

Wildlife Services

Protecting People
Protecting Agriculture
Protecting Wildlife

Protects American Agriculture

FY 2008

Managing Wildlife Damage to Crops and Aquaculture



Contact Information:

In any state, call 1-866-4USDA-WS
(1-866-487-3297)
For national issues, call 301/734-7921
Wildlife Services,
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4700 River Road, Unit 87
Riverdale, MD 20737-5157
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Overview

Wildlife Services (WS) provides the Federal leadership and expertise to resolve wildlife conflicts that threaten the Nation's agricultural resources. WS is a non-regulatory program of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). WS has a presence in every State where its wildlife biologists and technicians work to protect agricultural crops and aquaculture from damage caused by wild animals.

In the United States, wildlife damage to agricultural resources is significant. The survey on wildlife damage by the National Agricultural Statistics Service (NASS) reported wildlife damage to U.S. agriculture at \$944 million during 2001. Field crop losses to wildlife totaled \$619 million and losses of vegetables, fruits, and nuts totaled \$146 million.

More than half of all farmers and ranchers experience damage from wildlife each year. WS works to reduce this damage by providing producers with both technical and direct management assistance to resolve wildlife conflicts. Technical assistance, or the information, advice, and materials to resolve conflicts on their own, enables producers to work independently to reduce wildlife damage. WS provides critical information, training, and equipment such as bird dispersal devices that assist producers in managing their losses. When a conflict is complex in nature, however, WS specialists employ direct management assistance, using their expertise and skill to reduce crop losses caused by wildlife.

Protecting Crops from Bird Damage

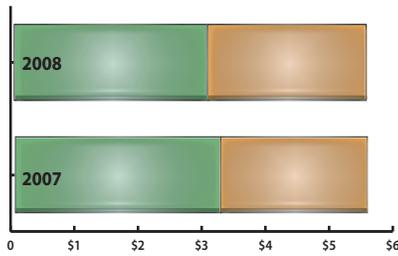
Blackbirds, gulls, geese, and other birds cause severe damage to sunflower, rice, corn, winter wheat, fruit, nut, and other agricultural crops throughout the United States. Based on data collected in seven major fruit-producing states, NASS estimated wildlife damage to apples, blueberries, and grapes exceeds \$41 million annually. Sunflower and rice crops are a favorite of blackbirds, leading to yearly losses of \$5 to \$13 million. WS helps farmers on the East Coast disperse Canada geese away from their crops using pyrotechnics and other noise-making devices. WS' National Wildlife Research Center (NWRC) scientists tested the effectiveness of a contraceptive agent to control reproduction in Canada geese, which has been registered by the U.S. Environmental Protection Agency for that purpose.

The sunflower industry has identified blackbird damage as a key reason that growers abandon sunflower production. Blackbirds are responsible for millions of dollars in annual losses to sunflower and grain crops in the upper Great Plains every year. In North Dakota and South Dakota, WS specialists show sunflower producers how to haze blackbirds away from production areas and reduce marshes that provide blackbird-roosting habitat. Cattail marshes, often located adjacent to sunflower fields, create a perfect place for blackbirds to roost. By identifying large acreages of prime cattail marsh habitat, in historically problem areas, for treatment with selective herbicides, WS has helped to make these roost sites less attractive, dispersing large concentrations of blackbirds away from sunflower production areas.

Another potentially important component of WS' integrated management protocol for sunflower is lure, or decoy, plantings. WS' NWRC data indicate that sunflower lure plantings have potential to be an important component for an integrated management plan to reduce blackbird damage to sunflower. In 2005, NWRC implemented a study to determine the ideal lure plot size, efficacy, costs, and benefits. Wildlife Conservation Sunflower Plots (WCSP) had a cost-benefit ratio of 3.4:1 but birds removed 3.2 times more sunflower seed in fields than in commercial sunflower fields near WCSP. Data from the study suggests that producers should consider planting cost-shared WCSP as part of an integrated pest management strategy to reduce blackbird damage to commercial sunflower.

