LAND MANAGEMENT AND CONSERVATION ACTIVITIES AS POTENTIAL OFFSET PROJECTS UNDER THE NORTHEASTERN REGIONAL GREENHOUSE GAS INITIATIVE

The states participating in the Northeastern Regional Greenhouse Gas Initiative (RGGI) have demonstrated tremendous leadership by stepping forward to develop a multi-state cap-and-trade program to reduce carbon dioxide (CO_2) emissions from electric power generators in the region.

The Nature Conservancy fully supports the development of a model greenhouse gas (GHG) cap-and-trade program that will achieve significant reductions in CO_2 emissions from power generators in the Northeast. Allowing covered sources to meet a portion of their emission reduction targets using carbon offsets from well-designed land management and conservation projects can ultimately help achieve a lower cap by increasing flexibility and lowering the overall compliance costs. In addition, such projects have the potential to generate substantial environmental and social co-benefits.

The Conservancy urges RGGI to structure the rules on the use of offsets to assure that significant emission reductions occur at the regulated power plants in the region. Offset projects should also be required to meet the highest standard of environmental integrity.

This paper discusses key issues and makes recommendations with regards to including carbon offsets from land management and conservation in the RGGI cap-and-trade program. More detailed recommendations on developing the specifics of the rules for use of land conservation and management offsets in the RGGI program will be provided in a forthcoming paper.

The Value of Land Management and Conservation Carbon Offsets

The Nature Conservancy believes that offsets from well-designed land management and conservation projects should play a valuable role in helping to meet RGGI emission reduction goals. This paper outlines six reasons why the Conservancy recommends the inclusion of land-based offsets in the model GHG cap-and-trade program.

1) Poor land management and forestry activities contribute significantly to the global warming problem. Conversely, improvements in these areas represent a major opportunity for reducing greenhouse gas emissions:

- Forests play a critical role in the global carbon cycle. Growing trees and plants absorb carbon from the atmosphere and store it in wood, stems, leaves, roots and soils. When forests are destroyed, they release significant, previously stable stores of carbon, back into the atmosphere.

- It is important to address all major sources of GHG emissions and employ all the effective tools that are available to reduce the risks of global warming. Land use change (primarily deforestation) accounts for 20-25% of global GHG emissions[1], an amount greater than the total fossil fuel emissions in the United States. Without substantial emission reductions from land-use, global warming can not be adequately addressed.

- The inclusion of land-based offsets can provide businesses with a means to cost-effectively reduce their overall GHG impact immediately, during the time that it takes to shift over to new technologies to dramatically reduce their fossil fuel related emissions.[2]

- Land-based carbon offset opportunities are sufficiently plentiful to warrant the development of a supporting framework to include them in RGGI rules. Between 1987 and 1997, forest destruction in the Northeast resulted in about 190 million tons of CO_2 emissions. If deforestation in the Northeast region continues at its current rate through 2050, 2.3 million acres of forest will be destroyed releasing an estimated 1 billion tons of CO_2.[3] Protecting forests that would otherwise be lost to housing, commercial development and other uses could significantly reduce emissions from this source. On the flip side, approximately 290 million tons of CO_2 were sequestered by the region's lands between 1987 and 1997.[4] There exist significant opportunities to enhance carbon uptake through activities such as planting forests on crop- or pasture-land, increasing forested riparian buffer areas, conserving lands threatened by development and improving forest management.

- Without additional economic incentives, such as carbon offset payments to land owners, land-based carbon storage rates in the United States are expected to continue to decline.[5] Carbon project financing associated with regulatory GHG offset programs, such as those under consideration by RGGI, is emerging as an important force for reducing terrestrial carbon emissions.

- Protecting land, or improving the way it is managed, can both reduce carbon dioxide emissions and increase carbon uptake. For example:

    - Conservation projects that protect threatened forests can prevent the release of large amounts of carbon into the atmosphere that would have otherwise resulted from their destruction.

