

**EXPERIMENTAL CONTROL OF A SUBURBAN POPULATION OF WHITE-TAILED  
DEER USING IMMUNOCONTRACEPTION**

PRINCETON TOWNSHIP, NEW JERSEY

**Interim Summary Report - August  
Year 2 (2004)**

Submitted By

WHITE BUFFALO, INC.

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## INTRODUCTION

After conducting observations on treated does in June 2004 (see Appendix A) it was determined that a high percentage of fawns had conceived. We had originally scheduled our research field efforts based on fetal counts from harvested female fawns (10-18% pregnancy, see Final Reports 2001-04). However, we noted that approximately 45% (6 of 13 observed) of the female yearlings (fawns last fall) were lactating. Given the new data, we decided to treat as many female fawns as possible in advance of the breeding season. Therefore, we shifted the majority of our Year 3 field research efforts from winter 2005 to August 2004.

## METHODS

**Capture** - We remotely immobilized deer from 16-23 August. We used 150 mg Telazol (tiletamine HCl + zolazepam HCl) and 100 mg xylazine HCl for fawns, and 250 mg Telazol and 150 mg xylazine for adults. After administering immobilizing drugs, ophthalmic ointment was applied to prevent ocular desiccation, and masks were placed over the eyes. All immobilizations were reversed with an intravenous injection of tolazoline HCl (0.12 mg/kg).

All females captured were fitted with radio-collars (150-151 Mhz) equipped with mortality sensors (Advanced Telemetry Systems, Isanti, MN) and white, extra-large, Duflex livestock ear tags numbered 75 -96 (Nasco Farm and Ranch, Fort Atkinson, WI). All ear tags were labeled: "Do Not Consume - 860-873-2782" (White Buffalo, Inc. main phone number). Radio-collars also had contact information for White Buffalo, Inc. Males were ear-tagged with red, extra-large, livestock ear tags number 18, 23 and 30-50. Some males were given white extra-large ear tags #22, 23, 24, 25, and 100. Again, tags were labeled: "Do Not Consume - 860-873-2782".

**Treatment** - We used a porcine zona pellucida (PZP) immunocontraceptive formulation developed by Dr. Robert Brown (IVT - SpayVac). Does were administered the PZP vaccine using a syringe hand-injection in the gluteal muscle (IM) while sedated.

**Reproduction and survival assessment** - We recaptured 6 does that were treated in February/March 2003 and January/February 2004 and drew blood for serum analysis to determine titer levels for SpayVac and GnRH. We made observations (lactational status or presence or absence of fawns) of all marked females from June through August 2004 to determine pregnancy rates of treated females. We also included data from necropsies of females that were found post-mortem.

## RESULTS - Year 2 (August)

**Capture** - We captured 68 deer during 7 days of fieldwork (see Appendix B). Deer capture and treatment was conducted from 16-23 August 2004. Thirty-five does (23 female fawns, 12 adult females) and 33 male fawns were handled. As of 25 August, 65 of 68 (96%) deer captured and released were still alive. We required 300 person-hours of effort for all deer captured. This results in approximately 4.4 person-hours for each deer handled.

**Treatment** – Thirty of the captured does received an intramuscular injection of the SpayVac vaccine (23 fawns and 7 adult does). We obtained a blood sample from the remaining 5 does to analyze for GnRH (GonaCon®) titer response.

**Reproduction and survival assessment** – We determined that 43% (9 of 21) of female fawns and 84% (27 of 32) adult females were pregnant through observations and necropsies of marked females from February through August (Appendix A – Lactation and Fawning Observations Spring/Summer 2004). These are minimum estimates as some females may have lost fawns post-partum that were not accounted for. To date, 14 marked females have died (Table 1).

