Proceedings of The National Conference
On Undergraduate Research (NCUR) 2016
University of North Carolina Asheville
Asheville, North Carolina
April 7-9, 2016

Home, Sweet Nest Box: A Comparison of Detection Methods for the Southern Flying Squirrel (*Glaucomys volans*) in Ozaukee and Washington Counties, WI

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Abstract

The purpose of this field study was to compare detection methods for *Glaucomys volans* through installation of nest boxes and wildlife cameras in Ozaukee and Washington Counties in Wisconsin, and to determine an optimal setup for using a feeding tray with a wildlife camera. *G. volans* does not have special conservation status, but requires wooded habitat. The wooded areas do not have to be large parcels of land, as proven by documentation of populations of *G. volans* in highly urban and fragmented areas. With the rapid onset of habitat change to address agricultural needs, residential or commercial planning, and the continued import of exotic species; forest compositions are changing. An understanding of the most effective detection methods for this species could facilitate the development of more targeted management strategies for southern flying squirrel populations. *G. volans* had never been documented in the high-quality, old-growth, beech-maple forest at the University of Wisconsin-Milwaukee Field Station in Saukville, Wisconsin. Ten nest boxes were secured to trees transecting the Field Station forest. The boxes were checked once a month for nesting material, nuts, or *G. volans*. An additional method used for detection was a wildlife camera trained on a feeding tray, which captured images of nocturnal visitors. A separate wildlife camera was used in Slinger, Wisconsin, where flying squirrels had been documented previously. The information from these cameras was used to compare the time, temperature, and food preference at the feeding tray between the Slinger and Field Station site in order to discern whether flying squirrels exhibited differential behavior at these sites. At the Field Station, the peak times of activity for the squirrels to visit the feeding tray were between 6 PM - 9 PM and 11 PM – 4 AM. The peak times of activity for the camera in Slinger, Wisconsin were between 5 PM – 7 PM, 9 PM – 10 PM, and 12 AM – 3 AM. At the Field Station, southern flying squirrels exhibited a preference for sunflower seeds over peanuts and the squirrels were most active in the tray around the edges, rather than in the center. Conclusions about food preference and behavior at the Slinger tray were not drawn due to inability to conclusively identify these behaviors in the images. The wildlife camera proved superior to the nest boxes for detection of flying squirrels. It took 18 days to detect flying squirrels at the Field Station using cameras, while flying squirrels were never detected at this location in the nest boxes. An increased understanding of the best detection methods for *G. volans* could lead to the preservation and management of appropriate habitat, leading to continued survivability and sustainability for this species into the future.

Keywords: Southern Flying Squirrel, Wisconsin, Detection Methods

1. Introduction

Small mammal species have the potential to exert significant influence on the plant and animal communities in their immediate area[14] through their consumption of plant matter[7], other small mammals[6], and invertebrates[2]; as well as through their role as prey for avian and mammalian predators[4,15]. Understanding the ecological needs of small mammals is imperative in ensuring that these species are not displaced through habitat alteration. Small mammal

species can be especially sensitive to habitat alteration, due to the often severe nature of habitat alteration and the speed with which these changes occur. For example, *Glaucomys volans*, the southern flying squirrel, is particularly dependent on natural cavities for nesting, consumption of food, and as a means of escape from predation[8,13]. When single-tree selection cuts were carried out in forests, natural cavities were reduced as a result[11]. Changes in habitat can lead to *G. volans* avoiding a forest entirely, in favor of a stand that better meets their needs. A study conducted in southern pine stands that had been logged found that southern flying squirrels responded by avoiding stands that were less than forty years old[16,17]. Before one can attempt to elucidate the habitat needs of a small mammal, one must be able to reliably detect the species. Some nocturnal species, such as the southern flying squirrel, can be difficult to detect. The impetus for this study was to compare two methods of detecting southern flying squirrels, nest boxes and wildlife cameras, at a high-quality site in Ozaukee County. This site was an optimal area to test these detection methods because *G. volans* was expected to occur there, based on the quality of the habitat, but had not previously been documented at the site. In addition, there were no feeding trays or nest boxes present at this site previously. The secondary goal was to discern common behavioral patterns in *G. volans*, using images from the wildlife cameras both at the site in Ozaukee County and at a residence in Washington County where flying squirrels were known to occur.

