

SUBURBAN WHITE-TAILED DEER (*ODOCOILEUS VIRGINIANUS*) FAWN SURVIVAL
AT FORT DRUM, NEW YORK

Martin Feehan
M.S. Student
Cornell University
Ithaca, New York

2016 Field Season Progress Report

September 1, 2016

Summary of Project

White-tailed deer (*Odocoileus virginianus*) populations are overabundant in many suburban landscapes. In such areas, the costs of vehicle collisions and landscape damage continue to rise, along with risks for transmission of Lyme disease. These impacts are in addition to the damage to forest ecosystems. With these increasing negative impacts, many communities have implemented suburban hunting programs for managing suburban deer. White-tailed deer have high reproductive rates and an important factor influencing their population growth is the survivorship of fawns to reproductive age.

In order to gain insight into fawn survival within suburban environments we captured and radio tracked fawns at Fort Drum during summers 2015 and 2016. While there have been many fawn survival studies, little has been done within suburban landscapes and especially in areas with suburban harvest programs due to property access constraints. This study examines fawn survival within the cantonment area of Fort Drum which is just northwest of the Adirondack Park. It is characterized by housing developments and office buildings and is therefore an ideal place to study suburban deer population dynamics. There is also a long term suburban harvest program. To better understand suburban white-tailed deer our study's primary objectives are to:

1. Determine the local fawn survival rate and leading sources of mortality in a suburban environment,
2. Determine the effect of suburban hunting on recruitment,
4. Determine blood characteristics of New York neonatal deer,
5. Determine the prevalence and transmission of blood borne parasites including *Neospora caninum*,
6. Analyze land use, home range expansion, and dispersal within the first 2 years.

Progress

The main project goal was to radio-collar at least 50 fawns with about 25 each year. Our project commenced field work in May 2015 and our summer fawn capture period continued through July 2015. We captured and collared 18 fawns during this first field season. Twelve of them were captured via basic ground grid-searching and another six were captured opportunistically by driving older fawns into nets. We faced a number of challenges the first year including the preceding harsh winter that had a record winter deer die-off within the study area. This limited the number of fawns on the ground to find. Additionally, we were limited to captures found by searching which increased the average age of fawns at capture. The first week post-birth usually has the highest mortality rate and capturing older fawns limits the ability to see the early mortalities.

Following the completion of the first field season we took additional steps to ensure a higher sample size and a higher proportion of early captures for the 2016 cohort. These included deploying 25 vaginal implant transmitters (VITs) in pregnant does that alerted us to births. Using temperature sensors VITs detect a change from the hot internal core temperature to the cooler environmental temperature after being expelled during birth. An internal radio transmitter is activated, allowing us to find fawn birth sites within hours after birth. We also increased our staffing levels with the support of the William C. Churchill Fund – Karl T. Fredrick Memorial Fund to help cover housing and travel costs for our undergraduate and veterinary student interns.

