

## ECOSYSTEM SERVICE PAYMENTS

# MARKETS FOR ECOSYSTEM SERVICES AND THE RECLAIMING OF THE GREAT DISMAL SWAMP

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The Great Dismal Swamp originally encompassed close to a million acres of land in southeastern Virginia and northeastern North Carolina. In 1763, George Washington declared its verdant wetlands a worthless wasteland in desperate need of human intervention. Washington, one of the nation’s first real estate developers, founded the Dismal Swamp Land Company (otherwise known as “Adventurers for Draining the Dismal Swamp”) for the sole purpose of ditching and draining this land for conversion to agricultural use and timber harvesting. This extractive use of the swamp continued for the next three centuries until its natural state was almost unrecognizable. However, as environmental awareness in the United States grew, managers began to see the future of the swamp in a new light.

Where the entrepreneurial first president of the United States saw wasteland and dismay, a group of modern day real estate investors saw a chance to put capitalism to work, bringing the swamp back into its natural condition. Ecosystem Investment Partners (EIP) is among a vanguard of private investors who are recognizing and capitalizing on the growing markets for ecosystem services in the United States. Before exploring the specifics of their investment in the Great Dismal Swamp, however, it is important to understand the concept of ecosystem services and how markets for these services are creating new advocates for conservation around the world.

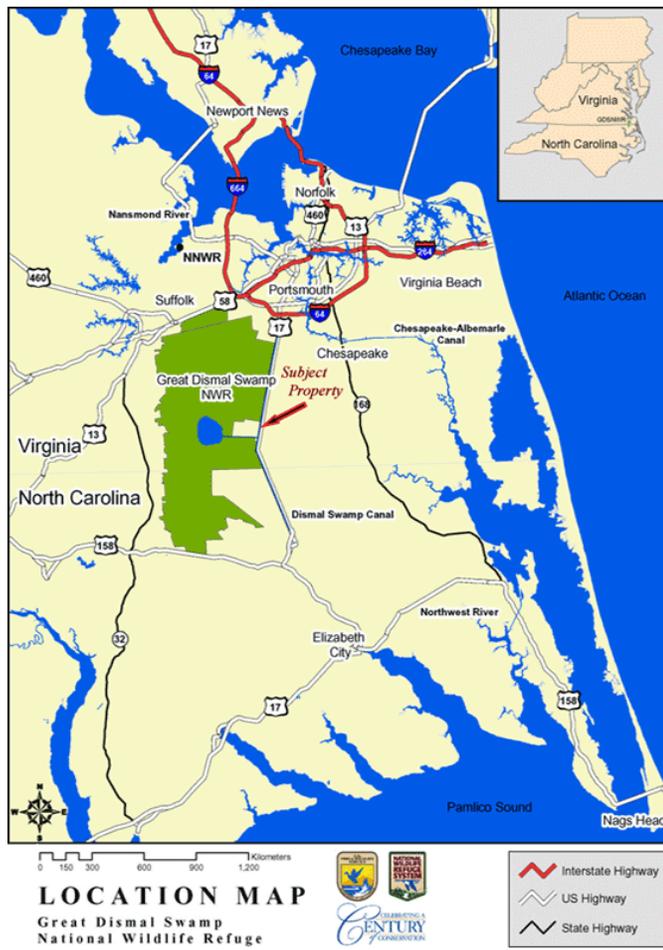


Figure 1: Location map of the Great Dismal Swamp and the Subject Property

## **ECOSYSTEM SERVICES AND EMERGING MARKETS**

Until recently, the world's economic systems put little or no value on the services provided by our planet. Many of the vital life-supporting actions of the planet were taken for granted until disrupted or threatened. The planet's life-supporting actions, termed "ecosystem services," include a wide range of processes through which natural ecosystems, and the species that are part of them, help sustain and fulfill human life. These services include water and air purification, mitigation of droughts and floods, decomposition of wastes, regulation of climate, and maintenance of biodiversity, to name a few.

In 1998, a group of researchers from the United States, the Netherlands, and Argentina attempted to put a monetary value on global ecosystem services. Examining 17 different ecosystem services, they calculated that the average value per year of services provided by the planet have an average value of US\$ 33 trillion per year. To put this into perspective, this is 1.8 times more than the current global GNP.<sup>2</sup> While no one is suggesting writing a check to the planet in this amount, this study indicates how different the global price system would be if these values were accurately captured by the economic markets. Probably the most important contribution of this study has been to increase awareness of the importance of ecosystem services in the world economy.