**Table 1. Survivorship of captured females**

<b>YEAR</b>	<b>Month</b>	<b>Number of marked females</b>	<b>Cause of Death</b>
2003			
	February	<b>20</b>	
	April	-1	Unknown
	May	-1	Unknown
	September	-1	Bowhunter
2004		<b>17</b>	
	New captures - February	<b>+58</b>	
		<b>75</b>	
	February	-1	Roadkill
	March	-3	Road strike followed by euthanasia 2 Roadkills
	April	-1	Roadkill
	June	-1	Roadkill
	July	-2	Unknowns
	August	-1	Roadkill
		<b>66</b>	
	New captures - August	<b>+27</b>	
		<b>93</b>	
	September	-2	Roadkill Bowhunter
		<b>91</b>	

**Demographics of research population** – We captured 6 unmarked does and 23 doe fawns. Upon completion of field efforts we estimated that there are no unmarked adult females and 3 fawns of unknown sex remaining in the population based on intensive field monitoring and observations. Thirty-three male fawns also were handled and 5 males fawns were identified with specific marked females and avoided. The captured portion of the population is not representative of the sex ratio or male composition because capture emphasis was placed on females. Incidental male capture was exclusively male fawns, as they are difficult to differentiate from doe fawns at 3 months of age, particularly after dark.

Typically, there are half as many yearling and adult males than yearling and adult females in suburban populations, including the management area of Princeton Township (DeNicola, Princeton Township Deer Management Summary Reports 2000-03, Presentation at the 10<sup>th</sup> Annual Conference of The Wildlife Society). This results in approximately 168 deer (70 yearling/adult does, ~22 doe fawns (21 marked, and 1 of the 3 unknown sex), ~40 males fawns (33 captured, 5 identified as definitely male, and 2 of the 3 unknown sex), and ~35 yearling/adult males) in the study area.

## **DISCUSSION**

We captured and vaccinated ~99% of all female deer in the research area during the last 18 months. We will continue to monitor the population for unmarked females and fawns. Any unmarked adult females that enter the study area, or fawns that were not handled in August, will be captured in January 2005. In addition, we will monitor the reproductive activity of all treated females during May and June 2005. We can then predict the number of female fawns that we will need to capture during winter 2005/6. We also will continue to conduct spotlighting sessions (May/June and November) to determine immigration rates and doe to fawn ratio changes.

We required approximately 4.4 person-hours for each deer handled. At this rate of effort using well trained professional staff at \$60/person-hour, it cost \$264/deer in labor to attain such a high-percentage capture. Effort per deer captured declined from January/February 2004 because fawns are significantly easier to capture than adult females. In addition to labor, there were fixed costs of approximately \$450/deer (\$250/radio-collar, \$150/SpayVac dose, and ~\$50/deer in immobilization drugs, darts, ear tags). Although the radio-collars are required for FDA purposes only, and may not be a necessary cost for future management programs, they were instrumental in capturing such a high percentage of the females in the population. Therefore, the costs experienced to date likely represent the high end of the treatment cost spectrum for future management scenarios.

**Appendix A. Lactation and Fawning Observations Spring/Summer 2004**

Tag #	Age	Treatment	Date	Observations
1	A	SV	6/13/2004	NO
3	A	SV	6/13/2004	NO
4	A	SV	6/14/2004	NO
5	2	SV	8/20/2004	NO
6	2	SV	6/13/2004	YES - 90W, 23 White male
7	2	SV	6/14/2004	NO
8	A	SV	6/14/2004	NO
9	3	SV	6/14/2004	NO
10	2	SV	6/14/2004	NO
12	3	SV	6/13/2004	NO
14	4	SV	6/13/2004	NO
15	5	SV		Missing
16	5	SV	6/13/2004	NO
17	7	SV	6/13/2004	NO
18	5	SV	6/14/2004	NO
19	3	SV	6/13/2004	NO
20	7	SV	6/14/2004	NO
26	0.5	SV	6/13/2004	NO
27	0.5	SV	7/27/2004	NO
28	0.5	SV	6/17/2004	YES - 88W, 39R
29	0.5	SV	6/13/2004	YES - ??
30	0.5	SV	6/17/2004	NO
31	0.5	SV	6/17/2004	NO
32	0.5	SV	7/17/2004	YES - ??
33	0.5	SV	6/21/2004	NO
34	0.5	SV	6/14/2004	NO
35	0.5	SV	6/15/2004	NO
36	0.5	SV and GNRH	6/15/2004	NO
37	0.5	SV and GNRH	6/15/2004	YES - ??
38	0.5	SV and GNRH	3/8/04 Mortality E	Not pregnant
39	10+	SV	7/19/04 Mortality	No data
40	0.5	SV and GNRH	6/15/2004	YES - 40R
41	7.5	SV	6/14/2004	YES - 91W
42	2.5	SV	6/24/2004	YES - 84W, 36R, 25W male
43	0.5	SV and GNRH	7/27/2004	NO
44	0.5	SV and GNRH	6/13/2004	YES - 75W
45	0.5	SV and GNRH	3/20/04 Roadkill	No data
46	0.5	SV and GNRH	4/25/04 Roadkill	1 female fetus
47	0.5	SV and GNRH	7/05/04 Lake Carn	No data
48	0.5	SV and GNRH	7/17/2004	YES - 81W
50	0.5	SV	7/23/2004	NO
166	7.5	SV	6/21/2004	YES - 77W
167	4.5	SV	6/14/2004	YES - 83W, 95W
169	9.5	SV	6/24/2004	YES - 33R, 47R
170	1.5	SV	6/15/2004	YES - 24R, 22W male

