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Estimated participation in U.S. carbon sequestration programs: A study of NIPF landowners in Massachusetts

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ABSTRACT

Although carbon sequestration programs for non-industrial forestland owners in Massachusetts are being developed, very little is known about the program attributes of importance to different types of landowners or the likelihood that landowners will participate in any given program. This study estimates the probability that Massachusetts landowners will participate in several carbon offset programs using data from a survey of 3000 Massachusetts forestland owners. Results from an ordered logit discrete choice model suggest that the likelihood of enrollment in most programs is quite low. Landowners are clearly motivated by economic factors, but other aspects of carbon sequestration may also be important in their decision making.

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Introduction

Depending on species, stand structure and growth rates, some forms of forest management have been shown to provide meaningful potential for storing carbon above and beyond what would be stored without management (Nunery and Keeton, 2010). The extra sequestered carbon could be traded on offset markets creating additional revenue for forestland owners as well as reduced net carbon emissions. Ten percent of US carbon emissions is absorbed by U.S. forests each year (Dickinson, 2010), and enhanced carbon sequestration from forests could play an important role in offsetting carbon

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emissions. However, very little is known about the extent to which forest landowners might participate in carbon sequestration programs.

This paper assesses the likelihood that non-industrial private forestland (NIPF) owners in Massachusetts would enroll in various forestland carbon sequestration programs. To that end, data from a 2009 landowner survey is used to build on the findings of a pilot study conducted by Fletcher et al. (2009) to estimate the response of Massachusetts NIPF landowners to alternative hypothetical carbon sequestration programs.

Background

At the national level, there are possibilities for the NIPF landowner to implement enhanced carbon storage and sell the resulting carbon offsets, through programs like the California Climate Action Reserve (see Nickerson, 2008), Western Climate Initiative (see Perschel et al., 2007), and the Regional Greenhouse Gas Initiative (Perschel et al., 2007). Over the counter (OTC) offset markets offer additional programs (Dickinson, 2010). Moreover, the U.S. Congress is debating a possible national cap and trade system that could involve NIPF landowners (U.S. Climate Legislation, 2010). Despite these possibilities, opportunities for Massachusetts NIPF owners to sell carbon offsets are limited.¹

Massachusetts is located in the northeastern United States and its land use is dominated by forest. In spite of being the third most densely populated state in the United States, 60% of the land cover is forest. Seventy percent of this forest is owned by over 36,000 different individual non-industrial private families and individuals. The overall average ownership size is 17.9 acres and when ownerships smaller than 10 acres are excluded, the average rises to 42.5 acres (Kittredge et al., 2008). The goals and attitudes of these owners are diverse and well documented. In numerous studies, owners consistently express strong preferences for amenity and non-consumptive benefits (e.g., aesthetics, wildlife, privacy, recreation, nature protection) and negligible interest in traditional forestry and timber harvesting (Belin et al., 2005; Finley and Kittredge, 2006; Kittredge, 2004; Rickenbach et al., 1998). Owners tend to be older (average age of 60 years), well educated (a majority have college degrees), and relatively affluent, which is not unlike the profile of non-industrial private forest owners in many eastern states where their collective ownership dominates forested landscapes (Butler, 2008). Because of the small ownership size in Massachusetts, the costs of certification and meeting requirements of existing carbon programs are often too high at the individual NIPF scale. However, several offset aggregation programs designed to create the economies of scale necessary to sell on carbon markets by pooling the offsets of Massachusetts NIPF landowners are being formed (Dickinson, 2010). These aggregation programs are fairly new developments and the requirements for participating in them are quite consistent. A prospective participant must be willing to sign a 15 years contract and file a management plan, and the participant usually will be penalized for breaking the contract. For example, one such aggregator in the Northeast U.S. is CarbonTree, LLC. In Massachusetts, a program that bases property tax on forestland current use may provide another option for sequestering carbon. This current use Massachusetts program (Chapter 61) provides substantial tax incentives in return for providing wildlife habitat and local timber products. It requires a professionally prepared 10-year forest management plan and obligates the owner to manage for timber. A Chapter 61B program, which is a recent variant of Chapter 61, does not require participants to file a management plan, has a minimal time commitment, a more modest tax benefit, and a low penalty for early withdrawal (Dickinson, 2010; Catanzaro et al., 2010). While both programs can be considered to sequester carbon, whether or not they provide additional carbon sequestration depends on what the landowner would do without the program. For example, if the landowner would use his or her land in the same way without Chapter 61B, this program cannot be said to provide additional carbon sequestration.

There is very little information available about the likelihood that NIPF landowners will participate in carbon offset markets. To the authors' knowledge, there is only one published study that investigates the topic quantitatively. In a pilot study conducted by Fletcher et al. (2009), a forest management

¹ It should be noted that at this time, there are no such opportunities for European NIPF landowners (Dickinson, 2010). And, the U.S. voluntary Chicago Climate Exchange (CCX) Program was eliminated in 2010.

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