Already the application of this valuation concept to land use decisions at the local and regional level has had some significant policy and management implications. For example, New York City planners found, in the latter part of the twentieth century, that they could avoid spending US\$ 6 billion to 8 billion on a new water treatment plant by instead investing \$1.5 billion in conserving land in the upstate watershed that had until that time, been purifying the City's water for free.<sup>3</sup>

Over the last decade, the concept of a market for ecosystem services has grown in popularity. While at the global level discussions of ecosystem services are still at a predominately theoretical level, in certain areas -- particularly in selected locaties -- governments and practitioners are beginning to implement this idea. Emerging markets are popping up for an array of ecosystem services including the control of greenhouse gases, the supply of clean water, the protection of threatened species, the avoided disruption of forest and watershed functions, and riparian restoration. For example, the European Union Emissions Trading Scheme is now trading billions of dollars annually in carbon credits annually. The Chicago Climate Exchange is operating on a smaller level in the United States. The federal environmental regulatory structure in United States has created markets for the wetland, stream and wildlife mitigation banking industries to offset 'unavoidable' development impacts. Several Latin American countries are experimenting with programs to provide landowners for payment for the ecological services provided by their forests and watershed.

In the case that is the subject of this paper, existing regulatory programs that provide mechanisms for valuing specific ecosystem functions (for example, valuing wetlands and biodiversity through the use of mitigation banks) were creatively combined with EIP's private sector funding to help restore the Great Dismal Swamp. Several of these regulatory programs and mitigation mechanisms are described below.

UNITED STATES CLEAN WATER ACT AND WETLANDS MITIGATION: Wetlands are complex ecosystems that provide many ecological and social benefits. Wetlands can improve water quality, diminish droughts, provide natural flood control, recharge groundwater aquifers and stabilize shorelines. They provide important habitat for a wide range of plant and animal species and can support commercial fisheries. Protection of wetlands in the US in the 21<sup>st</sup> century is based on the 1997 amendment of the 1972 Clean Water Act. In 1972, the United States enacted the Clean Water Act (CWA), “to restore and maintain the chemical, physical, and biological integrity” of the Nation’s waters. Section 404 of the CWA requires a permit for the discharge of dredge or fill materials into waters (including after 1997, wetlands) (33 U.S.C. 1344). A potential permittee 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.<sup>4</sup>

If an impact is determined to be unavoidable, the permittee must provide “compensatory mitigation” which means the restoration, creation, enhancement, and in some cases preservation of other wetlands in compensation for the destruction of natural wetlands. Mitigation can be done by the permittee or by a third party. Permittees can engage in on-site mitigation by restoring enhancing, creating or preserving wetlands on or contiguous to the impacted wetland area.<sup>5</sup>

Initially, in the late 1990s, the Corps favored on-site compensation by permittees for wetland impairments across the nation; that is, the permittee is responsible for enhancing other wetlands on the site where wetlands damage was occurring (for example, creating “artificial wetlands” to replace natural wetlands that had provided storm water management services). However, over time many studies showed that on-site compensation generally failed to adequately replace the wetland resource functions that were lost when the natural wetland was destroyed. Over time, the Corps came to favor mitigation by certified third-parties that created wetland banks. Wetlands mitigation banking is now the most prevalent form of mitigation in the United States.<sup>6</sup>

A wetland mitigation bank is a legally-established entity which owns a wetland, stream or other aquatic resource that has been restored, established, enhanced or preserved to compensate for unavoidable impacts to wetlands elsewhere.<sup>7</sup> Mitigation banks can be created by private corporations, nonprofit organizations and government agencies through a formal agreement with a regulatory agency. The value of a bank is defined by it’s the compensatory mitigation credits it creates. One benefit of third-party mitigation is that the permittee transfers liability to the third party 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 both by for-profit and non-profit organizations. Since 2001, the number of mitigation banks that have sold out

of their credits has tripled.<sup>8</sup> In 2007, Ecosystem Marketplace found that the U.S. wetland mitigation market was worth \$1 billion annually.<sup>9</sup>

**US ENDANGERED SPECIES ACT AND CONSERVATION BANKING:** The United States' Endangered Species Act (Section 9(a)(1)) prohibits the elimination of a species that has been identified as threatened or endangered (T&E), either directly or through the destruction of its habitat. Conservation banking represents a free-market mechanism for mitigating development impacts on endangered species habitat. When proposed development will unavoidably harm a species or its habitat, the project proponent must mitigate these impacts. Often these impacts are mitigated through habitat either through on-site compensation or through a conservation bank.<sup>10</sup> When a conservation bank is established for an endangered or threatened species, the owner of the bank is making a so-called "deposit" of habitat, for which they receive "credits." These credits can then be sold to the landowner whose development will impact habitat of the same species. The listed species gains permanently protected, secure habitat that is managed for its benefit.

