

CAST Meeting Notes March 2, 2022

In attendance: John Reid, Molly Smith, Carolyn Hooper Goetinck, Ashton, Jesse Pollard, Laura Simon, Lee Michaelides; Dana Clawson, staff; Guest: Tom Kahl, John Bouton.

Tom Kahl and John Bouton from the Hartford Conservation Commission explained the history and science behind the harvest plan for the Hartford town forest. (The Powerpoint and an excerpt related to climate change from the management plan have been attached to this email.)

Tom made the following points.

- *Climate change is an existential threat that need to be addressed.
- *The town forest is in the least developed part of Hartford. It is part of a larger priority habitat block of 5,200 acres.
- *Carbon management was added as an objective to the Forest Management Plan in 2020. (Pages 15-18 of the plan are included in this document.)
- *A goal of the plan is to increase site-appropriate diversity that would be beneficial to wildlife, carbon sequestration and storage and resilience to disease because of climate change.
- *There are 100 acres of the 465 acres in the town forest will never be logged.
- *Harvesting will take place in winter so as not to disturb the soil. Trees will be cut to length. Slash will be left on the forest floor.
- *The idea behind ecological forestry is to speed up the development of an old growth forest. The position of the Conservation Commission is that locally sourced wood used in wood products store carbon and reduce initial carbon atmospheric release.

John Bouton recapped that the long term plan is to create a forest with uneven aged trees. The current forest is even aged. It started growing on abandoned farms at the turn of the 20th century. The important part of the plan is the description of the plan's goals that can be telegraphed to people 100 years from now who will manage the forest.

Meeting Schedule: The Selectboard asked if we have enough bandwidth to do all we've be charged with. CAST will draft the roadmap of a climate plan. An open question— who will actually implement the plan? There are also ramifications for the forthcoming budget. John said we need to identify the specific steps we need to complete between now and May. Will a monthly meeting give us the time we need to complete tasks? Molly spoke in favor a bi-monthly meetings. Dana will send out a poll for the best days to meet. The Selectboard is looking at us to compile a list of concrete priorities and network with people who can carry them out. John said he didn't sign on to this committee to do the actual implementation.

Idea was floated to draft language to the Selectboard asking them to include language to the mission statements of all standing committees and commissions asking that they consider how their work can advance work on the climate action plan if that language isn't already in those mission statements. Some members had to leave the meeting early. Those that remained thought it was a good idea. This can be something we add to the report we'll be making in May to the Selectboard.



Hartford Town Forest 2023 Timber Harvest

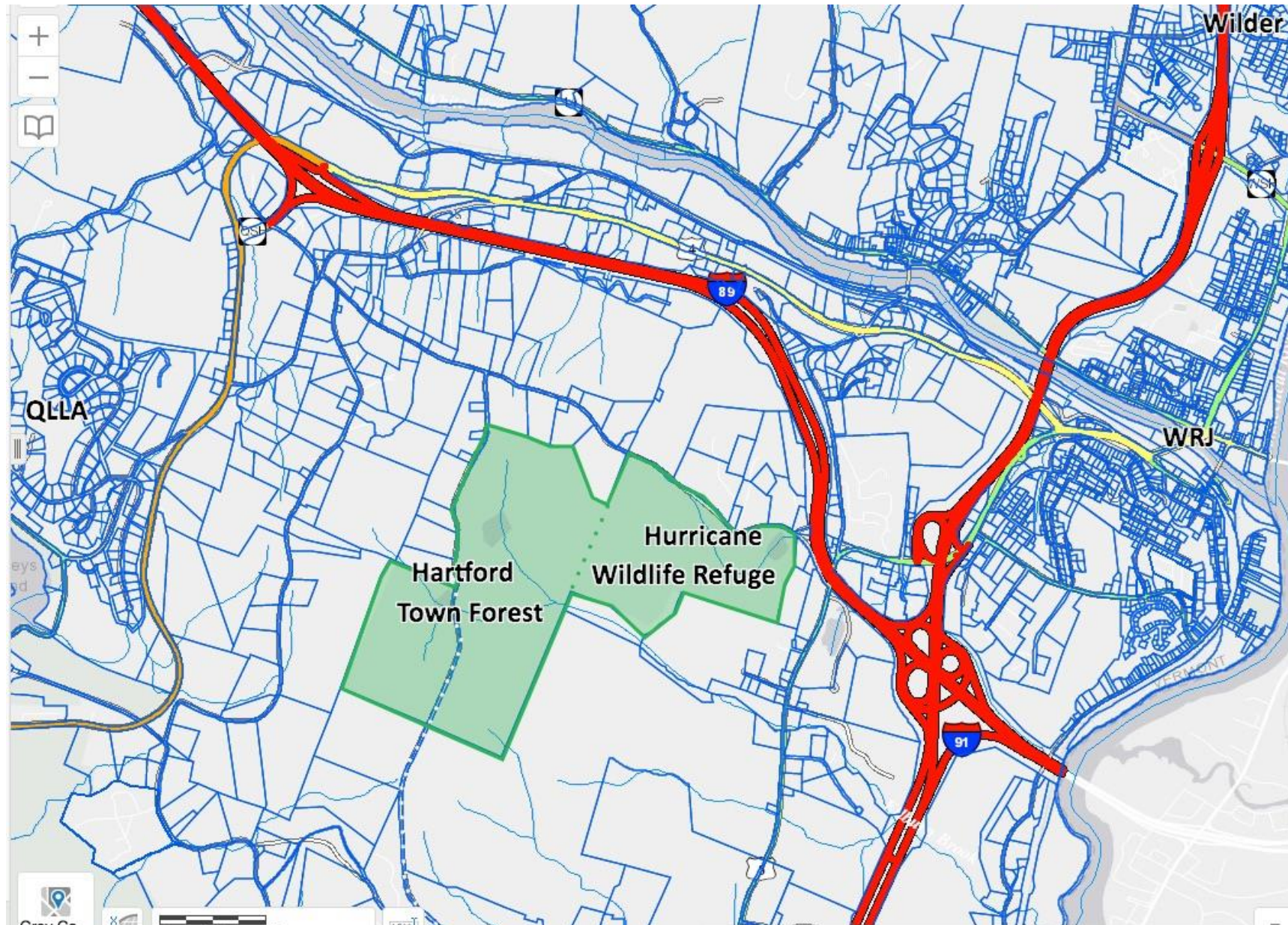
3-2-22 Meeting with
HARTFORD CAP Steering Committee

