

Partnerships and Progress



Wildlife Services

Protecting People
Protecting Agriculture
Protecting Wildlife



Wildlife Services: Past and Present

The Wildlife Services (WS) program's goals and objectives have evolved significantly since its establishment in 1895 as part of the U.S. Department of Agriculture's (USDA) Division of Entomology.

Initially, WS focused on predator control activities for the protection of livestock; program priorities revolved largely around agricultural economics. Although the program's mission and legal authority have not changed, the breadth of WS activities has increased over time due to societal demands.

The National Animal Damage Control Act of 1931 provided legal authority to WS, which was then known as the Division of Predatory Animal and Rodent Control, to protect American agriculture and other resources from damage associated with wildlife. In 1939, the program was transferred from USDA to the U.S. Department of the Interior. It later returned to USDA in 1985, where it remains today as part of USDA's Animal and Plant Health Inspection Service (APHIS).

Over the years, the program's philosophy—as well as the wildlife management profession as a whole—has evolved, along with societal values and perspectives. Now, the goal for program personnel is often to seek balance among a variety of priorities, including wildlife and environmental conservation, human health and safety, economic considerations, and social factors.

WS provides partnership-based Federal leadership to help resolve wildlife conflicts, and focuses its management efforts on those animals and local animal populations involved in a given situation. Overall, WS managers and biologists emphasize resolving conflicts and managing wildlife damage rather than on eradicating or suppressing wildlife populations.

Driven by increasingly diverse requests for assistance, WS has expanded its operational and research activities beyond its early emphasis on livestock protection and rabies control. Current program activities now include threatened and endangered species conservation, the protection

of public health and safety, wildlife disease surveillance and monitoring, a nationally coordinated research effort, and other activities and programs. Additionally, WS plays a vital role in our Nation's efforts to eliminate the negative effects of invasive species on the environment.



WS employees using telemetry to receive information about radio-collared wolves

Current Program Mission, Authorities, and Activities

WS' mission is to provide Federal leadership among the wildlife management profession, the public, nongovernmental organizations, and governmental/research entities to address wildlife-related problems in a science-based manner that is both accountable and transparent. The program's primary statutory authorities are found in two acts of Congress: The Act of March 2, 1931, (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and The Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c).

While WS' authorizing legislation continues to be the base of its authority, it is the program's *policy directives* that guide WS personnel daily in responding to requests for assistance. WS personnel meet the public's requests by relying on science-based decisionmaking, building connections with scientific and academic communities, and cooperating closely with other government agencies and organizations.

Currently, WS operational activities include conducting rabies control and eradication efforts, managing invasive species, completing wildlife

disease surveillance, reducing the impact of predation on livestock, preventing wildlife strikes at airports, protecting transportation infrastructure, and protecting threatened/endangered species, rare habitats, and ecosystems. Additionally, WS operates a one-of-a-kind national wildlife damage management research program.

Delivering Programs with Transparency and Accountability

WS personnel recognize that different groups sometimes have widely differing values concerning the environment, wildlife, and the government’s role in managing problems associated with wildlife. WS makes every effort to take the public’s diverse values into account during its decisionmaking.

As a commitment to transparency and accountability, WS established the National Wildlife Services Advisory Committee in 1986, which advises the Secretary of Agriculture concerning policies, program issues, and research needed to conduct the WS program. The Committee also serves as a public forum enabling those affected by the WS program to have a voice in the program’s policies. The Committee is comprised of individuals from a broad spectrum of agricultural, environmental, conservation, academic, animal welfare, and related interest groups who meet annually in an open public forum to discuss the direction of the WS program.

As part of its public decisionmaking process, WS adheres to the *National Environmental Policy Act* (NEPA) to evaluate alternatives and the potential impact of its programs and activities. WS conducts regional, State, and local NEPA analyses, and the program integrates the most current scientific information and various societal considerations, such as aesthetics and religious views concerning wildlife, into its decisionmaking. The WS NEPA compliance process and resulting environmental analyses help to ensure that WS’ actions do not jeopardize native wildlife populations or the ecosystems upon which they depend, thereby protecting the public’s interests in wildlife and the environment.

