

Clear Water Carbon Fund

A Payment for Ecosystem Services Approach
to Addressing Climate Change



Manomet Center for Conservation Sciences

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Climate Change and Payment for Ecosystem Services

Ecosystem services are simply those services that intact, healthy ecosystems supply to humans. Common examples include food supply, provision of drinking water, and climate stabilization. These services are typically grouped as provisioning services, regulating services, habitat provision and supporting services, and cultural services.¹ Climate change, in conjunction with other anthropogenic stressors, will impact ecosystem services delivery. The unprecedented pace and scale of alterations in temperature and precipitation will affect the land and natural resources these ecosystem services are provided through, as well as the viability and survival of plants and animals also reliant on these resources.²

One approach that is being used to address the adverse impacts of climate change on ecosystems services is known as Payment for Ecosystem Services (PES). PES is a system of transactions in which a well-defined environmental service, or form of land use likely to secure that service, is bought through conditional payments to a voluntary provider.^{3, 4} PES has led to the development of formal markets for these services throughout the world. These markets, which can be either non-voluntary (regulated) or voluntary, relate to areas such as carbon, water, and biodiversity.⁵ For example, the Regional Greenhouse Gas Initiative (RGGI) initiative, developed through an agreement between Northeast and Mid-Atlantic states, was the first mandatory, market-based CO₂ emissions reduction program in the United States. Through RGGI, power plants may use carbon offsets to meet 3.3 percent of their compliance obligation.⁶ The voluntary carbon mitigation market originated partly in expectation of increased government requirements in line with those mandated through programs like RGGI.⁷ However, businesses found they can benefit from investing in carbon mitigation as a mechanism to promote their community relations and corporate social responsibility to customers; a “green” business strategy.

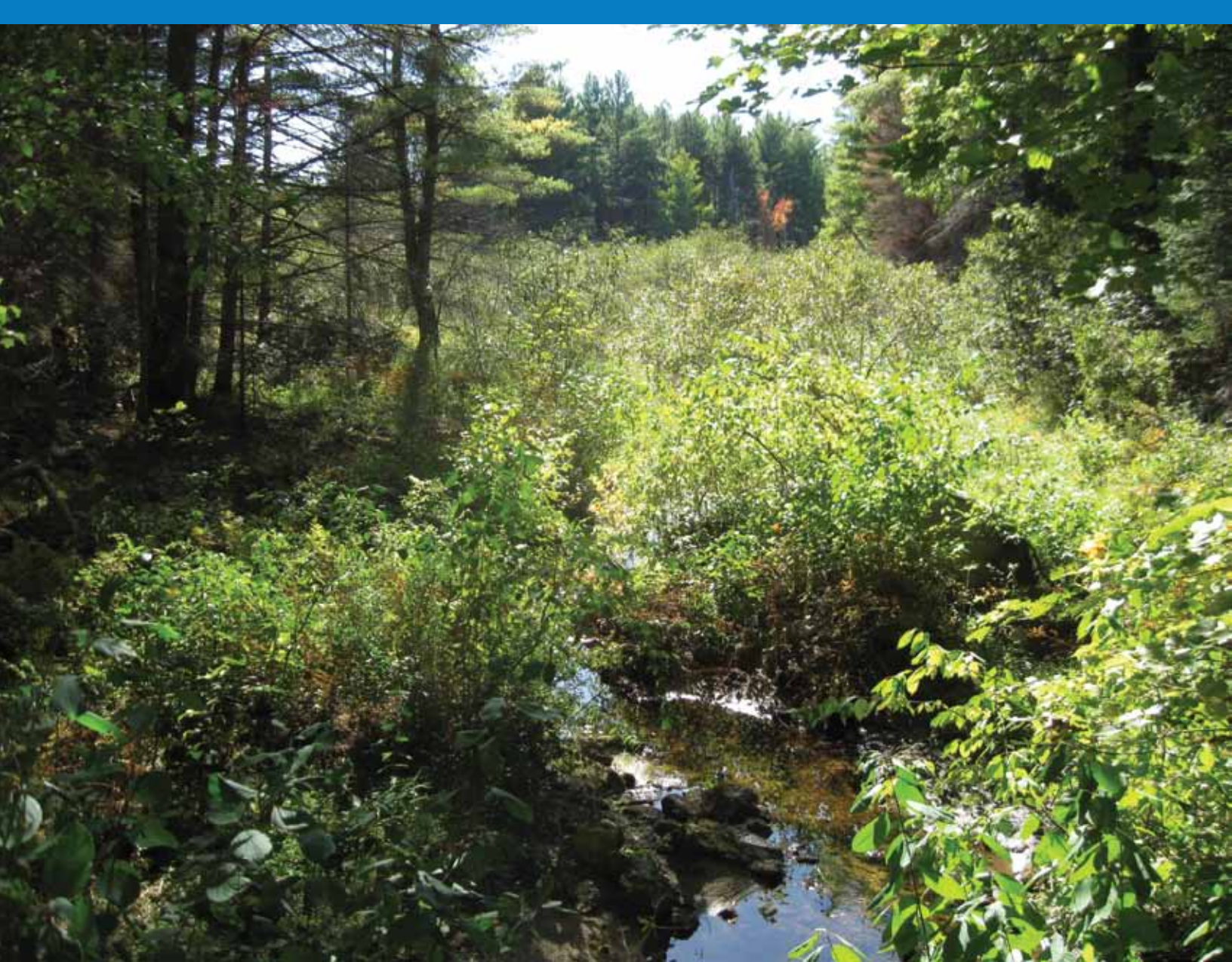
Manomet Center for Conservation Sciences has developed a voluntary PES program called the Clear Water Carbon Fund that simultaneously focuses on 1) carbon reduction based on contributions by non-governmental organizations, individuals and private business to mitigate their carbon emissions, and 2) water quality protection.⁸

