

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

1999 Progress Report to Fire Island National Seashore
and
the New York State Department of Environmental Conservation

Submitted by
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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 of this first phase is in preparation, with submission for publication planned for spring 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 9 September and 30 September 1999, the seventh annual darting phase of the Fire Island deer PZP immunocontraception project was carried out. Deer were treated by personnel from The HSUS, the Morris County, New Jersey, Park Commission (MCPS), USGS/SUNY and FIIS/NPS with the assistance of several Fire Island deer monitors and residents. Deer were darted at 12-different long standing, temporary bait stations and eight bait stations added just prior to or during the darting period between the communities of Kismet and Fire Island Pines and along community streets as they were encountered. Four darters, using marker darts almost exclusively, spent a combined 35 days delivering a total of 232 PZP treatments to approximately 215 white-tailed does, averaging 6.6 treatments/day. Approximately \$15,600 was spent on vaccine, bait, darting supplies, etc. at a cost of approximately \$67 per deer treatment (not including personnel costs).

FIIS provided a four-wheel drive vehicle and an all terrain vehicle (ATV). HSUS provided an additional four-wheel drive vehicle. In addition, FIIS and USGS/SUNY provided assistance in

distributing bait station supplies. Corn for bait stations was paid for by The HSUS and distributed to bait stations by FIIS, HSUS, and USGS/SUNY. Several of the Fire Island community residents provided us with areas for bait stations and storage in addition to ones provided by FIIS. FIIS, Saltaire, and a Fire Island Pines residents provided housing during our stay.

III. DARTING AND PZP TREATMENTS FOR 1999

During the treatment period, 16 unidentified does and one identified doe, assumed not to have been treated in the past, were temporarily marked and treated with a 65 μ g dose of PZP vaccine emulsified in 0.5 cc of Freund's Complete Adjuvant (FCA) and 200 unidentified does assumed to have been treated in the past or with FCA in 1999 were temporarily marked and treated with a 65 μ g dose of PZP vaccine emulsified in 0.5 cc of Freund's Incomplete Adjuvant (FIA). Six of the 16 unidentified does treated with FCA were believed to be yearling does based on their body size and the remaining 10 does were assumed to be adults based on body size. Approximately 10 to 15 days after treatments with PZP and FCA, 12 of the 16 new does were presumptively relocated and given booster treatments of PZP in FIA. An additional 15 treatments of PZP in FIA and one treatment of FCA were given to 16 identified does in two communities where monitors continue to monitor deer and collect fawning data (Table 1).

Table 1. PZP treatments on FINS during fall 1999

	Identified Does Treated w/ FCA	Unidentified Does Treated w/ FCA	Identified Does Treated w/ FIA	Unidentified Does Treated w/ FIA	Total Treatments
Yearlings	1	6		17	24
Adults		10	15	183	208
Total	1	16	15	200	232

IV. DARTING LOCATIONS

Does were treated this year in the areas of: (1) a six contiguous community region which includes Kismet, Saltaire, Fair Harbor, Dunewood, Lonelyville, and Atlantique Beach, (hereafter collectively referred to as the West End); (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); and (4) NPS land between Atlantique Beach and Robbins Rest, between Robbins Rest and Corneille Estates, between Point O' Woods and Cherry Grove, and between Cherry

Grove and Fire Island Pines (hereafter collectively referred to as NPS lands)(Table 2).

Table 2. PZP treatment locations on FINS during fall 1999

	West End Communities	Mid-Island Communities	East End Communities	NPS Lands	Total
Identified Does	0	1	15	0	16
Unidentified Does	108	72	24	6	211
Total	114*	73	39	6	232

* includes 6 treatments assumed to have been done in these communities.

Yearling does were treated in six different communities (including one in a new community) and 9 of the 10 adult does assumed to be new to the project were treated in communities while one was treated on NPS lands where deer have never been darted before.