The WS NEPA compliance process gives the public the opportunity to review and comment on WS’ proposed management actions and ensures that the public’s interests in wildlife are given full consideration when making management decisions. In addition, WS NEPA documents are accessible by the public on the WS Web site.

As recently re-affirmed by the U.S. Attorney General, WS is an open policy program under the Freedom of Information Act (FOIA). Since fiscal year (FY) 2003, the program has responded to 213 FOIA requests, and provided 39,566 pages of information to the USDA FOIA office with an average response time of 13 days. In addition, WS publishes commonly requested program information—including data and information related to wildlife management efforts and U.S. natural resources protected—on the program’s Web site annually via its *program data reports*.

A Leader in Managing Human-Wildlife Challenges

WS implements its activities through its national operational and research programs and its *regional and State offices*. WS program employees are educated in the scientific disciplines of wildlife biology and wildlife damage management. Approximately, 98 percent of WS State directors have bachelor’s degrees, with 40 percent also holding master’s degrees and 2 directors with doctoral degrees. Additionally, the majority (62 percent) are certified as wildlife biologists or associate wildlife biologists by The Wildlife Society (TWS), an international scientific association of professional wildlife biologists.

Through the program’s *State offices*, WS’ wildlife biologists, technicians, and support personnel coordinate the program’s technical and operational assistance efforts. WS State directors partner with State agencies, land grant universities, Federal agencies, and others to implement program delivery. WS has Memoranda of Understanding (MOUs) with the U.S. Department of Interior’s Bureau of Land Management (BLM) and the U.S. Forest Service (FS) that identify WS as the lead Federal agency for addressing wildlife damage on public lands. WS is also the lead Federal agency for NEPA compliance

for predator management on public lands managed by the BLM and FS. In many States, WS has multi-agency MOUs with State agencies and land grant universities that identify roles and responsibilities related to wildlife damage management.

WS' *National Wildlife Research Center* (NWRC) operates as the program's research arm and conducts research to resolve human-wildlife conflicts while maintaining the quality of the environment shared with wildlife. The NWRC develops methods and information to address human-wildlife conflicts related to the following: agriculture (crops, livestock, aquaculture, and timber), human health and safety (wildlife disease, aviation), property damage, invasive species, and threatened and endangered species.

The NWRC employs 174 professional scientists, of whom 82 percent hold advanced degrees (masters and/or doctorates), with the remaining 18 percent holding bachelor's degrees. NWRC scientists author an average of 120 publications in scientific literature each year. The NWRC is recognized nationally and internationally for its excellence and leadership in developing science-based methods toward resolving human-wildlife conflicts.

A Growing Profession

The science of wildlife management, and its disciplines, developed greatly during the twentieth century. Within the wildlife management profession, wildlife damage management is one of the fastest evolving disciplines. In fact, of the working groups within TWS, the largest and most active groups are those related to wildlife damage management issues. As TWS states in its wildlife damage control position statement, "Prevention or control of wildlife damage, which often includes removal of the animals responsible for the damage, is an essential and responsible part of wildlife management."

Program Policy and Approach

WS managers and biologists address wildlife damage problems and challenges using an integrated wildlife damage management (IWDM) approach. They rely on a variety of methods and techniques—including

both nonlethal and lethal approaches—to resolve conflicts.

WS' policy requires that a range of management approaches and alternatives be evaluated before the program selects a course of action. The IWDM approach includes the integration and application of all practical methods of prevention and control to minimize wildlife damage. The use of lethal methods to remove wildlife is sometimes necessary, and WS personnel work to remove only the offending animal or local population of animals associated with damage.



Guard Dog Protecting Livestock

With respect to nonlethal methods, WS is an international leader in the research and development of new and effective nonlethal techniques. Beginning in at least 1905, the program has advocated and actively used nonlethal methods. Since the early 1950s, WS has conducted research on nonlethal methods. In 1993, NWRC began spending approximately 75 percent of its annual budget on the development of nonlethal wildlife damage management tools and techniques.

Nonlethal methods may include the use of vaccines, repellents, contraceptives, visual/auditory stimuli, and other methods such as livestock guarding animals, noise making devices, predator-proof fencing, shed lambing, herding, and night penning. WS frequently recommends nonlethal methods, and these methods are often implemented directly by those who have requested assistance.

