



STEWARDSHIP PLAN

for
THE BETHEL COMMUNITY FOREST
BETHEL, MAINE

2019-2029

THE TRUST FOR PUBLIC LAND
30 DANFORTH STREET, SUITE 106
PORTLAND, MAINE 04101

MAHOOSUC PATHWAYS
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(207)200-8240

+/- 976 ACRES
Map 17 Lot 45
Oxford County

LVI Project # 11123

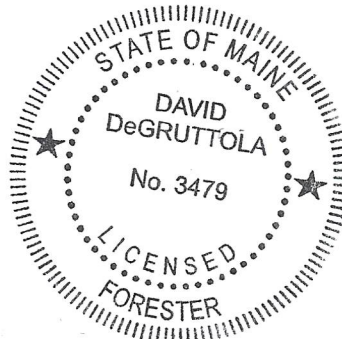
12/3/2019

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WoodsWISE



Incentives to Stewardship Enhancement

Landowner Stewardship Pledge

Forest Management Planning is partially funded by the USDA Forest Service's Stewardship Program.

I understand that any practice for which I receive cost-share funds must be maintained for 10 years. In placing my application for participation in Maine's WoodsWISE program, I pledge to conserve, nurture, enhance, and protect the forest resources of my/our land, and will strive to provide a high level of stewardship for all my/our natural resources.

This plan reflects my objectives as the landowner. I accept and approve the recommendations made by the resource professional who prepared the Plan. I pledge that any management practices implemented on my land will be consistent with these recommendations and it is my intention to follow them wherever possible.

I also understand that the Maine Forest Service may contact me for the purposes of monitoring the implementation of this Plan, either by a site visit or other means of communication.

Landowner signature: _____

date: _____

12/4/19

Landowner signature: _____

DocuSigned by:
Edward Easter
9D255AE9CB564E5...

date: _____

12/4/2019

Background:

The above statement must be signed by the landowner and is considered part of a Forest Management Plan. It means that, in return for accepting funding for assistance in management planning, the landowner will continue to manage their land in a responsible way. It further means that the landowner has accepted the plan as meeting their objectives, and will make a reasonable attempt to follow the plan, though the landowner may amend the plan to meet changing conditions or circumstances. The pledge does not mean that the landowner is obligated to accept or adopt a plan that does not meet their own objectives for their land.

The pledge also means that if a landowner who has received cost-share funding for the preparation of the plan later chooses to change the use of the land, e.g. for housing/commercial development, or otherwise engage in activities that are inconsistent with stewardship principles, the landowner who received the cost-sharing is obligated to return the funding that was provided to them for natural resource management planning.

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Property Description

OVERVIEW

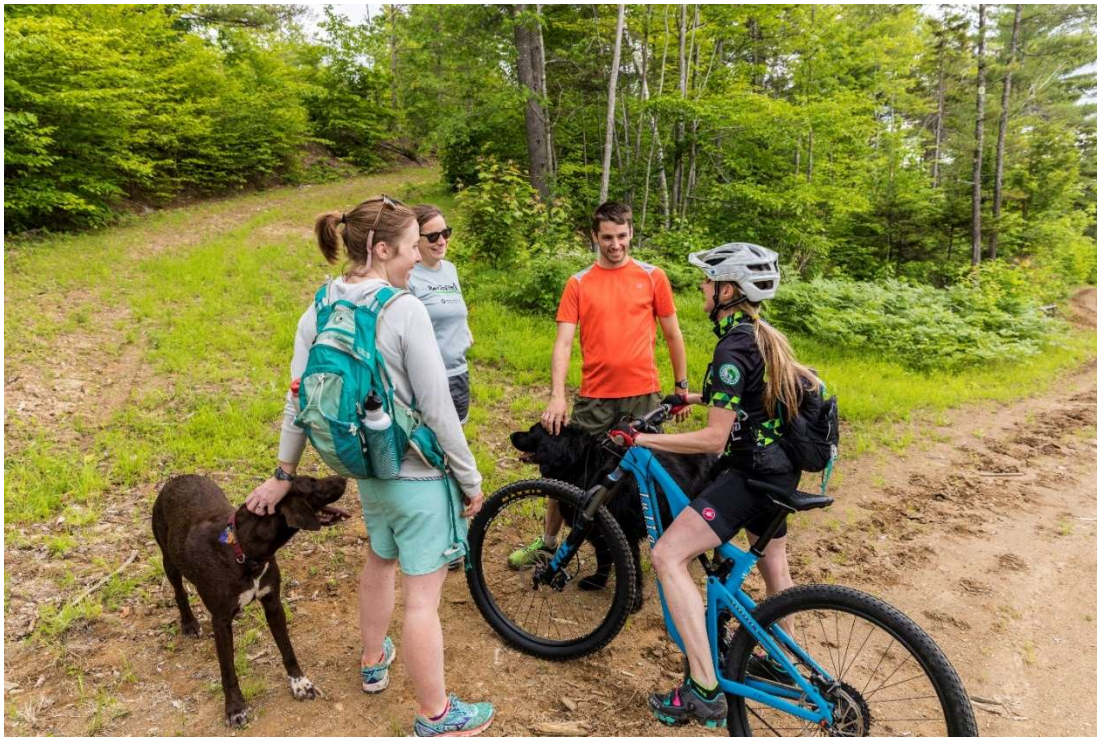
The Bethel Community Forest (BCF) is located in Oxford County situated in an area of mountains, wetlands, and streams. The surrounding landscape is comprised of large blocks of forest lands with a wide range of forest management and recreational use. The property is relatively close to properties of the Sunday River Resort, the Town of Bethel's Bingham Forest, and Mahoosuc Land Trust Properties Valentine Farm and the McCoy - Chapman Forest.

Bethel Community Forest is comprised of two parcels totaling 976 acres. One parcel totaling +/-125.9 acres is located on the westside of the Daisy Bryant Road +/- 0.75 miles north westerly of the intersection of the North Road and the Daisy Bryant Road. The second parcel totaling +/- 849.5 acres is located on the Locke Mountain Road +/- 0.37 miles north easterly of the intersection of the Daisy Bryant Road and the Locke Mountain Road. The forest contains 3 broad forest types hardwood, softwood, and mixed wood. The forest has

been aggressively managed by the previous owner(s) resulting in a forest that has entered a growth phase. Terrain is varied, with very steep portions in the northern sections. Several tributaries of Chapman Brook and Twitchell Brook (both direct tributaries to the Androscoggin River) flow through the property.

This Stewardship Plan is being prepared to help guide the community through the establishment of the community forest as well as creating guidelines for long-term goals and objectives for the property. The management cycle for this Stewardship Plan is 2019 - 2029. Geographic Information System (GIS) mapping accompany the plan, showing the property boundaries, forest cover types, infrastructure, and other management features.

COMMUNITY FOREST OBJECTIVES



From the onset of the Bethel Community Forest planning process, Mahoosuc Pathways has been gathering community input by conducting surveys at town events, holding public informational meetings, as well as ongoing conversations with the planning committee that met monthly for two years. The overall goal of this effort was to gather opinions on how the community wanted the BCF to be managed and used. This combined data was compiled and ranked based on desired activities/opportunities by number of occurrences on the survey. This data was then presented to the planning committee and further refined to meet the community goals and objectives, the conditions of the LMF easement, and the recommendations set forth by Maines Best Management Practices (BMPs) for protecting water quality, rare, threatened and endangered species, and any areas of cultural or conservation importance.

From the beginning, it was clear that the priorities of the Bethel Community Forest would reflect the culture of Bethel itself, and so habitat protection, education, and recreation soon rose to the top of stewardship objectives and priorities. Bethel has three schools and an intensive outdoor recreation culture for both residents and visitors. Through multiple community input opportunities, five main categories of activities were identified:

1. Infrastructure Needs

2. Recreation
3. Education
4. Working Forest
5. Community Events

Further refinement within those categories resulted in a diverse mix of priorities for both stewardship and use of the Bethel Community Forest and discussed in detail within this plan. The combined opportunity list and setting of priorities is shown in APPENDIX VII.

To ensure continued community involvement and adherence and implementation to the management plan a committee will be created of the Mahoosuc Pathways Board of Directors. This advisory board will be made up of up to three members of the Mahoosuc Pathways Board, one member of the Town of Bethel select board, up to one member the Bingham Forest Authority, and three to five citizens at large, representing recreational users, individuals with expertise or interest in natural resource management, and representatives of the general neighborhood.

VISION & MISSION

Vision:

The Bethel Community Forest is a showcase of exemplary land stewardship and high-quality outdoor recreation for Western Maine.

Mission:

Management of the Bethel Community Forest is balanced to provide quality recreational experiences, outdoor educational opportunities, and protection of critical wildlife habitat, while modeling thoughtful stewardship of the timber resources.

RECREATION

The Bethel Community Forest has the potential to support a diverse array of non-motorized outdoor recreation. The location of the property, its proximity and connectivity to existing recreation trails on abutting parcels (Mahoosuc Land Trust, Grey Birch Land-Invest LLC, Bethel Water District, Bingham Forest, Chapman-McCoy Forest and Sunday River Resort) make it a natural opportunity for trail development. Using information collected from town polls and discussions at the monthly community forest meetings, the priority outdoor recreational activities are as follows:

- Hunting
- Hiking
- Mountain biking
- Backcountry XC skiing, and
- Snowshoeing

Additionally, there is an existing snowmobile trail across the property which will stay in use. Future snowmobile trail expansion will remain a future option.

Multi-use trails may be possible on the BCF to satisfy all of the recreational interests. Other recreational ideas generated by surveys and the planning committee include birding and hosting a variety of events such as competitive racing in skiing, biking, and trail running.

Recommendation: An outdoor recreation plan for the property outlining trail design, placement, and activities should be developed prior to beginning any recreation projects. A trail placement priority map has been generated using slope, soil type, and existing trails to narrow down areas based on the type of outdoor recreation activity. (See Appendix II)

For more information regarding outdoor recreation on private and community land contact the Department of Inland Fisheries and Wildlife at (207) 287-8000 or visit www.maine.gov/ifw and click on the Quick Link for the Landowner Relations Program/Outdoor Partners.

STEWARDSHIP

The Bethel Community Forest acquisition was funded in part by the Land for Maine's Future (LMF) Grant Program. There is a Project Agreement between Mahoosuc Pathways and LMF).

Land for Maine Future (LMF) Requirements

There are also requirements that Mahoosuc Pathways will adhere to. Below is a summary of mandates and conditions for the BCF:

- Public recreation access is provided.
- Hunting, fishing and trapping may not be prohibited on property, except for farms, commercial working waterfront or for protection of rare threatened and endangered species.
- Public access may not be limited in any way based on location of visitor's residence. If entrance or usage fees are established, they must be uniform to all visitors. The establishment of fees must be allowed in the Project Agreement and approved by designated State agency.
- Buildings are generally not allowed except under specific circumstances, LMF staff needs to be contacted about existing buildings on property.
- LMF requires the appropriate signage acknowledging LMF support is located and maintained on all conserved lands. Signs will be provided at closing.
- Any reduction in scope (regarding public access, recreational opportunities, uses of land, and ecological of conservation activates/attributes) of project must be approved by LMF board.
-

Mahoosuc Land Trust (MLT) Considerations

The Mahoosuc Land Trust manages multiple properties in the vicinity of the Bethel Community Forest. The Mahoosuc Land Trust's easement places a high priority on maintaining wilderness areas and protecting critical wildlife habitats. The Bethel Community Forest contains one critical wildlife habitat designated by the State of Maine: Deer Wintering Area (DWA): While BCF is not legally bound to follow the MLT easement, it should be taken into consideration to capitalize on landscape level continuity for both wilderness areas and wildlife habitat needs. Mahoosuc Pathways has committed in writing to LMF management of the DWA.

Sustainable Forest Management

Implementing the right silviculture on the right acre at the right time of year is the foundation of sustainable forest management. To accomplish sound stewardship a balance needs to be maintained between ecosystem/environmental health, forest productivity, community goals/objectives, and economic considerations/constraints. To ensure this balance, stand level management recommendations combined with public input and involvement needs to occur.

Deed Covenant and Easement Restrictions

See Appendix for covenants and easements associated with the property.

Maine Forestry Laws & Acts

Maine Forest Practices Act and Clear Cutting Standards:

https://www.maine.gov/dacf/mfs/publications/rules_and_regs/chap_20_rules.pdf

Maine Liquidation Harvesting Law:

https://www.maine.gov/dacf/mfs/publications/rules_and_regs/chap_23_rules.pdf

Maine Shoreland Zoning:

https://www.maine.gov/decd/meocd/ceo/documents/2008shoreland_zoning_manual.pdf

Maine Tree Growth Tax Law:

https://www.maine.gov/dacf/mfs/policy_management/tree_growth_tax_law_info.html

For information regarding Best Management Practices go to:

https://www.maine.gov/dacf/mfs/policy_management/water_resources/bmps.html

For more information regarding the Land Use Planning Commission (LUPC) in the State of Maine go to:

https://www.maine.gov/dacf/lupc/laws_rules/ch10.html

For more information regarding potential local land use ordinance for timber go to:

<https://www.bethelmaine.org/>

For more information regarding requirements to file Forest Operations Notification (FON) and Landowner Report go to:

https://www.maine.gov/dacf/mfs/rules_and_regulations.html

Tree Planting

We recognize that this property has been heavily harvested in the recent past and opportunities exist to enhance the tree growth of the property. There are several grant programs offered to assist in the thoughtful management of timber resources: NRCS and the Ruffed Grouse Society are examples of grant programs.

Maple Tapping

Interest has been expressed in the sugar maple on the property for tapping and sugaring. The sugar maple on the property are currently too scattered to support viable commercial maple sap production. Commercial maple tapping requires 40 trees (sugar or red maple) per acre that are a minimum of 10 inches a Diameter Breast Height (DBH). Identifying sugar maple trees that are of suitable size to tap and in close proximity to the main access roads will be utilized for educational purposes.

Apple Orchard

Two apple trees have been identified to the south of the 7.1 acre opening, near an existing cellar hole. This area has been identified as the proposed location for a community apple orchard. Establishing an apple orchard on the property will require fencing, or at least cages around each tree for the first 3-5 years to protect from deer browse damage. The long-term purpose of the orchard will be for both human consumption and as supplemental wildlife feed. To minimize cost and maintenance requirements, it would be recommended to invest in seedlings that have rot resistant root stocks (EMLA-7 is most common, and also has dwarfing characteristics which allow for harvesting without the need of ladders) with resistant cultivars (main issue is with apple scab) refer to Penn States list of scab resistant cultivars for a complete list of choices.
(<https://extension.psu.edu/apple-cultivars-scab-resistance-selections>).

By choosing a variety of resistant cultivars, landowners can reduce the chance of pest and pathogen damage, as well as the need for chemical controls. A well-maintained apple orchard will begin producing fruit as early as year 3; in order to achieve these results irrigation and fertilization will be required. Trees also need to be pruned annually to ensure quality fruit production.

EDUCATION

Youth Education and Recreation

Bethel contains many entities that can benefit from a “living classroom” for outdoor education, school events, such as volunteer opportunities and fundraisers, as well as opportunities for students to get firsthand experience working in the woods. Currently, Telstar High School, Crescent Park Elementary School, Gould Academy, Maine’s School of Applied Technology (Region 9) have all expressed interest in utilizing the Community Forest as an educational resource. On top of new conduits for youth education and recreational opportunity, groups like the Mahoosuc Kids Association and the Telstar Freshman Academy will also be able to utilize the property to expand existing activities and programs, as well as pursue the development of new educational opportunities.

Citizen Science

The Bethel Community Forest provides a resource for education that spans all age groups. The most popular activities brought up by the planning committee revolved around interactive education opportunities as well as citizen science initiatives and:

- Wildlife tracking
- Birding
- Wildlife surveys
- Plant/mushroom identification
- Hunter safety
- Pest and pathogen monitoring

IMPLEMENTATION

Stewardship and use of the Bethel Community Forest should continue to reflect the goals and objectives of the community through time. Maintaining relationships and connectivity through continued community involvement with tools such as monthly meetings, annual reports, and public input to the Mahoosuc Pathways Board will be helpful in this regard.

COMMUNITY BENEFITS

Economics

The Bethel area has a rich history in forest products, recreation, hospitality, and retail businesses. The Bethel Community Forest will contribute to the regional economy in two ways. The first impact will be to provide additional four-season outdoor recreation opportunities for both the local community and visitors. As a recreational destination, Bethel provides many outdoor opportunities for recreation. Further trail development will add to the opportunity for visitation and outdoor experiences in a beautiful natural setting. Eventual hosting town sponsored events such as youth and adult educational opportunities and competitive sporting events will also increase visitation. The second driver will be the natural resources on the forest itself, including, protection of water, wildlife and cultural resources, and eventually revenue from sustainable timber management. Right now, the Bethel Community Forest supports local jobs by enlisting local foresters in its management.

Taxation

The property is enrolled in Maine's Tree Growth Tax Appraisal Program and was most recently updated in 2017. The current tax rate for the property is \$3,909.26/year. The Mahoosuc Pathways Board intends to either continue paying taxes on the property or to negotiate a Payment in Lieu of Taxes (PILT) with the Town of Bethel.

Environmental Benefits

Clean Water – The Bethel Community Forest lies within the Androscoggin River watershed, which is one of New England's largest rivers, a popular cold-water fishery, and a source of drinking water for tens of thousands of people downstream. Small brooks on the property flow into Chapman Brook a tributary to the Androscoggin River. Wetlands and riparian areas will be protected so that timber harvesting, trail construction, and use, or other management activities do not diminish the water quality that is important for both human use and essential to wildlife and aquatic habitat retention.

Carbon sequestration – With sustainable long-term management, the Bethel Community Forest will continue to sequester carbon dioxide, a greenhouse gas, which will aid in long term global efforts to mitigate climate change. **Education** – With five schools in the Bethel

area, and a culture of outdoor recreation in the town, the BCF is a natural fit for outdoor education in a variety of forms. Preliminary discussions with teachers at the Crescent Park Elementary School, Telstar High School, and Gould Academy have yielded great interest for student programs to be developed.

Carbon sequestration and climate change resilience: Among the many benefits provided by forests, removing carbon from the atmosphere and storing it in trees may have increasing significance in the years to come. For more information, visit www.maine.gov/doc/mfs/mfs/topics/carbon. As climate change increases the likelihood of severe weather events, the migration of both beneficial and invasive species and new risks to forest health and productivity, good woodland stewardship is the key to preparedness. For more information, check out the Climate Smart Land Network at <http://climatesmartnetwork.org/>

Replicable Model – Mahoosuc Pathways has committed to exemplary management of the Bethel Community Forest. The proximity to the town-owned Bingham Forest offers a unique opportunity for large scale demonstration of good forestry and best management practices in the stewardship of these properties. The focus on habitat protection and thoughtfully designed recreation trails will be of interest to other landowners in the region. With broad community participation in the ongoing stewardship and recreation use of the Bethel Community Forest, many people will be exposed to these good practices.

Recreational Benefits – As discussed fully in the Recreation section, the Bethel Community Forest will see much recreational use in the form of traditional open access and multi-use trail development over time. Traditional recreation such as hunting, is an important component of the region's culture and shoulder season economy and will be allowed and accommodated. Given the major abutting landowners, the potential for a comprehensive matrix of trails is great, and it will be sandwiched between the Sunday River Resort and the town village. Trail construction will be an important social opportunity to include volunteers of all ages and skills.

CONNECTIVITY

The major drivers for the establishment for the Bethel Community Forest was to expand all season outdoor recreation opportunities in Bethel and provide connectivity to existing recreational opportunities across the landscape.

