White Buffalo Inc.

Conserving Native Species and Ecosystems

Final Summary Report

2015 Deer Research Program
Village of East Hampton, NY

Submitted by:

Dr. Anthony J. DeNicola
White Buffalo, Inc.
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INTRODUCTION

The Village of East Hampton is located on eastern Long Island, and contains approximately 12.6 square kilometers. The Village represents one of the most challenging situations for deer managers. The community is densely populated (2010 census: 1,083 people, 635 households), with most of its land area covered by single family homes with limited open-space. This provides excellent deer habitat and at the same time can be restrictive to the implementation of some deer management options. Given the favorable conditions, the deer population in the community has increased to a level that is incompatible with some local land uses. To date archery hunting has been used to control the deer population but this method has had limited impact. These site characteristics, along with deer approachability, make the Village of East Hampton a suitable site to conduct an integrated surgical sterilization research project.

METHODS

Capture

Deer sterilization activities began on 2 January and continued through 16 January 2015. Capture efforts took place every night except 3 and 7 January due to weather delays. We followed the operations protocol outlined in the proposal, contract, and New York State Department of Environmental Conservation scientific collection permit number 639. Female white-tailed deer of all age classes were immobilized using projectors with 2-ml transmitter darts (Pneu-dart Inc., Williamsport, PA, USA) to administer Telazol (~4.4 mg/kg) and xylazine hydrochloride (~2.2 mg/kg). We approached deer in a vehicle on public roadways. A police officer accompanied the capture professionals. Once a dart was deployed and 15 minutes elapsed, the deer was located via radio-telemetry or through direct observation. Masks were placed over the eyes and opthalmic ointment was applied to prevent ocular desiccation. Deer were transported to a temporary veterinary surgical sterilization site.

Select captured females were fitted with VHF radio-collars containing 8-hour mortality sensors to facilitate future capture efforts and assess survival rates. We used radio-collars with a 5-year battery life that are 1/3 the size (150 grams) of traditional deer collars to lessen the physical burden on each deer (Advanced Telemetry Systems, Isanti, MN, USA). All captured deer were fitted with ear tags for individual identification. The back plate of each tag was labeled “Call Before Consumption” with a contact number included. We also collected data on weight, age, and general health of the deer.

Surgical Procedure (see attached full surgical report)

All female deer were pre-medicated with flunixin meglumine (1-3 mg/kg IM) and a long acting antibiotic (Excede 3-6 mg/kg IM). To maintain anesthesia supplemental doses of ketamine hydrochloride (5 mg/kg IV) were given as needed. Routine prepubic ventral midline laparotomy was used to expose the uterine horns and ovaries. We performed bilateral ovariectomies using a combination of clamping, electrocautery and excision for removal of the ovary, and coagulation to prevent hemorrhage. In select cases the ovarian artery was ligated with 0 PDS suture or a titanium hemostatic clip. Routine three layer closure of the abdomen was performed to complete the procedure.

Release

All deer were returned proximate to the capture location, in areas with the lowest likelihood of human disturbance during recovery. The reversal agent tolazoline hydrochloride (200 mg IV) was administered and each individual was monitored during recovery.

Population Estimation

Prior to initiating capture efforts we used a population estimation method called Distance sampling. This approach is based on the premise that you can determine the width of a transect traveled by creating a detection probability from the field observations (i.e., number of deer and distance from the transect). The transect was 30.9-km long and surveyed once each evening. Spotlighting surveys were conducted from ~2200-0300 h on 1 and 2 January 2015. While driving 10 km/h spotters searched their respective side of the road with 400,000 candlepower spotlights. Upon sighting deer, the number in each social group, age and sex of the individuals, and the perpendicular distance to the group was recorded. These data were then entered into a software program (Distance-Version 6.0) that estimates the deer density.

RESULTS

Capture and Sterilization

We captured 125 deer with remote-injection tranquilizer darts (Appendix A). Of the deer captured 114 were females (100 adult females and 14 female fawns) and 11 were male fawns. All of the females captured were sterilized via ovariectomy. Females received white ear tags and males received red/orange. There were three known mortalities associated with capture or the surgical procedures (22W, 27W, and 52W). We worked a total of 12 capture-nights. We expended 664 person-hours for capture efforts, and 221 person-hours for surgical sterilization procedures.