A third goal was to determine the most effective setup for collecting data via wildlife camera. The hypothesis was that if the flying squirrels were determined to be present at the site, that the nest boxes would be more effective at detecting flying squirrels than wildlife cameras. This hypothesis was formed due to the evidence from another study that found flying squirrels seemed to integrate nest boxes into their regular use, if present[13], and the fact that wildlife cameras can only photograph a small proportion of a given habitat, leading to a reduced probability of photographing a cryptic species, like southern flying squirrels. It seemed reasonable to expect that the nest boxes would be used by flying squirrels within our observation period (5 months) because a study on southern flying squirrel populations in southeast Ohio found evidence of flying squirrel use in their nest boxes within one to two months at four out of five of their sites[1]. It was also hypothesized that, if detected, flying squirrels would be more active at certain times of the night and at certain temperatures based on findings from other studies that have observed *G. volans* behavior. A study conducted in New York found that all of their images of flying squirrels were taken between 8:30 PM – 11:30 PM and that they were active in a range of temperatures; in this particular study, they were found to be active between 14.4°C– 21.0°C[3]. These ranges were used as a starting point to develop an idea of when flying squirrels would be active for this study; however, the temperature range was understood to be lower for this study, given the location and season of data collection.

2. Methodology

2.1 Study Sites

There were 2 sites, one in Ozaukee County and the other in Washington County, Wisconsin. The site in Ozaukee County, the Field Station, was chosen in order to determine whether *Glaucomys volans* resides at the site. Southern flying squirrels were never formally documented there previously. This site was ideal for observation due to the extremely high-quality forest present. The forest consists of old-growth beech-maple stands, a habitat that features multitudes of natural cavities for the flying squirrels to make use of. The tree species present include sugar maple, basswood, American beech, white ash, red oak, shagbark hickory, and yellowbud hickory. The Field Station will be referred to as UWM FS. The site in Slinger, Wisconsin was at the edge of a residential property that borders a forest patch. The tree species present include white pine, red pine, oaks, shagbark hickory, sugar maple, aspen, and white cedar. In the understory, there is a pronounced presence of glossy buckthorn, an invasive species, and European honeysuckle. This site will be referred to as Slinger. The Field Station (43.3859° N, -88.0247° W) was set up with both nest boxes and a wildlife camera, while Slinger (43.3611° N, -88.2805° W) had one wildlife camera under observation for this study.

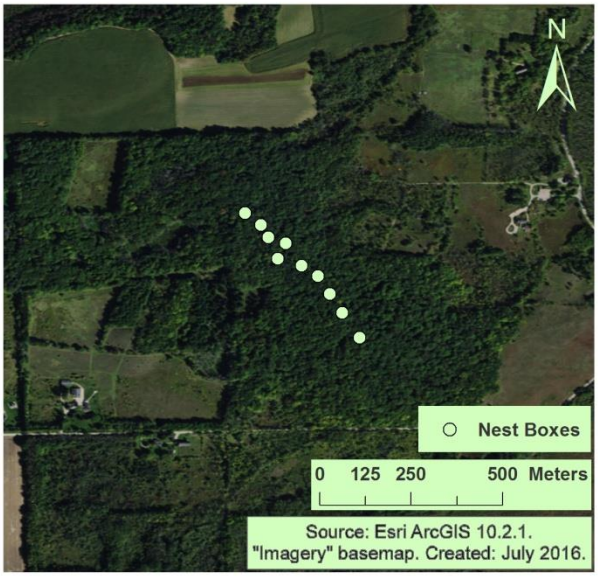

Figure 1. Location of nest boxes at the UWM FS site.

2.2 Nest Boxes

The construction of the nest boxes followed the design put forth in 2001 by a study that successfully monitored southern flying squirrel populations[1]. The UWM FS had ten nest boxes transecting the forest; these boxes were put in place on August 11, 2015 and were placed 4-6 m off the ground (Figure 1). The average distance between the nest boxes was 49.86 meters (range = 35.89-75.16 meters, Figure 1). All nest boxes were oriented so that the hole for entry pointed to the south. The nest boxes were not stocked with nesting material or food. The observation period for the UWM FS was from August 2015 through January 2016. The boxes were checked once monthly through use of an extension ladder to reach the nest box. The nest box was observed for any obvious signs of damage or wear that would compromise the integrity of the box. After this, the nest box was opened to check for signs of southern flying squirrels, fecal matter, nut remains, or nesting material. If nothing was observed in the nest box, the data for that box was recorded as zero and the next box at the site was checked. If there was anything found in the box, it was noted on the data sheet.

2.3 Wildlife Cameras

Wildlife cameras were used to collect photographic evidence and monitor the activity of *Glaucomys volans*. One Bushnell Trophy Cam Essential camera was installed at each of the two sites, the UWM FS and Slinger. These sites were separated by approximately 30 kilometers. Flying squirrels were enticed into the vicinity of the camera via feeding trays. The cameras were positioned such that there was an unobstructed view of the feeding tray, which was 3-4 meters away. The feeding tray (one at each site) was stocked with peanuts and sunflower seeds. The UWM FS tray was wooden and included a lip to prevent nuts and seeds from falling to the ground and to provide a perch for visitors. The tray was stocked just before or after sunset in order to avoid consumption by diurnal species (gray squirrels, fox squirrels, various species of birds, etc.). At the Slinger location, a wire mesh tray (17 X 17 cm with a 3 cm lip) was used from October 14, 2015 through December 19, 2015. After December 19, 2015, a specialized feeder (Wingscapes AutoFeeder) was installed. This feeder automatically dispensed seed twice a night into a tray that was difficult for raccoons to access, but remained accessible to songbirds and small mammalian species. The trunk of the tree was wrapped in galvanized steel flashing (below the feeding tray) to further discourage raccoon activity.

