Slow Communities
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Memo

To: Nick Richardson, President of Vermont Land Trust (and for informational purposes, to all the people I interviewed)
From: Bill Roper
Re: Future Opportunities for VLT in the Forest Carbon Markets
Date: November 17, 2020

Background
The Vermont Land Trust, in partnership with The Nature Conservancy, the UVM Carbon Dynamics Lab, Spatial Informatics Group, and Cold Hollow to Canada recently completed a project aggregating multiple landowners (with acreages ranging from 250-2000) into a carbon offset collaborative. This first-of-its-kind, aggregation project overcame many of the barriers to market for individual landowners with forest holdings of fewer than 1,500 acres, as previously identified and analyzed in a Forest Carbon Feasibility Study.

VLT is interested in building on this kind of work and to this end, I interviewed 22 people working in different parts of this complicated field (the list of interviewees is on the final page). The excellent Forest Carbon Feasibility Study takes a deep look at this whole field and my interviews were aimed at (a) bringing some of its information up-to-date, and (b) identifying opportunities for VLT moving forward.

It is important to note that while most of the readers of this memo have in-depth knowledge in particular areas of this work, recent innovations weren't always common knowledge and sometimes the whole picture wasn't understood, and so I am erring on offering perhaps too much background information to provide context for my discoveries.

The basic market concepts behind a "forest-carbon" project are these: forests sequester and store carbon; when forests parcels are inventoried, calculations can show how much carbon a parcel has stored and will sequester; these "carbon credits" can be sold through a variety of carbon markets; there are compliance and voluntary carbon markets which impose different requirements and offer different opportunities; and companies that emit carbon can buy carbon credits to help offset a small portion of their emissions. There are additional, significant non-market benefits associated with a forest-carbon project I'll discuss later.

Besides VLT's work, there are other efforts promoting or utilizing forest-carbon underway in Vermont. In 2017 Middlebury College sold carbon credits resulting from a 2014 conservation easement placed on 2,400 acres on its Breadloaf Campus. In 2019, the State of Vermont through Act 83, Section 9 created a "Vermont Forest Carbon Sequestration Working Group." This group issued an excellent Final Report on January 4, 2020 recognizing the potential and multiple benefits for the State in participating in the forest-carbon credit market and suggesting ways the State could lead, facilitate or partner in future projects. H. 656, Section 32 was subsequently adopted requiring written and oral testimony by January 15, 2021 regarding progress on the working group's recommendations.

And in 2020, the Nature Conservancy completed its Burnt Mountain project in 2020 successfully traveling a twisted road initially headed towards the compliance carbon market and eventually ending in the voluntary market (where VLT ended with its Cold Hollow project as well). TNC is now looking at pursuing a second forest-carbon project in VT.

Overarching Reasons for a Forest-carbon Project

There are primarily three reasons for VLT (and TNC) to undertake forest-carbon projects: (1) the resulting carbon sequestration and storage as a natural climate solution, (2) the application of new conservation and better management of forest lands, and (3) the prospect of a new source of revenue to the landowner. VLT and TNC were clear that increases in forest acres conserved, improved forestry management (as required by the carbon markets) and sequestration and storage through natural climate solutions were the primary motivating factors behind undertaking these complicated and time-consuming projects. Importantly, improved forest management not only produces greater carbon sequestration and higher quality wood (again good for the landowner and state), but it also provides essential "co-benefits": higher water quality, greater flood resilience, improved biodiversity and habitats, and of course, better air quality.

It may also be possible for the state of Vermont to develop a forest-carbon project on state-owned land. Under this scenario, the State would undertake stronger restrictions or improved forestry practices, and the carbon credits generated would create new revenue and lead to all the same co-benefits. A State forest-carbon project could also act as an anchor for VLT and/or TNC forest-carbon projects with adjoining or nearby, privately-held lands. However, there are challenges for a State project to overcome. The State may face the challenge of documenting "additionality," meaning it may need to propose new restrictions or management approaches that will produce increases in carbon sequestration over and above what is sequestered under current restrictions or management (the market requirements are somewhat vague in this regard, so I've used "may" instead of "must"). There is also some question amongst those I interviewed about the price the State will receive for its credits. It may be that the improved forest management practices, co-benefits and "anchor" attributes of a project will show ample enough benefits to justify proceeding even if the revenue is less than desired. One other hurdle: the Department of Forests, Parks and Recreation may need more staff (and hence funding) to carry forward a project.