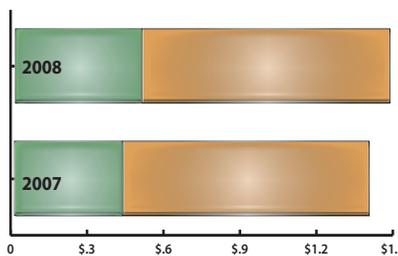
Expenditures for Crop Protection (Millions)

Cooperator Federal



Expenditures for Aquaculture Protection (Millions)

Cooperator Federal



United States Department of Agriculture
Animal and Plant Health Inspection Service

Sprouting rice is another crop vulnerable to blackbirds, especially red-winged blackbirds, common grackles, and cowbirds. Since the early 1990's WS has worked to protect sprouting rice fields located near large winter roosts from blackbird damage. Loss estimates run as high as \$10 million annually in Louisiana. In Arkansas, blackbird damage to maturing rice crops tops \$3.5 million.

WS' NWRC research in 2008 continued to make progress in identifying and evaluating nonlethal repellants to reduce bird depredations on seeded and ripening rice and sunflower crops. Three compounds used as seed treatments, one registered insecticide, and one registered bird repellent were evaluated in a series of no-choice feeding trials, and preference tests. All candidate repellents also were tested at various concentrations to develop a dose-response relationship. Several of the compounds showed promise for further evaluation in field efficacy studies.

Because no single solution exists for resolving bird damage, WS employs an integrated management approach for both technical and direct management assistance. In combination with harassment and other dispersal techniques, WS may recommend that producers change cultural practices including altering planting and/or watering dates or planting alternate crops. Lure crops to draw birds away from affected fields sometimes are recommended as part of an effective integrated damage management strategy.

In addition to providing on-site assistance, WS is instrumental in helping producers obtain the necessary U.S. Fish and Wildlife Service (FWS) depredation permits to address migratory bird damage to their crops. Most native birds are protected by the Migratory Bird Treaty Act, administered by FWS, which implements the U.S. commitment to four international conventions for the protection of shared migratory bird resources. Some protected birds, including Canada geese, cormorants, and vultures, cause significant economic and ecological damage in the United States. FWS recognizes WS' expertise on migratory bird damage prevention and management issues and places importance on WS' recommendations when evaluating migratory bird depredation permit requests.

Protecting Crops from Mammal Damage

Each year, WS responds to requests for assistance to manage damage to fruits, nuts, cantaloupes, watermelons, vegetables, corn, milo, rice, peanuts, turf, wheat, and other field crops from deer, beaver, feral swine, coyotes, badgers, raccoons and small mammals. WS provides technical and direct assistance to producers experiencing crop damage from mammals feeding, trampling, rooting and wallowing activities. Feral swine can destroy large portions of fields and cause thousands of dollars in damage in just a few short nights. Feral swine break through fencing, trample crops, and eat their way through planted fields. In the Eastern United States, overabundant white-tailed deer populations often rely on agricultural crops as a source of food. Beaver can also wreak havoc by building dams that flood agricultural lands and destroy crops. Damage from flooding can reduce crop quality, and in many cases, affect future production levels.

As with bird damage, WS recommends an integrated approach to resolve problems caused by mammals. WS officials work corroboratively with representatives of State agricultural and wildlife agencies, county extension programs, industry

organizations, and individual producers to develop strategies for alleviating mammal damage to croplands. After identifying the species causing the problem, WS biologists provide technical assistance and management recommendations. They also train landowners on how to manage the damage. Sometimes, WS' on-site assistance is necessary, especially when lethal management is required. For example, to manage beaver damage, WS' direct management assistance includes water-level manipulation, exclusion, population reduction, and the safe and effective use of explosives by a WS certified explosives specialist to remove beaver dams that cause crops and farm infrastructure to flood. Integrated management, when actively applied, is usually successful in alleviating mammal damage to row and field crops.