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[1] Watson, et al (Eds.) (2000) – Intergovernmental Panel on Climate Change (IPCC): *Special Report on Land Use, Land use Change and Forestry* – Cambridge, U.K.
[2] Bloomfield, Bonnie, Carey, Goffman, Willey (2004) – *A Bridge to Climate Protection* – Environmental Defense, NY.
[3] Assumes an average of 430 tons of CO_2 emitted per acre of forest cleared, and trends presented in Alig, R.J., A.J. Plantinga, S.E. Ahn, and J.D. Kline (2003) -- *Land use changes involving forestry in the United States: 1952 to 1997, with projections to 2050.* U.S. Department of Agriculture, Forest Service, Portland, OR.
[4] Birdsey and Lewis (2002) – *Carbon in U.S. Forests and Wood Products, 1987-1997: State-by-State Estimates* – U.S. Department of Agriculture, Forest Service, Newtown Square, PA.
[5] According to the Environmental Protection Agency's Inventory of U.S. GHG Emissions and Sinks, U.S. forests sequestered 18% less carbon in 2000 than they did in 1990.
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- Timberland can be managed to maximize carbon benefits by, for example, increasing the age at which the trees are harvested, thinning to encourage old growth structure, and setting aside wider buffer zones around streams and rivers.
- Reforesting degraded lands can result in the removal (i.e., sequestration) of carbon from the atmosphere by the growing trees.[7]
- Conservation tillage, reduced fallow, and changing crop rotations are practices that can be adopted by farmers to increase the level of carbon in the soil.

2) Proven methods for reliably measuring, monitoring and verifying land-based carbon offsets already exist and are in widespread use:

- Methods for measuring and monitoring terrestrial carbon pools, based on commonly accepted principles of forest inventory, are well established and tested. For decades, landholders and government agencies have been accurately measuring and monitoring forest status and growth using a combination of techniques including, direct field measurements, satellite and aerial photography and computer modeling.
- In addition, well-developed third-party verification approaches are being used for ensuring the veracity of offsets being claimed. To further enhance credibility, if there are scientific uncertainties regarding offset measurements, tons can be discounted to account for them.
- Carbon storage data for the Northeast's various forest types are readily available. Drawing from periodically collected Forest Inventory and Analysis data, the United States Forest Service has developed estimates for average carbon storage per acre, growth rates, and potential maximum carbon storage in spruce-fir, white pine, maple-beach birch, oak hickory and other major forest types.

Reforestation and conservation tillage projects are among the most practical to implement for carbon offsets, since proving additionality, developing baselines, and verifying carbon benefits for such projects can be done in a relatively straightforward manner.

The Nature Conservancy also strongly supports the inclusion of forest conservation and improved forest management projects (e.g., wider stream-side buffers, longer rotations) in the RGGI offsets program. As indicated above, several studies on forests in the Northeast suggest that there is significant potential to reduce carbon emissions in the region through forest conservation and improved management. The Conservancy believes the up-front analysis to facilitate these projects is worthwhile, given the significant carbon and other benefits that would accompany forest conservation and improved forest management projects.

[7] The U.S. Forest Service has found that forests across the country have the potential to sequester between 0.3 and 3.5 tons of carbon per acre per year [Moulton and Richards (1990) – *Costs of Sequestering Carbon Through Tree Planting and Forest Management in the United States* – USDA, Forest Service, Washington DC.

3) Including offsets from land-use projects increases flexibility of the regulation and can lower the cost of meeting emission reduction goals. Including offsets will result in a policy that will be more widely accepted and more readily implemented:

- Allowing a portion of the required emission reductions to come from outside the RGGI-capped sectors provides flexibility and can reduce compliance costs, thereby enabling more aggressive targets (in terms of quantity and timing) to be set. In addition, allowing a portion of the offsets to come from projects outside of the Northeast region and the U.S. could further reduce RGGI compliance costs and maximize global biodiversity conservation and poverty alleviation co-benefits. RGGI could develop standardized baselines in priority regions, such as the northeast, to help reduce transaction costs and encourage projects.