Conservation Commission Members

Tom Kahl and Jon Bouton



Town Forest Location



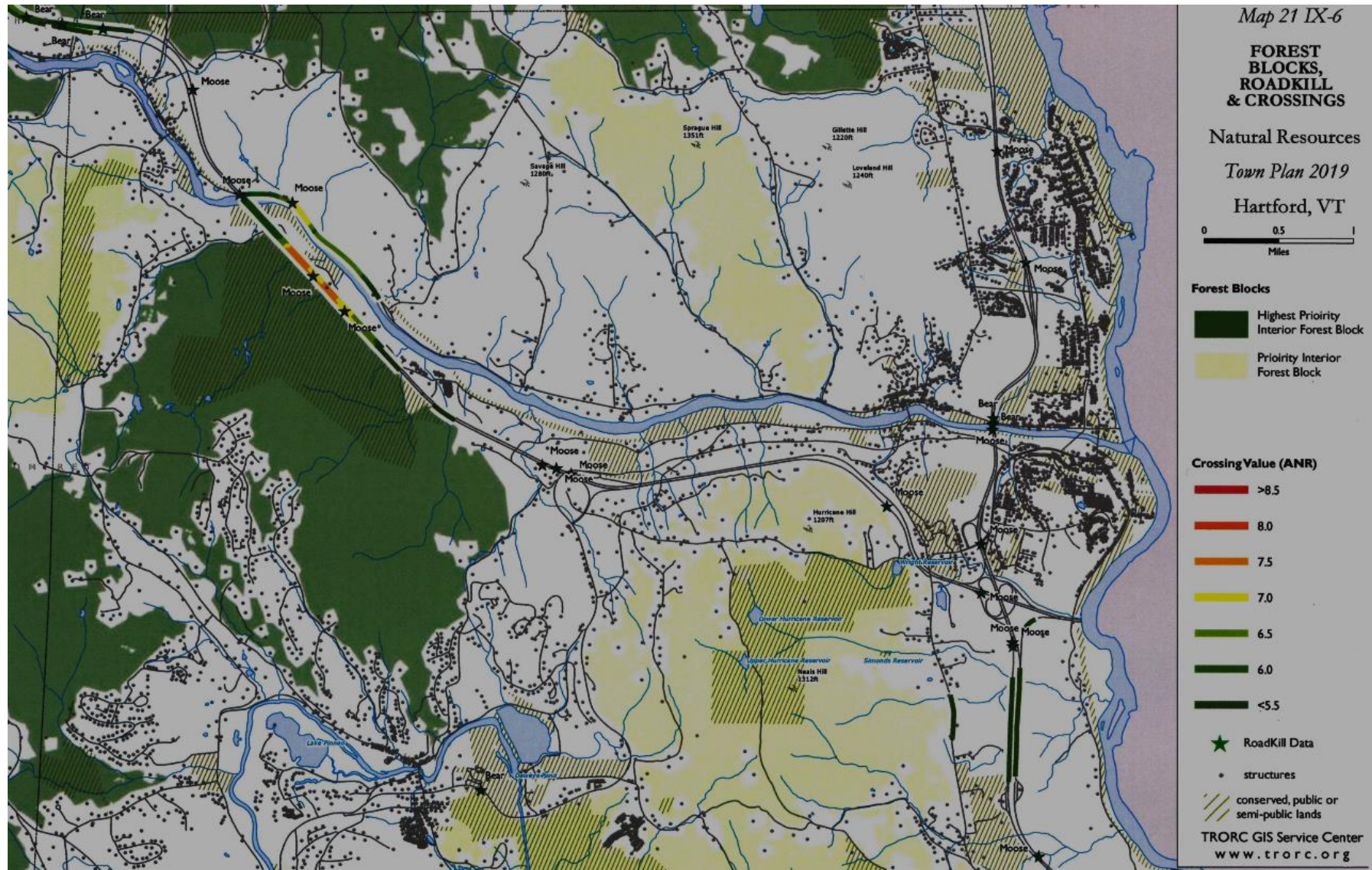
Town Forest:
423 Acres
(Conservation
Commission)

Hurricane Forest
Wildlife Refuge:
142 Acres
(Parks & Rec.
Dept.)

Total: 565 Ac.



Part of a Larger Forest



HTF: 423 Acres
(Cons. Comm.)

HFWR: 142 Acres
(Rec. Dept.)

Total: 565 Acres

Part of 5,200 Acre
Habitat Block

Wildlife
Connector
Overlay District
runs through HTF



Background



- Up to the 1980's heavier even-aged management harvests throughout HTF.
- A Forest Management Plan was first developed in 1984.
- The Conservation Commission has managed the Town Forest since 1997 and changed the HTF forest management to uneven-aged ecological based forest management.
- The latest timber harvests were selective timber harvests in the winters of 2005 and 2008.
- The latest Forest Management Plan was updated and approved in 2020. Carbon Management new Objective added (pp.15-18)



January 2019 HTF Public Value Survey

Management Focus

Less Important Equally Important More Important

0 1 2 3 4 5 6 7 8 9

Recreation



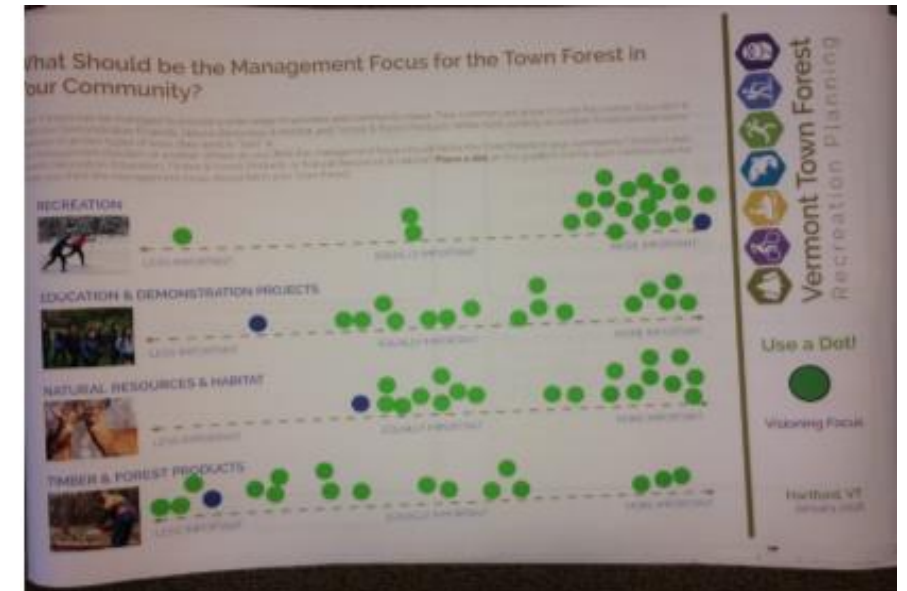
Education and Demonstration Projects



Natural Resources and Habitat



Timber and Forest Products





Management Balance in the Town Forest



- Natural Resources and Habitat
- Recreation
- Education and Demonstration Projects
- Timber and Forest Products

