2020 Report to the New York State Department of Environmental Conservation

License to Collect or Possess: Scientific #2670

White-tailed Deer Contraception and Impact Study
Village of Hastings-on-Hudson, New York

Allen T. Rutberg, Ph.D.
Center for Animals and Public Policy
Cummings School of Veterinary Medicine at Tufts University
200 Westborough Road, North Grafton, MA 01536

Kali Pereira, M.S.
The Humane Society of the United States
700 Professional Drive, Gaithersburg, MD 20879

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INTRODUCTION

After an extended community discussion of how to manage its conflicts with deer, the Village of Hastings on Hudson (HoH) joined with The Humane Society of the United States (HSUS) and Cummings School of Veterinary Medicine at Tufts University in 2014 to undertake a comprehensive approach to deer population management and impact measurement. This collaboration features an experimental effort to apply and evaluate the PZP (porcine zona pellucida) immunocontraceptive vaccine to stabilize and reduce deer numbers in HOH.

The scientific objectives of the HoH immunocontraception project are to:

1. Confirm that a single, hand-delivered, timed-release PZP preparation ("PZP-22") first tested on deer at Fripp Island, South Carolina, is effective for more than one year

2. Evaluate and compare the effectiveness and longevity of dart-delivered boosters containing either PZP-22 or a the standard emulsion-only native PZP booster ("ZonaStat-D") in deer receiving an initial treatment of PZP-22.

3. Test whether contraception can be used to stabilize or reduce deer population numbers in a suburban/urban environment in which deer movements are not tightly restricted by geographic boundaries (as distinct from islands and other isolated areas).

Through the first four field seasons (under permit #1356), winters 2014-2017, 69 individual females were captured and treated with PZP-22. In addition, three males were captured incidentally, and three previously tagged females who had lost their tag were recaptured and retagged. Blood sampling for pregnancy testing was conducted on captured females, and tagged females were observed for fawn associations through direct visual contact and camera trap records.

Scientific objectives aside, a cornerstone of the HoH deer project is community engagement in assisting the research team with locating deer and measuring impacts of the deer population in terms of deer-vehicle collisions, damage to backyard vegetation, and ecological impact on open space. Residents of HoH contributed substantially to the study through flagging of properties to indicate permission for access by the research team, online and telephone reports of deer observations, participation in the Host-a-Hosta impact measurement effort, and other means. Community support and participation are crucial to the success of any local wildlife conflict management effort.

2020 METHODS

Deer Observations

COVID-19 Impacts. Due to unfortunate circumstances surrounding the status of novel coronavirus spread within the United States, we were unable to visit the study site to collect field observations as planned during winter, spring, and summer this year.

Due to cancellations in projected field activities, community outreach and participation were reduced, and interactions with field staff during observations were discouraged. The deer hotline was not set up this year.

Fall Observations. Observations were made 28 September – 01 October 2020 from a labeled field vehicle and on foot between the approximate hours of 5:30 am and 10:00 pm. Spotlights were utilized in times of low light or reduced visibility. All deer observed were recorded, regardless of tag, sex, or age.

Deer Impact Studies

Population Surveys. Two approaches to population estimation have been undertaken for this study. One was an informal mark-resight approach made possible starting in 2015 after significant numbers of females were captured and ear-tagged. The second relied on placement of motion-sensitive trail cameras in a grid for approximately 60 days in late fall.

Because COVID prevented ground observations in March 2020, all mark-resight estimates this year were based on the September-October observations described above. Population estimates were based on the assumption that only tagged deer observed during that period and/or were observed on trail camera photographs were present in the study area; this may be a slight underestimate but probably represents an accurate snapshot of the number of individuals present during the fall. The ratio of observations of tagged to untagged does was combined with the number of tagged does assumed to be present onsite to estimate the total number of does present; that estimate was then used with the ratio of observations of fawns per doe and bucks per doe to produce estimates of fawn and buck numbers, and a total number of deer in the study area.

In 2020, eleven motion-sensitive infrared trail cameras were placed on the same grid used last year. Cameras were in place from October 1 – December 1, 2020 for a period of approximately 60 days.

As in previous years, demographic descriptions of photographs were entered in Excel spreadsheets, and analyzed using the modified Jacobson's method (Weckel et al. 2011). Population estimates were carried out by Christopher Johnson, MS.

