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Private Conservation Case Study

Chesapeake Wildlife Heritage

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On a warm October day, the sun glistens on the still water. Poised among the spike rush is a statuesque Great Blue Heron, silently stalking. The only sound is the interminable hum of insects punctuated by the splash of a frog. Here on the eastern shore of the Chesapeake Bay, near the town of Chester, Maryland, is a modest ten acre wetland. What makes this wetland unusual isn't the ducks or geese that stop here on their annual migrations, or the egrets and herons that hunt its waters for frogs and fish. What makes this wetland unique is the fact that just a few years ago, it did not exist.

Generations ago, the area was a wetland, but with the help of the federal and state agricultural agencies, farmers drained the land to plant crops. In 1992, however, the Chesapeake Wildlife Heritage restored the wetland, with the permission of the land owner, who voluntarily placed the land into a conservation easement.

This single restored wetland is not an isolated occurrence. At Barnstable Hill Farm, where the wetland is located, Chesapeake Wildlife Heritage (CWH) restored two other wetlands, and over the last five years, CWH has restored more than 100 acres of wetlands throughout the Chesapeake Bay watershed.

Wetland Restoration

Wetlands have properties of both aquatic and terrestrial ecosystems. Their most widely recognized and valued function is providing habitat for fish, birds, and other wildlife. In addition, wetlands carry out hydrologic functions such as flood control and groundwater recharge. Depending on their placement in the watershed, wetlands can also provide surface water quality improvements in the form of sediment accretion and nutrient uptake.

Wetlands in Maryland constitute only about 6.5 percent of the land surface.¹ Yet many wetlands are among the most productive of natural ecosystems, sometimes exceeding the best agricultural lands and rivaling the production of tropical rain forests. They provide habitat for a rich variety of native species. Nationwide, approximately one-third of North American bird species are wetland associates. In addition to supporting resident birds year-round, wetlands are important breeding grounds, over-wintering areas, and feeding areas for migratory birds.²

The role wetlands have in improving water quality is often overlooked, but wetlands remove and transform many types of pollutants. For example, as water floods into wetlands from rivers and streams, its velocity decreases, causing an increase in sedimentation. Chemicals adsorbed to sediments are removed from the water and deposited in the wetlands. Also, a variety of anaerobic and aerobic processes, which can transform and remove many types of pollutants, occur in both the water and the sediments. The shallow water, coupled with the presence of emergent vegetation, leads to sediment-plant-water exchange which can further reduce pollutants.³

Wetlands and Water Quality

The wetlands restored by Chesapeake Wildlife Heritage both help to control pollution from agricultural runoff and provide habitat for wildlife. As industrial sources of water pollution have been gradually reduced and eliminated over the last thirty years, agricultural runoff has emerged as the leading source of pollution in the nation's rivers, lakes and streams, according to the U.S. Environmental Protection Agency.⁴ Agricultural runoff, particularly fertilizer, has become a concern in the Chesapeake Bay.⁵

One reason Chesapeake Wildlife Heritage has focused their efforts on wetland restoration is because wetlands can serve the dual function of providing habitat for wildlife and controlling agricultural runoff, protecting the Chesapeake Bay from excessive nutrients. At Barnstable Hill Farms, Chesapeake Wildlife Heritage restored a wetland so that any water running off of the nearby fields is funneled into the wetland before flowing into a fifty foot ditch which runs into the Chesapeake Bay. Prior to the wetland's construction, the fields drained directly into the bay.

In 1994, the Smithsonian Environmental Research Center began monitoring thirteen wetlands constructed and managed by Chesapeake Wildlife Heritage on the Eastern Shore. A central objective of the study was to measure the effect of these constructed wetlands on water quality. At the one acre Barnstable site, the Smithsonian installed an automated system to measure flow and collect water samples in volumes proportional to the flow of water. In analyzing the samples, the Smithsonian found that the water flowing out of the wetland contained approximately one-fifth of the dissolved nitrate, and one-tenth of the dissolved phosphorus as the in-flowing water. The on-going Smithsonian research suggests that properly constructed wetlands can not only provide wildlife habitat, but also go a long way in ameliorating nutrient runoff from cropland.⁶

The Costs of Restoration

Nearly the entire Eastern Shore is hydric soil, which means the ground is so wet during growing seasons, only wetland plants can survive unless some sort of drainage system is installed. Thus, in most areas of the region, creating wetlands is a simple matter of plugging the drain, pushing up a levee to capture water, and installing a simple elbow pipe that can be rotated in the low dam to control water depths. A typical wetland of one to two acres can be constructed by Chesapeake Wildlife Heritage for \$ 1,200 to \$ 2,000.⁷ These wetlands typically average only 18 to 24 inches in depth. Consequently, wetland vegetation quickly colonizes the shallow waters, offering food and habitat for waterfowl and a host of wading birds and shorebirds.

