

DELAWARE RIVER WATERSHED INITIATIVE CASE STUDY



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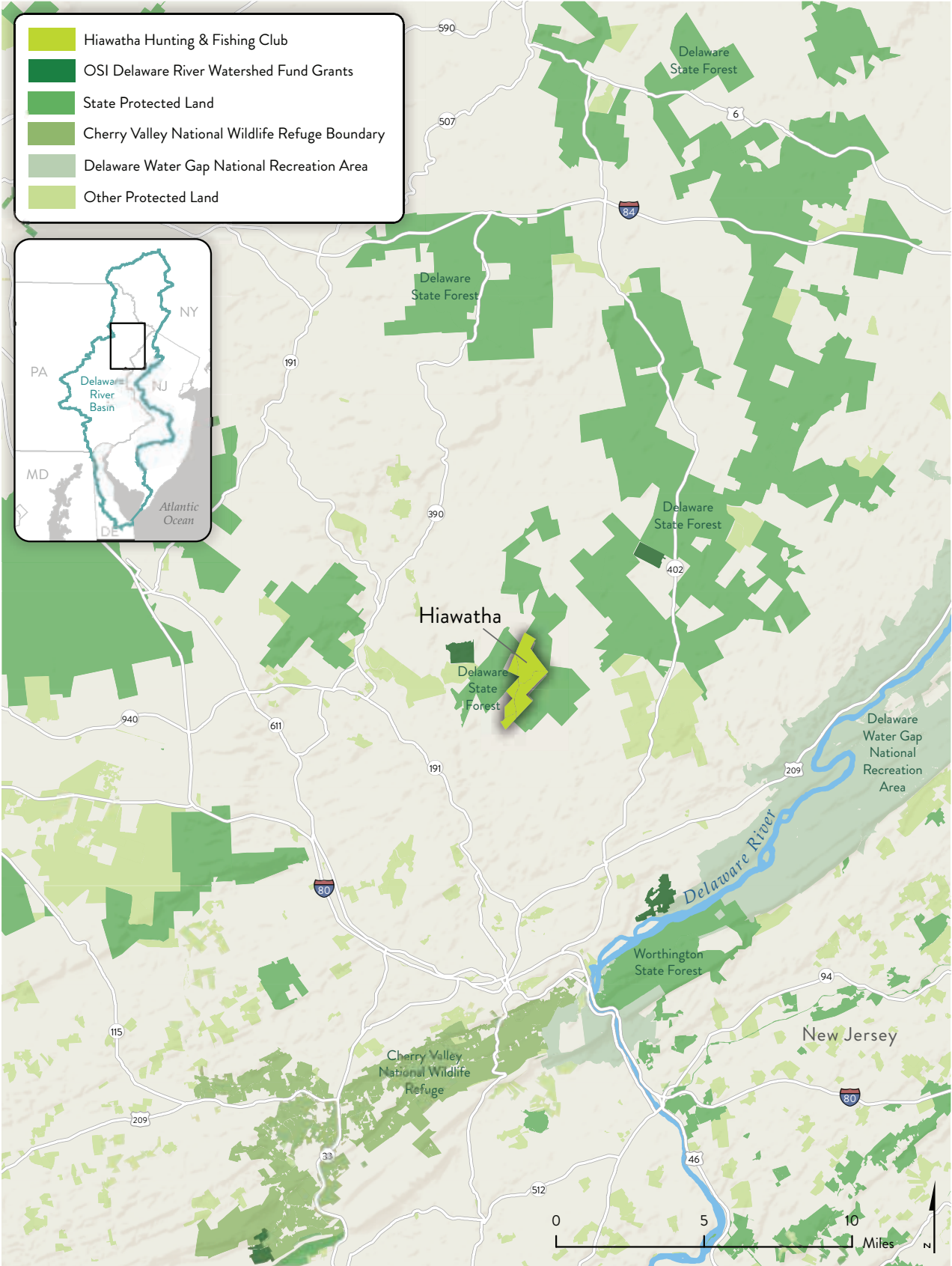
Tapping the Carbon Market to Conserve Forests in the Poconos

OSI partners
are evolving
new tools for
conservation
in the
Poconos.

Through the Delaware River Watershed Protection Fund, the Open Space Institute has approved capital grants to conserve almost 18,000 acres of watershed land. The Hiawatha Hunting & Fishing Club is one of many clubs that own large tracts of land in the Poconos, Pennsylvania. It is one of eight focus areas for the Delaware River Watershed Initiative, a consortium of more than 50 nonprofit groups that are working to enhance and restore water quality in the Delaware watershed.

