

Keynote Address: Challenges of Deer Management From An Ecosystem Perspective

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Abstract: *Restoring white-tailed deer to their previous range in the early 1900's, after being exterminated from many areas during a century or more of overexploitation, has often been touted as one of wildlife management's greatest success stories. Ironically, now, after decades of overprotection, one of the greatest challenges of wildlife management is to balance this important game species with its forest habitat. Winning support of recreational hunters to reduce deer populations to levels compatible with forest ecosystem management is a critical challenge with important consequences, not only to solving this conflict, but to the future of recreational hunting as well. Further exacerbating this problem is the declining numbers of hunters, their increasing age, lower mobility, and declining land access to hunt. The health and sustainability of forest ecosystems will likely be dependent on increasingly aggressive strategies to bring deer populations in balance. If this challenge is not met, and conflicts between deer and society continue to grow, alternative, untraditional solutions are likely to follow.*

Today, we're here to talk about the challenges of deer management from an ecosystem perspective. First, I would like to state that I did not come here to tell you how to manage deer in Michigan. I did not come here to tell you how to manage your forests either. The people of Michigan will decide that. But I was asked to come here and talk about my experiences of running a deer management program in Pennsylvania. Hopefully, some of our experiences, both good and bad, can help you in your goal to balance deer populations with forests here in Michigan.

I think it's worthy to make comparisons between Michigan and Pennsylvania because we have a lot of similarities. In terms of our deer populations, they are very similar, a little over one-and-a-half million in each state. Michigan currently has about 750,000 hunters and Pennsylvania has about a million, representing some of the largest hunter populations in the United States. What is really significant here is that 93 percent of Pennsylvania's hunters and 89 percent of Michigan's hunters hunt deer, according to a United States Fish and Wildlife Service survey. The significance of this is that when the wildlife agency is funded primarily by hunters, as it is in Pennsylvania, and those hunters demand to have more deer, the agency is under enormous pressure to deliver.

In both Michigan and Pennsylvania, a little more than half of each of our states is forested. In terms of human population, we are both very heavily populated with roughly 10 million people here in Michigan and 12 million in Pennsylvania. The other statistic that I think is significant is that in both states only 8 percent of the total population hunt. The relevancy of this in Pennsylvania, at least, is that we have a very small minority of our society that is deciding how all wildlife management is implemented for all of society. We were able to do that in the 20th century but I do not believe it will be allowed to continue very far into the 21st century. It is not an issue until that minority of society demands the wildlife agency do things that have enormous negative consequences on natural systems or on the impacts to the rest of society. That's a collision I think we're headed for right now with deer management.

Forest certification of our state forests is threatened by the lack of regeneration due to overbrowsing from deer in Pennsylvania. I don't know what the status of forest certification is in Michigan, though I do know you are in the process of getting certified, but certainly overbrowsing will be an issue you will have to deal with.

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Which brings us to the age old question, “how many deer should there be?” Well, the answer depends upon who you ask and on their value system. If you ask hunters, they often say we should have more deer. If you ask farmers, we should have fewer. So, how many should we have?

I once lived in an apartment house on two acres in the Pocono Mountains of northeastern Pennsylvania where the guy who owned it came from New York City. His life-long dream was to pave the entire two-acre field. All the vegetation in the field for him was just rubbish. I couldn't help but wonder why he would want to pave it. But I guess he comes from an area where concrete and pavement are more familiar, and that's what he wanted to do. That was his value system. It's his land and if he wants to pave it, he can. But if enough people do that, it changes our entire system.

Deer, too, can change our entire system. They have enormous consequences, not just for some of society, but for all of society. If you drive a car, raise a garden, or are interested in the economic sustainability of forest products, or health and sustainability of our forest ecosystem, then deer will impact you. They impact our economy to the tune of hundreds of millions of dollars annually in terms of damages to agriculture, forestry, and automobiles.

In terms of our agricultural paradigm style of deer management, with “maximum sustained yield” theory, trying to raise the maximum number of deer that can be sustained to appease the demands of recreational hunters, things have not gone well. It seemed like a good idea, but one of the problems I would submit is that we forgot about the sustained part. We have not been able to sustain forests in my state. We've been trying to raise more deer than the land can sustain resulting in declines in the health of our forests and in the numbers of deer. Sounds good on paper, sounds good in theory, but it's not working on the ground.