Wilderness



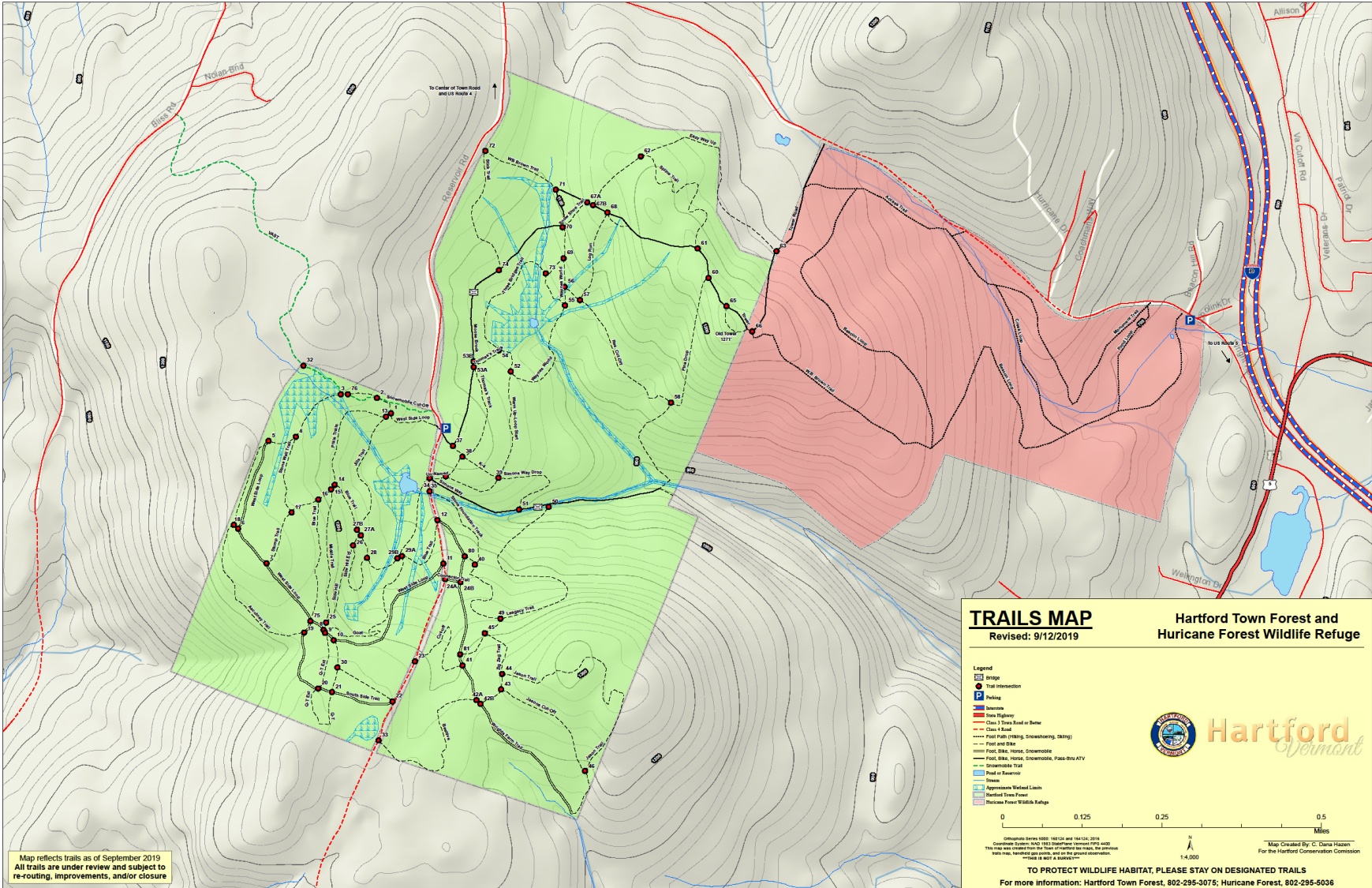
Park



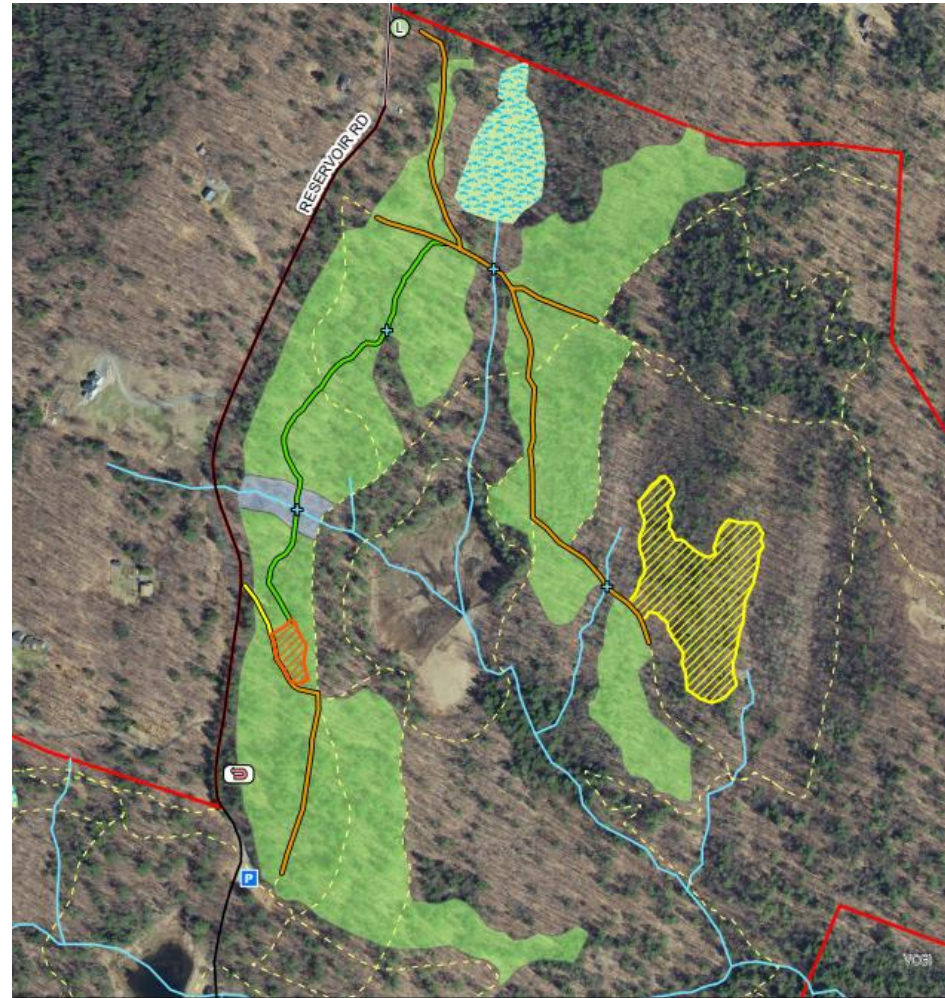
Forest Management Goals



- Increase Site-appropriate Diversity: Tree Species, Forest Structure (patchiness), Vertical Structure, Age & Size
 - Wildlife: Maintain Diverse Habitat Features
 - Carbon: Sequestration and Storage
 - Climate Change & Disease: Resilience
- Education: Demonstrate Sustainable Forestry and Locally-grown and Processed Forest Products (Landowners, HACTC, Cover ramps)
- Income: to Hartford Conservation Fund for Maintaining Town Forests, Natural Areas and Conserving Parcels with Important Natural Resource Attributes



Timber Harvest Area



Hartford Town Forest Timber Sale (Appendix B)

Timber sale area 49.5ac (Includes Patch)
Patch Cut Size 4.3ac
Scale: 1:5,000

Created by AJ Follensbee
Date: 8/30/2021

Map for planning purposes only





Provisions to Limit Harvest Impact (1/2)

- Occur in winter (late Dec-early March)
 - To reduce forest disturbance
