Part 7

Solving The Riddle Of Deer Movement

by Dr. James C. Kroll & Ben Koerth

In the previous six installments of this series, we presented a wealth of information that might help to answer the question "What makes deer move?" Now it is time to find an answer that will help you, as a hunter, be more effective in the field.

As we have noted, many authors have proclaimed that one factor or another "positively" influences deer movement. But frankly, we feel the evidence presented in this series investigation does not support these claims about any one factor being all-important. As we have often noted, "Many a beautiful theory has been murdered by a ruthless gang of facts," and so it seems to be with deer movement.

The layman often has problems with correlations; the mere fact that you might be able to correlate something does not necessarily mean there is a "cause and effect" relationship at work. The effect of moon position is a perfect case in point. There is a great deal of coincidence between deer activity and moon phase/position. For instance, the moon-overhead and moon-underfoot positions frequently touted as being great times to hunt often occur in dim-light hours when deer are likely to be active anyway.

Remember, in our research at the Institute for White-tailed Deer Management and Research, we discovered that deer have a four- to six-hour feeding activity cycle that is depressed during daylight hours. *The standard activity curve, no matter what the geographic location, is for deer to become increasingly active just about sunset and remain active on a four- to six-hour cycle throughout the night, then become less active at daylight.* If moon position had an appreciable effect on deer activity, this general pattern would shift with moon phase or position, but in our research we have not seen such a shift, only a change in feeding corresponding to the amount of nocturnal light. What we have learned from this and other studies forces us to conclude that moon models, as they currently are being used, are very poor predictors of deer activity.

Over the past six issues, we've examined the many factors that affect whitetail activity patterns. Now, let's put them all together to form an effective hunting plan you can use year after year.

Of course, the predictability of the basic four- to six-hour activity cycle can be drastically modified by certain environmental factors. For example, deer are averse to light, so they seldom want to move about much in bright sunlight; a cloudy day usually will see some increase in diurnal activity, all else being equal. Yet even this simple relationship does not always hold true. During the rut, bucks tend to ignore their basic activity pattern, as normal tendencies are overridden by the urge to breed.

No factor seems to have a greater impact on deer activity than human presence. Where deer have never been pursued by modern hunters, they still move regularly in daylight hours and sometimes will even let predators get to within relatively close range before fleeing. Genetic selection by at least two centuries of heavy firearms hunting has produced a much different activity pattern across the rest of the animal's range, however. Populations that are not currently hunted, but which came from hunted stock, maintain the mostly nocturnal pattern. And it is no secret to anyone that all bucks become more nocturnal with age.

We feel we have conclusively shown that *light is the most important variable in determining what a deer is doing at any point in time.* We also assert that there are significant modifiers which add a certain amount of serendipity to predicting deer movement.

This review of the series to this point has been necessary to make you aware of just how many factors, acting together, affect deer activity. Hopefully, this will keep you from mistakenly assuming that a single key can unlock the mysteries of the whitetail for you.

It is a lot easier to sell someone on a simple "magic bullet" than to be honest about the real complexity in making sense of deer movement. But our findings *are* encouraging in that there *is* a significant amount of predictability in them. Here, we will consolidate what we have learned into a system that, if followed, will significantly increase your chances year after year.

PUTTING IT ALL TOGETHER

The mature whitetail buck is a percentage player. If there is a remote possibility that something is wrong, he just won't take the chance. That makes it difficult, though not impossible, to play the game at his level. The trick is to know much more about deer patterns than does the average guy who is stumbling around the woods. If you do that, the percentages will swing in *your* favor.

Timing The Rut

The first step in developing a sound hunting strategy for your area is to know when the rut is likely to occur. Earlier in this series, we noted how deer cue on the full moon — be it the harvest moon, the hunter's moon or some other moon — to synchronize the rut. Unfortunately, however, hunting seasons are normally timed to the calendar, not to the rut. (In fact, some wildlife agencies could even be using a strategy to avoid having the gun season overlap the peak rut, to reduce buck harvest.) So, you might have to modify your hunting strategy to take full advantage of the rut.

Can we predict the rut's timing in most areas? Definitely! Although several factors, including herd density and weather, can alter rut timing significantly, peak breeding can be predicted with consistency in most areas. Sadly, herd condition in many places is deteriorating as a result of overpopulation, and with that the rut becomes more sporadic; thus, the level of rut predictability could decline in the next century.

If deer in your area are mid-November breeders, the hunter's moon is the primary rut cue in operation; the peak of breeding will occur shortly after the following full moon. Check with your wildlife agency to confirm the general breeding chronology for your area if you're in doubt as to the usual timing.