We need to stop talking about the numbers of deer and we need to start talking about the impacts of deer. Because as these forests lose their ability to regenerate, as we lose the vegetation of the lower understory, you cannot grow deer there the way you once did.

Our state governments have a responsibility to properly manage our natural resources for current and future generations. That, I think, is key. We hold these natural resources in public trust and we are the ones responsible for managing them. For those of us in the profession, whether it be forestry or wildlife, I believe that we have an obligation to help our government to try and make the right decisions about reaching that mission, particularly as it relates to the health and sustainability of our forest ecosystems.

I think that human dimensions research certainly needs to play an important role in the management of our natural resources. It allows us to see what public attitudes and levels of understanding are for various issues. It tells us where we need to focus our educational efforts to try to bring them along about what really is at stake and what needs to happen. The attitudes of our society will often change as they learn more about these issues.

To better understand our dilemma of balancing deer populations with our forests we need to understand where we are now, how we got here, where we want to go and, most importantly, how do we get there?

Where Are We Now?

Where are we now? We have an overabundance of deer that's threatening the health and sustainability of our forest ecosystems. We have significant numbers of hunters who want more deer and who are very effective at lobbying our government to ensure that deer numbers remain higher than is ecologically responsible. We will not have sustainability in forests in my state until we can get the rest of society screaming for fewer deer into the ears of legislators, policy-makers, and administrators louder than the hunters are screaming for more deer.

How Did We Get Here?

How did we get here? What went wrong that allowed deer to get out of balance with forests? In pre-colonial days, we're told the deer densities and their impacts were relatively low. Natural predators, such as wolves, cougars, and Native Americans helped keep deer populations in balance. Then during the 1700s and 1800s came an era of overexploitation. Many of our

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forest areas were converted to agriculture. Originally, Pennsylvania was over 90 percent forested but by 1890 nearly 70 percent of the state had been converted to agriculture. Much of the land was cleared to raise crops and the remaining old-growth forests were clearcut resulting in a loss of much of our forest wildlife at that time. There were no effective regulations to prevent the unlimited killing of deer, year round. Market hunting took a great toll and we literally wiped out deer and many other wildlife species throughout much of the eastern United States by the end of the 19th century.

Concern for the loss of so much habitat and so many species of wildlife gave rise to a conservation movement and the development of wildlife agencies to manage these wildlife resources and their habitats in an effort to try and bring back these wildlife, in particular game animals such as white-tailed deer. Deer were stocked in many areas and laws were enacted to protect them. The tremendous regeneration in the recently clearcut forests provided perfect habitat for deer populations to increase. So then we wound up with exploding deer populations and increasingly protective regulations which brought us into a new era, an era of overprotection.

As the decades went on, the economic viability of farms declined. They were abandoned and gradually reverting back to forest. As so often is the case, these landscape changes were not in response to any type of planned wildlife or forestry habitat program but rather due to land use changes necessitated by economics. When they couldn't make money raising cows, pigs, sheep, and chickens, they just let the land go. And of course through the process of succession, forests reclaimed the land which once had been agriculture. With this change in habitat, from fields to forests, we have seen the range of deer, bears, turkeys, and grouse increase while rabbits, pheasants, and quail have declined.

Perhaps the greatest mistake that launched a century of overprotection for deer was the "no doe hunting" regulation. In 1917 the executive director of the Pennsylvania Game Commission, Dr. Kalbfus, after being unsuccessful at preventing the establishment of a no doe hunting policy said it best. He knew once this started it would be nearly impossible to stop and in reference to his vision of implications of this act, he sent a letter to future director, Seth Gordon, which said, "Thank God I won't be in charge of this work 10 years from now, because someone is going to have hell to pay." No truer words were stated that could best reflect what happened in the 20th century and what's still happening right now. God help anybody who goes after this issue. For state-agency biologists who push hard to balance deer populations with their habitat, that is often a career-ending experience. I know because mine ended just six months ago.

