

Vermont Forest Carbon Sequestration Working Group Report

Context

In 2019, the Vermont Legislature passed S.160 (subsequently Act 83) that established the Vermont Forest Sequestration Working Group (Working Group). The charge assigned to the group is summarized in Sec. 9. (a) of the bill: *to study how to create a Statewide program to facilitate the enrollment of Vermont forestlands in carbon sequestration markets.* This report addresses the various items assigned for consideration by the Working Group. The full text of Sec. 9 is included in Appendix A.

The House Committee on Agriculture and Forestry and the Senate Committee on Agriculture each proposed bills in 2019 expressing interest in exploring possible mechanisms to increase forest carbon sequestration in Vermont. Sequestration a term that describes the removal of carbon dioxide (CO₂) from the atmosphere and its storage in a stable form. In the case of forests, trees absorb CO₂, convert the C component into plant biomass (wood) and other products and release the oxygen—all a part of normal photosynthesis. In the aggregate, forests in the US sequester approximately 15%¹ of the carbon dioxide emissions nationally. In New England, this estimate is closer to 35%, and in Vermont, closer to 50%² of our annual greenhouse gas (GHG) emissions are captured in the growth of our trees. In recent years, the value of this “ecosystem service” has received greater recognition: intact forests globally store a huge amount of atmospheric carbon in woody biomass. They also absorb carbon through growth, essentially providing “negative emissions.” Partly in recognition of the important role of forests in climate regulation, mechanisms have developed that encourage and reward good stewardship of our forests. One such mechanism is a forest carbon offset. A Forest Carbon Offset is a financial instrument that represents the equivalent of 1 metric ton of sequestered carbon dioxide (tCO₂e). These instruments can be sold and retired to “offset” emissions elsewhere in the economy. They can also be traded, like a stock certificate. Forest landowners may enroll in various programs that support the accounting, validation, listing, and tracking of these credits. Once verified to be in conformance with the program rules, landowners can sell these credits to interested buyers. The legislature, through this Working Group, is interested in evaluating the opportunities for landowners and the ways in which the State can play a role in facilitating landowner participation. In an ideal scenario, landowners can receive payments for a different type of forest product (carbon), while the State can demonstrate policies that increase or maintain the levels of carbon storage and sequestration in our forests.

The remainder of this report will address each of the following specific charges in the legislation:

- (1) evaluate the current status of carbon sequestration markets;
- (2) evaluate the economic and environmental case for encouraging forest carbon sequestration offset projects in Vermont;
- (3) analyze how to best market and sell carbon credits from State-owned and privately-owned forestland in carbon sequestration markets;
- (4) determine how to develop economies of scale in marketing and selling carbon credits in carbon sequestration markets;

¹ https://www.fia.fs.fed.us/library/brochures/docs/2012/ForestFacts_1952-2012_English.pdf

² <https://anr.vermont.gov/sites/anr/files/Final%20VCAC%20Report.pdf>

- (5) evaluate how to utilize financial incentives and existing forest management and certification programs and Vermont's Use Value Appraisal program to maximize the potential value of forestland in carbon sequestration markets while also enhancing conservation and other goals;
- (6) review how to structure and regulate a Statewide program to facilitate the enrollment of Vermont forestlands in carbon sequestration markets, including how the program should be governed, whether the program should be governed by a State agency, how forestland will be assessed and enrolled, how parcels and landowners will enter and leave the program, how landowners will be paid, and how requirements and standards concerning forest management will be applied and enforced;
- (7) estimate expected revenue from enrolling forestland in carbon markets and how that revenue should be allocated
- (8) any other issue the Working Group deems relevant to designing and implementing a statewide program to facilitate the enrollment of Vermont forestlands in carbon sequestration markets.

In addition to these items, the legislation requires the Working Group consider a) a proposal for a pilot project on State-owned forestland, and b) any recommendations for legislative or regulatory action.

Additional Background

Forest cover roughly 78% of Vermont's land area. Most forestland is privately owned and in relatively small parcels. While the extent of our forest area has been relatively stable over the past 20 years, the most recent data from the USFS shows an average of 20,000 acres per year was lost from the forest land base between 2012 and 2017.³ While the causes of these changes aren't clear, the removal of forest cover for development and other uses is likely. Statewide forest cover is at historic highs and there are no clear indications that forest loss will continue, yet the trend raises concerns. Other threats to forest integrity and health compound these concerns: invasive insect pests, changing landowner demographics, weak wood products markets, increasing ownership costs--all add stress to a resource we have long taken for granted.

The State has a powerful interest in protecting and enhancing our forest resources. Clean air, clean water, flood control, forest industry jobs, tourism, and our general sense of well being depend on a healthy and productive forest. [Highlight specific programs here, UVA, others? More about forest economy?] Forest Carbon Offsets—by providing addition revenues to landowners--are another tool that can support this goal of keeping forest lands forested and ensuring the benefits we receive from forest continue.