Assuming you will hunt the gun season, as the vast majority of other whitetail hunters do, the next step is to determine when opening day will occur in relation to the hunter's moon and the full moon following it. Remember, does that are not bred during their first estrus will be available again around the next full moon. *Because there is a lag time between the releaser (full moon) and actual breeding five to seven days later, most breeding activity will occur around the last-quarter moon.*

Consult the accompanying table, devised for a mid-November-breeding population, for the years 1997 through 2007. The table lists: the date of the second Saturday in November for each of those years (the gun opener in many states); the



The authors' research has turned up many interesting facts about deer activity, but one of the most useful is this: Mature buck movement during legal hunting hours is generally better in late afternoon than in the morning. This is especially helpful information for the hunter who doesn't have the chance to spend all day afield. Photo by Roger Hill.

date of the hunter's moon; and the date of the first full moon thereafter.

This table is a real eye-opener if you study it carefully, because it shows why a short gun season can be boom or bust for buck hunting! Let's look at 1997 as an example.

In our hypothetical state, opening day of gun season will occur on Nov. 8. The hunter's moon, however, occurs on Oct. 15, 24 days prior to opening day. This year, deer should be in their first (primary) rut by the second weekend of gun season, but opening weekend does not figure to be as good for natural movement of mature bucks. Most of the harvest and hunting pressure occur during the first three days of gun season, so there probably will be fewer hunters afield the second weekend. Yes, the deer will be more educated, but there still should be some quality buck hunting, thanks to higher rut activity.

It is just as important to know when the second rut peak will occur. Furthermore, *the time between the last quarter and the new moon should be interesting, as this should be the time when bucks are having difficulty finding receptive does.*

Again, this example is for an area with mid-November breeding. If you hunt in, say, Mississippi, you would want to look at the second and third full moons after the hunter's moon. East Texas hunters would be more interested in the timing of the harvest moon, as it is the cue for their deer to begin the rut cycle. The hunter's moon then is the one occurring just prior to peak rut.

By trying to simplify complex biological phenomena, are we falling prey to the same mistakes others have made? Perhaps, but we believe there is so much scientific evidence supporting our assumptions that we have to go with them. Try as we have to disprove the hypothesis that the full moon triggers breeding, we have not been able to reject it. So, you now should be able to plan your rut hunting. Now, let's see what else our theories can do.

The Moon & Activity Patterns

We have disproved the hypothesis that moon position has any real effect on activity, but this is not to say that the moon has utterly no effect on deer. A realistic look at our findings shows what is significant about the moon and what is not.

Based on our research, utilizing a variety of forms of unbiased monitoring of deer activity, we can announce that *the first quarter of the moon is the absolute worst time to be trying to harvest a buck. In fact, according to our data, as the midway point between the first quarter and the full moon approaches, daytime whitetail movement becomes almost nil!*

When we examine data from the non-hunting hours, we see that full-moon activity is significantly increased. That is no surprise, as the full moon provides more nocturnal light. Increased nocturnal deer activity pretty much confirms what many of us would have suspected.

We also examined our data to see *when* deer were moving during each moon phase. When we did that, we saw the typical activity pattern already noted: Most movement is at night, regardless of moon phase. However, there are some significant differences within time periods by moon phase. For example, *the new moon produces a significant reduction in activity from dark (30 minutes after sunset) to midnight.*

Separating the data into bucks only, we see the same pattern as for all deer. *Although not statistically significant, we see lowest midday buck activity for the first-quarter and full-moon phases.*



Bright sunlight tends to suppress buck activity during the rut, though not always. "If you have a choice," the authors note, "select cooler, cloudy low-wind days with stable to falling barometric pressure." Photo by Mike Biggs.

Now we turn our attention to all daytime buck activity by moon phase during the three daytime periods: 30 minutes before sunrise to 8:59 a.m.; 9 a.m. to 2:59 p.m.; and 3 p.m. to 30 minutes after sunset. When we examine the data, the first-quarter moon once again raises its ugly head! *The highest daytime activity occurs during the new moon to first quarter, then decreases significantly. The second highest daytime activity is from the full moon to last quarter.*

When we break this down into one of the three daytime periods, we find that, as you might expect, *midday shows the least activity, while late afternoon shows the highest.* (The relevance of this will be discussed later.) *Early-morning and late-afternoon activity drops precipitously during the transition from new moon to first quarter.*

We conducted a simple analysis of bucks harvested by readers of *The Journal of the Texas Trophy Hunter* (shown in the "Gamepoll" section). A higher percentage of bucks were taken during the afternoon (3 p.m. to dark) than in early morning or at midday. This is particularly interesting in that most of these bucks are considered "trophy-class" animals by the magazine's readers. Hence, the higher activity we found for bucks in the afternoon is supported by actual harvests of mature bucks, though there is admittedly some bias in hunter kills.

