The Use of Conservation Easements to Secure the Role of Private Forests in an Emerging Carbon Market

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Abstract:

Forests provide a wide range of conservation benefits. Among these benefits is their ability to help mitigate global warming through their capacity to store and absorb carbon dioxide, a global warming gas. In spite of this capacity, the forest sector is currently the second largest global source of carbon dioxide emissions. However, this trend may be reversed. With increased conservation-based efforts, forests can help mitigate global warming.

The unique role of forests as both a carbon dioxide source and carbon reservoir is a focus of climate change discussions among policy-makers as market-based approaches are developed to address global warming. Policy-makers are considering how forests should participate in the evolving market-based approaches to global warming. Specifically, they are assessing the extent to which forests currently contribute to global warming and determining how they should contribute to its solution in a market context.

In the United States, privately owned forestlands can play a significant role in a forest carbon market, as they represent the majority of forestland in the U.S. With the increased conservation and conservation-based management of these forestlands, these forests can help mitigate global warming and simultaneously achieve additional regional and national conservation benefits. However, in order to achieve such benefits, commonly accepted forest carbon accounting rules need to be established. While a regulatory structure that embodies such rules is evolving, there is an existing legal tool that can be used to implement these rules: conservation easements. Conservation easements are an available and effective legal mechanism that may be used to secure permanently carbon dioxide emissions reductions on private forestlands in a carbon market transaction.

Introduction:

Forests provide the public with a variety of conservation benefits. They help maintain water quality, as forested watersheds catch and filter water, regulate flow and moderate flooding. They are a major destination for recreational activities such as camping, bird watching, backpacking and hiking. Furthermore, forests provide habitat for multiple species. For instance, in the United States, forests host approximately 90% of the nation's amphibian, bird, and fish species and 80% of mammal and reptile species for at least part of their life cycles (U.S. Dept. of the Interior 1998). In fact, there are more endangered or threatened species listed for forests than for other land use types[1] (Best and Wayburn 2001).

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[1] The terms threatened and endangered pertain to classifications under the U.S. Endangered Species Act (ESA). Pursuant to the ESA, the term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man. The term "threatened

Biodiversity is also an essential service that forests provide for species survival. Biodiversity encompasses all the interactions and processes of an ecosystem and includes not only the numbers of species (or richness) in an ecosystem, but other elements as well, including the diversity of species, structural stages and life cycles, life in functional and nutritional niches and diversity of landscapes. The maintenance of diversity preserves options within a system, which in turn, provides greater resilience to disturbance. Thus, maintenance of options, or biodiversity, is critical to survival.

Moreover, forests play a critical role in climate stabilization, as they may be both a source of carbon dioxide as well as a carbon dioxide reservoir. As forests grow, they absorb carbon dioxide from the atmosphere. They convert the carbon dioxide into carbon and store the carbon in their leaves, roots, branches and boles. However, when forests are disturbed through events like deforestation or harvest, they release their carbon stores as carbon dioxide into the atmosphere.

At the global level, forests are the second largest source of carbon dioxide emissions. They comprise 23% of the world's total carbon dioxide emissions (U.S. Dept. of Energy 2001). The primary reasons for their emissions are forest loss due to 1) conversion to agriculture and development and 2) harvest.

Role of U.S. Forests in Global Warming

Forests of the United States play a significant role in global climate change. They currently cover approximately one-third of the total U.S. land mass, comprising 747 million acres (EPA 2001). It is estimated that about 29% of U.S. forestland has been lost since 1630, with approximately 300 million converted to other uses, mainly agricultural (Smith et al. 2001). In recent decades, the amount of forest coverage has remained fairly constant (Smith et al. 2001).

From a carbon perspective, U.S. forests are currently a net carbon reserve. Recent statistics indicate that they sequestered 247 million metric tons of carbon equivalent (MMTCE) in 1999 (EPA 2001). However, while US forests are currently a net carbon reserve, their sequestration capacity is declining. Between 1990 and 1999, carbon flux declined from 273 MMTCE to 247 MMTCE (EPA 2001). Much of this decline is attributed to land use change, such as conversion to other uses and increased harvest (EPA 2001).[2]

Privately owned forestlands contribute significantly to this decline. As they comprise two-thirds of total U.S. forestland, their management and status have significant implications for U.S. total forest carbon stocks and carbon dioxide emissions (i.e. global warming). Conversion of private forestlands to other uses is increasing. Between 1992 and 1997, approximately one million acres of private forestland were lost each year to development, which is a 70% increase over the previous decade (NRCS 1999). This trend of loss is expected to continue, as the National Resource Council predicts a continued decline of 5% (20 million acres) by 2020 (Best and Wayburn 2001).

