

Monetizing Carbon Offsets for Small Woodlands

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Recent studies show that net growth in U.S. forests offsets 13 percent of total U.S. carbon dioxide (CO₂) emissions annually. “Carbon offsets” as they are called, are a reduction in emissions of carbon dioxide made in order to compensate for emissions made elsewhere. Offsets are measured in tonnes of carbon dioxide-equivalent (MTCO₂e). The forests of many Maine Woodland Owners members surely contribute to these offsets, but due to the difficulty of monetizing them, receiving compensation for offsets takes work.

There are markets for carbon offsets – one is a compliance carbon market and the other is voluntary. The compliance market is more rigorous than voluntary ones because they permit carbon polluters to defray a portion of their legal obligation to meet a carbon cap. As such, the price is often higher. The gold standard appears to be the California cap and trade market. Recent prices for a carbon offset have been around \$18/metric ton. In the Northeast, there is the Regional Greenhouse Gas Initiative (RGGI) that provides an offset structure; but it has been inactive so far because electric generators have met their cap in other ways such as switching to cleaner fuel.

To understand the concept of monetizing carbon offsets better, I decided to see what type of potential my 25 acre woodlot in Cumberland, Maine would have. With the assistance of Two Trees Forestry, I reviewed the application materials and started the process of

registering my woodland with the Air Resources Board of California (ARB) with an eye toward future sale of carbon offsets. The application is complex; indeed the ARB forestry protocol is 146 pages. I used the occasion of updating my ten year forest management plan to start putting together the application. I found that much of the information requested was already part of what I would be providing to update my participation in Maine’s Tree Growth Tax Program (Tree Growth). All I was missing was a carbon inventory and growth projection which would provide a forecast of the carbon stocks I’ll have in my woodlot over several years by taking into account future harvesting plans.

For this part, I used an approved growth model called the Forest Vegetation Simulator (FVS) from the US Department of Agriculture Forest Service. The FVS simulates forest vegetation change in response to natural succession, disturbances, and management. It recognizes all major tree species and can simulate nearly any type of management or disturbance at any time during the simulation. Two Trees also conducted a “variable-radius plot” sampling to arrive at cords per acre and thereby an estimate of sequestered carbon to gather further detail such as actual height of each tree (including standing dead), in addition to diameter at breast height (dbh). A complex set of equations is then used to calculate volume of sound wood, convert it to biomass, and finally convert this to MTCO₂e. The estimated inventory of my woodland acreage averages 151.6 MTCO₂e per acre.

The results were instructive. The process revealed that the sequestered carbon, (carbon that is stored) in the woodland was quite a bit higher than the Maine average and that the woodland is growing at 1.2 cords per acre per year.

In order to achieve verification from the ARB, I needed to replicate the results with a series of fixed area plots so my inventory can be compared to an estimate called the Common Practice. Common Practice is based on a regionally defined supersection, a specific forest type, and site productivity which turned out to be 76.3 MTCO₂e per acre.

To obtain a growth model for my woodlot, we entered the tree list and stand information from the plan’s inventory into the Forest Vegetative Simulator. This provides a report showing the carbon stocks at 10 year intervals. The point of the growth model is to



