

# Partnerships and Progress



### Wildlife Services' Foundation

Established in 1895 as part of the United States Department of Agriculture's (USDA) Division of Entomology, Wildlife Services' (WS) goals and objectives have evolved through the years. Early program priorities revolved almost entirely around agricultural economics. The National Animal Damage Control Act of March 2, 1931, provided legal authority for WS, then named Division of Predatory Animal and Rodent Control, to "conduct campaigns for the destruction or control" of certain animals. The program was transferred out of USDA and into the US Department of the Interior in 1939, and was returned to the USDA in 1985, where it remains today within the Animal and Plant Health Inspection Service. Early on, predator control for the benefit of livestock was the initial, socially-acceptable program focus. Program philosophy and the wildlife management profession have evolved through the years and now seek balance among various factors, including wildlife and environmental conservation, human health and safety, economics, and sociological factors. Today, WS provides partnership-based Federal leadership towards resolution of wildlife damage problems, and focuses management efforts on specific animals and local populations. Overall, WS managers and biologists place greater emphasis on bringing damage under control rather than on "eradication" and "suppression" of wildlife populations. Likewise, WS operational activities, driven by requests for assistance in dealing with wildlife-related problems, no longer focus just on livestock protection and rabies control. Program activities range from threatened and endangered species conservation, public safety protection through wildlife hazard management at airports, and disease surveillance and monitoring. WS plays a vital role in our nation's

efforts to eliminate the negative effects of invasive exotic species on the environment. WS continues its dedication to protecting American agriculture through predation management to protect livestock based on agreements with States and organizations, and use of selective and efficient methods and approaches.



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

### Wildlife Services' Mission and Authorities Today

Wildlife Services is authorized by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the Wildlife Services program is 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). The Program's mission is to provide Federal leadership among the wildlife management profession, the public, non-governmental organizations, and governmental/research entities to address wildlife-related problems in a science-based manner that is both accountable and transparent. While our Program's authorizing legislation continues to be our foundation authority, *policy directives* guide WS personnel in responding to requests for assistance that have increased and diversified into areas unheard of when the Act of 1931 was passed. For example, WS personnel are now involved in emergency preparedness and response in support of large national frameworks, as well as research on wildlife fertility control methods to compliment traditional approaches. Requests for WS assistance evolve constantly as wildlife and human populations merge and interact in rural, suburban, and urban areas around this country. WS' programs and personnel meet this demand through science-based decision making, connectedness with the broader professional and public communities, and cooperation among governmental agencies. WS activities

include rabies and invasive species management, surveillance for other wildlife diseases, reducing the impact of predation on livestock, preventing bird strikes at airports, protecting transportation infrastructure, conserving threatened and endangered species, rare habitats and ecosystems, as well as operating a one-of-a kind national wildlife damage management research program. Now, and into the future, leadership in the areas of transparency, public service, and partnership will enhance WS program delivery to the American public.

Wildlife Services personnel recognize that different communities have a wide range of values related to the environment, wildlife, and the Government's role in managing problems associated with wildlife. Gathering and incorporating issues from a variety of perspectives is essential. Because of WS' commitment to transparency and accountability, the National Wildlife Services Advisory Committee (NWSAC) was established in 1986. NWSAC advises the Secretary of Agriculture concerning policies, program issues, and research needed to conduct the WS program. NWSAC also serves as a public forum enabling those affected by the WS program to have a voice in the program's policies. NWSAC 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.

**Wildlife Services is the World Leader in Management of Human-Wildlife Challenges**

Wildlife Services implements program activities through its National Programs, *Regional and State Offices*, and the *National Wildlife Research Center* (NWRC) and its Research Field Stations. NWRC employs 74 professional scientists, of whom 82% hold advanced degrees (47 PhD's, 13 Master's, and 1 DVM), and the remaining 18% hold Bachelor's

degrees. NWRC scientists authored 118 published, peer-reviewed manuscripts during FY 2008. Program delivery through technical and operational assistance is coordinated through *State Offices* by wildlife biologists, technicians, and support personnel. WS State Directors partner with State agencies, land grant universities, Federal agencies within the State, and others to ensure that WS programs are well-coordinated and responsive to needs. WS State Directors have formal credentials (98% possess Bachelor's Degrees, 40% have Master's Degrees, and 2 have PhD's), and the majority (62%) are certified as professional Wildlife Biologists or Associate Wildlife Biologists by The Wildlife Society. Program biologists address wildlife damage problems and challenges by application of methods and techniques via the integrated wildlife damage management (IWDM) approach. WS has Memoranda of Understanding (MOU) with the U.S. Department of Interior's Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) which identify WS as the lead agency in addressing wildlife damage on public lands. WS also is the lead Federal agency for National Environmental Policy Act (NEPA) compliance



