Bucks Gone Wild!
Spring Break Edition

The RUT isn't the only time bucks break out of their home ranges and go exploring. This study found "spring break" was common among mature bucks.

ANDY OLSON with 5½-year-old Buck 11, one of 15 mature bucks captured and fitted with a GPS tracking collar for a study in north central Pennsylvania.

BY **ANDY OLSON, ANDREW R. LITTLE AND KARL V. MILLER**

It's that time of year: The wintertime blues have got you down, so it's time to head south for spring break and some fun in the sun! Have you ever considered whether deer get the same wintertime blues and just need to get outside of their comfort zone for a short time? Previous deer research has documented temporary "excursions" by bucks outside of their normal home ranges during the rut, which we can probably attribute to searching for does in estrus. However, while conducting a study using GPS-collared mature bucks in north central Pennsylvania, we were surprised to observe highly unusual

springtime movements that really left us scratching our heads to come up with an explanation.

THE NORTH CENTRAL PENNSYLVANIA BUCK STUDY

Our study took place on a 7,400-acre privately owned property under Quality Deer Management in north central Pennsylvania. The property was primarily forested, consisting mostly of mature or selectively harvested/clearcut northern hardwoods including oaks, black cherry, American beech, red maple, tulip poplar, and eastern hemlock. The understory was comprised of hay-scented fern, New York fern, mountain laurel, and blackberry. The property did have a few small forest openings that contained fescue or supplemental food sources such as clover, forage chicory, and brassicas. The landowners also maintained a supplemental protein feeding program during the winter months.

We captured bucks between December 2011 and April 2012. All bucks in the study were at least 2½ years of age, and most were older than 3½. We deployed 15 GPS collars on bucks during the capture season. Deer also had ear tags so that we (and hunters) could visually identify unique bucks during the course of the study. The GPS collars collected and stored a GPS location every hour from January 1 to September 30, and every 15 minutes from October 1 to December 31. If bucks were moving or changing behavior, we knew it!

Although previous studies have reported that both bucks and does may make temporary excursions outside of their typical home range during the rut, excursions during other portions of the year rarely have been reported. Interestingly, as sometimes happens in life, things will surprise you. This is exactly what happened during our larger research project. Analysis of our GPS data indicated that *most of our bucks* engaged in one or more infrequent, short duration, long-distance movements during the *spring* (March 20 to June 20). Although a previous study in Florida reported that some deer exhibited long-distance, springtime movements, our observations were the first reports of spring excursions by mature bucks.

TIME FOR A SUNDAY STROLL!

We classified an excursion as any occasion where a buck traveled at least 1 mile measured in a straight line, or "as the crow flies," outside of its seasonal home range boundaries and remained outside its normal range for at least 12 hours. We also measured the total travel path distance, which is total distance from point to point as the buck is traveling.

What we found was truly remarkable. Of the 13 collared bucks that survived until spring, we observed that nine, or 69 percent of them, made an excursion of at least a mile or farther outside of their home ranges. Six of these nine bucks, or 67 percent of them, made multiple excursions during this time period, with one 3½-year-old buck making *seven* long-distance excursions between April 6 and May 26.

