

A Sustainable Chesapeake

BETTER MODELS FOR CONSERVATION

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THE CONSERVATION FUND



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Ecosystem Payments at Work

Conserving Land in Virginia's Great Dismal Swamp

Government land management agencies and entrepreneurs can mutually benefit from emerging ecosystem market opportunities that restore and preserve important conservation lands near existing public lands.

CASE STUDY SUMMARY

Ecosystem Investment Partners' Great Dismal Swamp project showcases how conservation-minded investors can use private capital and Payments for Ecosystem Services (PES) markets to conserve important landscapes. This case study provides an innovative example of capitalizing on multiple resource and value streams of a property to align return on investment with restoring a damaged ecosystem. This incentive-driven conservation solution can be applied to other properties in the Chesapeake Bay watershed.

Ecosystem Investment Partners' (EIP) Great Dismal Swamp property is a 1,037-acre inholding in the Great Dismal Swamp National Wildlife Refuge in southeastern Virginia. This intensively managed agricultural land was once part of an enormous swamp covering close to a million acres across southeastern Virginia and northeastern North Carolina. EIP's inholding is uniquely positioned to tap the converging needs for wetlands restoration and for a ready-made market for mitigation credits in the area. EIP is taking advantage of these factors and hoping to demonstrate both on-the-ground

environmental success and financial success for their investors.

EIP was founded in 2006 by Fred Danforth, Adam Davis and Nick Dilks. They represent three components of the newly emerging ecosystem services industry: business, real estate, and conservation. Adam Davis is president of Solano Partners, Inc., an environmental investment and conservation finance consulting firm. Davis is also co-founder of the website Ecosystem Marketplace, a global information service on market mechanisms and financial incentives for conservation. Nick Dilks is a career conservationist with experience at the Nature Conservancy, the Natural Lands Trust in Pennsylvania, the Maryland Environmental Trust, and The Conservation Fund. Fred Danforth was a co-founder and partner in the private equity firm of Capital Resource Partners, which successfully raised and placed almost \$1 billion during his tenure.

EIP purchased its first property, a portion of the Great Dismal Swamp, in June 2007. While only two years into their expected 10-year ownership of the property, EIP is already showing positive results. EIP is restoring

the property to its natural wetland condition and has established a wetlands mitigation bank under the auspices of the Clean Water Act. The purchase and restoration of the property is being funded by the sale of credits from the restored wetlands to development projects in the surrounding watershed. At the end of the investment period, EIP hopes to sell the conserved and restored property to the U.S. Fish and Wildlife Service so that it may become part of the National Wildlife Refuge. As private sector entrepreneurs, EIP is taking market-based restoration and conservation to a new level, creatively using multiple markets and investment approaches to define the environmental value of an ecosystem and create incentives for its conservation.

RESOURCE MANAGEMENT CHALLENGE

In 1763, George Washington encountered the Great Dismal Swamp and saw a "worthless" swamp wasteland in need of taming. As one of the nation's first real estate developers, Washington founded the Dismal Swamp Land Company (otherwise known as "Adventurers for Draining

the Dismal Swamp”) for the sole purpose of ditching and draining the swamp for agriculture and timber harvest.

Prior to this time, the Great Dismal Swamp supported a distinctive Tupelo-bald cypress and Atlantic white-cedar forest. Long before Washington’s arrival, settlers and slaves ventured into the swamp to harvest these trees for shingles, planking, and other products. More than two hundred species of birds have been identified in the swamp, including two southern species, the Swainson’s warbler (*Limnothlypis swainsoni*) and Wayne’s warbler (*Dendroica virens waynei*), that are more common in the Great Dismal Swamp than in other coastal locations. The swamp supported a variety of mammals including: river otter (*Lontra canadensis*), numerous species of bats, racoon (*Procyon lotor*), American mink (*Neovision vision*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), eastern gray squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), American black bear (*Ursus americanus*), and bobcat (*Lynx rufus*).

