

A Sustainable Chesapeake

BETTER MODELS FOR CONSERVATION

Edited by David G. Burke and Joel E. Dunn

THE CONSERVATION FUND



The case study you have downloaded is highlighted below. Other case studies from this Chapter of *A Sustainable Chesapeake: Better Models for Conservation* can be individually downloaded. The editors encourage readers to explore the entire Chapter to understand the context and sustainability principles involved with this and other featured case studies. The full publication contains 6 Chapters in total: Climate Change Solutions, Stream Restoration, Green Infrastructure, Incentive Driven Conservation, Watershed Protection and Stewardship.

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Effective Forest Banking

Forest Conservation in Carroll County, Maryland

Carroll County's forest banking program provides the county with an effective mechanism to stop the loss of forest cover from development and offers landowners the opportunity to protect land and water while making a profit.

CASE STUDY SUMMARY

Carroll County is at the cutting edge of effective forest banking and conservation efforts in Maryland, with an 82% forest retention rate compared with the state's 65% average.

At the beginning of the 20th century, the Carroll County landscape—like most of Maryland—had been purposely cleared of forests for agriculture. Much of the remaining historic forest tracks are now located on land deemed inappropriate for agriculture. The clearing of land for cultivation and pastures slowed dramatically, allowing some forest to return, until the middle of the 20th century when Maryland once again began losing forest, this time as a result of expanding urban development. The county currently has approximately 70,000 acres of forested land, which is about 25% of its total land area.¹

The Maryland Forest Conservation Act was passed in 1991 in an effort to offset development-related forest loss. In 1992, in accordance with the Forest Conservation Act, Carroll County implemented a Forest Conservation Code. The code contains stringent requirements, applicable to all categories of development, which

are designed to control forest loss and ultimately increase forest acreage in the county. These requirements affect business and industrial sites as well as residential development.

Carroll County's Forest Conservation Code includes a pioneering effort that established the use of a forest banking program. Forest banking is a conservation tool that involves the relinquishment of development rights by a landowner on newly planted forest, which generates mitigation credits that can be exchanged for a payment.² The payment typically comes from a developer who must replace forest that has been cleared at another location. Although the code has evolved since its first iteration, the use of forest banking as a mitigation alternative has survived because of its effectiveness.

The forest banking program has restored hundreds of acres of forest in Carroll County and created economic opportunities for landowners. In addition, the program enhances forest stewardship through environmentally sensitive or sustainable forest management. Currently there are varying requirements for the establishment of environmentally sensitive or sustainable forest banks

in Maryland, but Carroll County's program has exceeded all expectations set forth when the program was initially adopted.

RESOURCE MANAGEMENT CHALLENGE

Forests are crucial to maintaining water quality in Carroll County. They 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. Nevertheless, Carroll County has far less forest cover than most other Maryland counties, due to its agricultural history. In addition, the availability of open land provides a prime opportunity for suburban development, which threatens current and future forests.

Carroll County has within its boundaries eight incorporated towns, each of which is a nucleus for development. Retention of existing forests within the county is a high priority. Without a concerted effort, the most valuable and vulnerable forests could disappear, making the land less able to absorb and retain pollutants, thus impairing water quality and associated aquatic and riparian living

resources. Carroll County's resource management challenge is to maintain existing forestlands and target afforestation/reforestation efforts to maximize long-term forest sustainability and enhance water quality, particularly along riparian corridors.

CONSERVATION VISION

Maryland's Governor William Schaefer created a task force in 1990 to assess the problems and potential of Maryland's forests. The task force recommended creating a forest conservation, protection, and reforestation law, written by the Department of Natural Resources' Forest Service and others, called the Forest Conservation Act.³ Passed in 1991, the Forest Conservation Act was specifically intended to control the documented loss of forests in Maryland as a result of land development. It stands as the first law in the United States to require forest loss minimization and mitigation when regulated land use changes occur.

The Forest Conservation Act, implemented on the local level, has been responsible for the review of 199,925 acres of forest on land scheduled for development, of which 120,638 acres were retained, 71,885 acres were cleared, and 21,461 acres were planted with new forest.⁴ Carroll



County's forest conservation program was developed in response to the Act; the forest banking provisions are an innovative way to provide developers with an alternative way to meet its requirements.

