

## Re-engineering the forest

### Steward forest lands, thin the herd

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Written by Lorraine Ash / Staff Writer

As state conservation dollars dwindle and state-owned forests remain in need of a stewardship plan, ecologists are working in the private and nonprofit worlds to model what stewardship looks like.

But that doesn't mean they agree on a model. Whether it's good practice to cut trees is a matter of contention, as is the degree of emphasis placed on the role of deer.

The New Jersey Audubon Society leads the charge statewide to create what's called early successional habitat inside and outside forests. Inside forests, they do this by thinning trees and making clearings that allow sunlight to reach the forest floor and spur new growth.

Though designed for birds, these habitats benefit an array of species.

The strategic thinning of trees is crucial to forest health in New Jersey, according to Troy Ettel, who was New Jersey Audubon's director of conservation and stewardship for eight years and last month joined The Nature Conservancy.

Trees here are uniformly middle-aged — 80 to 110 years old — and basically the same size and shape, Ettel said. That means they're all at the same stage of development, or succession, as ecologists say.

“That's real problematic because we have species that need really old trees,” he said. “But we also have species that need forests that are very young and have a lot of little trees and thick vegetation — woody early successional habitat. But there's not a whole lot of species that need middle-aged forest.”

Waiting a century for trees to grow is not an option, Ettel said, because there are species that need different types of habitat right now.

Thinning trees expands forests in both directions on the age spectrum. To remove some trees, he explained, is to free those that remain to grow faster because they don't have as much competition.

“The ones left behind will be the old growth trees of tomorrow,” Ettel said. “In the meantime, we begin to grow a new generation in the gaps we created.”

### Forest health

Mankind needs to make the early successional habitat to allow for a new generation of growth, according to Ettel. That habitat may not occur naturally in a middle-aged forest, he said, because middle-aged trees are robust and may not fall in a storm event as readily as mature trees.

Even if a middle-aged tree does fall, he added, it will not leave as much of a natural light gap as a bigger, old tree would.

“By doing early successional management, we’re implementing clearcuts, even though nobody likes to use the ‘clearcut’ word,” said Don Donnelly, currently stewardship project director for forestry at New Jersey Audubon. “It’s the size and configuration of the clearcut that will define whether it’s going to be an environmental hazard for soil erosion or conducive to regenerating in the forest.”

New Jersey Audubon and the New Jersey Conservation Foundation were principal forces behind the New Jersey Forest Stewardship Act, which deals with private lands enrolled under the state farmland assessment law. Due to lack of funding at the state level, the law probably will not be implemented until 2014, according to Jon Wagar, vice president of conservation programs for Conservation Resources. The previous law required landowners to harvest a certain number of trees per year. But the new one changes that provision.

“In Morris County we have this problem where there’s not a lot of tree regeneration,” Wagar said, “whether that’s because of deer or invasive plants or what have you. So we’ve been cutting down trees and not getting new ones.”

The new law allows landowners to manage their properties sustainably and doesn’t require them to cut down trees to generate an income, according to Wagar. The law, however, does not mention deer management.

### **Weeding out invasives**

That’s a big problem for many ecologists, **including** Leslie Sauer of Sergeantsville, a member of **the Natural Heritage Committee of the New Jersey Highlands Coalition**. She contends early successional habitats are necessary and helpful but only if the native plants that regenerate in them are protected from deer overbrowsing and becoming overwhelmed by exotic invasive species.

“We need high-quality native landscapes,” she said, “not landscapes dominated by invasive species. We have to create healthy young successional habitats, but we also need to restore the native shade-tolerant understory of forest wildflowers, shrubs and sapling trees beneath the mature forest canopy. That understory has been lost to deer browse.”

Restoring native plants requires three steps: yanking out invasive species, whose seeds spread from residential landscaping; planting native species; and erecting fencing to stop deer from eating the new native plants.

“If we do a planting of young trees, we fence and we sometimes put up plastic five-foot deer guards around individual stems,” said Jean Lynch, Audubon’s stewardship project director for the southern part of the state. “That’s extra work and extra cost, but we usually do that. We plan that when we apply for grants for this type of work.”

### **Keeping deer out**

Fencing is shown to work. Bowman’s Hill Wildflower Preserve in New Hope, Pennsylvania, is known for its Plant Stewardship Index, which measures what kinds of plants are thriving at a given site. The 134-

acre preserve erected a fence, or deer enclosure, around 100 acres of its own site in 1993.