Guard Dog Protecting Livestock

for predator management on public lands managed by the BLM and USFS. In many states, WS has multi-agency MOU's with State agencies (typically, agriculture, health, and wildlife/natural resources) and land grant universities, that identify roles and responsibilities related to wildlife damage management. WS posts *State Reports* that describe partnerships and

priorities in the 50 states, the US Virgin Islands, and Guam.

Wildlife damage management is one of the fastest evolving disciplines within the wildlife management profession. In fact, the largest and most active working groups within The Wildlife Society (TWS), the professional society for wildlife biologists, are those related to wildlife damage management issues: Human Dimensions, Invasive Species, Urban Wildlife, Wildlife Damage Management, Wildlife Diseases, and

Wildlife Economics. Further, TWS' Wildlife Damage Control Position Statement affirms, "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." WS is the world leader in research and development of new and more effective nonlethal wildlife damage management methods. Nonlethal methods have been advocated and implemented by WS since at least 1905. WS has been conducting research since the early 1950's and spending 75% of the NWRC's annual budget on the development of nonlethal wildlife damage management tools and techniques.

Wildlife Services' policy requires that a range of management approaches and alternatives be evaluated and applied. 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 populations of animals associated with damage. Nonlethal methods are recommended by WS and are frequently implemented by the resource owner. For example, in West Virginia, WS cost shares with producers the purchase price of a guarding animal. During FY 2008, WS conducted nonlethal wildlife dispersal and harassment involving over 13 million animals, more than 72% of those encountered during the year. Nonlethal methods may include the use of livestock guarding animals, noise making devices, predator-proof fencing, fladry, shed lambing, herding, and night penning. According to a 2005 National Agricultural Statistics Service (NASS) survey report on cattle losses, farmers and ranchers spend \$199.1 million annually on nonlethal methods to manage predation. WS responds to over 200,000 human-wildlife conflicts annually, with many of these conflicts resolved by the general public using science-based, legal, and humane methods implemented through consultation with WS wildlife biologists.

WS developed a new Resource Management Specialist (RMS) position to serve as a liaison among producers, WS Operations and Research programs, and other organizations on a wide variety of wildlife

damage management methods, especially the use of guard animals to reduce predation on livestock. RMS responsibilities include development of informational resources, best management practices, and communication of advancements, research, and needs with producers, WS, and providers of guarding animals.

### WS Programs Provide Wildlife Damage Management Assistance to the American Public

Wildlife Services implements programs to deal with human-wildlife conflicts at the national level through the National Rabies Management, National Wildlife Disease Surveillance and Emergency Response (NWD SERS), and Airport Wildlife Hazards Programs (AWHP).



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

WS National Rabies Management Program. The Centers for Disease Control and Prevention estimate that public health costs associated with rabies disease detection, prevention, and control are estimated to exceed \$300 to \$450 million annually. The mission of the multi-agency cooperative *WS National Rabies Management Program* is to implement a coordinated, cost-effective, science-based program to contain and eventually eliminate rabies in wildlife. Rabies control efforts using oral rabies vaccination (ORV) or enhanced surveillance is currently conducted in 25 states. WS works closely with State Department's of Health, Agriculture, and Wildlife and others to contain specific strains of the rabies virus in