WS Protecting Aquaculture

Aquaculture is an important industry in the United States, but wildlife depredation, especially by fish-eating birds, is significantly impacting production. In 2003, NASS surveyed producers from 13 States dominating the catfish industry. Nearly 70% of catfish producers reported some losses to wildlife. In Arkansas, the rate of loss reported was 79%. In 2006, Wildlife Services research confirmed that catfish producers lose \$10–13 million annually to double-crested cormorants in Mississippi alone. American white pelicans don't just consume catfish, they serve as a host for a trematode parasite of catfish. Heavy infestations of this parasite can be catastrophic, but even light fish infections can cause economic strain to farmers.

In FY 2008, WS provided wildlife damage management assistance to aquaculture producers in 14 states. This included assistance to anglers, baitfish and crawfish producers, catfish farmers, fish hatcheries, sport fish producers for pond stocking, and tropical fish producers.

WS assists the industry in managing depredation by wildlife, specifically by reducing damage caused by fish-eating birds like cormorants, great blue herons, and pelicans. Muskrat damage to dikes and roads at aquaculture facilities is also a common management issue. Over the last 30 years, cormorant and pelican populations have grown significantly, which increased the number of birds wintering in the Lower Mississippi Valley, a major aquaculture-production area. During the year, WS biologists provided technical assistance and equipment to aquaculture producers. For example, propane cannons, netting, and bird dispersal devices were provided to catfish farmers, tropical fish farmers, and bait fish farmers in the Southeastern United States to reduce bird damage to their aquacultural resources. WS also assisted aquaculture farmers in various parts of the United States.

WS' NWRC is conducting research to develop nonlethal methods of managing depredating birds such as modifying fish-culturing practices and employing bird-scaring devices. A large-scale operational cormorant winter roost dispersal program sponsored by WS along with the use of low-powered lasers and other techniques developed by NWRC researchers have been tremendously successful. Aquaculture producers and wildlife managers also are using two depredation orders issued by the FWS to reduce local damage by double-crested cormorants.

Protection of Crops & Aquaculture

- NASS reported wildlife damage to U.S. agriculture at \$944 million during 2001. Field crop losses totaled \$619 million and losses of vegetables, fruits, and nuts totaled \$146 million.
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Temporary electrified fencing to reducing bear damage to bee hives.

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Assisting Farmers and Ranchers by Developing New Management Methods, Preventing Predation and Wildlife-Borne Diseases



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Livestock Protection Statistics

- Livestock loss to predators, predominantly coyotes, reaches about \$111 million annually; WS spent \$30.4 million in FY 2008 directed toward livestock protection
- Mountain lions, bears, wolves, foxes, bobcats, and eagles also prey on livestock.
- Sheep and lamb losses to predators in the U.S. totaled 224,200 in 2005; a NASS study valued the losses at \$18.3 million.
- Cattle and calf losses to predators in the United States totaled 190,000 head in 2005; a NASS study valued the losses at \$92.7 million.
- According to a NASS report, 155,000 goats and kids, valued at \$15.9 million, were lost to predators in 2004.
- In the absence of a professional, accountable damage management program, livestock losses to predators could be as much as two to three times higher.
- According to the National Commission on Small Farms, approximately 92% of all U.S. farms are considered small. These producers especially feel the impact of livestock predation.
- According to a 2000 NASS study, U.S. farmers and ranchers spent \$184.9 million on nonlethal measures to prevent predation of cattle and calves.
- In FY 2008, approximately 75% of WS' research funding was directed toward the development of nonlethal damage management tools and techniques.
- Every \$1 spent by producers on WS services to reduce livestock damage, protects \$3.00-6.75 in livestock.
- In FY 2008, WS wildlife disease biologists collected 6,900 samples from feral swine to monitor for diseases that could impact the pork industry and other livestock
- WS' wildlife disease biologists tested about 9,500 deer in Michigan for bovine TB in Michigan.

