



Education

Deer Can Harm Habitat

This is the second of a four-part series on problems that can result where there are too many deer.

Farmers are familiar with the damage deer can do to crops. Homeowners in areas with high deer populations become familiar with the effects of deer on shrubs and ornamentals. Wary drivers know to be on the lookout to avoid car-deer collisions. But often overlooked is the potential for long-term habitat damage where deer densities are high. The popular press carries few articles reporting on what has long been obvious to naturalists, foresters and wildlife biologists—high deer population density is a major cause of habitat damage.

When deer numbers exceed 50 per square mile, the result can be severe overbrowsing of the natural vegetation. Some shrub species, like the once-common New Jersey tea, are particularly palatable to deer and have been essentially eliminated by browsing in over-populated areas of Michigan. Other plant species, like bracken fern, are less palatable and/or better able to survive intense browsing, and therefore have a competitive advantage. Large grassy openings are a common feature of deer country landscapes where deer have not allowed woody species to revegetate after cuttings or other disturbances. Winter deer densities of 25 to 35 animals per square mile commonly cause damage in some types of habitat, and greater densities profoundly affect forest regeneration in nearly all cases.

Overbrowsing is not difficult to detect. Substantial browsing on recognized non-palatable “starvation foods” such as balsam fir, red pine, and spruce is one of the more common indicators. Another is to observe the diameters of browsed aspen (poplar) stems. If deer are nipping aspen stems of up to ¼-inch diameter or larger, there are probably too many deer in the area. Still another indicator is to observe whether there is substantial regeneration of palatable tree species such as red maple, basswood, and black cherry, and shrubs such as dogwoods. Those species will be heavily browsed where deer populations are high.

There’s not much room to debate whether deer damage habitat. The “jury has been in” since the 1950s, in part because of lessons learned at the George Reserve in Livingston County, about three miles west of Pinckney. The University of Michigan began studying the deer population there in 1928, when six deer were planted in a 1,146-acre fenced-in area. Colonel Edwin S. George brought two bucks and four does, assumed to be pregnant, from Grand Island in Lake Superior. Colonel George, a Detroit industrialist, established the preserve as a private estate, but donated it to the University of Michigan in 1930. Wildlife management and related studies have been conducted there almost continuously since 1928, with support from the National Science Foundation, among others.

Researchers estimated there were 220 deer there by 1933, and severe damage to vegetation could already be seen. The University began allowing hunting of deer to reduce the herd and they let numbers fluctuate experimentally between a low of 10 in 1975 to a near-high 212 in 1980. In most years since, the population has been held by hunting to about 130 or roughly 67 per square mile.

When deer numbers exceeded about 25 over-wintering animals per square mile at George Reserve, there was conspicuous browsing. When the number doubled to 50 per square mile, browsing was destructive to all palatable species. Even red cedar, a tree not high on the preferred list of deer foods, showed considerable damage due to winter browsing. High deer numbers actually reduced the “carrying capacity,” or the number of deer the land could support. Lowering numbers to less than 25 per square mile allowed the vegetation to slowly recover.

Similar effects have been measured in studies on North Manitou Island (which had many deer for 75 years) and South Manitou Island, which had none. Both are in Lake Michigan and are managed by the National Park Service as part of the Sleeping Bear Dunes National Lakeshore. American beech is more prevalent on the heavily browsed North Manitou, while sugar maple dominates South Manitou. Canada yew was eliminated by deer on North Manitou.

Recent studies by Jesse Randall, a doctoral candidate in forestry at Michigan State University, indicate that effects of overbrowsing are often long-lasting. Working primarily in the Upper Peninsula’s Menominee County, Randall has found that high deer numbers have led to almost complete lack of hardwood tree regeneration. With exception of ironwood and a few other non-palatable species, the understory is devoid of woody vegetation. Thriving in its place is woodland sedge (*Carex pennsylvanica*) which, in turn, also prevents new woody sprouts from emerging. Common forest management techniques—even burning—can’t beat back the woodland sedge, so that change to the habitat is long-lasting.

Randall has studied these relationships in greenhouses and fenced deer enclosures and found that a good growth of woodland sedge combined with a modest drought is 75 percent or more effective in prohibiting sugar maple regeneration. So, once browsing by deer allows colonization of the forest floor by woodland sedge, the trees and shrubs essentially stop regenerating. Then, even if deer numbers are reduced, the forest is extremely slow to recover to its former condition. In Randall's study area, deer have eliminated nearly all new woody stems above one foot in height.

Randall has also conducted limited studies on impacts of deer on herbaceous vegetation. He found that trillium increased from 7 per acre to 720-770 individuals per acre three years after deer were excluded by fencing. His findings are consistent with those of others who have watched wildflowers disappear where deer numbers are high.

Trilliums are among the first to go, but most wildflowers that grow under the forest canopy suffer from deer browsing. Where deer numbers are high, the number of plants flowering decreases along with the size of individual plants. The result is less seeds and a reduced root volume. One study on wild lily-of-the-valley showed that plants not subject to deer browsing were 30 percent larger, three times more plentiful, and much more likely to flower. Deer browsing is certainly a major limiting factor for woodland wildflowers at many nature centers, sanctuaries and suburban woodlots where deer densities are too high.

Dr. Patrick Ruz
Director of Wildlife Programs

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Copyright 2014, Michigan Wildlife Conservancy. 6380 Drumheller
PO Box 393, Bath, MI 48808
Phone: 517-641-7677 Fax: 517-641-7877 E-mail: wildlife@miwildlife.org