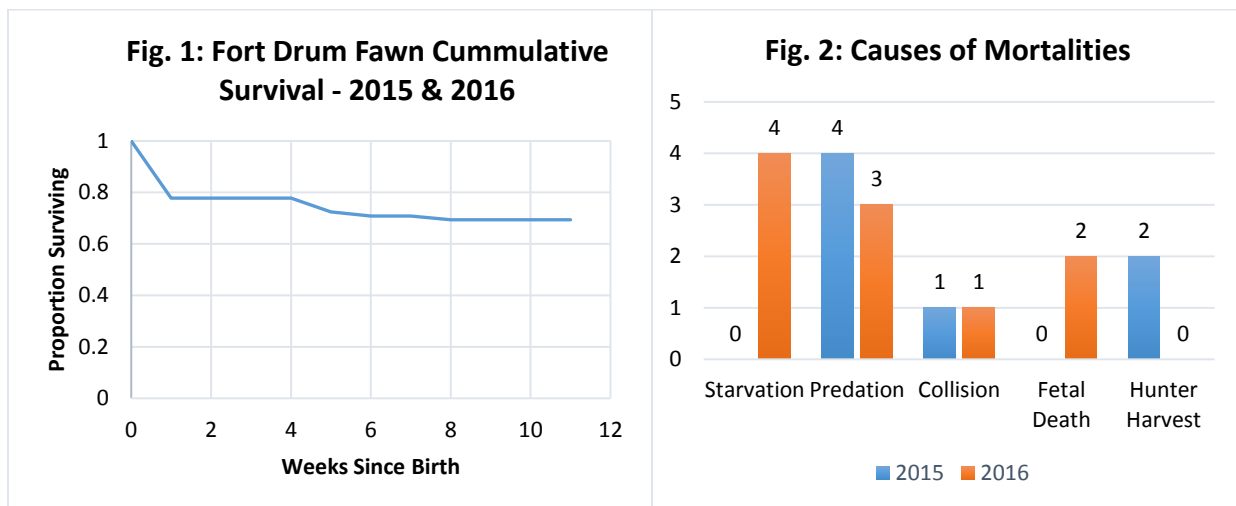
These modifications dramatically improved our project success. We completed the 2016 cohort in July with 45 fawns, well surpassing the project goal of 50 with a total of 63 fawns for the two years. Even more importantly, 31 fawns were captured on their birth day in 2016 compared to only 3 in 2015.

PRELIMINARY RESULTS

Of the 18 fawns captured in 2015, 15 survived through the summer and 10 survived to one year with one unknown fate. A fawn collar appeared to fall off of one fawn in late March. Through August 29th, 35 of the 45 fawns from the 2016 cohort have survived. Overall, survival is incredibly high within the cantonment area at Fort Drum.

Figure 1 shows a summary of the combined proportion of fawns surviving through the summer from both years. To be clear, this is only a summary cumulative survival curve. The full analysis will be completed in Program MARK after data collection has completed. The curve in Fig. 1 clearly illustrates that fawns surviving past the first week are likely to survive through the summer. The high proportion of mortalities during the first week is the reason why deploying VITs in 2016 was essential for project success.

Even with relatively few mortalities, several different causes of mortality have been identified. Figure 2 shows all of the mortalities that occurred during the full year for the 2015 cohort and the first 3 months through the present for the 2016 cohort. Predation was the clear leading cause of fawn mortalities in 2015 and is continuing to be important in 2016. Starvation is not likely to increase for the 2016 cohort because it almost exclusively occurs in the first 5 days after birth. Predations, collisions, and hunter harvest mortalities are all likely to be added during the next 9 months.



Next Steps

We will continue to track the radio-collared fawn from the 2016 cohort through their birthdays in May and June 2017. After that point we will process wound swabs from predated fawn carcasses to confirm the predator species. We will also be able to complete our analyses of survival rates, effects of harvest, and home range expansion after we conclude data collection.

Finally, we will complete a population survey in January 2017 of the entire study area using trail cameras for capture-recapture population estimation. Throughout the fall 2016 we will tag another 50-100 deer to increase the accuracy of the estimate. To date, 121 deer have been tagged including fawns in this study. We will also be collecting more blood samples from the additional tagged deer we capture. Our samples from the spring and summer indicate an unusually high prevalence of the parasite *Neospora caninum* which can cause miscarriages in cattle, domestic pets, and moose. This will be the focus of an expanded study heading through the fall into next year.

Outreach

This summer we launched an online website, fortdrumdeer.org, with accompanying Facebook pages and Twitter accounts. The primary driver for this effort was to utilize the Fort Drum community for logging sightings of tagged deer and reporting untagged fawns for us to capture in a citizen science approach. The effort has been highly successful and we average 4 posts per day. We have increasingly been using the platforms for education as well, including live streaming deer captures and handling procedures. We encourage anyone interested in more about the study to follow our Facebook account.