

**IMMUNOCONTRACEPTION OF WHITE-TAILED DEER AT
FIRE ISLAND NATIONAL SEASHORE**

2000 Progress Report to Fire Island National Seashore
And
The New York State Department of Environmental Conservation

Submitted by
The Humane Society of the United States
700 Professional Drive
Gaithersburg, MD 20879

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Prepared by Rick Naugle
Research Associate
Wildlife and Habitat Protection
The Humane Society of the United States,

Allen Rutberg, Ph.D.
Senior Scientist
Wildlife and Habitat Protection
The Humane Society of the United States

And

Ernest Taylor
Wildlife Biologist
Fire Island National Seashore

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I. INTRODUCTION

The first phase (1993-1997) of the Fire Island National Seashore (FIIS) deer immunocontraception project, which began in Autumn 1993, was intended to test whether the PZP immunocontraception vaccine could be delivered effectively to deer in the field, and whether vaccine efficacy under field conditions matched that under more controlled situations. This study confirmed that PZP vaccine could be delivered to large numbers of free-ranging, mostly habituated deer, but vaccine efficacy was lower than that seen in more controlled studies, especially the year following initial treatment. However, vaccine efficacy increased with successive annual booster treatments. In addition, the use of monitors to identify and attract individual deer for treatment was extremely labor intensive. A manuscript describing the results has been submitted for publication in 2000.

The Humane Society of the United States (HSUS) began the second phase (1998-2002) of the project, in cooperation with FIIS, the National Park Service (NPS), and the United States Geological Survey/ Patuxent Wildlife Research Center at the State University of New York (USGS/SUNY), in autumn 1998. The principal goal of this phase of the project is to determine whether the PZP vaccine can be useful at Fire Island as a deer management tool within the communities. Specific objectives include the demonstration of a reduction in the deer population in the communities; the scaling back and eventual elimination of the labor intensive deer monitoring system; the use of distance sampling methods to estimate population density and composition; reduction of the total amount of bait and bait stations used to attract deer for darting; shortening of the time that bait is available; and the relocation of bait stations outside the communities to the extent consistent with effective and efficient vaccine delivery. The immunocontraception project is closely linked to FIIS's goals of curtailing the feeding of deer and reducing the overall impacts of deer in the communities.

II. LOGISTICS AND COST

Between 7 September and 30 September 2000, the eighth annual darting phase of the Fire Island deer PZP immunocontraception project was carried out. Deer were treated by personnel from The HSUS and FIIS/NPS with the assistance of several Fire Island deer monitors and residents. Deer were darted at 10-different FIIS/HSUS run bait stations and nine monitor/resident run bait stations between the Fire Island Lighthouse west of Kismet and the Talisman Heliport east of Fire Island Pines. Deer were also darted along community streets and on NPS lands as they were encountered. Five darters, using marker darts almost exclusively, spent 23 days in the field delivering a total of 225 PZP treatments to approximately 222 white-tailed does, averaging 9.8 treatments/day. Approximately \$13,700 was spent on vaccine (\$5020), bait (\$1845), rental vehicle (\$1516), darting supplies (\$3049), and miscellaneous expenses (\$2270), at a cost of approximately \$61 per deer treatment (not including personnel costs).

In addition to manpower, FIIS provided a four-wheel drive vehicle and an all terrain vehicle (ATV). HSUS provided an additional four-wheel drive vehicle and three bicycles. In addition, FIIS provided assistance in distributing bait station supplies. Corn for bait stations was paid for by The HSUS and distributed to bait stations primarily by FIIS. Several of the Fire Island community residents again provided us with areas for bait stations and storage in addition to ones provided by FIIS. FIIS, Saltaire, and Corneille Estates and Fire Island Pines residents provided housing during our stay.

