

In spring I search for the first emerging leaves of wildflowers in . . .

Turtle Woods Wildflower Sanctuary

Part 2

FOUR YEARS have passed since we built our 3-acre deer enclosure, and already the changes are noticeable. Tree seedlings have sprouted and grown; new wildflower species have appeared; and the deer browse line has slowly softened and filled in.

We chose to put the enclosure in a mature deciduous forest, so the changes are not as dramatic as they would be if the area had been cut and then fenced. Still, month by month, season after season, I chart the changes in what my husband Bruce named the Turtle Woods Wildflower Sanctuary (see my column in May 2002).

In spring, I search for the first emerging leaves of wildflowers. Last spring false Solomon's-seal (or Solomon's plume as the late Lemont, PA botanist George Beatty more poetically called it) and Solomon's-seal bloomed for the first time. Beds of violets — common blue and downy yellow — covered the wet corner of the enclosure. The mayapple colony continued to spread, but not one flower has appeared yet. Pink lady's slipper, also known as moccasin flower, bloomed here and there, and a small patch of Canada

mayflower sent up its first blossoms.

In summer, when the woods are dark and deep, fewer wildflowers appear. The downy rattlesnake plantain that I discovered right after the fence went up produced 31 flowers two years later. The third year there were only five blossoms and last year none. Still, the attractive evergreen, white and dark green leaves continue to multiply, and I look forward to more flowers from this orchid in the future.

Not so the lone spotted wintergreen plant I found after the fence was built in the spring of 2001.



That year the wintergreen's single bud disappeared. The following summer, on July 6, a nodding, waxy, white flower that looked as if it was made of fine porcelain dangled from the top of the stem. Luckily, Bruce photographed it, because that was the last year I found any trace of it. Since then I have repeatedly searched the enclosure for more spotted wintergreen plants, but so far I have found none.

Spotted wintergreen, also called striped wintergreen, is a member of the Pyrola family and lives in dry woods from New England to the southern United States. I have seen it growing as a ground cover in the forests of Connecticut and North Carolina. *The Plants of Pennsylvania*, by Ann Fowler Rhoads and Timothy A. Block calls it "common in wooded areas; throughout except in the northernmost counties," yet on our mountain in southcentral Pennsylvania the spotted wintergreen in the enclosure was the first I've recorded in the 33 years we have lived here.

A far more common wildflower in mid-summer, both inside and outside the enclosure, is the Indian pipe. Last summer it did especially well because of all the rain. Inside the enclosure in one small corner alone I counted over 100 plants, far more than I found in any similar habitat outside the enclosure. Yet I've never seen any sign of deer herbivory on Indian pipe.

Pinesap, its close relative, is relished by white-tailed deer, so I was pleased when it appeared in the enclosure for the first time late last summer. Thirteen large, healthy, red and gold plants bloomed amid the blackened, uplifted pipes and stems of the pollinated Indian pipes. The

few pinesaps I found outside the enclosure were quickly browsed to the ground.

Another summer beauty, black Cohosh, blossomed first inside the enclosure in 2003. It also grows along our access road in the hollow above the stream, the same place where horsebalm thrives. Both species suffer some deer browsing, but horsebalm is especially hard hit. Still, I didn't expect the dozens of horsebalm plants growing waist high that now blanket the moist corner of the enclosure in mid-summer. Horsebalm, or richweed, is a member of the Mint family, and its light yellow, lemon-scented flowers retain their odor even after they have dried on their stems.

Clearweed, or coolwort, also grows in the moist corner of our enclosure. A member of the Nettle family, in late summer it sports undistinguished, branching clusters of greenish or whitish flowers.

By then white snakeroot is flourishing both inside and outside the enclosure, but especially outside. This is one wildflower that our deer never touch, unlike spotted Joe-Pye weed, which is mowed down almost as quickly as it germinates in our wet meadow.