Conservation banking schemes are providing real money to investors – for instance credits covering habitat for an endangered fly in California are now selling for around \$25,000<sup>11</sup> per acre. The United States currently has over 100 species mitigation banks transacting close to \$370 million in mitigation credits a year. Other countries are seeing the success of this model and following suit. Australia has several biodiversity banking programs and is considering a nation-wide program.<sup>12</sup> On the island of Borneo, the Sabah government and New Forests, a private asset management firm based in Australia, have signed an agreement to protect 34,000 hectares of rainforest that provides habitat to orangutans and other endangered species. New Forests will rehabilitate and protect the forest and recoup their investment by selling biodiversity credits to palm oil developers, energy firms, and other businesses working in the niche market of environmentally sustainable products.<sup>13</sup>

**US CLEAN AIR ACT'S ACID RAIN PROGRAM AND CAP & TRADE SYSTEMS:** Whereas banking schemes assign a cost for replacing a resource, the "cap and trade" model assigns a cost to releasing a certain volume of a particular pollutant, or, seen from another angle, a price for the right to emit a certain volume of a pollutant. Cap and trade programs regulate air and water emissions made by so-called "point sources" (for example, factories, power plants, and wastewater treatment plants that release pollutants at a smokestack or water pipe which can be pinpointed) as well as so-called "nonpoint sources" (more dispersed sources such as farms or suburban lawns which may release pollutants from a multiplicity of identifiable locations) with varying degrees of success, in different circumstances around the world. In cap and trade systems a regulatory agency will establish a legal limit, or "cap," for the amount of emissions of a specific pollutant by a group of polluters. By allowing potential polluters to "trade" these rights to pollute within the limits set by regulators, in the context of an organized market (for example, on the Chicago Climate Exchange), these systems rely on the power of the market place to curb detrimental pollution.

This cap is usually set at a restrictive level -- that is, a volume that is below the current volume emitted by a defined group (for example, a group of electric power utilities) at the time the system was created. Allowable emissions below the cap are grouped into individual

permits which, cumulatively, equal the total volumes of the pollutant which may be emitted once the cap and trade system takes effect. Because the cap is restrictive it creates a value for the permits which can be traded amongst the emitting industry. Market forces encourage those emitters who are able to efficiently reduce their emissions volume to sell any surplus credits they may hold to those polluters whose cost for reducing their emissions are less efficient (that is, those for which reducing emissions is more costly).

Cap and trade systems focus on measurable goals rather than trying to proscribe methods for pollution reduction. This model puts the market into the driver's seat by turning pollution reductions into marketable assets thus creating tangible financial rewards for environmentally-beneficial performance. The market then prompts technological innovations that reduce pollution down to or beyond required levels.<sup>14</sup>

*Singularly, each value stream might not have the potential to fund the protection of a property. However, by combining several value streams, the savvy investors involved saw not only how to restore a damaged ecosystem, but also to reap a significant financial return.*

The Acid Rain Program of the 1990 United States' Clean Air Act is a financially and environmentally successful example of the cap and trade model. This program caps the amount of sulfur dioxide (SO<sub>2</sub>) that can be emitted annually by a group of polluters (principally coal-fired power plants) and allocates emitters certain "rights to pollute" (in units equal to one ton of SO<sub>2</sub> emitted into the atmosphere) that are allocated based on each plant's historic levels of SO<sub>2</sub> emissions. Unused allowances can be sold, traded, or banked for future use. Polluters with insufficient allowances can buy more on the open market. The current cost of eliminating sulfur dioxide emissions averages about \$150/ton to \$200/ton, while the environmental damage produced by one ton of sulfur dioxide is estimated to be near \$4000. Due to the success of this trading system, the U.S. reached the goals called for in the enabling legislation more rapidly than predicted.<sup>15</sup>

In different locations around the country water quality is also regulated through the use of cap and trade systems. Carbon credit trading, which has taken off since the passage of the Kyoto Protocol, has been somewhat successful in Europe and is just starting to take hold in the United States, where compliance is not yet mandatory.