Due to model number differences for the cameras used at the UWM FS and Slinger sites, the camera at the UWM FS was set to only take photographs at night, with a ten second delay between photographs. The time reading was not always reliable for the UWM FS camera because it frequently defaulted to a different date/time stamp at some point in between camera checks, so only images that had the correct date/time stamp were used in analyses for peak time of activity. The camera in Slinger did not have the ability to set preferences for day or night imaging only, so it took

photographs 24 hours a day. As a result of the distance of the camera from the feeding tray and the frequent overexposure of images on the Slinger camera, the number of seed and peanut consumptions were not quantified for those images. At the UWM FS, occasionally the squirrel moved so quickly when snatching a peanut and subsequently leaving the frame of the image that only a blur at the edge of the image was visible, and then a change in the composition of the food in feeding tray. If this occurred, it was counted as a peanut consumption as long as there was a peanut visibly missing from the tray.

The cameras also recorded temperature (in Celsius), date, and time. This information was used to search for patterns in flying squirrel behavior. The UWM FS collected weather data from a weather station on a 24-hour basis, and this temperature data was graphed and compared to the temperatures where squirrels exhibited peak activity at the UWM FS. The Slinger location did not employ a method for 24-hour weather data collection, so this same type of comparison was not possible for the Slinger images. The UWM FS camera captured images from October 14, 2015 through January 4, 2016. The UWM FS camera and feeding tray were relocated on November 22, 2015 to a site nearer to the nest boxes. The Slinger camera captured images from October 16, 2015 through January 13, 2016.

3. Data

The first image of a southern flying squirrel at the UWM FS was captured on November 2, 2015; it took 18 days to detect this species. After the feeding tray was relocated at the UWM FS, it took five days for the flying squirrels to use the feeding tray again. This relocation took place so the feeding tray was nearer to the nest boxes. *G. volans* was never detected via nest box at the UWM FS in the observation period for this study, which was approximately five months. There was never any nesting material, nuts, or fecal matter detected in the nest boxes. The only species ever detected in the nest boxes at the UWM FS during a check were invertebrates, typically arachnids. During the observation period, there were no boxes that were damaged, but during the final nest box check in January, boxes were showing obvious signs of weather wear and one box would not open because it was frozen shut. Similarly to any other nest box where no relevant data was found, that box was counted as a zero.

There were thousands of images captured during the observation period. These images (approximately 16,200) were reviewed to discern behavioral patterns in southern flying squirrels. The peak times of activity for the squirrels to visit the feeding tray at UWM FS were between 6 PM - 9 PM and then again from 11 PM – 4 AM. In both of these peak ranges (6 PM – 9 PM and 11 PM – 4 AM), there were fluctuations where flying squirrel activity would decrease for a time before increasing again (Figure 4). The absolute peak time was from 8 PM – 9 PM, with ninety-three images captured of southern flying squirrels throughout the observation period (Figure 4). There was a noticeable lull in flying squirrel activity in the middle of the night (Figure 4). There was a precipitous drop in activity around 4 AM that lasted through the daytime, with flying squirrel activity resuming shortly before 6 PM. For the Slinger location, there were peaks of activity between 5 PM – 7 PM, 9 PM – 10 PM, and 12 AM – 3 AM. Unlike the camera at the Field Station, there was a small burst of activity at 5 AM that was concluded by 6 AM.

Southern flying squirrel activity varied with temperature changes. At the UWM FS, there were small peaks of activity at -7°C, -4°C through -1°C, and 5°C (Figure 2). There was a large peak between 0°C -2°C (Figure 2). For the camera in Slinger, there was a moderate peak between 11°C-13°C (Figure 2). There were large peaks between 0°C -2°C and 5°C -6°C (Figure 2). The mean overnight temperature for the months of November through January were graphed in order to try to determine whether squirrels were active during these temperatures because they were the most frequent temperatures experienced during the study period or because these were changing behavioral patterns (Figure 3). The relationship between average overnight temperature and flying squirrel sightings at the UWM FS was further analyzed by running a Pearson's product-moment correlation. The nights included in the correlation were November 2, 2015 through January 4, 2016. The result was a negative correlation between average overnight temperature and flying squirrel sightings, correlation coefficient = -0.27, n = 63, P = 0.033[12].

