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Wildlife Services National Wildlife Research Center: Leader in Nonlethal Wildlife Damage Solutions

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USDA Scientists Apply Wildlife Biology Expertise to Wildlife Conflicts

The Wildlife Services National Wildlife Research Center (NWRC) is a world leader in providing science-based solutions to complex issues of wildlife damage management. As the research arm of the Wildlife Services (WS) program, NWRC works with WS operations staff to provide Federal leadership and expertise to resolve wildlife conflicts related to agriculture, livestock, human health and safety (including wildlife diseases), invasive species, and threatened and endangered species. In 2004, approximately 75-percent of NWRC's funding was spent on efforts to develop or improve nonlethal wildlife damage management tools and methods. In fact, many of the nonlethal methods used today by Federal, State, and private sector wildlife professionals stem from research conducted at or through the Center.

Protecting Agricultural Crops, Aquaculture, and Natural Resources

NWRC is committed to finding nonlethal solutions to reduce wildlife damage to agricultural crops, aquaculture, and natural resources. In the 1980's, NWRC scientists showed that "decoy" plantings of sunflower could significantly reduce bird damage to nearby commercial sunflower fields. For a variety of logistical and economic reasons, however, decoy sunflower fields did not become widespread. Over the last decade, new Federal farm programs have placed more emphasis on wildlife conservation leading to a renewed interest in the use of decoy fields. NWRC researchers are continuing to gather data to support the use of decoy fields as a broad-based, dual-purpose wildlife management strategy that not only reduces blackbird damage but also provides habitat for wildlife.

NWRC is also working with numerous partners to reduce bird damage to rice crops and increase profitability to growers. NWRC efforts to reduce blackbird damage to sprouting and ripening rice involve evaluating the use of caffeine and GWN-4770 (a registered fungicide) as potential blackbird repellents. In initial field tests, blackbirds consumed less rice at fields treated with the repellents.

In addition to damaging agricultural crops, birds can also cause a great deal of damage at fish farms and other aquaculture facilities. Currently, NWRC is studying the migratory movements and feeding behavior of fish-eating birds, especially double-crested cormorants. With this knowledge, NWRC is perfecting the use of low-powered, nonlethal lasers to disperse cormorants from night roosts near fish farms.

Foraging wildlife, such as rodents and deer, can damage forest resources in many ways, such as reducing productivity or disrupting re-vegetation efforts. NWRC researchers conducted a series of tests showing the effectiveness of capsicum (pepper) and thiram (a fungicide) in reducing mouse damage to longleaf pine seeds (*Pinus palustris*). NWRC researchers continue to study the use of these potential repellents to protect longleaf pine seeds from rodent foraging when the seeds are used in re-vegetation efforts for southern pine forests.

Protecting Human Health and Property

NWRC works to protect human health and property by developing wildlife damage management tools that help reduce wildlife hazards. Wildlife that linger around airport runways are an ongoing concern for many airport managers. Over the years, aircraft have been severely damaged by wildlife collisions, and in a number of cases, passengers have been killed. NWRC researchers recently evaluated the effectiveness of a 5-strand braided electric fence (ElectroBraid™) to exclude white-tailed deer from airport runways. Results indicate the fence is effective at reducing deer intrusions by up to 99-percent and may be a feasible tool for use at small airports where 10 foot high chain-link fencing is too costly.

As goose populations and urban areas expand and overlap, Canada geese are often considered a nuisance and potential health problem (fouling land and water, colliding with and damaging aircraft, etc.). Nonlethal and humane means of managing the size of Canada goose flocks in urban areas are needed. NWRC researchers are currently evaluating the effectiveness of nicarbazin as a contraceptive agent for Canada geese. Current NWRC studies may lead to Environmental Protection Agency support for the registration of nicarbazin as a reproductive control agent for Canada geese.

Black bears that shred tents and damage car doors in order to get food from campers continue to be a significant concern for Yosemite National Park biologists. In an effort to enhance the effectiveness of the Park's hazing efforts, researchers from NWRC, in cooperation with Yosemite National Park and the Wildlife Conservation Society, have developed an alarm system that alerts park personnel to the presence of problem bears in developed areas. When a bear is detected with the alarm's radio telemetry equipment, park personnel can quickly respond and scare the bear away before it causes any damage.

As the number of vultures increases throughout the southeastern United States so does the number of vulture-human conflicts. Black vultures damage vinyl, plastic, and other synthetic construction and insulation materials. Additionally, black vultures prey on newly-born livestock and, in association with turkey vultures, form roosts that not only are nuisances to people but also contribute to human health and safety problems. To help alleviate these problems, NWRC researchers successfully tested the effectiveness of an artificial vulture effigy in dispersing birds from roosting sites in Florida. Following the installation of the effigies at several sites, vulture populations decreased by 84-percent.