This case study, the third in a series focused on best practices to protect and restore watersheds, focuses on Hiawatha's use of the carbon-offset market and identifies some of the challenges and opportunities. The hunting club's use of carbon credits to conserve its 1,300-acre property in the forested headwaters of the Delaware River Basin – thus helping to ensure clean water for residents downstream – may provide a model for how to finance conservation in an era of shrinking public dollars for land protection.

CONSERVED LANDS IN THE POCONOS KITTATINNY REGION



With more than 1,300 acres of forestland in Pennsylvania's Pocono Mountains, the Hiawatha Hunting & Fishing Club has been a private getaway for a community of like-minded outdoorsmen since 1913. Several generations of new members have followed the founders, and the club's traditions and sense of camaraderie live on. Members and their families hunt deer, bear, wild turkey, and small game. They fish in a man-made lake, and work together to improve the woodlands. "We describe ourselves as blue collar—we like to get our hands dirty and do projects," said Ken Huhn, the club's president. "You go there long enough, it's a Hiawatha family."

As the club reached its 100th anniversary, it faced rising expenses and frequent development offers. Members began to think about the club's legacy and the next 100 years. "If the land is always going to be there, there's a better chance it will stay as a hunting and fishing club," said Huhn. "The words 'to conserve and preserve' are in our original purpose statement—not just the game but the land, the resources, and the wildlife in general."

Conserving the club's forestlands also offers tremendous benefits for the public, especially with regard to watershed protection. Surrounded by state forest and other historic hunting clubs, Hiawatha's land is part of a large contiguous forest in the headwaters of the Delaware River, the source of drinking water for 15 million people on the East Coast.

To protect the land while keeping the club on a sound financial footing, its leaders turned to an innovative solution: turning the carbon stored in its forest into credits that can be sold on the carbon market. Working with The Nature Conservancy (TNC), it joined a small but growing number of landowners and land trusts that are using this strategy to help mitigate climate change while protecting watersheds, wildlife, air, and outdoor recreation.

PRESERVING FORESTS IN THE DELAWARE WATERSHED

The Delaware River is the longest free-flowing river in the Eastern United States, draining 13,500

square miles in four states. Forests in its headwaters keep the water clean and abundant by soaking up rain and snowmelt, filtering pollution, recharging groundwater, and releasing water slowly into streams.

These forests are increasingly at risk. The Upper Delaware Basin encompasses some of the fastest growing counties in New Jersey and Pennsylvania. Three-quarters of the region's forestland is privately held, and an aging landowner base is under growing pressure to sell or subdivide the land. Preventing the development and fragmentation of these headwater forests is a top priority for the Delaware River Watershed Initiative, a collaboration of conservation organizations and government agencies working to protect the river's watershed.

The hunting and fishing clubs of the Poconos, which together own more than 100,000 acres of land sandwiched between public forestland in the river's headwaters, present a good opportunity for keeping large swaths of forest intact. Some clubs are looking to the Federal Legacy Program to fund easements. However, declining public funding and stringent requirements for public access from some public sources have been obstacles to protecting these lands using the traditional strategy of purchasing land or conservation easements. As a result, several clubs are following Hiawatha's example with discussions aimed at tapping the carbon market to secure revenues to maintain their ownerships.

THE CARBON MARKET

The carbon market (see page 7) offers a promising strategy to finance forest protection and management. Landowners agree to preserve or manage forests in a way that creates carbon storage above and beyond what would have happened without the project, quantify and verify the amount of additional carbon captured, and sell the resulting carbon credits. A business can buy carbon credits to offset a percentage of its CO₂ emissions, either voluntarily or to comply with carbon-emission regulations in several jurisdictions.

The revenue generated by forest carbon offsets has enabled nearly a dozen land trusts across the nation to conserve more woodlands or better manage the forests they own or hold in easements.



In 2013 California created the compliance market in carbon offsets. In the state of Maine, Downeast Lakes Land Trust had one of the first forest carbon projects selling 200,000 carbon credits on its 33,708-acre Farm Cove Community Forest. The trust used the money to expand community forests in its area to over 55,000 acres. Other successful carbon offset projects included one by the Appalachian Mountain Club, which used the revenues from carbon credits on 10,000 acres in Maine to purchase additional properties for conservation. The Tennessee River Gorge Trust (TRGT), whose sale of credits on 5,000 acres of forestland outside Chattanooga almost doubled its operating fund, generating money for long-term stewardship to maintain species diversity and climate resilience.