III. DARTING AND PZP TREATMENTS

During the treatment period, 15 unidentified does and three identified does, assumed not to have been treated in the past, were temporarily marked and treated with a 65 g dose of PZP vaccine emulsified in 0.6 cc of Montanide ISA adjuvant (Seppic, Inc.) and 196 unidentified does assumed to have been treated in the past or with FCA in 1999 were temporarily marked and treated with a 65 g dose of PZP vaccine emulsified in 0.5 cc of Freund's Incomplete Adjuvant (FIA). Ten of the 15 unidentified does treated with ISA were believed to be yearling does based on their body size and the remaining five does were assumed to be adults based on body size. All five of the adult does treated with ISA were accompanied by fawns from this year and were treated in areas where few does received treatments in 1999. An additional 11 treatments of PZP in FIA and three treatments of ISA were given to 14 identified does in two communities where monitors continue to monitor deer and collect fawning data (Table 1).

Table 1. PZP treatments on FIIS during fall 2000

	Identified Does Treated w/ ISA	Unidentified Does Treated w/ ISA	Identified Does Treated w/ FIA	Unidentified Does Treated w/ FIA	Total Treatments*
Yearlings	1	10	1	10	22
Adults	2	5	10	186	203
Total	3	15	11	196	225

* based on the number of treatments indicated on log sheets

IV. DARTING LOCATIONS

During the 2000 fall darting period does were treated at bait stations and along community streets in the areas of: (1) a seven contiguous community region which includes Kismet, Seabay Beach, Saltaire, Fair Harbor, Dunewood, Lonelyville, and Atlantique Beach, (hereafter collectively referred to as the West End Communities); (2) Robbins Rest and Atlantique, and a five contiguous community region, which includes Corneille Estates, Ocean Beach, Seaview, Ocean Bay Park, and Point O' Woods (hereafter collectively referred to as the Mid-Island Communities); (3) Cherry Grove and Fire Island Pines (hereafter collectively referred to as the East End

Communities); (4) NPS lands between the Fire Island Lighthouse and Kismet (hereafter collectively referred to as West End NPS land); (5) NPS lands between Atlantique Beach and Corneille Estates (hereafter collectively referred to as Mid-Island NPS land); and (6) between Point O'Woods and Cherry Grove, between Cherry Grove and Fire Island Pines and the Talisman Heliport area (hereafter collectively referred to as Eastern NPS land) (Table 2).

Table 2. PZP treatment locations on FIIS during fall 2000

	West End Community	Mid- Island Community	East End Community	Western NPS Land	Mid- Island NPS Land	Eastern NPS Land	Total
FIIS/ Community Bait Stations	41 (46%)	7 (9%)	0	6 (40%)	0	2 (18%)	56 (25%)
Monitor/ Resident Bait Stations	23 (26%)	40 (53%)	21 (64%)	n/a	n/a	n/a	84 (37%)
Roaming Streets	25 (28%)	28 (38%)	12 (36%)	9 (60%)	2 (100%)	9 (82%)	85 (38%)
Total	89	75	33	15	2	11	225

V. BAIT STATIONS

Deer were darted at nine bait stations located in monitors/residents yards, eight on FIIS/NPS lands and two on community owned land. At six of the FIIS/NPS bait station sites automatic feeders, designed to dispense bait at preset times, were used to attract deer for darting. Baiting started three-weeks prior (August 15) to the start of the darting period and continued at most stations through September 30.

VI. METHODS OF TREATMENT

Of the 225 PZP treatments on FIIS during 2000, 207 were delivered in combination 1cc drug/3cc marking solution, barbless Pneu-Dart® marker darts with 2.5 cm needles, fired from either a Dan-Inject® injection pistol (n=192), Dan-Inject® injection rifle (n=2), or a Pneu-Dart® cartridge fired capture rifle (n=13). The remaining 18 treatments were delivered in standard 1cc barbless darts fired from a Dan-Inject® CO² injection pistol (n=15) or a Pneu-Dart® cartridge fired capture rifle (n=3) to several identified does, a few highly recognizable does, and in a few instances to extremely wary does. All does treated were presumably at least one year old and all vaccine was delivered in the hip or gluteal region of the deer. The marking substance used this year was non-toxic Sharpmark® red liquid livestock marker concentrate.