 - Time of least HTF public use.
- Logging hours restricted to 7 am to 5:30 pm Monday-Sat.
- Public access to unharvested portions of Town Forest.
- Will temporarily impact 8 of 46 HTF trails and 50 of 423 acres. Most trails will not be affected by harvest.
- Cut to Length Logging Method specified.
 - No noisy landing chipping.
 - Logs carried not dragged out of forest to limit forest disturbance.

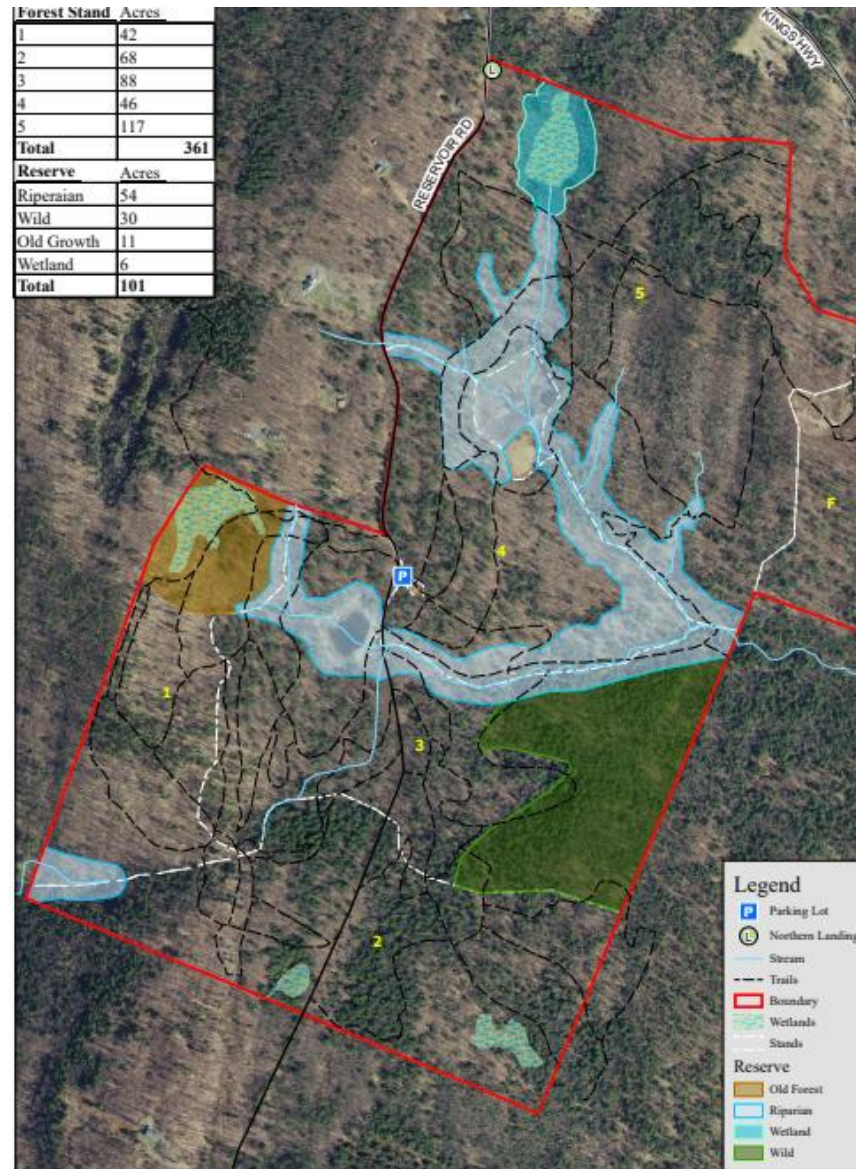


Provisions to Limit Harvest Impact (2/2)

- Forester determines where trails are used/crossed. Trail damage repaired at logger's expense.
- After work is complete all landings will be left in smooth neat condition and with skid roads barricaded to prevent unauthorized post logging use.
- After logging is complete affected trails will need some manual work such as removal of small branches and raking. Conservation Commission, HACTC, and volunteers will be used. Goal is to restore all trails in two to three months by later May.