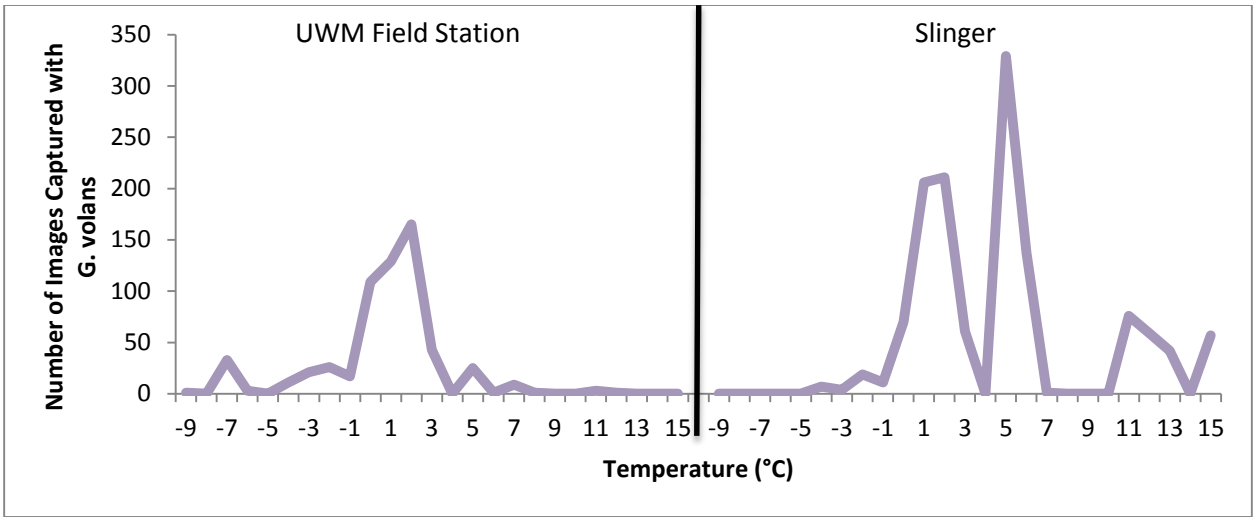

Figure 2. The relationship between temperature (°C) and the number of images captured of *G. volans* for the Field Station and Slinger cameras.

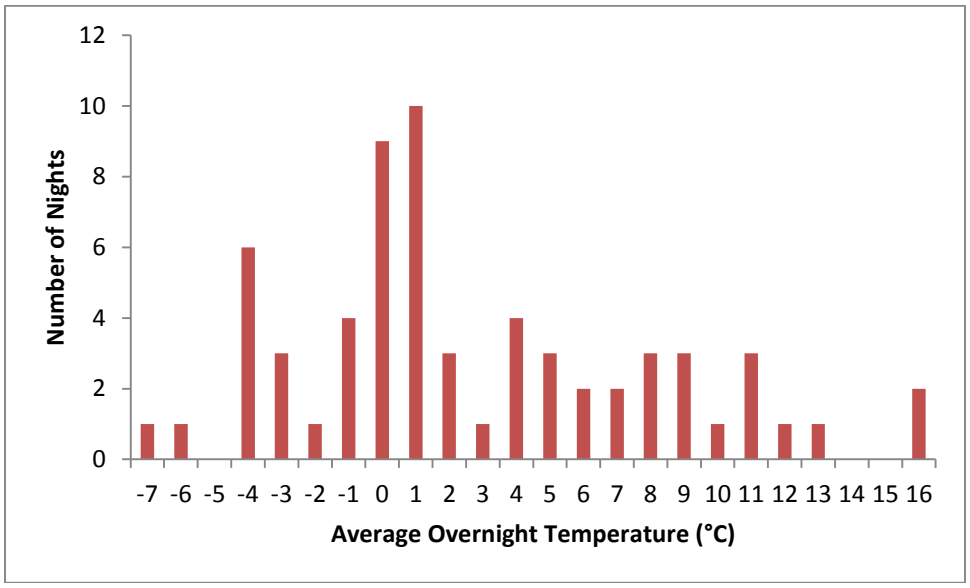

Figure 3. The relationship between mean overnight temperature (°C) and the number of nights that exhibited a given mean temperature average in the overnight hours. These values cover the months of November through January at the UWM FS.