In my state, I don't believe it is possible for the Pennsylvania Game Commission to balance deer populations with forest ecosystems because of the system that has evolved. The agency is funded almost entirely from hunters. Ninety-three percent of Pennsylvania's hunters hunt deer and surveys indicate that hunter satisfaction is closely tied to the number of deer they see. These hunters demand to see more deer than the land could ever possibly sustain and they very effectively lobby administrators and policy makers (the commissioners), forcing them to implement seasons and bag limits that have no chance of ever balancing the deer herd with their habitat. This action, ironically, leads to severe habitat destruction which leads to deer declines, destroying the very resource they wanted more of. Even more ironic, the hunters feel the declines were caused by shooting too many does and demand even further reductions in antlerless allocations - and again, that is exactly what they get. I believe this is the greatest mistake in the history of Pennsylvania wildlife management and will have negative implications for our wildlife agency and perhaps even the future of sport hunting.

Development of an adequate, sustainable, broader-based conservation funding program will be necessary to solve this and other problems. Currently the Game Commission is almost totally dependent on hunter-generated monies. The numbers of hunters are declining in Pennsylvania, as they are throughout the country. Some of our modeling, based on the demographics of our hunter population, indicates that the number of hunters may drop to half of current levels in 20 to 25 years. In the near future it will not be possible to fund our wildlife programs on this shrinking funding base. A Missouri-type funding program would be desirable in providing a more adequate and sustainable source of revenue to take on broader conservation issues and to prevent deer hunters from hijacking the agency's efforts to balance deer herds with forest ecosystems.



Urban/suburban sprawl is another challenge that deteriorates our ability to manage deer. You can't get hunters into these areas any longer because urban landowners often won't allow hunting on their land. As the density of human dwellings increases, it becomes unsafe to discharge rifles, and our options become more limited and our ability to manage deer becomes more challenging.

Our challenge of balancing deer with forests is not the only conflict our society has with deer. We are picking up about 45,000 dead deer annually on Pennsylvania highways. Some studies indicate that less than half of deer fatalities are picked up along the roads – many deer run off and die undetected. Accordingly, in Pennsylvania, we believe about 100,000 deer are killed on our highways each year. The average repair bill is about \$2000 apiece. Just auto repair bills alone cost about \$200 million each year, not to mention the human fatalities, medical bills and other problems.

For as long as we have deer, highways, and people, we will always have road kills, accidents, and fatalities. I'm not saying we're going to stop it. What I am saying is that, as a society, we have an obligation, and as a profession we have an obligation. When we try to hold deer densities higher than they should be, even for their own good, and even for the good of the hunters who are demanding to have more deer, we are killing people and shelling out millions and millions of dollars in damages that should never be happening.

Agriculture is also heavily impacted by overabundant deer. There are many areas in Pennsylvania where we cannot grow certain crops because the deer consume so much of it that the farmers cannot make a profit, and so, deer are impacting the ability of agriculture to survive.

But the thing that brings us here today, and the thing that I think is enormously important in the state of Pennsylvania, is our forests. In Pennsylvania, over four billion dollars a year are generated through forest products. That is an economic engine that should be sustainable, but if we don't bring deer under control it won't be sustainable. Make no mistake about it, the control of deer is not just a hunting issue. It is an issue of enormous economic, environmental, and ecological importance to the future of Pennsylvania.

We must continue to educate our public, and especially our hunters, on the relationship between deer and their habitat, and the relationship between nutrition and the ability of deer to reproduce and survive. Does don't start to reproduce until they reach 80 pounds. On good habitat more than half will breed at six months of age with most does producing twins, and some with triplets. On poor, overbrowsed forest habitat almost none will breed at six months, some may not even breed until 2 ½ years of age, and litters usually only consist of a single fawn. Fawn survival also is much lower on overbrowsed habitat. It's a game of energetics. If you want healthy, productive deer then you've got to keep that habitat healthy by controlling deer numbers.

Where Do We Want to Go?

Where do we want to go? We want to try to balance our deer population with forest ecosystems. What are the challenges for that to happen?

I think hunting is, obviously, the most cost-effective way to balance deer herds; it's the only way that really makes sense at this point in time but we have some serious challenges. What are the challenges? We have declining numbers of hunters, nationwide. We know that the age of hunters is above 50 and getting older. With recent hunter movement studies we now know that the mobility of hunters is lower than we once thought. The access of land to hunters is going down. More and more people are posting for a variety of reasons, but the trend is clear. Hunters are losing access to more and more land. We also have the "no doe hunting" deer-hunter culture to deal with as major challenges to balance deer herds with forest ecosystems.