Current NWRC research also protects human health by developing methods to reduce or eliminate disease transmission among wildlife, domestic animals, and humans. For example, NWRC researchers have identified a new method for estimating the intensity of West Nile virus activity in specific areas based on the number of over-wintering West Nile virus-positive ectoparasites (ticks, fleas, louse flies) found in cliff swallow nests. This finding is significant because early detection of the virus may occur in cliff swallow nests before it shows up in the general avian community or nearby human population. Early identification of viral activity is important for public health and vector-control preparedness.

In addition, NWRC has been active in the development and testing of wildlife rabies vaccines. Though rabies is well controlled in domestic animals, it is still cause for concern among wildlife populations. Research by NWRC has led to new bait designs, including bait-coated sachet packets, bait formulations for skunks, and better raccoon baits for delivery of the oral V-RG vaccine. Field studies are underway to evaluate new baits for skunks in five States. This research supports the WS' Oral Rabies Vaccination program.

For thousands of years, dogs have been used successfully to reduce predation on livestock. NWRC research shows that livestock protection dogs are effective at keeping deer away from cattle and may reduce the potential for bovine tuberculosis transmission from deer to cattle in areas where bovine tuberculosis is present.

Protecting Threatened and Endangered Wildlife

Predators can have a major impact on threatened and endangered wildlife. When this happens, WS' expertise is often called upon by State and Federal agencies or environmental groups to help reduce predation by relocating or excluding predators from certain areas.

One of the primary nesting beaches for the threatened eastern spiny softshell turtle, on the Vermont shores of Lake Champlain, has suffered nearly 100-percent losses of nests to raccoon predation in recent years. NWRC is working with Vermont WS to develop a raccoon indexing method using cameras instead of tracking plots. The index will be used to evaluate the effectiveness of an electric fence in excluding raccoons from nesting beaches. It will also index other species, such as fox, that may be preying on the turtle nests.

Protecting Against Invasive Species

NWRC develops innovative strategies to minimize the impacts and spread of invasive wildlife species in the continental United States, its territories and nearby countries or islands. For example, the monk parakeet, an invasive species from South America, has become established in Florida and several other states. For unknown reasons, monk parakeets often select electric utility facilities as sites to build their large, bulky nests of twigs and other materials. This behavior frequently results in power failures as nest materials and birds come into contact with conductors. NWRC is investigating the potential use of DiazaCon (an oral contraceptive) as a nonlethal method for reducing monk parakeet populations. Results so far look promising, and nesting behavior and reproductive success are currently being monitored. NWRC researchers are also investigating the use of reproductive inhibitors to reduce the brown treesnake population on Guam where an overabundance of the invasive snakes has decimated native birds, bats, and reptiles.

Protecting Livestock

Protecting livestock from predators is an important part of WS' mission. The need for acceptable and effective predator management tools is imperative in order to protect public safety and reduce livestock losses. Recent restrictions on the use of traps have led NWRC to test a wider array of nonlethal tools and methods that minimize predation on livestock.

Biologists from the NWRC Logan, UT, field station and Idaho WS are gathering data on the effectiveness of Radio Activated Guard (RAG) devices to control wolf predation on livestock. The RAG consists of a receiver programmed to scan for predetermined radio frequencies generated by radio collars on nearby wolves. Activation of the device triggers a strobe light and loud sound effects from a tape player. To date, 11 devices have been produced and deployed and have been successful in protecting cattle from repeated incursions by wolves.

NWRC is also investigating the use of reproductive control agents on predator populations. For example, NWRC has tested the effectiveness of contraceptive agents, such as porcine zona pellucida (PZP) and cabergoline, to limit reproduction in coyotes. Previous NWRC studies show that coyotes without pups are less likely to prey upon livestock. Therefore, limiting the ability for existing territorial coyotes to reproduce may be an effective method of reducing livestock predation.

The scientists working at NWRC are dedicated to resolving conflicts that arise between people and wildlife. Through their efforts, NWRC scientists provide WS field biologists, and those who struggle with wildlife damage, an array of tools and methods that they can employ and adapt to resolve wildlife conflicts. NWRC scientists are concerned about the welfare of all animals, and they look for solutions that are biologically sound, environmentally safe, and socially acceptable. This critical research ensures that the broadest array of wildlife damage management tools will continue to be available for use by WS biologists, as well as State wildlife agency professionals, landowners, and others.

Selected Publications

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