The Carbon Markets

A carbon "credit" represents one metric tonne of CO_2. A certificate representing that tonne facilitates tracking and trading. It becomes an "offset" and is extinguished when it is used to cancel out one tonne of CO_2 emissions. Numerous carbon pricing schemes have been present since the 1970s, including those that use offsets. More recently, these have gained prominence in the US through state and regional Cap and Trade policies. Under these policies, companies that emit less carbon than allowed under Cap regulations were able to quantify the difference between what they emit and the maximum allowed and then sell this difference as "allowances" to companies that aren't meeting the emissions cap. Carbon offsets are generated by renewable energy sources such as wind and solar or through carbon sequestration, and have become another vehicle by which carbon emitters can reduce their carbon footprint. Typically offsets can only be used in a very limited way to reduce an emitter's footprint (typically no more than 4-8% in the compliance markets), appropriately placing much greater emphasis on direct reduction of emissions.

My interviews focused on the carbon-credit, offset market as it relates to forest-carbon projects. There are two basic types of carbon markets: compliance and voluntary. The compliance market ties directly to federal or state emission limits imposed on various industries. The California Air Resources Board (CARB) is a compliance market under the state's Cap and Trade policy (note: the actual market is known as the Western Climate Initiative in which Quebec also participates, but most people interviewed talked of CARB). Due in part to its size, CARB has created a substantial demand for offsets. It is the most rigorous (some say onerous) in its requirements from inventorying to management practices to long-term monitoring, and requires that any offsets sold must persist in place for 100 years. Partly due to its regulatory rigor and a minimum auction price floor, it receives the highest price for carbon. It is worth mentioning that CARB now requires 50% of the offset projects to have a direct California impact, which influences prices and market availability to out-of-state projects.

In 2005 northeastern states cooperatively formed the Regional Greenhouse Gas Initiative (RGGI), which imposed its own limits on power generation facilities and created its own compliance market. To date, RGGI's carbon price has been relatively low because the regulated utilities have been effective at reducing their emissions at low cost. If RGGI were to significantly increase the ambition of the program (i.e. reduce the cap more quickly), then the price would likely rise and make offsets more cost effective. Both compliance markets have very strict guidelines and long commitments that make Vermont forest-carbon projects either infeasible or unattractive.

Voluntary carbon markets were created to offer an option to those industries that are not regulated (and hence do not need to comply with regulatory limits) but wish to voluntarily reduce their carbon footprints by buying credits. Over the last five years, consumer demand for a higher social conscience in the corporate world has spurred this voluntary purchase of credits. This "social contract" was reinforced when many of these companies pledged to help meet the Paris Climate Accord targets regardless of the US's decision to withdraw. For the forest landowner, the voluntary market's qualification hurdles are not as high, the commitments not as long (40 years instead of 100), and aggregation of disparate parcels to reach a minimum, financial-viability threshold is possible. On the other hand, prices for carbon received are typically lower than in the compliance market (although a project becomes more attractive depending on what co-benefits it is producing, and the more attractive, the higher the price received). Ecosystem Marketplace says this about the voluntary marketplace: "What the voluntary carbon markets lack in size, they make up for in flexibility – spinning off innovations in project finance, monitoring, and methodologies that also influence regulatory market mechanisms….In turn, in recent years governments worldwide have increasingly turned to voluntary carbon market mechanisms – particularly standards and registries – to inform the development of or serve as compliance instruments themselves."