In terms of what's happening in Pennsylvania, in the last 25 years we've seen about a 20-25 percent reduction in the number of licensed hunters. In terms of projecting ahead, when we look at demographics of those hunters, how old they are, and a variety of other statistics, it is not good. We believe, in Pennsylvania, that the number of hunters will go to half of what they are today within 25 years. If that's true, and if we cannot manage them today, how are we going to do it in 25 years? We can't sit around and wait for this to happen at some point in the future. We have to make moves. We have to make them now while we still have enough hunters to give it a try.

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How Are We Going to Get There?

How are we going to balance deer populations with forests? We need the support of the public and the hunters. To get their support we need credibility, and conducting research and sharing it with the public leads to credibility.

We launched a series of large-scale studies to learn more about our deer to better manage them, to increase credibility and win support from our hunters and our public. First we launched a fawn mortality study where we captured and radio-collared 212 fawns to find out what was killing them. Then we did a fawn conception study where we examined the uteri of over 3,000 road-killed does in the winter. By inspecting the uteri of road-killed does and measuring embryos we were able to determine rates of pregnancy, litter size, determine the timing of the rut and the birthing period. We measured the number of points, width, and antler beam diameter of over 75,000 harvested bucks for which we knew the county and township of kill, and the age of the buck. This information was crucial to determine what kind and where new antler restrictions should be implemented. We launched a "buck study" where we captured and radio-collared 551 bucks to monitor the compliance and effectiveness of antler restrictions once they were in place.

We contracted out a study of hunter movements to the Pennsylvania State University and the results indicated that hunters were not getting very far off the road. They put GPS units on about 500 hunters in a remote state-owned forest district and tracked their movements. In addition, they had aerial surveys with video cameras to record hunter positions with respect to highways. What they learned was that two-thirds of the hunters stayed within one-third of a mile of the road and much of the more remote forest areas received very little hunting pressure.

We contracted out landowner surveys, hunter surveys, and followed the movements of hunters with GPS units to better understand hunters and landowners. The results of these studies were released everywhere. They were, and still are being, published in professional journals and presented at conferences, published in popular magazines, newspapers, and are the topic of many radio and television shows. This has raised our credibility with the hunters and the public and allowed us to make many policy changes to help bring deer populations in balance with their forest ecosystem. In the past five years we have made more changes to seasons and bag limits of deer than for any other period in our history and we are killing more does than at any point in history. That would not have been possible without a massive research and public education program.

The Future of Hunting and Our Forests?

In terms of balancing deer with our forests, I think we have some very serious issues at hand, much of which I've described. But also, I think we have the great risk of compatibility of forest ecosystem management and recreational hunting. Somehow, we have to put the "hunt" back into hunting. We have to find a way to get hunters to exert more energy, to get farther back off the road, to help us balance these deer herds with those forest ecosystems. I do believe the future of sport hunting, as we know it today, is at stake if hunters either will not, or can not, balance deer herds with our forests and the needs of society.

My team and I have done everything we could in the past five years to try and get that message out in Pennsylvania and I'll continue as a consultant. We must be able to explain what's "good" about hunting and what is good about guns. Instead of hearing about Columbine, we need to be talking about how hunters are saving forests and bringing back forest health. I believe that will sell. If we fail at this effort I believe society will be forced to seek nontraditional, alternative solutions to this problem and that will not be in the interests of recreational hunting. In the end it will be society that will decide.

Not only is the future of hunting at stake, but the future of our forest ecosystems are as well. The impacts of the decisions we make today as managers will be etched in history for hundreds of years in our trees and in the composition of our forests, as well as all of the other plants and animals that make up these ecosystems. What we decide to do with these forests, and with these deer, will leave a legacy long, long after we are gone. I hope that we can leave a legacy that our descendents will be proud of, one that reflects leadership and stewardship. But if that is to be the case, we have a lot of tough decisions to make and a lot of work ahead of us. It

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all begins with an acknowledgement of the problem and a willingness to do something about it. For that reason, I thank you for the opportunity to come here and talk with you about this important issue.