According to a 2005 National Agricultural Statistics Service (NASS) survey report on cattle losses, farmers and ranchers spend \$199.1 million annually on nonlethal efforts to manage predation. In some cases, WS shares in the cost for producers' nonlethal efforts. For example, in West Virginia, WS promotes a nonlethal approach to alleviating livestock depredation by sharing the cost with producers for the purchase of a guarding animal. During FY 2008, WS personnel conducted nonlethal wildlife dispersal and harassment involving 13 million animals—more than 72 percent of those encountered during the year.



WS and a cooperator discuss the integrated wildlife damage management approach for site-specific problems

Furthering its commitment to an IWDM approach, WS has established a resource management specialist (RMS) position. The RMS serves as a liaison among producers, WS staff, and other organizations on a wide variety of wildlife damage management methods, especially the use of guarding animals and other nonlethal methods to reduce predation on livestock.

Annually, WS responds to more than 200,000 human-wildlife conflicts, with many of these conflicts resolved by the general public using science-based, legal, and humane methods recommended by the program's wildlife biologists.

Serving the American Public

In addition to responding to direct requests for assistance, WS conducts several programs at the national level to deal with human-wildlife conflicts. These programs include: research and development

through the NWRC, the National Rabies Management Program, the National Wildlife Disease Program (NWDP), and the Airport Wildlife Hazards Program.

National Wildlife Research Center

The mission of the NWRC is to apply scientific expertise to resolve human-wildlife conflicts while maintaining the quality of the environment shared with wildlife. Headquartered in Fort Collins, CO, the NWRC maintains eight field stations across the country dedicated to the development of wildlife damage management methods.

NWRC's animal facilities and laboratories (biosafety levels 1, 2, and 3) include extensive behavioral, analytical chemistry, immunology, physiology, and microbiology support for working with vaccines, wildlife contraceptives, pesticides, and repellent registrations. In addition, with its research scientists specializing in biology, ecology, behavioral study, and economics, NWRC develops risk assessments concerning wildlife disease and invasive species threats. Scientists also develop surveillance strategies, management plans, and damage assessments.

Tools and methods developed at the NWRC are used by WS and also by other Federal and State agencies, nongovernmental organizations, the private sector, and international organizations. For example, many of the methods developed and evaluated by NWRC researchers in the airport wildlife hazards management program have been used to assess and manage risk of wildlife-aircraft collisions at airports.

In all, the NWRC focuses on 16 areas of research and methods development and actively manages its intellectual property to encourage the transfer of new methods and inventions to the private sector.

National Rabies Management Program

WS' National Rabies Management Program is a multi-agency cooperative program. Its mission is to implement a coordinated, cost-effective, science-based program to contain and eventually manage rabies in wildlife.

WS and its partners currently conduct rabies control efforts—including distributing oral rabies vaccination (ORV) and/or carrying out enhanced wildlife rabies



Wildlife surveillance for the effectiveness of the Oral Rabies Vaccination (ORV) Program

surveillance—in 25 States. WS works closely with State departments of health, agriculture, wildlife, and others to contain specific strains of the rabies virus in raccoons, coyotes, gray foxes, and feral dogs. Together, they annually distribute more than 11 million ORV baits in 15 States to reduce the threat of rabies to humans, domestic animals, and wildlife.

WS also works closely with Canadian and Mexican partners along shared borders to manage rabies in wildlife as part of an international strategy outlined in the North American Rabies Management Plan. WS' rabies research and management provide multiple benefits to the citizens of the United States and its neighboring countries. The program is a model for the “One Health Initiative,” a worldwide strategy that promotes expanding interdisciplinary *collaboration and communication* and that recognizes the inextricable link between human and animal health.