171	0.5	SV	2/23/04 Roadkill	One fetus
172	0.5	SV	6/15/2004	NO
173	7.5	SV	6/17/2004	YES - 24W male, unkm. male
201	4.5	SV and GNRH	6/13/2004	YES - 38R
202	1.5	SV and GNRH	6/14/2004	YES - 100W male
203	1.5	SV and GNRH	7/6/2004	NO
204	6.5	SV and GNRH	6/25/2004	YES - 92W, 72R
205	2.5	SV and GNRH	6/17/2004	YES - 76W, 26R
206	A	SV and GNRH	6/17/2004	YES - 87W, 27R
207	A	SV and GNRH	7/26/2004	YES - Not lact 8/20/04
208	A	SV and GNRH	7/1/2004	YES - 41R, unkm. male
209	A	SV and GNRH	6/15/2004	NO
210	2.5	SV and GNRH	6/25/2004	YES - 79W, unkm. fawn
211	A	SV and GNRH	7/29/2004	YES - 93W, 94W, 96W
212	2.5	SV and GNRH	6/29/2004	YES - 43R
213	8.5	SV and GNRH	6/17/2004	YES - 78W, 89W
214	10+	SV and GNRH	7/26/2004	YES - 23R, 28R
215	A	SV and GNRH	6/14/2004	NO
216	7.5	SV and GNRH	6/15/2004	YES - 31R, 2 unkm. males
217	3.5	SV and GNRH	7/21/2004	NO
218	9+	SV and GNRH	7/25/2004	YES - ??
219	3.5	SV and GNRH	6/24/2004	NO
220	3.5	SV and GNRH	6/15/2004	YES - 80W, 32R, 48R
221	4.5	SV and GNRH	6/11/04 Roadkill	Lactating
222	2.5	SV and GNRH	6/15/2004	YES - 29R, 35R
223	9+	SV and GNRH	6/13/2004	YES - 18R, 42R
224	2.5	SV	7/29/2004	YES - S. of Lake Carnegie
225	6.5	SV	7/26/2004	YES - S. of Lake Carnegie