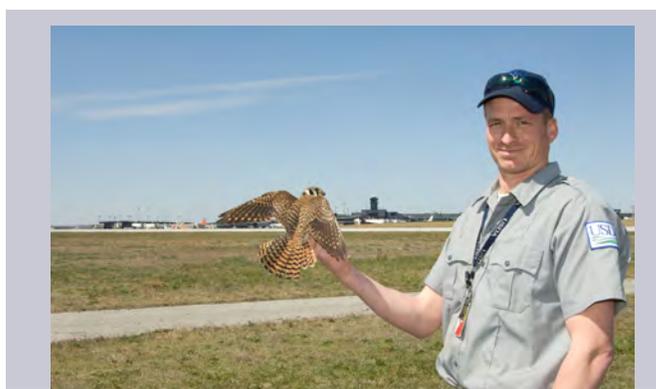
raccoons, coyotes, gray foxes and feral dogs by annually distributing more than 11 million ORV baits in 15 States to reduce costs and significant threats to human health, domestic animals, and wildlife. WS also works closely with Canadian and Mexican partners along shared borders to manage rabies in wildlife as part of an international strategy outlined in the North American Rabies Management Plan. Wildlife rabies research and management conducted by WS provide multiple benefits to the citizens of the United States and is a model for the “One Health Initiative,” a worldwide strategy recognizing that human and animal health, including wildlife, are inextricably linked and promote expanding interdisciplinary collaborations and communications.

*WS National Wildlife Disease Surveillance and Emergency Response*

*(NWD SERS) Program.* The Wildlife Services’ *National Wildlife Disease Program* (NWDP) promotes safe agricultural trade by protecting the health of humans, animals, plants and ecosystems to reduce the levels of incurred losses to agricultural and natural resources. NWDP biologists conduct surveillance activities through partnerships with State and Federal agencies in all 50 states and with non-governmental organizations and officials from other countries to promote and assist in the development of wildlife disease monitoring programs worldwide. The NWDP participates in avian influenza surveillance, as well as other disease monitoring and control activities of particular concern in this country. 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 within WS and is the only comprehensive, nationally coordinated system in the United States capable of conducting surveillance and emergency response for diseases in wildlife. SERS has a cadre of wildlife biologists who are prepared to

be mobilized within 24-48 hours of a request. NWDP-SERS biologists are provided with extensive Incident Command System training, have current medical clearances for personal protective equipment and have participated in emergency response scenario drills. It also functions as the first line of defense against wildlife-borne diseases that are transmissible to humans and livestock.

*Airport Wildlife Hazards Program.* Wildlife Services biologists work with the aviation community to minimize wildlife risks to aviation and public safety while conserving the Nation’s natural resources. WS, in cooperation with the FAA, U.S. Air Force, U.S. Army, U.S. Department of the Navy, U.S. Environmental Protection Agency, and the U.S. Fish and Wildlife Service (FWS), has become the world leader in addressing existing and future environmental



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

conditions contributing to aircraft-wildlife strikes throughout the United States and 6 other nations. In FY 2008, WS biologists provided assistance to 772 airports, providing direct management operations to 338 of them. Additionally, 2,178 airport personnel were trained by WS on techniques to reduce wildlife hazards at airports. Most recently, WS was invited by the National Transportation Safety Board (NTSB) to be on the accident investigation team for the crash of US 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 subsequent identification by the Smithsonian Institution. WS capabilities in this situation, and on airports and air bases throughout the world, make vital contributions to maintenance of public and aviation safety from *wildlife hazards*.

*Application of Integrated Management Programs to Protect People and Resources.* Not all wildlife damage problems can be resolved using only nonlethal techniques. For example, livestock losses to predators sometimes continue, despite the use of

one or more nonlethal methods (including guard dogs, fencing, and night penning). According to a 2005 survey by the [NASS](#), predators in Oklahoma alone killed 11,600 head of cattle and calves valued at more than \$5.6 million at facilities where nonlethal methods of management were utilized. In addition, a 2000 NASS survey found that in Oklahoma, predators killed more than 2,600 sheep and lambs annually. When predator management is conducted to resolve human-wildlife conflicts, it is conducted on specific properties and allotments where the damage occurs.