National Wildlife Disease Program

The NWDP promotes safe agricultural trade by protecting the health of humans, animals, plants, and ecosystems and reducing losses to agricultural and natural resources. NWDP biologists conduct surveillance activities through partnerships with State and Federal agencies in all 50 States and with

nongovernmental organizations. The program also works with officials from other countries to promote and assist with developing wildlife disease monitoring programs worldwide. For example, the NWDP participates in avian influenza surveillance and other disease monitoring and control activities. Additionally, the NWDP biologists serve as first responders in cases of emergency. The Surveillance and Emergency Response System (SERS), an essential component of the NWDP, serves as the primary emergency response contact point for WS.

SERS is the only comprehensive, nationally coordinated system in the United States with the capability of conducting surveillance and emergency response for diseases in wildlife. SERS has a cadre of wildlife biologists who are prepared to mobilize immediately and be on site within 48 hours of a request. NWDP–SERS biologists have extensive Incident Command System training and regularly participate in emergency response scenario drills. The NWDP is APHIS' first line of defense against wildlife diseases that are transmissible to *humans and livestock*.



An American kestrel is relocated from an airport to a safer location

Airport Wildlife Hazards Program

WS biologists work with the aviation community to minimize wildlife strikes to aircraft and protect public safety. Working in cooperation with the Federal Aviation Administration, the Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), and the U.S. Air Force, Army, and Navy,

WS provides Federal leadership in addressing the environmental conditions that contribute to aircraft-wildlife strikes throughout the United States.

In FY 2008, WS biologists provided assistance to 764 airports, conducting direct management operations at 338 airports. Additionally, WS trained 2,178 airport personnel on techniques to reduce wildlife hazards at airports. Most recently, WS was invited by the National Transportation Safety Board to join accident investigation teams, including the one which investigated the crash of U.S. Airways Flight 1549 in New York in January 2009. WS personnel provided the multi-agency team with airport wildlife hazard assistance and collected bird remains from the aircraft for identification. WS efforts at airports and U.S. air bases throughout the world contribute significantly to maintaining aviation safety and reducing risks from *wildlife hazards*.

Protecting Natural Resources and the Environment

Over the years, WS has become increasingly involved in efforts that help protect the Nation’s natural resources and environment. Specifically, program activities have expanded in the areas of invasive species control and protection of threatened and endangered species.

Invasive Species Control

WS involvement in *invasive species* programs developed further after the issuance of Executive Order 13112 by President Clinton (1999), which directs Federal agencies to prevent introductions of invasive species and to control their populations. WS operations and research programs are deeply involved with invasive species issues. Three of the 16 research project areas at the NWRC are dedicated to developing methods for controlling non-native species and to documenting the impact of invasive species on agriculture, the environment, and human health and

safety. Of all the species taken by WS during the last 5 years, over 80 percent were invasive species. These include species such as the European starling, the brown tree snake, feral swine, nutria, and pigeons.

An estimated 50,000 nonindigenous species cause major environmental damage and losses in the United States totaling approximately \$137 billion annually. For example, feral swine have an estimated impact of \$800 million per year on crops, livestock, natural resources, property, and people. As an invasive species, European starlings negatively affect livestock facilities by eating feed and contaminating feed bins. Estimates of U.S. economic losses due to starlings range from \$800,000 to \$4.1 million annually.

On the island of Guam, the brown tree snake has eliminated 10 out of the 13 native bird species, and numerous lizard and bat species, and it poses a hazard to human safety from its bite. Additionally, the snake

is responsible for damaging electric lines and causing significant power outages that result in large economic losses. If it were to be introduced and become established in Hawaii, the brown tree snake’s projected annual economic impact is estimated to range between \$593 million and \$2.1 billion.

These projections underscore the value of WS’ cooperative brown tree snake program on Guam.



WS employee and dog work as a team to find invasive brown tree snakes in Guam

Protecting Threatened and Endangered Species

WS conducts research and management activities for the protection of threatened and endangered wildlife species. Activities focus on several areas, including protection of listed species from predation and competition with other wildlife, enhancement of

recovery programs, and the application of wildlife damage management programs to increase the public's ability to live with introduced and expanding populations of listed species. During FY 2008, WS spent nearly \$6.8 million on threatened and endangered species conservation. The program partnered with other Federal and State agencies, nongovernmental organizations, landowners, and others to help conserve 131 species in 36 States, Guam, and Cuba.

