A Sustainable Chesapeake

BETTER MODELS FOR CONSERVATION

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THE CONSERVATION FUND

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CHAPTER 4 INCENTIVE DRIVEN CONSERVATION

Patuxent Greenway Reforestation Bank

Making Up for Lost Forestland in Anne Arundel County, Maryland

As part of Anne Arundel County's forest banking program, the Patuxent Greenway Reforestation Bank LLC reclaimed a former gravel mine and created a profitable forest bank that maintained forest cover, reduced pollution and provided endangered species habitat.

CASE STUDY SUMMARY

The Patuxent Greenway Reforestation Bank is located in southern Anne Arundel County, in Harwood, Maryland, along the Patuxent River. This 70-acre forest was planted in 2000 by the Patuxent Greenway Reforestation Bank LLC on a retired gravel mine that was formerly owned by the Brandywine Sand and Gravel Company. The forest bank has maintained forest cover in the county along the Patuxent River Greenway; provided habitat for endangered species; provided developers with a flexible mechanism to meet the requirements of Maryland's Forest Conservation Act and Chesapeake Bay Critical Areas Act; and gave a private landowner the capital and financial incentives needed to do important environmental restoration and conservation work.

As a result of historic quarrying operations, which occurred from 1950 to 1995, the Brandywine property was virtually barren with very few trees on it when the mine was capped in 1997. In accordance with state regulations to protect the environment and promote the reclamation of mined areas, the Brandywine Sand and Gravel Company re-graded and fertilized the site, which controlled erosion, promoted germination of seeds, fostered biodiversity, and increased the moisture-retention capacity of the soil. The Patuxent Greenway Reforestation Bank LLC purchased the property in 2000, placed an easement on it, and planted 100 trees per acre to create a forest bank. It then sold forest credits to developers to make the bank a profitable endeavor. This on-the-ground, incentive-driven conservation project could be replicated in other areas of Anne Arundel County or in any county in Maryland.

RESOURCE MANAGEMENT CHALLENGE

Forests are crucial to maintaining the quality of life in Anne Arundel County. Forests are the most beneficial land use for promoting and maintaining clean water.[1] Forests also safeguard wildlife habitat, contribute millions of dollars to the economy, protect public health, provide recreation opportunities, and enhance the quality of life for county residents. However, like many areas of Maryland, Anne Arundel County is rapidly urbanizing and faces intense development pressure, which results in significant loss of forest cover. From 1986 to 1999, Anne Arundel County lost 42% of its forests.[2]

Anne Arundel County's resource management challenge along the Patuxent River is to sustain existing forest cover and establish and manage riparian and upland forest buffers. Spurred by public demand, the Anne Arundel County Greenways Master Plan places a high priority on conservation of the Patuxent River Greenway and in particular a 25-mile segment in the southern portion of the county. Back in 1998, area residents determined that they wanted a greenway to mitigate the land use impacts from agriculture, residential development, and mineral extraction activities. They also sought increased public access to the Patuxent River for recreation.[3]

The former Brandywine gravel mine not only lacked forest cover, but also was a potential source of sediment and nutrient runoff into the

View of Patuxent Greenway Reforestation Bank.

Patuxent River. The formation of the Patuxent Greenway Reforestation Bank presented a means to solve a potential pollution problem at this site and restore forest in the county's designated greenway, all while turning a profit. In addition, the property could offer a private recreational resource for hunting and fishing.

CONSERVATION VISION

A variety of state and county laws and programs exist to protect important riparian area habitat along tributaries to the Chesapeake Bay, but few provide the free market financial incentive of forest banks. Anne Arundel County's Forestry Program, which allows for the use of forest banks, was developed in response to Maryland's Forest Conservation Act. The law was developed and adopted specifically to control the documented loss of forests in Maryland due to development. In short, the act holds developers and landowners responsible for preserving forests and replanting them to make up for any clearing above a certain threshold during construction.