**DIRECT CONSERVATION PAYMENTS:** A more direct way for the market to conserve many ecosystem services at once is to pay for the protection of a specific parcel or landscape. This can be done through public land purchases, conservation easement payments, and direct payments for preserving the ecosystem functions of their land. Governments entities at all levels have been buying land to protect for an array of public purposes for centuries. Because purchasing all the land necessary to protect the desired public purposes would be prohibitively expensive, governments have created mechanisms for protecting land without taking it out of private ownership. For United States, Australia, Canada, and a growing number of other nations around the world, this mechanism is the conservation easement. A conservation easement is a perpetual deed restriction placed on a piece of property to protect

its ecological and open space values. Conservation easements generally restrict development and other detrimental uses while often allowing other uses, such as hunting, recreation and agriculture, to continue. Payment for Ecosystem Service (PES) programs provide a way for governments or corporations to pay landowners for protecting the ecological functions of their land in the absence of a legal conservation easement framework. Since Costa Rica began their landmark program in the late 1990s, there has been a proliferation of these programs in Latin America. The Conservation Reserve Program (CRP) of the United States' Department of Agriculture operates under the same principals as many PES programs and protects more land on an annual basis in the U.S. than any other program. The CRP provides payments to farmers and ranchers to reduce soil erosion, reduce sedimentation in lakes and streams, improve water quality, establish wildlife habitat and enhance forest and wetland resources.

Each of these programs has shown promise at conserving the particular resource (or reducing the pollutant) it targets. However, it is clear that a single ecosystem is associated with many resource streams and ecosystem services. For example, a wetland may provide wildlife habitat, wastewater purification, and storm water management. By focusing solely on a single stream of value, an individual trying to gauge a given piece of property's value may vastly underestimate it.

This case study of the EIP's involvement in the restoration of the Great Dismal Swamp provides an innovative example of how an entrepreneurial approach, capitalizing on multiple resource and value streams, can better approximate the full economic value of a particular property. Singularly, each value stream associated with the property might not have had the potential to fund its protection. However, by combining several value streams, the savvy investors involved saw not only how to restore a damaged ecosystem, but also to reap a significant financial return.

### **PRIVATE ECOSYSTEM SERVICE MARKETS AT WORK ON THE GREAT DISMAL SWAMP**

**HISTORY:** Prior to the mid-1700s, the Great Dismal Swamp supported a distinctive Tupelo-baldcypress and Atlantic white-cedar forest. Long before the arrival of George Washington, local settlers and slave workers ventured into the Swamp to harvest these stands of trees for shingles, planking and other products. Over two hundred species of birds have been identified in the Swamp, including two southern species, the Swainson's warbler and Wayne's warbler (a race of the Black-throated Green warbler), that are more common in the Great Dismal Swamp than in other coastal locations. The swamp supported a variety of mammals including otter, bats, raccoon, mink, grey and red foxes, grey squirrels, white-tailed deer, bear and bobcat.

The Great Dismal Swamp Company originally purchased the land for agriculture. It took a decade before work began on the canals that would eventually make the land suitable for crop production. Once the canals were completed, the wild swamp was rapidly converted from a naturally functioning ecosystem to commercial timberland and row cropping. For three centuries, agricultural, commercial, and residential development destroyed much of the natural systems 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 wildfires created environmental conditions that drastically decreased plant and animal diversity across the Swamp.<sup>16</sup>



Figure 2: Aggressive 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. Photo: Lake Drummond credit: R.Winn/USFWS

After ownership by a succession of real estate developers, farmers and timber companies, the fate of the swamp finally began to change. In 1973, in what was then the largest corporate donation of conservation land in U.S. history, the Union Camp Timber Corporation donated 49,100 acres of the core swamp area to the Nature Conservancy (TNC). TNC then transferred this land to the U.S. Fish and Wildlife Service and the Great Dismal Swamp National Wildlife Refuge was established. Over the next several decades, a broad coalition of public and private conservation interests succeeded in adding over 60,000 acres to the Refuge, bringing its total acreage to 111,000 (still a fraction of its original size).