IMPLEMENTATION RESOURCES

The Carroll County Bureau of Resource Management administers the Forest Conservation Code, including project reviews and forest banking provisions. Land developers pay for the establishment of forest banks. Forest bank landowners typically require the services of a forester to

develop a forest conservation plan and survey the land. These costs are driven by the market.

CONSERVATION STRATEGY

The Maryland Forest Conservation Act and the Carroll County Forest Conservation Code place the highest priority on retention of existing forest land, as opposed to on-site removal and reforestation at another location. In compliance with the state law, Carroll County requires permittees for any construction project that disturbs an area of 40,000 square feet or greater to complete a forest stand delineation and a forest conservation plan. In certain situations, the stand delineation and conservation plan may require reforestation, which is the replacement of forest, or afforestation, which is the establishment of a forest in an area where the preceding land use was not forest.⁵

Carroll County adopted a local ordinance that is tailored to its rural/agricultural character. The ordinance generally requires a one-to-one replacement for forest removal, does not allow fee-in-lieu payments, and establishes the use of forest mitigation banks.⁶ Carroll County has had

BENEFITS OF THE CARROLL COUNTY FOREST CONSERVATION BANKING PROGRAM

- ▶ Helps maintain overall forest cover in the county
- ▶ Complements other elements of the county code to reinforce a no-net-loss of forest approach
- ▶ Offers flexibility for landowners and developers to comply with the Forest Conservation Code
- ▶ Provides protection and preservation of sensitive areas through the use of permanent easements
- ▶ Represents a good tool for forest management



A typical Carroll County landscape, a few miles south of the Pennsylvania border.

particular success at retaining forest and implementing its forest banking procedures for off-site reforestation.

The county's afforestation threshold requires that business and industrial construction sites must have 15% of the property forested and that residential and agricultural construction sites must have 20% of the property forested.⁷ In an effort to focus on retention, the county has also implemented best management practices in the forest conservation plan development process, providing construction contractors with examples of protective measures that stress survival of existing forests on the construction site. All remaining forests on development sites, and any newly planted forest, must be placed in long-term protection, through the assignment of a perpetual protective easement.⁸

Despite the stringent retention measures in the county ordinance,

new plantings may be required either through afforestation or reforestation at an off-site planting location. In an effort to simplify replanting efforts and ultimately yield larger and more contiguous blocks of forest, Carroll County created its innovative and effective forest banking procedure.

Using Forest Banks: Carroll County was the first local jurisdiction to propose and develop the use of forest banks to satisfy Maryland's Forest Conservation Act. Forest banks are established in a variety of ways, but always require landowners to either plant trees or allow for trees to be planted on their property. In order to protect new plantings, the landowner accepts permanent protection and gives up any development rights on the newly planted property. In cases where the bank is being established on land not owned by the bank owner, the planting is exchanged for a payment, based on the assessed value of forest acreage.

KEY FOREST CONSERVATION REQUIREMENTS IN CARROLL COUNTY⁹

- ▶ **A Forest Stand Delineation** is an inventory of existing site conditions and forests and is used during the preliminary review process to determine the most suitable and practical areas for forest conservation during development.
- ▶ **A Forest Conservation Plan** is a planning and construction document that provides specific plans for the amount of the forest which will be retained, reforested, or afforested; the locations where this will occur; proposed protection measures taken during development; construction scheduling; maintenance and monitoring procedures; long-term protection measures; and other measures that may be required.
- ▶ **Tree Quality Best Management Practices** include
 - 1) pre-development evaluation,
 - 2) development design considerations;
 - 3) construction protection measures including post construction damage mitigation and cleanup, and
 - 4) post-development, long-term resource management measures.