Deer Vehicle Collisions. Data on deer-vehicle collisions was provided by the Village of Hastings-on-Hudson Traffic Accident Index Report.

RESULTS

Vaccine Effectiveness

Two (2) of the 15 ear-tagged does observed during September 2020 were accompanied by single fawns. One additional fawn with a doe that was not observed by project staff (#8) was photographed by a resident. These confirmed fawning observations included

- 0/1 unboosted does from the 2015 capture cohort (Year Five after initial treatment)
- 3/15 previously boosted does (0/4 in Year One, 1/4 in Year Two, 1/4 in Year Three, and 1/3 in Year Four after boosting)

Over the course of the study, fawning rates among females receiving a single hand-injection of PZP-22 have averaged 14.7% over the first two years (with limited evidence, based on a small sample, that reduction in fawning continues after two years; Table 1). Fawning rates among females receiving boosters 2.5 years after initial treatment averaged 9.8% over three years, with no evidence of decreasing effectiveness over that period (Table 2). No difference in fawning rates was observed between females boosted with native PZP emulsion and those boosted with PZP-22.

Population Dynamics

Reproduction, Mortality and Disappearances. Up to 15 fawns were observed on a given day within HoH during the fall observation session. Most accompanied untagged females, and as in previous years were most likely to be sighted at the northern and southern boundaries of HoH, where females regularly accessed Dobbs Ferry and the Andrus School, respectively, where we had no access for darting.

Of the 69 females captured and ear-tagged since 2014, we are aware of 10 documented mortalities (no tagged deer were reported as deceased to us this year).

Table 1. 2014-2020 fawning among untreated (Year 0) and treated does receiving a single hand-injection of PZP emulsion + controlled release pellets (PZP-22), all cohorts.

Years After Initial Vaccination	**# Females Fawning/Total (%)**
Year 0 (based on pregnancy testing, 2014-17)	46/51 (90.2%)
Year 1 (2014-2017 cohorts)	5/38 (13.2%)
Year 2 (2014-2017 cohorts)	5/30 (16.7%)
Year 3 (2018 fawning for unboosted 2015 cohort)	0/2 (0%)
Year 4 (2019 fawning for unboosted 2015 cohort)	2/3 (67%)
Year 5 (2020 fawning by unboosted 2015 cohort)	0/1 (0%)
Total, Does Receiving One PZP-22 treatment	**12/74 (16.2%)**

Table 2. 2017-2020 fawning among does treated with a single hand injection of PZP emulsion + controlled release pellets followed 2.5 years later by one dart-delivered booster, 2014-2017 cohorts.

Years After Booster	**Native PZP Booster (ZonaStat-D)**	**Native PZP + Pellet booster (PZP-22)**	**Total**
Year 1	1/11 (9.1%)	0/9 (0%)	**1/20 (5.0%)**
Year 2	1/7 (14.3%)	1/5 (20%)	**2/12 (16.7%)**
Year 3	0/4 (0%)	1/5 (20%)	**1/9 (11.1%)**
Year 4	1/3 (33.3%)	-	**1/3 (33.3%)**
Total, does receiving one booster	**3/24 (12.5%)**	**2/19 (10.5%)**	**5/44 (11.4%)**

During September observations, we located 15 of the 69 does captured during 2014-17, including two who had lost both ear-tags but whose identities could be inferred with substantial confidence by their group associations and sighting locations. This is lower than observed in previous years; part of the decline may be due to the elimination of spring observation due to COVID. An additional five (5) ear-tagged does not seen in September observations were identified from photographs from the autumn camera traps along with one button-tag-only deer whose number was not seen (possibly #43) and one ear-tagged doe was photographed onsite by a resident (#8). Thus at least 22 ear-tagged does remained on site late in 2020.