- In some cases, forest protection and land management improvements represent low cost options for reducing greenhouse gas emissions. For example, an investment of $550,000 in the Bayou Pierre Floodplain Reforestation project in Louisiana will sequester 225,000 tons of CO_2 on 500 acres of land over 100 years (see Appendix A).

- Rules incorporating offsets that provide flexible and cost-effective methods of achieving meaningful emission reduction goals are likely to be more widely supported. This will reduce the likelihood of legal challenges and speed policy implementation.

- Offset programs that include land use activities are being incorporated into many GHG policy frameworks under development around the world.[8] Therefore, the inclusion of such offsets in the RGGI rules will facilitate expansion of the RGGI to include other states and jurisdictions.

- RGGI should structure the rules on the use of offsets to assure that significant emission reductions occur at the regulated power plants in the region, for example, by establishing a quantitative limit on the use of offsets and only issuing offsets for projects that meet the highest standard of environmental integrity.

[8] Both Oregon and Washington allow the use of forest offsets to meet required carbon-efficiency standards for new power plants. The Clean Development Mechanism (CDM) and Joint Implementation under the Kyoto Protocol include provisions for carbon from afforestation and reforestation projects in developing countries and economies in transition, respectively. Several European Governments are actively investigating opportunities to meet emission reduction goals for sectors not covered by the European Union Emissions Trading Scheme (ETS) using land-use offsets from CDM projects. While the ETS does not include land-based carbon offsets in the first phase of implementation (i.e., 2005-2007), European Governments are likely to include them in future phases.

4) ***Land management and conservation projects can deliver other environmental, social and economic co-benefits, in addition to reducing GHGs:***

- Forest and grassland conservation and restoration projects can:
  - Preserve open space threatened with conversion, thereby reducing urban sprawl and associated transportation emissions;
  - Protect (or create) important habitat for threatened and endangered species;
  - Protect watersheds and enhance water quality;
  - Protect areas with recreational and tourism value; and
  - Generate project employment, training opportunities and local tax revenues.

- Timberland management projects can:
  - Protect watersheds, streams and rivers by widening riparian buffer zones;
  - Reduce catastrophic fire risk through tree thinning and growth of larger trees;
  - Provide wood products for energy use, creation of fuel products (i.e. ethanol), and for the construction of products from wood; and
  - Create viable habitat for supporting biodiversity through natural forest management techniques.

- Cropland management projects can:
  - Reduce soil erosion, improve water quality and buffer against floods through the use of conservation tillage practices;
  - Provide seasonal wildlife habitat with cover cropping;
  - Improve air quality from reduced tillage and machinery use;
  - Increase farm profitability by reducing costs associated with operating tillage equipment and applying fertilizers; and
  - Improve agricultural productivity.

The Nature Conservancy's Bayou Pierre Floodplain Reforestation Project in Louisiana is described in Appendix A as an example of a project delivering verifiable and cost-effective carbon offsets while generating a host of valuable co-benefits, including biodiversity protection and economic development.

5) Land-based offsets can be used to establish broader state or regional incentives to reduce emissions from land-use activities throughout the Northeast:

- Allowing land-based offsets would provide information that would help in the development of state and regional land conservation and management strategies to reduce emissions and increase carbon-sequestration at a broader scale. For example, conservation offset projects could provide case studies to inform the development of state or regional policies that combine smart growth incentives with forest conservation incentives to reduce the emissions from transportation and to minimize the conversion of natural areas to development. The Connecticut Climate Stakeholders—a group of representatives from businesses, nonprofits, academics and government—recommended that the Governor align smart growth programs and efforts to protect forest and agricultural land as part of a strategy to meet the State's GHG emission reduction goal.[9]