Ecological Forestry – Reserve Areas



Hartford Town Forest-423ac

Hartford, VT





Ecological Forestry – Harvesting Method



- Harvesting in winter on frozen ground
- Cut To Length – Slash left at cut tree, not chipped and burned.
- Logs carried by Forwarder not dragged by skidder.
- Accelerate development of most old age forest characteristics by 100-200 years compared to unmanaged approach.



Thu, 05/24/2018 - 12:15pm --



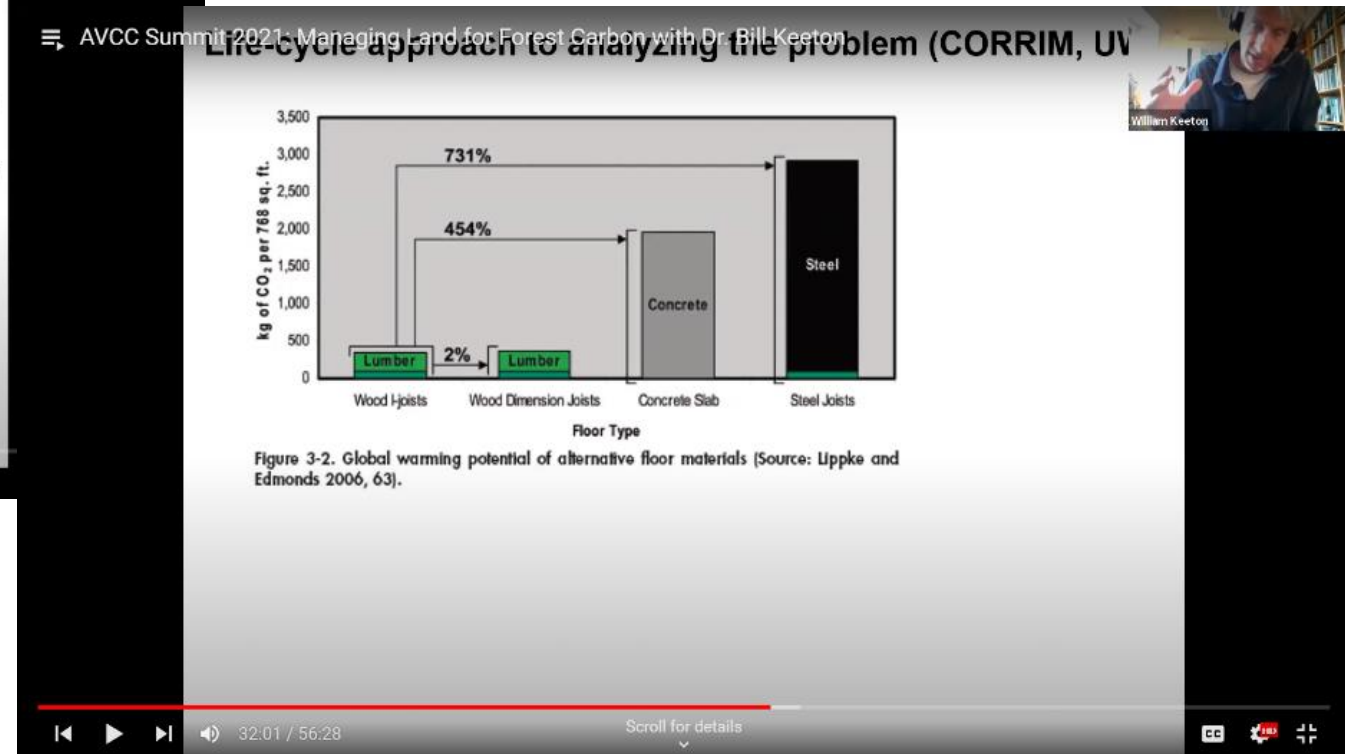
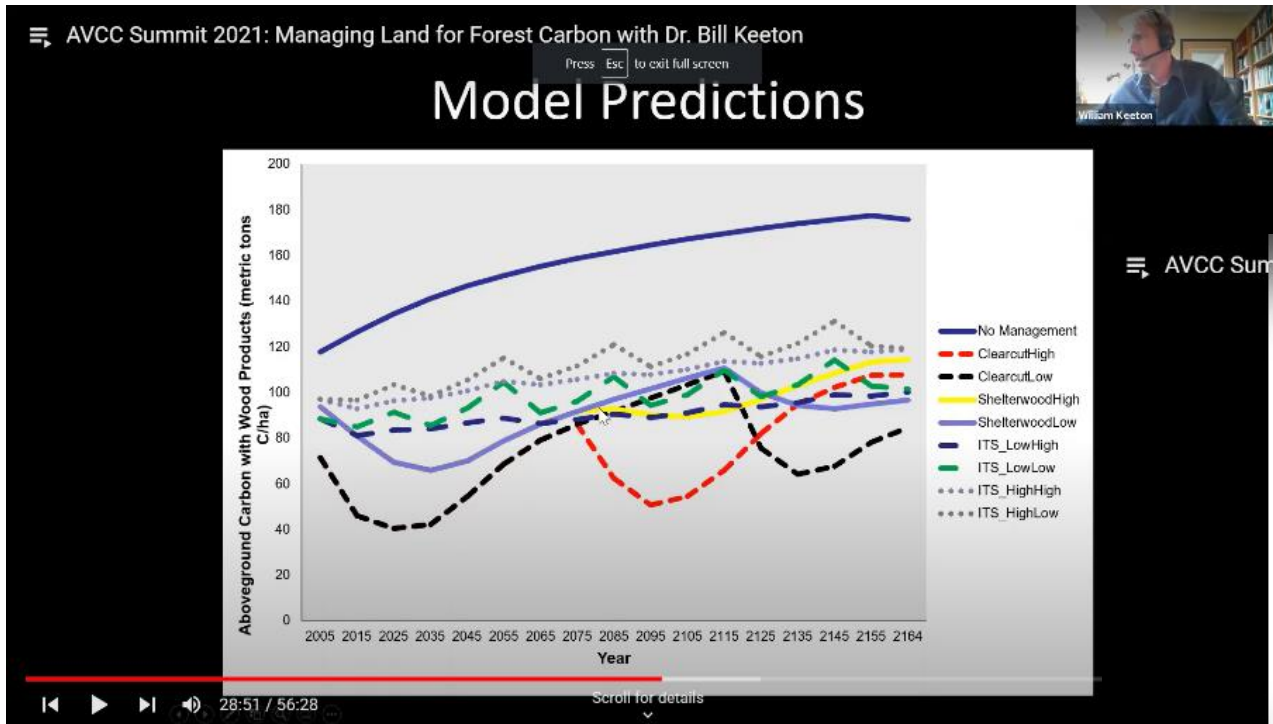
Log forwarder "Ingrid" allows Joel to selectively harvest trees with minimal damage to the surrounding forest, part of his family's commitment to sustainable forestry practices. Photo by Erica Houskeeper



