



**FACT SHEET: PZP IMMUNOCONTRACEPTION for DEER**  
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**How Immunocontraception Works**

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

***PZP is NOT a hormone and does not affect other body processes.***

**History of PZP Field Research**

PZP was first recognized as an effective contraceptive in the 1970's. Since we first began treating deer on Fire Island, New York, in 1993, nearly 2000 deer have been treated at field sites in seven states. ***The effects of PZP on deer and other animals are very well known.***

**Effectiveness**

Treatment of white-tailed deer with PZP typically reduces pregnancy rates by 80-90%. PZP can be delivered by hand or remotely, by dart. Using current technology, ***a single hand-injection of PZP prevents pregnancy for about 2 years.*** Subsequent boosters may last longer.

**Side Effects and Safety**

PZP is a naturally occurring protein that must be injected to be effective. ***If eaten, PZP is broken down like any other protein.*** In deer, the only known side effect of PZP treatment is extension of the mating season; there is no evidence that this causes any harm.

**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). All three sites are semi-isolated by geography or development, but deer move on and off all of them. ***Population effects of contraception are site-specific.***

**Deer-Vehicle Collisions**

Data from the Maryland site show that the number of deer-vehicle collisions goes down as deer population size goes down. ***PZP treatments do not increase deer-vehicle collisions.***

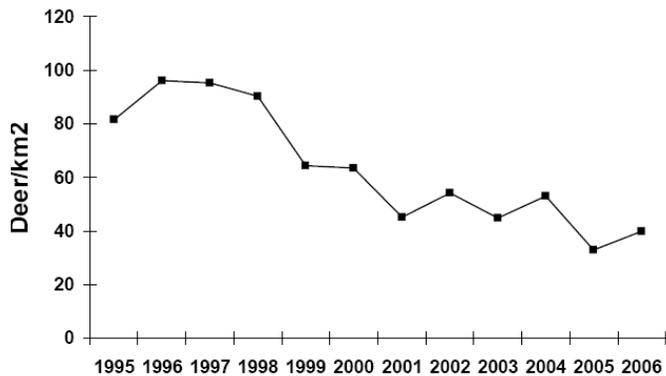
**Cost and Effort**

At Fripp Island, SC, the cost of initial capture and treatment of deer with 2-year vaccine was approximately \$500/deer; dart-delivered annual boosters cost \$100/deer. Achieving rapid population stabilization and slow decline for about 300 deer would require approximately ***\$40,000 for both the first and second years***, and lower amounts after.

**Regulatory Status**

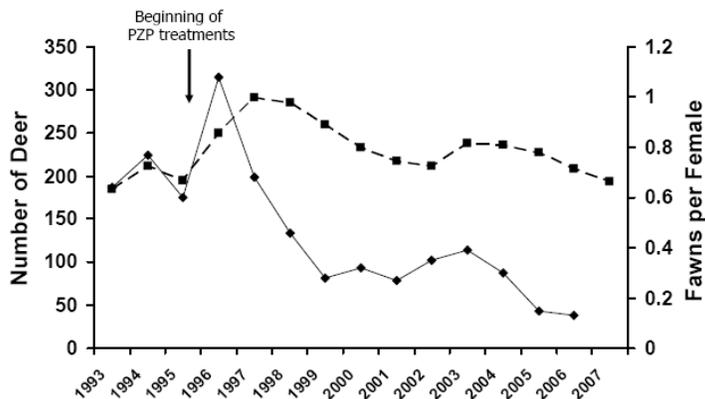
Use of PZP on deer must be approved by the CTDEP. Federally, the EPA has taken jurisdiction over contraception of free-roaming wildlife. In **January 2012, the EPA registered PZP for use in wild horses** under the trade name "ZonaStat-H," but it has not yet been registered for deer.

### Fire Island National Seashore, 1995-2006



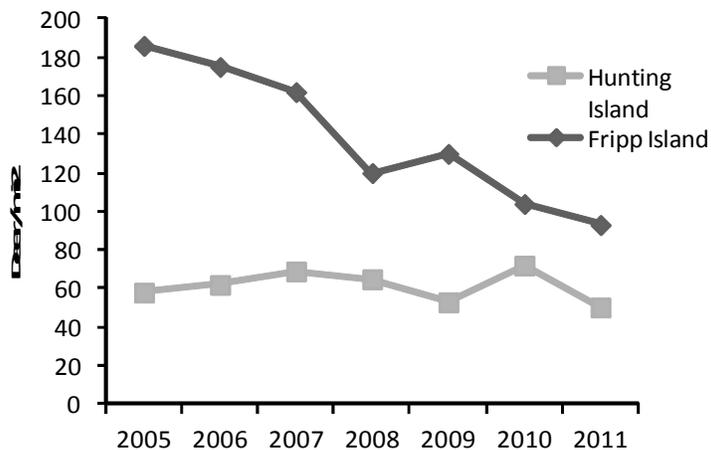
From Rutberg & Naugle 2009

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



From Rutberg & Naugle 2009

### 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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## Some Per-deer Cost Estimates from PZP Study Sites

### Fire Island National Seashore, NY

- Deer are highly accessible.
- Individuals have never been captured and are not ear-tagged or individually recognized.
- Deer are treated annually by dart with simple emulsions of PZP/adjuvant.
- Marking darts are used to determine which individuals have been treated.

Costs per treatment exclusive of labor: \$64

Person-hours labor per deer: 1.0 hrs.

Labor costs/deer @ \$15/hour \$15

**Total estimated treatment cost: \$79 per deer**

### National Institute of Standards and Technology, MD

- Deer are moderately accessible.
- Individuals are initially captured, ear-tagged, and hand-treated with simple emulsions of PZP and adjuvant.
- Subsequently, they are treated annually by dart with simple emulsions of PZP/adjuvant.

Cost of initial capture and treatment exclusive of labor: \$160

Person-hours labor to capture, eartag, and treat deer: 6.7 hrs

Labor costs/deer captured @ \$15/hour: \$101

**Total estimated cost of initial capture and treatment: \$261 per deer**

Costs of booster delivery exclusive of labor: \$58

Person-hours labor per deer: 2.0 hrs

Labor costs/deer @ \$15/hour: \$30

**Total estimated cost of annual re-treatment: \$88 per deer**

### Fripp Island, SC

- Deer are highly accessible.
- Individuals are initially captured, ear-tagged, and hand-treated with timed-release two-year vaccine.
- After two to three years, they are re-treated by dart with simple emulsions of PZP/adjuvant.

Cost of initial capture and treatment exclusive of labor: \$390

Person-hours labor to capture, eartag, and treat deer: 8.2

Labor costs/deer captured @ \$15/hour: \$123/deer

**Total estimated cost of initial capture and treatment: \$513 per deer**

Costs of booster delivery exclusive of labor: \$58

Person-hours labor per deer: 3.0

Labor costs/deer @ \$15/hour: \$45

**Total estimated re-treatment cost: \$103 per deer**