6) Rules and protocols for managing land-based offsets have already been established by a number of leading regulatory and voluntary programs in the United States and around the world:

- Offsets have a decade-long history of discussion and thinking behind them and have begun to attract investment in projects with real carbon and ancillary benefits. RGGI can draw from the best and most proven programs to develop a set of model rules appropriate for the Northeast.
- Key carbon programs and initiatives[10,11] RGGI can draw from, include:
  - California Climate Action Registry has developed a detailed Forest Project Protocol for reporting the carbon benefits of conservation and conservation-based forest management projects, some elements of which could be used by RGGI.
  - Climate, Community and Biodiversity Standards for evaluating multiple benefit carbon projects.
  - Kyoto Protocol and Clean Development Mechanism[12] for managing land-based offsets.
  - World Bank BioCarbon Fund, which finances land-based carbon projects that also deliver biodiversity and community benefits.
  - Greenhouse Gas Protocol, established by the World Resources Institute and World Business Council on Sustainable Development, is the most widely-used standardized approach for calculating and reporting GHG emissions from various sectors.

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[9] Connecticut Climate Change Stakeholder Dialogue: Recommendations to the Governor's Steering Committee. The Center for Clean Air Policy, January 2004. See p. ES-26, p 3.1-26, and p. 2.4.-17. (http://www.ccap.org/Connecticut/Report/2004-Jan--CT--03-4-AFW.pdf)

[10] See attached matrix comparing the various rules and elements of these programs.

[11] For additional information about these programs and initiatives, please visit their respective websites: www.climatetrust.org; www.climate-standards.org; http://cdm.unfccc.int; http://biocarbonfund.org; www.ghgprotocol.org; www.climateregistry.org

[12] The Clean Development Mechanism has attracted investment in reforestation projects in developing countries that sequester carbon while delivering valuable environmental co-benefits, such as recreating migratory corridors for endangered birds and animals.

- The Climate Trust, which implements carbon offset projects for Oregon power plants to satisfy the state's legislated CO_2 standard.
- Standards developed by 3rd party certification organizations – A number of certifiers (e.g., SGS, GFA Terra Systems) have experience evaluating the carbon benefits associated with land conservation and forest management projects. RGGI can also draw from the Clean Development Mechanism and the California Climate Action Registry, both of which have established rules to accredit forest carbon certifiers and protocols defining how land-based projects should be evaluated.

Recommendations for next steps

The Conservancy recommends the following next steps to develop rules for high quality land management and conservation offset projects.

- Conduct a cost curve study for land conservation and forest management projects to identify those activities with the greatest potential in terms of cost-effectiveness and magnitude of both carbon and co-benefits. This assessment would identify current carbon storage and emission rates and opportunities for improving land management to increase storage or reduce emissions and their costs. The study assessment would focus on the Northeast and draw on existing data, including land cover, forest inventory, soil carbon, forest growth, land use trends, and opportunity cost. Similar studies have already been completed for the Southeastern US and California. Another important outcome of this study is that it would provide an initial basis for standardized baselines for each of the activity types.

- Develop standardized baselines and measurement approaches. Drawing from existing data and the cost curve analysis, we recommend the development of standardized baselines for the most promising project types. For example, for forest conservation projects, a standardized baseline could be based on historic deforestation rates for the region. For conservation tillage projects, the measurement of carbon benefits could be standardized by using look up tables with credible and conservative estimates of annual tons of carbon sequestered per acre. Standardized baseline and measurement approaches can reduce transaction costs, and prevent project developers from inflating their project baseline to increase the amount of carbon credits they can claim. We recommend that RGGI develop default baseline values for each project type using county or regional data.

- For the most promising activity types identified through the cost curve study, we recommend that default leakage discount factors be created to subtract potential leakage from estimated carbon benefits in cases where leakage is an identified risk.

