Fertility-control methods may also help with wildlife disease management. For instance, brucellosis is a bacteria disease that causes abortions, infertility, and lower milk production in bison, elk, and cattle. Brucellosis is transmitted during the birthing process. The injectable GonaCon Immunocorticnace Vaccine may reduce the spread of brucellosis by preventing reproduction in infected breeding females. Scientists are investigating an approach that combines rubates and contraceptive vaccines to reduce stray dog populations and rubates in developing countries.

**Methods are promising new tools for managing wildlife**

Wildlife contraceptives and other fertility-control methods are:  
- **Safe for the target species, nontarget species, and the environment**
- **Free of undesirable side effects**
- **Safe for human consumption if ingested while eating animal products**

**GonaCon Immunocorticnace Vaccine**

**Target Species:**
- White-tailed deer (Odocoileus virginianus)
- Feral horses and burros (Equus caballus)
- Bisons (Bos bison)
- Cows (Bos taurus)
- Cats, and marsupials (kangaroos, brushtail possums, and wallabies).

**Application Method:**
- Injection by hand or remote dart

**How It Works:**
- GonaCon stimulates the production of antibodies against gonadotropin-releasing hormone (GnRH)—a key reproductive hormone needed to produce estrogen and progesterone and to trigger ovulation.

- By binding to GnRH, the antibodies reduce GnRH's ability to stimulate the ovary to release estrogen and progesterone, and to trigger ovulation.

- As long as a sufficient level of antibody activity is in the bloodstream, sexual activity is decreased, and vaccinated animals remain infertile.

**Effectiveness:**
- During field studies in New Jersey and Maryland with white-tailed deer, a single dose of GonaCon was 67 to 88 percent effective at preventing pregnancy the first year and 47 to 48 percent effective in the second year. Some female deer have remained infertile for up to 5 years in pen studies. A second dose of the vaccine given to extend contraceptive effectiveness. Additional research is needed to determine how often deer will need to be re-vaccinated to remain infertile for their reproductive lifetime.

**Registration Status:**
- USDA has two product registrations for GonaCon (GonaCon Immunocorticnace Vaccine and GonaCon-Equine) through the U.S. Environmental Protection Agency (EPA). The injectable vaccine use in adult female white-tailed deer and wild and feral horses and burros. For GonaCon to be labeled in a specific State, it must be registered with the State and approved for use by the State's fish and game or natural resource agency. In 2013, GonaCon-Equine was licensed to SpaySFRIS to produce and distribute the vaccine.

**OvoControl P**

**Safe for human consumption if ingested while eating animal products**

**Target Species:**
- Feral pigeons (Columba livia)

**Application Method:**
- Oral, broadcast bait pellet often distributed with a broadcast feeder

**How It Works:**
- OvoControl P contains 0.5 percent nicarbazin. Nicarbazin affects egg hatchability by weakening the yolk membrane, which allows the albumin and yolk to mix. When OvoControl P is fed to treated birds during their breeding season, it reduces the number of offspring produced. The effects are fully reversible, and when OvoControl P is withdrawn, egg production and hatchability return to normal within a few days.

**Effectiveness:**
- Under ideal conditions, all target birds eating the proper dose of OvoControl P no new chicks are hatched. However, during actual field use, not all targeted birds may consume the bait. Som, chicks may still be observed, but the numbers would be greatly reduced. Field observations of treated pigeon populations have shown up to a 75 percent reduction in flock population within 1 year.

**Registration Status:**
- OvoControl P is registered by the EPA and is produced and distributed by InnoLytics, LLC.

**Future Research**

Future NWRC research will focus on products that cause permanent sterility with one application. For instance, scientists are investigating compounds to reduce the number of ehrick eggs in mammals, such as free-roaming dogs and feral swine. Other efforts will help expand existing product registrations, develop improved contraceptives and oral delivery systems, and determine how fertility control can be used to prevent wildlife disease spread.
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This publication supersedes Miscellaneous Publication No. 2035, “Solutions Through Science: Wildlife Contraceptives,” which was issued in January 2010.

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www.aphis.usda.gov/wildlifedamage/nwrc

About the National Wildlife Research Center
NWRC is the only Federal research facility in the United States devoted entirely to developing effective wildlife damage management methods. The Center applies scientific expertise to address human-wildlife conflicts involving a range of issues: agriculture, human health and safety, property damage, invasive species, and threatened and endangered species. NWRC scientists strive to find solutions that are biologically sound, environmentally safe, and socially responsible for use in resolving wildlife damage management problems. Often, the Wildlife Services’ operational personnel help NWRC scientists develop and evaluate new management tools and methods.

NWRC employs more than 160 scientists and support staff at its headquarters in Fort Collins, CO, and at field stations throughout the United States. NWRC’s scientists have expertise in animal behavior, chemistry, economics, epidemiology, genetics, immunology, population modeling, reproductive physiology, statistics, toxicology, wildlife biology, wildlife sensory biology, and veterinary medicine.

NWRC researchers are investigating compounds that cause permanent sterility in mammals, such as free-roaming dogs and feral swine.

More Information
For more information on the development of wildlife contraceptives and other fertility-control products, contact NWRC at (970) 266-6000 or visit our Web site at www.aphis.usda.gov/wildlifedamage/nwrc.

Wildlife Services Office Phone Numbers
For help with wildlife damage management issues in your State, please call Wildlife Services’ toll-free number at 1-866-4USDAWS (1-866-487-3297) or one of the numbers listed below:

- NWRC Headquarters (Fort Collins, CO): (970) 266-6000
- Eastern Regional Office (Raleigh, NC): (919) 855-7000
- Western Regional Office (Fort Collins, CO): (970) 494-7443
- Operational Support Staff (Riverdale, MD): (301) 851-4009

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