V. BAIT STATIONS

Deer were darted at 12 community and/or monitor-run bait stations, at four NPS lands bait stations set up two-weeks prior to the start of the darting period, and at three monitor run bait stations set up in the middle of the darting period. In addition, 11 automatic feeders, designed to dispense bait at preset times, were set up and tested at two established bait stations in communities or on NPS land and three newly set up stretches of NPS land. Five automatic feeders were set up on NPS land at the Kismet firehouse bait station and one feeder was set up on NPS land at the western edge of Saltaire. Five additional feeders were set up in new locations as follows; two on NPS land between Atlantique Beach and Atlantique, one at the eastern edge of Point O' Woods, one on NPS land at the Carrington Estate, and one on NPS land at the Talisman Heliport at the eastern edge of Fire Island Pines. Each feeder was initially set to discharge bait at approximately sunrise and a few were set to discharge bait during late afternoon.

VI. METHODS OF TREATMENT

Of the 232 PZP treatments on FIIS during 1999, 196 were delivered in combination 1 cc drug/1 cc, 2 cc, or 3 cc marking solution, barbless Pneu-Dart® marker darts with 2.5 cm needles, fired from either a blowpipe, Dan-Inject® injection pistol, Dan-Inject® injection rifle, or a Pneu-Dart® cartridge fired capture rifle. The remaining 36 treatments were delivered in standard 1 cc barbless darts 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 in the Mid-Island and East End communities was non-toxic Sharpmark® red liquid

livestock marker concentrate. The marking substance used in the West End communities and the NPS lands was Nyanza.

VII. RESULTS

None of the 232 deer darted were injured during the darting period and all but three darts discharged were recovered and tested for complete injection. Two 1 cc/2 cc marker darts struck bone and both does were followed short distances until the darts fell out and they were recovered. There were nine complete misses with marker darts and one complete miss with a 1 cc dart. One 1cc/2cc marking dart was lost in phragmites along a street in Seaview, one 1cc/2cc marker dart was lost in tall grass along a street in Ocean Bay Park, and one 1 cc dart was lost at the Point O'Woods ballfield after it missed its intended target. Two vaccines were lost during mixing and loading darts and three vaccines are unaccounted for. An additional 17 marker darts loaded with vaccine and the end of the darting period were not used and the darts and vaccine had to be discarded. Four vaccines were known to be lost due to defective marker darts. One yearling buck was twice inadvertently darted with a 1cc/3cc marker dart and FIA.

Approximately 15 percent of the does encountered in the fall of 1999 were still in summer coats or in transition. The Sharpmark red marking dye again remained visible on deers' 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. Based on casual observations at two heavily used bait stations an estimated 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. It is not known, at this time, the effectiveness of the Nyanza marking substance used in the West End communities. However, a small test conducted on six highly recognizable does in the Mid-Island and East End communities revealed that none of the six does carried visible marks 24 hours after they were darted and marked.

Old concerns over the reliability of the Pneu-dart® marking darts were reduced slightly this year by lubricating the outside of the darts and the inside of the gun barrels. Failures of these darts — including lodging in the gun barrel, erratic flight after firing, failure to inject, and explosions of one or the other chamber — again still occurred at an unacceptably high rate. A change by the manufacturer to the new darts received in late September revealed a better delivery of darts with however, a reduction in the delivery of marking dye. The problems have been reported to the manufacturers and other delivery systems are also being explored.

VIII. CONCLUSION

There were several important factors that came to light in autumn 1999. First, the use of automatic feeders and the addition of new bait stations on NPS lands increased the bait usage considerably. Baiting began slightly later this year than in previous years, and at baiting sites

with automatic feeders the amount of feed provided was substantially more than at bait stations where bait was put out by hand. The feeders used in 1999 were of very poor quality and none performed to our expectations. On several occasions hundreds of pounds of bait was wasted when trying to set the timers or when timers malfunctioned and several feeders had to be shut down until they could be repaired. Second, set up, maintenance, and filling the automatic feeders involved considerably more time than did setting up and stocking regular bait stations.

The number of deer treated was again lower this year than anticipated. Although we expanded darting activities to new locations in the intervening NPS lands (adding about 16 deer to the program), the total number of treatments delivered this year decreased by 14 over 1998. While it is possible that the reduced number of dartings is due in part to diminished monitoring effort and darters failure to locate all of the deer, the deer monitors and The HSUS believe the reduction in dartings may reflect 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.