Among its numerous conservation activities, WS plays a crucial role in gray wolf reintroduction in the United States. Due to partnerships among tribes, and Federal and State agencies, the recovery of the gray wolf is one of the greatest success stories of the Endangered Species Act (ESA). WS conducts operational wolf management programs in six States, where wolf depredation management is a part of the overall recovery effort to enhance the public's acceptance of reintroduced wolf populations. WS, FWS, and States develop priorities and operating procedures related to wolf predation on livestock. WS implements targeted management actions, including removal of wolves in some areas, to reduce livestock and other losses to predation. These management programs are carefully conducted to protect livestock and the health of wolf populations. From 2007 to 2008, the Northern Rocky Mountain gray wolf population increased 8 percent, while agencies worked together to manage its impact on livestock.

Since 1998, two WS employees have received the Alpha Award, a prestigious award presented by the Wolf Recovery Foundation and the Defenders of Wildlife for outstanding efforts and contributions toward wolf recovery and management. The most recent WS Alpha Award recipient—a program wolf management specialist in Idaho—received the award in 2008.

When threatened and endangered species or their critical habitat is involved, WS consults with the FWS to ensure that its actions are not likely to jeopardize listed species. For example, WS has consulted with FWS on species such as the jaguar, gray wolf, black-footed ferret, Florida panther, grizzly bear, San Joaquin kit fox, red wolf, and desert tortoise.

Additionally, since 2000 WS has been working with FWS to update the program's nationwide Endangered Species Act Section 7 consultation to clarify WS program activities as they relate to Federal threatened and endangered species. Currently, WS is in compliance with the Endangered Species Act under its previous consultation completed in 1992.

Using Lethal Methods Responsibly

Not all wildlife damage problems can be resolved using nonlethal techniques. Even with the use of single or combined nonlethal methods, livestock losses to predators often continue. For producers, losses can be significant. According to a 2005 NASS survey, predators killed 11,600 head of cattle and calves in Oklahoma alone at facilities where nonlethal methods were used. The value of these losses was estimated at more than \$5.6 million.



This radio-collared wolf will be monitored to determine its movement patterns

When conducting lethal management activities, WS evaluates all potential tools for humaneness, effectiveness, ability to target specific individual animals and/or species, and the potential impact on human safety. Lethal methods that are part of integrated management approaches have a legitimate role in wildlife management and can foster the coexistence between people and wildlife. WS carefully weighs all of its wildlife management options—both nonlethal and lethal—and uses sound science and the best technology available to protect livestock, wildlife, people, and property.

The American Veterinary Medical Association acknowledges that, "...for wild and feral animals, many recommended means of euthanasia for captive animals are not feasible." An AVMA panel recognized that, "...there are situations involving free-ranging wildlife when euthanasia is not possible from the animal or human safety standpoint, and killing may be necessary." In its guidelines for euthanasia, the AVMA states that in these cases the only practical means of animal collection may be gunshot and lethal trapping and that personnel should be proficient and use proper firearms and ammunition. WS' policy and operating procedures comply with the AVMA guidelines.

Lethal methods typically are used concurrently with nonlethal methods or after nonlethal options have either been considered or actually implemented by the program or by individuals who received technical assistance from the program. In many cases, private individuals can be instructed on how to economically and safely conduct certain nonlethal methods themselves. In contrast, this is often not the case when a project requires lethal methods. Because of public safety issues, permit requirements, and the need to ensure the use of humane and environmentally sound methods, WS' involvement is often required. As a result, program personnel typically conduct lethal control methods more frequently than members of the public, leaving some individuals and groups with a critical view of the program.

These criticisms, however, frequently overlook the great care and diligence with which the program operates. WS is committed to the principle that wildlife is a publicly-owned resource held in trust and carefully managed by State and Federal agencies.

The U.S. General Accounting Office (GAO) has indicated that WS' take of predators is small compared to statewide populations and the number of predators removed by hunters and trappers. The GAO has further stated that WS' predator management efforts to protect livestock do not threaten predator populations in the 17 western States that were evaluated.