Wildlife Services damage management activities are not intended to eradicate a native species or to have a significant negative impact on the environment. Coyote population modeling has indicated that the removal of at least 60% of the population each year for 50 years would be necessary to affect a population level change (Pitt et al 2001). These results are consistent with an earlier model developed by Connelly and Longhurst (1975), and revisited by Connelly (1995), which indicated that coyote populations could withstand an annual removal of up to 70% of their numbers and still maintain a viable population. Further, the USDA General Accounting Office (GAO) asserts that WS take of predators is small compared to statewide populations and the number of predators removed by hunters and trappers, and that APHIS WS predator management to protect livestock does not threaten predator populations in the 17 western states. As supported by our mission, WS' predation management programs and activities to protect livestock seek resolution of wildlife damage problems, and are not focused on large scale or regional predator population reduction. The focused activities of WS have been successful at managing depredation while simultaneously allowing populations of carnivores, such as coyotes, to remain viable.

Wildlife is a publicly-owned resource held in trust and managed by State and Federal agencies. WS uses the best technology available based on sound science to protect livestock, wildlife, people, and property. Careful consideration is given to the selection of any lethal management method. 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% of all take in FY 2007 involved nontarget animals. Treves and Naughton-Treves (2005) state that lethal control can foster the coexistence between people and wildlife and has a legitimate role in wildlife management, but that lethal control must be undertaken with care. Further, those lethal methods used must be considered carefully and most often implemented by a government agency because, while wildlife are held in public trust, they are managed by the Government for the benefit of all.

When implementing management activities, WS evaluates all potential tools for their humaneness, effectiveness, ability to target specific individuals as well as species, and potential impacts on human safety. The American Veterinary Medical Association (AVMA 2007) also recognizes that "for wild and feral animals, many recommended means of euthanasia for captive animals are not feasible. The panel recognized there are situations involving free-ranging wildlife when euthanasia is not possible from the animal or human safety standpoint, and killing may be necessary." 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 the proper firearm and ammunition. WS policy and operating procedures are in compliance with these guidelines, and the WS program recognizes the importance of careful decision-making regarding use of lethal methods.

When WS uses lethal methods for wildlife damage management actions involving game species, partnerships are developed with State wildlife management agencies to optimize use of this valuable natural resource. During FY 2008, WS donated more than 91 tons of wild game from animals taken during wildlife damage management actions to charitable organizations. WS has recently implemented newly-developed guidelines for Canada goose meat donation. 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.

WS has played an important role in the development of improved methods for humane wildlife capture,

including support for the testing and establishment of trap standards and development of Best Management Practices for trapping. Furthermore, in the last decade the majority of studies on traps and new capture techniques were carried out by WS NWRC scientists. The American Association of Wildlife Veterinarians (AAWV) and The Wildlife Society (TWS) consider trapping an acceptable tool in wildlife management, stating “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.” Further, TWS asserts the following in its Position Statement on Traps, Trapping, and Furbearer Management; “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.”

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 by sportsmen. Wherever appropriate, and in consultation with the FWS, WS uses lead ammunition alternatives when working in the range of endangered species such as the California condor. WS has not only considered the possible effects of lead poisoning but includes precautionary procedures for limiting exposure to lead in the firearms training provided to its employees.

### **WS Applies Selective Chemical Methods**

WS employs the integrated management approach that includes a variety of methods, and sometimes uses chemicals to selectively target certain wildlife species involved in damage problems. There are several factors that limit nontarget wildlife risks from use of chemical methods, including: 1) safeguards provided by the registration process, 2) training and certification of WS pesticide applicators, 3) the low volume of use of these pesticides, 4) the limited area of use, 5) specificity in the action of these pesticides, and 6) the fact that the pesticides are targeted to specific animals or situations.

Before a chemical method can be used to manage a wildlife damage problem, the product is registered with the Environmental Protection Agency (EPA), the Federal agency responsible for regulating the sale, distribution and use of pesticide products. WS personnel who apply chemical products comply with EPA and State training, certification requirements, and with WS policy on use, storage, transport, and accountability. The registration process regulates the use patterns of pesticide products, and ensures that human safety and environmental health are considered. All of the products used by WS in managing wildlife damage situations have undergone EPA’s rigorous review, are registered products, and are applied according to label directions. WS works closely with EPA on [chemical product registrations](#), and to date, has registered 22 pesticide products (10 rodenticides, 2 gas cartridge products, 6 avicides, 3 predicides, and 1 snake management tool) to contribute to the management of wildlife damage to livestock, forestry, agricultural production, aquaculture, and management of wild animals creating human health issues through infectious diseases. WS considers all reported allegations of pesticide misuse serious, investigates all reports of pesticide misuse, and determines the best course of action.