The benefits of forest banks are many, but they principally offer the alternative of establishing forest cover prior to development. Banks can be used to create plantings in priority areas, such as stream buffers, that a development site may not offer. Both on and off-site plantings under the county forest conservation program are





EXPLORING FOREST BANK MARKET CONDITIONS

- ▶ Review current and anticipated forest banking regulations and requirements.
- ▶ Determine the current supply of available forest bank acreage. Secure a list of certified forest banks from the County government. Be sure the numbers are current.
- ▶ Evaluate the planning/development climate, including moratoriums and zoning changes. Contact a number of sources, such as County Offices of Planning, Economic Development, and Bureau of Resource Management; local surveyors and engineers; and the Home Builders Association.
- ▶ Determine the current market value of forest banks on a per-acre basis.
- ▶ Determine the costs associated with producing or buying forest from a forest bank.
- ▶ Contact a registered professional Maryland forester or a qualified professional familiar with the forest banking process.

preferred in priority areas, including banks. Also, when working on commercial and industrial development sites with limited or marginal lands, forest banks can consolidate smaller, isolated restoration efforts into larger contiguous tracks with better long-term prospects for a healthy forest. In application, Carroll County has developed and adopted principles, rules, and specifications that have created favorable market conditions and made forest banks particularly effective.

Forest Bank Rules and Conditions:

A person who owns property that is not forested may submit an application to the county for approval of a forest bank. The county must then review the application and determine, based on the physiographic priorities established in the Carroll County Forest Conservation Manual, whether the location, size, and other characteristics of the property are suitable.

Once the application is approved, a bank establishment plan must be developed and submitted to the county. When the plan is approved,

the bank must then be certified prior to the sale of any credits. A perpetual protective easement is required as a part of the certification process. The certification process also requires the completion of a 36-month forest maintenance period and adherence to specified tree survival rates.

When a development project involves a forest bank to satisfy conservation obligations, the developer must cite which bank will be used on the forest conservation plan and provide proof that the bank credits have been purchased. The use of a forest bank site must also be recorded in the land records and is subject to inspection every three years to ensure that the terms of the conservation easement are met.

Contracts, Responsibilities, or

Indemnification: The forest bank owner typically provides a forest bank purchase agreement whereby the bank owner promises and assumes all legal obligations for the off-site forest requirements, including posting of a monetary bond, inspections, survival rate guarantee, maintenance, etc. The buyer or developer provides

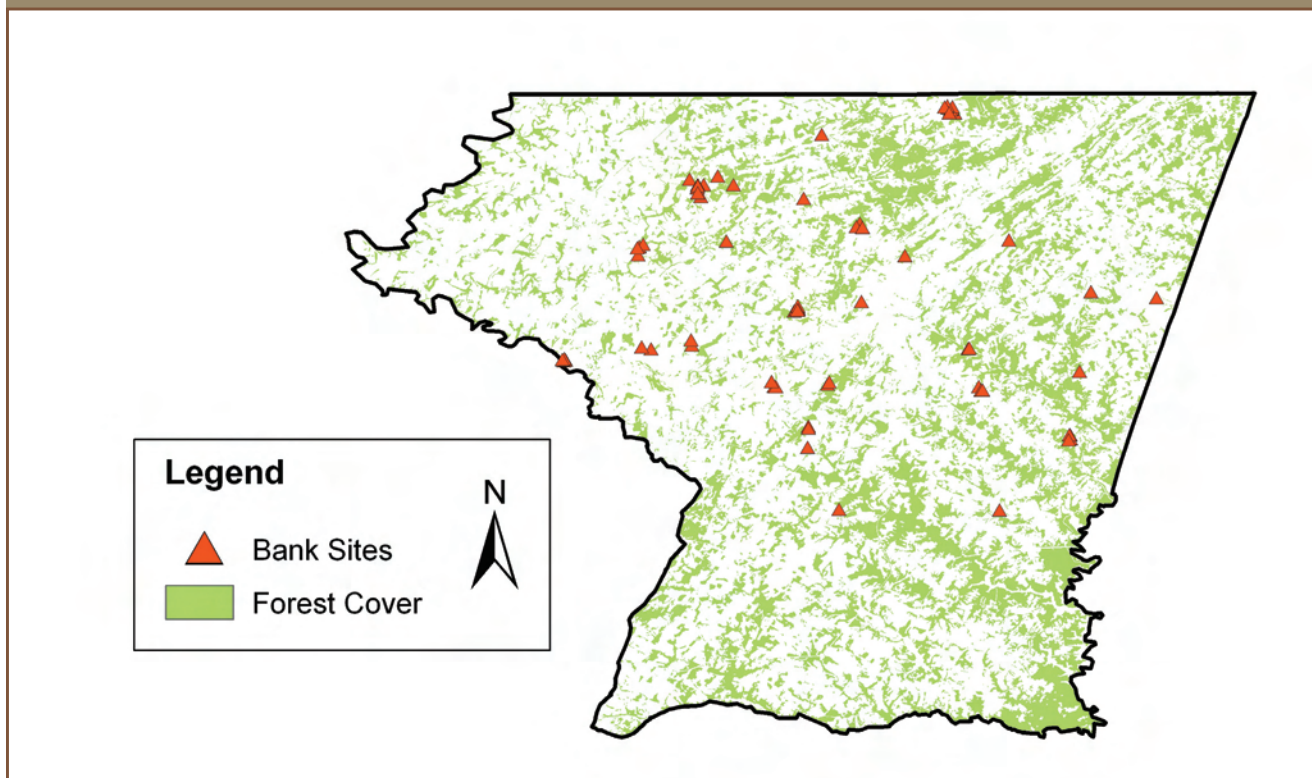
full payment to the forest bank owner and is provided with a written “proof of purchase” of forest bank credits (for a specific project) for presentation to the Carroll County Bureau of Resource Management. This type of arrangement is referred to as a “turn-key” agreement, signed by both parties. These agreements range from five pages to a simple one-page document. The county recommends that forest bank owners seek their own legal consultation in addition to discussing their responsibilities, agreements, and easement restrictions with the county attorney.