To put a capstone on our findings, we analyzed the feeding patterns for bucks of age 3 1/2 years or more during the same time periods. In doing so, we discovered two important points. First, as expected, a significant portion of their feeding activity occurs at night, amounting to 77 percent of total observations. This means that, on average, you have a 23 percent chance of getting a shot at a mature buck moving on his own during legal shooting hours.

Second, *there was significantly higher mature buck feeding activity in late afternoon than in either the early-morning or midday periods. We feel reasonably certain that when this information is combined with the above findings, we see that the afternoon — no matter what the moon phase — is the best time to harvest a mature buck.*

Age & Sex Differences

Next, we examined the differences between buck and doe activity patterns, as well as mature buck versus immature buck activity patterns. To do so, we analyzed some 31,000 deer observations.

What we found was that *older bucks tend to move significantly less than do other deer during most of the day, until late afternoon.* Our 2,450 observations of mature bucks also showed that they tend to be more active than younger bucks from 2 a.m. until 30 minutes before sunrise. We feel that during this period, mature bucks are spending a great deal of time in and around staging areas, searching for receptive does, before returning to their sanctuaries by first light.

SAMPLE GUN OPENERS & MOON PHASES, 1997-2007

Year	2nd Sat. In Nov.[1]	Hunter's Moon	Next Full Moon[2]
1997	Nov. 8	Oct. 15	Nov. 13
1998	Nov. 14	Nov. 2	Dec. 2
1999	Nov. 13	Oct. 22	Nov. 21
2000	Nov. 11	Oct. 10	Nov. 9
2001	Nov. 10	Oct. 29	Nov. 27
2002	Nov. 9	Oct. 18	Nov. 16
2003	Nov. 8	Nov. 5	Dec. 5
2004	Nov. 13	Oct. 24	Nov. 23
2005	Nov. 12	Oct. 13	Nov. 12
2006	Nov. 11	Nov. 1	Nov. 30
2007	Nov. 10	Oct. 21	Nov. 19

[1]Traditional opening day of regular gun season in many parts of the whitetail's range

[2]Environmental cue that triggers the start of breeding in areas with a mid-November rut

We also saw that *doe activity from 9 a.m. to 3 p.m. was consistently higher than the activity of immature or mature bucks during this time.* It was significantly higher for does than for either immature or mature bucks during the new moon, and it was higher than the activity of mature bucks during the full moon and last quarter. (Again, the first quarter showed little overall deer activity.)

During the full moon, immature buck activity was significantly lower than doe activity in the late afternoon. This makes biological sense, as mature bucks are more active at this time, and we have found that they suppress immature bucks by physical and hormonal means.

Now let's examine daytime activity patterns for mature bucks. Again, it is worth noting that *bucks reduce daytime activity during the first-quarter moon phase, and this is true for all time periods. The most precipitous decline is in early-morning and late-afternoon activity.*

An additional analysis separated mature bucks from other bucks. Activity curves for both groups were remarkably similar; however, *we found higher midday activity for mature bucks during the first-quarter to full-moon period than for other bucks.* We are uncertain as to what this means, but it might be a searching response by mature bucks, as there are fewer does in estrus at this time. Later, we will discuss how you can use this to your advantage.

Seasonal Effects

In many areas, there are whitetail seasons — most often for bow or blackpowder — well into the winter. Thus, we decided to partition our buck data into fall (September-November) and winter (December-February) time periods. When we did so, we found that there appear to be differences between the seasons.

Winter is characterized by much less variation in daytime movement. Activity is pretty much even from pre-dawn through dusk, while fall activity is the typical pattern we have been presenting thus far. There are very few differences in activity for winter daytime periods, which means that *hunting all day during the late season is a good strategy.*

Returning to our analysis from the "Gamepoll" section of *The Journal of the Texas Trophy Hunter,* we saw that *more bucks were taken during the midday period in winter than in fall. Furthermore, a higher percentage of bucks were taken between 3 p.m. and dark in fall than in winter.*

North vs. South

There also are differences between Northern and Southern deer that have to be considered. In the November issue, we compared deer activity patterns on Que Pasa Ranch (Texas) to those on Muy Grande Ranch (Michigan). As you might recall, the activity graph showed remarkably similar timing of movement, despite the Michigan herd's being roughly 1,000 miles north of the Texas population. Yet there was a notable difference: The Michigan deer became active earlier

in the afternoon than did the Texas deer.

There definitely is a logical reason for this. Those of us who have conducted research on moving Northern deer southward have learned the hard way that these animals have a difficult time handling the extreme temperature variations of the South. The afternoon is the warmest time of day everywhere on earth. In the South, temperatures can reach into the 80s Fahrenheit or higher even in late fall, while they seldom exceed 40 degrees Fahrenheit in the North. After sunset, Southern temperatures moderate to lows in the 40-to-50-degree range, while Northern evenings see drops to the freezing or even subfreezing mark. Hence, *Northern deer move earlier in the afternoon than do Southern deer, on the whole. This is the principal difference between the two regions, though Southern deer also move slightly more at night.*

Developing A Hunting Strategy

By reading this far, you now have a much better understanding of whitetails. This information alone should make you a better hunter. But let's finish by combining all we have learned into a strategy that significantly increases your chances of scoring on mature bucks.