Milt McCarthy, a trained wildlife biologist, has worked with developers and landowners for 30 years. He recognized that few developers were doing their own replanting. Instead, they were participating in the county's fee-in-lieu program, which requires them to pay up to $1.20 per square foot ($52,272 per acre) to replace forest in the county's Critical Area within 1,000 feet of tidal waters, and 50 cents per square foot ($21,780 per acre) to replace forest outside of the Critical Area. McCarthy recognized the forest bank concept as a cost-effective alternative to the fee-in-lieu program that could satisfy the requirements of the county's Forestry Program, so he created the Patuxent Greenway Reforestation Bank LLC and developed several profitable forest banks.

IMPLEMENTATION RESOURCES

The Patuxent forest bank was privately financed by the Patuxent Greenway Reforestation Bank LLC. The organization purchased the property at an undisclosed price and subsequently invested approximately

Anne Arundel County's Forestry Program

Anne Arundel County's Forestry Program allows developers and landowners three options to compensate for forests converted to other uses when on-site replacement is not possible:

- Conducting on-site replanting at another location they own or purchase;
- Paying a per-square-foot-fee of required forest mitigation into a fee-in-lieu program; or
- Buying tree credits in approved forest banks.

The forest bank created by the Patuxent Greenway Reforestation Bank LLC is an excellent example of incentive-driven conservation.

$4,000/acre (about $280,000 total) in forest conservation planning, land management, and tree plantings. Rodney Banks, a forester with the county government, provided important assistance during the process. McCarthy and his family did much of the planting on their own. In subsequent years, the Patuxent Riverkeeper and a series of volunteers have helped with trash removal in the property's floodplain.

The county's forest banking program requires that all forest banks be insured with bonds. If for some reason the landowner does not follow through on reforestation plans or the trees die and are not replanted, the bonding agent will replant them. Bonding costs approximately 1% per year, for the first five years of the project. The Patuxent Greenway Reforestation Bank avoided much of the bonding costs by planting in advance of market demand and with enough time for the trees to become sufficiently well established. This demonstrated the vitality of the trees and reduced the required bonding time from five years to less than three years.