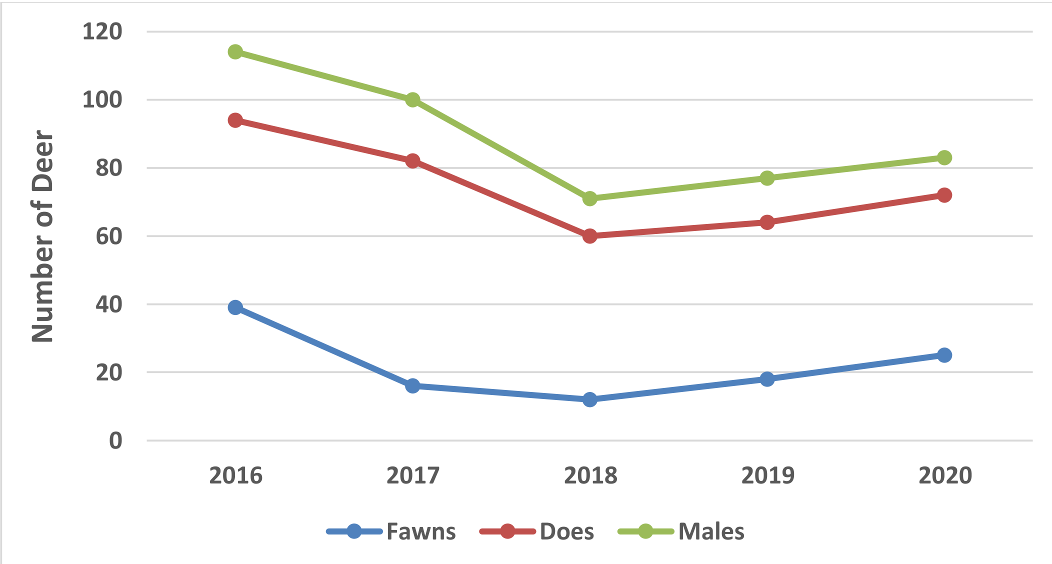
These included 2 of 8 females tagged in 2014 (plus #8); 6 of the 20 females tagged in 2015; 6 of the 20 females tagged in 2016 (plus #43); and 7 of the 21 females tagged in 2017 (Appendix B).

Deer Density and Herd Composition. I. Mark/resight estimates. In autumn 2020, we again made rough estimates of population density and composition using an informal mark-resight analysis based on observations of tagged and untagged females observed during autumn observations (Appendix A).

Summing raw observations of tagged and untagged females in September (Appendix B) yielded 33 observations of tagged females and 38 observations of untagged females, or 46.4% tagged females (down from the 2019 estimate of 62.6% observations of tagged females). In September, we observed 0.52 fawns/doe (up from .35 last year) and a doe:buck ratio of 4.4 (slightly higher than last year). If we assume that we have seen all tagged does present onsite either in observations or camera-trap photos (N=22) and that 46.4% of the females are tagged, we can infer that there are approximately 43 does (similar to 2019), 22 fawns (slightly up from last year), and 10 bucks (slightly down from last year), for a total of 77 deer onsite in autumn. Again, this number would be higher if we underestimated the number of tagged does on the site.

Between 2016, when sufficient numbers of females had been marked to justify use of this method, and 2020, deer population size estimates obtained using this method declined by about 36% (Fig. 1).

Fig. 1. Population Size and Composition based on Mark-Resight Estimates, 2016-2020
(Age-sex classes stacked; total represented by top line)



Deer Density and Herd Composition. II. Population estimates from camera trap models

Image production and data collection from camera traps in 2020 were hindered by COVID-19 restrictions, and data are still being analyzed. Estimates from 2014 have been previously reported; estimates using the Modified Jacobsen's Branch Antler method (Weckel et al. 2011) from 2015, 2016, 2018 and 2019 were completed this year (Fig. 2). (Camera trap data were not obtained in 2017.) Using this method, deer populations at Hastings-on-Hudson declined approximately 62% between 2014 (the year the study began) and 2019.

Broadly speaking, the two different methods (mark-resight and camera-trap) yielded similar population trends and (for 2018-19 especially) similar absolute population estimates (Fig. 3).

Deer Impacts: Deer-vehicle collisions

Deer-vehicle collisions reported by the Village of Hastings-on-Hudson declined during the period of the study (Figure 4). The number of collisions reported 2017-2020 was significantly lower than then number reported 2013-2016 ($\chi^2 = 7.08$, df =1, $p = 0.008$).