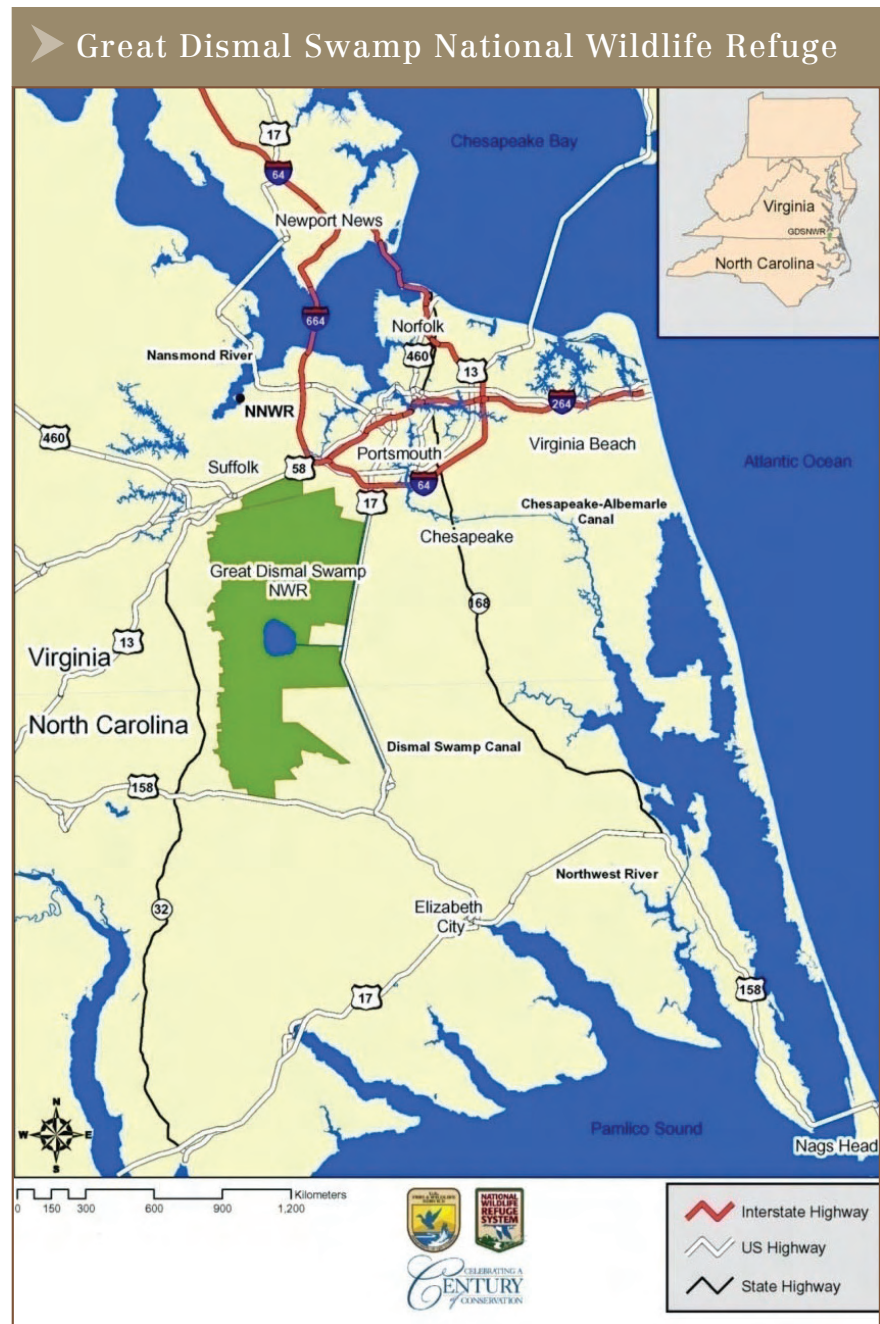
Washington’s company dredged the swamp land and built canals across the property to make it suitable for crops. Once the canals were complete, the wild swamp was rapidly converted from a naturally functioning ecosystem to commercial timberland and row crops. For three centuries, agricultural, commercial, and residential development destroyed the natural systems of the swamp until only a fraction of the original swamp remained. Logging nearly wiped out the native Atlantic white cedar and bald cypress stands, while related road and canal construction nearly destroyed the complex hydrology of the swamp. By 1950, no virgin timber remained on the property. A drier swamp and the suppression of wild-

fires created environmental conditions that drastically decreased plant and animal diversity.¹

After ownership by a succession of real estate developers, farmers, and timber companies, the fate of the swamp finally began to change. In 1973, the Union Camp Timber Corporation donated 49,100 acres of the core swamp area to The Nature Conservancy – then the largest land conservation donation by a corporation in U.S. history. The Nature

Conservancy then transferred the land to the U.S. Fish and Wildlife Service, which established the Great Dismal Swamp National Wildlife Refuge. Over the next several decades, a broad coalition of public and private conservation interests succeeded in adding more than 60,000 acres to the Refuge, bringing its total acreage to 111,000.

