



Sharon's Wish

When the subject is Privateer Farms in Bladen County, be prepared to talk big numbers. "There's a 500-pound bear running around my cabin," says Sharon Valentine, the vivacious co-owner. "He's eating all my deer."

"I saw a flock of 38 toms [turkeys] right by the clubhouse," says Buddy Bodiford, hunt manager for the property. "Of course, we shot the state record turkey here in '05—25 pounds with a 13-inch beard." Brother Terry Bodiford nods. "Heck, I saw a deer come across the field last week had only one rack, but it had six points on it. Probably weighed 180 pounds."

The biggest numbers concern the land itself. At 6,000 acres, Privateer Farms is one of the largest contiguous pieces of privately owned property in the state. And through the middle of it runs 6½ miles of newly restored stream, one of the longest restoration projects east of the Mississippi.

The restoration of Harrison Creek was the first step in the conversion of Privateer Farms from an exclusively commercial enterprise based on intensive poultry production, row crops and timber, to a working farm designed around nature. It became a model of conservation that demonstrated how federal, state and private programs can be combined to meet environmental goals ranging from wetland restoration to the reduction of greenhouse gases.

With the help of an environmentally minded landowner, the rebirth of Harrison Creek represents a stream restoration success story in the state's Coastal Plain.

written and photographed
by **John Manuel**

February - Mountain Region

March - Piedmont Region

April - Coastal Region





MELISSA MCGAW/NCWRC

If Valentine's wish for Privateer Farms comes true, it will become the crown jewel in a 15,000-acre crescent of prime wildlife habitat that includes the neighboring Suggs Mill Pond Game Land, Bushy Lake State Natural Area and preserves owned by the Cape Fear Land Trust and The Nature Conservancy.

True believers

The story of how Valentine came to preside over this landmark conservation effort is a fascinating one. The land that became Privateer Farms was originally cleared and drained in 1980. The owner converted Harrison Creek from a meandering stream to an arrow-straight canal 6 to 10 feet deep with steep sides, making it largely inaccessible to wildlife. He drained the adjacent wetlands and planted several thousand acres of row crops. On the upland sites, he erected metal barns and stocked them with domestic turkeys.

In 1987, turkey cholera swept through the flock, killing 60 percent of the birds. The operation went bankrupt. The farm went up for auction and was purchased by Sharon and her husband, Steve Valentine, along with their partner Marvin Johnson.

The Valentines brought in new birds and followed strict practices to limit the chances of recurring disease. By the third year, Privateer was producing 28 million pounds of turkeys per year, becoming one of the largest privately held turkey farms in the nation. Unfortunately, as the farm prospered, Steve's

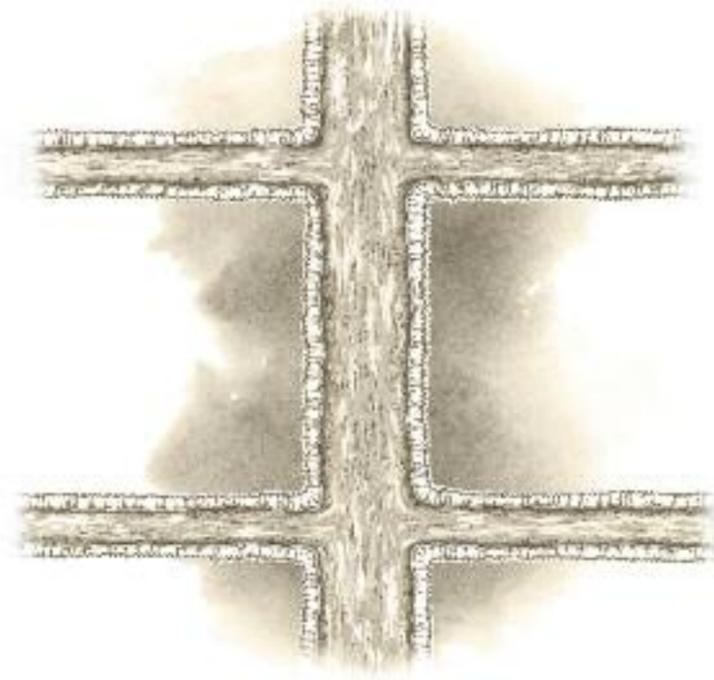
health began to fail. The Valentines began to think of the legacy they wanted to leave behind — one that, in Sharon's mind, revolved around wildlife and native forests rather than confined livestock and cultivated fields.

In 2000, the Valentines arranged a meeting with John Ray, regional supervisor for the USDA Natural Resources Conservation Service, to talk about what could be done with the land. Ray made the first of many visits to the farm, espousing his vision of a restored stream, forest and wetland, with the stream as the centerpiece. The Valentines contacted the N.C. Department of Transportation (DOT) to gauge its interest in funding a mitigation project. North Carolina law requires that, for any streams or wetlands damaged or destroyed in the course of construction, public or private entities must pay for the mitigation of an equivalent amount of stream or wetland in the same watershed. As it happened, DOT was looking for 35,000 linear feet of stream and 400 acres of wetland to mitigate land lost through road construction of a bypass around Wilmington. That was virtually identical to the stream length and acreage of wetland that Ray envisioned for Privateer Farms.