Indian tobacco is another wildflower our deer seem to dislike. It, too, grows within and without the enclosure. So do blue-stemmed or wreath goldenrod and white wood aster. Still, both of those species are more abundant inside the enclosure than on our road hank where they also appear.

Native shrubs have also been disappearing in our woods. Yet inside the enclosure they are thriving. In the wetland corner, nine new common elderber-

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ries, a red elderberry and a couple spice-bushes have sprung up. New sprouts of wild azalea have appeared in the drier woodland area of the enclosure.

But the shrub that is filling in the understory most rapidly is witch hazel. Back in 1952 research forester A.B. Mickalitis called witch hazel "the most common shrub native to Pennsylvania," according to Charles Fergus in his informative book *Trees of Pennsylvania and the Northeast*. Although we've always had a scattering of witch hazel in our forest, inside the enclosure the witch hazel sprouts have formed a green ground cover, and along the trunks of the older shrubs new green leaves have emerged.

A few greenbriers, a hawthorn, many huckleberry shrubs, some blackberry canes and a spreading wild black raspberry patch are, in addition to mountain laurel our other understory species. Even the ubiquitous mountain laurel shows more sprouting and leaves inside the enclosure, indicating it, too, may be adversely affected by too many deer.

Dr. Ed Levri of the Altoona College of Penn State and his botanist wife Dr. Maureen Levri, have been studying the effect of deer herbivory on the mating system of mountain laurel in our forest for four years. With the help of students, they have labeled and numbered dozens of shrubs both inside and outside the enclosure, as they carry on their research from year to year. They suspect that deer herbivory reduces the mountain laurel's ability to produce the more desirable

self-fertilized offspring.

But what of tree species? Those large trees, most between 100 and 200 years old, that we originally recorded throughout the enclosure — red maple, black and yellow birch, pignut hickory, white ash, black gum, white pine, black cherry, American elm, and white, chestnut, red and black oak — are, for the most part, flourishing. A pignut hickory did fall across the fence in July 2002, but already new hickory seedlings have sprouted. New white pine saplings are thriving, and all the oak species have produced many seedlings. Even a few American chestnuts

have germinated. Most surprising of all has been the regeneration of black gum. Many are already shoulder-high saplings. Yet outside the enclosure, where the mix of trees and shade are the same, no tree seedlings of any species survive.

Those less desirable, even, in some cases, invasive natives, are only a small portion of the overall species' numbers in our enclosure. For instance, with all the rampant undergrowth, only a small patch of hay-scented fern survives, yet one study,

back in 1989, found that as much as 30 percent of Pennsylvania's forest understories are blanketed in hay-scented and New York ferns. Striped and red maple seedlings — the only tree species that are regenerating in many forests — are far outnumbered in our enclosure by oak and black gum. All of the wildflowers inside the enclosure are natives. So, too, are the



native Virginia creeper and wild grape vines. The only non-natives in the enclosure are a multiflora rose and a couple Japanese barberry shrubs. Because this is an experimental plot, we are not removing them. We want to see what happens to them as the natives continue to spread.

In a recent study by researchers at the USDA Forest Service's Northeastern Research Station in Warren, in which they tested the effects of various numbers of deer on the Allegheny National Forest, they discovered "that deer affected the abundance and density of all plants; the horizontal and vertical structure of the forest; species abundance of wildflowers, shrubs, and birds; species composition

and biodiversity of the forest understory and resilient versus deer-preferred foods," according to *Forest Science Review*.

"We think we know our forests," says researcher Dr. Susan Stout. "But in Pennsylvania and many other parts of the Northeast, deer abundance has changed our forest so much and for so long that we truly don't know how our forests would look without too many deer."

Certainly having our enclosure has made us acutely aware of what is *not* growing outside the fence as well as what is growing inside. It also shows us how quickly some plants recover, such as the black gum, and how slowly, if at all, other plants come back. Every year there are more surprises.