

A Year in the Life of the White-tailed Deer

The role of the scrape

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While antler rubs are pretty simple signposts that involve only scent from the forehead glands, a scrape involves several scent sources and probably has multiple functions in deer communication and reproductive behavior.

Despite years of research by wildlife biologists, there is a tremendous amount that we don't know about scrapes. However, in recent years we have made some important steps toward understanding who makes and visits scrapes, when they are made, and what types of information is transferred at scrape sites.

Scraping typically begins with a buck approaching a branch hanging just above his head. The buck often mouths the branch and rakes it with his antlers. Judging from the buck's behavior, marking the overhanging branch appears pleasurable, and he sometimes seems almost oblivious to his surroundings. Clearly, the buck is leaving some type of scent on this overhanging branch, although the exact source is still ambiguous. Likely the forehead gland is involved in marking the limb, but other potential scent sources include the preorbital gland, the nasal gland, and even saliva. After the overhead limb is marked, the buck paws away the leaves directly below the limb, likely leaving scent from the interdigital gland in the pawed area. The area cleared of leaves varies, but typically a 3-foot diameter circle is common. The buck then steps forward and urinates over the tarsal glands while rubbing them together, allowing urine to flow into the pawed area. This urine leaves a persistent strong odor and may stain the soil dark even after it has dried.

Many hunters may not be aware that this full scrape sequence actually is a composite of three separate behaviors that may, in fact, occur independent of the other two. Several years ago we conducted some year-round observations in our research facility and found that the overhanging branches at some of these scrape sites are used throughout the year by bucks of all age classes. We speculated that these overhanging branches serve as a kind of 'calling card' to let other bucks know who is in the area. Bucks tend to live somewhat solitary lives, except during the spring and summer when they form bachelor groups. But even then, group membership tends to be somewhat fluid, so having a chemical signpost where bucks can communicate their presence could obviously be important. Since then, our observations of year-round use of these overhanging branches has been confirmed by other researchers. Interestingly, many of these licking-branches become scrape sites during the rut.

Similarly, rub-urination commonly occurs outside of the scrape. While most common and noticeable in bucks during the rut, all deer commonly urinate over their tarsal glands throughout the year. Does ruburate, on average, about once per day, typically when they rise from a nocturnal bed. Even day-old fawns urinate over their tarsal glands. The

scent that develops on the tarsal gland from this ruburination likely carries information on the deer's identity as well as social and reproductive status. (We'll discuss this more in next month's column).

When combined at a scrape site, the three behaviors appear to provide a host of information to any deer visiting the scrape. The overhanging branch provides a clue to who visited the scrape, pawing the ground may signal an aggressive intent and also provide more information in the identity of the scrape maker, and ruburination into the scrape further reveals who made the scrape along with his dominance status.

Although some scrapes may be made as early as September, numerous studies have repeatedly shown that the peak in scraping activity occurs two to three weeks before the peak of the breeding activity. For example, in a study directed by Larry Marchinton and myself on an un hunted area in Clarke County, Georgia, scraping activity increased dramatically during mid- to late October (Fig. 1). The peak of conceptions (the peak of the rut) occurred during the first week of November. In that study, our surveys indicated that the density of scrapes was in excess of 300 scrapes per square mile, with the majority of those scrapes made during a 4-week period! Some scrapes in the study were pawed repeatedly for up to 3 consecutive weeks, and many that were not had fresh tracks in them for up to 2 weeks.

The high number of scrapes that we observed in this study certainly was reflective of the un hunted deer population on our site and the presence of a number of older bucks. Several other research studies have also indicated that most scrapes are made by bucks 2.5 years old or older. A study conducted by John Ozoga in Michigan found that yearling bucks made only about 15% as many scrapes as older bucks, and that scraping activity by these yearling bucks typically occurred later in the breeding season.

However, there is some evidence that even mature bucks will vary greatly in the amount of scraping that they do. Age is important, but a buck's testosterone levels, social position, experience, and behavioral maturity also interact to promote scraping behavior. Some bucks just tend to be avid scrape-makers, whereas others are not. And, according to John Ozoga, competition appears to be important – where there are several mature, rut-experienced bucks working the same breeding range, scraping will be enhanced.

What's this mean for the deer hunter? First, the presence of scrapes early in the rut certainly is a good sign that there may be a mature buck in the area. Second, a dramatic increase in the number of scrapes provides a strong clue that the peak of rutting activity will occur in the next 2 to 3 weeks (Which means that continual scouting during the hunting season is critical!). And, third, if you are not seeing a lot of scrapes on your hunting area, you might want to consider if you are overharvesting your bucks.

Just because older bucks make the majority of scrapes does not mean that younger bucks will not scrape or at least visit scrape sites. In a 2-year study, 2 of my graduate students (Karen Alexy and Jon Gassett) placed motion-sensitive video cameras over scrape sites to monitor who made the scrapes, who visited them, and when they were visited. The

results were fascinating! Like other studies, scrapes were made and visited most frequently in the weeks just before the peak of breeding activity. When the peak of the rut hit, scrape visitation dropped to almost zero. More interestingly, Karen and Jon's study revealed that scrapes were investigated and marked by a number of different bucks, including yearlings, during the weeks before the rut. Does also visited the scrapes before the rut peak, but not during it.

Because scrapes were visited by a number of different bucks, one might be tempted to think that scrape sites would be excellent places to hunt. However, Karen and Jon's study also revealed that the vast majority of scrape visits (almost 90%) occurred at night. So, unless you're hunting past legal shooting hours, you're going to miss most activity at scrape sites.

So, what's the purpose of the scrape? Although only the deer themselves and their Creator know the answer to this question, our studies are giving us some insight into the types of information being communicated. Certainly they play an important role in the chain of events that lead up to the peak of the rut. Bucks relay information about their presence and dominance status to each other, as well as their availability to does in the area. In other words, the scrape tends to serve as an extension of the animal itself. Does may use scrapes to help identify and select the best mate, but we also believe that the scents left at scrape sites may play a role in priming the does reproductive cycle and synchronizing estrus among does in the area. This synchronization of estrus is important as it leads to a synchronization of the fawn drop 7 months later, which will help to enhance fawn survival by minimizing the risk of predation.

Figure Caption:

Temporal distribution of buck rubs and scrapes along with known conceptions dates at The University of Georgia's Whitehall Experimental Forest in Clarke County, Georgia.