Efforts across the Refuge have restored much of its natural hydrology and begun to bring back many native



Lake Drummond, a 3,100-acre natural lake in the heart of Great Dismal Swamp. Aggressive logging nearly wiped out the native Atlantic white cedar and bald cypress stands in the Great Dismal Swamp, while related road and canal construction nearly destroyed the complex hydrology of the swamp. By 1950, no virgin timber remained on the property.



species. However, one 1,037-acre unprotected inholding remained within the acquisition boundaries of the Refuge. Because the Refuge surrounded the inholding on three sides, gaining ownership of this property was of the highest priority for the Fish and Wildlife Service, the State of Virginia, and numerous conservation groups.² Attempts to purchase this final piece of the puzzle were repeatedly thwarted by lack of funding, coupled with the escalating value of real estate in this area.

CONSERVATION VISION

EIP's vision for its Great Dismal Swamp property, along with its other investments, is to capitalize on the critical services provided by ecologically important lands and the new

markets for these services in order to both restore and conserve land. EIP's investment strategy focuses on the double bottom line of achieving conservation goals and financial gains. EIP creates value for its investors by purchasing large properties in need of restoration and then actively managing them to create and monetize environmental value by using market mechanisms such as mitigation and conservation banking. They also manage the timber, agricultural, and real estate attributes of these properties that do not conflict with overall conservation objectives.

EIP's principals agree that environmental protection and restoration activities can be compatible with economic development and returns

to investors. "Unlocking return on investment from conservation and restoration action on private property is a necessity to promote large scale protection of ecosystems and working landscapes," said Nick Dilks. According to EIP's Adam Davis, the marketplace is increasingly interested in such partnerships. Conservation measures are now falling into place not simply for ethical reasons, but because of the measurable ecosystem services such protection provides.³ Since purchasing the Great Dismal Swamp, EIP has invested in three additional projects in Delaware, Louisiana and Montana.

EIP found a significant portion of the capital for this project from the Lyme Timber Company, a private equity



investment firm based in Hanover, New Hampshire, that is a pioneer in economically profitable conservation projects. Lyme has traditionally focused on timberland investment projects, purchasing large timber parcels with high conservation values as a way of bringing conservation and investment dollars to the table. Because of the properties they target, they are often able to sell working forest conservation easements to state agencies that permit sustainable timber harvests as well as public recreation, thus reducing their capital investment in the property. In the first decade of the 21st century, this conservation investment innovator began to see investment opportunities in projects that included markets for ecosystem services. Accordingly, Lyme decided to invest a portion of its fund with EIP.

The previous owner of the Dismal Swamp property knew that this parcel was very important to conservation interests. Therefore, he approached The Conservation Fund about purchasing this land before placing it on the open market. The Conservation Fund contacted the newly formed EIP which, with its partner Lyme Timber, was able to put together the funds needed to purchase the property.

IMPLEMENTATION RESOURCES

The term “ecosystem services” refers to the earth’s natural functions, which include water and air purification, mitigation of droughts and floods, decomposition of wastes, regulation of climate, and maintenance of biodiversity, to name a few. Traditionally, economic systems put little or no value on ecosystem services. The vital life-supporting actions of the planet are taken for granted until disrupted or threatened. Over the last decade, however, the concept of attributing a monetary value for ecosystem services in the marketplace has



Great Dismal Swamp Jericho Ditch.

grown. There are now markets for an array of ecosystem services including the control of greenhouse gases, clean water, habitat protection, forest and watershed functions, and riparian restoration.

What distinguishes sales of ecosystem services from other forms of environmental regulation is that they must involve scientifically verifiable units of performance. In order to market ecosystem services, one must be able to quantify how much of the service is being provided. The United States has created markets for ecosystem services through state and federal environmental regulatory structures that require polluters to mitigate for unavoidable impacts of development projects.

The most active PES market surrounding the Great Dismal Swamp project is the wetland mitigation program of the federal Clean Water Act. Wetlands are complex ecosystems that improve water quality, diminish droughts, provide natural flood control, recharge groundwater aquifers, and stabilize shorelines. They

also provide important habitat for a wide range of plant and animal species and can help support commercial fisheries. Protection of wetlands in the United States is governed by a 1997 amendment to the 1972 Clean Water Act.