Wildlife Services (WS), a program within the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, provides Federal leadership and expertise to resolve wildlife conflicts that threaten livestock. WS works in every State where livestock are raised to reduce predation, prevent the transmission of wildlife-borne diseases, and safeguard this important agricultural industry.

Understanding the Economic Impact of Livestock Predations

As a result of conservation efforts, wildlife populations are thriving across much of the Coyotes, mountain lions, bears and wolves kill thousands of lambs and calves each year. Livestock losses attributed to predators cost ranchers and producers more than \$111 million annually, according to the most recent surveys by the National Agricultural Statistics Service (NASS). A NASS survey found that in 2005, coyotes accounted for 51.1% of all cattle and calf losses to predators. Sheep are the most frequent victims of predation. A 2005 NASS survey recorded 224,200 sheep and lamb lost to predators, representing 37.3% of losses from all causes and costing farmers \$18.3 million.

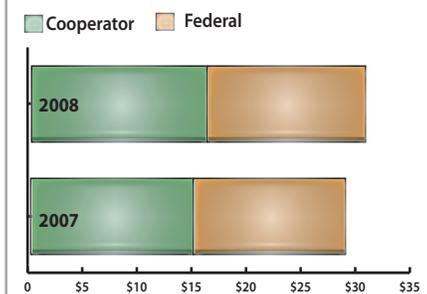
Coyotes are responsible for the majority of livestock predation. The 2005 NASS survey attributed 60.5% of sheep and lamb predation to coyotes. These losses occurred despite the use of multiple management tools and techniques to safeguard livestock. Without these protection measures, livestock losses could be as much as two to three times higher.

Some ranchers and livestock producers experience only minimal livestock losses to predators. Others must deal with serious predation. In Western states, such as Idaho, where livestock usually graze on open range lands, lambs and calves are especially vulnerable to predators. Furthermore, small farmers and ranchers often feel the impact of livestock predation more significantly than larger livestock operations.

Managing Livestock Predations

Coyotes, mountain lions, bears and wolves kill thousands of lambs and calves each year. Livestock losses attributed to predators cost ranchers and producers more than \$111

Expenditures for Livestock Protection (Millions)



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According to a General Accounting Office (GAO) report on wildlife damage, by the time livestock producers and ranchers request WS' assistance they have already employed a variety of nonlethal control measures but continue to experience livestock predation in spite of these efforts. Before beginning any type of damage management program, WS ascertains whether the producer was properly utilizing nonlethal management measures, such as scare tactics, fencing, and animal husbandry practices. In many cases, however, these measures by themselves are not sufficient to prevent livestock predation.

WS has the knowledge and skill, as well as the equipment, to track, capture, and remove predators from locations where they are causing serious damage. These efforts can significantly reduce predation in targeted areas, saving thousands of dollars in losses. WS saved producers \$3.00 to \$6.75 for every dollar they spent to reduce damage when comparing the market value of all livestock saved in 1998 with the cost of all livestock protection programs in place.

WS specialists also provide information and guidance to help producers better manage livestock predation. For example, WS regularly recommends the use of guard dogs and llamas to protect sheep flocks and new lambs. Many nonlethal methods work well, but only in certain situations or locations, and some work only temporarily. When nonlethal methods prove ineffective, impractical, or unavailable, however, the GAO report concludes that lethal management methods are a legitimate means for effectively resolving wildlife conflicts. In these cases, the GAO report notes that WS strives to select the method that will kill the predator in the quickest and most humane way possible.

Developing New Management Methods

While lethal management is necessary in certain situations, opportunity exists for developing effective nonlethal means of managing wildlife damage. The 2001 GAO report, prepared for Congress, found that WS' National Wildlife Research Center (NWRC) has contributed significantly to knowledge about coyote ecology and behavior and development of nonlethal tools. NWRC is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife. In Fiscal Year (FY) 2008, approximately 75% of NWRC's total research funding was spent on efforts relating to developing or improving nonlethal controls.