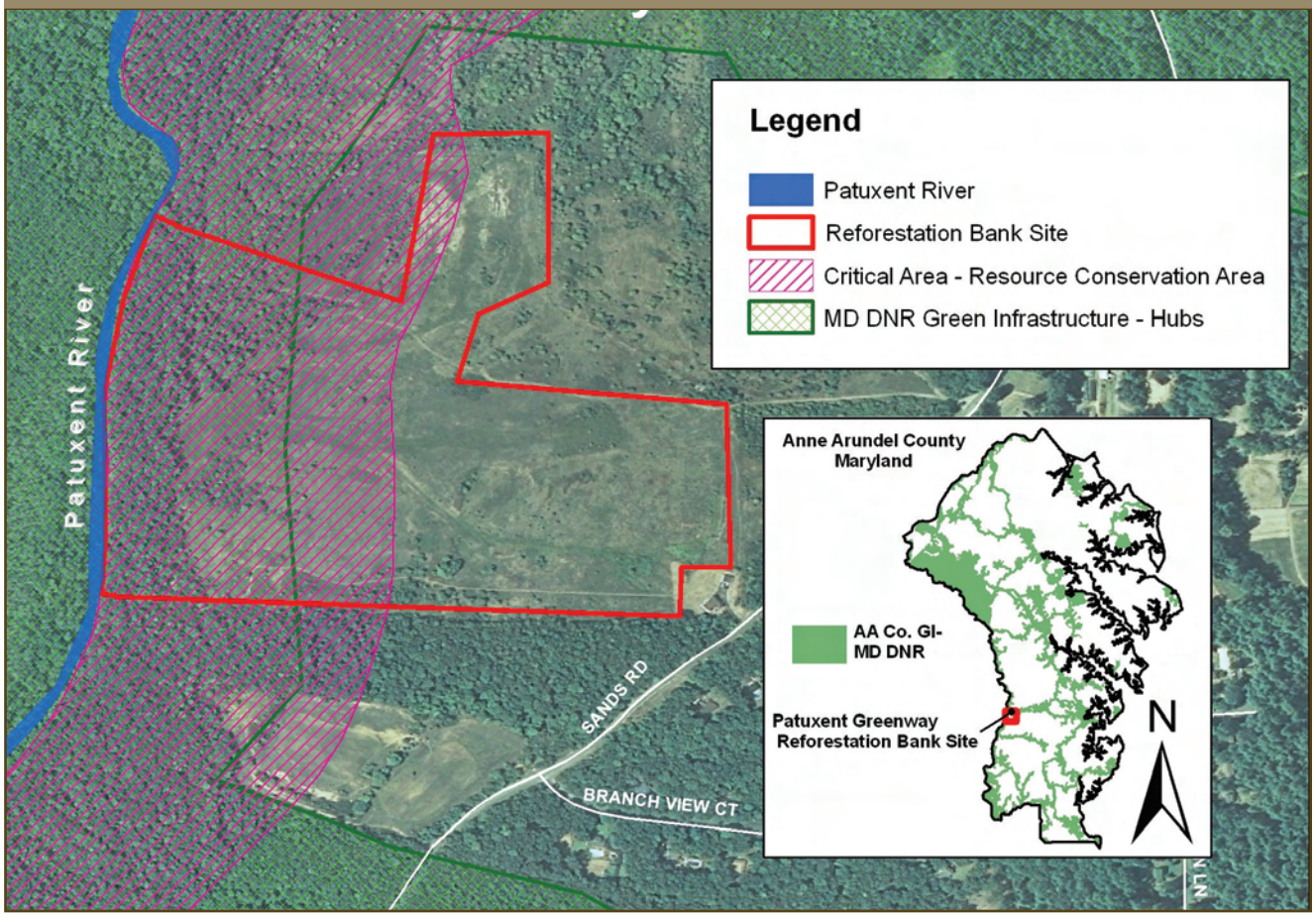
The property tax burden was reduced by entering into a Forest Conservation Management Agreement (FCMA) with the Maryland Department of Natural Resources and filing an application for an Agricultural Use Assessment (AUA) with the Maryland Department of Assessments and Taxation. An FCMA is a legal agreement that includes a forest management plan, conducted by a registered professional forester in consultation with the owner, which outlines forest management objectives.[4] An AUA indicates that the landowner is using the property for agricultural purposes. In return for signing a five-year FCMA and receiving an AUA, the property was assessed at $125 per acre and valuation was frozen at the assessed level for the life of the agreement

CONSERVATION STRATEGY

The Patuxent Greenway Reforestation Bank operated under the following objectives:

- Restoring forest cover to control sediment and nutrient runoff
- Creating wildlife habitat for recreation and hunting in the Patuxent River Greenway
- Ensuring sound management and security for the property

Patuxent Greenway Reforestation Bank



- Earning a profit from the investment in the property and its restoration

As a part of the mine restoration process, Brandywine Sand and Gravel Company worked with Synagrow, a contractor that operates wastewater treatment facilities, to inject treated waste material into the soil. This treatment was needed to provide restoration plantings with sufficient nutrients for sustained growth. Without soil amendments, trees could not grow. The Patuxent Greenway Reforestation Bank site was later planted with coniferous and deciduous trees. Some of the trees in the older mining sections of the property had an 8-inch diameter, and container plants were in 3 to 5 gallon containers. Unfortunately, drought killed the trees planted during 2002 and 2003, so replacement plantings were required. The plant density on the site is 100 trees per acre. Conifers appear to have had the highest survival rate on the site. The restoration effort required occasional mowing for the first three years. All the materials were installed in phases from 2000 to 2006.