Southern flying squirrels consumed fifteen times as many seeds or peanuts in the tray than they carried off (Figure 5). The most common behavior exhibited for food consumption at the feeding tray was for squirrels to eat on the edge of the tray, the next most common behavior was to eat in the middle of the tray, and the least common observed behavior in the images was for the squirrel to consume the nut or seed on the trunk of the tree (Figure 6). The flying squirrels consumed four times as many sunflower seeds as they did peanuts; sixty-seven sunflower seed consumptions were captured in images, while sixteen consumptions of peanuts were captured by the camera at the UWM FS. There were sixty-three nights of image collection at the UWM FS site, during that time there were eight instances where sunflower seeds remained in the morning, zero instances where peanuts remained in the morning, one instance where both food sources remained in the morning, and twelve instances where nothing remained in the morning. The remaining forty-two nights of collection could not be characterized in this manner for various reasons, such as the tray

had not been filled the evening before, the tray was emptied by raccoons before daybreak, or the tray fell off of the tree it was mounted on (this occurred once).

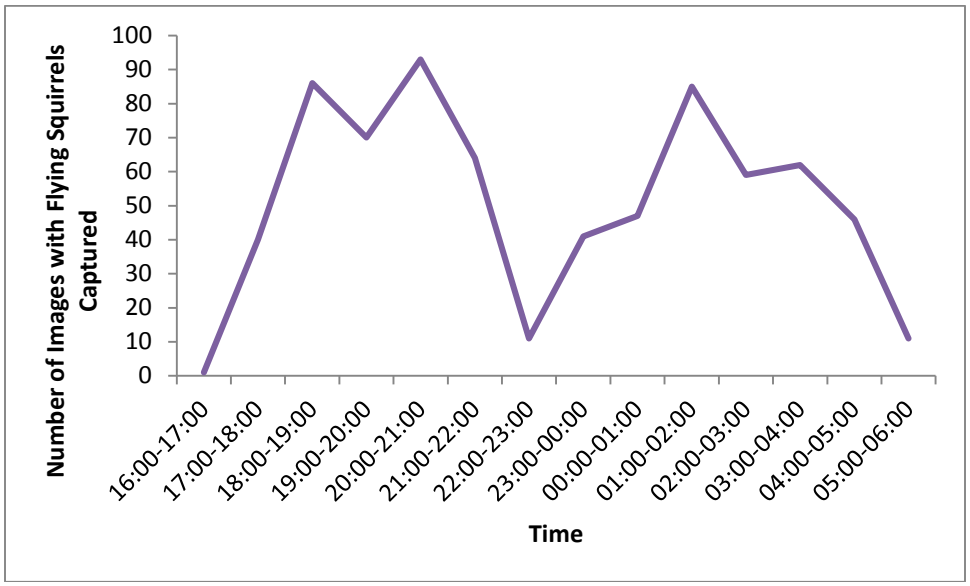

Figure 4. The relationship between time and the number of images captured with *G. volans* during a given one hour period. These times were the only hours during which flying squirrels were captured in images. This figure only addresses images from the UWM FS site.

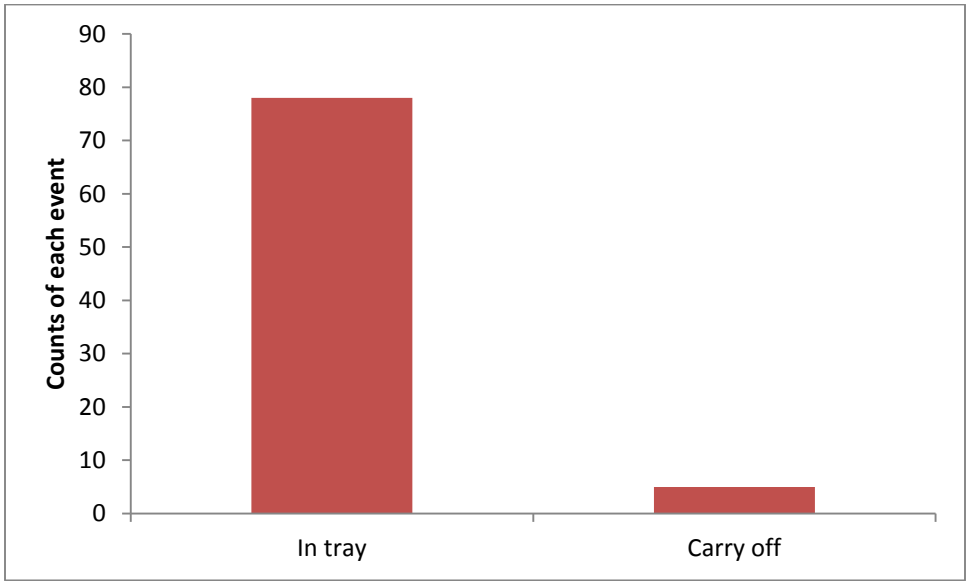

Figure 5. The number of occurrences where a peanut or seed was consumed in the tray or was carried off by *G. volans*. This data only applies to the UWM FS.