The longest excursion travel path we

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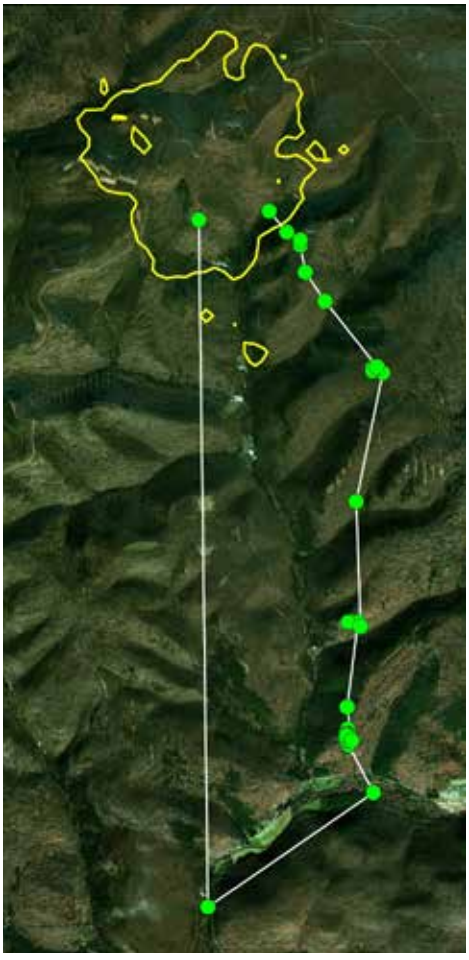
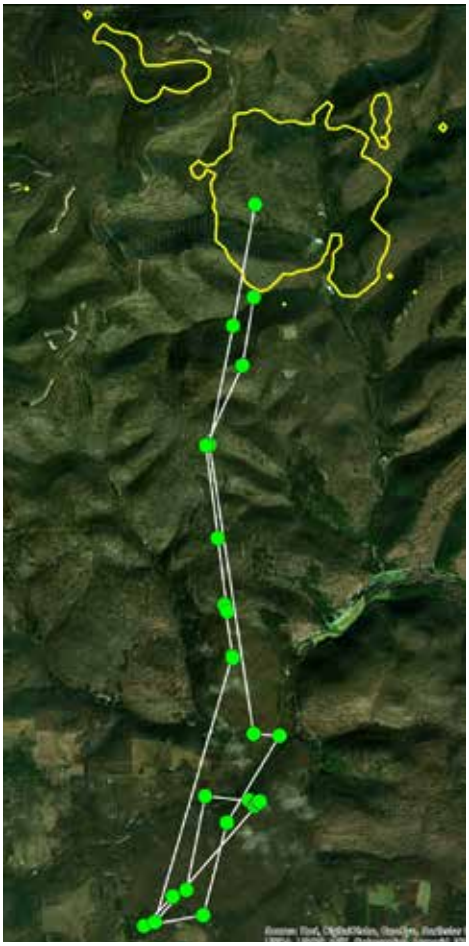


BUCK 17, a 5½-year-old, traveled 10.4 miles in this excursion outside his Pennsylvania home range (above). He departed on May 5 at 5 a.m. and returned home a week later on May 12 at midnight. Like the majority of excursions made during this study, this one was in a southerly direction. Buck 17 is seen below wearing his GPS collar in a trail-camera photo taken on August 9 the same year. Like the other bucks that made spring excursions, Buck 17 would have been carrying little or no antler growth at the time of his excursion.

documented was 13.5 miles in 40 hours measured as the total point-to-point distance along the buck's route (see map on the right). That trip started on May 11 at 5 a.m. and ended on May 12 at 9 p.m.

The shortest excursion travel path we documented was 3.2 miles made in 13 hours, which occurred on April 28 at 5 a.m. and ended the same day at 6 p.m. The farthest straight-line distance from the home range boundary was 4.7 miles and the shortest 1.1 miles. The longest duration of an excursion was 40 hours and the shortest 12 hours. Quite interestingly, it appears that most of the bucks left and returned along the *exact same route*, and their travel patterns did not appear to be affected by topography in this mountainous region.

So, the big questions are "Why are they doing this?" and "Where are they going?" When we looked at all of the excursions by all of the bucks, it became clear that the duration, distance, and direction of travel for these excursions was remarkably similar. The average directional bearing of travel away from home range boundaries was South at 192° – just like college students during spring break.



THIS MAY 11 EXCURSION by 3½-year old Buck 28 in north central Pennsylvania was the longest recorded during the study. It covered a total distance of 13.5 miles, and the buck was gone from its home range for 40 hours. The yellow boundary is the buck's home range, or where it spent 95 percent of its time that spring. Analysis of all spring excursions showed that they did not appear to be influenced by topography: Bucks seemed to be focused on a particular direction regardless of the difficulty of the mountainous terrain they encountered.

Only two of the 26 excursions we observed were in a northwesterly direction, and one was easterly. Among the bucks that made multiple excursions, some of the excursion paths appeared to be along the same route and some excursions were in different directions.

IS THIS A PENNSYLVANIA THING?

At the same time this study was in progress, we had two other projects tracking the movements of mature bucks, one in Georgia and one in Louisiana. When we looked at the results of these studies, we found some similarities, as well as some differences. Specifically, we found multiple bucks on both the Georgia and Louisiana studies made similar "spring excursions."