At Barnstable Farms, two wetlands have been restored predominantly for wildlife, in particular, waterfowl. Each year, the wetlands attract a large number of migratory water birds such as Mallards, Wood Ducks, Green-winged and Blue-winged teals, American Wigeons, Gadwalls, and Northern Pintails. The costs of restoring this wildlife habitat were relatively modest, about \$2,000 per acre.⁸

One factor that makes this type of restoration economically possible is the dramatic changes that have occurred in U.S. agriculture over the last thirty years. In the past, as a farmer's productivity on a particular parcel of land decreased, he would typically retire that land and plow under previously unfarmed land. However, as new technologies increased the productivity per acre of farmland, the need to plow new land has diminished dramatically.⁹

As demand for new cropland diminishes, the market value of farmland decreases. Because of this, the relative cost of converting cropland to wetland drops as well. Since 1985, average farm real estate values have been below \$700 per acre. Reduced prices for agricultural commodities and decreased land values, coupled with an increased awareness of the environment and a realization of the economic benefits of wildlife, have generally made wetland restoration more economical. For example, in 1992, the U.S. Department of Agriculture started a pilot program in which it offered to purchase a conservation easement and restore wetlands on 50,000 acres of farmland.¹⁰ Even though the initial program was available in only nine states, USDA received offers for 500,000 acres. Clearly, the economics of agriculture and wetland restoration have changed. These economic changes allowed Chesapeake Wildlife Heritage to afford the restoration of wetland in the Chesapeake Bay watershed.

History of Chesapeake Wildlife Heritage

The Chesapeake Bay is America's largest estuary. It remains one of the world's most productive ecosystems, despite absorbing significant amounts of agricultural, urban and industrial runoff which have affected certain populations of the Bay's inhabitants.

In the bay itself, oyster populations are significantly lower when compared with the abundance of past decades. This is due to both a long history of open-access exploitation and the likely correlation between pollution in the bay and the decimation caused by disease since the 1970s. The bay's once

famed striped bass fishery was closed for five years, and today it appears to have recovered remarkably. Lately, problems with the blue crab have environmentalists asking for reductions in the catch, but more recently, the National Marine Fisheries Service determined that the decline in catch was due to natural population fluctuations.

Gone from the Chesapeake are swarms of ducks that 18th and early 19th century sportsmen admired and hunted. The huge flocks dwindled as commercial hunters earlier this century exploited this open access resource. Additionally, in many areas there are houses, towns, and cornfields where ducks used to forage and roost in winter.

In 1980, a group of Chesapeake Bay duck hunters decided to do something for their sport. They pooled resources and began to build ponds for ducks. The continuing results of their efforts show that local people can produce immediate, visible, on-the-ground results for fish and wildlife, often cheaper and better than government agencies and national conservation organizations.

After this duck hunters' group was formed, it began hosting the Easton Waterfowl Festival in Easton, Maryland. The festival is among the premier wildlife art shows in the country. Each year, it draws tens of thousands of decoy traders, gun collectors, art aficionados and artists to the small eastern shore town. Many of the proceeds are spent on various projects to enhance waterfowl.

During the mid-1980s, it became obvious that wildlife other than waterfowl needed help too. Consequently, the duck hunters' group became the Chesapeake Wildlife Heritage and expanded to encompass all Chesapeake Bay species. CWH eventually left the festival fold to go out on its own. Today, it is a coalition of sportsmen, bird watchers, and other fish and wildlife enthusiasts, who all recognize that habitat is the key to maintaining all of their interests. Although CWH and the Easton Waterfowl Festival have formally separated, the festival remains a sponsor and contributor.¹¹

Ned Gerber, a native of Maryland's eastern shore, is the chief wildlife habitat ecologist for CWH. He grew up hunting waterfowl among the marshes and is dedicated to stopping the slide in hunting opportunities caused by habitat loss. He is a farmer and a trained wildlife biologist, which lets him view the competing nature of agriculture and wildlife in more positive terms than most farmers or biologists.