Bethel – Newry

The Bethel Community Forest will provide access to the recreational opportunities on the Bingham Forest, Bethel Water District, and Sunday River Resort.

North Road Loop

The Mahoosuc Land Trust has two eased properties that currently provide non-motorized recreation opportunities in Bethel along the North Road. The Valentine Farm Conservation Center abuts the Bethel Community Forest to the southeast, and the McCoy Chapman Forest to the west. The connectivity with the Bethel Community Forest is attainable with cooperation from the Bethel Water District, Bingham Forest, and Gray Birch Land Invest LLC properties. (SEE APPENDIX VIII: Landscape level connectivity map)

Snowmobiling

As mentioned above local snowmobile trail #13 bisects the Bethel Community Forest. This trail is the critical link between Bethel and Newry, Andover, and Rangeley.



Infrastructure & Access

The Bethel Community Forest lies on the north side of the North Road in Bethel, Maine. On the North Road there are two access points to the property. The first access point is an unnamed road terminating in an old gravel pit (approx. 0.41 miles total length). The second access is off the Daisy Bryant Road, which is a town-maintained road up until the first fork (approx. 0.2 miles), at which point the left fork becomes a private road and the right fork becomes the Locke Mountain Road. The Locke Mountain Road is the main access into and through the property. The Locke Mountain Road is an improved gravel road. At the time of the timber inventory, the road was drivable with a four-wheel drive vehicle for approximately 1.2 miles. The property has had a history of forest management activity and contains an immense network of seasonal truck roads, skid trails, and spur trails. This pre-existing network can be utilized as a baseline to layout recreational trails on the property and can continue to be utilized for forest management activities. Stabilizing trails by implementing proper BMPs must be a priority if this network is to be utilized in the future.

Parking

The Bethel Community Forest has two main access points, one through an existing gravel pit off the North road, the other on the Locke Mountain Road off the Daisy Bryant Road. The Bethel Community Forest will construct a 3-season parking lot near the top of the first clearing (stand 9a/9b) on the Locke Mountain Road for spring, summer and early fall access. This will be located at what is known as the “four corners, or times square”. This parking area will stage visitors in a location which provides access to the northern part of the property, Bethel Water District land and The Bingham Forest. The Locke Mountain Road and the parking lot at the “Four Corners, or times square” will not be plowed or maintained for winter access and will be closed during spring and fall mud seasons to reduce erosion and water quality issues as well as keep maintenance cost low. The second access point will be maintained for four season access and will utilize the existing gravel pit for parking. From the gravel pit, a 16-20’ trail and boardwalk will be constructed to gain access to the property through the cedar stand on the southern end of the property (stand 5). For situations where this parking is not sufficient to support guests (larger events, holiday weekends etc.) the Mahoosuc Land Trusts’ Valentine Farm parking lot can be utilized for overflow parking. (SEE APPENDIX I: proposed parking locations)

Structures

All structures or modification to property must be proposed and approved by Land for Maine's Future (LMF) board (LMF conditions listed under the "Stewardship" section below)

Kiosks with information such as trail maps, event dates, and educational opportunities will be placed at both the gravel pit lot and the four corners lot. Sites will be evaluated for small structures such as bathrooms (Port-a-potty), warming huts and storage sheds as the need for them arises.

Roads/Trails

The property contains a vast network of woods roads and skidder trails that can be utilized for recreation trails. (See further discussion below SOILS) The map (page 22) will be used as a guide to prioritize existing trails for specific recreation activities such as mountain biking and XC skiing.

Access Agreements

The properties abutting the community forest (Bingham forest & Bethel Water District) require access through the Bethel Community Forest to move forward with their forest management programs. The priority is truck road access north from the "four corners" on the Locke Mountain Road. Approximately 1.1 miles of road will have to be built on Bethel Community Forest Property and a bridge will need to be replaced to obtain the need access. To assure the Bingham Forests use of the constructed access road, The Bethel Community Forest will deed a Right of Way to the Bingham Forest. It will be important to list in the deed the width of road, acceptable use (time of year, equipment type etc.), who is responsible for maintenance (culverts, ditches, mowing, plowing etc.) and close out requirements after harvests have been completed. It is recommended that any road that has resources invested in it should have some form of access control (gate, boulders), to protect the resource from unauthorized vehicle use. (ROW agreement: Appendix X)

Restricting Access and Land Use Education

It is expected that the Parking lots and trails will be open from sunrise to sunset seven days a week. Access will be seasonally limited on the Locke Mountain Road. Parking lot and road closures/re-openings will be at the discretion of the Mahoosuc Pathways Board of Directors.

The State of Maine offers an Outdoor Partner Program to help facilitate the interaction between land users and land owners. It is recommended that the Bethel Community Forest enroll in this program, to aid in land use education and policy enforcement.

The Outdoor Partners Program provides funding to protect Maine's longstanding tradition of public access to privately owned land.

Funds from the Outdoor Partners Program go to:

1. Enhanced law enforcement in areas where problems occur
2. The landowner sign program, which offers an alternative to No Trespassing signs and aids landowners in managing access to their land
3. Equipment to investigate and prosecute landowner abuse and criminal trespass complaints

Promotional and educational programs designed to promote and maintain access

Woodland Legacy Planning Information

The Bethel Community Forest will remain as open space for the enjoyment of the Bethel community and the general public in perpetuity under the terms of the formation documents drafted by the Trust for Public Lands and the Forest Legacy funds used to acquire the property. Private landowners interested in maintaining open space for the future more information from the U.S. Forest Service about conservation-based legacy planning, go to www.na.fs.fed.us/stewardship/estate/estate.shtml. You may also want to contact the Small Woodland Owners Association of Maine (SWOAM) at 207 626-0005; info@swoam.org; or visit their website at <http://www.swoam.org/LandownerResources.aspx> and look for the Succession Planning link.

Wetland and Water Resources

There are several intermittent and perennial streams associated with the property. Chapman Brook forms a portion of the eastern boundary line of the parcel located west of the of Daisy Bryant Road, and flows directly into the Androscoggin River. East of the Daisy Bryant Road, the southeast corner of the property is a forested wetland that connects with a larger wetland complex associated with Twitchell Brook. The main channel of Twitchell Brook is +/-0.40 miles east of the property and flows into the Androscoggin River south of the North Road.

There is a small unnamed stream that drains the central portion of the property. This unnamed stream provides a wildlife travel corridor and flows into the wetland in the southeast corner of the property. The stream exits the wetland and flows into the Androscoggin River south of the North Road.

Chapman Brook and Twitchell Brook along with the associated tributaries are capable of supporting population of wild brook trout. Brook trout require clean well oxygenated water. Future forest management and outdoor recreation activities should strive to meet and/or exceed the Best Management Practices (BMP) for the State of Maine. Forest management activities should be scheduled during the appropriate time of the year to minimize sediment movement and implement the correct sized buffer to maintain water quality. Outdoor recreation trails should be designed to minimize sediment movement and maintain water quality.

The forested wetland complex located in the southeast corner of the property creates a filter. This filter slows sediment movement, slows waterflow and improves water quality before water enters the Androscoggin River. Healthy wetlands result in a cleaner healthier environment.

Chapman Brook, Twitchell Brook, and the associated tributaries are classified by the State as: Streams between the 300-acre drainage point and the 25 square mile drainage point and require a 75-foot buffer around wetlands and perennial streams during timber harvesting. Prior to the start of timber harvesting, wetlands perennial streams within the project area will need to have the 75-foot buffers clearly marked. Any trees to be harvested within the buffers should be marked. Stream crossings should be identified prior to the start of timber harvesting and shown to the logging contractor to discuss the type of crossing that will be used to cause the least impact to the water feature.

Both forested wetlands and other kinds such as open marshes, bogs or beaver ponds provide habitat, flood control and scenic beauty. For more information, see the book Natural Landscapes of Maine, available from the Maine Natural Areas Program, 207-287-8044 or <http://www.maine.gov/doc/nrimc/mnap>; or contact your local MFS District Forester.

Water quality protection: Activities in the woods that involve roads, log landings, and yarding or recreational trails, can sometimes contribute to rutting, soil movement and pollution of the watershed. Improperly conducted logging operations can also cause damage. Use of appropriate Best Management Practices (BMPs) greatly reduces this risk. For more information, see the booklet entitled “Best Management Practices for Water Quality,” available from the MFS by calling 1-800-367-0223 or visiting www.maineforestservice.gov ; or contact your local MFS District Forester.

Boundary Lines:

The property boundary lines consist of orange painted blazes, pink flagging with some scattered evidence. Flagging will last 1-5 years depending on the weather and the amount of sunlight. Sunlight and cold weather make flagging brittle overtime, causing it to break off

at the knot where it is tied. Boundary line evidence deteriorates overtime as trees grow, dead trees fall to the ground and return to the earth, and adjoining properties are harvested. Once the boundary lines for the property are established, a five to ten-year maintenance cycle can be implemented to preserve ground evidence.

Management History and Timber Resource

The timber resource on the property has been recently harvested, leaving most of the property in an early successional growth phase. The majority of the property is fully regenerated, heavy to pioneer hardwood species such as gray birch, paper birch, and quaking aspen. Areas where beech was a large (>50% of the overstory BA) component of the forest, the understory has been inundated with beech root-sucker sprouts. The remaining commercial timber species are diverse and differ slightly as you move north to south on the property. Red spruce, beech, and eastern hemlock dominate the northern third of the property and contain the steepest terrain. Red maple, quaking aspen, eastern hemlock, and beech dominate the central third of the property. Northern white cedar dominates the forested wetland that occupies the southern third of the property.

The last harvest resulted in an estimated 400-500 cords of wood left in bundles on the property. The bundles range from small pole sized wood to sawlog quality (hardwood and softwood). Judging from the extensive rutting in those areas the assumption is the bundles were left due to wet ground conditions and operating during the wrong time of year. At this point most of the wood has lost all commercial value except for the hardwood, which can be utilized as firewood. The life of the hardwood remaining suitable for firewood is limited. Eventually, the wood will become brittle and fall apart as it is moved to a landing. Firewood is a low value forest product. The challenge will be to find a contractor willing to try and capture the value before it is lost. One option is to utilize the students at the Region 9 school to capture value and to give the students an opportunity to gain equipment and job experience.

Inventory results show there is an average of 9.6 Cds/Ac of pulpwood (70% total volume) and 4.15 Cds/Ac of sawlogs (30% Total Volume) for a total of 13.75 gross cords per acre. Basal area is a measurement used by foresters to determine stocking. Forests can be overstocked too many trees per acre. Understocked, not enough trees per acre.

Adequately stocked, about the right number of trees per acre given the available growing



space. As with most forested properties, stocking is heavier in some areas than in others and is based on past management activities or natural disturbances. The average basal area for the property is 74 sq. ft. per acre (tree diameters 1 – 50 inches DBH) with an average of 740 trees per acre. The average basal area for merchantable trees on the property (tree diameters 5 – 50 inches DBH) is 61 sq. ft. per acre with an average of 166 trees per acre. Focusing on the

merchantable diameter classes (5 – 50 inches DBH) and looking at the property as one forest stand, hardwood is 67% of the basal area and softwood 34% of the basal area. Reviewing the Mixed Wood Stocking Chart for the Northeast published by the USDA Forest Service the property is currently understocked. Over the next 10 – 20 years the goal will be allow the current forest to occupy the available growing and work to an adequately stocked condition. As the timber resource matures forest management activities designed to reallocate growth can be implemented to reduce stocking to maintain the adequately stocked condition until it is time to regenerate a new forest.

Some of the heavier stocked areas are associated with the steep terrain at the north end of the property, stream buffers, and the forest wetland on the southeastern portion of the property. Overall stem quality ranges from poor to fair mostly due to tree form and logging damage. The level of retention of high value species in the overstory (northern red oak, eastern white pine, & yellow birch) is adequate to ensure, through proper forest management, that the ecological and economic diversity can be maintained for the future. .

Much of the property is in a growth phase. The average stem diameter is 4.3 inches at DBH. Looking at merchantable diameter ≥ 5 inches at DBH the average stem diameter is 8.2 inches at DBH. Across most of the ownership this young forest is free to grow with minimal overstory competition. The larger diameter stems are found on the steep ledge area at the north end of the property, the riparian zone associated with Chapman Brook, and the

forested wetland associated with the deer wintering area in the southeast corner of the property.

Overall the property is heavy to beech in the understory, most likely the result of past harvesting. When damaged or harvested, american beech responds by sprouting advantageous buds throughout its root system, creating a clonal colony around the parent tree. Beech competition in the understory is a challenge being faced by forest owners/managers across the northeast, as it decreases species diversity, resulting in higher risk of pest/disease outbreak, decreases habitat diversity, and lowers the value of future forest products. Past harvesting has created significant openings in the forest canopy. In open conditions american beech can shock from the exposure to direct sunlight. More desirable species such as yellow birch, paper birch, sugar maple, white ash, and northern red oak can out compete american beech when advanced regeneration is released to fully sunlight. (SEE APPENDIX III: Forest type map)

Operability

The property is accessible to most types of modern timber harvesting equipment. As with most forest ownerships soils dictate the season of operations. Portions of the property can be access for timber harvesting during dry summer months. Wet soils and rutting caused by past timber harvesting require frozen ground conditions when considering future timber harvest activities. The area associated with the eco-reserve area are too steep to operate safely with timber harvesting equipment.

Essential or Significant Wildlife Habitat

The Bethel Community Forest supports a wide range of wildlife species. The property contains whitetail deer, black bear, turkey, eastern coyote, woodcock, ruffed grouse, a variety of song birds and many other non-game species. Specifically, there are established wildlife openings, the potential to affect native brook trout and cold-water fisheries downstream, and a deer wintering area mapped on the property.

The state data on Deer Wintering Areas (DWA's) was collected during a 1992 aerial survey. This information needs to be confirmed on the ground through either a pellet count or deer trail density survey to determine the status of the functioning portions of the DWA. From what was seen during the inventory much of the DWA mapped in stands 8, 9B, and 10 is no longer a functioning DWA, due to timber harvesting. The DWA mapped area in stand 5 was not harvested due to wet ground conditions. The stand is intact, but contains mostly white cedar, with low live crown ratios. Live crowns that are less than 1/3 of the total tree height

are not ideal for creating the thermal benefits that a hemlock or spruce/fir dominated forest would provide to white-tailed deer.

There are seven open areas (patch cuts from prior forest management activities) on the property ranging from 0.2-7.1 acres in size. These areas are very important habitat for early successional species, such as woodcock, ruffed grouse, and many species of songbird.



These openings also provide readily available browse for whitetail deer, black bear, moose, and turkeys. There are two openings along the Locke Mountain Road one 7.1-acres and one 6.7-acres in size. A parking area will be established at the northern end of the 7.1-acres opening with the remaining area maintained as a field. The 6.7-acre opening will be maintained on a 3-year mowing cycle. The open remaining open areas will be permitted to grow back to forest, with new early successional habitat created during future timber

harvests. The permanent openings will have to be removed from the acreage classified for Tree Growth and moved, at no penalty, to the Open Space program. (SEE APPENDIX IV: Specific species management guidelines)

The Bethel Community Forest is in its infancy. Wildlife management goals and objectives will be further defined and refined as more knowledge of the property is gained. As part of managing according to Stewardship Principles, maintaining a healthy functioning forest will contribute to maintaining healthy fisheries and wildlife habitat. For more information, contact the Department of Inland Fisheries and Wildlife at (207) 287-8000 or visit www.maine.gov/ifw; or contact your local MFS District Forester.

Biodiversity

Forested landscapes are homes for more than just trees. No one parcel can provide habitat for all species. However, maintaining or improving existing woodland communities is a desirable goal. Elements of ecological structure such as snags, downed woody material, cavity trees, etc., can enhance biodiversity and a variety of wildlife habitat. For more information, contact the Maine Natural Areas Program at 207-287-8044 or visit <http://www.maine.gov/doc/nrimc/mnap>; or contact your local MFS District Forester.

Due to slope, terrain, and shallow soils, there is a 23.1-acre area located in the northern section of the property that will be maintained as an eco-reserve area. The eco-reserve area is associated with a portion of Locke Mountain. During the timber inventory of the property no evidence of past timber harvesting was observed. Maintaining an area in its natural state will help to maintain the biodiversity on the property.

Forests of Recognized Importance (FORI)

Currently no FORI areas are located on the Bethel Community Forest. The Bethel Community Forest will review new information regarding FORI as it becomes available and will amend this stewardship document as needed to address any information that is specific to the ownership.

FORI are globally, regionally and nationally significant large landscape areas of exceptional ecological, social, cultural or biological values. These forests are evaluated at the landscape level, rather than the stand level and are recognized for a combination of unique values, rather than a single attribute. There is no state or federal government regulation of FORI on private lands.

How do you know if your woodland is a FORI? There is no central clearinghouse for information on FORI. However, in Maine the best resources are the [Maine Natural Areas Program](#) and the [Maine Historic Preservation Commission](#). If you are interested in finding out more, you or your forester can send a location map to either of these agencies to get information related to FORI in your area.

Most FORI in the U.S. that are globally, nationally or regionally significant have already been identified and protected by state or federal government or have been put under a conservation easement by an environmental nonprofit organization. So you're more likely to be near a FORI than to have one.

Historical, cultural & archaeological sites

Stone walls and old cellar holes or foundations are often found in woodlands, as remnants of previous settlement and agriculture. High and dry areas near water bodies may have been pre-historic or Native American dwelling sites. Most properly conducted forest management activities will not harm these resources. Construction of roads, trails or landings, however, could potentially disturb significant sites. If you are interested in finding out more about the history of your woodland, contact the Maine Historic Preservation Commission (MHPC) at (207) 287-2132 or visit www.maine.gov/mhpc.

Threatened and Endangered Species

The Maine Department of Inland Fisheries and Wildlife (IFW) and the Maine Natural Areas Program (MNAP) were contacted for a records review of the property. This review covered: Essential Wildlife Habitats, Natural Resource Protection Act (NRPA) Habitats,

Seabird Nesting Islands, Deer Wintering Areas (DWAs), the Biological Conservation Database (BCD), and lastly the Natural Areas Program Rare Plants/Communities. This review is required by the Maine Tree Growth Tax Program for any parcel enrolled and is to be included in the Forest Management Plan. A copy of the results of this search are included as part of this plan (Appendix 1). Results indicate that **an MNAP- Identified Feature(s)** occur on the property. If an MNAP- Identified Feature(s) occurred, MNAP conducts a closer review of the subject area. A detailed report is then sent to the landowner stating what the MNAP Identified Feature(s) is. Information is provided summarizing the best management practices that can be implemented to protect the MNAP Identified Feature while maintaining a working forest.

Chapman Brook and Twitchell Brook and their associated tributaries support populations of wild brook trout. Brook trout require clean, cold, well oxygenated water. Brook trout also benefit from intact riparian corridors. Implementing the appropriate buffer distances maintains shade, minimizes sediment movement and supports healthy brook trout habitat. Forest management guidelines for brook trout are included with the attached Maine Natural Areas Program report.

A Deer Wintering Area is found in the southern portion of the property. Use of DWA varies within and between winters mainly on the depth of the snow during the winter. Deer move to DWAs when snow depth exceeds 10 to 12 inches and primarily use core shelter areas when snow depths exceed 16 to 20 inches. Deer may range far from softwood shelter or not use the DWA at all during mild winters. Some DWA are not used every year but are still an important part of the deer habitat during severe winters. Deer can travel more than 20-miles between autumn habitat and the DWA that is used annually. The forest management guidelines for deer wintering areas are included in the appendix for reference.