Population Estimate

The survey team conducted the 2 transect replicates under similar weather conditions (Appendix B). Deer were observed 0 - 310 meters from the road. The estimated density for the area surveyed (12.6 km^2) is 18.47 deer/km^2 (CI: 11.13 – 30.65). The estimated demographics of the population were ~46% yearling and adult females, ~45% fawns, ~3% yearling and adult males, and 6% undetermined based on observations during the survey.

DISCUSSION

The spotlight based distance sampling provided an estimate of 232 deer using the study site. If a 1:1 male to female fawn ratio is assumed, there are 159 females in the population. Based on these estimates we captured ~72% of the females.

We experienced less than 3% mortalities related to capture or the surgical procedure (Appendix C). There also were no complaints filed by members of the public during operations. This clearly demonstrates that these types of research actions are compatible with humaneness standards and human activities in a developed environment. In addition, we were able to train several veterinarians, veterinary technicians, and local support volunteers. This should prove fruitful in future efforts to facilitate repeating the capture and sterilization process with minimal professional staff. Phase 2 capture efforts should be conducted next fall (October/November 2015).

ACKNOWLEDGEMENTS

We would like to thank the following individuals and organizations for assistance provided prior to and during the sterilization project; Mayor Paul Rickenbach and fellow Trustees for their effort to organized and administer the research project, Chief Gerry Larsen and all the officers of the Village of East Hampton Police Department without whom this project would not have been feasible, and Scott Fithian and his staff from the Department of Public Works. We cannot thank Joshua Stiller, Wildlife Biologist, NY State Department of Environmental Conservation, and his colleagues enough for their patience and guidance during the permitting process.

PRINCIPAL INVESTIGATORS

Dr. Anthony J. DeNicola, CWB® is President of White Buffalo, Inc., a non-profit research organization dedicated to conserving ecosystems through wildlife population control. He received a M.S. degree from the Yale School of Forestry and Environmental Studies and a Ph.D. from Purdue University. Dr. DeNicola has conducted contraceptive and sterilization projects throughout the United States over the last 22 years. Dr. DeNicola's research interests include ecological approaches to control wildlife damage, control of introduced vertebrate species, and wildlife reproductive control.

Dr. Steven Timm graduated from the University of Minnesota, College of Veterinary Medicine in 1986. In addition to his training and expertise in soft tissue and orthopedic surgery, he has diverse experience in wildlife capture and disease investigation, to include experience with capture, restraint, tissue sampling, pathology, diagnostics and treatment of carnivores (Channel Island skunks, Channel Island foxes, Red foxes, Bald and Golden eagles, Red-tailed hawks, Great Horned owls), ungulates (White-tailed deer, Mule deer, Black-tailed deer, Fallow deer, elk, bison, Rocky Mountain and Desert Bighorn sheep) and feral species (feral cats, pigs, goats and wild horses). Dr. Timm and White Buffalo Inc. recently established a protocol for rapid ovariectomy and tubal ligectomy using both direct surgical approaches and with the use of rigid endoscopy. This work involves the combined experience of the White Buffalo team of researchers and the surgical and field experience of Dr. Timm, and has established a technique to provide surgical (definitive) sterilization in a field environment. Currently, Dr. Timm lives in southwestern Wisconsin and provides mobile surgical services to companion animal clinics in southern

Wisconsin. He has interests in veterinary surgery and intensive care, and free-ranging wildlife disease research.

Charles S. Evans, AWB® is a Georgia native with deep outdoor roots. From a young age he has been an avid conservationist. He has an intense interest in white-tailed deer management. This led him to the Warnell School of Forestry and Natural Resources at UGA. While attending Warnell Charles became involved by being a member of multiple wildlife organizations. He worked on deer capture efforts in Georgia, Pennsylvania, and Connecticut. He graduated in 2012 with a Bachelor of Science in Forest Resources. After graduation he worked for the Georgia Department of Natural Resources compiling and editing the information that will be published in *Georgia's Statewide Deer Management Plan 2015–2024*. Charles has returned to Warnell working toward a M.S. Degree in wildlife under Dr. Robert Warren. His research is being conducted in conjunction with Dr. Anthony DeNicola of White Buffalo Inc. The project focuses on methods for effectively lowering white-tailed deer densities in suburban environments.

APPENDIX A

Deer capture data 2 – 16 January 2015 in the Village of East Hampton, NY.

