Growing up hunting as a kid in New Hampshire, I didn't give much thought to how the deer population was managed or what went into setting hunting seasons every year. My mind was focused on things like finding deer sign, locating productive oak stands, and, with a lot of hard work and a little bit of luck, maybe harvesting a deer. My hunting buddies and I would talk about where and when we were seeing rubs and scrapes, not about long-term trends in population indices. In those early years, as far as I knew, there could have been a room full of people who had never stepped foot in the woods rolling dice, deciding how many days we were allowed to hunt does. It didn't really matter to me, because all I cared about was getting into the woods every chance I got.

As my love of hunting grew, I realized I wanted to transform my passion for the outdoors and wildlife into a career. I wanted to learn about the intricacies of what influences wildlife populations, how these natural forces interact with one another, and how science is used to measure and manage these factors. Having been a biologist for a number of years now, I have a better appreciation for what goes into managing wildlife populations, but I've also learned that biologists aren't the best at communicating to the public what we do. So here's my attempt at explaining some of what's behind managing the state's deer population, because I truly believe that knowing what's involved in managing wildlife enables us to understand why decisions are made and makes us all better stewards of the wildlife resources we love.

TAKING THE LONG VIEW

Prior to the early 1980s, deer seasons were set by the Legislature. For the most part, management of deer consisted of a north/south split of the state and an open or closed season (dice rolling may or may not have been involved). This led to drastic population declines following a series of severe winters and overharvesting of female deer. In 1983, a total of 3,280 deer were harvested statewide, the lowest deer harvest in the state since the 1940s. Around this time, management authority was handed over to the Fish and Game Department, and a more focused, scientific approach to deer management was established. Since then, the state's deer population has increased dramatically; harvests now average close to 11,000 deer a year.

Fish and Game now takes a long-term approach to managing the deer population. In order to fulfill our mission as guardians of the state's wildlife resources, the Department works with the public to develop a Game Management Plan. This Plan sets management goals for all big game species in the state for a 10-year period. It includes deer population objectives for each of the state's 20 Wildlife Management Units (WMUs), which
New Hampshire’s deer population has more than tripled in 30 years. Here’s the science behind Fish and Game’s deer management success.

are areas with similar habitat, relative deer density, and weather. This allows the Department to more precisely manage the state’s deer herd. Population objectives are set using historical harvest and biological data, as well as public input about how many deer people want on the landscape.

While the Plan guides our long-term management goals, it doesn’t spell out the specifics of how to get there. For that, we use the state’s administrative rules process to set hunting seasons, a process that typically takes place every two years. At the end of every hunting season, all the deer harvest data are analyzed to look at trends in deer populations and herd health, and where the population is compared with plan goals. Based on this analysis, season structures are proposed, with the intent of moving the population toward goal, or stabilizing it once there. Initial season proposals are first reviewed by a team of Fish and Game biologists. Input is then gathered from other divisions in the Department. The initial proposals are reviewed by the Fish and Game Commission and approved to move to the formal rule-making process. After this, the public has an opportunity to comment at three public meetings around the state. Public comment is then considered, and final proposals are reviewed by the Fish and Game Commission. The final step is approval by the Joint Legislative Committee on Administrative Rules. Voilá! – a new season is set.
Studied conducted from 1981-1987 and from 2011-2013 evaluated productivity of the state’s deer herd by collecting and aging road-killed does and examining their fetuses. One finding showed an increase in productivity between these time periods because there was a higher proportion of adult does in the population as a result of limited doe-hunting days. The average age of does collected during the 2011-2013 study was 7 years, and 32% of them were 10 years or older, with the oldest deer age 17! The vast majority of samples were collected north of the White Mountains, where severe winters are more common. This study helps illustrate how reduced antlerless harvests have allowed more does to reach prime breeding age (3-7+ years), and many of them (based on their ages) are capable of surviving multiple winters of above-average severity. This has increased the reproductive potential of deer populations and allowed quicker recovery following severe winters throughout the state.

The implementation of “either sex” hunting days to regulate the numbers of does harvested in a given season has proven to be a very successful management tool, positively impacting population growth. The next season-setting cycle will take place in the winter/spring of 2018.

The state’s deer harvest has increased substantially since Fish and Game took over deer management in the early 1980s, reducing antlerless harvest rates. Note the drastic dip in 1983.
COUNTING DOE DAYS
But what about the science that goes into managing the state’s deer population? For that, let’s start with a little basic deer biology. Deer are polygamous breeders; one male can breed with multiple females during a single year, and female deer are highly productive. If you remove a buck, another will simply step in and breed with the remaining females in the area. You have simply removed one deer from the population. However, if you remove a female deer, you have removed her and any potential future offspring she may have had, which will have a larger impact on the population.

This is why hunting seasons for bucks have remained fairly liberal, while seasons for female deer are highly regulated. In New Hampshire, we use “either-sex” hunting days to regulate the female harvest. While male deer can be hunted throughout the season, does can only be hunted during these limited either-sex days. By regulating the number of these days allowed in each WMU, we can affect how many female deer are harvested, and in turn impact population growth.

WEATHER WILD CARD
Because factors other than hunting influence the population, and these vary from year to year, we must base decisions on what is most likely to happen by looking at historical trends and average conditions. In New Hampshire, deer are near the northern limit of their range, so increased mortality from severe winters is one of the main factors limiting population growth (second only to the hunting season). This makes winter severity an important factor when setting the number of either-sex days.

Our either-sex day allocations also take into account how the hunting harvest interacts with other forms of mortality. We can estimate winter mortality by using rates observed in scientific studies, together with winter severity data collected annually by the Department. During years with severe winters, winter deaths can increase and sometimes surpass harvest mortality. We can’t predict when a bad winter will hit, but we can regulate hunting harvest, which in most cases is the biggest source of mortality in the state’s deer population.

But if these deer are going to die during the winter anyway, why not just let people harvest more does? Unfortunately, it’s not that simple. Because periodic severe winters have been a fact of life throughout the history of deer management in New Hampshire, we know that increasing adult doe harvest numbers above sustainable levels causes the population to crash even further and slows recovery time by targeting the removal of breeding females. We can look at population trends and management strategies over time to see how this plays out. The graph at left shows that prior to the mid-1980s, the antlerless harvest in the state nearly equaled or surpassed the antlered harvest. As a result of heavy hunting pressure on does, in addition to increased mortality from severe winters, the state’s deer population plummeted.

Since Fish and Game took over management and reduced antlerless harvest rates, the state’s deer population (and harvest) has increased substantially. Harvests on average have surpassed previous levels, are comprised of more adult bucks than does, and because of this, have been much more stable. In fact, 21 of the top 25 total deer harvest years going back to 1922 have taken place in the last 22 years (1995-2016), and all of the top 10 years for antlered deer harvest have taken place since 2000.

So there you have it. Clear as mud, right? Essentially, what we need to know is where we want deer populations to be, how the main mortality factors interact with each other, what role hunting mortality plays, and how to use hunting mortality to move populations in the desired direction. Between the detailed harvest data we collect and the scientific studies we have conducted, we can estimate these factors and use that data to inform management decisions.

So now that you know a little more about what goes into deer management in New Hampshire, I’m sure you’ll all be thinking about rule making and population dynamics the next time you head out into the woods. Yeah, hopefully me neither!

Dan Bergeron is the New Hampshire Fish and Game Department’s Deer Biologist.
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