Chapman Brook is associated with a population northern spring salamander. The northern spring salamander (nss) is uncommon to rare throughout much of New England. The exception being Vermont and northwest Berkshire County Massachusetts where the nss is common.

The nss requires forested areas with clear, cold water, springs, mountain streams, creeks, and boggy areas. Nss usually occur at higher elevations in spruce/fir forest types where ground conditions remain moist. The nss can also be found in the moister beech/maple/hemlock forest types. In winter nss requires wet soil near water where it remains somewhat active in burrows.

Breeding season is Mid-October to winter months. Egg deposition occurs April to summer and into the fall. The eggs are deposited in running water under logs and stones usually in groups. Eggs typically hatch late summer to early fall with the young remaining close to the nest site for several months after hatching. Preferred food includes aquatic insects and their nymph and larval forms, a wide variety of terrestrial insects, as well as other salamanders, snails, crustaceans.

Nss is one of the many features that make this property unique. Implementing the right forest management activity on the right acre at the right time of year will insure the protection of the nss habitat. The MNAP report found in the appendix outlines buffer recommendations for Chapman Brook, Twitchell Brook, Lanes Brook the associated tributaries. Prior to timber harvesting in the riparian areas, the proposed harvest area should be reviewed with MNAP and Maine IF&W.

Monitoring

Several site visits were made to the Bethel Community Forest during the acquisition process, timber inventory, and while drafting the stewardship plan. The monitoring visits helped to refine the goals/objectives for the Bethel Community Forest, identify priority areas for erosion/sediment control, and better understand the natural and cultural resources on the property. Monitoring of the property will be on an ongoing basis and will be conducted by the natural resource manager, citizen scientists, and a cadre of local outdoor enthusiasts. Monitoring can take the form of regularly scheduled boundary line maintenance, recreational activities such as hunting or hiking, or following up after completing silvicultural activities to check results or after major weather events. Keeping in touch with the land can help prevent theft/trespass detect insect/disease outbreaks and identify weather related infrastructure damage. It can also be rewarding on many levels. Consider keeping a photographic record of the changes your woods go through before, during and after harvests and other management activities. One way to do this is with a picture post. For more information, visit www.picturepost.nh.edu . For more information about monitoring your woods, contact your local MFS District Forester.

Aesthetic Quality

Maintaining the beauty of the Bethel Community Forest is important, as it is for many landowners, especially near dwellings, along trails and special areas. Stewardship can include activities undertaken to create or protect aesthetic qualities. In addition, the visual impact of forestry activities such as timber harvesting can communicate a lot about caring for your woods. Efforts to maintain a harmonious woodland appearance usually pay off in a greater acceptance of silvicultural practices. For more information on logging aesthetics contact the Sustainable Forestry Initiative at (207) 622-9288 or visit www.sfinmaine.org.

Forest Health:

The goal of forest management on this ownership as it relates to resource protection is simple and direct: Maintain forest health through timber management. The two major issues which fall under this heading are the control of wide spread disease and insect infestation and the prevention of forest fires.

The first issue of controlling insects and disease is best accomplished by maintaining vigorous, healthy stands. Normally scheduled harvests will almost always remove individuals which are severely affected by insects or disease. This slows down or stops the spread of pathogen or pest. However, it must be remembered that endemic populations of forest insects are always present and are not necessarily a detriment to a balanced ecosystem. It is only outbreaks, such as Forest tent caterpillar or White pine blister rust that generally need immediate attention. By removing diseased or damaged trees during harvest entries, stand health and vigor can be maintained or increased. Removals of infected trees and continued monitoring of other stands and applied control when needed will all help to maintain a healthy forest.

Invasive insects are a continued threat to the property and New England as a whole. Asian longhorn beetle (ALB) is presently established in Massachusetts near Boston. More recently emerald ash borer (EAB) has been verified in Merrimack County, New Hampshire approximately 3 hours to the south, Orange County, Vermont 3 hours to the southwest, and Washington County, Maine 4 hours to the east of the ownership. It is estimated both insects were established for five to ten years before being detected. Shipping pallets and firewood are the primary vectors for movement of ALB and EAB. Recreational camps, camp grounds, and industrial parks are potential epicenters for an outbreak of ALB and EAB. Currently management of these two invasive insects is very difficult. There has been some success with managing emerald ash borer with the introduction a parasitic wasp to the outbreak area. There is no effective way to eliminate Asian long horned beetle other than to remove and chip all infected trees in an attempt to interrupt the life cycle. The Maine Forest Service has been given permission to hang pheromone traps on the ownership to assist with early detection of Asian long horned beetle and emerald ash borer.

Recreational camps and camp grounds are high risk sites for introduction of invasive pests because campers often bring out of state firewood with them and unknowingly bring the invasive with them. Maine has banned out of state firewood and maintains an outreach program to educate the public.

Industrial parks are high risk sites for invasive pest because of the shipping pallets used to move product from overseas. There are now requirements that shipping pallets be heat treated or sprayed with pesticide to kill insect larva.

Invasive plants continue invade New England region and threaten Leavitt Plantation. Many seed and plant catalogs offer some of the most difficult to control invasive species such a hardy kiwi for sale annually. Homeowners knowingly or unknowingly plant invasive plants in their yard as part of landscaping projects. Seeds are then spread to the surrounding forests by birds and rodents. Other times homeowners grow tired of a particular plant dig it up and dispose of it in home compost piles or other areas and the invasive plant becomes established and spreads from there. The property is monitored for invasive plants during fieldwork and site visits.

Early detection will be critical to limit the amount of herbicide needed control and prevent invasive plants from becoming established on the property. As invasive plants are discovered on Leavitt Plantation, an attempt will be made to remove and dispose of the plants. If the area is too large control by simply pulling the plants, herbicide applied following manufacturer's instructions will be the control agent. All Best Management Practices and regulations for the State of Maine will be followed in the event herbicide and insecticides are used on the property.

Protection from Fire

Forest fires, while always a concern, are not as widespread or destructive as they have been in the past. Nature generally cooperates with more than 40 inches of annual rainfall received most years. However, during dry times or drought, the potential posed by fire can go up substantially. When these times occur, harvest operations must work with extreme care. Worst case scenario is the shutting down of operations until significant rain comes. Firefighting machinery must be able to get to the hot spots, as roads in poor condition can stop even rugged 4WD vehicles. If gates are present and locked, it is critical that keys or combinations are given out to fire department personnel and other pertinent people. At present, there is very little of the Pope Mountain property that could not be reached by emergency vehicles if the need arises.

Soils

The soils found on the Bethel Community Forest reflect a broad range of productive site quality. Soils range from moderately well drained to poorly drained conditions. Within this range of topographic and other resource conditions there is a broad variability on an acre-to-acre basis of the soil composition and site quality. In general, the soils found on the property can support good growth and achieve reasonable rates of return when proper silviculture is implemented with care. These soils support high quality Northern hardwood, pine-oak-hemlock stands, cedar hardwood stands occurring in the low-lying areas, and spruce-fir stands at higher elevations.

Soil protection: Activities in the woods that involve roads, log landings, and yarding or recreational trails, can sometimes contribute to rutting, soil movement and pollution of the watershed. Improperly conducted logging operations can also cause damage. Use of appropriate Best Management Practices (BMPs) greatly reduces this risk. For more information, see the booklet entitled "Best Management Practices for Water Quality," available from the MFS by calling 1-800-367-0223 or visiting www.maineforestservice.gov; or contact your local MFS District Forester.

Refer to the soils map and soils key in APPENDIX V: Soil map and descriptions, for the complete list of soil types found on the ownership. The following shows the major soil types that occur on The Bethel Community Forest based on the acres represented by each soil type:

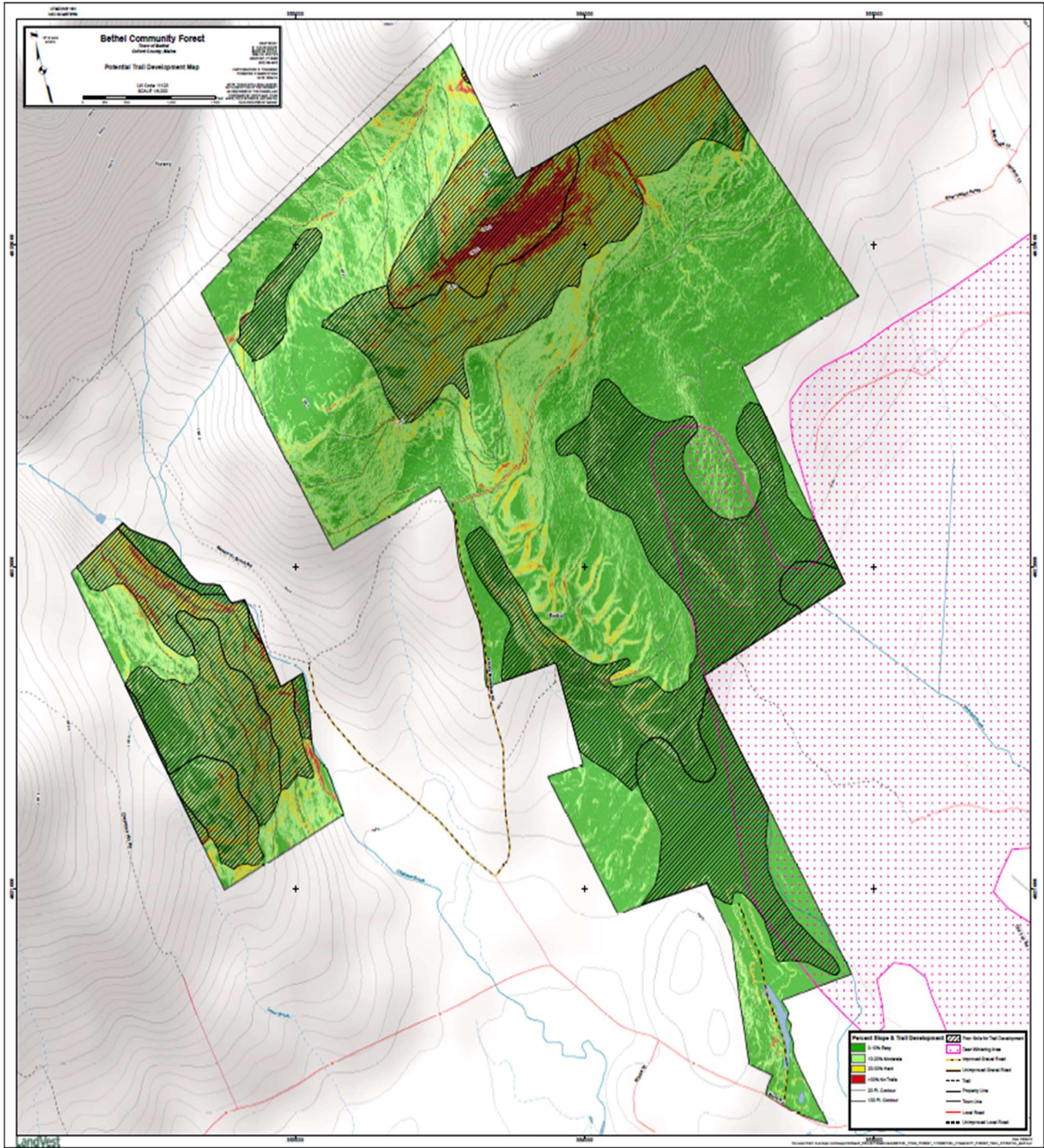
- 1) Monadnock – Hermon association 23.1% of the total acres.
- 2) Skerry-Colonel association 21.5% of the total acres.
- 3) Brayton-Peacham complex 15% of the total acres.
- 4) Skerry-Becket association 11.3% of the total acres
- 5) Hermon - Skerry association 7.2% of the total acres.
- 6) Abram-Rock Outcrop- Lyman complex 6.2% of the total acres.
- 7) Vassalboro-Wonsqueak association 5.5% of the total acres.

Trail Priority Map

The map depicted on the next page was created to aid in recreational and operational trail design and layout. Variables incorporated into the analysis include slope, soil drainage, parent material, location of existing trails and proximity to special features such as Deer Wintering Areas, creeks, and inoperable ledge.

Following Page

Bethel Community Forest Trail Priority Map



INVENTORY

TIMBER INVENTORY

In the fall of 2018, LandVest, Inc. (LV) was retained by the Trust for Public Land, Mahoosuc Pathways, and other partners to conduct a timber inventory of the property. The project area consists of two parcels totaling +/- 976 total acres of which +/-928 acres is forested. The remaining acreage is in nine regenerating openings ranging from 0.2-7.1 acres in size, as well as non-productive areas (i.e. ledges, roads, and gravel pits) totaling 48 acres. The purpose of the timber inventory was to accurately determine the current standing timber volume on the ownership, evaluate infrastructure, and report on the cultural and wildlife resources on the property. Data collected during the timber inventory was used to develop the forest type map, forest stand type descriptions, and forest stand type prescriptions. (SEE APPENDIX VI: Comprehensive inventory report)

FOREST MANAGEMENT RECOMMENDATIONS

When forest stand types are evaluated for management activities, timber production is not the only consideration. A forest stand's composition, constitution, and how the stand fits into the surrounding landscape are all factors that guide long-term management decisions. When a forest is manipulated either by nature or by man some species of plants and animals benefit, and others do not. As natural resource managers, it is important to understand the cause and effect relationship associated with various silviculture practices and methods. The time of year when a forest management activity occurs will affect the soil in a given stand type. Operating poorly drained soils only in the winter under frozen conditions will minimize the footprint made by a management activity. well-drained soils should be managed during dry summer months. Forest stand types that have different riparian zone management guidelines than forest stand types that occupy an upland slope. When harvest activities are completed, installing water-bars to control erosion, stabilize stream



crossings, and landings will help to minimize the impact of forest management activities.

From a regional perspective, the vast Spruce-fir region (boreal forest type) is starting to reach its southern limit here, and the Northern Hardwood Forest (the primary species being Sugar maple, Yellow birch, and American beech) is approaching its northern limit. The forest types on The Bethel Community Forest are Northern Hardwoods, Pine Oak Hemlock, Spruce-Fir uplands and Cedar-Hardwood Swamp. Northern hardwood stands represent approximately 64% of the forested acres on the tract. Pine-Oak-Hemlock Hardwood covers approximately 21%, cedar hardwood swamp approximately 7 %, and spruce/fir approximately 4%. Of the remaining acres approximately 4% represents roads, water, landings/open areas, gravel pits.

Management will focus to enhance each acre by utilizing a wide range of silvicultural treatments. These actions will be specifically selected on a stand-by-stand basis to reflect the goals of management, while fully accounting for the impacts of past management actions. Many acres were found in a condition where stocking, species composition, or recent timber harvests dictated the best option was to do nothing and allow the forest to grow and occupy the available growing space.

STAND TYPE NOMENCLATURE:

Major species group or dominant species, size class and density will classify the timber types found on this ownership. This standard, which is used commonly in the northeast, allows for quick interpretation once the type has been discerned. Following is the system used for this management plan and associated maps.

Type – Dominant species group or species, greater than 75% of species composition.

Timber Types

H	Hardwood
S	Softwood (Hemlock, Spruce/Fir, and Larch)
SH	Softwood and hardwood, a mixture with softwood dominant.
HS	Hardwood and Softwood, a mixture with hardwood dominant.
P	White pine
RP	Red pine
PH	Pine and hardwood, a mixture with White pine dominant.
SP	Softwood and White pine, a mixture with softwood dominant.

Non-Commercial Types

CC	Clearcut
GP	Gravel pit
LG	Ledge
OB	Open bog
PR	Private Road
WA	Water
YD	Yard or log landing

Size Class – 4 classes

1	Seedlings	0.50 -1.50" DBH
2	Sapling	1.51- 4.50" DBH
3	Poletimber	4.51 -11.50" DBH
4	Sawtimber	11.51 - 12" DBH +

Density

A	Overstocked
B	Fully Stocked
C	Understocked
D	No Stocking

Stand Descriptions and Prescriptions

Stand: 1

Type: HS34B

Acreage: 24.8

Description:

Site/type:

Mixed wood – Riparian

Species Composition:

Eastern hemlock

Red maple, beech, white ash, sugar maple, and

Stand Description: This stand is comprised of a steep bank running down to Chapman Brook. Unlike the rest of the western parcel, this stand has had minimal impact from forest management. This can be attributed to limited operability and proximity to Chapman Brook. Eastern hemlock and white ash dominate the overstory, with hemlock on the banks and the white ash down on the flats by Chapman Brook.

Management Recommendation: Uneven-aged management. While not textbook uneven-aged management the goal will be to create three age classes over time. Individual Tree/Group Selection. This portion of Chapman Brook falls within the 300-acre drainage point into the Androscoggin River, requiring a 75' buffer.

Due to operability and shoreland zoning restrictions, this stand has few commercial timber management options. This stand should be managed using single tree selection to capture value of high-risk trees on operable ground, with the main priority to maintain stand health so it continues to control erosion on the bank and the water quality of Chapman Brook.

The next entry into this stand for forest management should be combined with forest management activities in adjoining stands. The stand should be monitored for the presence of emerald ash borer as white ash makes up a portion of the species composition.

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Volume by Species Expanded by Acreage

Level: Selected Merged
 All Strata All Plots
 Selected Products All Species
 Diameter Classes 1 to 29
 Forested Acreage Form Classes

Stand 1 HS3-4B

Total Acres: 24.8		Sampling Method: Point				Plots: 3						
Forested Acres: 24.8		BAF: 10										
Species	Sawlogs		Pallet		Boltwood		Pulpwood		Growing stock		Cull	Species Total
	BF-Int		BF-Int		BF-Int		CDS		CDS		CDS	CDS
Eastern hemlock	53,246.9						122.1		14.1			242.6
American beech			6,547.3				134.4					147.5
Northern red oak	6,599.8		5,197.8				9.6					33.2
Paper birch					6,749.6		6.0					19.5
Quaking aspen							59.8					59.8
Red maple	3,054.8		4,393.3				6.3					21.2
Sugar maple	20,308.8		14,875.1				18.6		8.7			97.6
White ash	10,568.5		14,976.2		12,443.5		121.2		23.9			221.0
Yellow birch	5,355.8						16.1		7.3			34.1
Softwood:	53,246.9	54%	0.0	0%	0.0	0%	122.1	25%	14.1	26%	0.0	242.6 CDS
Hardwood:	45,887.6	46%	45,989.7	100%	19,193.1	100%	371.9	75%	39.8	74%	0.0	633.9 CDS
Total Vol:	99,134.5	BF	45,989.7	BF	19,193.1	BF	494.0	CDS	53.9	CDS	CDS	876.5 CDS
Per Acre:	3,997.36	BF/Ac	1,854.42	BF/Ac	773.91	BF/Ac	19.92	CDS/Ac	2.17	CDS/Ac	35.34	

Stand: 2

Type:HS3C

Acreage: 17.9

Description:

Site/type: Hardwood

Species Composition: Red maple, beech, and sugar maple

Type Description: The species composition and diameter distribution in this stand are the result of recent timber harvests. The last harvest was a final overstory removal, cut using a diameter limit. Most overstory trees left are in the pole sized class (5-10') or smaller and have poor form. the understory is heavy to beech sucker sprouts and red maple coppice regeneration.

Management Recommendation: Even-Aged with 100 yr. rotation. Pre-commercial timber stand improvement.

The manageable resource for this stand is in the understory. If left alone, the mature stand will be predominately american beech. Beech across the northeast has been plagued with a bark disease caused by the *nectria* fungus. This disease reduces tree vigor allowing for other diseases to more readily infect the host tree, reducing growth rate, timber value, and quality of hard mast. When healthy, beech is one of the best producers of hard mast in the fall and is a staple in the diet of many western Maine wildlife species, especially black bear, turkeys, and whitetail deer.