WORKING WOODLANDS

The Nature Conservancy's Working Woodlands program, begun in 2009, offers landowners a comprehensive package of carbon-credit development, permanent land protection, and a forest-management plan certified by the Forest Stewardship Council (FSC). TNC's first Working Woodlands' project in Pennsylvania was on watershed lands owned by the Bethlehem Water

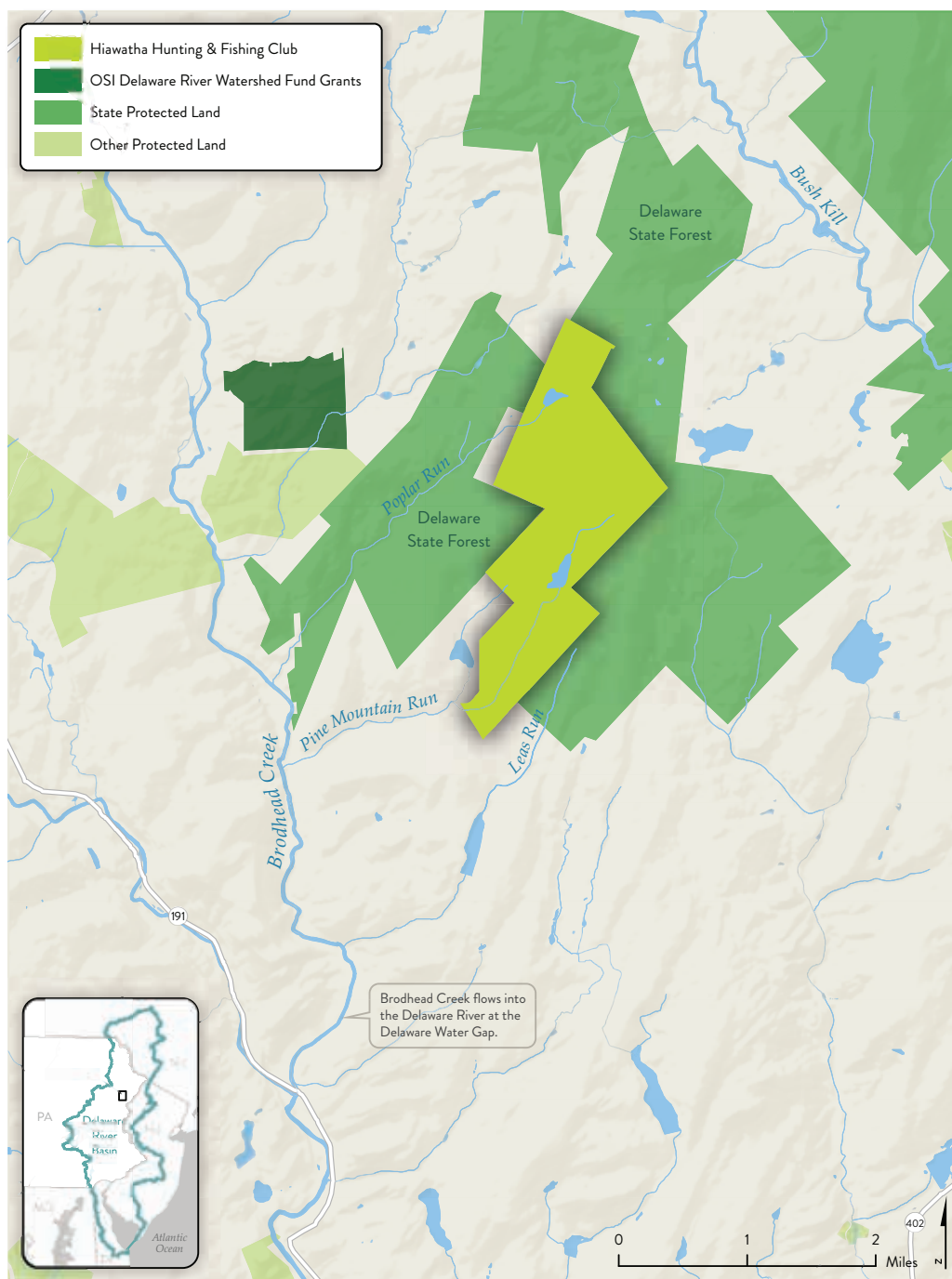
Authority. The credits were sold on the voluntary market to Disney and Chevrolet, giving the authority much-needed funding to better manage its forests and protect the water supply.

