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Development of Reproductive Control Methods

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National Wildlife Research Center Scientists Study Wildlife Contraception

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques.

Research on the reproductive management of various avian and mammalian species that cause damage or threaten public health and safety is a high priority for WS. The severity of human-wildlife conflicts often is directly related to wildlife population density: many problems are exacerbated as wildlife populations become larger. In many urban and suburban settings, for example, overabundant deer create safety hazards for motorists, consume ornamental shrubs, harbor and transmit diseases and parasites (e.g., Lyme-diseasebearing ticks), and degrade habitat quality in public parks and other locations. Rodents also carry a variety of diseases (e.g., plague, hantavirus), and they damage rangelands and crops, causing the loss of millions of dollars in agricultural production. More than two million feral hogs now occur in at least 28 states, where they cause serious ecological damage as well as serving as a reservoir for pseudorabies and brucellosis. Overabundant feral horses in several western states continue to create costly ecological and political problems. Tens of millions of feral cats and dogs in the United States harass and kill wildlife and livestock, and create public health nuisances through their bites, waste, and transmission of diseases and parasites. In addition, when populations of native predators such as coyotes are locally overabundant, they are sometimes responsible for severe losses by livestock producers.

The goal of NWRC's research with wildlife contraceptives is the development and field testing of economical and effective agents to suppress reproductive fertility in populations of selected species that are causing conflicts.

Major Research Accomplishments:

- WS developed a new adjuvant (AdjuVac[™]), which facilitated the creation of a new, GnRH-based, single-injection immunocontraceptive vaccine called Go $naCon^{TM}$.
- WS conducted numerous studies of the safety, efficacy, and practicality of the PZP and GnRH vaccines on several wildlife species including California ground squirrels, Norway rats, feral cats and dogs, baboons, burros, swine, horses, and deer.
- WS is conducting several laboratory and field studies to evaluate the use of



Applying Science and Expertise to Wildlife Challenges

Wildlife Contraception—NWRC researchers have successfully tested a single-injection, GnRH (gonadotropin-releasing hormone), immunocontraceptive vaccine (called GonaCon™) on free-ranging California ground squirrels, captive Norway rats, feral cats and dogs, domestic and feral swine, and white-tailed deer. Temporary infertility was achieved in all species tested. Ongoing pivotal studies in Pennsylvania and Maryland are evaluating the safety and efficacy of this vaccine, as required by the U.S. Food and Drug Administration.

Development of the single-injection form of the GonaConTM vaccine was made possible by the creation at NWRC of a new adjuvant called AdjuVacTM. An adjuvant is an immunological agent that is added to a vaccine to improve the immune response. The GonaConTM vaccine, which incorporates the AdjuVacTM adjuvant, could prove useful in the management of overabundant wildlife species in situations where regulated sport hunting and other traditional management tools are impractical or prohibited by law.

NWRC's AdjuVac[™] adjuvant is also a critical component of a wildlife immunocontraceptive vaccine developed from the zona pellucida (a protein layer that coats the egg) of pigs (porcine zona pellucida or PZP). NWRC has completed a cooperative service agreement with ImmunoVaccine Technologies (IVT), a company in Nova Scotia that manufactures SpayVac[™], the PZP vaccine. NWRC and IVT will work together to gain regulatory approval for the use of SpayVac[™], which incorporates NWRC's AdjuVac[™] adjuvant, for wildlife contraception in the United States.

Scientists at NWRC are also developing safe, effective, and economical infertility agents for other wildlife species, including prairie dogs, Canada geese, and other mammals and birds. Ongoing studies are evaluating several contraceptive agents, including DiazaCon and nicarbazin in birds, and a range of compounds in mammals. In addition, NWRC scientists are testing the stability and viability of an oral vaccine in a variety of formulations to find the best method for delivering infertility agents to free-ranging animals.

Field Situations—NWRC has received Investigational New Animal Drug permits for PZP and GnRH injectable vaccines. These permits allow NWRC researchers and their collaborators to ship and test the vaccines on both captive and free-ranging animals. Tests of these

Groups Affected by This Problem:

- Urban and suburban residents
- Airports, airlines, airline passengers
- Motorists, pedestrians
- Farmers
- Ranchers/Livestock producers
- Natural resource managers
- Landscapers
- Pet Owners

Major Cooperators:

- Cornell University
- Pennsylvania State University
- University of Florida
- Colorado State University
- University of Sao Paulo, Brazil
- Idaho Department of Fish and Game
- Florida Department of Agriculture and Consumer Services
- U.S. Army
- Wildlife Services Operations personnel

vaccines are ongoing in several states and countries, involving a wide range of wildlife and feral species.

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