Ear Tag	Frequency	Sex	Age	Sterilization	Capture Date
01W	151.843	F	5.5	Ovariectomy	1/2/2015
02W	-	F	4.5	Ovariectomy	1/2/2015
03W	-	F	2.5	Ovariectomy	1/2/2015
04W	-	F	1.5	Ovariectomy	1/2/2015
05W	150.532	F	1.5	Ovariectomy	1/2/2015
06W	150.772	F	2.5	Ovariectomy	1/2/2015
07W	150.011	F	2.5	Ovariectomy	1/2/2015
08W	150.382	F	2.5	Ovariectomy	1/3/2015
09W	-	F	1.5	Ovariectomy	1/3/2015
10W	-	F	4.5	Ovariectomy	1/3/2015
11W	-	F	1.5	Ovariectomy	1/3/2015
12W	150.081	F	6.5	Ovariectomy	1/3/2015
13W	151.134	F	2.5	Ovariectomy	1/4/2015
14W	151.122	F	2.5	Ovariectomy	1/4/2015
15W	-	F	3.5	Ovariectomy	1/4/2015
16W	-	F	3.5	Ovariectomy	1/4/2015
17W	-	F	2.5	Ovariectomy	1/4/2015
18W	-	F	3.5	Ovariectomy	1/4/2015
19W	-	F	3.5	Ovariectomy	1/5/2015
20W	-	F	5.5	Ovariectomy	1/5/2015
21W	-	F	2.5	Ovariectomy	1/5/2015
22W	-	F	2.5	Ovariectomy	1/5/2015
23W	-	F	2.5	Ovariectomy	1/5/2015
24W	150.261	F	2.5	Ovariectomy	1/5/2015
25W	-	F	3.5	Ovariectomy	1/5/2015
26W	150.031	F	3.5	Ovariectomy	1/5/2015
27W	-	F	2.5	Ovariectomy	1/5/2015
28W	150.322	F	2.5	Ovariectomy	1/6/2015
29W	-	F	3.5	Ovariectomy	1/6/2015
30W	150.023	F	0.5	Ovariectomy	1/6/2015
31W	151.041	F	7.5	Ovariectomy	1/6/2015
32W	-	F	3.5	Ovariectomy	1/6/2015
33W	-	F	0.5	Ovariectomy	1/6/2015
33W	151.194	F	4.5	Ovariectomy	1/6/2015
35W	151.152	F	4.5	Ovariectomy	1/6/2015
36W	151.204	F	7.5	Ovariectomy	1/6/2015
37W	151.162	F	6.5	Ovariectomy	1/7/2015
38W	151.173	F	4.5	Ovariectomy	1/7/2015
39W	-	F	1.5	Ovariectomy	1/7/2015
40W	-	F	2.5	Ovariectomy	1/8/2015
41W	-	F	2.5	Ovariectomy	1/8/2015
42W	-	F	0.5	Ovariectomy	1/8/2015
43W	151.182	F	4.5	Ovariectomy	1/8/2015
44W	151.013	F	2.5	Ovariectomy	1/8/2015

