FERTILITY CONTROL AND MULE DEER POPULATION MANAGEMENT
Fact Sheet #14

Overview

At times, deer may be more abundant than desired, especially in urban locales. The number of deer in an area can be reduced by 1) hunter harvest or culling (i.e., lethal removal), 2) trapping and relocating them elsewhere, or 3) decreasing reproduction. Increasing hunter harvest or culling can be effective and humane, and can be used in some urban areas under safe and controlled conditions. Capturing and moving animals is difficult, time consuming, requires specially trained personnel, carries a risk of disease spread, and translocated animals experience increased stress and mortality as they adjust to new habitats. Where hunter harvest and culling are not possible or are considered socially unacceptable, the use of contraception or surgical sterilization is often suggested as an alternative.

Photo: Scott Lerich

Fertility Control

Several fertility control techniques have been explored in large, free-ranging mammals including surgical sterilization, hormone implants, and contraceptive vaccines. All methods require capture and marking of treated deer, are logistically challenging, require professional expertise, and involve an ongoing commitment of resources. Surgical sterilization is considered highly invasive requiring anesthesia and the surgical alteration of reproductive tissues. Hormone implants are surgically placed under the skin and must be replaced every couple years. There are also concerns about human and predator consumption of deer treated with hormones. Finally, the use of vaccines to control fertility, called immunocontraception, disrupts specific functions of the reproductive system and is currently considered an experimental approach in mule deer. Although it is expensive, difficult to implement, and unlikely to be a practical population control measure, birth control is often perceived to be a popular alternative to lethal removal.

Immunocontraceptives

Several immunocontraceptive vaccines have been tried experimentally in the United States and Canada (e.g., SpayVac™, ZonaStat™, and GonaCon™). These products stimulate the animal to make antibodies that interfere with some aspect of the reproductive system. SpayVac™ and ZonaStat™ use Porcine Zona Pellucida (PZP) as the antigen to produce antibodies that attach to the surface of the eggs of treated does and prevent sperm from fertilizing the egg; PZP vaccines are ineffective on males. SpayVac™ can be effective for a few years with just a single dose, while ZonaStat™ and others require boosters. GonaCon™, stimulates the production of antibodies against gonadotrophin-releasing hormone (GnRH) which is the primary hormone that turns on the production of reproductive hormones.

Implementing a Deer Population Immunocontraception Program

The success of vaccination to control deer populations depends on 4 factors:
1) access to an effective, long-lasting contraceptive vaccine, 2) the ability to treat and mark a high percentage of does, 3) that authorization can be obtained to administer the vaccine, and 4) that adequate resources are available to sustain the program over the required period to achieve a significant decrease in population.

Photo: Tom Newman

Tests of effectiveness of GonaCon™ in free-ranging white-tailed does resulted in two-thirds of the treated deer being infertile the first year and about one-half in the second year, which is too limited to be successful. No matter how effective the contraceptive agent, if deer are difficult to capture or if untreated deer can easily enter the population, then fertility control will fail. The ideal situation for applying contraception is an isolated population with small numbers of easily approachable deer.

A critical component to the successful implementation of the program is that at least 70% of the females in a population must be treated to effect a noticeable population reduction. Treatment includes capture, vaccination, and a permanent marking for identification to avoid unintentional recaptures of previously treated animals. The best time of year to capture deer is often winter; however, adult females are usually pregnant at this time. The vaccines do not affect unborn fawns, so there will be a delay in controlling the population and a need to treat the new female fawns born in the spring.

Photo: Andy Lindbloom

The process of reducing a free-ranging population by contraception alone is slow at best, even when working with a nearly isolated population. Because of this, a combination of contraception and lethal removal may be optimal. For example, treating less than 70% of the females in a population will be largely ineffective, so it may be useful to treat a target number of adult females, followed by the lethal removal of unmarked animals of both sexes.

Authorization and Costs

Capture, handling, and administration of tranquilizing drugs and vaccines require regulatory approval, specialized training, as well as state, federal, and/or provincial licenses. GonaCon™ is currently the only immunocontraceptive vaccine registered by the U.S. Environmental Protection Agency (EPA) for use in deer (EPA Reg. No. 56228-40). In the United States, GonaCon™ is registered only for hand-injection in female white-tailed deer (not mule deer) by USDA-Wildlife Services or state wildlife agency personnel. No immunocontraceptive vaccines are licensed in Canada. SpayVac™ is available under experimental permits from the EPA in the U.S. and in Canada under permits from Health Canada.

The cost of capturing deer varies considerably depending on capture method, but is often about $400-600/individual and GonaCon™ costs $25/dose. Additional expenses may include personnel costs associated with consultation, permit application, planning, and coordinating public outreach. Population monitoring and follow-up treatment is necessary to vaccinate untreated females that enter the population and untreated fawns. Implementing immunocontraception is an expensive and long-term commitment. A program to vaccinate only 20-25 adult females would likely cost more than $20,000-$25,000 USD. Currently there are few, if any, situations where this approach would be effective and feasible to manage mule deer populations.

More information on mule deer can be found at www.muledeerworkinggroup.com

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