Fig. 2. Population Size and Composition based on Modified Jacobsen's Branch-Antler Estimates from Camera Trap Grid, 2014-2019 (cameras not placed 2017) (Age-sex classes stacked; total represented by top line)

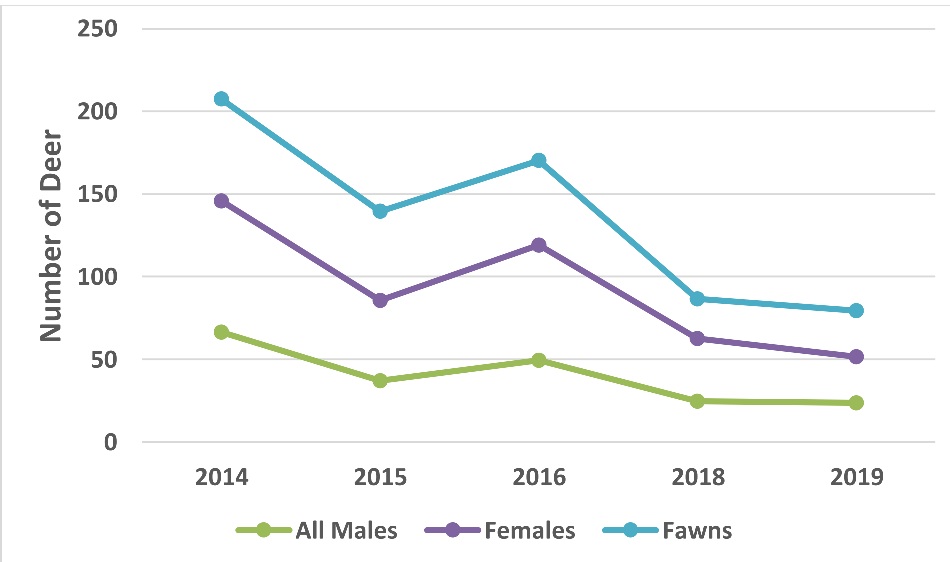


Fig. 3 Total number of deer, mark-resight and Modified Jacobsen's Branch-Antler Estimates compared. (Age-sex classes stacked; total represented by top line)

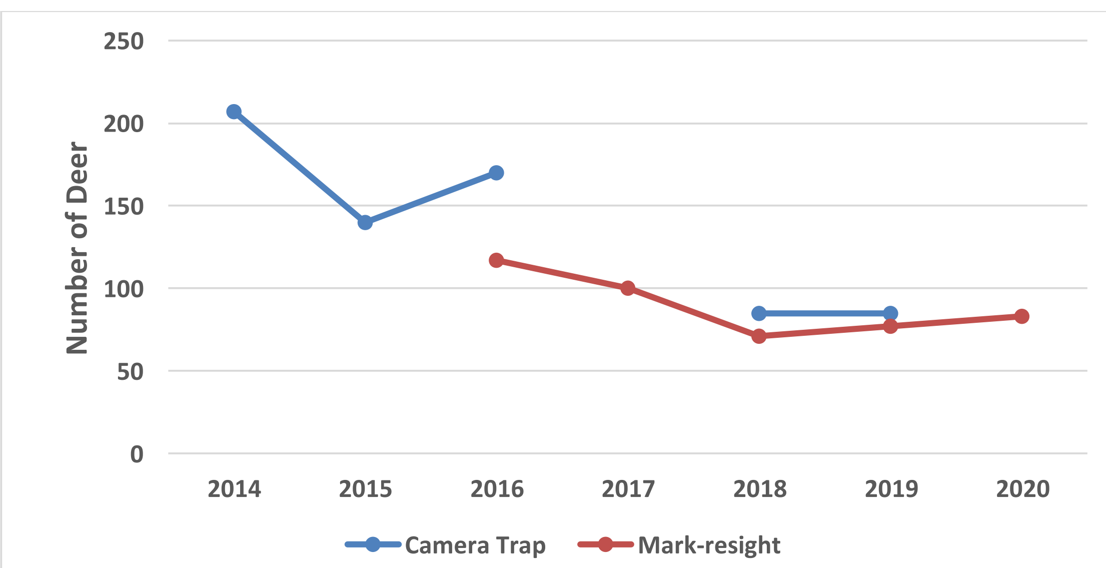
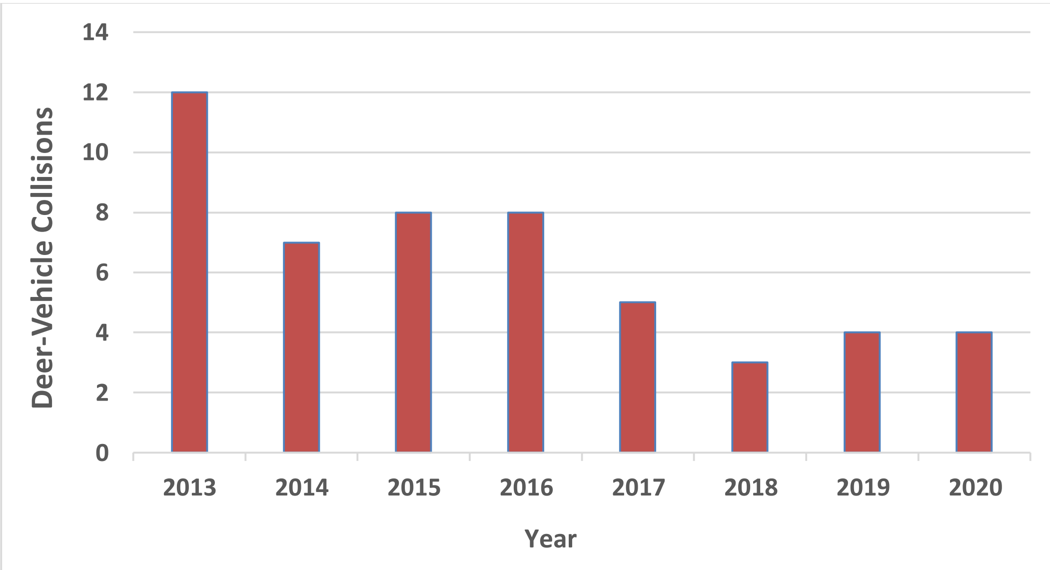