In the Hiawatha Club agreement, TNC guaranteed a minimum of \$20,000 a year for ten years from the sale of carbon credits. Because of the uncertainties in the carbon market, TNC based its guarantee on a conservative estimate of carbon revenues; the actual revenue could be higher. In exchange, in 2016 the club donated a working-forest conservation easement on 1,205 acres, all of its land except the area around the lake and clubhouse. The Nature Conservancy created a ten-year FSC-certified management plan for the club's land and handled the complex carbon sale process.

Developing carbon credits typically takes several years and can cost up to \$200,000. The steps include selecting an approved protocol for determining and verifying additional carbon storage; conducting a detailed forest inventory of statistically accurate permanent sample plots; calculating how much carbon will be stored as the forest grows and translating that into carbon credits; and arranging a third-party audit to verify the credits.

In most projects, a carbon developer handles this process and is paid with a percentage of the carbon credit sale. In the case of the Hiawatha Club, TNC's experienced staff was able to develop the carbon credits in-house with the help of a consultant. The costs of this implementation will be covered by part of the revenues when the credits are sold, and offset as well by a private donation that made the project viable. Other costs, for which TNC raised funds privately, include legal and administrative expenses of the easement—similar to what land trusts incur in traditional land conservation transactions—and staff time for developing the forest management plan.

Once the credits are verified by an audit in the winter of 2017–18, TNC will market them to voluntary buyers and negotiate the sale. Few organizations have the connections with potential buyers that a large international conservation organization like TNC has, so most normally work with carbon developers who market the credits. During the 40-year life of the carbon credits, the forest must be managed sustainably. Carbon storage is regularly monitored through audits and repeated forest inventories, using funds set aside from credit sales. Timber harvesting is allowed as long as carbon levels are maintained.





KEY LESSONS

The Hiawatha transaction illustrates some key take-aways for the successful use of carbon credits. Chief among these are the following:

For a project to be feasible, a forest's total carbon-storage potential over time — which is primarily determined by acreage but can vary depending on timber volume and predicted growth—has to translate into enough credits to make a profit above the considerable upfront expense of implementing the carbon-credit program. At current prices, that typically requires acreage of 1,500–3,000 on the voluntary market and 3,000–5,000 on the compliance market, which has more regulatory hoops to jump through and more rigid standards for determining the carbon-credit yield of a parcel of land. Although the Hiawatha project was slightly smaller than what would typically work for the voluntary market, TNC and a private donor made the project viable.

The landowner, Hiawatha, was willing to donate a conservation easement. That was the leverage that allowed TNC to use its fundraising capacity to cover its substantial upfront costs for the carbon-credit development, conservation easement, and forest-management plan.

“The bottom line is, you have to care more about preserving the property,” said Huhn. “If you're just in it for the financial return, I'm not sure carbon is the way to go. Our primary motivation was the club's legacy and better management of the forest.”

Carbon finance is a good solution for landowners who want to better manage their forests and need money and guidance to help them do it. Many private landowners in Pennsylvania are not actively managing their woodlands, but realize that they need to do more. According to TNC Josh Parrish, Director of Working Woodlands Program, who negotiated the Hiawatha agreement, “They are receptive to new incentives that move the needle on both forest health, land productivity, and consequently store more carbon,” he said. The carbon inventory by itself can be very useful, said TRGT Executive Director Rick Huffines. “Now we have benchmark information that we can use to understand the changes we see in our forest over time and whether we need to form adaptation strategies for the species we're monitoring.”

Forest Stewardship Council certification is a plus. Although not required by all carbon-credit standards, it guides the obligatory long-term management of forests for carbon storage, makes projects more attractive to voluntary buyers, and ensures that forestlands are managed sustainably regardless of the carbon deal. FSC certification may also enable better access to markets for the timber that can be sold. The free TNC-created FSC-certified plan, which can cost from \$20,000 to \$40,000, was a major selling point for the Hiawatha Club, whose members do all the forestry work themselves. “TNC discussed with us our goals for the forest, and came up with a consistent plan that will help us manage the forest for the wildlife we hunt,” said Huhn.



CHALLENGES TO INCREASING USE OF CARBON CREDITS

The main obstacle to the wider use of carbon finance for conserving and sustainably managing forests is the prohibitive cost for small properties. Small landowners also lack information about the carbon-storage potential of their land. That information would allow them to consider carbon finance as an alternative to development or unsustainable timber harvesting.