Capture technology has relied largely on tools and materials developed hundreds of years ago. Although effective, they have raised concerns about animal welfare. In response, NWRC scientists have developed and tested new and alternative capture devices and restraining methods to safely restrain captured animals. Behavioral research is also underway to study visual, mechanical, and odor-cue attractants, which will change capture technology. In addition, research is being conducted to develop more effective frightening devices employing lights and sirens to keep predators at bay. Devices that have shown potential usefulness in preventing livestock loss include: a radio-activated wolf alarm that senses radio collars on wolves and activates sound and light to frighten the predator; a motion-activated system producing the same effects; or fladry, which consists of strips of flagging prominently displayed around an area to be protected.

NWRC researchers are also studying coyote reproduction and its effects on livestock predation. Study results have shown surgically-sterilized coyotes were significantly less likely to prey on lambs than were coyotes with pups to feed. This critical research will provide new damage management options for livestock producers and enable WS to expand the list of available tools to resolve predator conflicts that are too significant for producers to handle on their own. Also, NWRC is researching the potential use of a mixture of theobromine (chemical found in chocolate) and caffeine as a predicide for use in predator damage management activities. NWRC has been determining an effective formulation and delivery system for the potential use of this chemical. This mixture could develop into a selective, effective and socially acceptable toxicant for the control of pest coyotes.

Protecting Livestock from Wildlife-Borne Diseases

Although a serious problem for producers and ranchers, predation is not the only issue impacting livestock health. Wildlife-borne diseases also pose a serious threat to livestock. In FY04, WS began assigning wildlife disease biologists to conduct wildlife disease surveillance and provide assistance to Federal, State, Tribal, and other entities. Currently, the program has increased to include 44 wildlife disease biologists and this expansion has been invaluable in helping a number of entities in the United States to address significant wildlife disease concerns, which have the potential to affect the Nation's livestock.

Highly pathogenic avian influenza H5N1, a virus very deadly to birds, became a global issue in 2006. Confirmed in Asian poultry during 2003, the next year it was reported in humans who had close, direct contact with birds. Transmission of the disease by wild birds potentially threatens the United States and could seriously affect commercial poultry populations. WS assisted a diversity of partners in collecting samples from wild birds in an effort to detect entry of the disease into the United States before it has an opportunity to spread. In FY 2008, WS worked cooperatively with State wildlife agencies and others to collect about 81,000 samples in all States across the country. The samples were examined for the presence of AI in an ongoing early detection/rapid response National initiative.

Another concern is bovine tuberculosis (TB), a respiratory disease that can infect most mammals. Significant progress had been made in the 20th century to eradicate the contagious, bacterial disease; Where it is found, restrictions can be placed on interstate transportation of cattle, a significant impact on producers. The presence of bovine TB in white-tailed deer puts people, livestock, and wildlife at risk. Captive cervids (members of the deer family) and free-ranging wildlife may both be a reservoir for the disease. The WS' wildlife disease biologist in Michigan, aided as needed by an additional eight wildlife disease biologists, con-

ducted surveillance for the disease, helping test approximately 9,500 deer in Michigan for bovine TB. WS is also developing research, disease management, and educational tools to complement the efforts of other Federal and State agencies. WS is concluding a research project to study the interaction of deer and cattle, and another investigating whether coyotes may be reservoirs of bovine TB.

Chronic wasting disease (CWD) is a fatal neurological disease carried by deer and elk, which can be transferred from wild populations to captive cervid herds. Due to greater testing of free-ranging cervid populations, the number of states reporting confirmed CWD cases increased to 14 by the end of FY 2008. WS' wildlife disease biologists assisted with CWD surveillance in 19 states in FY 2008. WS also has the expertise to assist with depopulation efforts and to help landowners obtain permits to remove deer from their property in order to protect their herds from potentially diseased wildlife.