Figure 4. Number of deer-vehicle collisions recorded by Village of Hastings-on-Hudson Police Department (2013-2020)



DISCUSSION

No darting was planned or carried out in 2020.

Because of COVID-19, observations and camera trap placement were both subject to travel constraints, and on-the-ground observations were not carried out in March or August. Thus we might have missed tagged does and fawns that were present onsite only during those times, and not counted fawns that were born but died before September-October observations. We also relied on local volunteer assistance to monitor and remove cameras, so image collection and timelines differed from previous years. Tampering with trail cameras also increased in 2020.

Vaccine Effectiveness

Within our observation limits, fawning continued at very low rates among treated females in 2020, with only two fawns observed among 15 treated females observed. Again, we commonly saw fawns associated with untagged females, especially at the northern and southern edges of the village where does often crossed into areas to which we did not have access for the capture, tagging, and treatment of deer during the study.

Observations from this and previous years confirmed that hand injections of PZP emulsion plus controlled release pellets (PZP-22) delivered in March are effective for at least two years, approximately replicating the efficacy and longevity results from the study conducted on Fripp Island, SC (Rutberg et al. 2013). Very limited data hint there may be some lingering effectiveness of the initial treatment beyond Year Two (2 fawns in 6 fawning opportunities in years 3-5); this may be worth further investigation.

Our evidence is now strong that boosters of either PZP-22 or native PZP delivered 2.5 years after hand injection with PZP-22 add at least three years of contraceptive effectiveness, with only 4 fawns produced in 43 fawning opportunities. We saw no indication that effectiveness declined across three years, suggesting that booster effectiveness may extend past three years. There was also no indication of differences in effectiveness between PZP-22 and native PZP boosters. These results parallel or improve upon those reported on PZP booster effectiveness in wild horses (Rutberg et al. 2017).

Two practical conclusions emerge. The most important conclusion is that a single hand-delivered PZP-22 primer and a single PZP booster administered several years later may suffice to effectively contracept most adult does for the remainder of their lifespans. The second is that, because PZP-22 boosters carry no effectiveness advantage and are more difficult to handle and costly than native PZP, future protocols should use native PZP to boost PZP-22-primed deer.

Population Dynamics

Although both methods of population estimation used here are imperfect, the camera-trapping and mark-resight estimates largely corroborate one another (Fig. 3). Both point towards a deer population decline of 50% or more between the start of the study in 2014 and 2018, when the full effect of contraception would have first been experienced in the population. The inferred deer population reduction is paralleled by the reduction in deer-vehicle collisions across the study period (Fig. 4). Although fawn numbers are rising slowly as of 2020, they are still only about half of what they were in 2014, and the reduced deer population levels appear to have persisted into 2020.

More than three years after we stopped tagging new does, our observations suggest that tagged females still comprise nearly half of the adult females present onsite. Despite the reduction in deer density, there is no evidence of a large-scale migration of untagged females into the site. This observation is consistent with earlier work on removals of local deer populations (McNulty et al. 1997; Porter et al. 2004). Most untagged does and fawns continued to be observed near the Village boundaries, including Dobbs Ferry to the north, the east side of Saw Mill River Parkway, and the Andrus School in Yonkers to the south.