Carbon Offset Credits exist because there is a market demand for what they represent. The largest demand for carbon offsets in the United States currently results from the Cap and Trade regulation enacted in the state of California in 2013. Under this law, emissions of CO₂e and other GHGs by most sectors of the California economy are "capped." The covered entities are allowed to continue to emit at the level of their cap and must hold "allowances" equal to their emissions⁴; however, over time, the cap is lowered and the allowed emissions are reduced. Industries can "trade" these allowances to pollute, since some may have excess allowances while others need to purchase additional credits to meet the level of their emissions. Carbon credits can also be used to offset a small portion of this regulatory obligation. The

³ https://fpr.vermont.gov/sites/fpr/files/documents/2017_FIA%20report_VT.pdf

⁴ An allowance is equal to 1 metric ton of CO₂ equivalent, similar to an offset credit. Many references are available that describe the detailed workings of Cap and Trade programs. Generally speaking, Cap and Trade policies have demonstrated efficacy and efficiency in reducing levels of airborne pollutants.[cite the JFO report?]

sheer size of the California economy means the demand for carbon offsets is robust. Offsets can be generated using a limited set of approved methods or protocols besides forestry protocols, but forest offsets represent nearly 80% of the 160 million offset credits generated to date.⁵ One offset—a tonne of CO₂e-- is currently worth approximately \$14⁶ in this regulatory or “compliance” market.

The sale of carbon offset credits in non-regulatory markets is also seeing strong demand. These buyers are typically companies that have undertaken a voluntary program to reduce their emissions. Similar to compliance programs, offsets typically represent a relatively small portion of the emission reductions targeted under any company’s program. Voluntary programs are seen to be slightly less rigorous than compliance programs. As a result, markets tend to price them at a lower point. Since the majority of these trades are over-the-counter, negotiated transactions, we have little public record of prices paid, but various sources place current prices in the range of \$3 to \$11 per credit.⁷ It has also been reported that credit prices may reflect not only the integrity of the credit, but its “provenance”—where it was generated, and how the story of its conservation value can be woven into the message of the company’s program.

Compliance and voluntary offsets share certain aspects and are quite different in other aspects. Additional details of these programs are explored in the next section. In general, these programs are still relatively new. They can also be very complex and therefore expensive to develop. For these reasons, most forest landowners that have committed to this program have had relatively large holdings or have particularly high levels of carbon stored in their forests. Bringing small landowners (under 2,000 acres) into the programs has been challenging. The legislators involved in the development of Act 83 believe the State can play a role in reducing the entry barriers for landowners in Vermont. We hope the work of this Study Group will inform the path that Vermont chooses to take.

⁵ https://fpr.vermont.gov/sites/fpr/files/documents/2017_FIA%20report_VT.pdf

⁶ In March 2018, the Vermont Land Trust and partners released the Vermont Forest Carbon report (https://www.vlt.org/wp-content/uploads/2018/07/Vermont_Forest_Carbon.pdf). This report examined the opportunities and feasibility of various programs to support landowner participation in these programs. That report claims carbon offsets in the compliance markets trade at about 80% of allowance prices. As of August 2019, allowances were trading in the vicinity of \$17.35.

⁷ https://www.forest-trends.org/wp-content/uploads/2018/09/VCM-Q1-Report_Full-Version-2.pdf and proprietary sources.

Charge (1): Evaluate the current status of carbon sequestration markets.

- (A) Review available information on the feasibility of enrolling public and private land from Vermont in a carbon sequestration market, including review of existing feasibility analyses specific to the development of forest carbon sequestration projects in New England and Vermont.

[Jad Daley—ED of US Forests is working with C. Danks to compile a review of programs and projects. Feasibility is often very project specific. RT proposes an examination of all listed and credited projects—public and private-- in the Northern Forest. We can decide whether to explore specific questions with project developers or other project participants.]

- (B) Evaluate examples from forest carbon sequestration project development on public land in other states.

- (C) Evaluate, if available, technical assistance programs developed by other states and organizations to assist private landowners in engaging in carbon sequestration markets.

[This is where more specific information about Working Woodlands, VLT-Aggregation etc should go. Massachusetts is also developing a program to support carbon sequestration could add info here. AFF-TNC Family forest Carbon?]

Charge 2: Evaluate the economic and environmental case for encouraging forest carbon sequestration offset projects in Vermont

Sources: Keeton, et al. report, Ecosystem marketplace reports, FIA data, other sources may offer support for the following questions:

VT emissions: current status and policy responses

- 1) What is VT's current level of CO₂e emissions and how might carbon offsets compliment other legislative and administrative initiatives?

