

FACT SHEET: PZP IMMUNOCONTRACEPTION for DEER
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How PZP Immunocontraception Works

Immunocontraceptive vaccines activate the immune system to block a crucial aspect of reproduction. When administered to a female deer, the porcine zona pellucida (PZP) vaccine causes her to produce antibodies that bind to the protein envelope surrounding the egg, blocking fertilization.

History of PZP Field Research

PZP was first recognized as an effective contraceptive in the 1970's. Since we first began treating free-roaming deer with dart-delivered PZP on Fire Island, New York, in 1993, more than 2000 deer have been treated at field sites in seven states. PZP is also widely used in wild horses, African elephants, and about 100 species of animals in zoos.

Effectiveness and Longevity

PZP comes in two forms, which can be administered by hand-injection or dart. "Native PZP" must be administered annually to maintain effectiveness. "PZP-22" (consisting of native PZP plus controlled-release PZP pellets) yields two or more years of contraception after a single initial treatment. In wild horses, single boosters of native PZP administered 2-3 years after initial PZP-22 treatments yield at least 3-4 years of additional effectiveness; similar results are indicated for deer. Treating deer with PZP typically reduces pregnancy rates by 80-90%.

Side Effects and Safety

PZP is a naturally occurring protein that must be injected to be effective. If eaten, PZP is digested like any other protein. In deer, the only known side effect of PZP treatment is extension of the mating season. Current evidence indicates that this mating season extension does not increase the risk of deer vehicle collisions or cause any harm to the deer themselves.

Population Control

Suburban deer populations have been stabilized and modestly reduced (20-50%) at three field sites. Typically, population stabilization is rapid, but population reduction is gradual (5-10% per year). Although high rates of female immigration could overwhelm efforts to control populations, multiple studies have shown that ~90% of adult female deer in suburbs stay close to their birthplace throughout their lives. Population effects of contraception are site-specific.

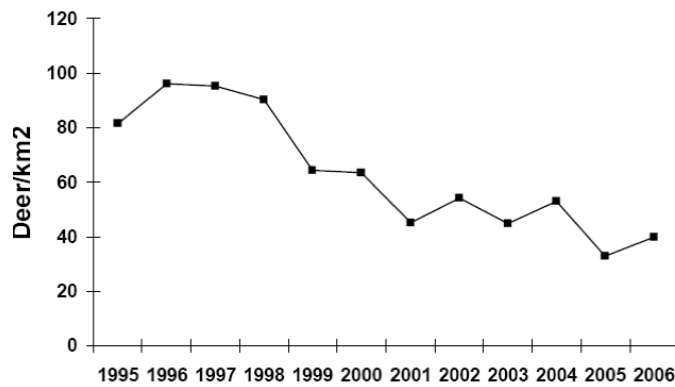
Cost and Effort

Costs and effort vary from site to site, depending mostly on how much time it takes to administer PZP to deer and whether the deer need to be captured. For example, at Fripp Island, SC, where deer were relatively approachable, deer were captured, ear-tagged and treated with PZP-22 at a cost of ~\$500/deer. At Fripp, dart-delivered native PZP treatments cost ~\$100/deer.

Regulatory Status

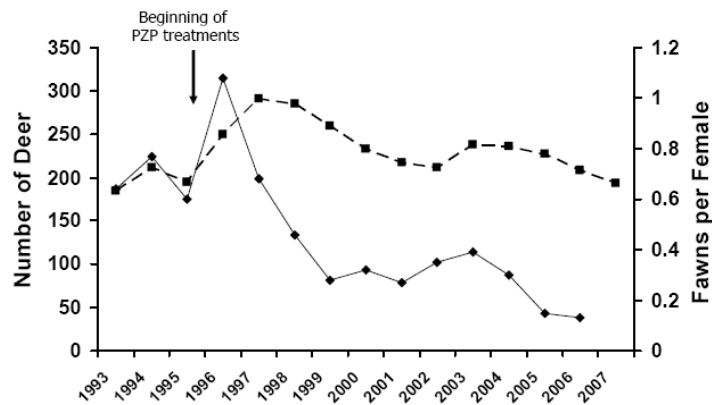
Use of PZP on deer must be approved by the state wildlife agency. Federally, the EPA regulates wildlife contraceptives, and native PZP is registered with EPA for use on deer under the trade name "ZonaStat-D." Approval of state pesticide agencies may also be needed for management use.

Fire Island National Seashore, 1995-2006



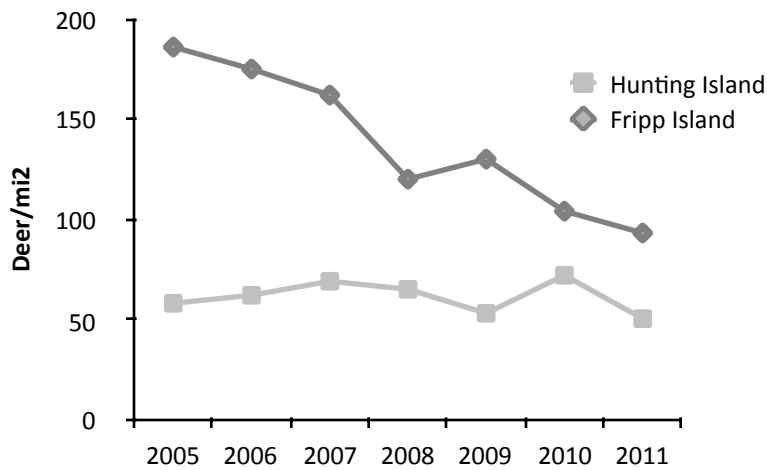
From Rutberg & Naugle 2008 *Wildlife Research* 35:494-501

National Institute of Standards and Technology, MD, 1993-2008



From Rutberg & Naugle 2008 *Wildlife Research* 35:494-501

Deer Population Densities at Fripp Island and Hunting Island (Control Site), SC, 2005-2011



From Rutberg et al. 2013 *J. Zoo Wildl. Med.* 44(4S):75-83

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