Ecological Forestry – Carbon Storage and Substitution (1/2)



- Locally Sourced Wood Used for Long Term Products Store and Reduce Initial Carbon Atmospheric Release

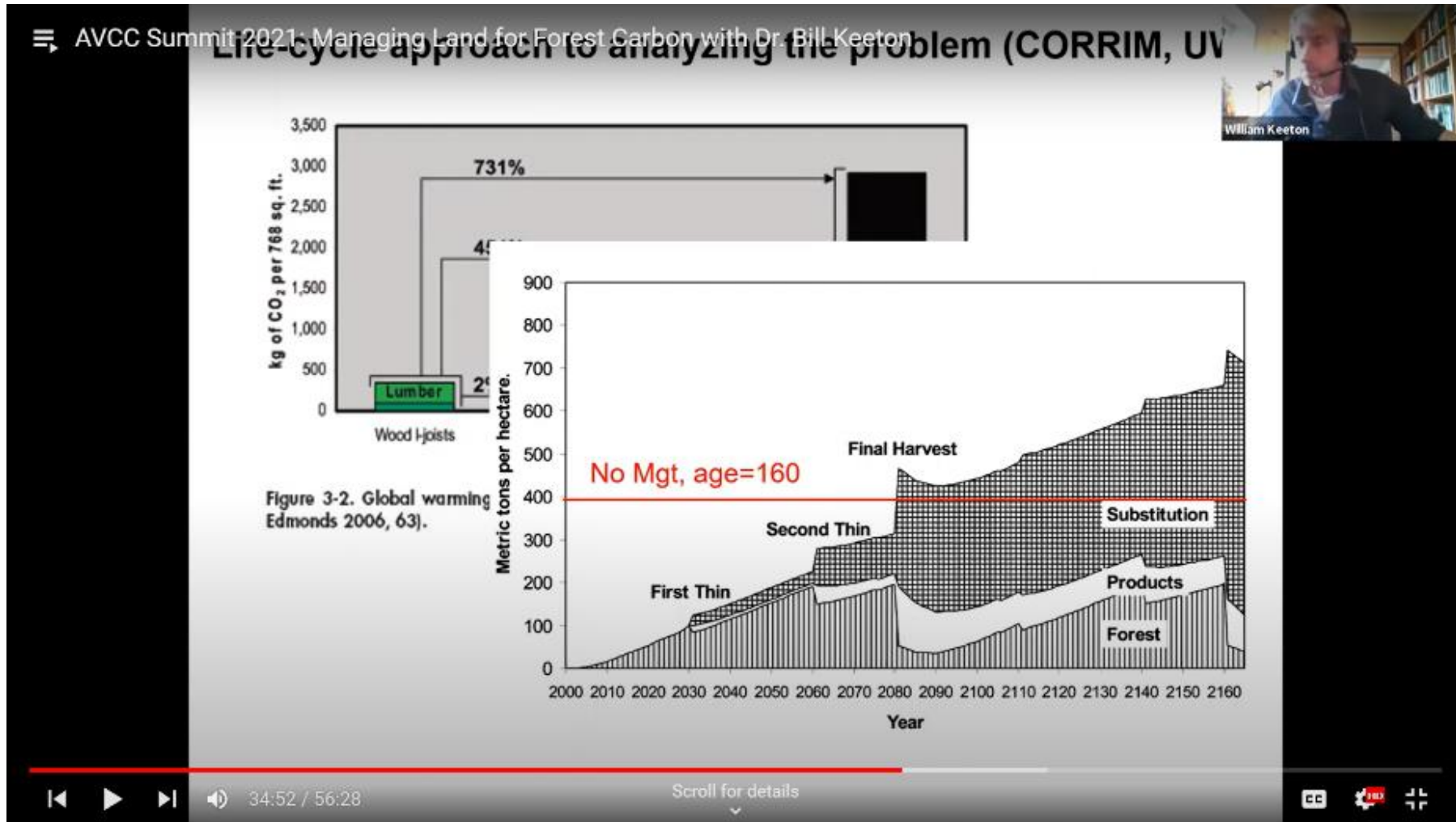




Ecological Forestry – Carbon Storage and Substitution (2/2)



- Locally Sourced Wood Used for Long Term Products Store and Reduce Initial Carbon Atmospheric Release





Ecological Forestry – Best Practices



FOREST CARBON An essential natural solution for climate change” by UMass Amherst, Paul Catanzaro and University of Vermont, Anthony D’Amato, 2019. This can be downloaded at <https://www.uvm.edu/rsenr/tonydamato/pubpdfs/Catanzaro%20and%20D%27Amato%202019%20Forest%20Carbon.pdf>

“Healthy Forests for Our Future: A Management Guide to Increase Carbon Storage in Northeast Forests”, by The Nature Conservancy and Northern Institute of Applied Climate Science, 2021. **Note that practices 9 and 10 are what is incorporated into the HTF Management Plan.** This can be downloaded at [Healthy Forests for our future: a management guide to increase carbon storage in Northeast forests \(fs.fed.us\)](https://www.fs.fed.us/nrs/pubs/jrnl/2021/nrs_2021_marx_001.pdf) https://www.fs.fed.us/nrs/pubs/jrnl/2021/nrs_2021_marx_001.pdf.