WS' efforts carefully balance the need to manage depredation with the viability of carnivore populations. Coyote population modeling has indicated that removal of at least 60 percent of the population each year for 50 years would be necessary to affect a population level change. Similarly, previous models indicate that coyote populations could withstand an annual removal of up to 70 percent and still maintain a viable population.

WS gives careful consideration when selecting lethal management methods. Only highly selective methods that minimize risk and exposure of nontarget species are used. The selectivity of WS' techniques is illustrated by the fact that only 2.4 percent of all animals taken in FY 2007 were nontarget animals. Further, when WS personnel conduct predator management activities to resolve human-wildlife conflicts, they carry out their efforts on specific properties and allotments where the *damage occurs*. Program activities are not intended to eradicate a native species or to have a significant negative impact on the environment.

WS recognizes the importance of careful decisionmaking regarding all aspects of program delivery, especially application of lethal approaches. This includes, in some cases, adapting program efforts to avoid potential secondary impacts. For example, the use of lead in hunting and fishing has become a primary concern for the California condor, due to potential poisoning from scavenging on carcasses that have been shot with lead-based ammunition. Wherever appropriate, and in consultation with the FWS, WS uses alternative ammunition when working in the range of endangered species such as the California condor.

When using lethal methods for wildlife damage management actions involving game species, WS works in partnership with State wildlife management agencies to optimize the use of animals as a charitable food resource. During FY 2008, WS donated more than 91 tons of wild game to charitable organizations. The program recently implemented newly developed guidelines for Canada goose meat donations to eliminate potential health risks from exposure to environmental contaminants. WS

partners with State and local agencies throughout the country to determine the best use of our natural resources, while simultaneously contributing to the social good.

Developing Humane Wildlife Capture Methods

WS has played an important role in the development of improved methods for humane wildlife capture. In the last decade, the majority of studies concerning traps and new capture techniques were carried out by WS' NWRC scientists. The American Association of Wildlife Veterinarians and TWS consider trapping an acceptable tool in wildlife management, stating that, "The capture and handling of wildlife is necessary for wildlife conservation, research, disease surveillance, and management, as well as to protect property and human and domestic animal health. Foot-hold traps are important tools for achieving these objectives and, when used properly, are humane, safe, and practical."

Additionally, TWS affirms in its position statement on traps, trapping, and furbearer management that, "Trapping is a primary tool of most animal damage control programs and an important technique in wildlife research. In some situations, trapping is important in furbearer management and the management of other species and can be effective in reducing or suppressing wildlife diseases."

Using Selective Chemical Methods

WS' integrated management approach includes the use of chemicals to selectively target certain wildlife species that are causing damage problems. Importantly, several factors limit the risks to nontarget wildlife and ensure chemical applications are handled safely and responsibly. These factors include: 1) safeguards provided by the EPA's registration process, 2) training and certification of WS pesticide applicators, 3) low volume of pesticide use by the program, 4) limited area of use by the program, and 5) specificity in the action of these pesticides.

Before WS uses a chemical product for wildlife damage management, the product must be registered with EPA, the Federal agency that is responsible for regulating the sale, distribution, and use of

pesticide products. The registration process ensures that human safety and environmental health are considered and that all registered products used by WS are applied according to their specific labeled instructions. WS personnel who apply chemical products comply with EPA and State training and certification requirements, and follow WS' policies concerning product use, storage, transport, and accountability. WS treats any reported allegations of pesticide misuse seriously and investigates each to *determine an appropriate course of action*.

WS personnel work closely with EPA on product registrations, and to date, have registered 22 pesticide products (10 rodenticides, 2 gas cartridge products, 6 avicides, 3 predicides, and 1 snake management tool). These products help to control damage to U.S. livestock, forests, agricultural production, and aquaculture and to manage wild animals that pose human health risks through infectious diseases.

The pesticides and methods that are recommended and used by WS for vertebrate animals specifically target certain species. The methods used take into account a given species' ecological and behavioral characteristics. For example, to manage coyote depredation, the program sometimes uses livestock protection collars (LPC), which specifically target coyotes in the act of attacking a sheep. The collars, which are made of rubber and filled with Compound 1080 (sodium fluoroacetate), are placed around the neck of sheep in select areas where coyote attacks have occurred. Only when a coyote attacks a sheep, does it ingest the Compound 1080 from the LPC.