The first step is figuring out what the deer *ought* to be doing when you take to the field. Get rut data for the area and use it for planning your hunting time around the time of peak breeding activity.

Suppose, for instance, that you are hunting a Midwestern state which has its opener on the second Saturday in November. The year is 1999, and the area you hunt is relatively small, with numerous gun hunters. The anticipated rut for that region is mid to late November. This puts us on the first full moon after the hunter's moon as our peak rut. The 10-year table reveals that the 1999 season opens on Nov. 13, while peak rut will occur just after Nov. 21. That puts opening day right in the midst of the dreaded first-quarter doldrums! What do you do?



Norm Nothnagle arrowed this huge 15-pointer, grossing 177 Pope and Young points, late on the afternoon of Dec. 18, 1993, in Greene County, Missouri. Bowhunting the second rut gave Norm his chance at the late-season trophy.

There are two possible strategies. First, it is a nine-day season, ending on Sunday of the second weekend. By then, at least, the pre-rut will be well under way. Based on our data, estimated daytime movement will be about 26 percent of total, with the highest daytime buck activity period being the afternoon (3 p.m. to dark). The highest activity of the 24-hour period will be from 30 minutes after sunset to midnight.

This is significant information! What will these deer be doing during the day, and where will they be?

Because whitetails in the area will then be in the pre-rut, bucks will be bedding for long periods, then getting up and traveling to establish staging areas near doe feeding areas. Think of feeding activity as a "moving party" in which doe groups move from place to place without much advance notice. By patterning feeding activity over several years, you can predict when this shift will occur and you can be waiting when the bucks arrive in search of does.

Because the obvious activity pattern for this moon phase is for bucks to become active just at dusk, it makes no sense to hunt right at feeding areas. Rather, your strategy should be to move in to hunt travel corridors as close as safely possible to buck bedding areas. Remember, you can hunt a food source and yet be hundreds of yards from it.

We have noted how increasing hunting pressure tends to push deer, especially mature bucks, into a nocturnal pattern. The heavy hunting pressure this hypothetical area will endure no doubt will do just this. Yet you should not forget that a deer has to eat *something* during the 4- to 6-hour period in midday. Bucks in this situation will adjust to hunting pressure by feeding briefly at this time, and that is when you should be in position to intercept them.

In this example, we probably would do little more on opening weekend than monitor hunting-pressure patterns. This is a time to be patient; many of the other hunters will leave the woods on Sunday evening following the opener. We then would depend largely on midday-to-dusk hunting, with our setups being along travel corridors some distance from feeding areas.

The second part of our approach would be to take full advantage of various weapon types. Because the regular gun season will not fall during the best time to hunt, we might try hunting with bow or blackpowder. Many states have an early bow season, followed by a short gun season and then a late bow season.

In this case, the deer will just be starting to breed when gun season ends Nov. 22. So, hunting the early part of the late bow season would greatly enhance your chances of at least seeing a mature buck. We would not abandon gun season, but rather use it primarily to fine-tune the pattern for the area and then make adjustments during bow season. We also would focus on the second rut, two full moons (around Christmas) after the hunter's moon.

Also, before gun season, bucks should be feeding heavily around the hunter's moon on Oct. 22. The last week of October should offer good bowhunting in this hypothetical case.

In choosing a specific day to hunt, always consider weather and other environmental modifiers. Refer back to our look at weather and other environmental variables (last issue) and their effects on buck movement. *While bucks do tend to move on warmer days, does actually move less under such conditions. If you have a choice, select cool, cloudy, low-wind days with stable to falling barometric pressure.*

We have come a long way in this series and in the book from which it was adapted. If you use the information we have provided, you will improve your odds of taking mature bucks consistently. Of course, there is still much to be learned about whitetails, and there probably always will be. But you can rest assured that we at the Institute are out there as you read this, attempting to find out even more about our favorite game animal.

FOR YOUR INFORMATION

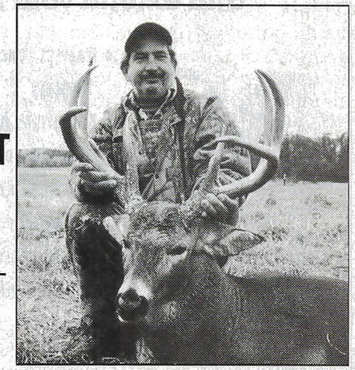
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