- We recommend that RGGI develop straightforward additionality criteria that would only allow credit for those project activities that are not already regularly occurring in the region without government or philanthropic subsidies or carbon credits. For example, for conservation tillage, only activities where the land manager commits to no-till management for 10 or more years would be eligible. This would set a high bar for additionality because no-till, if used, is rarely practiced for more than two years. For reforestation projects, we recommend that RGGI require reforestation with native species

in areas that have not been in forest use for the previous 10 years and that the forestland be protected through long-term easements or other protection status.[13]

- We recommend that RGGI require that all projects provide some benefit to the environmental or local community (e.g., habitat protection, water quality improvement, reduced soil erosion) in addition to the carbon benefits.

The Conservancy believes that all offset projects should meet the highest standard of environmental integrity such that they achieve real, verifiable and permanent reductions in greenhouse gas emissions, and provide ancillary social and environmental benefits. The Conservancy also believes RGGI should structure the rules on the use of offsets to assure that significant emission reductions occur at the regulated power plants in the region. A forthcoming paper will provide more detailed recommendations for establishing effective rules for land management and conservation projects.

[13] The California Climate Action Registry uses this additionality criteria for reforestation projects. The CCAR requires projects to promote and maintain native forests. In addition, managed forest lands must promote natural forest management (i.e. mixed species and ages).

[14] The project-specific baseline approach has been the norm to date under existing offsets programs and is the approach adopted by the CDM and the Oregon Climate Trust. The California Registry forest protocols allows conservation projects to use either a project specific baseline or county-level default values. As county-level data on deforestation rates for different forest types in California improve, the project specific approach will likely be phased out.

Appendix A

Bayou Pierre Carbon Offset Project

PROJECT DESCRIPTION

The Nature Conservancy, in partnership with others, is carrying out a bottomland hardwood forest restoration project on marginal farmland to sequester atmospheric carbon dioxide (CO_2), a principal greenhouse gas. The project reestablishes bottomland hardwood forests on 500 acres of private land along Bayou Pierre. The project site (see attached map) is located in the Lower Mississippi Valley (LMV), in central Louisiana between the Natchitoches and Shreveport, and lies between the Bayou Pierre Wildlife Management Area and the Bayou Pierre Unit of the Red River National Wildlife Refuge.

Beginning in early 2005, nursery raised seedlings will be planted at Wetland Reserve Program standards, on a 12 x 12 foot spacing for an initial density of 302 seedlings per acre. The native species to be used include sweet gum, bald cypress, tupelo, green ash, willow, overcup, cherrybark and nuttall oaks.

Over its 100 year lifetime, the project is expected to absorb 225,000 US tons of CO_2 equivalent from the atmosphere and store it over the long term.

ADDITIONALITY

According to preliminary data from forest change detection in the Lower Mississippi Valley, since the mid-1980s forest cover increased by 790,000 acres (Ducks Unlimited, 2003). This increase in forest cover has been driven by public payments (WRP and CRP), planting on federal lands, and through carbon sequestration projects funded by energy companies (see Table 1).

Table 1. Reforestation in the Lower Mississippi Valley 1986-2004

Category of reforestation	Acres	Years	Source	Notes
NWR Lands	56,916	1987-2003	LMVJV Reforestation Tracking System (2003b)	Restricted to boundaries of Lower Mississippi Valley.
State Lands	3,630	1986-2003		
Private Lands (Federal funded)	9,735	1989-2003		
Private Lands (AEP – carbon project)	7,866	2000-2001		
WRP (Arkansas)	77,625	1995-2001		
WRP (Louisiana)	118,789	1992-2002		
WRP (Mississippi)	94,285	1992-2001		
WRP (Tennessee)	9,038	1995-2001		
CRP (Arkansas)	74,256	1986-2004	Farm Service Agency, USDA (2003)	Acreage for counties that intersect Lower Mississippi Valley boundaries. Acreage in active contracts enrolled under CP 3 and CP 11. Excludes acreage enrolled between 1986 and 1989 that was not re-enrolled (i.e. acreage in contracts that have expired and not been re-enrolled).
CRP (Illinois)	874	1986-2004		
CRP (Kentucky)	1,326	1986-2004		
CRP (Louisiana)	109,732	1986-2004		
CRP (Mississippi)	202,285	1986-2004		
CRP (Missouri)	2,481	1986-2004		
CRP (Tennessee)	2,980	1986-2004		
Total	771,817			