It is recommended to reduce number of host trees and remove the more susceptible specimens, a hack and squirt herbicide application to the beech in the understory is recommended. This will reduce the number of stems per acre, increase species diversity and reduce risk of disease. This practice will improve forest health and benefit both wildlife needs and future timber management.

Non-herbicide options include cutting out excessive american beech competition with a brushsaw. The highest success rate for this option is to do the work in the fall. Severing the american beech at this time in the fall cuts off the reserves needed for spring. The use of brushsaws is laborious and expensive.

Another non-herbicide option would be to use goats to eat the undesirable species. The draw back is goats do not discriminate when they graze. For this option to work areas that a predominately american beech and stripe maple will need to be identified and fenced off. The goats would then be released into the fenced off area and allowed to graze on the vegetation until the trees are gridled. When a tree is gridled the cambium layer is severed

stopping the transpiration of water and nutrients up and down the bole of the tree. Any desirable species within the enclosure would also have to be protected if the stems are to remain. It may be difficult to find a goat herd and an owner willing to release the goats into the forest.

Refer to US Forest Service, Northern Research Station: Manual Herbicide Application Methods for Managing Vegetation in Appalachian Hardwood Forests
https://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs96.pdf

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Volume by Species Expanded by Acreage

Volume by Species Expanded by Acreage

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 2 HS3C

Total Acres: 17.9

Sampling Method: POINT

Plots: 3

Forested Acres: 17.9

BAF: 10

Species	Sawlogs BF-Int	Pallet BF-Int	Boltwood BF-Int	Pulpwood CDS	Growing stock CDS	Cull CDS	Species Total CDS
Eastern hemlock				6.8	4.9		11.7
American beech				29.5			29.5
Red maple				6.4	5.0		11.4
Sugar maple				6.5	5.3		11.8
Softwood:	0.0	0.0	0.0	6.8 14%	4.9 32%	0.0	11.7 CDS
Hardwood:	0.0	0.0	0.0	42.5 86%	10.2 68%	0.0	52.7 CDS
Total Vol:	BF	BF	BF	49.3 CDS	15.1 CDS	CDS	64.3 CDS
Per Acre:	BF/Ac	BF/Ac	BF/Ac	2.75 CDS/Ac	0.84 CDS/Ac	CDS/Ac	3.59
CDS/Ac							

Stand: 3

Type:H3D

Acreage: 83.2

Description:

Site/type: Hardwood

Species Composition: American beech, sugar maple, yellow birch, red maple

Type Description: This stand is in an early successional growth phase due to a recent overstory removal with reserves. The overstory reserves left are of poor health and form. The understory is fully stocked and has a large component of American beech.

Management Recommendation: Even-aged management with 100 yr. rotation. Pre-commercial timber stand improvement.

The manageable resource for this stand is in the understory. If left alone, the mature stand will be comprised of beech. Beech across the northeast has been plagued with a bark disease caused by the *nectria* fungus. This disease reduces tree vigor allowing for other diseases to more readily infect the host tree, reducing growth rate, timber value, and quality of hard mast. When healthy, American beech is one of the best produces hard mast in the fall, a staple in the diet of many western Maine wildlife species, especially black bear, turkeys and whitetail deer.

It is recommended to reduce number of host trees and remove the more susceptible specimens, a hack and squirt herbicide application to the beech in the understory is recommended. This will reduce the number of stems per acre, increase species diversity and reduce risk of disease. This practice will improve forest health and benefit both wildlife needs and future timber management.

Non-herbicide options include cutting out excessive american beech competition with a brushsaw. The highest success rate for this option is to do the work in the fall. Severing the american beech at this time in the fall cuts off the reserves needed for spring. The use of brushsaws is laborious and expensive.

Another non-herbicide option would be to use goats to eat the undesirable species. The drawback is goats do not discriminate when they graze. For this option to work areas that a predominately american beech and stripe maple will need to be identified and fenced off. The goats would then be released into the fenced off area and allowed to graze on the vegetation until the trees are gridled. When a tree is gridled the cambium layer is severed stopping the transpiration of water and nutrients up and down the bole of the tree. Any desirable species within the enclosure would also have to be protected if the stems are to

remain. It may be difficult to find a goat herd and an owner willing to release the goats into the forest.

Refer to US Forest Service, Northern Research Station: Manual Herbicide Application Methods for Managing Vegetation in Appalachian Hardwood Forests
https://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs96.pdf

468 Bethel Community Forest**Volume by Species Expanded by Acreage**

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 3 H3D

Total Acres:	83.2	Sampling Method: POINT				Plots: 9							
Forested Acres:	83.2	BAF: 10											
Species	Sawlogs BF-Int		Pallet BF-Int		Boltwood BF-Int		Pulpwood CDS		Growing stock CDS		Cull CDS		Species Total CDS
Eastern hemlock							41.9		13.9				55.8
American beech			3,660.9				84.7		18.3				110.3
Paper birch							10.3		8.8				19.1
Quaking aspen							11.5		19.6				31.1
Red maple	3,326.5		5,688.6				34.7		7.7				60.4
Sugar maple	30,032.5		8,183.6		3,185.8		65.0		5.7				153.5
Yellow birch	12,322.0		14,269.9		6,529.7		66.3		46.1				178.7
Softwood:	0.0	0%	0.0	0%	0.0	0%	41.9	13%	13.9	12%	0.0		55.8 CDS
Hardwood:	45,681.0	100%	31,802.9	100%	9,715.6	100%	272.5	87%	106.1	88%	0.0		553.0 CDS
Total Vol:	45,681.0	BF	31,802.9	BF	9,715.6	BF	314.4	CDS	120.0	CDS	CDS		608.8 CDS
Per Acre:	549.05	BF/Ac	382.25	BF/Ac	116.77	BF/Ac	3.78	CDS/Ac	1.44	CDS/Ac	CDS/Ac		7.32
CDS/Ac													

Stands: 4 & 5

Type:SH3B

Acreage: 71.6

Description:

Site/type: Softwood dominated mixed wood swamp
Species Composition: Northern white cedar, eastern white pine, spruce/fir, eastern hemlock, and red maple.

Type Description: This stand is in a low-lying area of the property, with scattered small perennial streams running through it. It is dominated by northern white cedar, with red maple, spruce, and balsam fir colonizing natural canopy gaps created by blowdown and natural tree mortality. Super canopy eastern white pine legacy trees are scattered along the stand edges and drier microsites. The western portion of stand 5 is mapped as a DWA and needs to be evaluated in terms of use/function before any management activities take place. Stand 4 and the southern half of stand 5 are too wet to operate and should be managed for water quality and wildlife habitat.

Management Recommendation: Uneven-aged management. While not textbook uneven-aged management, the goal will be to create three age classes. Individual Tree/Group Selection.

The northern half of stand 5 was recently harvested. The skid trails have severe rutting in making forest management access in the future challenging. There are two options when it comes to management of the operable resource.

1. Rehabilitation, expansion, and maintenance of a functioning DWA: use single tree selection to promote high priority cover species (eastern hemlock, red spruce, balsam fir) by removing hardwood species as well as low quality softwood species.
2. Manage for tree species diversity, focusing removals on high-risk or diseased trees regardless of species to promote a diverse, healthy, and productive resource.

Stand: 6

Type: S23BC

Acreage: 7.8

Description:

Site/type: Softwood

Species Composition: Red spruce, balsam fir

Type Description: Early successional spruce/fir stand with the remnants of a scattered red spruce overstory. Understory is dominated by beech with scattered patches of spruce/fir.

Management Recommendation: While not textbook uneven-aged management, the goal will be to create three age classes. Pre-commercial timber stand improvement

This stand is in a growth phase and contains a species composition in the understory that contains mostly american beech, but not to the extent as mentioned in stands 2&3. In this case mechanical removal of beech stems should suffice and ensure species diversity in the mature forest. Mechanical removal should be focused around the edges of the scattered spruce/fir regeneration to maximize impact. Most efficient method of mechanical removal is with brush saws. Removal work will target beech stems from 0.5-5 inches at DBH (diameter at breast height), prioritizing areas that are adjacent to spruce/fir.

468 Bethel Community Forest**Volume by Species Expanded by Acreage**

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 6 H34D

Total Acres:	7.8	Sampling Method:	POINT	Plots:	1		
Forested Acres:	7.8	BAF:	10				
Species	Sawlogs BF-Int	Pallet BF-Int	Boltwood BF-Int	Pulpwood CDS	Growing stock CDS	Cull CDS	Species Total CDS
Red spruce				5.5	7.8		13.4
Softwood:	0.0	0.0	0.0	5.5 100%	7.8 100%	0.0	13.4 CDS
Hardwood:	0.0	0.0	0.0	0.0 0%	0.0 0%	0.0	0.0 CDS
Total Vol:	BF	BF	BF	5.5 CDS	7.8 CDS	CDS	13.4 CDS
Per Acre: CDS/Ac	BF/Ac	BF/Ac	BF/Ac	0.71 CDS/Ac	1.01 CDS/Ac	CDS/Ac	1.71

Stand: 7

Type:SH3C

Acreage: 31.0

Description:

Site/type: Mixed wood

Species Composition: Red maple, red oak, paper birch, balsam fir, eastern hemlock.

Type Description: As a result of the recent timber harvest, most of the mature softwood component was removed from the overstory. The result is a scattered overstory comprised of: poor-fair quality red maple, white birch, spruce, balsam fir, and hemlock. The stand overstory contains a small scattered component of fair-good quality red oak.

Management Recommendation: Even-aged management with an 80-100 yr. rotation. No management activities required for 10-15 years

The overstory is of too low of quality to justify an overstory removal currently. The ground is wet but will be operable under frozen conditions. In 10-15 years a free thinning should be implemented to harvest high risk trees to reduce chance of disease and pest populations as well as release crop trees.

468 Bethel Community Forest

468 Bethel Community Forest

Volume by Species Expanded by Acreage

Volume by Species Expanded by Acreage

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 7 SH3C

Total Acres:	31.0	Sampling Method:				POINT	Plots:				4				
Forested Acres:	31.0	BAF:				10									
Species	Sawlogs BF-Int		Pallet BF-Int		Boltwood BF-Int		Pulpwood CDS		Growing stock CDS		Cull CDS		Species Total CDS		
Balsam fir							15.5		16.2				31.7		
Eastern hemlock	7,818.3						6.5						22.1		
Northern white cedar										8.3			8.3		
American beech							27.1		7.9				35.0		
Northern red oak	21,976.4		10,069.1		1,983.0		26.8						94.8		
Other hardwoods							8.6						8.6		
Paper birch	6,907.9		1,520.1				42.5		8.1				67.4		
Red maple	10,345.5		9,790.0				60.3		4.8				105.4		
Sugar maple							8.6		7.3				16.0		
Yellow birch	7,675.7		6,583.3				22.8						51.3		
Softwood:	7,818.3	14%	0.0	0%	0.0	0%	22.0	10%	16.2	37%	8.3	100%	62.1 CDS		
Hardwood:	46,905.5	86%	27,962.5	100%	1,983.0	100%	196.7	90%	28.2	63%	0.0	0%	378.5 CDS		
Total Vol:	54,723.8 BF		27,962.5 BF		1,983.0 BF		218.7 CDS		44.3 CDS		8.3 CDS		440.7 CDS		
Per Acre: CDS/Ac	1,765.28 BF/Ac		902.02 BF/Ac		63.97 BF/Ac		7.06 CDS/Ac		1.43 CDS/Ac		0.27 CDS/Ac		14.21		

Stand: 8

Type:SH3B

Acreage: 25.4

Description:

Site/type: Mixedwood

Species Composition: Northern white cedar, eastern hemlock, red maple

Type Description: Softwood dominated mixed wood stand bisected by a tributary of Twitchell Brook. Due to buffer restrictions and the eastern boundary line, the east side of the stand is well stocked with white cedar and eastern hemlock. The west side of the brook was harvested during the recent timber harvest. The residual stand contains multiple skid trails with substantial rutting. Most of the softwood overstory was removed, leaving poor quality red maple, beech, and yellow birch.

Management Recommendation: Even-aged management with an 80-100 yr. rotation. No management required for 10-15 years

This stand is unique due to buffer restrictions and prior forest management. The east side of the brook is a functioning DWA, while the west side no longer functions as a DWA. As a result of timber harvesting during the wrong time of year, the hydrology of the west side of the stand has been altered. As a result, the skid trails and areas associated with the more intensive management have grass, ferns, and other herbaceous plants in the understory. A grassy understory will outcompete most woody vegetation in full sunlight and will delay the start of the new forest. The first priority in this stand should be to stabilize trails in accordance with Maine's Best Management Practices for maintaining water quality (BMPs).

468 Bethel Community Forest**Volume by Species Expanded by Acreage**

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 8 SH3B

Total Acres:	25.4	Sampling Method: POINT				Plots: 4					
Forested Acres:	25.4	BAF: 10									
Species	Sawlogs BF-Int	Pallet BF-Int	Boltwood BF-Int	Pulpwood CDS	Growing stock CDS	Cull CDS	Species Total CDS				
Balsam fir				74.4			74.4				
Eastern hemlock	25,514.2			53.9			104.9				
Northern white cedar				202.7			202.7				
American beech				61.9			61.9				
Quaking aspen				23.0			23.0				
Red maple	7,257.4	15,655.6		243.8	3.8		293.5				
White ash	6,024.2	1,423.9		4.2			19.1				
Yellow birch	6,524.6	3,390.9		82.4	9.2		111.5				
Softwood:	25,514.2	56%	0.0	0%	0.0	330.9	44%	0.0	0%	0.0	382.0 CDS
Hardwood:	19,806.2	44%	20,470.4	100%	0.0	415.4	56%	13.1	100%	0.0	509.0 CDS
Total Vol:	45,320.4	BF	20,470.4	BF		746.3	CDS	13.1	CDS	CDS	891.0 CDS
Per Acre:	1,784.27	BF/Ac	805.92	BF/Ac		29.38	CDS/Ac	0.52	CDS/Ac	CDS/Ac	35.08
CDS/Ac											

Stand: 9

Type: HS3D

Acreage: 213.6

Description:

<u>Site/type:</u>	Hardwood dominated mixed wood
<u>Species Composition:</u>	Eastern hemlock, red maple, beech, white ash, and white pine

Type Description: This stand encompassed the majority of the previous timber harvest on the property. This stand is in an early successional growth phrase.

Management Recommendation: Even-aged management with an 80-100 yr. rotation. No management needed for next 15-20 years.

Monitor for invasive species due to the intensive disturbance of the last timber harvest. Stabilize trails in accordance with Maines Best Management Practices for maintaining water quality (BMP's).

468 Bethel Community Forest

Volume by Species Expanded by Acreage

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 9 HS3D

Total Acres:	213.6	Sampling Method: POINT				Plots: 27									
Forested Acres:	213.6	BAF: 10													
Species	Sawlogs BF-Int		Pallet BF-Int		Boltwood BF-Int		Pulpwood CDS		Growing stock CDS			Cull CDS		Species Total CDS	
Balsam fir	7,590.0						20.1							35.3	
Eastern hemlock	80,473.5						240.5		32.7					434.2	
Eastern white pine	41,462.9		15,867.6				61.6							176.2	
Northern white cedar	10,641.3						84.5					12.7		118.5	
Red spruce	11,029.2						53.0		22.2					97.3	
American beech	5,889.7						151.1		30.8					193.6	
Northern red oak	13,126.7		3,624.9				18.8		7.4					59.7	
Other hardwoods												8.8		8.8	
Paper birch	2,846.7		2,027.6		10,388.4		70.6		13.1			4.8		119.0	
Quaking aspen							62.3							62.3	
Red maple	29,158.2		11,871.6				243.2		25.7					351.0	
Sugar maple							44.1		7.5					51.6	
White ash			11,668.4		2,794.0		99.1		22.7					150.7	
Yellow birch	5,239.6		1,888.1		2,794.0		70.9		51.3					142.0	
Softwood:	151,196.9	73%	15,867.6	34%	0.0	0%	459.7	38%	54.9	26%	12.7	48%		861.5 CDS	
Hardwood:	56,260.9	27%	31,080.5	66%	15,976.4	100%	760.0	62%	158.5	74%	13.5	52%		1,138.6 CDS	
Total Vol:	207,457.8	BF	46,948.2	BF	15,976.4	BF	1,219.7	CDS	213.4	CDS	26.3	CDS		2,000.1 CDS	
Per Acre:	971.24	BF/Ac	219.79	BF/Ac	74.80	BF/Ac	5.71	CDS/Ac	1.00	CDS/Ac	0.12	CDS/Ac		9.36	
CDS/Ac															

Stand: 10

Type: SH34C

Acreage: 44.8

Description:

Site/type:

Mixed wood

Species Composition:
hemlock

Red maple, yellow birch, sugar maple, and eastern

Type Description: This stand lies along the eastern boundary of the property, similar to stand 8, the majority of the stocking is along the boundary line and around the tributary of Twitchell Brook. Overall tree quality and form decrease as you move west across the stand. The mapped DWA on the western part of the stand is no longer functioning.

Management Recommendation: Uneven-aged management. While not textbook uneven-aged management the goal will be to create three age classes. Individual Tree/Group Selection.

The western half of stand 10 was recently harvested. The skid trails have been rutted making forest management access in the future a challenge. There are two major options when it comes to management of the operable resource. The eastern edge of the stand is stocked heavily with eastern hemlock, which are the best softwood species to mitigate snow depth on the forest floor and provide the best thermal insulation in a functioning DWA.

1. Rehabilitation, expansion, and maintenance of a functioning DWA: use single tree and group selection to promote high priority cover species (eastern hemlock) by removing hardwood species as well as low quality softwood species.
2. Manage for tree species diversity, focusing removals on high-risk or diseased trees regardless of species to promote a diverse, healthy, and productive resource.

468 Bethel Community Forest**Volume by Species Expanded by Acreage**

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 10 SH34C

Total Acres:	44.8	Sampling Method:		POINT	Plots:		5					
Forested Acres:	44.8	BAF:		10								
Species	Sawlogs BF-Int	Pallet BF-Int	Boltwood BF-Int	Pulpwood CDS	Growing stock CDS		Cull CDS	Species Total CDS				
Eastern hemlock	40,044.2			51.7				131.8				
American beech				27.9				27.9				
Black cherry							8.3	8.3				
Paper birch			5,225.1	15.2	12.6			38.3				
Red maple	3,272.0	6,252.2		89.5				108.5				
Sugar maple			10,685.9	40.9	4.6			66.9				
White ash				37.3	8.5			45.7				
Yellow birch		3,272.0	13,538.0	83.1	26.6			143.3				
Softwood:	40,044.2 92%	0.0 0%	0.0 0%	51.7 15%	0.0 0%		0.0 0%	131.8 CDS				
Hardwood:	3,272.0 8%	9,524.2 100%	29,449.0 100%	293.9 85%	52.3 100%		8.3 100%	438.9 CDS				
Total Vol:	43,316.2 BF	9,524.2 BF	29,449.0 BF	345.6 CDS	52.3 CDS		8.3 CDS	570.8 CDS				
Per Acre:	966.88 BF/Ac	212.59 BF/Ac	657.34 BF/Ac	7.71 CDS/Ac	1.17 CDS/Ac		0.18 CDS/Ac	12.74				
CDS/Ac												

Stand: 11

Type:H3C

Acreage: 306.7

Description:

Site/type: Hardwood

Species Composition: American beech, red maple, sugar maple, northern red oak, and white pine.