The author in his woods in Cumberland, Maine

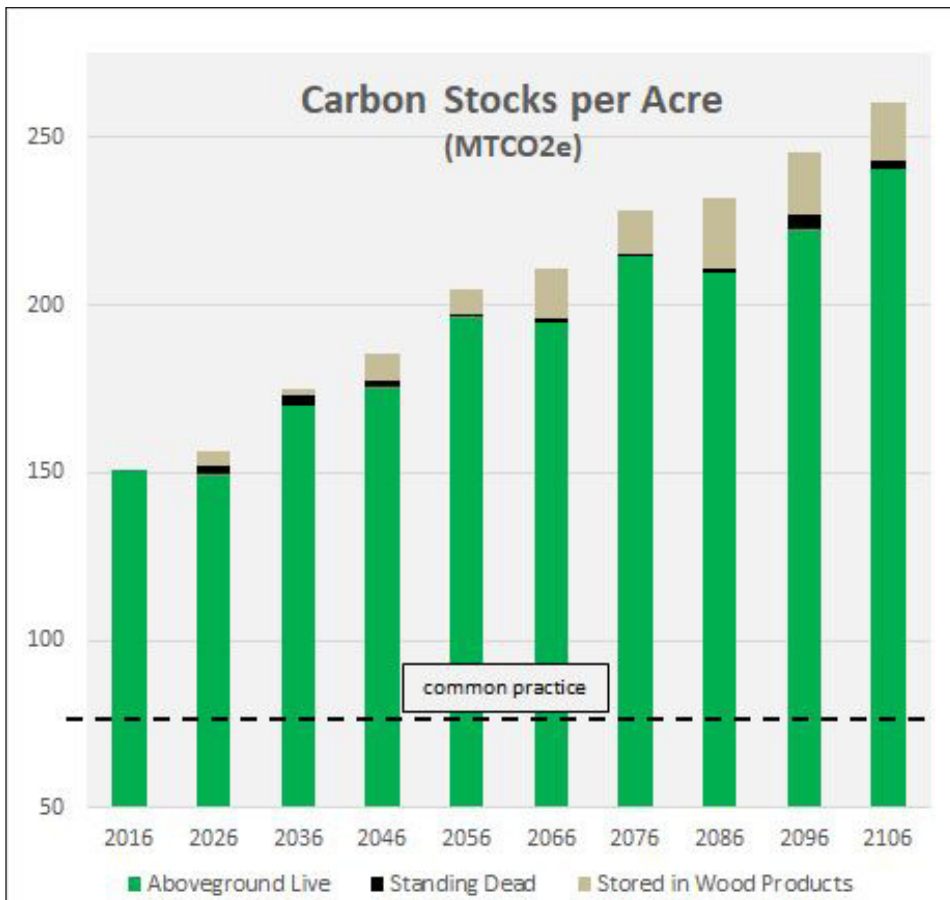


Figure 1: Carbon chart for Gallaudet woodlot.

demonstrate to ARB that the forest management plan will not cause carbon stocks to fall below my starting inventory.

The chart (Figure 1) models my new forest management plan, which calls for moderate harvests at 20 year intervals. No matter what, activities in the forest cannot let the carbon stocks drop below what has been established as the landowner's initial basis inventory.

Thus, with the addition of some work beyond the Tree Growth update, we now have a project ready to be listed on one of the ARB registries. The total cost for the first year totaled \$800.

Two final considerations should be taken into account before taking this step.

First, ARB requires that, if a landowner qualifies for and receives offsets, they must stay with the program for 100 years – namely maintain MTCO_{2e} stocks above the initial baseline, report annually, and undergo verifications. Similar to Tree Growth, landowners can withdraw at any time but with a penalty. The penalty is the market value of the offsets

received at the time of withdrawal – plus a small multiplier in the initial years. The landowner must pay the penalty by purchasing the required number of offsets in the secondary market and returning them to the registry.

Second, the project must be verified in full by an ARB-approved third party at the outset and every 6 years thereafter. Full verification involves a site visit and a close check of the timber inventory. In Maine we are accustomed to a 10 year review for Tree Growth and find the cost reasonable. It appears that the cost of ARB verification could be substantially higher depending on the project. Also there is a very short list of approved lead verifiers, with few in the Northeast. Perhaps over time costs will diminish and local firms will emerge to do this work.

Based on our review, we suggest that landowners take the time to

understand the carbon dynamics of their woodland. The market for forestry carbon offsets is functioning now and may well strengthen in the coming years. I found the exercise very worthwhile as I learned a great deal about carbon sequestration and the structure of carbon markets and felt it was very much worth the investment of my time.

I have not moved ahead to an actual sale of carbon credits because of the dearth and expense of third party certifiers, as was mentioned earlier. Were I to sell the offsets today, I would likely receive up front around \$1,200 per acre before expenses and then future amounts depending on realized growth of carbon net of future timber harvests.

Editor's note: For more information about concepts presented in this article go to www.maine woodlandowners.org/links-apps. There you'll find useful links under "Carbon Offsets Information."

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