Doe home ranges that cross the Village boundaries complicated both population control efforts and population estimates. Our numerical estimates of the deer population may be best understood as a snapshot in time reflecting the dynamic nature of deer occupancy of the Village edges.

Deer Impacts on the Community

The most important impact of this study on the Village was the significant reduction in deer-vehicle collisions during the study period. The number of reported collisions declined from an average of almost 9 per year from 2013-2016 to 4 per year in 2017-2020.

The Host-a-Hasta program, like so much else, was cancelled due to COVID-19.

Community Involvement

Although Covid-19 has impacted field activity and participation from residents, the Village deer website is still being updated in an effort to keep the community informed.

Although the Deer Hotline was not activated this year due to cancellation of field sessions in which that reporting is requested, it remains a productive tool for the research team that aids in opening lines of communication between the community and the research team and will be reinitiated in future field sessions. It was also suggested by a Village Trustee, to re-institute electronic reporting from residents via email or village-hosted website to increase engagement and continue community level data collection and oversight beyond the study timeline.

Work Planned for the Remainder of 2021

During late August 2021, the team will return to HoH for approximately 4 days to observe and locate previously tagged animals, match tagged and untagged females with fawns, and estimate the proportion of females in the population that are tagged. The 2021 data should provide us with additional insight on estimating the efficacy and longevity of the two types of PZP boosters.

Photographs from the camera traps in place in October and November 2020 have been catalogued in the Excel database. Because of inconsistencies with methodology from previous years, and relatively smaller numbers of deer recorded on camera, population estimates from 2020 are still being refined. Analysis of the spatial relationship of tagging and darting efforts to the presence of fawns and more complete descriptions and analysis of survivorship of tagged deer will also be carried out in 2021.

References

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APPENDIX A. TABLE AND TRANSCRIPTION OF SEPTEMBER OBSERVATIONS

	# Tagged Doe sightings	# HOH Untagged Does sightings	# HOH fawn sightings	# HOH Bucks sightings	# Yearling Sightings	Total Deer Sightings	Tag Numbers	NOTES
DAY 1 9/28/20	4	5	4	4	1	18	11, 15, 68, 65	All fawns seen this day accompanied by untagged does
DAY 2 9/29/20	11	14	15	1	1	42	39, 11, 15, 63, 5, missing both, 4, missing both, 35	Missing tag doe with 4, 5 (possibly 36 or 44); Missing tags (suspect 21/75); #39 has 1 F
DAY 3 9/30/20	5	4	3	6	0	18	37, 64, 26, 4, 5	
DAY 4 10/1/20	13	15	14	6	0	48	4, 5, missing tags, 26, 64, 37, 15, 11, 68, 24	
Total HoH	33	38	36	17	2	119	(15) 13 individual tagged deer +2 does missing both tags	
Total outside HoH (Yonkers & Dobbs)	*0*	*6*	*8*	*3*		*17*		*Incidental observations adjacent to HoH*

APPENDIX B. Capture dates, measurements, treatment history, and fawning observations for white-tailed deer captured in Hastings-on-Hudson, New York, 2014 - 2017. All deer captured were adult females except for #13, 61, and 69, who were young adult males. (N/O = not obtained; Em = emulsion only; Em + Pel = Emulsion + Pellets; NS = Not Seen; Unknown = Not directly observed as of September 2018; U = udder seen but not fawn; * = diagnosed as pregnant in blood testing; † = diagnosed as not pregnant in blood testing)