45W	-	F	8.5	Ovariectomy	1/8/2015
46W	151.100	F	4.5	Ovariectomy	1/8/2015
47W	-	F	1.5	Ovariectomy	1/8/2015
48W	151.073	F	5.5	Ovariectomy	1/9/2015
49W	-	F	1.5	Ovariectomy	1/9/2015
50W	151.050	F	2.5	Ovariectomy	1/9/2015
51W	-	F	1.5	Ovariectomy	1/9/2015
52W	151.092	F	3.5	Ovariectomy	1/9/2015
53W	-	F	4.5	Ovariectomy	1/9/2015
54W	151.033	F	3.5	Ovariectomy	1/9/2015
55W	-	F	0.5	Ovariectomy	1/9/2015
56W	151.113	F	6.5	Ovariectomy	1/9/2015
57W	-	F	5.5	Ovariectomy	1/9/2015
58W	-	F	3.5	Ovariectomy	1/10/2015
59W	-	F	3.5	Ovariectomy	1/10/2015
60W	151.083	F	0.5	Ovariectomy	1/10/2015
61W	-	F	1.5	Ovariectomy	1/10/2015
62W	-	F	3.5	Ovariectomy	1/10/2015
63W	-	F	0.5	Ovariectomy	1/10/2015
64W	-	F	6.5	Ovariectomy	1/10/2015
65W	151.061	F	3.5	Ovariectomy	1/10/2015
66W	-	F	2.5	Ovariectomy	1/10/2015
67W	-	F	3.5	Ovariectomy	1/10/2015
68W	-	F	1.5	Ovariectomy	1/11/2015
69W	-	F	2.5	Ovariectomy	1/11/2015
70W	-	F	4.5	Ovariectomy	1/11/2015
71W	-	F	1.5	Ovariectomy	1/11/2015
72W	-	F	1.5	Ovariectomy	1/11/2015
73W	-	F	0.5	Ovariectomy	1/11/2015
74W	-	F	4.5	Ovariectomy	1/11/2015
75W	-	F	0.5	Ovariectomy	1/11/2015
76W	151.143	F	1.5	Ovariectomy	1/11/2015
77W	-	F	3.5	Ovariectomy	1/12/2015
78W	-	F	4.5	Ovariectomy	1/12/2015
79W	-	F	0.5	Ovariectomy	1/12/2015
80W	-	F	6.5	Ovariectomy	1/12/2015
81W	-	F	2.5	Ovariectomy	1/12/2015
82W	-	F	5.5	Ovariectomy	1/12/2015
83W	-	F	3.5	Ovariectomy	1/12/2015
84W	-	F	6.5	Ovariectomy	1/12/2015
85W	-	F	4.5	Ovariectomy	1/12/2015
86W	-	F	2.5	Ovariectomy	1/12/2015
86W	-	F	2.5	Ovariectomy	1/12/2015
88W	-	F	3.5	Ovariectomy	1/13/2015
89W		F	2.5	Ovariectomy	1/13/2015
90W	-	F	6.5	Ovariectomy	1/13/2015

91W	-	F	2.5	Ovariectomy	1/13/2015
92W	-	F	6.5	Ovariectomy	1/13/2015
93W	-	F	2.5	Ovariectomy	1/13/2015
94W	151.092	F	4.5	Ovariectomy	1/13/2015
95W	-	F	3.5	Ovariectomy	1/13/2015
96W	-	F	3.5	Ovariectomy	1/13/2015
97W	-	F	0.5	Ovariectomy	1/14/2015
98W	-	F	5.5	Ovariectomy	1/14/2015
99W	-	F	0.5	Ovariectomy	1/14/2015
100W	-	F	0.5	Ovariectomy	1/14/2015
101W	-	F	3.5	Ovariectomy	1/14/2015
102W	-	F	1.5	Ovariectomy	1/14/2015
103W	-	F	0.5	Ovariectomy	1/14/2015
104W	-	F	0.5	Ovariectomy	1/15/2015
105W	151.023	F	2.5	Ovariectomy	1/15/2015
106W	-	F	1.5	Ovariectomy	1/15/2015
107W	-	F	1.5	Ovariectomy	1/15/2015
108W	-	F	4.5	Ovariectomy	1/15/2015
109W	-	F	1.5	Ovariectomy	1/15/2015
110W	-	F	1.5	Ovariectomy	1/15/2015
111W	-	F	8.5	Ovariectomy	1/15/2015
112W	-	F	-	Ovariectomy	1/15/2015
113W	-	F	4.5	Ovariectomy	1/16/2015
114W	-	F	1.5	Ovariectomy	1/16/2015
17R	-	M	0.5	-	1/4/2015
14R	-	M	0.5	-	1/6/2015
21R	-	M	0.5	-	1/7/2015
25R	-	M	0.5	-	1/9/2015
9R	-	M	0.5	-	1/9/2015
14R	-	M	1.5	-	1/9/2014
20R	-	M	0.5	-	1/11/2015
15R	-	M	0.5	-	1/11/2015
23R	-	M	0.5	-	1/12/2015
24R	-	M	0.5	-	1/12/2015
19R	-	M	0.5	-	1/15/2015

APPENDIX B

Spotlight based distance sampling data 1 - 2 January 2015 for Village of East Hampton, NY