According to Anne Brennan, Plant Stewardship Index coordinator, there are 118 native plant species thriving in the fenced woodland protected from deer, compared to 88 in the unfenced area where deer are free to munch on the understory.

Professor Sara Webb, director of environmental studies and sustainability at Drew University in Madison, uses fencing in the Drew forest. The university erected a 10-foot fence around 18 acres of its forest this past spring. In 1999 Drew erected, and continues to maintain, a very small enclosure to create an oasis of forest protected from deer overbrowsing.

Webb says good forest stewardship practices vary from state to state and site to site, depending on conditions. But she opposes clearing trees in New Jersey, calling it a widespread but ill-advised practice.

“It is not good stewardship to go into your forest and clear out trees here and there, and partially log, or create clearings,” Webb said. “The trouble is that here in New Jersey, when we have an opening, we get invasive species coming in because they’re all around us.”

She gave examples. The Norwood maple tree, which suppresses diversity. Garlic mustard, which changes the soil, inhibits beneficial fungi, and makes it impossible for baby trees to get started. Barberry, which also changes the soil and makes it more difficult for wildflowers to grow.

Clearings give invasives a toehold, she said, when the goal is supposed to be preserving the biodiversity of native species and migratory birds.

### **'This is the basis of a food chain'**

For Emile DeVito, manager of science and stewardship for the New Jersey Conservation Foundation, protecting shade-loving native plants and wildflowers — the food chain of other native life — also is the highest priority. He pointed out a portion of forest in the Berkshire Valley Wildlife Management Area in Roxbury where deer are hunted. In all, 30 percent of the plants on the site were invasive species while 40 percent of the native plants had been chewed away.

“Look at the leaves of a native plant. There are leaf miners on them,” he said, referring to the larvae of insects. He ran his fingers over the pocks, stains, and holes on the leaf. “There are pieces taken out by caterpillars and tiny wasps laying their eggs. This is the basis of a food chain.”

He then pointed out the flawless leaves of a winged euonymus, an invasive plant.

“There’s not a mark on them,” he said. “It might as well be in a museum case. It doesn’t support a food chain.”

DeVito said the forest floor should be bathed in darkness.

“When the forest floor is bathed in darkness,” he said, “only native plants can survive.”

### **Controlling deer**

Part of protecting the native growth, most ecologists say, involves hunting deer.

Contraception only is used in captive herds and even then is not completely effective, according to Carole Stanko, deer biologist with the New Jersey Division of Fish and Wildlife. GonaCon treatments given to New Jersey herds had a 70 percent efficacy rate in adult females, she said.

“That means 30 percent of adult females are still going to give birth,” Stanko said.

Contraception did not work for the Morris County Park Commission, which abandoned its porcine zona pellucida vaccine study in 2000 after a three-year trial. The study showed it was too difficult to relocate deer to administer a necessary booster shot, according to Kelli Kovacevic, superintendent of natural resources management.

Morris County parks have allowed controlled hunting since 1991 and employ a variety of other techniques to protect their native plants, including yanking invasives, planting native species, erecting deer exclosures, prescribed burning to create early successional habitat, and more.

The degraded state of New Jersey forests is proof in itself that the present system of recreational hunting is not enough, according to DeVito. Sauer said hunting to cull the herd, as was done in Princeton and Fairmount Park in Philadelphia, would provide better protection for native plants.

“The only two things that have worked have been effective deer control via hunting, or fencing,” she said. “Fairmount Park is seeing some serious recovery of its forest but it’s had a controlled hunt for a long time, which is very different from recreational hunting that sometimes actually could increase the herd. It’s not very managed.”

Even though a hunt allows for a large number of deer to be harvested, that doesn’t mean a forest will be hunted enough to allow very many other species to survive.

**Next week: Part 3: Stop hunting deer in the belief the forest will heal itself.**

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## **Deer Harvests in New Jersey by Hunting Season**

1972\* - 11,021  
1980 - 21,191  
1990 - 48,222  
2000 - 77,444  
2010 - 55,404

*\*Official records for numbers of deer killed began in 1972.*

**Source:** *New Jersey Department of Environmental Protection*