Using available sources of data (Table 1), 98 percent of the detected increase in forest cover in the Lower Mississippi Valley can be attributed to publicly-funded reforestation and carbon sequestration projects funded by energy companies. Practically all reforestation that has occurred in the Lower Mississippi Valley in the last seventeen year has been due to government payments. Thus on a region-wide scale, the baseline, business-as-usual reforestation rate in the Lower Mississippi Valley is negligible, without government incentives.

Thus the Bayou Pierre Carbon Offset Project is additional to the baseline, business-as-usual reforestation rate.

LEAKAGE

It is highly unlikely that forested areas outside of the project boundary would be converted to cropland as a result of the project activities. First, the agricultural production on the project lands is currently minimal. Furthermore, there are millions of acres of non-forested lands in the geographical area of the project to continue to support agricultural demand.

PERMANENCE

The project life will be 100 years. The Nature Conservancy will ensure that the property is protected in the long-term. Protection options include adding the project land to the public trust where it will remain in public ownership in perpetuity.

MONITORING AND QUANTIFICATION

Periodic monitoring of the project area will be made by Environmental Synergy Inc. Monitoring and quantification will follow peer-reviewed methodologies developed by Winrock International to measure the above-ground, below-ground, and soil carbon pools. Until field measurements are conducted, CO_2 benefits will be projected based on sequestration research by Louisiana Technical University and Winrock International for the LMAV region.