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species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (ESA 1973).

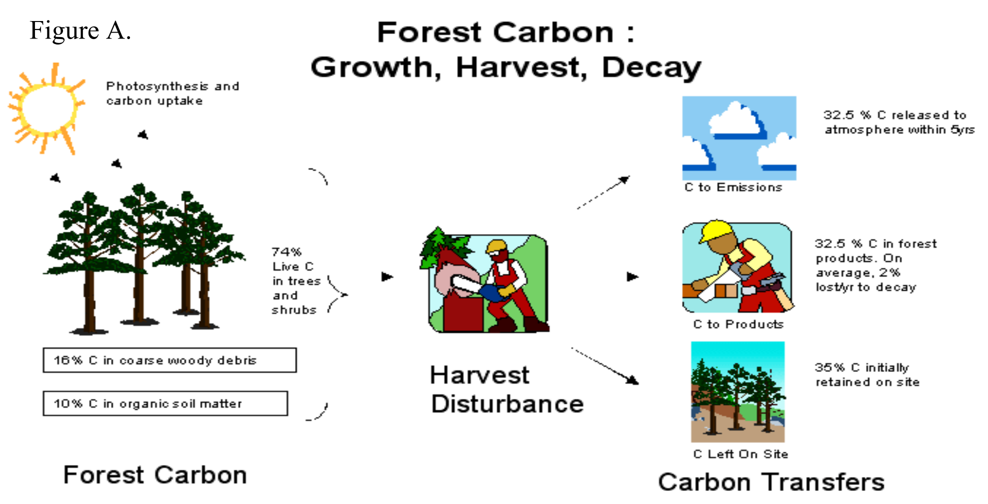
[2] While total acreage under forest coverage has remained fairly constant in recent times, underlying changes are occurring on private forestlands. Many older private forestlands are undergoing conversion while new younger plantations are replacing former agricultural lands (Wayburn et al. 2000; Best and Wayburn 2001).

California and Washington are among the national leaders in terms of forest loss. Over the past decade, California's rate of forest loss to nonforest use has increased steadily. The State currently loses 60,000 acres of forestland annually, the majority of which is private (NRCS 1999). Coincidentally, statistics concerning California's inventory of greenhouse gases indicate that net carbon sequestration of California's forests and soils has declined by approximately 27% between 1990 and 1999 (Choate et al. 2002).

Statistics for Washington also portray a significant loss of carbon due to conversion. Between 1982 and 1997, 262,800 acres of private forestland in Washington were converted to nonforest uses (NRCS 1999). In 1990, over 4 million tons of carbon dioxide emissions in Washington were due to the conversion of forest to other uses, such as agriculture and development (Kerstetter 1994a). Similar emission rates are projected to continue through 2010 (Kerstetter 1994b). When forests are converted, not only are large amounts of carbon released to the atmosphere through burning and decay, but additionally, with development, no future carbon stores can be realized.

Harvest on private forestlands also impacts total U.S. forest carbon stocks and emissions. In 1997, approximately 90% of the total U.S. timber harvest came from private forestland (Best and Wayburn 2001). Between 1991 and 1997, private harvest increased by 7% (1.02 billion cubic feet) and similar increases in harvest are projected to continue through 2020 (Best and Wayburn 2001). The carbon dioxide released into the atmosphere as a result of the harvest process is significant. In a typical harvest, one third of a forest's carbon stores is released into the atmosphere within five years of harvest (Harmon et al. 1996). The remaining two-thirds are almost completely lost over time due to decay and site preparation (see figure A). Ultimately, about 5% of the original forest carbon stores remain on site. While forest carbon may be stored for a term in forest products, the carbon is eventually released over time through decay.[3]

Figure A.



Sources: Harmon, M.E., S.L.Garman, and W.K.Ferrell. 1996; Turner et al, "A carbon budget...","1995; and Turner et al, "Carbon sequestration ..."1995.