Type Description: This stand is dominated by hardwoods with rolling topography. The stand was recently harvested. Most of the stands woods roads and skid trails lack erosion control devices such as water bars or broad-based dips to manage water runoff. The maple and beech are of poor form and quality, the red oak ranges from fair to good form/quality. There is a softwood component associated with this forest and is found along the stand type edges.

Management Recommendation: Even-aged management with an 80-yr. rotation. No management required for 10-15 years

Monitor for invasive species due to the intensive disturbance of the last timber harvest. Stabilize trails in accordance with Maines Best Management Practices for maintaining water quality (BMP's).

468 Bethel Community Forest**Volume by Species Expanded by Acreage**

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 11 H3C

Total Acres:	306.7	Sampling Method: POINT				Plots: 34							
Forested Acres:	306.7	BAF: 10											
Species	Sawlogs BF-Int		Pallet BF-Int		Boltwood BF-Int		Pulpwood CDS		Growing stock CDS		Cull CDS		Species Total CDS
Balsam fir	5,835.2						8.8		72.5				93.0
Eastern hemlock	10,814.8						33.9						55.5
Eastern white pine	49,369.1		4,878.0				108.4		58.1				274.9
Northern white cedar							39.1						39.1
Red spruce	11,264.9						15.2		28.1		17.5		83.4
American beech	59,435.4		85,681.3				694.8		55.8				1,040.9
Northern red oak	31,040.1		34,148.0		3,473.6		174.8		16.6				328.8
Paper birch	5,974.5		6,067.4		11,554.9		97.0		17.3				161.5
Red maple	15,592.2		27,692.8				447.8		65.4				599.8
Sugar maple	46,098.5		49,754.7		18,584.5		198.0		54.2		5.5		486.6
White ash	6,540.1				2,442.1		109.2		12.5				139.6
Yellow birch	7,918.5		3,108.7		3,108.7		75.2		23.2				126.6
Softwood:	77,284.0	31%	4,878.0	2%	0.0	0%	205.4	10%	158.7	39%	17.5	76%	545.9 CDS
Hardwood:	172,599.3	69%	206,453.0	98%	39,163.9	100%	1,796.9	90%	245.0	61%	5.5	24%	2,883.8 CDS
Total Vol:	249,883.3	BF	211,331.1	BF	39,163.9	BF	2,002.2	CDS	403.7	CDS	23.0	CDS	3,429.7 CDS
Per Acre: CDS/Ac	814.75	BF/Ac	689.05	BF/Ac	127.69	BF/Ac	6.53	CDS/Ac	1.32	CDS/Ac	0.07	CDS/Ac	11.18

Stand: 12

Type:HS34C

Acreage: 28.1

Description:

Site/type:

Hardwood dominated mixed wood

Species Composition:

Beech, red maple eastern hemlock, eastern white pine

Type Description: This stand is heavy to beech and multi-stemmed red maple. Most of the stand is of pulpwood grade due to form. The white pine and red oak stems are of fair to good quality.

Management Recommendation: Even-aged management with a 100 yr. rotation. Overstory removal with reserves, Timber stand improvement to favor white pine and northern red oak regeneration.

The white pine and red oak growing in this stand is the seed source of the future forest. They show the greatest potential in their form and vigor. The understory is dominated with beech sprouts and multi-stemmed red maple, both a result of asexual reproduction from prior timber harvests. White pine and red oak grow regenerate very well under each other's canopy when treated with a three stage shelterwood prescription. Currently, the beech in the understory is the largest hurdle to rehabilitating this stand. An overstory removal targeting all of the low quality and high-risk trees in the overstory, reserving all of the white pine and red oak as seed trees is possible. This harvest should be timed with a white pine cone year and expose mineral soil to ensure a good catch of white pine seed. Simultaneously the understory should be evaluated for TSI work targeting the removal of hardwood competition, especially beech. A hack and squirt herbicide application would be the most effective approach.

It should be noted that beech is a hard mast producing tree that many wildlife species depend on for a late season food source. Beech produced by sucker sprout colonies rarely produce vigorous mast trees and tend to create conditions that concentrate beech bark disease inoculum. Identifying good mast trees around the property will be key to ensuring a consistent mast source for wildlife.

Refer to US Forest Service, Northern Research Station: Manual Herbicide Application Methods for Managing Vegetation in Appalachian Hardwood Forests
https://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs96.pdf

468 Bethel Community Forest**Volume by Species Expanded by Acreage**

Level: Selected Merged
 All Strata All Plots
 Selected Products All Species
 Diameter Classes 1 to 29
 Forested Acreage Form Classes

Stand 12 HS34C

Total Acres:	28.1	Sampling Method: POINT		Plots: 2						
Forested Acres:	28.1	BAF: 10								
Species	Sawlogs BF-Int	Pallet BF-Int	Boltwood BF-Int	Pulpwood CDS	Growing stock CDS		Cull CDS		Species Total CDS	
Eastern hemlock	21,278.5			38.0					38.0	
Eastern white pine				21.6					64.1	
American beech				76.9					76.9	
Northern red oak				20.6					20.6	
Paper birch				12.0	19.8				31.7	
Red maple				36.2					36.2	
Softwood:	21,278.5	100%	0.0	0.0	59.6	29%	0.0	0%	0.0	102.2 CDS
Hardwood:	0.0	0%	0.0	0.0	145.7	71%	19.8	100%	0.0	165.5 CDS
Total Vol:	21,278.5	BF	BF	BF	205.3	CDS	19.8	CDS	CDS	267.6 CDS
Per Acre:	757.24	BF/Ac	BF/Ac	BF/Ac	7.31	CDS/Ac	0.70	CDS/Ac	CDS/Ac	9.52 CDS/Ac

Stand: 13

Type: HS34B

Acreage: 41.7

Description:

Site/type: Hardwood dominated mixed wood

Species Composition: Eastern Hemlock, paper birch, red maple, white ash

Type Description: This stand lies in the northwest corner of the property and is bisected northeast to southwest by a tributary of Chapman Brook. This tributary lies at the bottom of a valley that dominates the center of the stand. Due to the water feature and the terrain, this stand has not been impacted by prior forest management activities to the extent that the rest of the property has. The eastern hemlock in this stand are of good quality and are an indicator for what this stand should be managed for. The high volume of paper birch is an indicator past timber harvests created sufficient openings in the forest canopy to encourage pioneer species regeneration. The mature ash in this stand ranges from poor- to fair health.

Management Recommendation: Uneven-aged management. While not textbook uneven-aged management the goal will be to create three age classes. Individual Tree/Group Selection.

The indication from the soils and the quality of the remaining overstory indicate that eastern hemlock grows best in this stand. To manage toward this goal Individual Tree/Group Selection is recommended targeting the removal of short-lived pioneer species such as paper birch and high-risk species such as white ash should be removed in small patches (0.5-1.5acre) to create conditions suitable to regenerate eastern hemlock.

468 Bethel Community Forest

468 Bethel Community Forest

Volume by Species Expanded by Acreage

Volume by Species Expanded by Acreage

Level: Selected Merged
All Strata All Plots
Selected Products All Species
Diameter Classes 1 to 29
Forested Acreage Form Classes

Stand 13 HS34B

Total Acres:	41.7	Sampling Method: POINT				Plots: 6							
Forested Acres:	41.7	BAF:				10							
Species	Sawlogs BF-Int	Pallet BF-Int		Boltwood BF-Int		Pulpwood CDS		Growing stock CDS		Cull CDS		Species Total CDS	
Balsam fir								32.8				32.8	
Eastern hemlock	36,110.5					105.3						177.5	
American beech		2,752.3				14.1						19.6	
Northern red oak	7,492.1	1,913.7				7.5						26.3	
Paper birch	7,104.0	5,982.4		4,276.7		172.4		17.7				224.8	
Quaking aspen						22.8						22.8	
Red maple	7,141.1	1,964.7				81.4		5.8				105.3	
Sugar maple				2,454.5		12.6						17.5	
White ash	9,376.2	6,590.5		2,454.5		55.6		7.6				100.1	
Yellow birch						30.3		21.3				51.6	
Softwood:	36,110.5	54%	0.0	0%	0.0	0%	105.3	21%	32.8	39%	0.0	210.3 CDS	
Hardwood:	31,113.3	46%	19,203.6	100%	9,185.8	100%	396.6	79%	52.4	61%	0.0	568.0 CDS	
Total Vol:	67,223.9	BF	19,203.6	BF	9,185.8	BF	501.9	CDS	85.1	CDS	CDS	778.3 CDS	
Per Acre:	1,612.08	BF/Ac	460.52	BF/Ac	220.28	BF/Ac	12.04	CDS/Ac	2.04	CDS/Ac	CDS/Ac	18.66	
CDS/Ac													

Stand: 14

Type:SH3A

Acreage: 8.9

Description:

Site/type: Softwood dominated mixed wood

Species Composition: Red spruce, balsam fir, red maple, yellow birch

Type Description: Spruce/fir dominated sections are of fair to good quality in both form and vigor and should be the focal species of the stand. The red maple is mostly the result of coppice re-sprout from prior timber harvesting activities and as a result are growing in multi-stem clumps. Yellow birch poles are of good quality and should be managed as a component of this stand.

Management Recommendation: Even-aged management 60-80 yr. rotation. Free Thinning (10-15 years). This stand is not large enough to stand alone as a commercial timber harvest unit. The next entry should be timed with commercial timber harvesting in adjacent stands.

Capture high risk or declining spruce/fir and encourage the expansion of those two species, small (0.25-1 acre) patches should be cut in areas heavy to red maple. Care should be taken to avoid areas that have regenerated yellow birch.

468 Bethel Community Forest

Volume by Species Expanded by Acreage

Level: Selected Merged
 All Strata All Plots
 Selected Products All Species
 Diameter Classes 1 to 29
 Forested Acreage Form Classes

Stand 14 SH3A

Total Acres:	8.9	Sampling Method: POINT				Plots: 1							
Forested Acres:	8.9	BAF: 10											
Species	Sawlogs BF-Int		Pallet BF-Int		Boltwood BF-Int		Pulpwood CDS		Growing stock CDS		Cull CDS		Species Total CDS
Balsam fir							14.0						14.0
Red spruce	19,914.5						45.3						85.1
Red maple	3,202.6		2,409.5				34.7						45.9
Yellow birch							7.4		9.6				17.0
Softwood:	19,914.5	86%	0.0	0%	0.0		59.3	59%	0.0	0%	0.0		99.1 CDS
Hardwood:	3,202.6	14%	2,409.5	100%	0.0		42.1	41%	9.6	100%	0.0		62.8 CDS
Total Vol:	23,117.1	BF	2,409.5	BF	BF		101.3	CDS	9.6	CDS	CDS		162.0 CDS
Per Acre: CDS/Ac	2,597.43	BF/Ac	270.73	BF/Ac	BF/Ac		11.39	CDS/Ac	1.08	CDS/Ac	CDS/Ac		18.20

Stand: 15

Type: S3B-S/F ECO-Reserve

Acreage: 23.1

Description:

Site/type:

Softwood

Species Composition:

Red spruce, Balsam fir, northern red oak

Type Description: This stand lies on the northern edge of the property characterized by steep ledge and rugged terrain. The ridgetops are dominated by red spruce and balsam fir with northern red oak scattered at the base of and throughout the ledges.

Management Recommendation: No Treatment

Manage as a reserve, monitor for invasive species and pests.

468 Bethel Community Forest

468 Bethel Community Forest

Volume by Species Expanded by Acreage

Volume by Species Expanded by Acreage

Level: Selected Merged

All Strata All Plots

Selected Products All Species

Diameter Classes 1 to 29

Forested Acreage Form Classes

Stand 15 Eco-Reserve

Total Acres:	23.1	Sampling Method: POINT				Plots: 3				
Forested Acres:	23.1	BAF: 10								
Species	Sawlogs BF-Int	Pallet BF-Int	Boltwood BF-Int	Pulpwood CDS	Growing stock CDS		Cull CDS		Species Total CDS	
Balsam fir				25.9					25.9	
Eastern white pine	11,554.1			9.4					32.5	
Red spruce	148,387.5			105.8	12.5				415.0	
American beech				7.9					7.9	
Northern red oak	3,167.2	2,657.1		66.0					77.7	
Red maple				11.7					11.7	
Softwood:	159,941.5 98%	0.0 0%	0.0	141.0 62%	12.5 100%	0.0			473.4 CDS	
Hardwood:	3,167.2 2%	2,657.1 100%	0.0	85.6 38%	0.0 0%	0.0			97.3 CDS	
Total Vol:	163,108.7 BF	2,657.1 BF	BF	226.7 CDS	12.5 CDS	CDS		570.7 CDS		
Per Acre:	7,060.98 BF/Ac	115.03 BF/Ac	BF/Ac	9.81 CDS/Ac	0.54 CDS/Ac	CDS/Ac		24.71		
CDS/Ac										

Treatment Schedule

The previous owner aggressively managed the property prior to acquisition. Many forest stands simply need time to grow and occupy the available growing space. There are areas that would benefit from active forest management but need to be combined with forest management activities in adjoining stands to create a viable commercial timber harvest unit. The Bethel Community Forest is also in its infancy. Time is needed for the community to transition into the ownership, refine goals/objectives, and better understand the natural resources on the property.

The following is a tentative schedule of activities on the Bethel Community Forest:

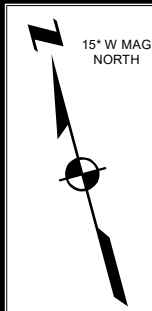
- 1) Implement Best Management Practices for erosion control as soon as funding is obtained.
- 2) Continue with ongoing monitoring for invasive plants, insects, and other forest health pathogens.
- 3) Pre-commercial thinning/Timber Stand Improvement. Better understand the options available to improve species composition on the property. Choose an option that best reflects the values of the Bethel Community. Implement Pre-commercial thinning/Timber Stand Improvement on soil types that offer the best overall chance of success.
- 4) Develop a recreation management plan that addresses the wide range of outdoor activities that are planned for the property.
- 5) Evaluate forest stands at 5-year intervals to determine the timing for the next commercial timber harvest.

VOLUME AND VALUE

Bethel Community Forest					
LANDVEST PROJECT # 11123					
Bethel, Maine Timber Inventory 2018					
VOLUME AND VALUE					
TOTAL ACRES: +/- 976			FORESTED ACRES: +/- 928		
SAWLOGS	VOLUME & UNIT MBF		\$VALUE/MBF		TOTAL \$ VALUE
AMERICAN BEECH (MAT LOG)	65	MBF	\$150	/MBF	\$9,750.00
BALSAM FIR	21	MBF	\$135	/MBF	\$2,835.00
BOL TWOOD (RO, PB, SM, WA, & YB)	132	MBF	\$65	/MBF	\$8,580.00
EA STERN HEMLOCK	305	MBF	\$65	/MBF	\$19,825.00
EA STERN WHITE PINE	248	MBF	\$200	/MBF	\$49,600.00
EA STERN WHITE PINE PALLET	37	MBF	\$50	/MBF	\$1,850.00
HARDWOOD PALLET	448	MBF	\$55	/MBF	\$24,640.00
NORTHERN RED OAK	83	MBF	\$300	/MBF	\$24,900.00
NORTHERN WHITE CEDAR	18	MBF	\$50	/MBF	\$900.00
PAPER BIRCH	23	MBF	\$130	/MBF	\$2,990.00
RED MAPLE	119	MBF	\$150	/MBF	\$17,850.00
RED SPRUCE	226	MBF	\$135	/MBF	\$30,510.00
SUGAR MAPLE	96	MBF	\$300	/MBF	\$28,800.00
WHITE ASH	33	MBF	\$175	/MBF	\$5,775.00
YELLOW BIRCH	45	MBF	\$275	/MBF	\$12,375.00
TTL SAWLOG	1,899	MBF	Total SAWLOG VALUE		\$241,180.00
CORD EQUIVALENTS	3,798	CORDS			
PULPWOOD & GROWING STOCK	CORDS		VALUE/ CORD		
BALSAM FIR	414	CORDS	\$2.00	CORDS	\$828.00
RED SPRUCE	321	CORDS	\$2.00	CORDS	\$642.00
HEM LOCK	792	CORDS	\$2.00	CORDS	\$1,584.00
PINE	320	CORDS	\$2.00	CORDS	\$640.00
NORTHERN WHITE CEDAR	994	CORDS	\$1.00	CORDS	\$994.00
ASPEN	199	CORDS	\$20.00	CORDS	\$3,980.00
HARDWOOD	5,940	CORDS	\$14.00	CORDS	\$83,160.00
TTL PULPWOOD	8,980	CORDS	TOTAL PULPWOOD VALUE		\$91,828.00
GRAND TOTALS	1,899	MBF	TOTAL GROSS VALUE		\$333,008.00
	8,980	CORDS	TIMBER CAPITAL		
GROSS CORDS	12,778	CORDS	VALUE PER FORESTED ACRE		\$358.84

APPENDIX

- I. Property Lucas Map
- II. Proposed Parking Map
- III. Trail Priority Map
- IV. Forest Type Map
- V. Wildlife Species Management Guidelines
- VI. Soil Map & Description
- VII. Inventory Report
- VIII. Community Objectives Survey Results
- IX. Landscape Level Connectivity Map
- X. Pest & Disease Management Guidelines
- XI. Glossary of Forestry Terms