While WS goes to great lengths to ensure the safety of its methods and the products it uses, some individuals still disagree with certain control methods. In January 2007, EPA received a petition requesting that it suspend and cancel the use of sodium fluoroacetate (Compound 1080 in LPC) and sodium cyanide (used by the program in a device called an M-44). Both products are registered and used by WS for predator control. EPA carefully reviewed the petition—and also the comments submitted by WS and others. In 2009, EPA officials denied the

petitioner's request. EPA's conclusion affirmed the product registrations and WS' ability to safely and effectively continue using both products.

The LPC and M-44 play an important role in WS' predation management program and help protect livestock throughout the Nation. Based in large part on WS procedures, accountability and operational transparency, EPA agreed with WS that the M-44 and LPC have significant benefits and are effective in reducing predation without causing significant nontarget losses.

Conducting Aerial Operations

WS uses highly effective and target-specific aerial operations to protect livestock, crops, and wildlife resources from depredation in vast, open, and remote locations. WS also uses its aviation resources to support other program activities, such as locating gray wolves for radio-collaring and research, conducting bird damage management actions, and assisting with search and rescue missions.

Aerial operations present minimal risk to nontarget animals and are one of the most effective, selective, and environmentally sound approaches to lethal management. Aerial operations allow WS to selectively target animals that are preying on livestock or endangered species, posing a potential danger to human health and safety, or representing a disease risk to other wildlife. During FY 2008, WS conducted aerial operations in 16 States, and not a single nontarget animal was taken with this method.

Aerial operations provide effective damage management by addressing specific predation damage in a short period of time. Total lamb losses declined 25 percent on grazing allotments using preventive control methods in which coyotes were removed by winter aerial operations 5–6 months ahead of summer sheep grazing. Confirmed losses to coyotes declined by 7 percent on allotments where aerial operations were conducted, but increased 35 percent on allotments receiving no aerial operations.

The safety and effectiveness of its aerial operations are top priorities for WS. In 2008, the Interagency

Committee for Aviation Policy (ICAP) awarded WS' aerial operations a certificate of recognition for meeting the requirements of the ICAP Federal Aviation Gold Standard Program.

Taking Preventive Action to Manage Wildlife Damage

As part of its integrated wildlife damage management approach, WS uses preventive control methods, when appropriate, to address predation losses. Preventive actions to reduce predation are effective, and can reduce the number of animals managed through lethal control programs on individual properties.

WS uses preventive management approaches such as habitat management and harassment of wildlife at airports to reduce wildlife presence and hazards, thereby protecting public safety from aircraft collisions with wildlife. WS also sometimes uses preventive aerial operations to reduce predators during the winter. As described in the section immediately above, such efforts have been shown to be highly effective in addressing and preventing livestock losses.

Ensuring Cost-effective Actions

WS works hard to ensure the fiscal responsibility of its operations and to deliver programs that are valuable and cost-effective. Program officials regularly review and incorporate economic factors into their decisionmaking and have performed several cost-benefit analyses concerning program operations.

Cost-benefit analyses identify and compare the monetary costs of performing specific program operations with the monetary benefits or outcomes that result from the program's efforts. Because WS' efforts typically focus on preventing losses or damage, it can be inherently complicated to calculate the resulting monetary value of the program's efforts. In addition to the difficult challenge of accurately estimating the value of a damaging event or loss that did not occur, program officials must also account for numerous variables that can naturally affect the program's efforts and its outcomes (e.g., changes in a given predator's local population, its distribution, and other seasonal variables).

In developing cost-benefit analyses, WS' research economists carefully collect and review a wide range of data to best ensure their accuracy. Based on their analyses of numerous projects and efforts, WS has largely found its program activities to be consistently cost-effective.

For example, WS economists evaluated the program's domestic dog-coyote oral rabies vaccination effort in Texas. Based on information collected and reviewed, they estimated that the total benefit of the effort ranged from \$89 to \$346 million. In comparison, the program's costs for the effort totaled \$26.4 million over ten years. The results of this study found that the program benefits outweigh the costs by at least a 3 to 1 ratio, and possibly as high as 13 to 1.