- 2) How much carbon is sequestered? How does this “service” relate to our current statutory requirements under the Comprehensive Energy Plan, Act 56 or other legislation that sets out GHG reduction goals? Are negative emissions or sequestration “counted” towards these goals?
 - (a) Recent legislative proposals related to carbon pricing: H.791, H.528, H.531, H.532, H.533
 - (b) RFF/JFO study on Carbon Pricing
 - (c) Non Pricing initiatives: Vermont Climate Action Commission report

VT forestland characteristics

- 1) Parcel size, number of owners, owner demographics
- 2) Are there studies that examine the costs of forestland ownership and management in VT?
- 3) Summarize trends in local wood products markets, including biomass and residential wood heating? Sugaring lease rates? Logging and other infrastructure capacity?
- 4) Highlight the specific benefits of C sequestration in VT forests. What specific statutory and policy goals are supported by increased sequestration? How does sequestration and the maintenance of forests apply to statewide water quality objectives?
- 5) Examine feasibility work on individual projects...does it make financial sense to do this?
 - (a) Vermont Carbon Report says, yes!, with aggregation.
 - (b) Evidence—interest in VT market by developers?
 - (c) Why have so few projects been developed compared to other NE states?

This section should also reference Vermont Conservation Design and the opportunity for carbon to support forest block and connectors

TNC Resilient and Connected Network has identified x% of Vermont as being resilient and connected and important to maintain in the face of climate change. %% is in forest with carbon stock that could qualify for credit markets.

Charge 3: Analyze how to best market and sell carbon credits from State-owned and privately owned forestland in carbon sequestration markets

Trends the industry

- 1) What current information is available on the level of offset trading activity in the US or globally?
- 2) Are any Vermont companies engaged in purchasing or selling offsets?
- 3) What are buyers of credits looking for? Volume? Steady supply? Particular “stories” that might fit a brand?
- 4) What are the characteristics of forest offset projects in the region? Acres, owners, program, developers?
- 5) Are there any identifiable trends that pertain to the economic case? (phone apps that enable easy offset purchase, CORISA status, CARB policy changes, new protocols, developer initiatives, registry initiatives?)

Characterize the attributes of the VT forest offset brand...

- 1) Who’s interested in marketing carbon offset programs to VT forest landowners?
- 2) What evidence do we have that landowners are interested?

Characterize VT’s particular assets

- 1) VLT and TNC as a potential partners: what do they offer?
- 2) Well managed well stocked forests; UVA covering 1.2 million acres.

Charge 4: Determine how to develop economies of scale in marketing and selling carbon credits in carbon sequestration markets

- 1) What is an appropriate scale?
- 2) What are the typical skills required to develop a project?
- 3) What potential services of programs might be offered by local providers?
- 4) What capacity exists in the forestry sector in VT to provide these services? Private consultants, non-profit partners, DFPR?
- 5) What role might the state take in helping landowners access markets, if any.

Charge 5: Evaluate how to utilize financial incentives and existing forest management and certification programs and Vermont's Use Value Appraisal program to maximize the potential value of forestland in carbon sequestration markets while also enhancing conservation and other goals

Are financial incentives or public support needed (beyond proceeds from offset sales)?

How do various existing programs fit? Certification is sometimes required. Would UVA enrollment be a substitute for other 3rd party certification? Under which programs?

In what areas does it make the most sense to offer support?

Inventory? Aggregation? Legal? Analytical? Marketing offsets/brokerage? Education?

What are the GHG reduction or conservation goals any program should support?

No forest loss? Focus on high conservation value lands? Measure and monitor sequestration as a component of our state GHG goals? VT Conservation Design—forest block and habitat goals? Specific departmental goals or statutory mandates?

How do we monitor our progress towards these goals? Who's responsible for statewide monitoring (DFPR, USFS-FIA, other)?

Charge 6: Review how to structure and regulate a Statewide program to facilitate the enrollment of Vermont forestlands in carbon sequestration markets, including how the program should be governed, whether the program should be governed by a State agency, how forestland will be assessed and enrolled, how parcels and landowners will enter and leave the program, how landowners will be paid, and how requirements and standards concerning forest management will be applied and enforced

Is a state-wide or state-administered program necessary, feasible, desirable?

What functions might such a program provide that aren't currently available in the private sector?

[This charge asks for a lot of specific responses that may be beyond the scope of our time and abilities in this group]

From what we've learned to this point, what other creative approaches to supporting the enrollment of landowners might we list, short of a government program?

What potential partners might be interested in a statewide program that is not a state-run program?

What opportunities exist in the area of Green Bonds or investor funds that might facilitate enrollment?

What opportunity exists for state invested funds (retirement etc) to invest in carbon projects and sell them in the market.

Charge 7: Estimate expected revenue from enrolling forestland in carbon markets and how that revenue should be allocated

How would revenues be generated? A portion of C proceeds? Fees? What might be a reasonable dollar potential? How would any revenue be used?

Charge 8: Evaluate any other issue the Working Group deems relevant to designing and implementing a statewide program to facilitate the enrollment of Vermont forestlands in carbon sequestration markets.