



### WHAT IS WILDLIFE FERTILITY CONTROL?

Wildlife fertility control is a nonlethal method of population management which focuses on reducing the birth rates of wildlife rather than increasing the mortality rates.<sup>1</sup> The study of wildlife contraception dates to the 1960s when synthetic steroids were being investigated for their contraceptive use.<sup>2</sup> Surgical contraception research has been ongoing since the 1970s.<sup>17</sup> During the mid-1980s research into the use of immunocontraception emerged.<sup>3</sup>

### WHAT ARE THE CURRENT TYPES OF WILDLIFE FERTILITY CONTROL?

Contraceptive methods for wildlife management include fertility inhibitors such as Nicarbazin, surgical, hormonal, and immunocontraception.<sup>4 15</sup>

- Nicarbazin is a compound that causes a reduction in hatchability and egg laying due to increased membrane permeability between the egg white and egg yolk.<sup>2</sup> This oral fertility inhibitor is reversible and is cleared from the body after 48 hours.<sup>1</sup>
- Surgical methods of contraception include tubal ligation, tubal transection, ovariectomy, ovariectomy, gonadectomy, vasectomy and salpingectomy. While most of these procedures are permanent, tubal ligation is reversible.<sup>5 15 18</sup>
- Hormonal methods of contraception include progestins, which disrupt reproductive processes in males and females.<sup>16</sup> There are oral progestins as well as depot injections containing progestin that regulate contraception. Deslorelin implants are an example of a GnRH-agonists which have been used on captive wildlife to inhibit reproduction.<sup>1</sup>

### WHAT DOES AN IMMUNOCONTRACEPTIVE VACCINE DO?

An immunocontraceptive vaccine induces antibodies against proteins or hormones essential for reproduction.<sup>14</sup> Porcine zona pellucida (PZP) vaccine and gonadotropin-releasing hormones (GnRH) vaccine are both examples of immunocontraceptive vaccines.<sup>1</sup>

### HOW ARE IMMUNOCONTRACEPTIVES ADMINISTERED?

These vaccines are injected intramuscularly via syringe-darts shot by dart rifles or injected by hand. They can also be injected using bio-bullets.<sup>4</sup>

### CAN YOU EAT ANIMALS TREATED WITH PZP?

Yes, PZP and GnRH-based vaccines are digested like any other protein, so they never enter the food chain; they do not pose a risk to predators or humans.<sup>4 13</sup>

### WHY ARE FEMALES TYPICALLY TARGETED?

Fertility control focuses on females because many mammal species are polygynous or polyandrous. If males were targeted there would need to be a very high percentage of male sterility to have population-level effects.<sup>4</sup>

### CAN PREGNANT OR JUVENILE ANIMALS BE TREATED WITH IMMUNOCONTRACEPTIVES?

Both are safe; GonaCon™ (a GnRH vaccine) given to 3- 4 month-old fawns did not contracept nor prevent sexual development. When given to pregnant bison it did not affect the pregnancy.<sup>4</sup> PZP was found safe to be given to pregnant or lactating females as well.<sup>4</sup>

### WHO REGULATES FERTILITY CONTROL PRODUCTS?

The Environmental Protection Agency regulates products in the United States, but each individual state has the authority to control the use of fertility control products. In Australia it is the Australian Pesticide and Veterinary Medicine Authority. The European Union Directives regulates products in Europe, as well as by each individual member country. The Environmental Risk Management Agency/Food Safety Authority regulates products in New Zealand.<sup>6</sup>

### ARE THERE ANY IMMUNOCONTRACEPTIVES REGISTERED FOR USE IN THE U.S. AS WELL AS INTERNATIONALLY?

#### In the US...

- Ovocontrol® was registered by Innolytics LLC as a reproductive inhibitor for use in Canada geese in 2005 and for use in pigeons in 2007.<sup>1</sup>
- GonaCon™ was registered in 2010 for use with white-tailed deer, feral horses, and feral donkeys.<sup>4</sup>
- ZonaStat-H was registered by The HSUS in 2012 as vaccine for horses and wild burros.<sup>7</sup>
- ContraPest® was registered in 2016 by SenesTech, Inc. as an oral fertility inhibitor for Norway Rats and Roof Rats.<sup>8</sup>
- ZonaStat-D was registered by The HSUS in 2017 as a vaccine for white-tailed deer.<sup>9</sup>

#### Internationally...

- Ovistop® was registered in Italy by Acme Drugs as a fertility inhibitor for pigeon control.<sup>10</sup>
- SpayVac® is registered in Canada by Immunovaccine Technologies, Inc. as a vaccine for animal contraception.<sup>11 19</sup>
- Improvac® was registered in South Africa as a GnRH vaccine for pigs in 2006.<sup>15</sup>