Feral swine are a subject of increasing concern as potential carriers of or catalysts for a variety of diseases that could impact livestock, domestic pork producers, ranchers, farmers, and the general population. Diseases such as pseudorabies, swine brucellosis, classic swine fever, e-coli contamination and others have been linked to feral swine. During FY 2008, a total of 6,900 disease samples were collected by WS disease biologists working with APHIS-VS to protect the American pork industry, as well as all agriculture. Disease surveillance continues to grow as control efforts intensify. Range expansion and massive population growth are occurring throughout the US, with current feral swine estimates at 4-5 million animals. An internal WS survey conducted in FY 2008 indicated that 35 states (70%) currently have feral swine and an additional 8 states expect to have feral swine invade their borders within the next 5 years. If realized, 86% of states will have feral swine present by 2013. During FY 2008, over \$3.7 million dollars were spent to control feral swine in the United States, with 76.4% coming from other entities cooperating with APHIS, WS. Control activities primarily include trapping and aerial hunting. Over 27,800 hogs were taken in control activities during FY 2008. As the swine population continues to rise and expand geographically, disease surveillance and control activities will need to expand proportionally to even attempt to keep disease threat and economic losses at current levels.

Livestock also are threatened by diseases such as histoplasmosis and salmonella, diseases that are carried in or furthered by bird feces where large numbers of birds are present. In feedlots and dairies, livestock that become infected frequently lose weight and dairy cattle can experience a significant drop in milk production. WS works with producers to test collected birds for diseases, to reduce the attractiveness of feedlots to birds by making feed more difficult to obtain, and to reduce bird populations when appropriate. These efforts benefit not only livestock, but also agricultural workers who can contract the diseases. Ultimately American consumers benefit through economic efficiencies and safer foods.



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Developing New Management Methods, Preventing Predation and Wildlife-Borne Diseases



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- Total funding for all agricultural resource protection in FY 2008 was \$48 million, 53% provided by federal funding and 47% by cooperators.
- Agricultural resource protection includes, aquaculture, crops, forests, range and wildlife disease surveillance in addition to livestock protection.
- Livestock producers spend more than \$190 million on nonlethal control of predation but still lose livestock valued at more than \$126 million annually.
- In FY 2008, WS collected 6,900 samples from feral swine and more than 80,000 samples for avian influenza.

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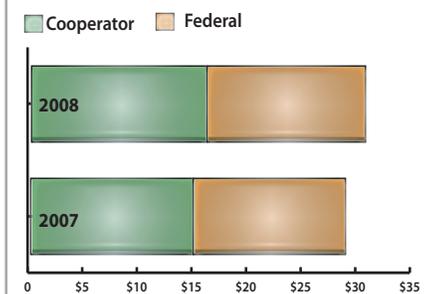
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In agreement with the livestock industry's desire for greater assistance in broadening the use of range of wildlife management practices (especially nonlethal methods such as guarding animals), WS has created a new Resource Management Specialist (RMS) position. The RMS position will have national responsibilities, and will provide informational

Expenditures for Livestock Protection (Millions)



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resources for WS personnel, producers, the media, and the public. Although efforts will focus on reducing livestock losses to predators through nonlethal techniques, the RMS will also provide informational resources for other wildlife damage management challenges.

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Another concern is bovine tuberculosis (TB), a respiratory disease that can infect most mammals. Significant progress had been made in the 20th century to eradicate the contagious, bacterial disease. Where it is found, restrictions can be placed on interstate transportation of cattle, a significant impact on producers. The presence of bovine TB in white-tailed deer puts people, livestock, and wildlife at risk. Captive cervids (members of the deer family) and free-ranging wildlife may both be a reservoir for the disease. The WS' wildlife disease biologist in Michigan, aided by an additional eight wildlife disease biologists, conducted surveillance for the disease, helping test approximately 9,500 deer in Michigan for bovine TB. WS is also developing research, disease management, and educational tools to complement the efforts of other Federal and State agencies. WS is concluding a research project to study the interaction of deer and cattle, and another investigating whether coyotes may be reservoirs of bovine TB.

