

Can small deer exclosures work?



by Karl Martin

Understanding the impact of deer density levels on forest regeneration is critical for determining acceptable deer populations. Deer are a natural component of the ecosystem, however, a variety of human impacts on the landscape may have resulted in deer numbers exceeding their natural densities in some areas.

Researchers, resource managers, and the general public have noted negative impacts from high deer densities on tree regeneration, herbaceous plants, aquatic systems, and vertebrate and invertebrate species. These impacts can result in severe ecological degradation and economic losses, as has been observed in forestry regeneration projects in many parts of the country, including Wisconsin.

A common technique to assess the impact a wildlife species has on a system is to exclude the particular species from all or a portion of the system that you are interested in. For deer this most often involves the construction of a fence type structure to exclude deer from an area. One of the challenges with this approach is that deer have the ability to jump over fences in excess of 8-feet in height. Construction of 8-foot high or higher deer fence is expensive, time consuming, and often involves modifying vegetation near the fence as part of the construction process. In addition, it can be extremely difficult to install an 8-foot high deer proof fence in remote areas because of the logistical constraints of getting supplies to the field site.

We wanted to assess the effectiveness of relatively short fences (5-foot high hog wire) for excluding deer from relatively small plots (5, 6, and 7 meters' on a side). We decided that food was the most logical tool for us to assess the effectiveness of various exclosures since this would be the primary motivation for a deer to jump a fenced exclosure in a wild setting or backyard garden.

To amplify the desire we decided to test our exclosures in the middle of winter in northern Wisconsin; a time when deer should be physiologically stressed and most in need of food. The ultimate goal of this research project was to evaluate low fence exclosures as an economical, logistically feasible method to assess deer impacts on tree regeneration and understory development.

This initial research was aimed at developing a solution for installing remote deer exclosures for research as well as for landowners who want to exclude deer from their gardens or a small regeneration site. This is the first part of what will be a longer research project that installs 420 deer exclosures distributed evenly in northern Wisconsin where we have a silvicultural experiment designed to accelerate and evaluate development of old-growth characteristics

Study

We established 4 replicate study areas on private property in northern Wisconsin to assess the effectiveness of a 5-foot high fence at keeping deer excluded from an area. Since deer have the ability to jump a 5-foot high fence with ease the real issue is how a deer perceives its ability and willingness to jump into and out of a relatively small enclosed area. To test this we set up 3 exclosures of 3 different sizes at each of our 4 study sites. After a 2-week period of prebaiting to get deer habituated to each site we built 3 square exclosures that measured 5, 6 and 7 meters on a side at each of the 4 study sites. Experience has shown that once deer begin using a location, like

a garden, it is more difficult to exclude them. Thus, prebaiting deer and habituating them to the exact sites added to the rigor of our test.

Each study site was at least three miles apart, to evaluate different individual deer at several sites, while maximizing the number of deer visiting each of the exclosures and allow our cameras to monitor multiple exclosures at one time.

Baiting

In January 2005, we started prebaiting each site with a mixture of corn and black sunflower seeds. Once the exclosures were built on a site we continued to check each exclosure every other day. Two gallons of bait were at the center of each exclosure and we distributed 2 gallons of the bait mixture on the outside of the 3 exclosures to keep deer interested and returning to the site daily. The outside bait was completely consumed during each 2-day period and had to be replenished on every visit. The bait was often removed within the first few hours of the 48-hour period between rebaiting.

Monitoring

Each site was monitored by digital, motion sensitive, infrared cameras to observe deer movements at each site and to determine if deer jumped over the fence into any exclosure. We also used tracks as evidence of deer activity inside and outside of each exclosure which worked extremely well since fresh snow was common during the study. Snow depth at the time of the study ranged from



Deer exclosures that were 5-feet tall and between 5 and 7 meters on a side seemed to be effective in keeping deer away from bait during a 2005 test in northern Wisconsin. Photo by Karl Martin

¹ One meter equals 39.4 inches.



More than a dozen deer can be seen standing around the outside of three small exclosures (5, 6, and 7 meters on a side) in Karl Martin's research project. Photo by Bruce Kohn

12 to 20 inches. Deer were observed for 10 days after the installation of the fences at each site, with one site maintained for several additional months as an anecdotal assurance that deer might not become accommodated to the fence after a longer period.

Results

Each study site had more than 10 deer visiting nightly, with one site having more than 22 deer observed. The bait placed on the outside of the fence was consumed each night and eventually deer started to visit the exclosures in the daytime.

On the first night a single deer jumped into one of the four 7x7 meter exclosures. The deer ate the bait mixture for about 16

minutes while several deer stood on the outside of the exclosure and watched. The deer on the outside of the exclosure made no attempt to jump into the exclosure even though there was no bait remaining on the outside of the exclosed area. This was the only deer we observed inside our exclosures at any of the study areas during the 10-day monitoring period following the installation of the exclosures.

Deer used their heads and necks to bend the hog wire down several inches at each of the sites, but no deer entered the exclosures at those sites.

No more deer entered the 7 x 7-meter exclosure even though bait was provided there for several months longer than the study.

Discussion

Our results support the use of 5-foot high fences for excluding deer from areas up to 7 by 7 meters for research purposes, but these exclosures should also be effective at excluding deer from small areas such as home gardens or planting areas. We purposely tested the effectiveness of fencing at a time of year when conditions were extremely harsh and using food that was highly palatable and being eaten by deer. The desire of a deer to enter a vegetation exclosure in the forest should be

significantly lower than the conditions we set up in our study. In addition, at the time of year when home gardens are at their peak production the amount of highly palatable food outside the exclosure will be significantly higher than the available food in this study. Establishing an exclosure prior to deer use should add insurance of protection against deer.

A remaining unknown is the size area that can be effectively protected with a 5-foot high fence. Will such a fence protect an area as large as 10x 10 meters? Meanwhile, gardeners might consider using a dividing (intermediate) fence if they want to protect a garden significantly larger than 7x7 m.

The supplies we used included 7.5-foot T-posts, hog wire, post maul, and wire—all of which are available at hardware stores. In addition, these supplies can be hauled out and installed in remote areas without the use of machines such as ATV's or post-hole diggers.

Karl Martin, Ph.D. (karl.martin@dnr.state.wi.us) is a forest research scientist at the DNR in Rhinelander. He provided this article for information for WWOA members. Future research plans include a long-term research project using deer exclosures to understand deer impact on forest ecosystems. Funding for this research was provided by DNR Divisions of Forestry and Enforcement and Science.