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became pregnant. The records prior to treatment showed that in 24 doe-years, 34 fawns were born (1.4 fawns/doe-year). In contrast, during 54 doe-years posttreatment with SpayVac®, only one fawn was born (0.019 fawns/doe-year). SpayVac has also been proven to provide multi-year efficacy with a single dose in Fallow Deer (*Dama dama*), White-tailed Deer (*Odocoileus virginianus*), horses (*Equus caballus*), and Gray Seals (*Halichoerus grypus*).

Field Evaluation of the Immunocontraceptive, GonaCon-B, in Free-ranging Horses (*Equus caballus*) at Theodore Roosevelt National Park

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Unchecked free-ranging horse populations can have adverse effects on native plant communities and ecosystem processes, and may lead to conflict regarding appropriate resource allocation between sympatric grazing ungulate species. In response, many land management agencies have reduced free-ranging horse populations through periodic roundups and adoption or sale of excess animals. These methods are time and resource intensive, and can result in injuries to animals and humans. Consequently, more efficient, effective, and humane approaches are desired. One alternative is controlling the fertility of female horses through immunocontraception. We are currently in the final year of a 3-year study at Theodore Roosevelt National Park (ND) to evaluate the effects of the gonadotropin-releasing hormone vaccine, GonaCon-B, on fertility, behavior, and injection site reactions in female horses. In October 2009, park horses were captured via helicopter round-up. All mature mares and band sires were retained to avoid disrupting existing herd dynamics, whereas foals, yearlings, and most satellite males were removed. Mares were blocked according to age and pregnancy status and randomly assigned to a treatment ($n = 29$; 2.0 ml GonaCon-B) or control ($n = 28$, 2.0 ml 0.9% NaCl) group. During March and July 2010 there was no difference between treatment groups in the number of foals observed with mares ($P = 0.65$). During the same time period in 2011 treated mares were three times less likely to have a foal by side than control mares (odds ratio 0.11–1.01, 95% CI). Estimated foaling rate in 2011 was higher ($P = 0.04$) in control mares (0.74, 0.56–0.88) than treatment mares (0.48, 0.31–0.66). Between 25 and 280 days posttreatment nearly 80% of treated mares had visible swelling at the site of injection and a purulent draining abscess was observed in one animal. By 380 days posttreatment approximately half of these swellings were no longer visually detectable. No treatment effects were observed on mare activity

budgets, and sociosexual behavior data are currently being analyzed. Our preliminary examination of the data indicate that vaccination with GonaCon-B during gestation does not affect foaling success, decreases fertility for one year posttreatment, is associated with injection site swelling, and does not affect general activity budgets in free-ranging female horses.

Effects of Gonadotropin-releasing Hormone Vaccination (GonaCon-B) on Fertility in Free-ranging Female Rocky Mountain Elk (*Cervus elaphus nelsoni*)

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Fertility control is one method, among a suite of management tools, which may assist in mitigating conflicts associated with locally overabundant wildlife. Rocky Mountain elk (*Cervus elaphus nelsoni*) are resilient, adaptable cervids that can have ecological as well as socio-political impacts on the coupled human-natural environment. We evaluated the safety and efficacy of the gonadotropin-releasing hormone vaccine, GonaCon-B, in free-ranging elk. In January 2008, 120 mature (>2 yr) female elk were captured in Rocky Mountain National Park (CO) and randomly assigned to treatment ($n = 60$; 1.5 ml GonaCon-B) or control ($n = 60$; 1.5 ml 0.9% NaCl) groups. All injections were given with hand-held syringes in the biceps muscle. Location of the injection was recorded in reference to anatomic landmarks. Transrectal palpation and pregnancy specific protein B analyses were used to diagnose pregnancy at the time of application. During the following three winters females were recaptured and euthanized in conjunction with park management culling operations (2009, $n = 20$; 2010, $n = 25$; 2011, $n = 34$). At necropsy pregnancy status was determined. Tissues were collected and preserved from organs associated with the hypothalamic-pituitary-gonadal (HPG) axis. Injection sites were relocated, muscle tissue collected, and microbial culture performed when gross evidence of inflammation was present. There were no differences in pregnancy rates between groups at the time of treatment ($P = 0.558$). In the following three years saline administered control females ($n = 36$) had a mean pregnancy rate of 0.83 (0.71 - 0.95, 95% CI). Pregnancy rate in the treatment group was 0.0 (0.0 - 0.22, $P = 0.0001$) year one, 0.33 (0.12 - 0.61, $P = 0.05$) year two, and 0.65 (0.43 - 0.83, $P = 0.17$) year three. Study animals showed no evidence of lameness or external swelling at the injection site prior to euthanasia; however, at the time of necropsy all females in the treatment group had pyogranulomatous inflammation at the site of injection.