Chronic wasting disease (CWD) is a fatal neurological disease carried by deer and elk, which can be transferred from wild populations to captive cervid herds. Due to greater testing of free-ranging cervid populations, the number of states reporting confirmed CWD cases increased to 14 by the end of FY 2008. WS' wildlife disease biologists assisted with CWD surveillance in 19 states in FY 2008. WS also has the expertise to assist with depopulation efforts and to help landowners obtain permits to remove deer from their property in order to protect their herds from potentially diseased wildlife.

Feral swine are a subject of increasing concern as potential carriers of or catalysts for a variety of diseases that could impact livestock, domestic pork producers, ranchers, farmers, and the general population. Diseases such as pseudorabies, swine brucellosis, classic swine fever, e-coli contamination and others have been linked to feral swine. During FY 2008, a total of 6,900 disease samples were collected by WS disease biologists working with APHIS-VS to protect the American pork industry, as well as all agriculture. Disease surveillance continues to grow as control efforts intensify.

Range expansion and massive population growth are occurring throughout the US, with current feral swine estimates at 4-5 million animals. An internal WS survey conducted in FY 2008 indicated that 35 states (70%) currently have feral swine and an additional 8 states expect to have feral swine invade their borders within the next 5 years. If realized, 86% of states will have feral swine present by 2013. During FY 2008, over \$3.7 millions dollars were spent to control feral swine in the United States, with 76.4% coming from other entities cooperating with APHIS, WS. Control activities primarily include trapping and aerial hunting. Over 27,800 hogs were taken in control activities during FY 2008. As the swine population continues to rise and expand geographically, disease surveillance and control activities will need to expand proportionally to even attempt to keep disease threat and economic losses at current levels.

Livestock also are threatened by diseases such as histoplasmosis and salmonella, diseases that are carried in or

furthered by bird feces where large numbers of birds are present. In feedlots and dairies, livestock that become infected frequently lose weight and dairy cattle can experience a significant drop in milk production. WS works with producers to test collected birds for diseases, to reduce the attractiveness of feedlots to birds by making feed more difficult to obtain, and to reduce bird populations when appropriate. These efforts benefit not only livestock, but also agricultural workers who can contract the diseases. Ultimately American consumers benefit through economic efficiencies and safer foods.

Livestock Protection Statistics

- Livestock loss to predators, predominantly coyotes, reaches about \$126.9 million annually; WS spent \$30.5 million in FY 2008 directed toward livestock protection
- Mountain lions, bears, wolves, foxes, bobcats, and eagles also prey on livestock.
- Sheep and lamb losses to predators in the United States totaled 224,200 in 2005; a National Agricultural Statistics Study (NASS) study valued the losses at \$18.3 million.
- Cattle and calf losses to predators in the United States totaled 190,000 head in 2005; a NASS study valued the losses at \$92.7 million.
- According to a NASS report, 155,000 goats and kids, valued at \$15.9 million, were lost to predators in 2004.
- In the absence of a professional, accountable damage management program, livestock losses to predators could be as much as two to three times higher.
- According to the National Commission on Small Farms, approximately 92% of all U.S. farms are considered small. These producers especially feel the impact of livestock predation.
- According to a 2005 NASS study, U.S. farmers and ranchers spent \$199.1 million on nonlethal measures to prevent predation of cattle and calves.
- In FY 2008, approximately 75% of WS' research funding was directed toward the development of nonlethal damage management tools and techniques.
- Every \$1 spent by producers on WS services to reduce livestock damage, protects \$3.00-6.75 in livestock.
- In FY 2008, WS wildlife disease biologists collected 6,900 samples from feral swine to monitor for diseases that could impact the pork industry and other livestock
- WS' wildlife disease biologists tested about 9,500 deer in Michigan for bovine TB.

