant benefits in reducing

The M-44 cyanide capsule is an EPA-registered, restricted-use pesticide for coyote, fox, and wild dog control.

predation on livestock without negative long-term impact on the target predators or other nontarget species.

In addition to agricultural damage, predators can also limit the recovery of threatened and endangered species. Placing a dollar value on any threatened and endangered species is difficult; even the loss of only one animal can be catastrophic to a local population or species. The Aleutian Canada goose has been removed from endangered species lists specifically because predation by arctic foxes has been managed by WS using various predation control methods, including M-44s. The device also has been useful in protection of the Rocky Mountain experimental flock of whooping cranes. Although M-44 devices have not been used often for threatened and endangered species protection, it is available to natural resource managers as a vital predator management option when warranted.

Environmental Safety and Security

M-44 devices and cyanide capsules pose no significant environmental risk. Each capsule contains approximately 0.03 ounce (0.97 gram) of the compound (0.88 gram of sodium cyanide and 0.09 gram of inert ingredients). Contact with carbon dioxide and acids in the soil rapidly dissipates the active ingredient into gas if, for some reason, capsule contents spill onto the soil. If carbon dioxide and acids are not present in the soil, the sodium cyanide filters through the soil and is degraded by micro-organisms or other mechanisms. Research by WS' National Wildlife Research Center indicates that the toxic effects of cyanide are extremely short-lived because cyanide decomposes within 24 hours into harmless byproducts. Bioaccumulation is extremely unlikely because the material is metabolized immediately.

To protect M-44 applicators against the unlikely event of exposure, amyl nitrite is available as an antidote.

All applicators are required to carry an antidote kit when applying or inspecting M-44s. No human fatalities have been associated with WS' use of M-44s.

Because of potential security issues related to hazardous materials, WS personnel take appropriate security measure in the handling and storing of M-44s. In a 2007–09 review, EPA consulted with the Department of Homeland Security and agreed that it is not necessary for security reasons to cease the use of M-44s as a wildlife damage management tool.

Nontarget Hazards

To prevent harmful environmental effects, WS assesses the potential impact of its activities before using any wildlife damage management tool, including the M-44. In placing M-44s, program personnel use their expertise in animal ecology and consider animal behavior patterns to minimize the risk of attracting nontarget animals. The use of specialized baits and lures attractive to target animals minimizes that risk. Placing M-44s near where depredations occur or at locations frequently visited by the target species further enhances target selectivity.

Because of the M-44's mechanical design, the device is triggered by pulling straight up, which makes it extremely selective for targeted canid. From 1996 to 2006, more than 97 percent of the animals killed by WS' use of M-44s were target species listed on the product label.

The risk of secondary poisoning to scavengers is nonexistent. The M-44's cyanide powder causes chemical asphyxiation and blocks the use of oxygen in the target animal's blood. As a result, scavenger animals are not harmed because virtually no poison remains in the tissue of an animal killed by the M-44.

WS takes great care in its use of M-44s and in ensuring that its efforts do not jeopardize any threatened and endangered species or any other species. M-44s are not used where federally listed

**Animals killed by M-44s show no overt signs of distress or pain.
No secondary poisoning hazards are associated with M-44s.**

threatened and endangered animal species might be adversely affected. In accordance with the National Environmental Policy Act, the use and potential impacts of M-44s have been fully analyzed in a programmatic environmental impact statement and in numerous environmental assessments. Continuing consultations with the U.S. Fish and Wildlife Service further ensure that WS' use of M-44 cyanide capsules will not adversely impact any federally listed threatened and endangered species or their critical habitat.

Integrated Management

WS addresses damage using an integrated wildlife damage management approach. In selecting control techniques for specific wildlife damage situations, damage is confirmed and assessed. Personnel then consider the species responsible, frequency and extent of the damage, status of the species, local environmental conditions, environmental impacts, and

other factors. These factors are evaluated and used to formulate strategies that may include use of one or more nonlethal or lethal techniques. Environmental analysis has concluded that WS' integrated management approach, including the use of M-44, has not adversely impacted any target or nontarget species populations, including threatened and endangered species.

Additional Information

For more information about this and other WS programs or to request assistance from a WS State office, please telephone 1-866-4USDA-WS or contact the WS Operational Support Staff at (301) 734-7921. Additionally, you can contact WS by mail at: USDA, APHIS, WS, 4700 River Road, Unit 87, Riverdale, MD 20737.

You can also find information on WS programs by visiting our Web site at www.aphis.usda.gov/wildlife_damage/.



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United States Department of Agriculture
Animal and Plant Health Inspection Service