Ecological Forestry – Best Practices



Trees, Carbon, and Climate Change

Much information on forest carbon that explains the approach in the HTF Management Plan is available from the Vermont Department of Forests, Parks and Recreation, website including a useful one page summary. https://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Climate_Change/Files/TreesCarbonClimateChange_1pgr_Aug2021.pdf -

While forests can help us reduce CO₂ in the air, they are only one part of the solution to addressing climate change

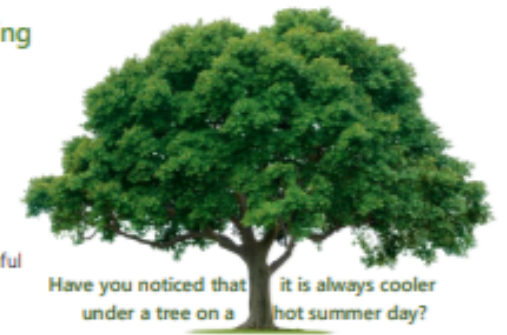
On average, an acre of Vermont's forest stores about 300-400 metric tons (Mt) of CO₂ and sequesters an additional metric ton each year². The diagram below shows how the average annual sequestration rate of Vermont's forests compares to emissions from an average car and average Vermonter.



About 12 acres of forest will remove the same amount of CO₂ that an average Vermonter emits in a year.

Trees provide critical benefits in a changing climate

In the summer, trees provide shade and help to lessen temperature extremes. In the winter, trees act as a windbreak from cold winds and reduce home heating demands. Their roots hold soil and prevent erosion. By sucking up water from the soil, trees help cycle and filter water. Their leaves intercept air pollution that can be harmful to our health. And of course, trees also provide food and shelter to many insects, fungi birds, people, and wildlife.



Trees can help us, but climate change poses a threat to forest health and the ability to sequester and store carbon

The burning of fossil fuels, which releases carbon that has been stored deep in the Earth for thousands of years, is causing changes to the climate. From more extreme rainfall events to warmer winters with less snow, we are already seeing climate change in Vermont. Trees have adapted to tolerate a wide range environmental conditions. However, forests that face a lot of stressors or have trees in poor health may not be able to withstand future changes. It is important that we keep forests healthy, reduce stressors and other vulnerabilities, and understand how to help forests adapt to climate change.

Looking for more information on Vermont's Forests and Climate Change? Check out Vermont

Trees, Carbon, and Climate Change

Trees are carbon sequestration and storage machines

Through photosynthesis, living trees take carbon dioxide (CO₂) from the air to grow and maintain their trunks, branches, leaves, and roots. Conversely, dead trees and leaves on the forest floor emit carbon back into the air as they decay. Some of this released carbon is used by insects, fungi, trees, and other organisms for energy and growth. Even trees that are burned in a forest fire or felled for use as firewood release carbon into the air, feeding into the carbon cycle.



Older forests store more carbon than younger forests, but they sequester it at a slower rate. This means that age diversity within a forest and across the landscape is the best way to maximize both carbon storage and sequestration. Plus, diversity is a good strategy for climate resilience, too.

There are many houses in Vermont built with wood that contains carbon that was sequestered by trees hundreds of years ago

Harvesting trees removes carbon from the forest, but other trees will quickly occupy the newly created space and sequester carbon as they grow, sometimes at an accelerated rate. Harvested wood that is used for long-lived products like furniture, flooring, and building materials, stores the carbon as long as it is in use. Plus, use of wood in construction or heating instead of concrete, steel, or fossil fuels reduces carbon emissions while supporting our local forest economy and helping to keep forests as forests.

Terminology

Carbon sequestration

The rate at which carbon from the air is taken in by trees and stored in wood and soil.

Think of this as the amount of money you deposit into your bank account each month.

Carbon emissions

The rate at which carbon is released to the atmosphere. This occurs when wood decays or burns.

Think of this as the amount of money you withdraw from your bank account each month.

Carbon storage

The total amount of carbon contained in a tree or a forest.

Think of this as the amount of money in your bank account. If sequestration (deposits) is larger than emissions (withdrawals), your bank account increases in size.

Hartford Town Forest Resource Assessment and Forest Management Plan Hartford, Vermont

Adopted by the Hartford Selectboard

November 2, 2020

FF 15 / \$* only
JLK 3/25/22



Prepared By:
AJ. Follensbee
Windsor/Orange County Forester

Table of Contents

Introduction and Purpose	3
Location.....	4
Forest Block	5
Terrain.....	6
Operations	7
Boundary Lines	7
History.....	7
Wildlife.....	12
Invasive Plants.....	12
Forest Health	12
Goals	15
Resources	15
Management Tactics & Objectives	16
Stand 1.....	20
Silvicultural Management	23
Stand 2.....	24
Silvicultural Management	27
Stand 3.....	28
Silvicultural Management	32
Stand 4.....	33
Silvicultural Management	36
Stand 5.....	37
Silvicultural Management	41
Schedule of Management Activities.....	43
Works Referenced.....	44
Glossary.....	45

Note: The Glossary at the end of this report defines forestry terms used in this Plan.

Goals

The objectives for the property are based on what was stated in the 2011 Forest Management Plan. These ownership objectives were the result of two-public meetings. They were developed by Harwood Forest Services by working with the Hartford Conservation Commission, the Hartford Parks and Recreation Director and the Town Planner. The goals and objectives as stated in the 2011 FMP read as follows:

- ☐ *Maintain a healthy, viable forest resource using sustainable, socially responsible and environmentally sensitive methods.*
- ☐ *Protect all water resources using acceptable management practices for the benefit of both water quality and riparian wildlife habitat protection.*
- ☐ *Maintain and enhance wildlife habitat and habitat connectivity.*
- ☐ *Develop and maintain a multiple use recreational network that respects the users and the related natural ecosystems.*
- ☐ *Expand the educational uses of the property for youth and adults through cooperation with schools, outdoor groups and professional organizations. Activities within the Watershed should be exemplary and demonstrable.*
- ☐ *Educational and recreational activities should be exemplary and follow "tread lightly" guidelines.*

The Conservation Commission is adding these goals

- ☐ *Enhance carbon storage and sequestration.*

The HCC also notes that maintaining wildlife habitat and connectivity is a strategy for a new goal of having a forest resilient to climate change.

Resources

The forests on the property have been split up into stands. Stands are groups of trees. These trees normally have something in common. Things like species composition, age, topography and operability. Lumping groups of trees together makes it easier to assess the forest and make management decisions. The Town Forest has been split into 5 different forest stands. These stands were separated mostly based on the operability of an area. They are based on the stands that Harwood Forest Service proposed in their 2011 FMP.

A forest resource inventory was done during the winter of 2019-2020, by AJ Follensbee. A total of 150 randomly assigned points were taken using a 10-factor prism. Density, diameters, merchantable heights, tree regeneration coverage, species and coarse woody debris information were gathered at each point. The data was then processed using the State of Vermont's FOREX forest inventory analysis program. Coarse Woody Debris information was gathered ocularly and given a rating based on the amount at each point, low 1-3 pieces, moderate 3-5 pieces and high 6 + pieces. Tree regeneration information was gathered qualitatively.