Clear Water Carbon Fund

The Clear Water Carbon Fund* (CWCF) is a PES program initiated by Manomet Center for Conservation Sciences to simultaneously address water quality and carbon sequestration issues through reforestation of land along rivers and streams. Individuals and businesses that seek to mitigate carbon emissions and protect local water resources support the CWCF’s tree planting activities. The goals of the CWCF are to (1) create local, place-based carbon mitigation projects, (2) protect and improve clean water and aquatic habitats that are important to local communities and businesses, and (3) create a new revenue stream for land conservation and watershed protection. The CWCF was piloted in the Sebago Lake watershed in Maine and the White River watershed in Vermont in 2010. Over the past 3 years, the CWCF has expanded to 5 watersheds and raised enough money to plant 1,800 trees along rivers in Maine and Vermont. Over time, these trees will remove over 1 million pounds of carbon emissions from the environment and protect clean water and wildlife habitat.

* For more information on the Clear Water Carbon Fund, please go to <http://www.clearwatercarbonfund.org>.





CWCF users can use the website to determine the number of trees needed to neutralize their carbon emissions from heating, travel, commute, etc. Users can also select a specific number of trees to plant for themselves or as a gift. A single tree costs \$10.00 and will remove over 570 pounds of carbon from the atmosphere over the 40 year monitoring period.⁹ An average home heated with oil emits approximately 16,000 pounds of carbon each year. Users selecting that mitigation will plant 29 trees at a cost of \$261.00. The program was designed according to published standards, methodologies, and tools for greenhouse gas accounting, carbon sequestration calculations, and monitoring protocols. However, the program does not currently offer verified offsets because the costs of independent third party verification are prohibitive

Funds are used for planting and maintenance of trees near streams and rivers, monitoring of carbon sequestration, and rental payments to land owners. Manomet partners with local land trusts to both identify willing landowners and monitor the afforestation sites.¹⁰ Afforestation sites are selected to minimize nonpoint source pollution of receiving waters, shade streams to keep them cool, provide habitat, and sequester and store carbon.¹¹



CWCF Projects and Partnership

As mentioned, the goal of Clear Water Carbon Fund is to partner with local land trusts and watershed groups throughout the Northeast, creating a comprehensive network of local carbon reduction options for consumers. The Fund currently partners with the following groups:

- › **White River (VT):** CWCF partnered with the White River Partnership, an organization with over ten years of tree planting experience that provides the critical grassroots support and local landowner connections necessary for identifying landowners willing to commit to have trees planted and maintained on their land along streams and rivers. The CWCF planted 400 trees along the White River in 2012 and will plant another 400 trees in 2013, an area heavily damaged during the aftermath of Tropical Storm Irene in 2011. Local school students helped plant saplings and gained hands-on understanding of the importance of trees in stabilizing the riverbank and creating a diverse ecosystem.
- › **Upper Clyde River (VT):** CWCF partnered with NorthWoods Stewardship Center in East Charleston, VT, to plant trees along the Upper Clyde River. The CWCF will plant 400 trees in the spring of 2013. This watershed is in close proximity to Jay Peak, a supporter of the CWCF, and will be the recipient of funds raised through the partnership with Jay Peak Resort.
- › **Upper Androscoggin River (ME):** The upper Androscoggin River has a renowned trout fishery and the recreational opportunities provided by the river are important for regional tourism. CWCF partnered with the Androscoggin River Watershed Council in spring of 2013 to plant 300 of trees along the Pleasant River near Bethel, Maine. The Pleasant River is a tributary to the Androscoggin River and recent water quality monitoring found high water temperatures and low levels of dissolved oxygen in the Pleasant River. Over time, the trees planted by the CWCF will help shade the stream and keep water cool for trout and other fish. The funds for these trees came from Central Maine Power.
- › **Sebago Lake (ME):** CWCF partnered with the Western Foothills Land Trust to plant approximately 450 trees on two acres along the Crooked River near Harrison, Maine. The Crooked River has an excellent trout fishery and is the largest water source for the Sebago Lake, the drinking water supply for almost 200,000 people in 11 communities near Portland, Maine, as well as an important destination for fishing, swimming and boating. In 2013, the CWCF will plant 200 trees in conjunction with the restoration of a former gravel pit.
- › **China Lake (ME):** China Lake is the sole source drinking water supply for the Kennebec Water District, which serves 25,000 customers near Waterville, Maine. China Lake has experienced nuisance blue-green algal blooms, which can complicate drinking water treatment, raise costs of providing water service, pose potential health risks to consumers, and decrease local property values and recreational opportunities. CWCF has partnered with the Kennebec Water District and the Maine Rural Water Association to explore planting trees in riparian and priority upland habitats to reduce nutrient inputs to China Lake. They have identified potential landowners and are in the process of fundraising to plant trees in the spring of 2014. Work in this watershed was leveraged by receipt of a \$10,000 Maine State Drinking Water Program grant.



Benefits of CWCF

It is important that the Clear Water Carbon Fund's tree planting activities provide tangible benefits to carbon sequestration and water quality. The tree planting and monitoring protocol was designed so that carbon reductions are real and permanent. At this time the Clear Water Carbon Fund projects do not undergo third-party verification due to the high costs of auditing afforestation projects (approximately \$100,000 in upfront and annual monitoring costs). However, the Fund has made efforts to ensure this project has the scientific rigor, transparency, and trusted local partnerships to provide confidence that the projects will achieve desired climate benefits.

Planting trees along streams and rivers is a well-established and cost-effective way to protect clean water. These trees can trap mobilized soil particles and can typically reduce 40-70% of soil and nutrients from reaching water bodies.¹² Forests can further reduce sediment, improving water infiltration and storage, reducing the velocity of overland flow by stabilizing soil on upland slopes and stream banks as well as shading the stream channel from solar radiation, and providing coarse woody debris important for fish habitat.

In addition to the obvious greenhouse gas mitigation benefits from removing and storing carbon from the atmosphere, the CWCF program addresses several elements of climate change adaptation. Recent trends and modeled projections indicate a continued increase in the percentage of precipitation received in heavy precipitation events. As this shift continues the threat of non-point source pollution and erosion and sedimentation will continue to increase. The focus of the CWCF on afforestation of riparian areas restores an important suite of ecosystem services including stormwater management, flood control, and provision of habitat for fish and wildlife.

In addition to supplying carbon mitigation, CWCF's tree-planting program provides the "green infrastructure" benefits to maintain high water quality, habitat, and economic and recreational benefits that clean water provides. "Green infrastructure" is the interconnected network of planned and managed natural lands, working landscapes, and other open spaces that helps conserve ecosystem values and functions and provide associated benefits to human populations (e.g., ecosystem services).^{13,14} Emphasizing protection of significant core habitat areas and the corridors that connect them is one of the most effective approaches to maintaining high biodiversity and resilience to climate change, by supporting species in larger, uninterrupted areas that cannot occur in smaller patches. Often riparian areas are important corridors for linking these significant habitats, as they support high biological diversity used frequently as wildlife passages and habitat, and play an important role in water quality protection (e.g., reducing non-point source pollution).

Manomet believes that PES through an array of innovative mechanisms such as the CWCF project represents a potential "third generation" of conservation strategies (following [1] buying land, and then [2] conservation easements, which are now well established). For more information about Manomet's Clear Water Carbon Fund, please visit: www.clearwatercarbonfund.org. www.clearwatercarbonfund.org.



Endnotes

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