Vertebrate pesticides used and recommended by WS target certain species through use of their ecological and behavioral characteristics. One example of this is the livestock protection collar (LPC), a rubber collar filled with Compound 1080 (sodium fluoroacetate) that is placed around the neck of sheep in areas where coyote depredation has been occurring. This method targets only coyotes in the act of attacking a sheep in this manner.

During FY 2008 and FY 2009, WS responded to the EPA’s request for comments regarding a petition filed on January 24, 2007, requesting that EPA suspend and cancel the registrations of the predator control uses of sodium cyanide (in the M-44) and sodium fluoroacetate (Compound 1080, in the Livestock Protection Collar – LPC). EPA denied the petition in January 2009, and subsequently denied the Petitioners’ appeal in March 2009. The petition review and the conclusions drawn by the EPA affirm WS registrations and uses of these chemical products, and highlight WS’ priorities

of safe, effective, and environmentally responsible use, storage, and accountability related to chemical methods. Both of these products play important roles in WS' predation management programs to protect livestock in numerous states throughout the Nation. EPA's agreement with WS that the M-44 and LPC have significant benefits and are effective in reducing predation, without causing significant nontarget take is based in large part on WS procedures, accountability and transparency in its operations with these products.

### **Aerial Operations Supplement Management Programs**

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

Aerial operations are one of the most effective, selective, and environmentally sound methods of lethal management and present a minimal risk to nontarget animals. Aerial operations allow WS to selectively target animals that are preying on livestock or endangered species, are a potential danger to human health and safety, or pose a disease risk to other wildlife. Aerial operations provide effective damage management by addressing specific predation damage in a short period of time. In 2008, the Interagency Committee for Aviation Policy (ICAP) awarded WS a Certificate of Recognition for meeting the requirements of the ICAP Federal Aviation Gold Standard Program.

During FY 2008, aerial operations were conducted by WS in 16 states, and 100% of the animals were intentionally targeted individuals. Analyses by the Air National Guard (1997a, 1997b) show that, despite considerable research on numerous wildlife species, no scientific evidence exists that indicates any substantive adverse effects on wildlife populations will occur as a result of any of the types of low-level or other overflights that do or may occur.

### **WS Applies Preventative Efforts to Manage Wildlife Damage**

Preventative actions to reduce predation are effective, and can reduce the number of animals eventually managed through control programs on individual farms and ranches. Wagner and Conover (1999) found that total lamb losses declined 25% on grazing allotments using preventative 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% on aerial operation allotments, but increased 35% on allotments receiving no aerial operations (Wagner and Conover 1999). Therefore, there is considerable evidence that predation damage management, including aerial operations, is effective at reducing predation and is cost-effective.

Without a combination of nonlethal and, when necessary, lethal control methods, livestock producers estimate that losses due to predation would be significantly higher. The integration of these nonlethal damage management methods with lethal methods, when appropriate, has significantly reduced predation by wildlife on domestic animals. Thus, deaths from disease, weather, and birthing have exceeded those due to predation, thanks in part to WS research and operational actions.

### **Invasive Species Control in Support of Executive Order 13112**

Wildlife Services' increasing involvement in *invasive species* programs has developed following the signing of Executive Order 13112 by President Clinton (1999) which directs Federal agencies to prevent introductions of invasive species and to control their populations. Of all species taken by WS during the last 5 years, over 80% were invasive species, such as European starlings, brown tree snakes, feral swine, nutria, and pigeons. The approximately 50,000 non-indigenous species in the United States cause major environmental damage and losses totaling approximately \$137 billion annually. For example, feral swine impact crops, livestock, natural resources, property, and people, with a potential cost of \$800 million per year. European starlings are an invasive



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

species that impact livestock facilities by eating feed and defecating in feed bins. Estimates of economic losses due to starlings range from \$800,000 - \$4,137,119 annually in the United States. Brown tree snakes have eliminated 10 of the 13 native bird, lizard, and bat species on the island of Guam, are responsible for large economic losses from damaged electrical lines and resultant power outages, and pose a hazard to human safety from bites. The total annual projected economic impact of the translocation of brown tree snakes to Hawaii was estimated to fall within the range of \$473 million to \$1.8 billion. These projections underscore the value of WS' cooperative brown tree snake interdiction and control program on Guam.