When forests are disturbed by harvest, 32.5% of the carbon is released to the atmosphere within 5 years. This increases to 62.5% over time as the majority of the 35% of carbon initially retained on site (in stumps, roots, and coarse woody debris) is released through decay over time through decay. 32.5% of carbon is transferred to the forest products pool where 2% of this carbon is released per year through decay.

[3] The average estimate of the decay rate for all forest products is 2% per year (Harmon et al. 1996).

Some states have calculated the carbon dioxide emissions associated with the harvest process. Carbon dioxide emissions associated with harvest and forest products in Washington amounted to 37,304,000 tons of carbon dioxide in 1990 (Kerstetter 1994a).[4] Projections for 2010 show a slight increase in carbon dioxide emissions for this category at 38,683,442 tons CO_2 2010 (Kerstetter 1994b). Oregon attributed 8% (55.3 million tons) of its total carbon dioxide emissions in 1990 to old growth timber harvests (Oregon Dept. of Energy 1995).

The preceding information indicates that private forests of the United States certainly play a role in the global warming problem. At the same time, they also indicate that there is opportunity for these forests to be a part of the global warming solution. By mitigating or preventing private forestland conversion, the carbon dioxide emissions associated with this loss can also be avoided or at least minimized. Likewise, the improvement of forest management practices can also lead to fewer carbon dioxide emissions from harvest and increased forest carbon sequestration.[5] This can be accomplished by extending rotations, retaining trees through one or more harvests, and rebuilding older age classes of forest on the landscape (Wayburn et al. 2000; Harmon et al. 1996).

Such conservation-based forest activities will not only maximize the potential of private forests to help mitigate global warming, but they will also maximize the multiple other conservation benefits that forests provide. Efforts to conserve carbon on private forestlands will help improve water quality, biodiversity and endangered species habitat. These benefits will also benefit recreational opportunities.

Thus, trends of private forestland loss in the United States demonstrate an opportunity for forests to play a positive role in global warming. It will require private forestland owners to undertake conservation-based measures that prevent forest carbon loss (i.e. forest loss) and encourage forest carbon gains. However, landowners will need an incentive to undertake such efforts. A forest carbon market that arises from market-based approaches to address global warming can provide such an incentive.

Conceptual Framework for Forest Carbon Market:

In order for a forest carbon market to develop, there needs to be a demand for the carbon stored in forests. Such a demand could evolve from a regulatory system that caps greenhouse gas emissions – carbon dioxide in particular – from certain sectors whose emissions result from the combustion of fossil fuels (e.g. energy, transportation etc.). Similar to the emissions trading provisions of the federal Clean Air Act in the U.S., capped entities could be issued allowances (or permits) to emit a certain amount of carbon dioxide in a given year. If these entities emit less than their permitted amount, they would be able to sell (or trade) the remaining amount to another entity, perhaps one that is not able to meet its reduction goals on its own.

As a sector that both emits and sequesters carbon dioxide, forests would likely be integrated into such a market or trading system. Forest landowners ("sellers") could receive credit for the carbon stored in their forests that resulted from practices that exceeded "business-as-usual." These forest carbon "credits" could then be sold as emissions reductions to capped sectors/entities ("buyers"). Under such a scenario, the financial incentive to undertake forest carbon conservation would be created, as buyers would pay sellers to undertake conservation-based activities on their forestlands.

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[4] This statistic is a product of measuring CO_2 emissions from forest residue, long and short-term forest products, and slash burns.

[5] Reforestation is an additional means for sequestering carbon.

Elements of this market framework are evolving at the international, federal and state levels of government, as well as in the private sector. The Kyoto Protocol, while it has yet to enter into force, requires certain industrialized countries to reduce their greenhouse gas emissions to 1990 levels by 2012. The Protocol permits reforestation, afforestation and forest management as a means for countries to achieve emissions reductions goals. States in the U.S., like Oregon and Massachusetts, have passed laws and regulations that limit carbon dioxide emissions from power plants and allow for at least some of the emissions reductions to be achieved through forest carbon projects.