Bethel Community Forest

Town of Bethel
Oxford County, Maine

Type Map over Aerial Photo

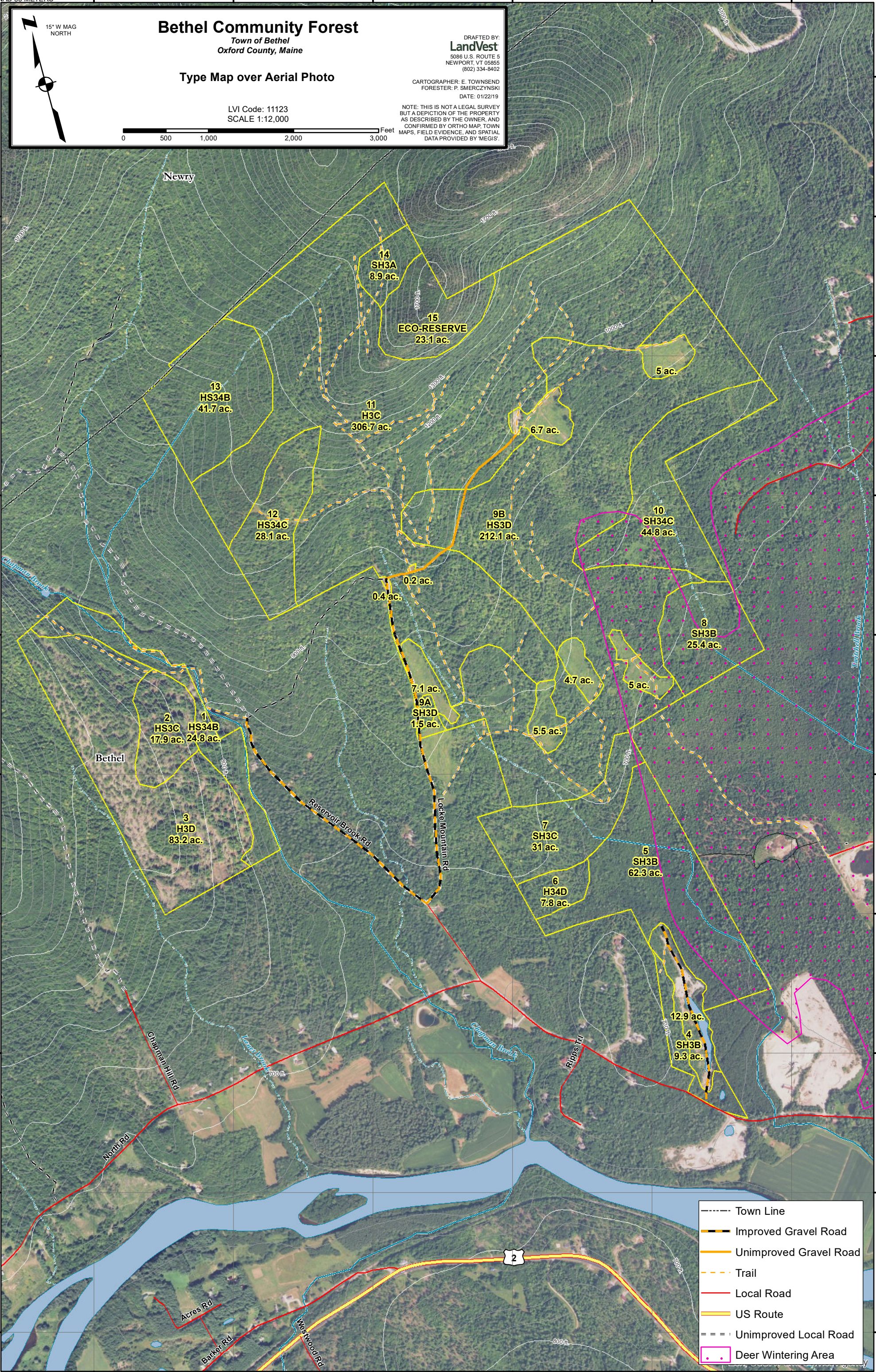
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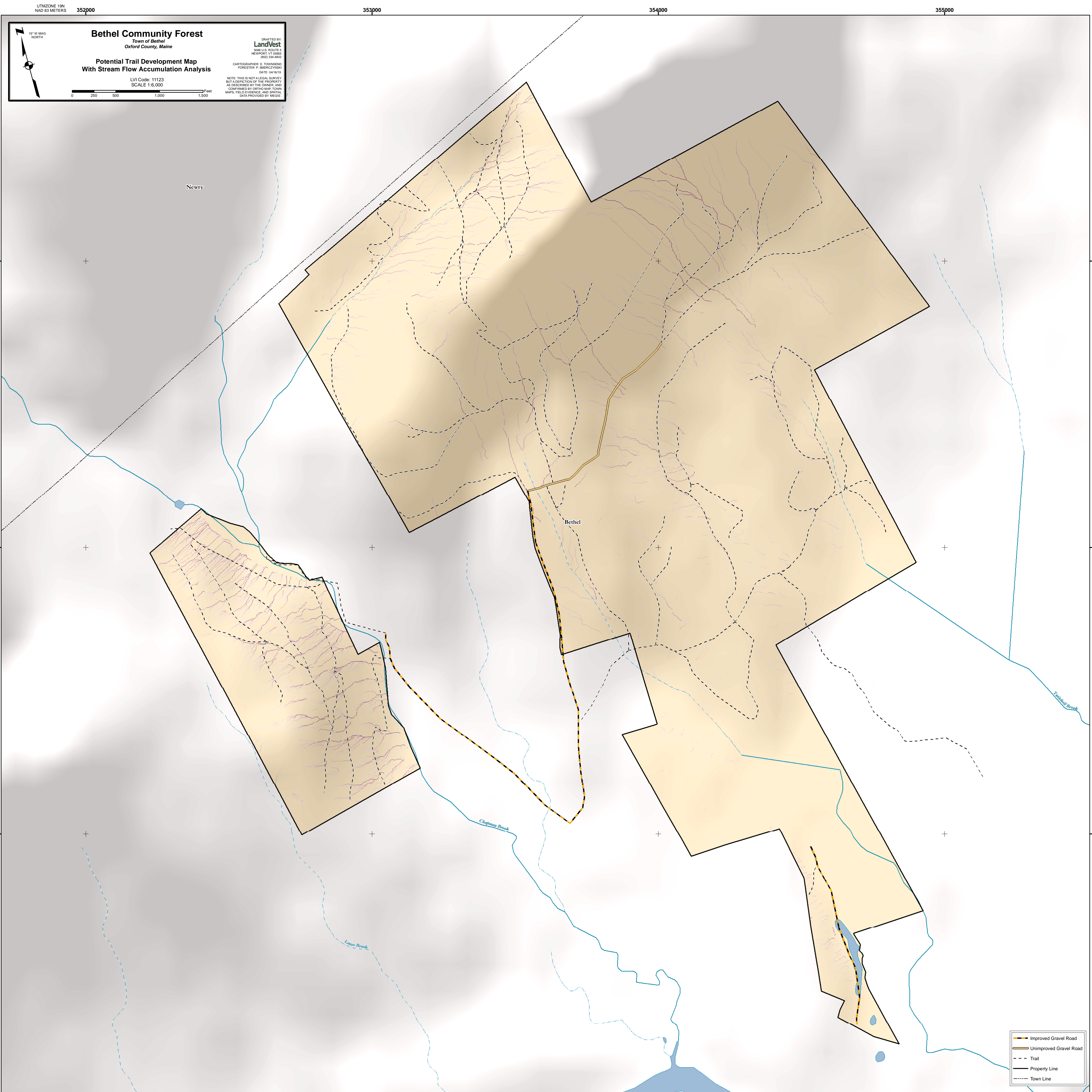
DRAFTED BY:
LandVest
5086 U.S. ROUTE 5
NEWPORT, VT 05855
(802) 334-8402

CARTOGRAPHER: E. TOWNSEND
FORESTER: P. SMERCZYNSKI
DATE: 01/22/19

NOTE: THIS IS NOT A LEGAL SURVEY
BUT A DEPICTION OF THE PROPERTY
AS DESCRIBED BY THE OWNER, AND
CONFIRMED BY ORTHO MAP, TOWN
MAPS, FIELD EVIDENCE, AND SPATIAL
DATA PROVIDED BY 'MEGIS'.



- Town Line
- Improved Gravel Road
- Unimproved Gravel Road
- Trail
- Local Road
- US Route
- Unimproved Local Road
- Deer Wintering Area



UTM ZONE 19N
NAD 83 METERS

352000

353000

354000

355000

15° W MAG
NORTH

Bethel Community Forest
Town of Bethel
Oxford County, Maine

Potential Trail Development Map
With Stream Flow Accumulation Analysis

LVI Code: 11123
SCALE 1:6,000

025050010001500

Feet

DRAFTED BY:
LandVest
5000 U.S. ROUTE 5
NEWPORT, VT 05855
(802) 334-8402

CARTOGRAPHER: E. TOWNSEND
FORESTER: P. SMERCZYNSKI
DATE: 04/16/19

NOTE: THIS IS NOT A LEGAL SURVEY
BUT A DEPICTION OF THE PROPERTY
AS DESCRIBED BY THE OWNER, AND
CONFIRMED BY ORTHO MAP, TOWN
MAPS, FIELD EVIDENCE, AND SPATIAL
DATA PROVIDED BY MEGIS.

- Improved Gravel Road
- Unimproved Gravel Road
- Trail
- Property Line
- Town Line

LandVest

352000

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Date: 04/16/19



JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

AMANDA E. BEAL
COMMISSIONER

November 22, 2019

David DeGruttola, LandVest
Via email: ddegruttola@landvest.com

Re: Forest Management Plan Review

Dear Mr. DeGruttola:

In response to your request received on November 19, 2019, I have searched our data system for information on rare or unique botanical features, rare animal populations, and essential or significant wildlife habitats in the vicinity of the Bethel Community Forest in Bethel.

For individual parcel reviews, we use a simple checklist that summarizes our findings. The enclosed checklist includes our review of several data sets, some of which are maintained by MNAP and others that are maintained by the Maine Department of Inland Fisheries and Wildlife (MDIFW), and the U.S. Fish and Wildlife Service (USFWS). If a parcel intersects with a data set maintained by MDIFW or USFWS, please contact the appropriate biologist indicated on the checklist for additional information.

The Bethel Community Forest is associated with a population of Northern Spring Salamander (Special Concern) at Chapman Brook. Northern Spring Salamander is a species of conservation concern in western Maine that occupies higher elevation first and second order streams underlain by coarse substrate (rock, cobble, gravel, sand) and bordered by hardwood or mixed-wood dominated forest. MDIFW recommends maintaining a 250-foot management zone on either side of Chapman Brook, Twitchell Brook, Lanes Brook, and unnamed streams highlighted in yellow on the attached map, within which the first 50 feet from the brook is retained as a no-cut and no disturbance zone, and the remaining 50-250 feet is maintained with no less than 60-70% forest canopy cover in an evenly distributed stand. Construction of roads and log landings, or any other permanent land use conversion, should be avoided or minimized within the 250-foot management zone. The following recommendations also apply within the 250-foot riparian management zone: build temporary bridges across all perennial streams prior to any motorized equipment crossing, harvest only during dry or frozen ground conditions, and avoid the use of herbicides or insecticides. Always use Best Management Practices to prevent or minimize soil movement and to protect soil and water quality.

This property is associated with a Deer Wintering Area. Please consider contacting the regional wildlife office for advice and recommendations to ensure the continued availability of critical conifer shelter for wintering deer while accommodating the need to manage for timber production. You can find more information about managing for deer wintering areas at the MDIFW website, http://www.maine.gov/ifw/docs/DWA_Guidelines_2.4.10.pdf.

Chapman Brook, Twitchell Brook, and their tributaries support populations of wild brook trout. Brook trout prefer cool, well-oxygenated waters that benefit from intact riparian corridors. Any forest management activities planned for riparian zones should closely follow the state's Best Management Practices, including appropriate buffer distances, shade retention, and minimization of sediment runoff. Because of the topography of this area,

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

Letter to David DeGruttola
Comments RE: Bethel Community Forest
November 22, 2019
Page 2 of 4

sediment management and erosion control are key factors to maintaining healthy fisheries systems. Please see the attached fact sheet for more information about brook trout in Maine.

Good management of these habitats is consistent with good forestry, and MDIFW's regional wildlife and fisheries biologists are available to assist you in maintaining their integrity while allowing for forest management and timber procurement. According to the information currently in our files, there are no other species or important habitats documented within the property. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare features.

Thank you for using the MNAP in the forest management planning process. If you have questions about the MNAP, or if you would like more information about this site, please feel free to contact me. You can also visit us on the web at www.maine.gov/dacf/mnap.

Sincerely,

Lisa St. Hilaire

Information Manager | Maine Natural Areas Program | maine.nap@maine.gov | Phone: (207) 287-8044 | Fax: (207) 287-8040

cc: Sarah Boyden, Liz Thorndike, MDIFW

Forest Management Plan Review

Forester: *David De Gruttola* Landowner: *Mahoosuc Pathways* Lot Name: *Bethel Community Forest*
 Date Received: *11.19.2019* Town: *Bethel* County: *Oxford* MDIFW Region: *D*

PLANT, ANIMAL, AND HABITATS	Documented to occur at the site? YES NO		Contact the following biologist to discuss conservation considerations
Plants: rare, threatened and/or endangered <i>If yes, see attached summary table.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Natural Communities: rare and/or exemplary <i>If yes, see attached summary table.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Animals: rare, threatened, or endangered <i>If yes, see attached summary table.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MDIFW Assistant Regional Wildlife Biologist Sarah Boyden, 778-3324
Mapped Essential Wildlife Habitats: Roseate tern Piping plover and Least tern	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	
Mapped Significant Wildlife Habitats: Deer wintering area Inland waterfowl and wading bird habitat Tidal waterfowl and wading bird habitat Significant vernal pool Shorebird feeding/roosting area	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	MDIFW Assistant Regional Wildlife Biologist Sarah Boyden, 778-3324
Wild brook trout habitat	Yes <input checked="" type="checkbox"/>	Unknown <input type="checkbox"/>	MDIFW Assistant Regional Fisheries Biologist Liz Thorndike, 778-3322
Atlantic Salmon: Salmon critical habitat Salmon stream habitat	Yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/>	No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>	USFWS Biologist Wende Mahaney, 902-1569 For more information: www.fws.gov/mainefieldoffice/Atlantic_salmon.html
Canada lynx: The town & parcel may provide habitat for lynx	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
LANDSCAPE CONTEXT			
Does parcel intersect with a Beginning with Habitat Focus Area? Focus Area Name: Additional information on this focus area may be available at www.maine.gov/dacf/mnap/focusarea	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is the parcel adjacent to or on Conservation Lands? Owner: Mahoosuc Pathways Ownership type: <input checked="" type="checkbox"/> Fee <input type="checkbox"/> Easement Area Name: Bethel Community Forest	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the parcel within an area identified by MNAP as a potential inventory site for undocumented rare plants or exemplary natural communities? If so, MNAP will contact the landowner for permission prior to any inventory work.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Review completed by: LRS
 Date: 11-22-2019
 MNAP #: 2019-11-22-LS-03

Forester: *David De Gruttola* Landowner: *Mahoosuc Pathways* Lot Name: *Bethel Community Forest*

Summary Table: Plants, natural communities, and animals documented to occur at the site

Feature Name	State Status ^a	State Rank ^b	Global Rank ^c	SGCN Priority ^d	Additional Information
Northern Spring Salamander	SC	SNR	G5T5	2	Chapman Brook

^a **State Status (please note that all species with E, T, or SC status are listed as Species of Greatest Conservation Need in the State Wildlife Action Plan)**

- E** Endangered; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** Threatened; Rare and, with further decline, could become endangered; or federally listed as Threatened.
- SC** Special concern; A species that does not meet the criteria for E or T, but is particularly vulnerable and could easily become a Threatened, Endangered, or Extirpated Species.

^b **State Rank (State Rarity Rank)**

- S1** Critically imperiled in Maine because of extreme rarity or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine.
- S4** Apparently secure in Maine, includes **S4B** for breeding birds and **S4N** for nesting birds.
- S5** Demonstrably secure in Maine.

^c **Global Rank (Global Rarity Rank)**

- G1** Critically imperiled globally because of extreme rarity or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity or because of other factors making it vulnerable to further decline.
- G3** Globally rare.
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.







^d **SGCN Priority**

Describes the prioritization of Species of Greatest Conservation Need based primarily on risk of extirpation, population trend, endemism, and regional conservation responsibility. **Priority 1** is Highest Priority; **Priority 2** is High Priority; **Priority 3** is Moderate Priority. For more information, please visit Maine's State Wildlife Action Plan (SWAP) – 2015, http://www.maine.gov/ifw/docs/2015%20ME%20WAP%20All_DRAFT.pdf.

^e **EO Rank (Element Occurrence Rank)**

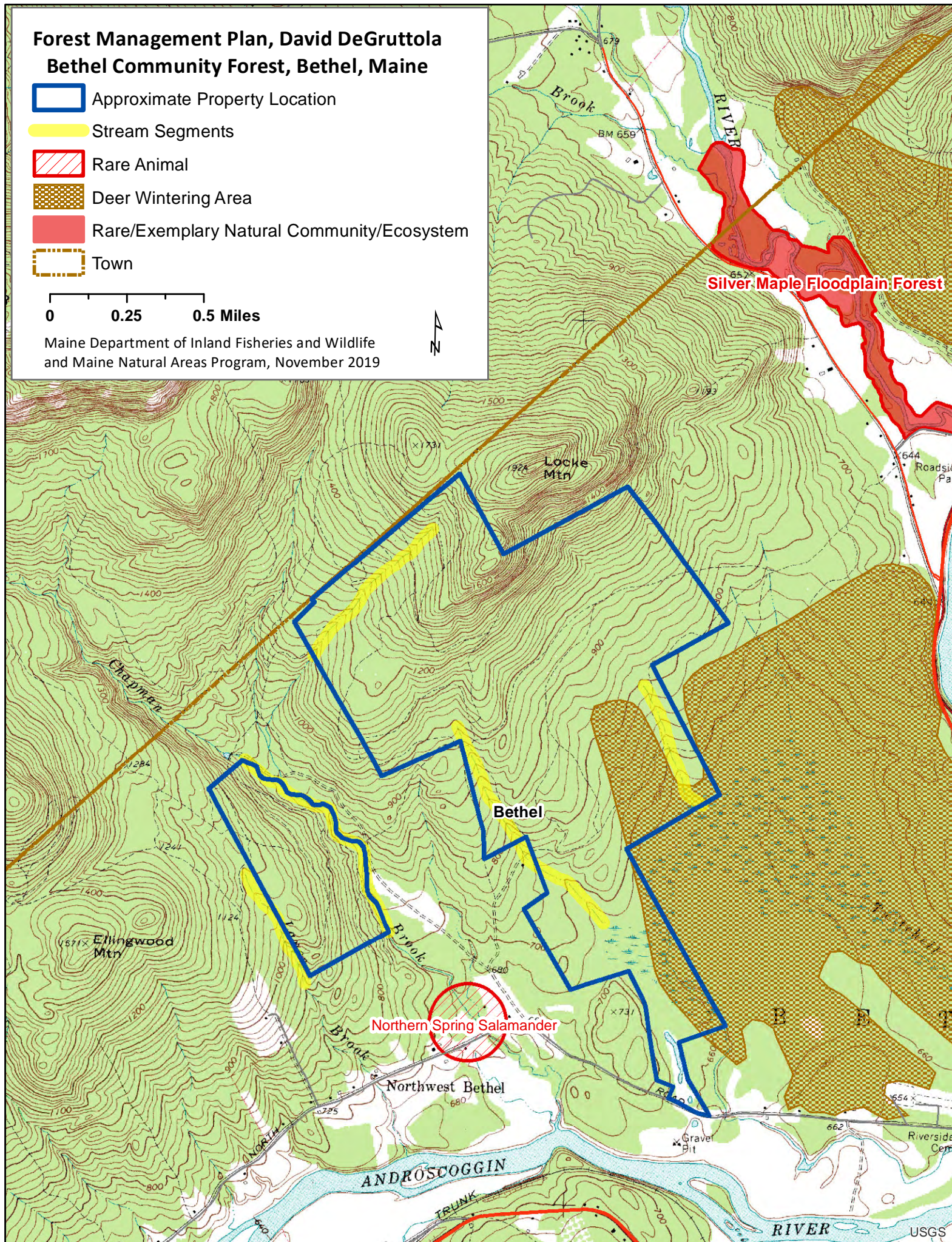
Describes the quality of a rare plant population or natural community based on size, condition and landscape context. Ranks range from A-E, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank.

Forest Management Plan, David DeGruttola
Bethel Community Forest, Bethel, Maine

-  Approximate Property Location
-  Stream Segments
-  Rare Animal
-  Deer Wintering Area
-  Rare/Exemplary Natural Community/Ecosystem
-  Town

0 0.25 0.5 Miles

Maine Department of Inland Fisheries and Wildlife
and Maine Natural Areas Program, November 2019



MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE



Forest Management Recommendations for Brook Trout

Background

Brook trout (*Salvelinus fontinalis*), commonly referred to as squaretail, brookie, and speckled trout, are native to Maine. This colorful fish is the most preferred sport fish sought by Maine anglers. Size may vary, depending on water temperature, productivity, and food sources, but 3 year-old brook trout in Maine lakes may range from 7.5 to 17.5 inches long. Stream populations are typically slower growing where lengths of 6 to 10 inches are more common place, although some populations mature and reproduce at lengths smaller than 6 inches.

Maine is the last stronghold for brook trout in the eastern United States. There are more than twice as many watersheds supporting brook trout in Maine than all of the other 16 states within the eastern brook trout range combined. Maine is also the only state with extensive intact lake and pond dwelling populations of wild brook trout.

Brook trout require clean, cool, well oxygenated water and are very sensitive to changes in habitat and water quality. Rivers and streams typically provide spawning and nursery habitat. Adults are commonly resident in streams, but migrate throughout and between drainages to meet seasonal life history requirements.