Animal Identification Information				PZP -22 Treatment		Fawning Hx						
Animal ID	**Date of Capture:**	**Age @ Capture**	**STATUS:**	**Initial:**	**Booster:**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
1	3/9/2014	Ad > 2	DECEASED 11/25/2014	3/9/2014								
2	3/23/2014	Ad > 2	Dispersed -2015	3/23/2014	Due: 9/2016	1	0	NS	NS	NS	NS	NS
3	3/25/2014	Ad > 2	Unknown -2014	3/25/2014	Due: 9/2016	2	NS	NS	NS	NS	NS	NS
4	3/25/2014	Ad > 2	Alive	3/25/2014	9/26/2016 Em	1	0	0	0	0	0	0
5	3/26/2014	Ad > 2	Alive	3/26/2014	9/26/2016 Em	2	0	NS - Yes	1	0	0	0
6	3/27/2014	Ad > 2	Alive	3/27/2014	9/26/2016 Em + Pel	NS	0	NS	0	0	0	NS
7 aka 30	3/27/2014	>7	Alive	3/27/2014	9/26/2016 Em + Pel	1	NS†	NS	0	0	0	NS
8	3/28/2014	Ad > 2	Alive	3/28/2014	9/27/2016 Em	1	0	0	0	0	0	1
9	2/7/2015	Ad	Alive	2/7/2015	9/29/2017 Em + Pel		2*	0	0	0	NS	NS
10	2/8/2015	Ad	DECEASED 10/29/2016	2/8/2015			2*	NS				
11	2/12/2015	Ad	Alive	2/12/2015	9/27/2017 Em		NS*	0	0	0	0	0
12	2/12/2015	Ad	Alive	2/12/2015	9/27/2017 Em		1*	0	0	0	NS	NS
13	2/18/2015	Ad	Alive	BUCK	0	-	-	-	-	-	-	-
14	3/6/2015	Ad	Unknown (2015)	3/6/2015	Due: 9/2017		1*	NS	NS	NS	NS	NS
15	3/7/2015	2.5	Alive	3/7/2015	9/27/2017 Em + Pel		1*	0	0	0	0	0
16	3/6/2015	3	Unknown -2015	3/6/2015	Due: 9/2017		NS*	NS	NS	NS	NS	NS
17	3/8/2015	5	Unknown (2015)	3/8/2015	Due: 9/2017		3*	NS	NS	NS	NS	NS

18	3/10/2015	2.5	Alive	3/10/2015	9/29/2019 Em		1*	NS	U poss	1	1	NS
19	3/10/2015	4.5	DECEASED -2016	3/10/2015			2*	0				
20	3/11/2015	6	Prev. Missing	3/11/2015	9/29/2019 Em + Pel		NS*	NS	NS	NS	1	NS
21	3/9/2015	2	Alive	3/9/2015	Due: 9/2017		1*	0	0	0	0	0
22	3/23/2015	5	Unknown -2015	3/23/2015	Due: 9/2017		NS*	NS	NS	NS	NS	NS
23	3/23/2015	2.5	Unknown (2016)	3/23/2015	Due: 9/2017		2*	NS	NS	NS	NS	NS
24	3/27/2015	Ad	Alive	3/27/2015	9/27/2017 Em + Pel		1*	1	1	0	1	1
25	3/30/2015	2	DECEASED (11/2016)	3/30/2015			1*	0		-		
26	3/31/2015	Ad	Alive	3/31/2015	9/29/2018 Em		2*	0	0	0	0	0
27	3/11/2015	2.5	Unknown (2017)	3/11/2015	9/27/2017 Em + Pel		2*	0	0	NS	NS	NS
28	3/19/2015	3.5	DECEASED (10/2016)	3/19/2015			NS*	NS	NS			
29	3/20/2015	5.5	Alive	3/20/2015	9/28/2017 Em		1*	0	0	0	0	NS
30 aka 7	4/3/2015	Ad	Alive	3/27/2014		1	0†	NS	0*	0	0	0
31	2/25/2016	2	Alive	2/25/2016	9/27/2018 Em + Pel			2*	0	0	0	NS
32	2/29/2016	2	Unknown -2016	2/29/2016	Due: 9/2018			NS	NS	NS	NS	NS
33	3/1/2016	Adult	Unknown -2016	3/1/2016	Due: 9/2018			NS*	NS	NS	NS	NS
34	3/4/2016	3-4 y	Unknown -2017	3/4/2016	Due: 9/2018			0	0	NS	NS	NS
35	3/6/2016	Adult	Alive	3/6/2016	9/26/2018 Em + Pel			1*	U poss	0	0	0
36	2/26/2016	Adult	Alive	2/26/2016	9/25/2018 Em + Pel			1*	0	0	NS	NS
37	2/27/2016	2-3 yr	Alive	2/27/2016	9/29/2018 Em + Pel			1*	0	0	0	0
38	3/1/2016	3 y	Unknown -2016	3/1/2016	Due: 9/2018			NS*	NS	NS	NS	NS
39	3/1/2016	3 y	Alive	3/1/2016	9/27/2018			2*	0	0	0	1

