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Oh Deer!

Contraception shows promise, but other measures may be needed to lessen the toll that the deer boom is having on forests and suburbs

By Anne Broache

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"Put your chest on the deer. Reach out and hold the legs. Never let go of the hooves."

Bill McShea, a wildlife biologist at the National Zoo in Washington, D.C., is instructing a handful of assistants in the art of subduing a wild white-tailed deer. The researchers are in Virginia's Blue Ridge Mountains on a warm morning, the mowed grass along the boundary of the woods still gleaming with dew. The night before, the group had sprinkled a trail of alfalfa pellets into five deer traps, wooden boxes about five feet tall with doors that fall shut when a deer steps inside and trips a string. This animal went for the bait.

"It's a feisty one," an assistant says, listening to the thumping hooves.

McShea and co-workers guide the deer through a door in the trap into a smaller box, then pull the squirming nearly 100-pound animal out by its hind legs. Two people pin it to the ground, and each grabs a set of kicking legs. Another helper covers its eyes with a dark towel. "That'll take 90 percent of the fight out of the deer," says McShea. The animal is female, so McShea reaches for a syringe and injects her in the rump.

The syringe contains an experimental contraceptive drug. McShea and others are testing, first, whether it will reliably block a doe's reproductive cycle for life and, second, whether birth control drugs could possibly make a dent in America's deer population boom. When it comes to controlling deer populations, McShea says, "You want to have as many tools as possible."

Once overhunted, white-tailed deer have returned in such explosive numbers that they're ravaging forestland and besieging rural and even suburban communities. The animals cause car accidents, carry ticks that can transmit infectious diseases to people, chew up landscaping and otherwise make pests of themselves, albeit sometimes strikingly graceful ones.

Deer numbers are rising in part because their traditional predators, including mountain lions and gray wolves, were eliminated from most Eastern forests long ago. Also, white-tailed deer reproduce quickly—a female bears one to three fawns each year—and they're one of the more adaptable species around, living from subarctic to tropical climates. Past restrictions on deer hunting have also fueled the boom.

But deer are also thriving because of the ways people have carved up the countryside, unwittingly creating prime deer habitat. Deer, says McShea, are an "edge species," meaning they thrive where forests meet fields. They seek shelter in forests, but most forest food is too high for them to reach. Edges abound in plants deer can munch. "Originally, the eastern United States was one deep, dark forest," McShea says. "Now it's deer nirvana. It's one big edge."

In some parts of highly suburbanized New Jersey, up to 60 deer live in a square mile, according to the state's Division of Fish and Wildlife, compared with just 5 to 10 deer per square mile before the land was settled by Europeans.

With so many deer at large, interactions are common. Nationwide, cars hit at least 1.5 million deer a year, the Insurance Institute for Highway Safety reports, causing more than a billion dollars in vehicle damage. In 2003, collisions with animals killed 210 people, and three-quarters of the encounters involved deer. Deer transport ticks that carry Lyme disease; more than 21,000 cases were reported in 2003.

At the same time, scientists have more and more evidence that an overabundance of deer takes a surprising toll not only on suburban pansies and azaleas but also on wild forestlands. From the Rocky Mountains to the Midwest and up and down the East Coast, white-tailed deer are vacuuming up acorns, herbs, flowering plants, woody shrubs and short saplings that make up the forest's "understory," plants from ground level up to about six feet. West Virginia University ecologists have reported that deer are a major threat to American ginseng, an increasingly rare herb.

Deer browsing transforms forest ecology. Harder to find are yellow spicebush blossoms (and the spicebush swallowtail butterflies that feed on them), highbush blueberries and white trillium. Invasive Japanese knotweed, multiflora rose and garlic mustard outnumber once common native orchids and ferns. Thrushes, warblers and other shrub- and ground-nesters have taken flight in search of choicer areas. Chipmunks, frogs and snakes are rarer because they have little to eat—as do the hawks and owls that prey on them. What's left is a "ghost forest," says Eric Stiles, the New Jersey Audubon Society's vice president for conservation and stewardship.

Stiles says that in the past 30 years the group's Scherman-Hoffman Wildlife Sanctuary, in the north-central part of the state, has lost dozens of species of plants and well over a dozen species of birds that nest on the ground or in shrubs because of the burgeoning deer population. For the first time in its 108-year history, the conservation organization recommended hunting in its sanctuaries as a wildlife-management strategy. But in many areas, including almost all suburbs, shooting deer is both unpopular and illegal. Which is why deer contraception may be an idea whose time has come.

That day in the Virginia forest, biologist McShea measures the doe's length (67 inches, from the tip of her tail to her nose) and girth (27 1/2 inches) and attaches a numbered tag to each ear. An assistant uses a portable ultrasound device, which looks like a computer monitor, to measure the fat on the deer's rump, an indicator of health.

"One, two, three," McShea says. "Go!" They release the animal. "That's the only dicey part. Whoever lets go last is going to get kicked." Researchers have gotten black eyes, bruises, gashes worthy of stitches, but no one is hurt this time. The doe prances off into the woods.

At the 3,200-acre campus of the National Zoo's Conservation and Research Center near Front Royal, Virginia, McShea has been overseeing a study of immunocontraception, or using a vaccine to prompt the animal's immune system to prevent conception. Thirteen years ago, McShea tested a drug called porcine zona pellucida, which comes from pig eggs and is known as PZP. He found that the drug prevented pregnancy, but only for one season. Since 2003 he has been testing a Canadian PZP-derived drug called SpayVac, which costs \$110 per dose but may last a deer's lifetime.

Unlike human hormone-based contraceptives, which prevent ovaries from releasing an egg, PZP causes a female deer to produce antibodies that stick to the egg's surface. The antibodies block sperm from fertilizing the egg. The drug has to be given directly into the bloodstream, largely because researchers have yet to develop an oral version that can survive a trip through a deer's digestive system. The U.S. Food and Drug Administration still considers the drug "experimental." The manufacturer prohibits women, such as McShea's female co-workers, from handling the contraceptive—nobody knows if it could sterilize them too.

The drugs aren't perfect. McShea's team has injected 38 deer with SpayVac. None had fawns in the first year after treatment. But at least two treated does gave birth the second season.

Not even reliable contraceptives can, by themselves, solve the problem, McShea says. Before the SpayVac tests began in 2003, he had 232 deer culled from his 850-acre experimental area, leaving about 50 deer behind. Now the population in that area is growing, despite contraceptives, because new deer are immigrating to the property. He says widespread hunting will be needed to reduce deer populations to a sustainable level. McShea says he's "guardedly optimistic" that, eventually, improved immunocontraceptives will help control deer overpopulation. Until people learn to manage the deer numbers, McShea says, his advice is to "drive slower."

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