Stream habitat suitability is maintained by the presence of intact, stable, mature wooded riparian corridors that: conserve forest soils, provide shade to reduce stream warming, protect stream water quality, provide cover for fish, provide a source of woody debris and leaf litter from mature trees that maintain critical in-stream habitat for fish and the aquatic insects they feed upon (leaves provide the energy source that drives productivity in streams). Floodplain and fringe wetlands associated with streams are a significant source of springs and groundwater discharge that maintain stream flows and cool temperatures during warm low flow summer periods. Protection of these important riparian and wetland functions insures that the overall health of the stream habitat and watershed is maintained.

Maine brook trout fisheries are unique and highly valuable, but vulnerable to habitat alteration that may be caused by poorly planned and implemented land management activities, including road and trail construction, as well as timber harvesting. However, well planned

forestry operations can protect habitat and help ensure that forests remain as forest, which is the most beneficial land use for brook trout and many other fish and wildlife.

Management Recommendations

Brook trout are not afforded any special state or federal regulatory protection, and as such provided management recommendations are advisory.

The MDIFW recommends following Best Management Practices (BMPs) during all road and trail building activities, as well as timber harvesting. BMPs are detailed in the booklet entitled “[Best Management Practices for Forestry](#)”, which offers guidance on managing and protecting water quality, installing road-stream crossings, and providing fish passage. This information is available at:

www.maine.gov/dacf/mfs/publications/handbooks_guides/bmp_manual.html or contact the Maine Forest Service at 1-800-367-0223).

Potential harmful impacts to fish and wildlife may be further minimized by designating “low impact riparian protection areas” adjacent to streams and stream-associated fringe and floodplain wetlands in forest management and harvest plans. Smaller streams may be greatly influenced by land management practices; these systems benefit the most from well-managed and intact riparian corridors.

The MDIFW also recommends limiting the harvest of trees and alteration of other vegetation within 100 feet of streams and their associated fringe and floodplain wetlands to maintain an intact and stable mature stand of trees, characterized by heavy crown closure and resistant to wind-throw. In some situations wider buffers should be considered where severe site conditions (i.e., steep slope, vulnerable soils, poor drainage, snow pack, etc) increase risk to soil and stand instability. Any harvest within the riparian buffer zone should be selective and less valuable trees may remain uncut to enhance stand integrity and maturity.



TIMBERLAND DIVISION

CRUISE PROCEDURES and SPECIFICATIONS

For

Bethel Community Forest

Bethel

PROJECT #: 11123

October 1, 2019

VERSION 1.4

**R. CARBONETTI ACF CF
VP TIMBERLAND DIVISION
NEWPORT, VERMONT**

**Patrick Smerczynski
PROJECT FORESTER
Bethel, Maine**

OVERVIEW AND PURPOSE:

This document is the LandVest baseline cruising procedure and method manual for all cruisers working on the above named projects. These specifications will serve as the basis for practices to be used in the field, on each plot, and in the overall gathering of data by all cruisers.

It is very critical for all cruisers to appreciate and understand that failure to comply completely with all elements of the cruise specifications will lead to failed check cruises and the retaking of all plots taken before the failed cruise. Something as simple as an incomplete field map, improperly completed cruise cards or PDA fields, or any other failure to comply will lead to a complete retaking of all of the cruisers previously completed points. Quality and accuracy are critical to payment and achieving bonus payments as well.

POINT LOCATION and MONUMENTATION:

1. **CRUISE LINE DOCUMENTATION:** This cruise will utilize **magnetic** bearings. Starting point of each line shall be marked with two **pink** flags, one of which will indicate the **cruiser's initials, and the date**, along with the **distance and bearing** to the first sample point. When crossing a road (passable with 4WD), two **pink** flags shall be hung. One flag shall be labeled with the information above, the second flag shall be labeled with the bearing and distance to the previous point.
2. **POINT LOCATION:** Cruise point location can be either by compass and hip chain or GPS. For compass and hip chain navigation, an overhead flag must be hung occasionally to facilitate back-siting. If GPS is used, the last 1.5 chains (+/- 100 feet) to the sample point must be navigated by compass and hip chain to avoid any bias in the location of plot center. A **pink** ribbon shall be hung at the "Chain in Point" and labeled with "To PT _____, Bearing____, Distance____" Cruisers navigating to cruise points using the Flint or BAP units are not required to chain in to plot center because of increased accuracy of the GPS on the units.

For points which fall near property boundaries, non-forest or non-cruised type boundaries, major streams, roads, or other non-cruisable areas, take the point where it falls (no offset) and utilize the Walkthrough Method (See Appendix). Do not tally property boundary trees which are marked as such (blazes, paint or otherwise).

Boundary Line Encounters: Points which fall outside of property boundaries may be dropped. If boundary is not located as expected, additional points shall be added on the same spacing to fill the void until boundary is reached. Use the next highest point number that is higher than the point number that is highest on the provided cruise field map.

Check Cruise Tolerance: GPS located points must fall within +/- 30 feet of where a hip chain and compass check would find the plot. Recognizing that GPS accuracy can vary by unit, day and even time of day, check cruisers will use discretion to determine evidence of point location bias. Offset procedure must be used correctly and direction of offset must not show evidence of bias.

Check Cruise Value: 1 point

3. **FIELD MAPS and NOTES:** Each cruiser is required to record a detailed cruise field map. See Appendix for the required notes and a model field map. Date, Cruiser's Initials, Weather, Route from point to point and physical features (roads, streams, stand type changes, boundaries, property corners, etc.) are required. Cruisers will also identify any offset points and the direction and distance of offset. In addition, cruisers shall collect any additional notes which may be helpful to the Project Forester. Notes may be collected on the map, notes section of PDA/Cruise Card or separate sheet. Key is that appropriate notes must be taken.
4. **GPS DATA COLLECTION:** Cruisers must collect all line and point features as waypoints. List of features to be collected shall be provided on a laminated GPS Feature Card. Property boundaries, stand boundaries, and unmapped or incorrectly mapped roads are especially important. Each waypoint shall be named XX (or XXX)-YY, where XX or XXX is the feature number from the GPS Feature Card and YY is the sequential number of the feature collected. For example: 138-02 will be the name of the waypoint which represents the second instance of a boundary line collected.
5. **POINT MONUMENTATION:** All plots shall have a **pink** flag hung at or above eye level as close to point center as possible. This flag shall be labeled with the following information: Plot #, Cruiser's initials, LVI, and Date. There should also be a **pink** pin flag or stick with **pink** flagging placed on or stuck in the ground labeled with the plot number.

Cruiser shall collect the bearing and distance from point center to the first tree. Distance shall be the straight line (not slope corrected) distance from DBH to point center. On null points, this element may be skipped.

Check Cruise Tolerance: Overhead flag and point center flag must be present and labeled accurately and completely. Any failure of the above is an error. For compass and hip chain location, backsite flags must be visible. For GPS located points, the "chain in flag" must also be present and labeled. Bearing and distance from Tree 1 to PC must be accurate and recorded.

Check Cruise Value: 1 point

POINT TALLY: (See sample Cruise Card and codes in Appendix)

1. At a minimum; record Client ID (Project Number), Point Number, Cruiser's Initials, and Date
2. **FOREST MANAGEMENT DATA:**
"X" in boxes below indicate which elements will be collected for this cruise. Unless otherwise described below, these determinations should be made at the stand level, rather than at the plot level. Example: PC falls in a small pothole that is holding water, but the balance of the stand is completely operable. Correct call would be "Operable".



FOREST TYPING

Record the Overstory and Understory forest type using the following nomenclature:

Cover Type Species Composition:

Hardwood	H More than 75% hardwood
Softwood	S More than 75% softwood
HW Mixed	HS 50-75% Hardwood
SW Mixed	SH 50-75% Softwood

Size Classes:

Seedling-Sapling	1 .51 to 3" DBH
Sapling-Poletimber	2 3 to 7" DBH
Poletimber-Sawtimber	3 7 to 12" DBH
Sawtimber	4 > 12" DBH

Density/Stocking Levels:

A	Fully stocked to Overstocked
A-B	Falling near the mid-range of the A and B
B	Adequately Stocked
B-C	Falling near the mid-range of the B and C
C	Inadequately stocked but should reach B
D	Very scattered OS that still plays a role in

Nomenclature

EX: **H3A** = Hardwood – Poletimber/Sawtimber – Fully S
SH2C = 50-75% Softwood – Sapling/Poletimber - U
Mixes (2-3, 3-4, etc.) can be used if the size class is true



OPERABILITY

This is a 3 digit call based on a combination of the terrain, site conditions, operational limitations or enhancements, harvestable timber volume (with recommended silviculture), and season of harvest. The best alternative shall be indicated. In other words, a medium harvest that may be marginal in the summer due to a wet site, but would be excellent in the winter shall receive a "5BW". If there is no preferred season, just use 2 digits.

SITE		VOLUME		SEASON	
1	Inoperable	A	High Harvest Volume	W	Winter
2	Marginal	B	Medium Harvest Volume	P	Spring
3	Average	C	Low Harvest Volume	S	Summer
4	Good			A	Autumn
5	Excellent				

Nomenclature

EX: 4BP = Good site, medium volume, operable in Spring

**SILVICULTURE**

Using the three letter codes available, select the single item that best reflects the cruiser's observations and recommendations for a treatment to be implemented in the next 5-10 years. If no treatment is suitable or required, use the NON code.

**INSECT & DISEASE**

Using the three letter codes available, please record the insect or disease condition that is currently, or has recently, impacted the stand and area surrounding the point. If no impacts are noted, use the NON code.

**WILDLIFE HABITAT**

Using the three letter codes available, please record the Wildlife Habitat condition that is currently, or has recently, impacted the stand and area surrounding the point. If no significant habitat is present, use the NON code.

**SHRUB/HERBACEOUS PLANTS SITE INDICATORS**

The presence of site indicator herbaceous species will be recorded if found in the vicinity of the plot center. Up to three different species may be recorded. If none of the indicators are present, use the NON code.

**HABITAT TYPES**

Record the Flex Fiber Habitat Type that best describes the site conditions. Additional information and codes are in the Appendix

**SITE CLASS**

Record the Site Class that best describes the site conditions. Additional information and codes are in the Appendix

**LEGACY TREES**

Legacy trees are generally defined as "something very unique". Examples include, but are not limited to, large diameter and old age Yellow birch, White pine, or other species of unique size and age. The tree's species and diameter will be recorded as well as comments as to why it was selected. If the tree is an "in" tree on the prism plot, then it will be noted as a legacy tree but graded and tallied the same as other trees. If it occurs off-plot, then GPS its location and record the above information in the GPS and record it on the PDA in the Legacy Tree Screen. Use the Notes section of the PDA/ Card to record additional information.

Check Cruise Tolerance: All Point Tally elements must be completed accurately. If the field is blank, it will be considered an error.

Check Cruise Value: 1 point for ALL elements.



DOWNED COARSE WOODY DEBRIS:

CWD is defined as any dead bole section that is lying completely on the ground, unsupported by any other free-standing tree, living or dead. CWD will be measured using the perpendicular distance sampling method described here. The diameter of all downed logs that are "in" will be measured perpendicular to plot center to the nearest inch class at the point where the log is perpendicular to plot center. Species and Maser decomposition class will also be recorded. "In" trees meet the following criteria:

- Log is perpendicular to a straight line extending from plot center (Appendix)
- Diameter at the log center is 4.6" or greater
- Log is within the limiting distance defined by its diameter (Appendix)

Check Cruise Tolerance: CWD tolerances are as follows: A missed down stem that meets the limiting distance & diameter standard is an error. A 10% or greater rate of errors will cost a cruise value point and will be followed throughout the points associated with a day's check cruise.

Check Cruise Value: 1 point.



REGENERATION TALLY:

A mil acre plot, (radius of 3.72 feet) will be used to tally four 1/4-mil acre samples. Record the species of the most dominant seedling/sapling less than 1.35" DBH in each quadrant; NE, SE, SW, and NW. Plot shall be centered on the same point center as used for the point sample inventory. The location of where the stem of the selected seedling-sapling enters the ground determines which quadrant is in effect occupied. If no vegetation occupies the quadrant, mark it as non-stocked (NS) or if it is occupied by dominant vegetative plants of a non-commercial nature, mark it NC. Examples of non-commercial species are ferns, raspberries, grasses, etc. These are tallied if the cruiser views them as an impediment to the establishment or growth of commercially desirable species. The determination of advanced regeneration is based on the cruiser's judgment that if the stem were to be released it has the form and vigor to continue to develop and survive, as a viable tree over the next 10-15 years and in all likelihood will become a viable part of a future stand.

Check Cruise Tolerance: The correct species code (or NS, NC) must be recorded for each. If the field is blank, it will be considered an error. In addition, any quadrant that has a call that is deemed out of compliance to the specification will be considered an error. For example if the NE quadrant is called HM and the check cruiser determines the species is incorrect or the seedling that was available did not meet the AGS requirement then the check cruiser, will record a correction and an error will be tallied.

Check Cruise Value: 1 point for ALL quadrants



MOOSE BROWSING TALLY:

On the same 4 quadrant Regeneration Plot, we will be recording information to document moose browsing levels. This is an important consideration for the client and the data collected here should be considered as important as any other data collected on this project. Here is the methodology to be utilized:

- 1) For each quad of the Mil-acre plot, record a simple yes or no for the evidence of moose browsing.
- 2) Then make an objective value judgment as to the level of browsing, light, medium, or heavy. Light damage would be evidence of browse, but no immediate danger to the loss of a viable regeneration class in the quad. Medium would be significant damage, but trees capable of recovery without further browsing occurring. Heavy damage is where the moose browsing activity have significantly altered the form and vigor of the available regeneration of any species and that even with the removal of further browsing there is insufficient health and form to insure that the regeneration will develop into a viable acceptable understory.
- 3) Then so as to get a numerical sense of the damage for each quad where you have indicated the presence of moose browsing of any level, we will count the total number of stems of regeneration of all tree species, commercial and non-commercial and then a tally of the number of those that have been impacted by moose browsing.

Check Cruise Tolerance: Data must be collected as specified and representative of the moose browse impact. If check cruiser finds the data to be inaccurate or incomplete, it will be an error.

Check Cruise Value: 1 point.

TREE TALLY:

1. This cruise will utilize a **10** BAF prism.
2. In addition to collecting data for Live, typically formed forest trees, collect data for trees marked and defined as below:



CULL TREES

In addition to tallying merchantable trees, all cull trees on the prism plot will also be tallied. Record Species, Diameter, UGS, and 1 Product Code **7**. Mark the tree with a "**C**" in the field.



DEAD TREES

In addition to tallying live trees, all dead trees on the prism plot must also be tallied. Record Species, Diameter, Level as "D", and 1 Product Code **7**.



WOLF TREES

Wolf trees will be recorded and graded in the same fashion as other “in” trees. A “wolf tree” is defined as any stem that has had excessive growing space and/or pest/disease damage that has caused large, spreading crowns, often limiting merchantability beyond pulpwood.



HEIGHT TREE

In order to calibrate the Cruiser's eye for additional height and segment estimates, Cruiser's are required to measure the merchantable height of one tree per point using a clinometer or similar instrument. Choose a tree with sawtimber products, is visible from most locations on the plot, and has a height similar to or representative of the other trees on the point. This tree should be marked with an "H" using spray paint. The Tree number and height should be noted in the comments section of the cruise card. If there are no trees meeting the above description, this element may be omitted.

3. **STARTING POINT FOR FIRST TREE TO TALLY and TALLY ORDER:** Cruisers shall always start at the first tree at or to the east of magnetic north. The first tree shall be marked above DBH with **point number using spray paint (if first tree is too small to paint point number legibly, mark "1" with crayon)**. Trees shall be tallied in a tree-by-tree movement clockwise. For multiple trees which are in a direct line from point center, the tree closest to PC shall be collected first, then additional trees collected in the order that they radiate from PC. If a tree is missed, data shall be collected at the end of the plot and an arrow used to identify its real location on the point (Use notes on PDA).

Check Cruise Tolerance: Tree #1 must be located and labeled correctly. Trees must be collected in clockwise order. Trees collected out of order, but noted correctly on cruise card or PDA, will not be considered an error.

Check Cruise Value: 1 point

4. **BORDERLINE TREES:** Any tree that cannot be definitively determined to be in or out using the prism shall be measured for horizontal Limiting Distance. See Appendix for limiting distance calculations and tables. DBH shall be measured to the nearest 0.1" for the calculation and distance shall be measured with a steel tape. If a borderline tree is found to be out, the tree shall have an "X" marked through the DBH line. If a borderline tree is found to be in, the tree shall have a vertical line marked through the DBH line.

Check Cruise Tolerance: Missed or extra trees found to be in or out by more than 1', shall be an error. The 1' tolerance will only apply to trees that have been measured for LD and appropriately indicated with an "X" or vertical line. Any missed tree that has not been measured for LD, regardless of whether it is within the 1 foot error tolerance will be considered an error. For missed or extra trees, each call within that tree is considered to be one error. This error call thusly multiplies errors very rapidly.

Check Cruise Value: Variable dependent on number of calls in tree

5. **SPECIES:** Each cruise will use the species codes on the provided cruise specification card and in the Appendix. Any failures to utilize the correct species will be an error.

Check Cruise Tolerance: Species must be identified and recorded correctly.

Check Cruise Value: 1 point

6. **DIAMETER:** DBH height must be established on the uphill side of the tree using normally accepted DBH rules. See Appendix for examples. This cruise will utilize 1 inch diameter classes and collect trees down to 1 inch in size. All diameters shall be measured with calipers at a carefully established DBH. Mark the tree with a horizontal line at the location as to where you located DBH. This assures that the check cruiser will know that you properly utilized the DBH height rules and accurately located DBH. If this mark is not visible from plot center, then make a vertical mark on the tree facing plot center. This is critically important when measuring trees for limiting distance. Please remember to mark the DBH line with an X or a vertical line if you measured the tree as a borderline call. Diameter breaks for the appropriate diameter classes are shown below.

1" Diameter Classes		
DBH Range		DBH Class
0.51 to 1.5		1
1.51 to 2.5		2
2.51 to 3.5		3
etc.		etc.
11.51 to 12.5		12
12.51 to 13.5		13
13.51 to 14.5		14
14.51 to 15.5		15
etc.		etc.

2" Diameter Classes		
DBH Range		DBH Class
1.01 to 3.0		2
3.01 to 5.0		4
5.01 to 7.0		6
etc.		etc.
11.01 to 13.0		12
13.01 to 15.0		14
15.01 to 17.0		16
17.01 to 19.0		18
etc.		etc.

Check Cruise Tolerance: DBH must be established correctly and marked facing PC. DBH height tolerance is +/- 2". DBH tolerance is +/- 0.3" for sawtimber trees; +/- 1" for pulpwood trees.

Check Cruise Value: 1 point

7. **LEVEL:** This data call will be used to make Acceptable (A) and Unacceptable (U) calls for the entire tree, not a segment call.
- (A) **Acceptable Growing Stock** – any tree which now contains saw or pallet and will continue to contain saw or pallet for the next 10 years. Also use for any tree which does not now contain saw or pallet, but has the stem quality & vigor to predict that it will contain saw or pallet at some point in the future as it increases in diameter to achieve the appropriate size at DBH to achieve pallet or sawlog quality stem sections.
- (U) **Unacceptable Growing Stock** – any tree which now contains saw or pallet, but whose vigor at present demonstrates that it will decline in the next 10 years to the point where it will not contain saw or pallet. Also use for any tree which does not now contain saw or pallet currently, and does not have the quality or vigor so that it will ever contain saw or pallet as it increases in size.