Voluntary greenhouse gas registries and reporting protocols are also signals of an emerging forest carbon market. The U.S. government, as well as several states, have developed or are in the process of developing, protocols for the registration of carbon dioxide from the forest sector. For instance, the Climate Leaders program, recently established by the U.S. Environmental Protection Agency, is a federal voluntary greenhouse gas registry that allows for the registration of forest-produced emissions reductions. Similarly, California has established a voluntary greenhouse gas registry that will include the registration of forests carbon stocks and emissions. Other private institutions, like the World Resources Institute and the Chicago Climate Exchange, are also creating guidelines and setting precedents for the role of the forest sector in a carbon market.

Rules for a forest carbon market:

In order for forests to play a credible role in a market intended to reduce greenhouse gases, forest-produced carbon dioxide emissions reductions need to achieve a real benefit for global warming. In addition, they should achieve local conservation benefits on the ground. In recognition of this reality, a set of rules to guide a forest carbon market policy have emerged and are gaining increasing acceptance. These rules will likely be incorporated in future forest carbon market policies, and they are as follows:

Additionality:

To produce real atmospheric carbon dioxide reductions for buyers, creditable forest carbon stocks will need to result from activities that exceed "business as usual" (BAU) practices. These additional actions would cause additional carbon dioxide to be absorbed and stored in forest biomass and/or prevent carbon dioxide emissions from being emitted from forests.

Permanence:

In order to achieve long-term reductions of carbon dioxide in the atmosphere and simultaneously, enduring conservation benefits on the ground, additional forest carbon stocks will need to remain stored for the long-term.

Conservation benefits:

A forest carbon market should foster the additional local conservation benefits that can be achieved through the conservation of forest carbon, such as improved water quality, biodiversity and species habitat, qualities that older, less disturbed forests promote. In addition, it should promote sustainable forest economies by rebuilding depleted forest timber inventories. Moreover, it should avoid encouraging or crediting perverse incentives such as the replacement of native forests or ecosystems with nonnative forests in order to generate carbon credits.

Annual credit/debit accounting:

To ensure that only net carbon gains are credited accurately, there should be annual credit/debit accounting of forest carbon stocks and emissions.

Third party certification:

Third party certification (third party to the landowner and buyer) ensures that participants follow the same set of rules and provides assurances to all stakeholders that real creditable reductions are achieved.

Practical application of these principles through a conservation easement:

While a governing policy that incorporates these rules has yet to be established, a conservation easement is an existing legal mechanism that may be used to implement these rules and facilitate a forest carbon transaction. Similar legal tools exist and may be used in other countries to secure the same benefits.[6] The Pacific Forest Trust (PFT) has successfully executed sales of carbon dioxide emissions reductions from privately owned forests with the use of conservation easements. The following explanations should provide practical insight regarding how such rules might be implemented on the ground in conjunction with a conservation easement.

A conservation easement is a voluntary legal agreement between a private landowner and qualified non-profit land trust or governmental agency. Multiple tax benefits, estate and income, are associated with conservation easements that meet the U.S. Internal Revenue Code requirements.[7] The conservation easement is a perpetual deed restriction that defines and limits development and land uses to protect public benefits such as habitat, water quality, open space and scenery. The easement sets broad, long-term goals for consistent, sustainable forest management, which allows the forestland land to stay in private ownership and productive use, including timber harvest. The land trust or other qualified governmental entity holds the easement and ensures, through monitoring and enforcement, that the terms of the easement are upheld.

In a forest carbon transaction, conservation easements can legally ensure the additionality of carbon dioxide emission reductions. Upon the development of an easement, a baseline description of the ecological condition for the covered area is created. This provides an overview of existing zoning and land use practices, infrastructure (e.g. roads, fences, bridges etc.), conservation values, types and extent of vegetation, riparian zones, forests and soils and timber inventory. The baseline serves as the foundation for the monitoring of conservation easement terms, which outline the improved conservation-based management that will continue in perpetuity on that land area. It also serves as the basis for determining baseline measurements and subsequent additionality of forest carbon stocks, since timber inventory is a main component

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[6] Like conservation easements, conservation covenants in British Columbia serve as voluntary perpetual agreements that can secure carbon on private property. A covenant allows for identification of specific property and property use rights on a given ownership, and secures the permanent dedication of lands to specific purposes, particularly ecological purposes and in this case, carbon. At least 26 other countries have conservation easements or legal equivalent.