The growing forest has created excellent habitat for deer, quail, and fox. Along the Patuxent River where there is mature flood plain forest, one can observe colonial nesting birds, nesting wood duck, beaver, and river otter. To ensure sound management and security of the property, the Patuxent Greenway Reforestation Bank operates under an agreement with the Maryland Natural Resource Police that allows them to hunt during the appropriate season in return for monitoring the property and dealing with occasional poachers and trespassers in all-terrain vehicles. In addition, Patuxent Greenway Reforestation Bank site has benefited from the Patuxent Riverkeeper, a non-profit watershed advocacy organization, through their volunteers efforts in cleaning up the riparian area of the property.

Planted or Naturally Colonized Woody Vegetation at Patuxtent Greenway Reforestation Bank

Common Name	Scientific Name
Sycamore	*Platanus occidentalis*
Green ash	*Fraxinus pennsylvanica*
Black willow	*Salix nigra*
Southern red oak	*Quercus falcata*
Black locust	*Robinia pseudoacacia*
Virginia pine	*Pinus virginiana*
Loblolly pine	*Pinus taeda*
Black cherry	*Prunus serotina*
Eastern red cedar	*Juniperus virginiana*
Crabapple	*Malus sylvestris*
White pine	*Pinus strobus*
River birch	*Betula nigra*
Sweet gum	*Liquidambar styraciflua*
Red maple	*Acer rubrum*

The forest bank is encumbered with a perpetual restrictive easement, which prevents any future development or clearing of the forest. The county holds the easement and has monitoring responsibilities. The easement will convey with the property's future owners indefinitely. McCarthy has willed both the organization and its various properties, including the Patuxent Greenway Reforestation Bank, to his children, who he hopes will manage and enjoy the properties for years to come.

The county has helped refer potential buyers to the Patuxent Greenway Reforestation Bank. The buyer works with the county planner to determine the official requirement in acres. The Patuxent Greenway Reforestation Bank provides the buyer with a contract for the banked acres. Once the transaction is complete, the buyer must prove to the county planner that the required acres have been purchased from an approved forest bank. Then the buyer has satisfied the forest conservation requirements and may receive their development permits from the county, pending approval of the various other non-forest conservation requirements.

RESULTS

The reforestation and property clean-up has enhanced the Patuxent River Greenway along an important section of the river. A former pollution source to the river has been converted into a sink for nutrients, filter for sediment and habitat for endangered species. Volunteers with the Patuxent Riverkeeper have removed several tons of trash from the property—including old cars, gas cylinders, and washing machines—which improved the aesthetics for boaters on the river.

The Patuxent Greenway Reforestation Bank reforested 30 acres in the Critical Area portion of the property and 32.8 acres outside the Critical Area. To date, it has sold 90% of the forest credits for the property. The property is now used as private conservation land for McCarthy, his family, and

Volunteers with the Patuxent Riverkeeper remove trash from the floodplain of the Patuxent Greenway Reforestation Bank further improving wildlife habitat and aesthetics of the river.

friends. The project was highly profitable and exceeded a 100% return on the investment.

The southern edge of the property appears to contain the largest population of wild lupine (*Lupine perennis*) in the State. This threatened species is thriving in the sunny woodland areas of the forest bank. The Maryland Department of Natural Resources is currently examining the property for potential inclusion in the voluntary Landowner Incentive Program, which provides cost-share assistance funding from United States Fish and Wildlife Service to private landowners to protect, enhance, and restore habitat for rare, threatened, and endangered species.