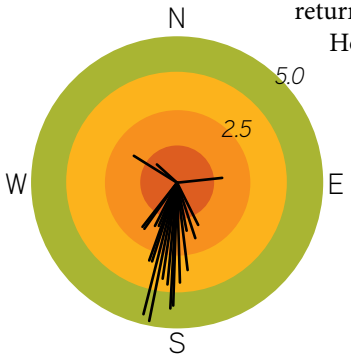
However, the directionality and the duration appeared quite different. Spring excursions of bucks on these study areas were generally longer in duration, and they did not have the strict directionality as in the Pennsylvania study. Excursions occurred in all cardinal directions except north. Interesting!

Now you're sitting there wondering why these bucks are making these sudden trips outside of their home ranges during spring. Let's discuss some potential reasons.

POSSIBLE EXPLANATIONS

All of our observed spring excursions occurred from March 20 to June 20. Obviously, the early excursions during this period occurred simultaneously with spring green-up. Could bucks be making these excursions to "scout" for new food sources? Based on the GPS data, the bucks remained in forested habitats and appeared to avoid openings and newly planted agricultural fields. Additionally, these excursions seemed to terminate in a random, unremarkable place to which the deer would never return. So locating food sources does not appear to be a reliable explanation.

Of the 26 total excursions, more than half were made during the month prior to peak fawn drop in early June. Does tend to become territorial around the time of fawn drop, and perhaps aggression associated with the upcoming fawning season might have caused bucks to temporarily leave an area. However, each buck returned to his typical range within 40 hours of the excursion initiation. Furthermore, many excursions occurred before fawning, suggesting a maternal aggression cue is unlikely. Finally, because no excursions occurred after June 5, maternal aggression associated with birth and fawn rearing is not likely to be the cause.



Direction and distance in miles, measured from the perimeter of spring home ranges of 26 excursions made by nine mature bucks. The average direction was 192°, or south southwest.

Based on research conducted in Florida, Dr. John Kilgo, a research wildlife biologist with the U.S. Forest Service, hypothesized that spring and autumn excursions by adult deer may represent return trips to birth areas. However, research conducted in the Allegheny Plateau of Pennsylvania by Dr. Eric Long, professor of biology at Seattle Pacific University, showed that average dispersal distance of yearling bucks is approximately 5 miles with a maximum dispersal distance of 25 miles. In contrast, the excursions by mature bucks we observed averaged 2.5 miles, which is much shorter than the reported dispersal distances. Furthermore, 23 of 26 excursions were directed toward the south or southwest. Both Eric's Pennsylvania work and John's Florida study reported that dispersal movements from birth ranges tended to follow an east or east-west axis. Therefore, with the comparatively short distances and southerly orientation of most spring excursions, it's unlikely that a return to their birth range is a reason for this behavior.

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We also hypothesized that perhaps bucks were visiting mineral sites during these excursions. In West Virginia, Dr. Tyler Campbell reported 30 of 121 radio collared deer traveled an average of 1.9 miles to a gas-well site to consume water from a ground seep containing a high concentration of sodium. Sodium deficiencies during the spring and summer months often cause deer to seek sodium sources, which may occur outside their home range, and to the south of our study site is a paved township road where salt is used to melt ice during the winter months. However, analysis of our excursion destinations, where bucks spent several hours, did not reveal any mineral attractant. Furthermore, mineral sites are abundant throughout the study site, and at least one mineral site was present within the spring home ranges of all GPS collared bucks. Therefore, it is unlikely mineral lick visitations were a factor influencing the occurrence of excursions.

After running through the possibilities of why bucks are making these sudden movements, we are simply at a loss to explain why. Perhaps bucks just like to go on spring break too!

Although spring excursions may be a common occurrence in white-tailed deer populations, they had not been reported in previous studies, perhaps because there have been relatively few employing GPS technology during this time of year. Alternatively, in the more fragmented habitats typical of the whitetail's range, excursive behaviors would be risky as deer are exposed to unfamiliar open areas and highways. Future research of this phenomenon should seek to examine the spatial associations these bucks make with the landscape as they traverse unfamiliar territories.

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