[7] See Internal Revenue Code, 26 U.S.C. 170(h)(4)(A) et seq.

for determining forest carbon stocks and sequestration. During monitoring, the land trust or governmental entity will use the baseline and conservation easement terms as a reference to ensure that the landowner is managing the property according to the improved management terms of the agreement.

The specific terms of the conservation easement may vary, depending on the type and condition of the forest and goals of the landowner. However, from a broad perspective, the terms will promote conservation-based practices by prohibiting or limiting subdivision and development, dedicating the property to permanent forest use, and improving the management of the property for conservation purposes, which can include carbon conservation. Examples of such terms can include: maintaining native forest, limiting the amount of timber that may be removed from the property at any time, reforesting certain areas, extending timber rotations, and increasing the size of riparian buffer strips. Essentially, the easement terms result in the increased average age of the forest, which in turn, results in increased, or additional, forest carbon stocks when compared to the baseline. Furthermore, the conservation easement, because it is perpetual, acts as a legal guarantee that these additional forest carbon stocks – on average - will remain stored in perpetuity. Such a legal guarantee is very attractive to buyers who are looking to buy emissions reductions that minimize risk.

The terms of the conservation easement will also preserve forest conservation benefits on the ground, such as endangered species habitat, water quality and enhanced biodiversity. As mentioned earlier, conservation easements as defined pursuant to the Internal Revenue Code should be developed in accordance with one of the conservation purposes outlined in the Code. These purposes include: 1) the protection of open space (including farmland and forest land) for the scenic enjoyment of the general public or pursuant to government conservation policy that significantly benefits the public, and 2) the protection of relatively natural habitat of fish, wildlife or plants (or similar ecosystem) (IRC 1986).[8] The specifics of these requirements become a part of the permanent easement agreement and help ensure forest carbon gains. These conservation benefits are not only beneficial for the general public but also for the buyers who are looking for emissions reductions that have the added tangible benefits of local conservation. Thus, forest based emissions reductions secured by conservation easements can have additional value in a forest carbon market due to these mandated local benefits.

A conservation easement is also added security for third party certification. If the landowner chooses to retain ownership of the carbon stocks that are secured by a conservation easement, the land trust (or qualified governmental entity) may play the role of third party certifier. If the land trust has the adequate expertise, it may certify carbon stocks on easements as it conducts its regular monitoring to ensure that the terms of the conservation easement are being followed. Thus, the land trust may conduct annual monitoring to ensure that the forestland is managed in accordance with the easement, which in turn, is a check on the conservation and accumulation of forest carbon stocks.

The monitoring process associated with conservation easements is also a convenient arrangement for annual credit/debit carbon accounting. The land trust, while conducting annual monitoring of the easement property, can also account for the forest carbon gains and losses. The annual gain and loss of forest biomass is tracked by the land trust and checked against the

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[8] Other purposes include 1) "the preservation of an historically important land area or a certified historic structure" and 2) " the preservation of land areas for outdoor recreation by, or the education of, the general public" (IRC 1986).

easement terms. The annual gains and losses of forest carbon can be extrapolated easily from the forest biomass and reported in a central registry.

Conservation easements are a tool that may currently be used in the practical application of evolving forest carbon market rules. They provide a financial incentive that is needed to encourage landowners to undertake additional conservation efforts on their forestlands, which lead to real climatic benefits, as well as other valued conservation benefits. Conservation easements are attractive to the buyers in a carbon market, as the easements provide a perpetual legal guarantee of additionality, permanence, and conservation and provide the basis for third party certification and annual debit/credit accounting.

Summary/Conclusion:

Private forests of the United States can play a significant and positive role in emerging market-based solutions to global warming. The financial incentive created by a market for forest carbon can help reverse the trend of private forest loss and their associated carbon dioxide emissions. For the same reason, a forest carbon market can also encourage more forest conservation and conservation-based management practices, which will increase the amount of carbon dioxide absorbed and stored by these forests. Such practices will help mitigate global warming and simultaneously achieve other significant local conservation benefits, such as improved water quality, species habitat and biodiversity.

Commonly accepted rules that govern the role of forests in a carbon market are emerging. These rules require additionality, permanence, local conservation benefits, credit/debit accounting and third party certification. While a specific policy that reflects these rules has yet to be established, conservation easements are existing accepted legal mechanisms that can be used to effectively implement these rules and secure permanent gains for the climate and local conservation.

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