Section 404 of the Clean Water Act requires a permit for the discharge of dredge or fill materials into waters of the United States. Since 1997, this applies to wetlands as well. In order to obtain a permit, a developer must demonstrate that they have 1) taken steps to avoid wetland impacts, 2) minimized potential impacts on wetlands, and 3) if necessary, provided compensation for any remaining unavoidable impacts.⁴ If an impact is determined to be unavoidable, the permittee must provide “compensatory mitigation” for their project. This means that other wetlands must be restored, created, enhanced, or, in some cases, preserved in compensation for the destruction of natural wetlands. This mitigation can be done by the permittee or by a third party, such as EIP.



In April of 2008, a new mitigation rule was promulgated by the U.S. Army Corps of Engineers that established one set of standards for all Section 404 mitigation responses. The action superseded previous guidance documents and consolidated it in one rule that ranks the allowable compensation methods in order of preference. Highest preference is given to mitigation through mitigation banks, followed by fee-in-lieu programs and then permittee responsible mitigation actions. The rule further stated that every type of compensation must include a mitigation plan with a clear and uniform set of required components.⁵

A wetland mitigation bank is a legally established entity that owns a wetland, stream, or other aquatic resource that has been restored, established, enhanced, or preserved to compensate for impacts to wetlands elsewhere.⁶ Mitigation banks can be created by private corporations, nonprofit organizations, and/or government agencies through a formal agreement with a regulatory agency. The value of a bank is defined by the mitigation credits it creates. One benefit of third-party mitigation is that the permittee transfers all liability to the bank and the mitigation is usually done by an entity with more restoration experience than the permittee/developer. Between 1992 and 2005, there was a 376% increase in the number of approved mitigation banks owned by for-profit and nonprofit organizations. Since 2001, the number of mitigation banks that have sold all of their credits has tripled.⁷ In 2007, the Environmental Law Institute found that the annual United States wetland mitigation market was worth \$2.9 billion.⁸

CONSERVATION STRATEGY

Prior to purchasing the property, EIP went through a rigorous process of

Formula for Credit Creation at EIP's Dismal Swamp Bank		
	Acres	Credits
Preservation	243.33	24.33
Restoration	689.09	686.09
Upland Buffers	4.36	0.29
Enhancement	29.15	1.45
Easement Bonus	0	35.608

“due diligence” to determine whether their financial estimates for the various PES markets were accurate. They anticipate ongoing demand for credits from small-scale projects as well as additional large-project demand that will be generated by public infrastructure projects like roads, airports, and transmission lines. When EIP purchased the property, there were three large projects planned for the next three to five years that would require up to 370 acres of mitigation. Since there is only one other wetland mitigation bank in the area with available credits, EIP's anticipated market share is very favorable. The approximate value of wetland credits in the area has historically been in the range of \$12,000 to \$15,000 per acre.

EIP will restore and conserve former wetlands that had been converted to agriculture on the Great Dismal Swamp property. Demand for wetlands mitigation in this part of Virginia is driven by commercial and residential development and road construction in and around the Virginia Beach, Chesapeake, and Norfolk metropolitan area. EIP, with the help of the Williamsburg Environmental Group, has established a wetlands mitigation bank, the Dover Farm Mitigation Bank on 966 acres of the property. The site on which the Bank is situated is comprised of 239 acres of existing wetlands, approximately 700 acres of agricultural land, and 27 acres of nonagricultural upland terrain. Approximately 71 acres of the property that was entirely uplands was excluded from the Bank.

The goal of the Bank is to “establish a self-sustaining functional aquatic system to replace the functional values of wetlands and other aquatic resources anticipated to be adversely affected within the authorized service area.” The Bank's credits may be used to offset development impacts within the Albemarle Sound drainage basin, which includes all or part of South Hampton County, Chesapeake City, the City of Suffolk, and the City of Virginia Beach. The Bank will generate a total of 747 wetlands credits and has already sold all 112 of its pre-released credits to the Hampton Roads Executive Airport project. The area included in the mitigation bank is subject to a conservation easement donated to The Nature Conservancy.

The number of credits created per acre depends on the type of land in the bank. More credits are given for restoring land than for preserving existing wetlands. The table entitled Formula for Credit Creation at EIP's Dismal Swamp Bank shows how credits were allocated.