Bids were submitted by various engineering companies, and the contract eventually was won by Buck Engineering (now Baker Engineering) of Cary. Meanwhile, the Valentines began selling off their livestock. The last of the turkeys was off the farm by September 2003. In November, Steve died. The restoration of Harrison Creek began the following month.

A unique situation

Stream restoration in the Coastal Plain is markedly different from that in the Piedmont or Mountains. In the latter two areas, bank erosion is usually the major problem, and the primary goal of restoration is to reduce the sediment load of the stream. In the Coastal Plain, the primary problem is that streams such as Harrison Creek have been ditched in order to drain and clear the land for agriculture and timber production. Wildlife habitat has been destroyed and a system established to speed the flow of water off the land. The goal of restoration in these circumstances is to restore the original hydrology and habitat. "In the Coastal Plain, we are really replacing ditches with streams," says Greg Jennings, professor of biological and agricultural engineering



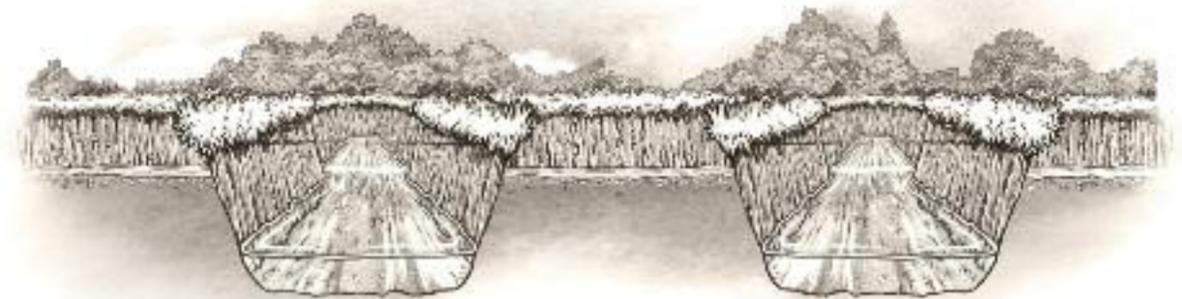
BEFORE RESTORATION



AFTER RESTORATION

THE RESTORATION OF PRIVATEER FARMS' HARRISON CREEK proved to be a case study for Coastal Plain stream restoration. The original waterway had been ditched and channelized to maximize the run-off of water (above left and below). As opposed to a more gentle and graceful meander, the low, flat lands of the area necessitated that the engineers of Baker Engineering give it a more serpentine meander (above right). The resulting waterway featured sharp curves and permanent wetlands surrounding it. Due to the small amount of rocks in Coastal Plain streams, the engineers instead used logs and pieces of wood to break up the stream channel (bottom).

BEFORE RESTORATION



AFTER RESTORATION



ILLUSTRATIONS BY JIM BROWN

Sharon Valentine is shown here with John Ray of the USDA Natural Resources Conservation Service (top). Valentine wanted to work with Ray to make her property (middle and above) an example of what can be done to restore damaged lands.



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Kevin Tweedy of Baker Engineering (top), project manager of the Privateer restoration project, helped ensure that the landowner's desires for restoring the stream to its natural state were realized (middle and above).

forcing the closure of shellfish waters all along the North Carolina coast.

The trade-off with filling in ditches and rewatering fields in the Coastal Plain is that the land no longer has any value for agriculture. Therefore, Jennings urges, we should focus on converting the least-productive farmland back to its natural ecosystem. Jennings further encourages focusing restoration activities in the headwaters of coastal streams, as that will result in the most dramatic improvement in water quality.

"If there is a square mile of farmland in the headwaters, a drainage system will have been built to remove all the water from the land," he says. "By plugging up the ditches and restoring the natural hydrology, we would remove the downstream impact of the pollutants as well as reduce the potential for downstream flooding."

Case study

Harrison Creek made an ideal candidate for restoration because it forms the headwaters to a larger stream system draining into the Cape Fear River. And though many coastal streams have been ditched beyond recognition, engineers were able to find aerial photographs that showed the old stream channel. They were also able to gather verbal accounts of what the stream looked like from people who had been on the site prior to its conversion to agriculture. This, combined with the use of data from the state's floodplain mapping program, allowed them to determine exactly where the original channel lay.

With a green light from Valentine and funding from the DOT, Baker Engineering set to work in the late summer of 2004. The construction was done by River Works Inc., a contractor that specializes in environmental restoration projects. Using bulldozers and other heavy equipment, the contractors recreated the original stream meanders. They also elevated the channel bed 5 to 6 feet in order to raise the surrounding water table and allow floodwater back into the fields. Fill dirt was provided by bulldozing the dirt road beside the channel. "We just knocked the material back into the drainage canal and filled in the lateral ditches," Tweedy said.