Amongst the people I interviewed there was general optimism about the strength, stability, and future of the carbon markets. Certainly some of the potential depends on our national energy policies and actions following our November election (e.g., re-entering the Paris Climate Accord, passing green energy legislation, etc.), and how energy demands recover from the Covid-related downturn. People see the airlines as important future buyers of credits but this may not materialize until 2024-25 (depending of course on global recovery from the pandemic). Predictions of the price of carbon over the next couple years hover in the $6-$8, maybe $10/ton range. While predictions of stability and reliability of the market bode well this price is not attractive for forest-carbon projects in Vermont, since only larger acreage deals of 3,000-5,000 acres are likely to generate a sufficient number of credits at current offset prices and using conventional project development techniques to

make a project financially attractive. That said, demand in the 2019 voluntary market was stronger than predicted and is forecasted to increase, thereby hopefully pushing the price for carbon up. The other good news is the innovations discussed below will help to lower the associated project costs.

I also heard from a variety of perspectives that if we are to be successful in combatting climate change and transforming energy and emissions practices, the carbon offset market should only be part of the solution for the next 20-30 years. Put differently, if offsets are still being widely used 30 years from now, we will have lost the urgent battle to combat climate change with far more drastic actions needed at that point. For this reason offsets were characterized as a "transition tool" or a "bridge to more significant actions and reductions." In addition to the limited duration of the market is the modest impact of offsets. Typically offsets can only be used to help counteract a small portion of a company's carbon emissions. Even with these limitations, there was still enthusiasm for this transition tool. One person said, "With climate change there is no silver bullet, but there is silver buckshot." Another commented that even if all emissions stopped today, scientists stress the need for increased carbon sequestration to lower the levels of carbon already in our atmosphere.

Getting to Market

Many people I interviewed stated that getting to the point of selling forest-carbon credits is complicated, confusing, and expensive. The carbon market is specialized and so requires specialized knowledge and experience. Many players are involved along the way, often offering competing services. Currently, the task of inventorying a parcel to qualify it for the market is labor intensive (and hence expensive) as is the longer-term monitoring of performance and compliance. The price of carbon requires large forest parcels to generate enough revenue to address the cost of the project and still satisfactorily compensate the landowner. Of course the amount of forested acreage required is a challenge for Vermont where forest parcels are generally small. VLT had to undertake the challenging and expensive effort of aggregating numerous parcels under different ownership to reach the financial viability threshold offered in the voluntary market. Aggregation also poses risks in the management and monitoring of multiple parcels to ensure the aggregated parcels meet carbon sequestration goals over time. For example, VLT's new LLC that was specifically created to undertake the Cold Hollow aggregated, forest-carbon project is legally liable for credits lost due to overharvesting or landowners leaving the collective.

Despite these challenges, many people agreed the future of the markets looked promising and worth pursuing. The markets are more stable than in the past and more mature. Interviewees acknowledged that a lot was evolving fairly quickly but felt innovation was a testament to developer and investor confidence. I learned of four particularly exciting innovations aimed at tackling some of the significant impediments to Vermont's small-to-medium-scale, forested parcels, thereby offering greater opportunities for Vermont forest-carbon projects in the future:

1. *Finite Carbon* has developed "CORE Carbon," which uses near-infrared and other remote sensing technologies to vastly reduce the time and significant cost required in inventorying and monitoring forest tracts. Its website states: "Landowners with as little as 40 acres can now get paid for sustainable management practices." CORE is focused on the voluntary market and after initial application in the Southeast in early 2021, it should be up and running in the Northeast by late 2021.
2. Finite Carbon and the Land Trust Alliance have developed a pooled project approach to reduce the costs of project development for LTA-accredited land trusts. Similar to VLT's Cold Hollow to Canada project, accredited land trusts can by joining forces across

ownerships achieve the acreage scale needed to make land trust participation in carbon projects a more feasible proposition.