The Bank will be developed over several years. Construction was completed in 2009, with grading and plugging of the ditches that traverse the site and the installation of hydrological control structures. EIP also selectively graded the property to create variations in micro-topography and increase habitat diversity. The entire property has been seeded with a wetland seed mix and planted with over 290,000 native trees and shrubs. The plant diversity will also reflect

The Dover Farm portion of the Great Dismal Swamp Property before restoration: drainage ditches illustrate the way that water had been managed on the site. Working with local experts in hydrology, conservation biology and soil science, EIP develops and implements detailed restoration plans for each project.



those volunteer species already present and species found at the adjacent Refuge. The Williamsburg Environmental Group worked closely with the U.S. Fish and Wildlife Service to ensure the appropriate species mix was planted on the site.

The Refuge contains identified habitat for the state endangered canebrake rattlesnake (*Crotalus horridus*) and the bank has the potential to provide additional habitat. After generating wetland credits, a secondary goal of the bank is the expansion of canebrake rattlesnake habitat on upland portions of the property.¹⁰ EIP has been authorized by the U.S. Army Corps of Engineers and Virginia Department of Game and Inland Fish to sell rattlesnake credits off 239 acres of the wetland bank.¹¹

There are other current and potential revenue sources on the property. Prior to commencement of restoration activities, EIP leased the farm fields for corn and soy bean production. Recreational leasing for quail, waterfowl, deer, and bear hunting also provides some revenue. Virginia is in the process of establishing a cap

and trade system for reducing Total Maximum Daily Loads of nutrients into the Chesapeake Bay watershed. Depending on the rules that are ultimately established, it is possible that EIP could receive credit for water quality improvements made as the farmlands are restored to forested wetlands. These credits could then be sold much like wetland mitigation credits to entities that need to offset their nutrient outputs. There is also a possibility that the nascent carbon sequestration market could develop in such a way that EIP's forest restoration and conservation work could generate marketable carbon credits.

Because EIP's property is within the boundary of the Great Dismal Swamp National Wildlife Refuge, the U.S. Fish and Wildlife Service is very interesting in purchasing it. At the end of the investment period, after the bank is sold out, EIP would like to sell the land to the Refuge. EIP will work with the Fish and Wildlife Service to facilitate funding from various federal and state conservation funding sources, such as the Land and Water Conservation Fund and

the Migratory Bird Program. Under this strategy, the Refuge would be able to acquire the fully restored and permanently conserved property for less than it would have otherwise paid for the parcel, even in an unrestored condition.

RESULTS

EIP's conservation investment model has led to the conservation and restoration of one piece of the Great Dismal Swamp. Because of EIP, the land will be restored to its natural hydrology, conserved forever, and hopefully become part of the Great Dismal Swamp National Wildlife Refuge.

Without an investor like EIP, the only hope of conserving the property would have been the traditional model of seeking government funding and generous philanthropic donors to pay for its conservation. Even if that effort were successful, the property still would not have been restored and endowed. The market for wetland mitigation credits is the financial driver that facilitated the restoration of the property. Without

such a market, it is unlikely that EIP could have made this model work for its investors.

While the Great Dismal Swamp project requires more time to prove its financial success, the company is currently on track to meet its projections. When it is complete, the Dover Farm Mitigation Bank will have restored 700 acres of degraded former wetlands and conserved at least 966 acres in perpetuity.

KEYS TO SUCCESS

EIP's Great Dismal Swamp Project shows how the creation of PES markets can bring a new set of players to the conservation game. These players are not only protecting land from development, but are actually restoring degraded lands—because it makes economic sense. Some keys to the project's success are:

- A property with potential for rehabilitation and conservation
- Investors who embrace the ecosystem services investment model and have relatively patient capital
- The complementary experience of the EIP partners with expertise in the three important fields of conservation, finance and PES markets
- A strong market for the Bank's wetlands mitigation credits in the surrounding communities
- A conservation entity, in this case the U.S. Fish and Wildlife Service, interested in purchasing the restored and conserved property at the end of the investment period
- A strong management partner such as Williamsburg Environmental Group to construct and maintain the Bank

PHOTOS AND FIGURES

Page 145, 147: Photos, R. Winn, U.S. Fish and Wildlife Service
 Page 146: Figure, U.S. Fish and Wildlife Service
 Page 148, 152: Photo, C. Lowie, U.S. Fish and Wildlife Service
 Page 150: Photo, Ecosystem Investment Partners
 Page 151: Figure, Burke Environmental Associates/The Conservation Fund, using Google Earth image

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