**Appendix B.** Princeton Township Fertility Control Capture Data for 16 August - 23 August 2004.

<b>FEMALES</b>	<b>Frequency</b>	<b>Sex</b>	<b>Age</b>	<b>Weight</b>	<b>Capture Date</b>	<b>Method</b>	<b>Treatment</b>
6 W	150.834	F	2	60	8/22/04	DART	SPAYVAC & blood
35 W	150.252	F	6	110	8/16/04	DART	SPAYVAC
39 W	150.732	F	5	130	8/20/04	DART	SPAYVAC
40 W	151.392	F	1	55	8/21/04	DART	Captured for blood
46 W	150.431	F	5	125	8/17/04	DART	SPAYVAC
48 W	151.591	F	1	125	8/21/04	DART	Captured for blood
53 W	151.942	F	A	135	8/8/04	DART	SPAYVAC
75 W	151.084	F	0.3	30	8/16/04	DART	SPAYVAC
76 W	151.164	F	0.3	30	8/16/04	DART	SPAYVAC
77 W	151.913	F	0.3	30	8/16/04	DART	SPAYVAC
78 W	151.604	F	0.3	30	8/16/04	DART	SPAYVAC
79 W	151.564	F	0.3	25	8/16/04	DART	SPAYVAC
80 W	151.463	F	0.3	25	8/17/04	DART	SPAYVAC
81 W	151.114	F	0.3	20	8/17/04	DART	SPAYVAC
82 W	151.933	F	0.3	25	8/17/04	DART	SPAYVAC
83 W	151.982	F	0.3	25	8/17/04	DART	SPAYVAC
84 W	151.5329	F	0.3	15	8/20/04	DART	SPAYVAC
85 W	151.303	F	0.3	25	8/17/04	DART	SPAYVAC
86 W	151.8733	F	10+	140	8/17/04	DART	SPAYVAC
87 W	151.543	F	0.3	30	8/18/04	DART	SPAYVAC
88 W	151.383	F	0.3	25	8/18/04	DART	SPAYVAC
89 W	151.004	F	0.3	30	8/18/04	DART	SPAYVAC
90 W	151.424	F	0.3	30	8/18/04	DART	SPAYVAC
91 W	151.823	F	0.3	30	8/19/04	DART	SPAYVAC
92 W	151.784	F	0.3	30	8/19/04	DART	SPAYVAC
93 W	151.2728	F	0.3	30	8/20/04	DART	SPAYVAC
94 W	151.623	F	0.3	35	8/20/04	DART	SPAYVAC
95 W	151.2532	F	0.3	20	8/20/04	DART	SPAYVAC
96 W	151.654	F	0.3	25	8/22/04	DART	SPAYVAC
209 W	151.233	F	A	140	8/21/04	DART	Captured for blood
220 W	150.652	F	4	135	8/21/04	DART	Captured for blood
221 W	150.292	F	4	115	8/17/04	DART	SPAYVAC
222 W	150.972	F	03	125	8/21/04	DART	Captured for blood
<b>MALES</b>							
18 RED	-	M	0.3	25	8/16/04	DART	-
22 WHITE	-	M	0.3	25	8/20/04	DART	-
23 RED	-	M	0.3	30	8/16/04	DART	-
23 WHITE	-	M	0.3	40	8/20/04	DART	-
24 RED	-	M	0.3	25	8/19/04	DART	-
24 WHITE	-	M	0.3	35	8/21/04	DART	-
25 WHITE	-	M	0.3	20	8/20/04	DART	-
26 RED	-	M	0.3	35	8/16/04	DART	-
27 RED	-	M	0.3	35	8/16/04	DART	-
28 RED	-	M	0.3	35	8/16/04	DART	-
29 RED	-	M	0.3	35	8/16/04	DART	-
30 RED	-	M	0.3	30	8/17/04	DART	-
30 RED	-	M	0.3	35	8/18/04	DART	-
31 RED	-	M	0.3	15	8/17/04	DART	-
32 RED	-	M	0.3	25	8/17/04	DART	-
33 RED	-	M	0.3	30	8/17/04	DART	-
34 RED	-	M	0.3	25	8/17/04	DART	-
35 RED	-	M	0.3	30	8/17/04	DART	-
36 RED	-	M	0.3	20	8/18/04	DART	-
37 RED	-	M	0.3	35	8/18/04	DART	-
38 RED	-	M	0.3	35	8/18/04	DART	-
39 RED	-	M	0.3	35	8/18/04	DART	-
40 RED	-	M	0.3	25	8/18/04	DART	-

41 RED	-	M	0.3	35	8/20/04	DART	
42 RED	-	M	0.3	30	8/19/04	DART	-
43 RED	-	M	0.3	40	8/21/04	DART	-
44 RED	-	M	0.3	25	8/19/04	DART	-
45 RED	-	M	0.3	30	8/19/04	DART	-
47 RED	-	M	0.3	30	8/17/04	DART	-
48 RED	-	M	0.3	20	8/17/04	DART	-
72 RED	-	M	0.3	40	8/19/04	DART	-
100 WHITE	-	M	0.3	30	8/19/04	DART	-
<b>MORTALITY</b>							
82 W	151.114	F	0.3	30	8/16/04	DART	SPAYVAC
84 W	151.525	F	0.3	20	8/17/04	DART	SPAYVAC
43 RED	-	M	0.3	25	8/19/04	DART	-