3. Forest Carbon Works has developed a smart phone inventory tool and other efficiencies that significantly ease the feasibility process and vastly reduce the time and significant expense of developing a forest carbon offset project. It touts itself as oriented towards small land ownership, believing its streamlined processes significantly reduce the costs and other challenges getting to market, thereby making small forest projects more possible. Forest Carbon Works develops projects through the CARB compliance market which generates the most rigorously verified offset credits and sells credits at premium prices. Forest Carbon Works has developed the smallest forest carbon offset project to date, at approximately 120 acres, and has a pipeline of hundreds of potential projects from all over the U.S., with most ownerships ranging in size from 50-250 acres.
4. American Forests Foundation is partnering with TNC to develop a very different approach. They believe carbon sequestration resulting from a prescribed set of forestry management practices can be proven. Therefore, if a landowner agrees to undertake these prescribed practices the resulting carbon sequestration can reliably be assumed and carbon credits calculated and sold. This approach would eliminate most of the costs of inventorying and a number of players and steps required by the current carbon market, with revenue going more directly to the landowner.

While it will take time for these approaches to earn acceptance by the markets, VLT has time to explore the possibilities since the market is currently somewhat depressed from low energy demands and an over-supply of credits.

Achieving a Greater Regional Relevance between Carbon Credits and Climate Goals

In my conversations, some folks expressed an intellectual unease over the concept of selling carbon credits generated by VT's forests as offsets for power plants or other large-scale emitters in California or elsewhere. Put slightly differently, there is the desire to find a way to at least count VT-forest offsets against regional emissions. I explored the possibility of RGGI with its confederation of Northeastern+ states, hoping that VT forest-carbon credits could help Northeastern states meet part of their climate objectives. Unfortunately, this hope seems unfounded for several reasons. RGGI regulates only carbon-emitting power utilities and Vermont's utilities do not (thankfully) emit enough carbon to warrant the purchase of Vermont-generated carbon credits. RGGI adopted CARB's onerous protocols so only very large, stand-alone forested parcels will qualify. With development costs high and RGGI's lower carbon price, there is no incentive to develop a project under RGGI. From my conversations, none of these factors will likely change anytime soon and explains why there have been no forest-carbon projects within RGGI.

There is one potential bright spot on the regional horizon. There are talks amongst these same RGGI states (which now includes Virginia with Pennsylvania's addition likely) about adopting a "Transportation Climate Initiative" (TCI) (note: District of Columbia is also part of the TCI discussions). It raises the potential for states to use carbon credits as one tool for meeting states' goals of transportation-related emissions reductions. At the end of December there will be a regional vote as to whether to pursue this initiative, and then each state will have to go through its own process for deciding whether to participate. A decision to participate requires a plan of how to start a program and then where to invest those proceeds. If states vote to participate it will take a year or two to establish the regional administrative capacities and so while TCI's potential is exciting, the hurdles faced means it won't happen any time soon.

I also heard push-back on the desire to more closely connect forest-carbon credits to a particular geographic market. One person commented, "You can't put boundaries around emissions. Climate change is a national and global issue and carbon emissions are far beyond regional in reach and impact." Another person argued that this local approach did a disservice to the realities of emissions and our role(s) in the larger context of climate change--that people needed to understand and embrace the larger picture. Yet another person talked passionately about the idea of "the Commons" and how if this concept of shared resources and responsibilities was better understood and accepted, the geographic relevance became unnecessary. The point was also made that even if the forest-carbon credits generated in Vermont were sold in California or elsewhere, Vermonters still enjoyed the direct co-benefits of cleaner air and water, better flood resilience, greater biodiversity, stronger and less fragmented habitats, remarkable recreational offerings, and the less quantifiable peace, quiet and aesthetic attributes of healthy forests. These comments certainly illuminate the need for an inspiring national policy aimed at this rapidly developing national and global challenge.

The recent passage of Vermont's Global Warming Solutions Act (GWSA) places additional pressure on the State to get more serious about emissions and may create some opportunity for Vermont-generated carbon credits to help the State meet its ambitious climate goals. The California Carbon Market was developed after California passed its own Global Warming Solutions Act and while I certainly don't see Vermont developing its own market, the new law could lead to carbon-credit opportunities.