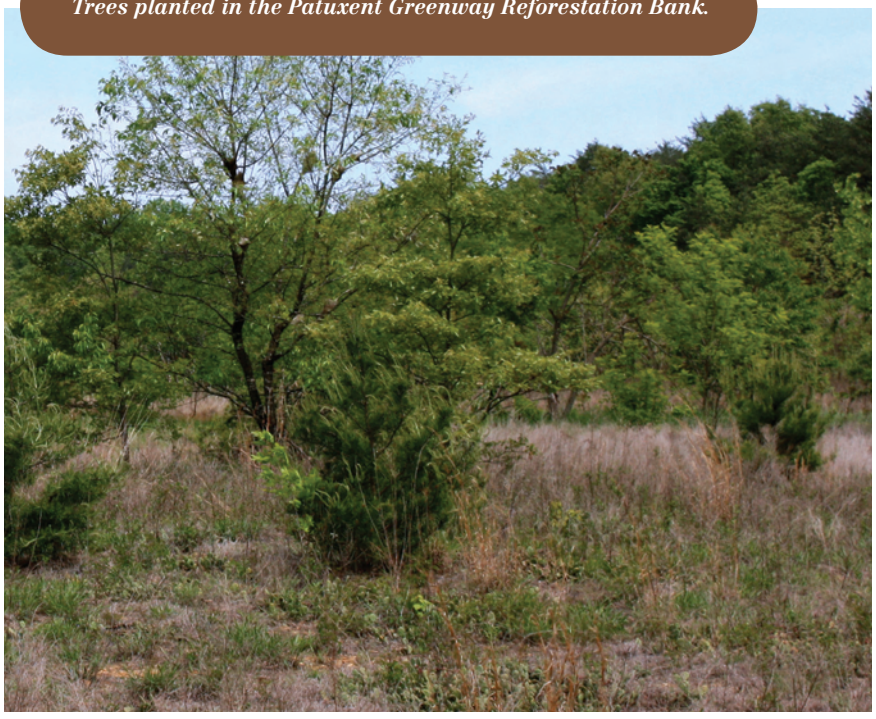
The Patuxent Greenway Reforestation Bank subsequently purchased another 50-acre gravel mine just down river, where many of the practices discussed above were replicated. This downstream property is also in the Patuxent River Greenway and contributes to the restoration of water quality and wildlife. The forest credits created from this second project have also been sold to developers at a profit.

KEYS TO SUCCESS

The Patuxent Greenway Reforestation Bank shows how forest banking can be done to maintain forest cover and restoring degraded lands, while ensuring a good financial return for landowners. Some keys to the project's success are:

- **Knowledge of the System:** McCarthy's many years as a wildlife biologist and consultant allowed him to become very familiar with the Forest Conservation Act,

Trees planted in the Patuxent Greenway Reforestation Bank.



Critical Areas Act, and other associated restoration laws. He saw an opportunity to restore the environment and make money doing it.

- **Public Support for the Patuxent River Greenway:** The public's early interest in the Patuxent River corridor provided a key impetus for local governments to support the restoration of deforested land in priority areas.
- **Private Capital:** The Patuxent Greenway Reforestation Bank provided its own capital for this venture. It planted the trees in advance of market demand, thereby reducing bonding costs and allowing the plants to mature.

PHOTOS AND FIGURES

Pages 153, 154: Photos, Joel Dunn
Page 155: Figure, Burke Environmental Associates/The Conservation Fund, using Google Earth image
Page 157: Photo (top), Patuxent Riverkeeper; photo (bottom), Joel Dunn
Page 158: Photo, Sara Tangren

REFERENCES

[1,2]Sprague, E., D. Burke, S. Clagget and A. Todd (editors). 2006. *The State of Chesapeake Forests*. The Conservation Fund, Arlington, VA. 114 pp. +appendices. Available online at: http://www.na.fs.fed.us/watershed/socf.shtm.

[3]Anne Arundel County. 2002. Anne *Arundel County Greenways Master Plan*. Anne Arundel County, Annapolis, Maryland. 79 pp. + appendices. Available online at: http://www.aacounty.org/PlanZone/MasterPlans/Greenways/.

[4]Kays, J. and V. M. Shultz. No date. Tax and Estate Planning for Maryland Forest Landowners. Maryland Cooperative Extension. 12 pp. Available online at: http://extention.umd.edu/publications/pdfs/FS639.pdf.

Wild lupine (Lupine perennis) in bloom on the eastern shore of Maryland. This threatened species was found at the Patuxent Greenway Reforestation Bank.

FOR MORE INFORMATION

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