**WS Protects Threatened and Endangered Species Through the Endangered Species Act**

Wildlife Services also conducts management activities for the protection of other wildlife species, including endangered species. Programs to benefit threatened and endangered (T&E) species include direct protection, recovery enhancement, and application of wildlife damage management programs. During FY 2008, WS expended nearly \$6.8 million on T&E conservation, and partnered with agencies, non-governmental organizations, landowners and others to help conserve 131 T&E species in 36 States, Guam, and Cuba.

Wildlife Services plays a crucial role in wolf reintroduction in the United States. Due to partnerships among Federal and State agencies, and with tribes, the recovery of the gray wolf throughout much of its historic range is one of the greatest success stories of the Endangered Species Act (ESA). With livestock depredation management as part of the overall recovery effort, the gray wolf population in the Northern Rocky Mountain Distinct Population Segment increased 8% from 2007 to 2008. WS conducts operational wolf management programs in 6 states, through cooperative relationships among the agencies, tribes, and the public. As the wolf population continues to increase and occupy areas intensively used for livestock production, localized depredation management continues to be an integral component of the recovery effort. Several WS employees have received the Alpha award, a prestigious recognition by the Wolf Recovery Foundation and the Defenders of Wildlife, for outstanding efforts and contributions toward wolf recovery and management. Most recently, a WS Wolf Management Specialist in Idaho received the 2008 Alpha Award.

When threatened and endangered species or their critical habitat are involved, WS consults with the FWS on a regular and ongoing basis to ensure that our actions are not likely to jeopardize the continued existence of any listed species. Since 2000, WS has been working with FWS to update our nationwide ESA Section 7 consultation to clarify and support WS



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

program activities across the country as they relate to Federal T&E species. The previous consultation, completed in 1992, will provide Section 7 compliance until the new consultation is completed. In addition, WS has consulted with FWS on numerous occasions at the State level for T&E species such as the jaguar, gray wolf, black-footed ferret, Florida panther, grizzly bear, San Joaquin kit fox, red wolf, desert tortoise, and others.

### **WS Programs are Cost-effective and Accountable**

Funding provided to WS through the Federal budget process supports operational programs, research, aquaculture protection activities, surveillance and testing for Highly Pathogenic Avian Influenza, contraceptive studies for managing geese and other avian populations that threaten airport safety, and rabies eradication work through an Oral Rabies Vaccination (ORV) program. Cost effectiveness of certain WS programs can be calculated using cost-benefit analyses. In 2007, WS spent \$26 million to control and eliminate the spread of rabies in the United States. Benefits of the rabies ORV program ranged from \$89-346 million in TX alone. Bodenchuk et al. (2002) reported predation management benefit-cost ratios of 3:1 up to 27:1 for agricultural resource protection. Sheep and lamb losses, including price benefits to consumers, has been calculated at 2.4 times the cost of providing WS services for sheep protection in the 16 western states (USDA 1997). Additionally, Shwiff and Merrell (2004) reported 5.4% increases in numbers of calves brought to market when coyotes were removed by aerial operations. The current WS program was compared with the other alternatives (USDA 1997) and was concluded to be the most effective of the alternatives considered for controlling human-wildlife conflicts.

APHIS WS' activities, programs, and policies, have been reviewed extensively by external interests and reviewers, notably Department-appointed commissions (The Leopold and Cain Commissions, in 1963 and 1971, respectively), the Office of the Inspector General (OIG 2004), and the USDA General Accounting Office (GAO 1990 and 2001). The processes and results of external reviews and collaborative implementation of recommendations are top-priority issues for WS, and contribute to the Program's transparency and accountability to the public.