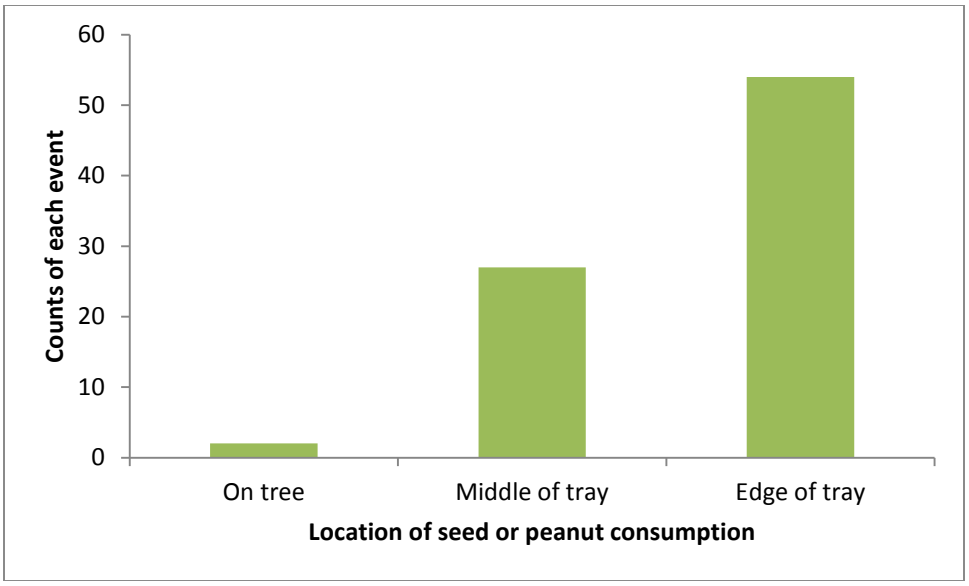

Figure 6. The number of occurrences for each type of event analyzed for peanut or seed consumption. This data only applies to the UWM FS.

Raccoons were present and photographed at both the UWM FS and Slinger. Based on the number of raccoons photographed at each site, there were more raccoons present at the Field Station than in Slinger. There were a few images captured where a raccoon was sitting in the feeding tray while a flying squirrel was on the trunk of the tree, above the tray, or on a different side of the tree. These images were rare. There were no images captured where a raccoon and a flying squirrel shared the feeding tray. There were multiple images from the UWM FS where a few raccoons were seen fighting in the tray or on the ground below the tray. There were no such images of raccoons disputing the feeding tray at the Slinger location. The presence of raccoons seemed to alter the behavior of the flying squirrels, based on the photographs captured at the UWM FS. For example, if a raccoon fell out of the tray momentarily, there were images of flying squirrels immediately after the raccoon vacated the tray, and then the flying squirrels were no longer in the tray once the raccoon had climbed back up.

4. Conclusion

The hunt to obtain evidence for the presence of *G. volans* in Ozaukee and Washington Counties was successful. Southern flying squirrels were not tagged or identified in any way, so there was no way to know whether the squirrels in the images were the same or different squirrels, or to draw conclusions about southern flying squirrel population sizes at these sites. Nest boxes may be most appropriate for long term studies in areas where there will be little to no disturbance of the boxes that could affect the squirrels' use of the boxes. Although flying squirrels are sensitive to disturbance of artificial nest boxes, the installation of such structures is ultimately less damaging to the natural habitat than checking natural cavities for squirrel activity[5].

The lack of detection of *G. volans* through use of nest boxes at the UWM FS could be due to the short term nature of the study, or the high quality forest that is present. There are ample natural cavities that southern flying squirrels may prefer over artificial cavities. A study conducted in New York involving artificial cavities created out of PVC piping found southern flying squirrels completely eschewed using the artificial cavities throughout the duration of the study[3]. The researchers posited that the squirrels did not need the artificial cavities due to the abundance of snags and natural cavities at the site where the study was conducted[3]. Five months may not enough time for flying squirrels to feel comfortable using the nest boxes; this idea is corroborated by the Althoff and Althoff study, where it took nine months before evidence of flying squirrel use in the nest boxes at the HOUS site was detected[1]. Multiple studies have proven the validity of using nest boxes as a means to detect flying squirrels, but they are an investment on the part of the researcher. Time and money spent to build nest boxes may exceed one's budget quickly, in which case one may

want to use wildlife cameras in order to be certain that flying squirrels are in the area prior to investing in nest box development.

Alternatively, lack of detection of southern flying squirrels in the nest boxes may be attributed to territorial disputes. Female *G. volans* have been found to maintain and defend territories that do not overlap, or overlap to a small extent, with other female southern flying squirrels[10]. Male *G. volans* were found to allow their territories to heavily overlap with other males[10]. It is difficult to say whether this is one of the reasons that no use of the nest boxes at the UWM FS were recorded during the observation period. There might be more support for this possibility if one female southern flying squirrel was found to be monopolizing the nest boxes, or if a group of males sharing the boxes without dispute had been discovered. The extent to which territorial disputes affected southern flying squirrel behavior in this study cannot be stated, but territoriality is a valid concern for future studies to take into account.