Market Conditions: Forest banking has been particularly successful in Carroll County due to the enormous development surge that occurred during the 1990s. This created the free market conditions and demand needed for a thriving banking industry. By establishing a forest bank, marketable credits are produced that can be sold to those who need to satisfy forest replacement requirements. The familiar economic principle of supply and demand holds true in determining forest banking market conditions.

The volume of development plans being processed and progressing to the final approval level is usually the best indicator of demand in the Carroll County marketplace. If the planning process is active and moving forward, then off-site forestation may be necessary and forest banking could be an integral method to meet those needs. Since Carroll County introduced forest banking in the mid-1990s, approximately 653 acres required an off-site planting alternative. Sixty-two percent or 397.6 of those acres were supplied by forest banks.

Sales of forest bank credits follow the trends and cycles of the overall economy. Given the current economic trend, forest bank credits are not

► Forest Bank Sites in Carroll County, Maryland



moving as quickly as in past years. Additionally, changing regulations (including proposed zoning changes) have an unknown affect on forest bank credits sold annually. In the long term however, the on-going need for off-site forest banking credits is expected to continue. Knowing and understanding the local market conditions is crucial before engaging in the venture of forest banking.

Carroll County Forest Conservation Statistics	
Element	Acres
Bank afforested	179.3
Bank reforested	218.3
Total bank acres	397.6
Other acreage	
On-site retention	584.1
On-site afforested	81.3
On-site reforested	139.5
Off-site retention	26
Off-site afforested	103.8
Off-site reforested	142.2

Market Confidence: For landowners or businesses interested in forest banking, determining market confidence is part of the work necessary to minimize risks and reach the comfort level needed to establish a bank. Understanding buyers' numerous considerations may help. When a development project has no other option than to mitigate forestation requirements at an off-site location, their preference has been to acquire forest bank credits by "turn-key" agreement from a certified forest bank for numerous reasons. The various challenges facing developers, particularly time constraints and financial carrying costs, make it desirable and practical to have a third party do the work of establishing the forest bank, so that certifiable credits are immediately available.

Market Access: Once a forest bank is certified, it is listed with all the other forest banks in Carroll County by the Bureau of Resource Manage-

ment. Available bank acreage and contact information is provided for the potential buyer/developer to initiate contact with the bank owner. Some forest bank owners prefer to handle the business calls and contract arrangements directly with the developer and some defer this to a representative familiar with the industry, such as environmental consultants, engineers, or surveyors. Marketing can also include a letter to developers introducing a banking entity and bank acreage availability. Pricing information is usually not included and is provided with specific inquiries.