Opportunities for VLT moving forward

VLT invested time and resources in pursuing its first forest-carbon project. Its new structures and learning were not wasted as virtually everybody I talked to was optimistic about the potential for additional forest-carbon projects. However, as the market evolves and innovation continues VLT's role may also need to change. VLT holds a ***uniquely strong*** connection with landowners and organizations around the state and people embraced its continued leadership and partnerships in this area. The market is both maturing and rapidly evolving, which will hopefully make future projects less complicated and expensive. Based on what I heard, VLT should consider the following actions:

1. Stay on top of the innovations, establishing and maintaining regular conversations with the Land Trust Alliance, Forest Carbon Works, Finite Carbon, SIG, TNC, American Forests Foundation, UVM and other people or organizations actively involved in this arena.
2. Consider undertaking different projects with one or all of the innovative programs discussed above, since they are all focused on making forest-carbon credits more accessible to smaller forest landowners. Besides some obvious partnerships with TNC, there may be an opportunity to work with Trust for Public Lands concerning town forests. These projects would capitalize on VLT's strong relationships with landowners, its newly created forest-carbon LLC, and the desire for VLT to continue to pave the way for others.
3. Pursue conversations with developers like Finite Carbon and Blue Source about finding a Northeast buyer of VT forest-carbon credits. I heard that while they are open to the discussion, they are also not confident the market is there.
4. Remain in close touch with Vermont's Department of Forests, Parks and Recreation to support a public-lands, forest-carbon experiment. If the State proceeds, VLT should look to piggyback with a forest-carbon project on nearby, privately-owned forest lands. A partnership with the State could include engaging as a private sector partner supporting

Vermont as it participates with other Alliance states in the U.S. Climate Alliance Natural and Working Lands Initiative (such as through future Learning Labs).

5. Partner with other regional Vermont land trusts in a forest-carbon project, lending VLT's "back office" structures and project expertise and helping boost these regional land trusts' capacities and profiles.
6. Participate in Vermont's GWSA implementation efforts, ensuring the law fully acknowledges the role of forests in mitigating carbon emissions and exploring how carbon credits generated in Vermont forests could help the State meet its GWSA's standards. I see at least two possibilities: first, the state could implement greater restrictions or higher management practices in its public forests, thereby sequestering more carbon (additionality) and use these increments of higher carbon sequestration as direct offsets to state emissions. Alternatively, if Vermont's public forests can produce carbon credits for sale, it could then use all or a part of this revenue to buy carbon credits generated by privately-owned forests in VT, offsetting a part of the state's emissions. There is considerable concern about avoiding a double-counting of credits, so this needs careful consideration.
7. Assist a Vermont-legislative effort to draft an Ecosystem Services law (or other future legislation) facilitating forest carbon projects.
8. Consider how carbon forestry practices, which include longer harvest rotations, greater post-harvest structure retention, production of durable wood products, and continued harvest of pulpwood could promote the forest industry by creating enough demand to open mills or value-added production facilities in VT and the Northeast, (i.e., furniture shops, finished flooring, etc.), reversing current trends. There are some who think carbon projects could result in less harvesting and resulting "leakage" in the forest product industry, so this potential opportunity needs a closer look.
9. Explore how forest-carbon credit projects could boost the percentage of "forever wild" or more passively managed forests in Vermont. Currently these type of forest lands only constitute 2-3% of Vermont's holdings. A few people I talked to really focused on this, contending that entities such as Vermont Conservation Design say this number should be more in the range of 9%. Research by VLT board member, Dr. Bill Keeton, has shown old and passively-managed forests store carbon at higher levels than actively managed forests and, of course, these wild or wilder lands provide all kinds of co-benefits. Another recent study co-authored by Dr. Keeton demonstrates that old forests are more resilient to pests, pathogens, droughts, and other stressors caused by climate change. In one of these conversations it was suggested that Vermont's Use Value tax program be amended to add a "Wildlands" category to further encourage this important and necessary holding of lands. Some people are reluctant to open up Current Use for this purpose (or to recognize carbon practices), but these are ideas worth considering.
10. Work with partner organizations such as Vermont Coverts, Vermont's Department of Forest, Parks and Recreation, and the Land Trust Alliance to more broadly educate landowners, land trusts and foresters, helping them understand all the moving parts and technical requirements in a forest-carbon project. VLT should consider sharing redacted management and aggregation agreements as examples for others, and compare its agreements with the ones developed for LTA (note: the LTA carbon operating agreement is a privileged and confidential document for accredited land trust participants in LTA's program). Lawyers and accountants who could be involved in this kind of work also need education.
11. Continue VLT's August 27 convening of interested Vermont partners and players to help them stay on top of and involved in this evolving market.