One potential avenue for lowering development costs is to pool the carbon credits of multiple landowners in one sale. Parrish at TNC has been discussing aggregation with several other hunting clubs in the Poconos. He is also working with conservation partners on developing a carbon project with a group of landowners in northern Vermont. Given the difficulties of getting independent small forest owners to agree as a group on long-term forest restrictions, aggregation seems most promising for projects with just a few landowners or neighbors who already have a cooperative relationship.

“Assembling batches of forest owners has been the holy grail for carbon work,” said Will Price, President of the Pinchot Institute for Conservation, a forest conservation think tank. Pinchot has been experimenting in the Pacific Northwest to find ways to make the carbon market work for small landowners, trying out different models on the voluntary and compliance markets to combine carbon sales from multiple properties. Another

approach Pinchot is taking is to help small landowners access federal Farm Bill technical and financial assistance (through the USDA Natural Resources Conservation Service’s Regional Conservation Partnership Program) to take the steps needed for carbon offset projects and land conservation.

In addition, technological solutions are being developed to reduce the time and cost involved in measuring, verifying, and monitoring carbon credits. Pinchot is testing a new sampling and inventory design using a handheld digital device—a kind of souped-up smartphone that derives tree volume measurements with photography and laser range-finders. It requires measuring fewer trees and can be used by less highly trained forest technicians.

TNC is working with the forest inventory company SilviaTerra to assess the feasibility of a new carbon verification protocol that enables the use of remote satellite and aerial forest imaging, already in wide use for other forestry applications, to measure and verify carbon storage at a much lower cost. This could enable owners of properties as small as 200 acres to participate in the carbon market as well as make it easier for land trusts to communicate with the owners about financial alternatives to selling for development. These new technologies still need to be accepted as accurate by the third-party carbon credit verifiers.

The other main factor that will determine how widely carbon credits can be used to finance forest conservation is demand in the carbon market. Will there continue to be enough buyers to keep prices high enough to make forest-carbon projects economically viable—or even to be able to sell credits at all? Some carbon developers are more bullish than others.

In the compliance market, demand is limited to what regulated companies in California, Quebec, and now Ontario are allowed to buy. The California law originally allowed companies to buy approved offset types to meet 8 percent of mandated emissions reductions. In 2017 legislators extended the program until 2030. But they reduced the percentage of offsets that regulated companies can buy to 4 percent, and required half of that to be generated by projects in California.

“Effectively, what that did to the non-California market was cut demand by 75 percent,” said Dylan Jenkins, Vice President for Portfolio Development at Finite Carbon, a major developer of carbon offsets. “It is somewhat counterbalanced by the demand from Ontario and Quebec, which enables a new set of regulated entities to buy offsets created outside California and the two provinces.” Ontario’s market is about 40 to 50 percent the size of California’s and Quebec’s is 15 percent. Experts believe long-term demand for compliance-driven carbon offsets will continue in the United States throughout the foreseeable future.

The voluntary market is a fraction of the size of the compliance market, and it can be difficult for organizations without connections to find buyers for carbon credits they develop, according to Jenkins. “Will you see dozens of projects getting done every year and land conservation being done at scale because of demand in the voluntary market?” he said. “I don’t think that’s going to happen.”

Others, like Joshua Strauss, Vice President at Bluesource, a major carbon-credit developer that TNC works with on many of its projects, sees potential for growth in the voluntary market, especially for forest projects. Compared with other types of carbon offsets, forest credits appeal

to buyers because of their secondary benefits like habitat protection, water quality, recreation, and air pollution reduction. They can also bring higher prices, he said.

“Companies are not just buying a commodity—they are buying a story, a project, a situation altered by an activity. They want to know what they are doing in terms of their carbon footprint and other co-benefits,” said Strauss. “The story that accompanies a forest project can actually have some market value of its own, especially when tied to a well-known organization like TNC.”

According to a 2017 report from Forest Trends’ Ecosystem Marketplace, voluntary activity in North America continues to advance alongside compliance markets, and is spurring innovation in those markets through adoption of methodologies developed for the voluntary market. And despite the voluntary market’s small size, there are no intrinsic limitations on its growth as there are in the compliance market. “There are an increasing number of companies that do this because it’s part of their ethos and some that do it because it’s becoming more apparent that it’s good for business,” said Strauss. “That’s why I’m bullish that there’s going to be more of it.”

Many companies that were interested in purchasing voluntary offsets were on the fence, waiting to see whether there would be a new national compliance system under which they might have obligations. Now, with the reversal of US climate policy, they are moving ahead on their own. “In the current political climate, the number of companies looking to do offsets is on the rise,” said TNC’s Josh Parrish. “They want to lead by example. They’re looking ten years down the road and want to get ahead of the curve on potential solutions.”