The two wildlife cameras used in this study were successful in detecting southern flying squirrels quickly. As was pointed out in the Results section, it took 18 days to obtain photographic evidence of southern flying squirrels at the UWM FS, a site where flying squirrels had never been detected previously. While wildlife cameras can quickly detect cryptic nocturnal species, such as flying squirrels, one must take care to ensure that the settings are appropriate for the lighting conditions. Camera settings may need to be adjusted multiple times before they are satisfactory. In general, the newer the camera model, the better the ability to distinguish between light levels. One common problem with the Slinger, WI, camera was that the photos were overexposed to the point that identification of flying squirrels was difficult. Additionally, sometimes peanuts would be missing from the tray, but one would not be able to see in the preceding image or following images whether the peanut was removed by a flying squirrel or simply fell out of the tray. In this study, the cameras were set to take images every ten seconds between motion stimuli. Setting the camera settings so that images are taken more frequently (waiting less than ten seconds between movements) would potentially allow for capturing images of flying squirrels in flight and for more accurate identification of whether there is a preference between seeds and peanuts for consumption. Peanuts are much easier to identify in the images than seeds, so it is recommended that the camera be placed as close to the feeding tray as possible, without disturbing the activity of the squirrels, if one wants to conduct a detailed analysis of food preference in this species. It is recommended that the camera be placed in such a way that the image is not obstructed by the lip of the feeding tray (if the tray has a lip), because occasionally a positive identification of seed or peanut consumption was impossible in this study for this reason.

The data collected on whether the squirrels exhibited a preference for sunflower seeds or peanuts is valuable information for others looking to install a similar set-up to detect southern flying squirrels. In this particular study, it was determined that sunflower seeds were preferentially consumed by the squirrels, even when there were peanuts present in the feeding tray. Alternatively, sunflower seed consumption may be attributed to the squirrels seeking food with the most nutritional value or food that can be consumed quickly. Further study is needed in order to conclusively determine what the cause is for the preference of sunflower seeds. Sunflower seeds and peanuts are not the only food sources chosen by researchers trying to attract southern flying squirrels; a similar study in New York employed a mixture of peanut butter and oats and also experienced success attracting flying squirrels[3]. If an ongoing study was struggling to detect flying squirrels in an area where they seemed likely to occur, a swap of the type of bait used in the feeding tray may be helpful in attracting foraging squirrels.

The feeding tray installed at the Slinger location until December 19, 2015 was insecurely attached to the tree and wobbled under the weight of raccoons who sat on the tray. This was problematic for data collection on flying squirrels because the nuts and seeds fell to the ground while the tray tilted back and forth under the weight of the raccoon. This behavior likely affected the frequency of flying squirrel visits when this occurred, since there was no elevated food to be had. The squirrels' lack of activity on the ground was corroborated by a study that employed both traps on the ground and on trees and found that arboreal species were underrepresented when only ground traps were used to census small mammal species[9].

Raccoons were frequently captured in the images at both sites. There was a period of time at the UWM FS feeding tray where there was a complete lack of raccoons in the photographs; this was immediately after the tray was relocated. At Slinger, once the specialized feeder was installed, raccoons were unable to access the seeds or nuts in the feeder. In both of these instances, the inability for raccoons to interfere with the camera/feeding tray set-up led to reduced disturbances for the flying squirrels. Lessening the disturbance in the area of the feeding tray would presumably lead to more typical behavior from the flying squirrels, strengthening the ability of researchers to draw strong conclusions about flying squirrels' natural habits. If one wants to capture photographic evidence of *G. volans* in an area where raccoons reside, live trapping raccoons and relocating them should be a point of consideration. Additionally, instead of having an open-air feeding tray, one could install a specialized feeder which precludes raccoons' consumption of the bait.

The differences in peak time of activity between the UWM FS and the Slinger camera may be attributed to learned behaviors to deal with competition from raccoons or other mammalian species that are not as prevalent in residential areas (similar to the location of the Slinger camera). As a result, flying squirrels at the Field Station may have to eat at different times or watch for raccoons in the area when foraging at the tray. At the Field Station, it was not uncommon for raccoons to arrive at the tray soon after sunset and sit in the tray for hours. In contrast, it was typically flying squirrels that dominated the tray for hours at the Slinger location, especially after the installation of the specialized feeder. One of the unintended consequences from the installation of the feeder was that squirrels could be obstructed behind the feeder, which complicated or prevented positive identification for some images from the Slinger camera. One of the positive outcomes from the Slinger camera being farther away from the tree was that one could discern a pattern where squirrels would snatch nuts or seeds from the tray before retreating to a higher branch on the tree for consumption. This was a pattern that would not have been noticed at the Field Station due to the camera being located much closer to the feeding tray, thus excluding any branches located higher on the tree from the images.