Efforts across the Refuge have restored much of the natural hydrology of the property and begun to bring many native species back. However, one 1,037-acre unprotected inholding remained within the acquisition boundaries of the Refuge. Because it was surrounded on three sides by the Refuge, gaining ownership of this property was of the highest priority for the Fish and Wildlife Service, State of Virginia and conservation groups.<sup>17</sup> 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. It is at this point that our parallel stories of emerging markets for ecosystem services and a degraded parcel of Virginian swampland finally intersect – with the arrival of Ecosystem Investment Partners.

**GREAT DISMAL SWAMP PROJECT:** Ecosystem Investment Partners was founded in 2006 by Fred Danforth, who soon recruited Adam Davis and Nick Dilks to the company to pursue new business opportunities. The three men 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. Nicholas 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 of the private equity firm Capital Resource Partners (CRP), which had successfully raised and placed almost \$1 billion during his tenure. Danforth had stepped aside from his daily responsibilities at CRP in 2002 to pursue personal interests. As a conservation buyer for a unique property in the Blackfoot Valley of Montana, he led a major restoration of a spring creek and cold-water stream providing excellent habitat for various species including the endangered Bull Trout. Through this experience, he became deeply interested in the potential for private investment in conservation and ended up creating the first conservation banks in Montana.<sup>18</sup>

*“Land now is being protected not just as an expression of ethical values but because of what it is doing”*

Ecosystem Investment Partners is at the forefront of an important trend in conservation investment that is capitalizing on the critical services provided by ecologically important lands and the new markets for these services. EIP’s investment strategy focuses on the double bottom line of achieving conservation and financial gains. EIP creates value for its investors by purchasing large properties in need of restoration and then actively managing these properties to create and monetize environmental value by using market mechanisms such as mitigation and conservation banking. They will also develop 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.” According to EIP Partner Adam Davis, “the growing recognition of the economic value of ecological assets and of their increasing scarcity is a fundamental driver that is affecting financial values now”. He goes on to say, “Land now is being protected not just as an expression of ethical values but because of what it is doing”.<sup>19</sup> The Great Dismal Swamp Project was EIP’s first investment, and it has been followed by two additional investments in Delaware and Louisiana.

EIP’s first round of capital for the Dismal Swamp Property was supplied in part by the Lyme Timber Company. Lyme Timber Company is private equity investment firm based in Hanover, New Hampshire that pioneered the concept of economically profitable conservation projects. Lyme has traditionally focused primarily on timberland investment projects, finding their niche purchasing large timber parcels that have high conservation values, thereby bringing conservation and investment dollars to the table. In some cases, they are able to sell 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 21<sup>st</sup> century, this conservation investment innovator began to see investment potential in projects that that included markets for ecosystem services. Accordingly, in 2006 Lyme decided to invest a portion of its fund into EIP and these types of projects.

Because of its well-known importance to the refuge, the previous owner of the Dismal Swamp property 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 purchase of the property. There are two primary components of value in the property that EIP will develop - wetlands mitigation and the sale of a conservation easement.

COMPONENTS OF VALUE: EIP will restore and conserve 697 acres of former wetlands on the Property that had been converted to agriculture. To do so, EIP is using two different methods of wetland mitigation. Demand for wetlands mitigation in this area is driven by commercial and residential development and road construction in and around the Virginia Beach, Chesapeake and the Norfolk metropolitan area.



Figure 3: The Dover Farm portion of the Great Dismal Swamp Property before restoration: drainage ditches illustrate the way that water is currently managed on site. Working with local experts in hydrology, conservation biology and soil science, EIP develops and implements detailed restoration plans for each project.

EIP plans to establish a wetlands mitigation bank on all but 60 acres of the property, which will generate about 747 wetlands credits. The area included in the mitigation bank will be subject to a conservation easement, which will most likely be held by The Nature Conservancy. Credits generated by the bank will be certified and released for sale on the open market. Prior to purchasing the property, EIP went through a rigorous process of “due diligence” to determine whether their financial estimates for the various ecosystem services markets were accurate. They anticipate ongoing demand for credits for small scale projects as well as additional large project demand generated by public infrastructure projects like roads, airports and transmission lines. At the time of purchase, 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 market share is very favorable. The U.S. Army Corps of Engineers, the lead agency with responsibility for approval of mitigation actions, indicated that credits from the EIP bank would be given priority because of the high conservation importance of the property. The

approximate value of wetland credits in the area has been in the range of \$12,000 to 15,000 per acre.