“The potential of carbon revenue as an asset for conservation, through great projects like Hiawatha, is already being proven,” said Pichot Institute’s Will Price. “Now we need to figure out ways the conservation community can get that source of revenue to smaller, more vulnerable landowners.”

Carbon Markets

Through photosynthesis, trees absorb CO₂ from the air, releasing oxygen and storing carbon in their biomass as they grow. When forests are burned or cut down, the carbon goes back into the atmosphere. In the US, forests and other natural landscapes sequester 14 percent of the country's CO₂ emissions and could capture as much as 20 percent annually.

By putting a price on carbon sequestration, carbon markets can create an economic incentive to protect and restore forests. Because of the extensive scientific data available on how different species of trees grow in different areas, the amount of carbon stored in any given forest can be quantified and sold as carbon offsets or credits. There are two markets on which these credits are sold: compliance and voluntary.

California created the compliance market with the passage in 2013 of the Global Warming Solutions Act, AB 32. In 2017 the Act was extended through 2030. It is a cap-and-trade system that incorporates a carbon cost into business decision-making while encouraging the implementation of carbon-reduction technologies. The law sets an incrementally decreasing cap on greenhouse gas emissions from the 450 companies responsible for 85 percent of the state's greenhouse gas emissions—electricity generators, large industrial facilities, and distributors of transportation, natural gas, and other fuels. To give companies time and flexibility, the state allows them to meet a small part of their emissions targets by buying offsets from specified methods that reduce carbon emissions, including “improved forestry management.” Only the largest California emitters—about 10 percent—actually buy carbon offsets.

Quebec also put a cap-and-trade system in effect in 2013 and linked it with California's in 2014; as of January 1, 2018, Ontario's program will also be linked. Offsets on the compliance market have been trading at around \$10 to \$12.

In the voluntary market, companies buy carbon credits as part of efforts to reduce their carbon footprint to demonstrate corporate social responsibility, or respond to market pressure, public opinion, and stockholder demand. The use of carbon credits for forest protection began with the 2008 UN Reducing Emissions from Deforestation and Forest Degradation (REDD) initiative.

The voluntary market is much smaller than the compliance market and prices are much more variable and generally much lower. There is no single marketplace, which requires forest-protection project developers to find companies that might buy offsets, and market projects to them. Both the voluntary and compliance markets rely on various standards that have been developed to guarantee that carbon storage is permanent, verifiable, and over and above what would be done without carbon finance. Those standards also require that forests be sustainably managed. However, the voluntary market offers more flexibility in the way additional carbon storage is determined and how forests can be sustainably managed.

RESOURCES

LTA's Climate Change website <http://climatechange.lta.org/mitigation-cs/>

TNC's Working Woodlands <http://bit.ly/working-woodlands-tnc>

“Unlocking Carbon Markets for Family Forest Owners in the PNW” Pinchot Institute

www.pinchot.org/gp/RCP

Climate Trust's Carbon Investment Fund

<https://climatetrust.org/carbon-investment-fund-launches/>

OSI Delaware River Watershed Initiative Case Studies

Click on the linked titles to download pdfs.

[Case Study: Saving Lands for Clean Water in Sussex County, NJ \(2016\)](#)

[Case Study: Riparian Buffer Preservation Harris Farm \(2017\)](#)

[Case Study: Tapping the Carbon Market to Conserve Forests in the Poconos](#)

Short videos on various approaches to conservation in the Delaware Watershed are also available on OSI's website research page:

www.openspaceinstitute.org/how/research

With leadership support from the William Penn Foundation, the Open Space Institute administers the Delaware River Watershed Land Protection Fund, which provides capital grants for land acquisition and planning grants to promote watershed protection. Visit OSI's website to learn more.

www.openspaceinstitute.org/funds/delaware-river-watershed-fund

Open Space Institute

The Open Space Institute (OSI) protects scenic, natural, and historic landscapes to provide public enjoyment, conserve habitat and working lands, and sustain communities. Founded in 1974 to protect significant landscapes in New York State, OSI has been a partner in the protection of over 2.2 million acres in North America.

Delaware River Watershed Protection Fund

With leadership support from the William Penn Foundation, the Open Space Institute administers the Delaware River Watershed Protection Fund, which provides capital grants for land acquisition and planning grants that advance scientific tools, planning, and public policies that help secure abundant, clean water.

See [Fund Summary](#).

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