Chesapeake Wildlife Heritage Today

As a whole, the CWH program is essentially divided into three parts: agricultural land management; wetland construction and management; and artificial nesting structures.

The agricultural effort includes actual hands-on management of more than 60,000 acres around the bay, as well as overseeing conservation plan implementation on 90,000 additional acres. On this growing amount of acreage, CWH teaches farmers how to produce crops with less pesticide and

fertilizer, less filling, and more wildlife habitat. The program significantly improves water quality for fisheries, wetlands for wildlife, and both of these for humans.

One segment of the CWH agricultural program involves convincing farmers to plant odd corners and wet areas with a diversity of tree species. Forest habitat is disappearing on the eastern shore, and each patch restored is quickly adopted by wildlife, especially songbirds. In many of these small wooded patches, CWH installs artificial nesting devices. CWH has installed more than 6,000 Wood Duck boxes in the Chesapeake watershed during the past few years. The boxes get about 50 percent usage by Wood Ducks, according to Gerber, and produce more than 25,000 Wood Ducks annually. The boxes not used by ducks often provide nesting habitat for Eastern Screech-Owls and other cavity nesting birds. Along with the Wood Duck program, CWH maintains hundreds of houses for Eastern Bluebird, Osprey nesting platforms and American Kestrel houses.¹²

CWH also encourages farmers and farmland owners to take advantage of federal conservation programs, such as the Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP). CRP pays landowners under 10-year contracts to plant highly erodible land with grasses, legumes or trees beneficial to wildlife. WRP pays landowners to restore wetlands that have been converted to cropland.

However, their most innovative work is the private wetland restoration. Thus far, the group has restored approximately 100 acres of wetlands over the last five years, each requiring little more than a couple of heavy equipment hours and modest lengths of plastic pipe. The construction is relatively easy because the water table is high, and water ponds quickly. The CWH wetland creation and restoration program is unique in that it produces numerous wetlands for few dollars. Chesapeake Wildlife Heritage demonstrates how a private organization devoted to providing environmental amenities can achieve significant gains even with limited resources.

This case study was written by Jonathan Tolman, deputy director of environmental studies at the Competitive Enterprise Institute and director of the Center for Private Conservation's Karner blue butterfly restoration project.

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ENDNOTES

¹ T.E. Dahl, *Wetlands Losses In The United States 1790s to 1980s* (Washington, D.C.: U.S. Department of Interior, Fish and Wildlife Service, 1990), p. 6.

² National Research Council, *Restoration of Aquatic Ecosystems* (Washington, D.C.: National Academy Press, 1992), p. 265.

³ *Ibid.*, p. 269.

⁴ Office of Water, *National Water Quality Inventory: 1994 Report to Congress* (Washington, D.C.: U.S. Environmental Protection Agency, December 1995), p. ES 12.

⁵ Thomas C. Malone, Walter Boynton, Tom Horton and Court Stevenson, "Nutrient Loadings to Surface Waters: Keeping Pace With Science And Engineering" (Washington, D.C.: National Academy Press, 1993), p. 9.

⁶ Dennis Whigham, Thomas Jordan, Kathleen Callahan, and Toni Pepin, *Effectiveness of Constructed Wetland for Control of Agricultural Runoff and Wildlife Habitat* (Edgewater, MD: Smithsonian Environmental Reserach Center, 1995), p. 12.

⁷ Personal conversation with Ned Gerber, Wildlife Habitat Ecologist, Chesapeake Wildlife Heritage, Easton, MD, September 24, 1996.

⁸ *Ibid.*

⁹ Jonathan Tolman, "How We Achieved No Net Loss," *National Wetlands Newsletter* (Environmental Law Institute), Vol. 19, No. 4 (1997), p. 15.

¹⁰ Keith Weibe, Ababayehu Tegene, and Betsey Kuhn, *Partial Interest In Land: Policy Tools for Resource Use and Conservation*, U.S. Department of Agriculture, Agricultural Economic Report Number 744, November 1996, p. 19.

¹¹ Lonnie Williamson, "Home Improvement: Chesapeake Wildlife Heritage Works to Protect The Chesapeake Bay," *Outdoor Life*, November 1993, p. 24.

¹² *Ibid.*