Market access to prospective buyers of forest bank credits is very important in reducing the time it takes to recoup the forest bank owner's investment. Forest bank credits are rarely sold in one transaction. In most cases, particularly if the forest bank is large, it will take numerous projects over a long time span to completely





Stone Road Forest Bank (in background) adjacent to typical row plantings.

use the bank acreage. Forest bank owners can improve market access by networking with local surveyors, engineers, and environmental consultants who work directly with developers.

Price: Historically, forest bank pricing has fluctuated but the range has remained stable since its inception in the 1990s—generally from \$11,000 to \$15,000 per acre. This variation is due to supply and demand, along with the investment costs required to get a bank to the point of certification. Every potential forest bank site has variables (such as boundary survey costs, site prep, etc.) and should be discussed with a registered forester or a Maryland Department of Natural Resources qualified professional, as well as a surveyor or engineer. Some banks use an average flat rate price; other banks use a price schedule and discount pricing depending on the quantity of acreage purchased.

RESULTS

In Carroll County, 397.6 acres of forest have been created by forest conservation banks since the inception of the

Maryland Forest Conservation Act in 1991. Carroll County landowners are engaged in the establishment of viable and marketable forest conservation banks. The projects highlighted below represent a sample of numerous successful efforts.

Stone Road Forest Bank

Year Completed: 2000 to Present

Acres: 35

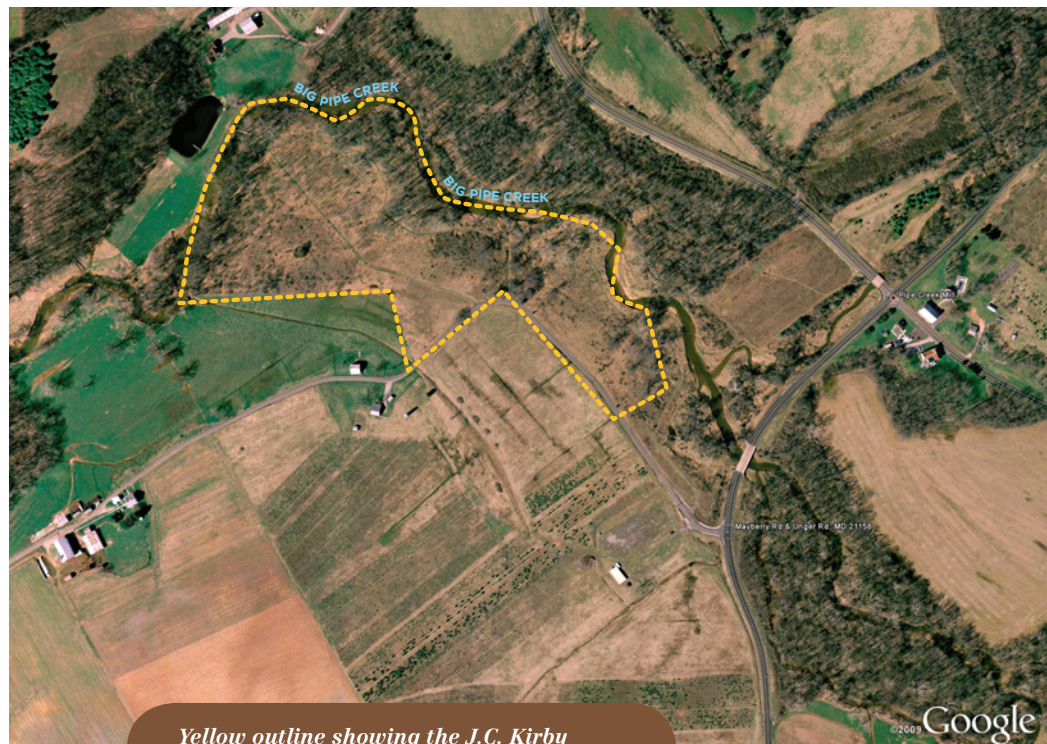
Created in 2000, the Stone Road Forest Bank converted a non-productive, over-mature apple orchard and cultivated agricultural fields to a forest bank. The project includes a new 10-acre section currently in the planning stage. The forest bank will enhance water quality in the area by protecting on-site headwaters of an unnamed tributary to Big Pipe Creek. Core partners include property owner Mark E. Lynn; environmental specialist Glenn Edwards of CLSI, Inc.; and registered professional forester Len Wrabel of Mar-Len Environmental, Inc.