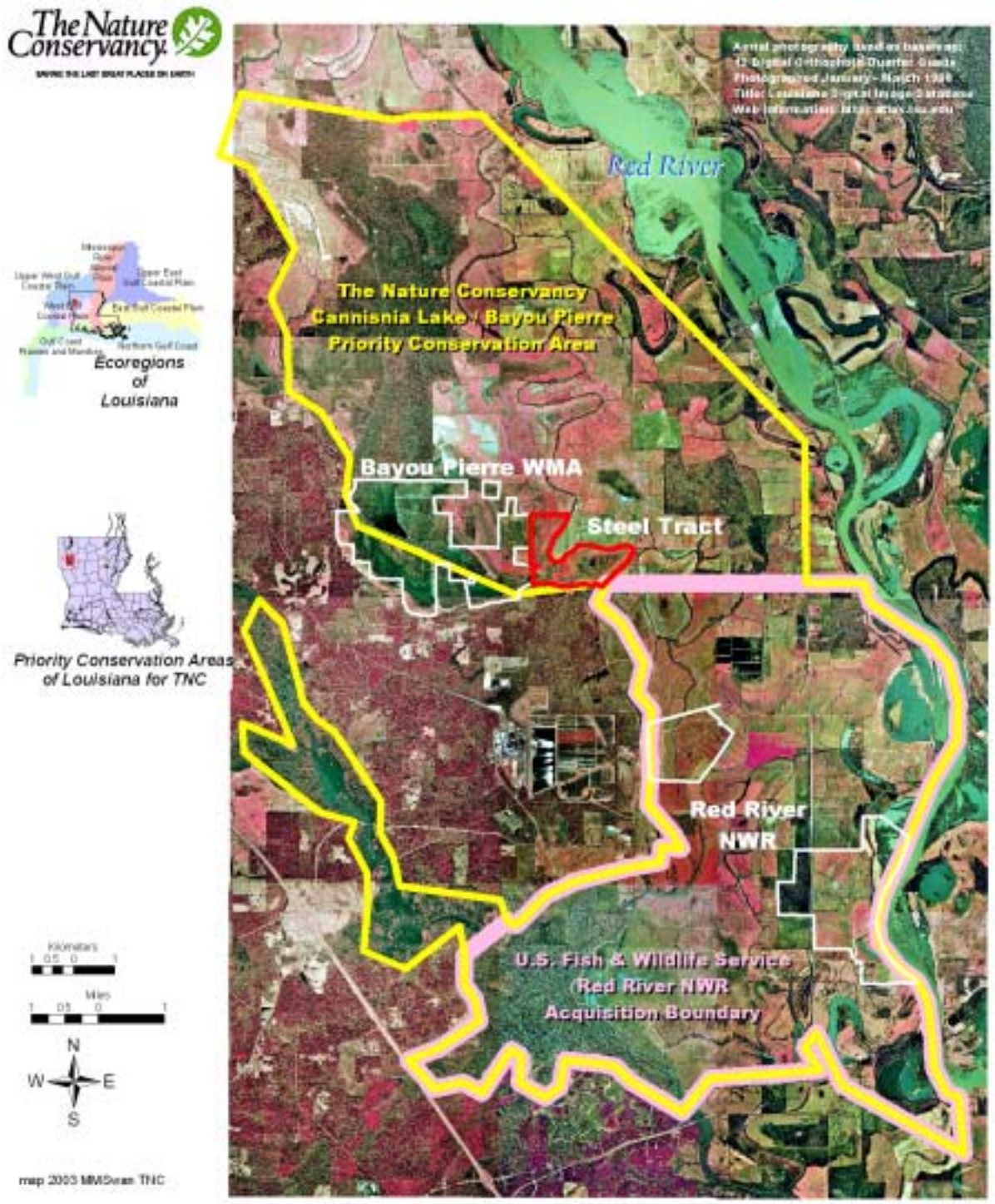
SECONDARY AND ANCILLARY BENEFITS

Restoration of bottomland hardwood forests in the LMAV will restore wildlife corridors by connecting fragmented habitats for migratory birds and waterfowl and other wildlife and will help protect biodiversity in the region. More than a million acres of bottomland hardwood forests were cleared in the LMV in the 1970s for agricultural crop production. Much of the land was poorly suited for crops due to low soil productivity, and cultivation has contributed to extensive soil erosion and nitrogen fertilizer runoff contributing to the hypoxia zone and degraded fisheries in the Gulf of Mexico. The extensive clearing was also devastating to wildlife habitats, destroying and fragmenting wooded habitats critical to migratory birds, waterfowl, and protected species such as the bald eagle, peregrine falcon, and the Louisiana black bear. In addition, this extensive increase to the agricultural land base in the LMV added a significant logistical and financial burden to the flood control mission of the US Army Corps of Engineers.

Planting native trees on this marginal agricultural land for carbon sequestration purposes helps reverse many of the above impacts. Afforestation decreases soil and nutrient inputs to waters, reducing the hypoxia zone and helping to improve fisheries in the Gulf of Mexico. The project thus contributes to the habitat restoration goals of the Lower Mississippi Joint Venture and the North American Waterfowl Plan, the soil protection goals of USDA's Wetland Reserve and Conservation Reserve Programs, and reduces the flood protection burden of the US Army Corps of Engineers. The project helps multiple agencies achieve society's long-term goals for the environmental security of the LMV. Since the federal and state budgets for such projects are limited, these projects often would not take place at all without external funds. Where projects might have gone forward with federal or state funding, external funding leads to more tree planting. Either way, earlier and greater environmental benefits accrue. Over time, the projects also reduce the overall cost to taxpayers.

ALLOCATION OF CARBON CREDITS

PowerTree Carbon Company, LLC, will retain the rights to all emission reductions associated with the project. PowerTree Carbon Company, LLC, will distribute the carbon offsets among its 25 member companies.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