In another recent cost-benefit analysis, program economists evaluated WS' aerial operations in Wyoming to remove coyotes and protect livestock and wildlife. Based on the data collected and reviewed, they found that the benefits outweighed the costs by a ratio of 21 to 1. Similarly, in a 2008 cost-benefit analysis, WS carefully assessed beaver damage in Mississippi, including the economic impact on the State's timber industry. WS economists found that the benefits were greater than the cost by an estimated ratio of 1.23 to 1 at the low end, and up to as much as 37.67 to 1.

In an independent 2001 report, the GAO concluded that for the prevention of agricultural damage—especially predation on livestock—the exact overall cost-benefit ratio for WS' efforts may be incalculable, but that program costs are typically less than the benefits achieved. The GAO report echoes WS' observation that natural variables make cost-benefit analyses difficult to produce. The report notes that although average losses to predators may be small compared to losses from other causes, the damages are not evenly distributed over time or area. As a result, a small proportion of producers may absorb high losses and experience serious economic impact.

Reviewing and Refining Program Efforts

WS' activities, programs, and policies have been reviewed extensively by external reviewers over

the years. The program has consistently placed a high priority on the results of these external reviews. Working both independently and collaboratively, WS has implemented significant changes after each review. WS officials recognize that such reviews contribute to the program's continued accountability and transparency to the public it serves.

Based on a 1969 congressional review and the recommendations of the Leopold Report in 1964, WS incorporated several changes into its program, including hiring additional personnel with academic credentials and introducing in-service training for long-time employees. Additionally, the program reduced nearly all of its predator control practices and tightened its regulation and supervision of toxicants.

In 1972, the Cain Report provided further recommendations for WS via its reports to the Council on Environmental Quality and the U.S. Department of the Interior. Both reports called for increased WS personnel with professional credentials as well as increased restrictions on pesticide use. In response, WS again responded by enlarging the number of staff with professional credentials. Additionally, the program reaffirmed its personnel's adherence to both EPA and State agency regulations pertaining to chemical methods registration and use.

In two separate reports (1990 and 2001), the GAO reviewed WS' use of lethal methods and its impact on predators. In its 1990 report, the GAO indicated that WS directs its efforts at individual offending animals or local populations of predators, and is not focused on eradication of statewide predator populations. In the 2001 report, GAO officials further recognized and noted that nonlethal control methods may be implemented most appropriately by livestock producers themselves, and that WS must use lethal methods in situations where nonlethal controls are ineffective, impractical, or unavailable.

In 2004, USDA's Office of the Inspector General (OIG) issued an audit report to WS and provided recommendations on hazardous materials management. OIG's recommendations related to accountability of pesticides and controlled drugs, the storage and security of hazardous materials, and

inventories and inspections. WS has completed its corrective actions to address each of the OIG’s recommendation. Among them, WS developed and implemented a controlled material inventory tracking system for the hazardous materials and controlled drugs used by the program for wildlife management. Through policy directives—which now also require quarterly pesticide inventories and reconciliations under supervisory oversight—WS further increased its oversight and management of such materials.

In FY 2007, WS completed a comprehensive *national safety review* to evaluate the safety of its current program areas and to develop recommendations for improvement. During a 1-year review period, 9 external subject matter experts conducted 33 field visits to WS programs and offices in 24 States. During the visits, they evaluated both WS’ work culture and safety protocols concerning numerous areas, including aviation, explosives and pyrotechnics, firearms, hazardous materials, immobilization and euthanasia drugs, pesticides, vehicles, watercraft, and zoonotic diseases. While the reviewers generally found that WS personnel followed appropriate safety practices, they did make several recommendations to improve the work environment. In 2008, the external reviewers submitted their findings and recommendations to WS, and the program has since prioritized the recommendations for implementation. The program anticipates completing all of the high priority recommendations during FY 2010.

WS in the Future

WS will continue to implement a model national program for managing wildlife conflicts and to provide partnership-based leadership through research and science-based programs for agricultural producers, natural resource managers, and the American public. WS is committed to wildlife damage management efforts that are necessary, safe, effective, and environmentally responsible.