J.C. Kirby Tree Bank

Year Completed: 1997

Acres: 25

The J.C. Kirby Tree Bank created a riparian forest that buffers Big Pipe Creek. In response to market conditions, Mr. Kirby, once a large commercial Christmas tree producer, proactively changed the land use



Yellow outline showing the J.C. Kirby Forest Bank adjacent to Big Pipe Creek.



LEFT: *Bivona forest bank is on a residential lot and adjacent to existing forest.*
RIGHT: *Mayberry Game Protective Association Forest Bank showing an open meadow surrounded by a natural seed source.*

from pasture and potential tree plantation to a native mixed hardwood planting following Carroll County's guidelines for forest bank creation. Core partners include property owner J.C. Kirby; environmental specialist Glenn Edward of CLSI, Inc.; and registered professional forester Len Wrabel of Mar-Len Environmental, Inc.

Bivona Forest Bank

Year Completed: 1995

Acres: 2.5

The Bivona Forest Bank project is an innovative 2.5 acre forest bank on a five-acre residential lot in rural Carroll County. Bivona sold an easement to CLSI, Inc., who then established the bank on the rear portion of the property. The bank reduced lawn maintenance for the property owner. The bank was created adjacent to an existing contiguous forest tract, enhancing one of the larger forests in the area. Small banks, when established and managed in the right setting, can have a positive cumulative effect on the environment. Core partners include property owner Dan Bivona; forest bank owner CLSI, Inc.; registered professional forester Len Wrabel of Mar-Len Environmental, Inc.; and environmental specialist Glenn Edwards of CLSI, Inc.

Mayberry Game Protective Association Forest Bank

Year Completed: 2006

Acres: 4

The Mayberry Game Protective Association Forest Bank applied a natural regeneration method using seed from surrounding forests to establish a new forest on an open meadow owned by a private conservation group. Extensive study, planning, management, and monitoring by a registered professional forester resulted in a successful forest bank. Management practices allowed natural forest regeneration while preventing invasive plants from dominating the site. Core partners include the property owner, Mayberry Game Protective Association; registered professional forester Harry Staley of Forestry Concepts, Inc; registered professional forester Len Wrabel of Mar-Len Environmental; and Environmental Specialist Glenn Edwards of CLSI, Inc.

KEYS TO SUCCESS

- **Understand the potential risks and rewards:** Successful forest bank owners have a good land stewardship mindset with a clear understanding of the potential risk and rewards any agro-forestry business venture may bring. Forest

bank owners must understand the potential risks of crop failure and the reward of crop success. They should also understand the environmental benefits, including enhanced water quality and wildlife habitat.

- **Obtain the assistance of professionals:** Successful forest bank owners hire a registered forester or a Maryland Department of Natural Resources qualified professional, as well as a surveyor or engineer, to ensure plans are done in accordance with state and county regulations.
- **Have a clear plan:** Every landowner and/or prospective forest bank owner should determine their environmental and financial objectives. This will ensure both healthy sustainable forests and economic interests.
- **Have a sound regulatory system:** A forest bank used in combination with rules to minimize forest removal and to retain existing forest helps to achieve the goals of the Forest Conservation Act. In Carroll County, the deliberate decision not to offer developers a fee-in-lieu alternative for required plantings also helped ensure success.





Stone Road Forest Bank which features a mix of planted and natural trees.

PHOTOS AND FIGURES

All photos by Glenn Edwards
Page 160, 163: Figures, Burke Environmental Associates/The Conservation Fund

Page 161: Image, Google Earth

Page 164: Figure, Burke Environmental Associates/The Conservation Fund, using Google Earth image

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