Date	Transect (km)	Distance (m)	Deer in group	Group composition
1/1/2015	30.9	23	1	AF
1/1/2015	30.9	115	4	2 AF, 2 F
1/1/2015	30.9	60	2	AF, F
1/1/2015	30.9	30	2	AF, F
1/1/2015	30.9	12	2	AF, F
1/1/2015	30.9	0	1	AF
1/1/2015	30.9	21	6	2 AF, 4 F
1/1/2015	30.9	59	7	3 AF, 4 F
1/1/2015	30.9	311	3	AF, 2 F
1/1/2015	30.9	49	3	AF, 2 F
1/1/2015	30.9	44	5	2 AF, 3 F
1/1/2015	30.9	90	2	2 AF
1/1/2015	30.9	28	1	AF
1/1/2015	30.9	18	9	4 AF, 5 F
1/1/2015	30.9	24	1	AM
1/1/2015	30.9	50	3	AF, 2 F
1/1/2015	30.9	24	2	AF, F
1/1/2015	30.9	42	1	AF
1/1/2015	30.9	38	3	AF, 2 F
1/1/2015	30.9	14	4	2 AF, 2 F
1/1/2015	30.9	24	2	AF, F
1/1/2015	30.9	96	1	AF
1/1/2015	30.9	71	3	AF, 2 F
1/1/2015	30.9	9	1	AF
1/1/2015	30.9	12	1	AF
1/1/2015	30.9	5	4	AF, 3 F
1/1/2015	30.9	48	6	3 AF, 3 F
1/1/2015	30.9	11	1	AM
1/1/2015	30.9	93	9	5 AF, 4 F
1/1/2015	30.9	19	2	AF, F
1/2/2015	30.9	47	3	AF, 2 F
1/2/2015	30.9	0	2	Unknown
1/2/2015	30.9	107	1	Unknown
1/2/2015	30.9	37	1	AF
1/2/2015	30.9	36	7	3 AF, 4 F
1/2/2015	30.9	55	1	Unknown
1/2/2015	30.9	39	11	5 AF, 6 F
1/2/2015	30.9	0	2	Unknown
1/2/2015	30.9	65	4	2 AF, 2 F
1/2/2015	30.9	35	2	2 AF
1/2/2015	30.9	23	1	AF
1/2/2015	30.9	45	2	2 AM
1/2/2015	30.9	32	1	Unknown
1/2/2015	30.9	79	3	Unknown

1/2/2015	30.9	119	4	2 AF, 2 F
1/2/2015	30.9	37	4	2 AF, 2 F
1/2/2015	30.9	52	1	AF
1/2/2015	30.9	28	2	AF, F
1/2/2015	30.9	69	5	2 AF, 3 F
1/2/2015	30.9	18	1	Unknown
1/2/2015	30.9	20	1	AF
1/2/2015	30.9	45	4	2 AF, 2 F
1/2/2015	30.9	9	3	2 AF, F

APPENDIX C

White-tailed Deer Sterilization Surgical Report for East Hampton, New York
Steven F. Timm, DVM

Methods and Results

One hundred and fourteen female white-tailed deer were surgically sterilized over twelve nights from 2 - 15 January 2015. All deer were captured with remote injection tranquilizer darts using a combination of Telazol and xylazine. Following transportation to an indoor facility, all deer were given flunixin meglumine at a dosage of 1-3 mg/kg via intramuscular (IM) injection, and a long acting antibiotic (ceftiofur) at 3-6 mg/kg also IM. To maintain anesthesia, supplemental doses of ketamine HCl (2-4 mg/kg) were given intravenously (IV) as needed. Routine prepubic ventral midline laparotomy exposed the uterine horns and ovaries. All deer had bilateral ovariectomies using a combination of clamping, electrocautery, ligation (0 PDS suture material) and excision. Routine three layer closure of the abdomen was performed to complete the procedure (#1 PDS: 0 PDS: stainless steel skin staples). All animals were returned to the area where they were captured, given a reversal agent of 200 mg tolazoline HCl IV, and monitored during recovery.

Comments

Although three mortalities were discovered following the surgeries, we feel this represents a very low major complication rate, considering an open abdominal procedure was involved. This is well within the range of capture related mortality documented in the literature without surgical procedures, and can vary by location. Two of the three deer that suffered mortalities, were noted to have muscle tremors (i.e., myotonia) starting prior to surgery (not associated with pain, or responsive to medication). A correlation between these events is being investigated. Post-surgical bleeding or other gross complications related to the surgical procedure did not appear to have been a causative factor in these deaths. In general, each surgery lasted between fifteen and twenty minutes.