Wildlife Services has a long history of program reviews to address accountability and effectiveness and has implemented every recommendation that has been made. After a 1969 review by Congress, recommendations of the Leopold Report (Leopold et al. 1964) were incorporated into the WS (formerly Animal Damage Control) program's operations, procedures and policy manual. For example, additional personnel with academic credentials and degrees were added to the program, in-service training for long-time employees was instituted, nearly all predator control practices were reduced, and regulation and supervision of toxicants were tightened. Subsequently, the Cain Report (Cain et al. 1972) provided further recommendations to modify predator control operations, through 15 recommendations to the Council on Environmental Quality and the U.S. Department of Interior. Both reports called for increased professional credentials for ADC/WS personnel, which has been achieved as detailed above, as well as increased restrictions on pesticide use. EPA and State agency regulations pertaining to chemical methods registration and use are adhered to by WS personnel, and are reviewed and upgraded as appropriate. An Audit Report issued to APHIS (WS) by the Office of Inspector General (OIG) in 2004 provided recommendations on hazardous materials management. The recommendations from the report related to accountability of pesticides and controlled drugs, storage and security of hazardous materials, and inventories and inspections. As of April 30, 2007, all corrective actions for the audit were completed by WS. One correction action was the development and implementation of a controlled material inventory tracking system (CMITS), a comprehensive inventory accounting system, for hazardous materials and controlled drugs used for wildlife management purposes. WS has increased controls in policy directives, including quarterly pesticide inventories and reconciliations attended by supervisory oversight.

The U.S. General Accounting Office (GAO 2001 and GAO 1990) has reviewed APHIS WS program use of lethal methods and impacts to predators. The GAO (2001) acknowledged that economic evaluations of APHIS WS activities have been conducted by or in collaboration with APHIS WS, and that these studies were peer reviewed prior to publication in professional journals. Regarding APHIS WS activities to reduce predation on livestock, the 2001 GAO

report recognized that nonlethal control methods may be most appropriately implemented by the livestock producers themselves, and that APHIS WS must use lethal methods in situations where nonlethal controls are ineffective, impractical, or unavailable. The 2001 GAO report concluded that for the prevention of agricultural damage, especially predation on livestock, the exact cost-benefit ratio may be incalculable, but that program costs are typically less than the benefits achieved. Additionally, the report addresses the issue 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. It is noted that a small proportion of producers may absorb high losses, and that these losses can have serious economic impacts. Similarly, the 1990 GAO report recognizes that APHIS WS directs their efforts at individual offending animals or local populations of predators, and is not focused on eradication of statewide predator populations.

In FY 2007, WS initiated a comprehensive National Safety Review, to evaluate the safety of current program areas and provide recommendations for improvement. During the 1-year period of the Review, nine external subject area experts conducted 33 field visits to 24 states to evaluate WS' safety protocols and culture related to aviation, explosives and pyrotechnics, firearms, hazardous materials, immobilization and euthanasia drugs, pesticides, vehicles, watercraft, and zoonotic diseases. Recommendations were made by the *National Safety Review* team and have been prioritized. As of April 2009, WS has completed or is in the process of completing 52% of the high priority items, and plans

to complete all of the high priority recommendations during FY 2010.

**WS Develops and Delivers Programs with Transparency and Accountability**

Wildlife Services conducts NEPA processes to evaluate alternatives and potential impacts of its programs and activities, and fully incorporates NEPA into its decision-making process. WS conducts regional, state and local NEPA analyses, and integrates current scientific information, sociological issues, such as aesthetic values, as well as human religious values toward wildlife. The *WS NEPA* compliance processes and resulting environmental analyses help to ensure that WS actions do not jeopardize native wildlife populations or ecosystems upon which they depend, thereby protecting the public's interests in wildlife and the environment. The WS NEPA compliance process also 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. WS NEPA documents are accessible by the public on the WS website.

Wildlife Services is an open policy program under the Freedom of Information Act (FOIA) as recently re-affirmed by the U.S. Attorney General. As such, WS has responded to 213 FOIA requests since FY 2003, providing approximately 39,566 pages of information to the USDA FOIA office with an average response time of 13 days. Additionally, commonly requested program information, including data and information related to wildlife taken, harassed, relocated, and sampled, as well as resources protected nationwide is published annually via *Program Data Reports* (PDR's) on the program's website.

In summary, WS continues to implement a model national program for managing wildlife conflicts and provides 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.



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

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