VII. RESULTS

None of the 225 deer darted were injured during the darting period and all but three darts discharged were recovered and tested for complete injection. One 1cc/3cc marker dart stuck in a deer's hip in Seaview and was not recovered after the deer disappeared into heavy cover. An additional 1cc/3cc marking dart was lost in tall grass at the Kismet Firehouse and a 1cc/3cc marker dart was lost in tall grass at the Atlantique (FIIS) bait station, after having missed their intended targets. There were 11 complete misses with marker darts and one complete miss with a 1cc dart. Two vaccines were known to be lost due to defective marker darts and 10 vaccines were discarded after being mixed and carried in darts for periods of two days or longer. In addition, one vaccine was lost during mixing and loading a dart. One yearling buck was inadvertently darted with a 1cc/3cc marker dart and FIA for a total of 251 vaccines dispensed during fall 2000.

This year less than 5 percent of the does encountered were still in their summer coats or in transition. The Sharpmark red marking dye again remained visible on deer's coats for times ranging from less than one day to over 30 days, depending on whether deer licked the site of injection and whether they were in a full summer coat or in transition from summer to winter coat. However, casual observations by monitors and darters at several heavily used bait stations showed that greater than 90 percent of the does routinely visiting them for two weeks after darting ceased continued to carry some trace of the red dye. The Sharpmark marking dye is not entirely satisfactory, and efforts will continue to identify alternative, non-toxic marking dyes that will reliably persist on deer's coats for 4-8 weeks. A small test was conducted on five identified does in Fire Island Pines to determine the effectiveness of the Nyanza dye we tested in 1999 when mixed with ethanol instead of water. None of the five does marked carried marks for more than 24 hours after they were marked.

Of the 225 deer darted on Fire Island in 2000, approximately two-thirds were darted at bait stations and the remaining one-third were darted along community streets or in a few instances (4%) in semi-remote areas such as the Sunken Forest and Sailors Haven. While many of the deer darted along community streets may have eventually been darted at bait stations there were approximately 30 deer (14% of the total), excluding the ones treated in the Sunken Forest and at Sailors Haven, that were never observed at bait stations. In addition, there were several more deer darted along community streets that were often observed at bait stations, but failed to get darted there because of their shyness toward darters. Between the shyness of some deer to enter and then linger at bait stations and the relatively small size and confinement of a few bait stations it was often easier to roam streets around the bait stations and dart deer to shy to enter as they were encountered in more open areas.

VIII. CONCLUSION

There were three important factors that came to light during the fall 2000 darting period. First, limited use of automatic feeders and limitations on the amount of bait placed out daily at several bait stations on FIIS/NPS lands decreased bait usage considerably (14,000 pounds used in 2000 vs. 21,450 pounds used in 1999). Baiting began slightly earlier this year than in previous years, and at baiting sites with automatic feeders the amount of feed provided was approximately the same as at bait stations where bait was put out by hand. Second, darting deer primarily at bait stations in the mornings and an increase in the amount of time spent roaming community streets in the late afternoon and evenings drastically increased our ability to locate deer in a short amount of time and dart several deer that seldom visit bait stations or several that are often to shy to enter when darters are present. Third, four to five people darting deer at the same time in each of the three community groups and on FIIS/NPS lands allowed us to dart the majority of deer in each section in a relatively short amount of time (approximately 6 days/community grouped described in table 2) and before dye marks wore off. It should also be noted that the five darters were in constant communication with one another and by doing so were able to cover every area between the Fire Island Lighthouse and the Talisman Heliport, dart the majority of deer in these areas, and do so with little fear of the same deer being darted multiple times or deer going without being darted.

Although the number of deer treated in 2000 was lower than in 1999 we feel strongly that we darted well over 95% of the does in the communities between Kismet and Fire Island Pines and over 90% of the does on FIIS/NPS lands between the Fire Island Lighthouse and the Talisman Heliport. The total number of treatments delivered this year decreased by seven over those treated in 1999, but surveys conducted by darters and monitors at bait stations, along community streets, and on FIIS/NPS lands indicated that few deer were left untreated. While it is possible that the reduced number of dartings is due in part to diminished monitoring effort and darters failure to again locate all of the deer, the deer monitors, residents, and The HSUS believe the reduction in deer darted is the direct result of a genuine decline in the number of deer inhabiting Fire Island between Kismet and Fire Island Pines, or at least in their visibility. However, conclusions about changes in deer densities in the Fire Island communities await analysis of data being collected by USGS/SUNY.