Rather than the rock structures commonly used in the Piedmont and Mountains, the engineers used wood structures to direct flows and provide in-stream habitat (because rock is not a natural feature in this part of the

Coastal Plain). Log weirs were installed at intervals to keep the channel from downcutting. Log vanes were placed on the outside of bends to promote the scour of pools and provide cover for fish. Root wads were also laid in to provide cover and for deeper pools.

To restore the adjacent wetlands, Baker graded the land to allow floodwaters from the new stream channel to flow outward. They also roughed up the ground to create a series of small mounds and depressions to help restore wet conditions. "You see this rough ground surface in natural wetlands where trees have fallen, creating a depression where the root mass was pulled up and a mound where it sticks above the ground," Tweedy says. "Biologists commonly call these features 'tip mounds,' and over a long period of time, a wetland will get a whole series of these mounds. They play a vital role in helping hold the water and creating habitat for amphibians and wetland plants."

The contractor transplanted numerous small trees and shrubs on the site to help anchor the banks and provide shade. They also planted nursery-raised saplings, including bald cypress, sycamore, swamp tupelo and other staples of a riverine hardwood forest.

Work was completed in March 2005 and included 36,000 feet of stream and 400 acres of wetland. Tweedy says this is one of the largest stream restoration projects in the eastern United States. Subsequent monitoring has shown the stream to be stable. Benthic macroinvertebrate data have yet to show dramatic improvement, though that is expected with time. Wildlife appears to be making ample use of the restored stream and riparian buffer. During a helicopter survey in the summer of 2007, deer could be seen wading in the channel, orchard orioles and buntings flitted among the planted saplings, and marsh hawks hunted the newly created wetlands.

Onward and upward

With the completion of the stream work, Valentine has moved on to the next stage—converting 3,300 acres of low-lying cropland into wetlands and bottomland hardwood forests. This is being done under the Wetland Reserve Program, a USDA initiative that provides assistance to landowners to restore wetlands in exchange for their retiring marginal land from agriculture. A key feature of the restoration will include construction of a 200-acre lake to attract migratory waterfowl.

Working with Ray, Valentine is developing plans for the rest of the farm as well. "We will be bringing back open meadows for songbirds," she says. "We will be planting native grasses for quail. We'll plant Atlantic white cedar and longleaf pine. And I want to build a sustainable lodge on the farm, a place where hunters or birdwatchers can kick back at the end of the day." Valentine currently allows hunting for deer and turkeys, though not for bears, on the property.

Valentine hopes to include an additional 1,500 acres in a number of farmland and water-quality easement programs. She is working with The Conservation Consultant LLC, a firm that helps private landowners manage and derive income from their "conservation assets." One example that Privateer Farms may be able to take advantage of is selling carbon credits to finance reforestation. In much the same way that DOT purchases mitigation credits to offset impacts to streams and wetlands caused by their construction activities, industries can purchase carbon credits to offset their production of the greenhouse gas carbon dioxide. The seller, in this case Privateer Farms, agrees to plant a certain number of trees that, theoretically, will fix a certain amount of carbon and thereby limit the CO₂ that collects in the atmosphere.

"The amount of carbon we can sell will be determined by the long-term management regime for the entire property," says Jeff Fisher, owner of The Conservation Consultant and a conservation-driven real estate firm, Unique Places LLC. "Whether it is carbon, wetlands, prime farmland, scenic views, or unique habitat and species, the wise use and protection of conservation assets is an increasingly critical element of land management."

The sale of carbon credits is yet another way that Valentine and her associates are looking to "layer" credits, conservation payments and tax benefits to help finance the long-term viability of this working farm and increase its overall contribution to wildlife habitat.

"This is going to be a model of how federal, state and nonprofit agencies and landowners can collaborate to design something that is sustainable and beautiful," Valentine says. "Ours is one of the last great tracts of land in North Carolina. As the saying goes, 'Man is temporary. The land is forever.'" ♦

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North River Restoration

In the vast and sparsely inhabited peninsula south of Pamlico Sound, a pioneering stream and wetland restoration project in the North River watershed is under way at North River Farms in Carteret County. The 5,500-acre project is significant both for its scale and for the fact that it includes both tidal and freshwater streams and their associated plant communities.

Phase I of the plan, completed in 2003, involved plugging ditches, contouring the land and planting hardwoods on 250 acres of previously converted cropland. Phase II involved wetland restoration and construction of two streams and their associated floodplains. These streams receive some water from upstream agricultural drainage canals but are also connected to tidal waters in their lower reaches. The project design seeks to improve natural water flow and nutrient cycling pathways, as well as create land and aquatic habitat.

So far, the stream appears stable, and the plantings have taken hold. N.C. State University researchers have begun monitoring nutrient, sediment and bacteria loads. Monitoring began before the restoration, so there will be a solid baseline of data from which to compare improvements. Although it is too early to measure any improvement in water quality, researchers are pleased to see that wildlife is making use of the habitat.

"There are already crabs and fish moving into these creeks," says Mike Burchell, assistant professor of biological and agricultural engineering and team leader for NCSU's research effort. "We've seen all kinds of wading birds along the creeks, and tracks of deer, bear and what we presume are coyotes."

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Female Orchard Oriole