Management Tactics & Objectives

Before each stand is described in detail and prescriptions for each stand are recommended, it is important to discuss what the overarching management philosophy and desired future conditions will be for the property. Any prescribed treatments will take the following into consideration.

Carbon Management

Trees and plants sequester carbon from the atmosphere, storing it in biomass (wood and plant material). This carbon is found in both living and dead biomass in the forest, and a large portion of it can be found in forest soils. Globally, forests are a major carbon “sink,” absorbing and storing large amounts of carbon. Forests can be managed to maximize their carbon sequestration and storage by avoiding large-scale disturbances (such as clearcutting), encouraging the accumulation of dead biomass in the forest, and performing management activities that support the increased health and resilience of the forest, such as the encouragement of structural diversity.

The Town Forest should be managed to support and improve carbon sequestration and storage in the forest whenever possible. Carbon sequestration and storage priorities:

- ☐ Avoid creating large-scale disturbances (openings larger than 5 acres).
- ☐ Minimize soil disturbance during forest management activities to an extent dictated by responsible silvicultural practices.
- ☐ Retain dead biomass in the form of dead-standing and fallen trees and as much coarse and fine woody debris as possible during forest management.
- ☐ Retain biological legacy trees of a variety of species throughout the forest.
- ☐ Employ uneven-aged and low-impact silvicultural techniques as much as possible to encourage a healthy, diverse, resilient forest.
- ☐ Encourage the development of large trees throughout the forest. Allow for some of these large trees to naturally live out their life cycle in the forest.

Species and age diversity

Forests are complex. The forest management to be done in the Town Forest will embrace these complexities and enhance them. Not just one or a group of certain species will be managed for, instead all native plants species will be managed for and promoted where appropriate. This will make the forest more resilient.

A natural forest structure will be managed for. This will be done through uneven aged management. Uneven aged management has been the type of forest management done in the forest for nearly 30 years. Uneven aged management strives to have at least 3 or more ages of trees represented in a stand. The forest will be managed in a way that very old trees can be found in a stand along with very young trees. This will create complex structure throughout the forest.

Legacy Trees

Legacy trees will be retained in any treatment done. These are trees that will be left to complete their life cycle naturally. Trees that will be retained for this purpose will be trees of any species that are healthy and vigorous. This will ensure large trees can be found in the future in Town Forest. There are areas of the forest that can be left more or less alone with no major human manipulation taking place. These areas can be left to naturally develop. Over time an old growth condition will develop. The northern part of stand 1 and the western part of stand 3 would be great places to allow to develop naturally and to leave alone. The forested wetlands on the property are also going to be left to develop naturally, with no forest management taking place in these areas

Wildlife Habitat

Two different reports have been developed looking at the wildlife habitat conditions of the Town Forest. The recommendations from both reports will be incorporated into any forest management prescribed in this plan. The recommendations of each report are as follows.

Audubon Vermont did a Forest Bird Habitat Assessment in 2010. This was done by Steve Hagenbuch. The report in its entirety can be found on the Hartford Conservation Commissions website. This report listed the following italicized management recommendations to improve forest bird habitat (regular font style is added by HCC for clarity):

- 1) *Enhancement of vegetative structure in the mature interior forest of the Hartford Town Forest that covers approximately 66% of the total Hurricane Watershed acreage. A variety of silvicultural options that are complimentary with timber management objectives exist for doing so.*
- 2) *Maintenance of currently developing patches of early-successional habitat in Upper and Lower Reservoirs and the FAA tower clearing. There may be opportunities, if deemed silviculturally appropriate, in other areas of the Hartford Town Forest where the creation of an additional approximately 7 acres of early-successional habitat would benefit birds that require this condition for nesting and foraging. (These patches may be temporary, in which case new regeneration patches can be created when the old patches grow above the shrub-scrub or sapling stage.)*
- 3) *Protection of the high-quality forested wetland Canada warbler habitat in the Hartford Town Forest.*
- 4) *Development of late-successional forest conditions on the Hurricane Forest Wildlife Refuge. This is an uncommon condition in the landscape that would provide ecological and social benefits.*

Alan Thompson of Northern Stewards did a wildlife habitat assessment of the forest in 2011. This report in its entirety can also be found on the Hartford Conservation Commissions website. In his summary Alan list the following recommendations:

Current habitat conditions support wildlife using mid-late successional red oak northern hardwoods, small streams and small wetlands. The forest resources are in

excellent condition and will continue to mature and develop into late successional conditions. Early successional habitat is lacking and the property does not have a diversity of food or cover resources available for species that prefer or depend on conditions found from early successional hardwoods. Recreational use of the property is likely reducing the use of available habitat as wildlife will avoid humans in all forms of recreation. Off trail excursion and recreation around wetlands are most detrimental. Recommendations for habitat management include:

- ☐ careful designation for target habitat improvements
- ☐ the creation of early successional habitat in patches >1 acre and at a minimum 5.5 acres in perpetual early successional growth.
- ☐ The immediate implementation of recreational recommendations found within including but not limited to:
 - Trail closures around Lower Reservoir and modifications at Wright Reservoir to prohibit trails encircling the wetland
 - Discuss the temporal closing of trails in target habitat areas from March 1st-June 15th
- ☐ Incorporation of recommendations into forest management plan and during every harvest including
 - the designation of No-harvest management areas
 - Red oak regeneration methods
 - No foliar chemical application, if any

Invasive Plant Management

Prescribed forest management will be mindful of the risks of invasive plants. Following logging activities, areas treated will be monitored for new infestations of invasive plants. Any plants found will be dealt with promptly. In areas where established plants are present prior to harvest, invasive plant control must be part of any silvicultural treatment. In areas where herbicide treatment is necessary to achieve control a Vermont-licensed pesticide applicator must apply the herbicide

Water Quality

There are many water resources on the property. These include wetlands, streams, vernal pools, seeps and the drained reservoirs. All the water resources on the property will be protected during logging activities. This will be done through logging in only frozen conditions, buffering water resources and following Vermont AMP's. The current Vermont Water Quality Acceptable Management Practices Manual for Logging Professionals (AMP'S) will be followed. All logging roads and trails used during logging operations will be closed out to the standard of the AMP manual.