The peak times of activity for the Field Station and Slinger also differed from a similar study conducted in New York. The study in New York documented peak times of activity between 8:30 PM – 11:30 PM, since all of their images of flying squirrels were captured during that time period[3]. Differences between our peak time of activity results and other studies are to be expected, given the harshness of Wisconsin winters and the reduced foraging opportunities that were available due to subzero temperatures and severe snow events. The study in New York did not provide information on when their data was collected, so it is impossible to comment on the possibility that weather differences between this study in New York and the present study may have led to the differences in patterns detected.

There is potential that the differences in flying squirrel behavior between the sites can be attributed to structural differences between the sites. The Slinger site had more conifer species than the UWM FS. It was shown in another study that canopy cover affected the density of northern flying squirrels (*Glaucomys sabrinus*) on the east side of the Washington Cascades. Researchers found that density of flying squirrels was higher in stands with greater than 55% canopy cover, while stands with less than 55% canopy cover supported lower flying squirrel density[18]. In the case of this study, canopy cover was not characterized at either site. Conclusions in regards to this potential explanation cannot be drawn, but future studies might consider the role that structural differences between sites may play in the behavior of southern flying squirrels. Future studies might also consider including more study areas in their observation, because this study only observed two sites and so the power to analyze the differences between these sites is limited by the small sample size.

It is difficult to tease apart whether the flying squirrels were active at various temperatures because these temperatures occurred the most frequently during the study period, or whether there were behavioral correlations with overnight temperatures. For example, the most common overnight mean temperatures at the UWM FS were 0°C and 1°C (Figure 3). The large peak seen in Figure 2 for the UWM FS was likely not due to behavioral change associated with temperature variation, but rather due to the fact that those temperatures occurred extremely frequently overnight from November through January. One possible explanation for flying squirrels use of the feeding tray even during extremely low temperatures, -7°C for example, could be that there were limited foraging opportunities at these temperatures. Potential prey, such as other small mammals[6], are not easily accessible when the temperatures dip so low, leaving the feeding tray as one of the most reliable food sources for the flying squirrels during times of unfavorable weather conditions. The Pearson product-moment correlation offers some insight into the relationship between average nightly temperature and flying squirrel sightings by the camera at the UWM FS. The negative correlation indicates that when the temperatures decrease, flying squirrel sightings increase. The reverse is also true of a negative correlation, when the temperatures increase, flying squirrel sightings decrease. In order to draw firmer conclusions about how the squirrels' behavior responded to temperature variation, the study would need a longer observation period. There were not enough pictures correlated with specific temperatures that would allow for a strong, definitive conclusion about this relationship to be drawn.

Through comparison of two detection methods for *Glaucomys volans*, it was shown that wildlife cameras can be a more efficient means of detecting this species. Nest boxes were the predominant method used to detect flying squirrels for decades, partly due to the fact that wildlife cameras have only recently advanced to the point where they can take pictures rapidly enough to capture a species that could be missed simply because it was just gliding through the area under camera surveillance. Flying squirrels will only inhabit forest that is of high quality with natural cavities present. The ability to detect flying squirrels could assist in the justification of preserving forests that are being considered for future development, and the ability to use wildlife cameras to detect them is more cost effective and, in this study, less time-consuming than nest boxes. As has been shown with the University of Wisconsin-Milwaukee Field Station, it is possible that southern flying squirrels inhabit natural areas that are well-studied and well-maintained. These findings prove that one does not always know what species are residing in a natural area, lending weight to the fact that it is extremely hard to quantify, with accuracy, the species that are negatively affected by the removal of a natural area.

Cryptic species, such as the southern flying squirrel, will hopefully be a greater point of consideration when deciding whether to maintain or remove natural areas in the future.

5. Acknowledgements

The author wishes to express her appreciation to Dr. Gretchen Meyer for sponsoring this project and providing insight, advice, and guidance that made this project possible; Dr. Gary Casper for sharing his time and knowledge, as well as helping to check the boxes at the Field Station; Dr. James Reinartz for helping to install the nest boxes, as well as helping to interpret the photographs obtained at the Field Station; Ron Tagye for constructing the nest boxes, modifying them, and providing his personal ladder for nest box checking; Satjinder Singh for helping to check the nest boxes at the Field Station and assisting with transportation to the Field Station; Sarah Russ for providing invaluable assistance with ArcGIS; and the University of Wisconsin-Milwaukee Field Station for allowing use of their facilities and natural spaces to learn more about the scientific process in the field.

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