					Em							
40	3/8/2016	Adult>3	Unknown (2017)	3/8/2016	Due: 9/2018			2	0	NS	NS	NS
41	3/12/2016	2-3 yr	Unknown (2016)	3/12/2016	Due: 9/2018			NS*	NS	NS	NS	NS
42	3/13/2016	3-4 yr	Alive	3/13/2016	9/24/2018 Em			1*	1	0	NS	NS
43	3/15/2016	4-5 yr	Alive	3/15/2016	9/26/2018 Em			NS*	0	0	0	NS
44	3/15/2016	Adult	Unknown (2017)	3/15/2016	Due: 9/2018			1*	0	NS	NS	NS
45	3/20/2016	3 yr	Unknown (2016)	3/20/2016	Due: 9/2018			NS	NS	NS	NS	NS
46	3/22/2016	1.5-2.5yr	Unknown (2016)	3/22/2016	Due: 9/2018			NS *	NS	NS	NS	NS
47	3/29/2016	1.5-2.5yr	Alive	3/29/2016	Due: 9/2018			NS*	0	0	NS	NS
48	3/10/2017	3-4 yr	DECEASED (3/30/17)	3/10/2017								
49	3/20/2016	3-4 yr	Unknown (2017)	3/20/2016	Due: 9/2018			2*	U	NS	NS	NS
50	3/22/2016	3-4 yr	DECEASED (6/17/17)	3/22/2016				NS				
51	3/22/2016	3 yr	Alive	3/22/2016	9/28/2018 Em			NS†	U	0	NS	NS
52	3/12/2017	Adult	Alive	3/12/2017	9/28/2019 Em				U	0	0	NS
53	3/15/2017	1.5	Unknown (2017)	3/15/2017	Due: 9/2019				NS*	NS	NS	NS
54	3/11/2017	Adult	DECEASED (3/12/17)_	3/11/2017								
55	3/10/2017	3+	Alive	3/10/2017	9/26/2019 Em + Pel				0*	0	0	NS
56	3/10/2017	Adult	Unknown (2017)	3/10/2017	Due: 9/2019				NS*	NS	NS	NS
57	3/11/2017	Adult	Unknown (2017)	3/11/2017	Due: 9/2019				U*	NS	NS	NS
58	3/12/2017	Adult	Unknown (2017)	3/12/2017	Due: 9/2019				NS*	NS	NS	NS
59	3/11/2017	Adult	Alive	3/11/2017	Due: 9/2019				0†	NS	0	NS
60	3/12/2017	N/O	Unknown (2017)	3/12/2017	Due: 9/2019				U*	NS	NS	NS
61	3/16/2017	Adult	Alive	BUCK	0	-	-	-	-	-	-	-
62	3/15/2017	N/O	Unknown (2017)	3/15/2017	Due: 9/2019				NS*	NS	NS	NS
63	3/13/2017	2+	Alive	3/13/2017	9/27/2019 Em + Pel				U	0	1	0
64	3/15/2017	2	Alive	3/15/2017	9/26/2019				0†	0	0	0

					Em							
65	3/15/2017	Adult	Alive	3/15/2017	9/28/2019 Em + Pel				U	0	0	0
66	3/16/2017	Young Adult	Unknown (2017)	3/16/2017	Due: 9/2019				NS†	NS	NS	NS
67 / GPS A	3/19/2017	3	Alive	3/19/2017	Due: 9/2019				U*	0	NS	NS
68	3/15/2017	Adult	Alive	3/15/2017	9/25/2019 Em				1*	NS	0	0
69	3/18/2017	Adult	Alive	BUCK	0	-	-	-	-	-	-	-
70	3/22/2017	1.5	DECEASED (7/9/17)	3/22/2017					†			
71	3/20/2017	2.5	Unknown -2017	3/20/2017	Due: 9/2019				NS*	NS	NS	NS
72 / (prev 34)	3/20/2017	3+	Unknown (2017)						0†	NS	NS	NS
73	3/21/2017	2+	DECEASED (9/2019)	3/21/2017					0*	0	1	
74 / GPS B	3/21/2017	2.5	Alive	3/21/2017	Due: 9/2019				U*	0	NS	NS
75/ (prev 21)	3/21/2017	3+	Alive						0†	0	0	0

Color Guide:

Yellow	Re-Tag/Duplicate
Grey	Deceased
Salmon	Tagged Male