Because the property is within the acquisition boundary of the Great Dismal Swamp National Wildlife Refuge, it is one of the U.S. Fish and Wildlife Service's top priorities for acquisition. At the end of the investment, after the land has been restored via the various mitigation structures and conservation easements have been put into place, EIP would like to sell the land to the Refuge. EIP will work with the FWS 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 property at a substantial discount from what it would have otherwise had to pay for the parcel in an unrestored condition.

In addition to these primary components of value, there are other revenue sources on the property that are either currently active or may become so in the future. Prior to commencement of restoration activities, EIP will continue to lease the Property's farm fields for corn and soybean production. Recreational leasing for quail, waterfowl, deer and bear hunting also provides some revenue. While not yet active, 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. If this system is approved by state water quality agencies, EIP could receive credit for water quality improvements made when the farmlands are restored to forested wetlands. These credits could then be sold much like wetlands 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 CO2 credits.<sup>20</sup>

## **CONCLUSION**

Environmental awareness and the state of the natural world in the first decade of the twenty-first century have brought us to the point where we can no longer take for granted the benefits provided to us by properly functioning ecosystems. Indeed, we now understand that such ecosystem services are vital to the physical and economic well-being of the entire planet. Over time, environmental policy makers have learned to value such services and achieve specific environmental goals through 'market approaches.' As private-sector entrepreneurs, Ecosystem Investment Partners is taking the market-based restoration and conservation of the Great Dismal Swamp property to a new level, creatively using multiple market and investment approaches to define the environmental value of an ecosystem and create incentives for its conservation

The Great Dismal Swamp Project shows how the creation of financial markets for ecosystem services 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. With the emergence of groups like EIP, conservation interests no longer have to rely solely upon the old model of seeking government funding and generous philanthropic donors to conserve ecologically important parcels of land. This case shows the need for groups like EIP to take advantage of these emerging opportunities to use existing

and developing economic tools to achieve conservation goals. Without the involvement of EIP or a similar group that could capitalize on the markets for mitigation and conservation, it is very likely that this portion of the former swamp would not have been conserved or restored.

While EIP's Great Dismal Swamp project has yet to prove its financial success, they are currently on track to meet their projections. This model can be replicated anywhere that ecosystem markets are emerging, from Borneo to Brazil. Similar examples have shown this model to work on all sizes of parcels, both with or without public support and incentives. Investors, conservationists and governments around the world will be watching projects like the Great Dismal Swamp closely to see their success proven. With success, eager imitators will likely appear and multiply, spreading the model far and wide.

## ENDNOTES

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<sup>1</sup> Shannon Meyer is a principal at Meyer Conservation Services, LLC, and former Associate Director of the Aspen Valley Land Trust. She can be reached at shannonmeyer@live.com.

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<sup>5</sup> Natural Resources Council, Board on Environmental Studies and Toxicology, Water Science and Technology Board, Committee on Mitigating Wetland Losses "Compensating for Wetland Losses under the Clean Water Act", National Academies Press, 2001, page 2.

<sup>6</sup> J.B. Ruhl, Alan Glen, David Hartman, "A Practical Guide to Habitat Conservation Banking Law and Policy.", *Natural Resources & Environment*, American Bar Association, Summer 2005, Vol 20 No. 1. page 26.

<sup>7</sup> EPA Wetlands Fact Sheet on Mitigation Banking. October 17, 2007, [www.epa.gov/owow/wetlands/facts/fact16.html](http://www.epa.gov/owow/wetlands/facts/fact16.html)

<sup>8</sup> Ecosystem Market Place website, [www.ecosystemmarketplace.com/pages/marketwatch/overview.transaction.php?market\\_id=4](http://www.ecosystemmarketplace.com/pages/marketwatch/overview.transaction.php?market_id=4).

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<sup>10</sup> J.B. Ruhl, Alan Glen, David Hartman, "A Practical Guide to Habitat Conservation Banking Law and Policy.", *Natural Resources & Environment*, American Bar Association, Summer 2005, Vol 20 No. 1, page 26.

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<sup>16</sup> United States Fish and Wildlife Service, Great Dismal Swamp National Wildlife Refuge website. <http://www.fws.gov/northeast/greatdismalswamp/Habitat.htm>

<sup>17</sup> Investment Overview for Great Dismal Swamp Project. Ecosystem Investment Partners. (Internal document) October 2007.

<sup>18</sup> Fred Danforth, Adam Davis, Nicholas Dilks, Ecosystem Investment Partners, personal communications, summer 2008. For more information on EIP, their website is [www.ecosystempartners.com](http://www.ecosystempartners.com).

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