12. Remain attentive to "soil carbon" sequestration-and-credits research. A few people saw this as the next frontier and is an area that obviously relates well to VLT's work. There is apparently a lot of interest in this possibility and a number of new agriculture-based methodologies are in development for quantifying and trading soil carbon credits; that said, it may take up to 10 years for this to reach scientific and carbon market acceptance. One person also commented on research showing bodies of water, such as Lake Champlain, sequester significant amounts of carbon and wondered if TMDL money could be used to take advantage of this opportunity…or to help conserve forests utilizing carbon-friendly practices within the Lake Champlain basin.
13. Consider the question of socio-economic equity. A couple people wondered whether offsets that mitigate against regional and global emissions actually facilitate new, local sources of pollution situated in disadvantaged locations. For example, RGGI came under fire when it permitted new power plants built in Rhode Island—while these new plants enabled the closure of older ones and resulted in a net reduction of greenhouse emissions, the new plants were built in lower-income neighborhoods and produced negative, local impacts. What other, if any, injustices or inequities for VT landowners might be created or perpetuated through this kind of work?
14. My interview questions focused on the future of forest-carbon and thus, so did most of the answers. One comment pointed in a slightly different, complementary direction: VLT could work at the leading edge of identifying and advancing non-market alternatives to pay Vermont landowners for climate-focused forestry practices, such as a federal tax credit and/or a USDA program paying landowners on a per-acre basis for these practices. Both options avoid the complexities and barriers of offset markets while arguably having a similar effect on the land and also landowner finances. The Forest-Climate Working Group policy platform, endorsed by LTA, includes tax credit mechanism and VLT could voice its support for measures such as the Growing Climate Solutions Act, which is aimed at reducing barriers to entry for carbon markets.

In closing I recognize this memo is not a definitive look at the future. While fairly representative of the perspectives and possibilities, it is not exhaustive and there are certainly other knowledgeable people I could have interviewed. I invite the suggestion of others who could contribute to my findings as well as additional thoughts from those I did interview. I am grateful to all those who took the time to openly share with me (listed on the next page). I found them all deeply concerned about global warming and passionate about their various roles in contributing to the collective and monumental task of combating and reversing climate change.

People Interviewed by Bill Roper
(in no particular order)

1. Mike Snyder, Commissioner of Department of Forest, Parks and Recreation
2. Ali Kosiba, VT Climate Forester
3. Zach Ralph, VT House, Windsor County
4. Chris Bray, VT Senator, Addison County
5. Robert Turner, S&A Carbon and VT Forester
6. Jamey Fidel, Vermont Natural Resources Council
7. Lisa Sausville, Vermont COVERTS
8. David Brynn, Vermont Conservation Forester and UVM professor
9. Dr. William Keeton, UVM Carbon Dynamics Lab
10. Peter Stein, Lyme Timber Company
11. Mary McBryde, Fidelity Foundation
12. Jim Shallow, VT chapter of TNC
13. Jad Daley, American Forests
14. Joe Short, Northern Forest Center
15. Kelly Watkinson, Land Trust Alliance
16. Chelsea Welch, Land Trust Alliance
17. Peter Walke, VT Depart. of Environmental Conservation, one of two VT reps on RGGI
18. Zach Porter, Conservation Law Foundation
19. Dylan Jenkins, Finite Carbon
20. Mary Kallock, Forest-carbon Works
21. Shelley Semmes, Trust for Public Lands
22. Andy Bicking, Scenic Hudson