Check Cruise Tolerance: None

Check Cruise Value: 1 point

8. **MERCHANTABLE HEIGHT and PRODUCT CALLS:** The total number of segments shall be estimated by rounding up or down based on the mid-point of the segment. EXAMPLE: A tree that has 44' of merchantable height shall have 5, 8' segments; a tree with 44.1' of merchantable

height shall have 6, 8' segments. The projected portion of rounded-up trees shall be assumed to be of the same grade as the visible portion of that segment.

Record the product code for each 8 foot section of the tree from the stump to the limit of merchantability. Product codes and specifications are provided on the Laminated Spec Card and below.

CODE	PRODUCT	SPECIES	MIN. DBH CLASS	MIN. TOP DIA. ISB	MIN. LENGTH	DESCRIPTION
1	NOT USED					
2	SAWTIMBER	ALL HW	11"	10"	8'	Except Aspen. Min 2 CLF, max 25% internal defect, Straight (max 4" sweep)
		SP-FIR	8"	5"	16'	Sound, Straight, Free of Excessive Knots. Can call 8' after 16'
		HE_TAM	10"	8"	12'	Sound, Straight, Free of Excessive Knots. <3" re knots <1" black knots. Can call 8' after 16'
		CEDAR	10"	8"	12'	Sound, Straight, Free of Excessive Knots. <3" re knots <1" black knots. Can call 8' after 16'
		PINE	10"	8"	12'	WP & RP. Sound, Straight, Free of Excessive Knots. <3" re knots <1" black knots. Can call 8' after 16'
3	TIE/PALLET	ALL HW	10"	8"	8'	Except Aspen. Straight (max 4" sweep) and Sound, No estimated internal defect or rot, 0-1 CLF.
		PINE	9"	8"	8'	Straight (max 4" sweep) and Sound, No estimated internal defect or rot, 0-1 CLF.
4	AG TIE/PALLET	HM RO YB	9"	8"	8'	Straight (max 4" sweep) and Sound, No estimated internal defect or rot, Min 2CLF. Potential to grow into a sawlog or veneer.
5	PULPWOOD	ALL SPECIES	5"	4"	8'	24" maximum diameter, call pulpwood above sawtimber to merchantable hgt. If Top Diameter used no products called above the selected point on stem.
6	GROWING STOCK	ALL SPECIES	5"	4"	8'	Currently does not meet min. size requirements for a saw or pallet, but has potential to grow into a sawlog of any grade (pallet to veneer). Smooth and straight.
7	CULL	ALL SPECIES	5"	4"	8'	If Entire Tree, tally species & Dia., one cull segment and top diameter of 4

- Often, product breaks will occur outside of the segment intervals. Use the product calls that most accurately account for the volume of products in that tree. If 75% of a segment meets the specifications for a product, then the segment is that product. Project Forester/Check Cruiser will review product specifications and segment call protocol with cruisers at the beginning of the project. Only count the main leader on multiple stemmed trees.
- Do not call Growing Stock in UGS trees or above Cull or Pulpwood in AGS trees
- For cull trees, record one "7" and mark the tree with a "C" in the field.
- **No Product Call Trees:** For trees below the minimal merchantable diameter, record the species, diameter, level code and total height in feet.

Check Cruise Tolerance: While there should be in most cases a clear and distinct proper segment call, the Check Cruiser may find that a call is border-line and in his mind can make a reasonable determination that while the cruiser's call is different than the checker's, it is a valid call within the terms of the specific product call. This of course can never be the case if the segment clearly does not meet the specification.

Check Cruise Value: 1 point per product call.

9. TOP DIAMETERS: When utilized, record the estimated top diameter inside bark (d.i.b.) at the top of the last segment called.

- Even though the default top diameter for all product trees is 4", record TD for all trees.
- Even though the default top diameter for all no product trees is 1", record TD for all trees.

- TD must match specifications of last product called. For example, if last segment is a sawlog with d.i.b. minimum specification of 10", TD must be at least 10".
- **Form Class Change/Blow-out Trees:** If the TD of a segment is more than 4 inches smaller than the TD of the preceding segment, height estimate shall be ended at the preceding segment and record the TD of that segment. This rule **does not** apply to saw and pallet segments. Record all saw and pallet segments. See example in Appendix.

Check Cruise Tolerance: There will be a tolerance of +/- 1" on Top Diameter calls.

Check Cruise Value: 1 point

CHECK CRUISE PROCEDURES and SPECIFICATIONS:

LandVest Project Forester will check a minimum of 3% of each cruiser's points. The purpose of the check cruise is to evaluate the cruiser's compliance with all protocols of the cruise, the accuracy of the data collected and to identify any problem areas, misunderstandings, patterns, inconsistencies and/or bias. Cruisers will be notified as soon as possible as to the results of each check cruise. The score of the current check as well as a running score will be provided to the cruiser.

In addition to the score values assigned above, the check cruiser will evaluate the data and procedures to determine any bias on the part of the cruiser. Evidence of bias may include: marginal calls consistently rounded up or down, DBH consistently high or low, point locations consistently in lower stocked or open areas, etc. A bias penalty ranging from 0 to 5 points per cruise point may be assigned if necessary. This will be in addition to any errors on the point. If a cruiser is deemed to be biasing or negatively impacting the accuracy of the cruise results through inconsistent, incomplete, biased or generally inaccurate work, regardless of the cruise checkers technical score the cruiser could be failed. All cruisers must be deemed to be objectively implementing and meeting all cruise protocols and specifications.

The final acceptable error rate for this cruise will be 4%. The error rate for individual checks may exceed the acceptable rate. Check cruiser will determine the appropriate course of action based upon the actual errors discovered. The check cruiser may determine that points need to be revisited or that additional checks will need to be completed before the significance of the error is known.

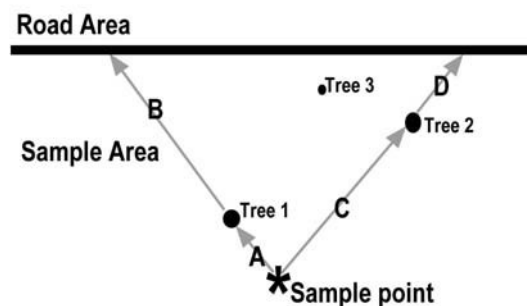
APPENDIX

THE WALKTHROUGH METHOD (IF UTILIZED FOR THIS CRUISE)

Boundary overlap for this cruise will be dealt with through the use of the “walkthrough method”. The method is applied for all tallied trees near the boundary of the sampled area. Cruisers first measure the distance between point center and the tally tree. They then “walk through” the tree the same distance on the same heading. If their ending location falls outside the sample area, the tree is tallied twice. If the location falls within the sampled area, the tree is tallied once as normal.

Figure A1 illustrates proper implementation of the method in its simplest form. Both Trees 1 and 2 in Figure A1 are large enough to be tallied. In most cases it is unnecessary to actually walk the second distance. The cruiser simply needs to compare the distance between point center and the tree, and the distance between the tree and the boundary. This is especially useful where the “out” area is water.

Figure A1. Walkthrough Method Basics



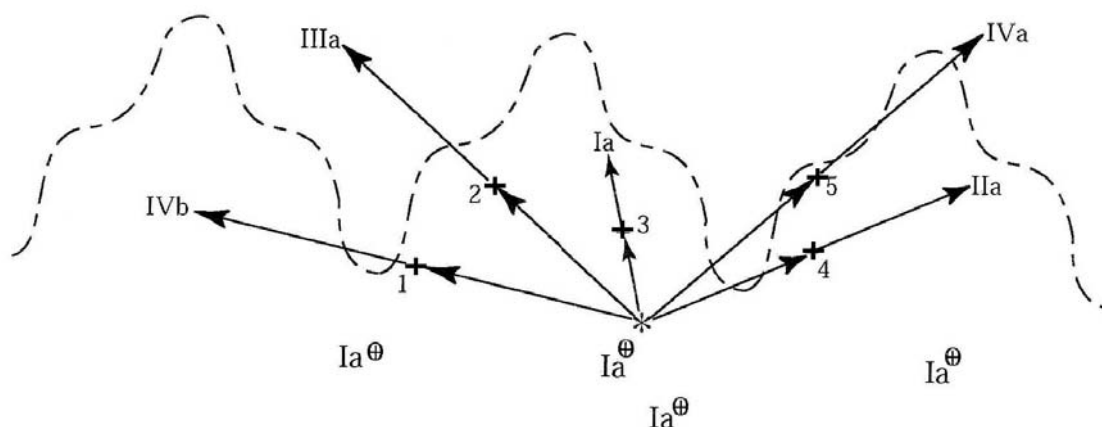
In the case of Tree 1, the cruiser measures the distance from point center to the center of Tree 1 at DBH (A). The cruiser also measures the distance from the center of Tree 1 to the road boundary (B). If distance A is smaller than distance B; that is, if the tree is closer to point center than the boundary, then Tree 1 is tallied normally. In many cases where the distances between point center and the tree, and the tree and the boundary line are obvious, no measurement is necessary.

In the case of Tree 2, the cruiser again measures the two distances between point center and the tree (C), and the tree and the boundary (D). In this case, Tree 2 is closer to the boundary line ($C > D$) than to the sample point. The tree is tallied twice.

In the case of Tree 3, the tree is too small to be tallied by the prism, so the walkthrough method need not be applied. The method is identical in the case of fixed radius plots.

The vast majority of boundary overlap cases are covered by the examples illustrated in Figure A1. However, it is conceivable in rare cases for a cruiser to walk out of the sample area and back in one or more times. The following key should be used in such cases. Figure A2 illustrates the results described by the key. Double-tally trees should be recorded twice. Signify double-tally trees in the field by marking two vertical lines below the tree's DBH line.

Figure A2. Graphic Illustration of the Walkthrough Method



Five sample objects (+), lying close to the boundary, have been tallied from a sample point (*). The arrows indicate the layout of the walkthrough points for each object; the outcome on the key is indicated for each walkthrough point. Objects 1, 3, and 4 are tallied normally; objects 2 and 5 are doubled-tallied. Four objects (⊕) lie “close to the boundary” but in positions where they would be single-tallied, and no measurements would be needed.

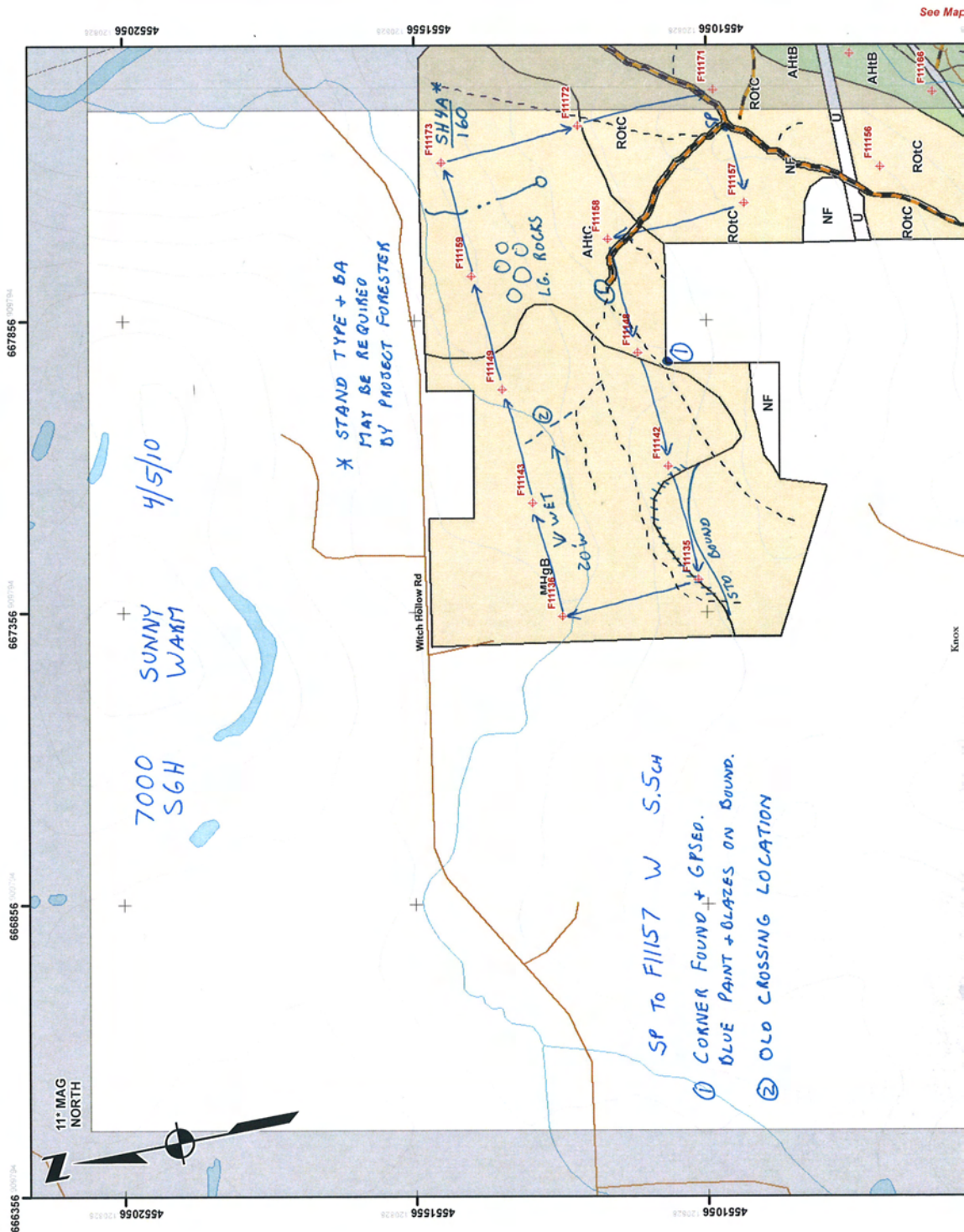
KEY

I	Is it possible that the tallied object is closer to the boundary than to the sample point?	
	Ia. NO – No action needed. Tally the object normally.	Ib. YES – Proceed to II.
II	Measure the distance from the sample point to the object – call this distance x. Now measure the distance from the object to the boundary, continuing on the same bearing. Call this distance y. Is y less than x?	
	NO – No action needed. Tally the object normally.	YES – Proceed to III.
III	Does the boundary curve back across the walkthrough line?	
	– Walkthrough point must be outside the tract. Double-tally the object.	YES – Proceed to IV.
IV	Move to the walkthrough point, so that the distance to the object equals the previously measured distance x along the same bearing, or to a point where that location can be clearly identified. Is the walkthrough point inside the tract?	
	NO – Double-tally the object.	YES – Tally the object normally.

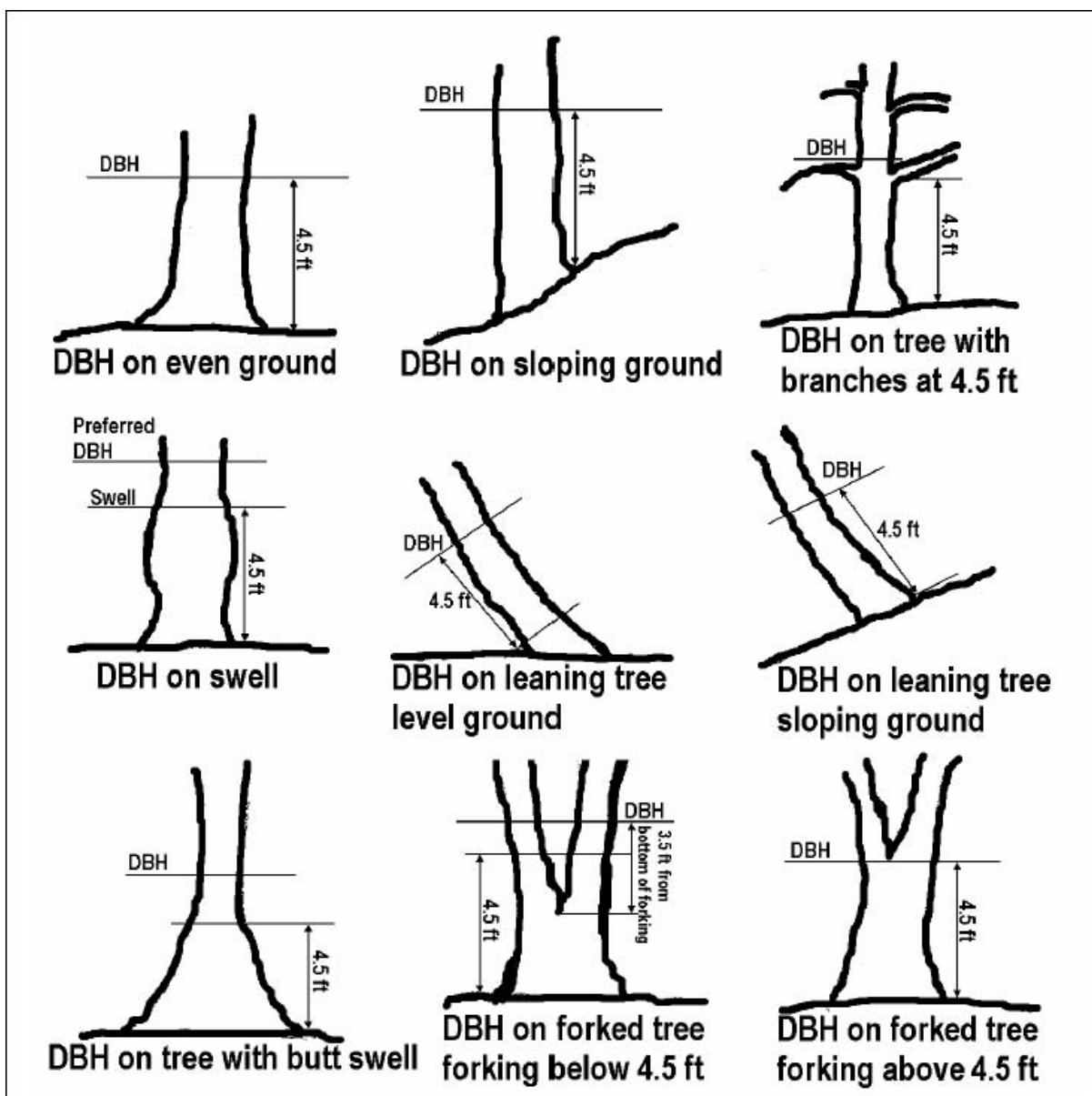
SPECIES CODES

AS	ASPEN, BIG TOOTH ASPEN
BA	BROWN ASH
BB	BLACK BIRCH
BC	BLACK CHERRY
BE	BEECH
BF	BALSAM FIR
BW	BASSWOOD
CE	NORTHERN WHITE CEDAR
EH	HEMLOCK
EL	ELM
GB	GRAY BIRCH
NU	NOT USED
NU	NOT USED
NU	NOT USED
NU	NOT USED
NU	NOT USED
NU	NOT USED
OH	OTHER HARDWOOD
OS	OTHER SOFTWOOD
PB	PAPER BIRCH
RM	RED (SOFT) MAPLE
RO	RED OAK
RP	RED PINE
SM	HARD (SUGAR) MAPLE
SP	SPRUCE
TA	TAMARACK
WA	WHITE ASH
WO	WHITE OAK
WP	WHITE PINE
YB	YELLOW BIRCH
<p>PLEASE NOTE: USE THESE TWO FOLLOWING CODES ONLY ON REGENERATION PLOTS</p> <p>NC Only for Regeneration Tally use for non-commercial species such as musclewood, witch-hazel, raspberries, etc.</p> <p>NS Only for Regeneration tally for a quadrant that is non-stocked.</p>	

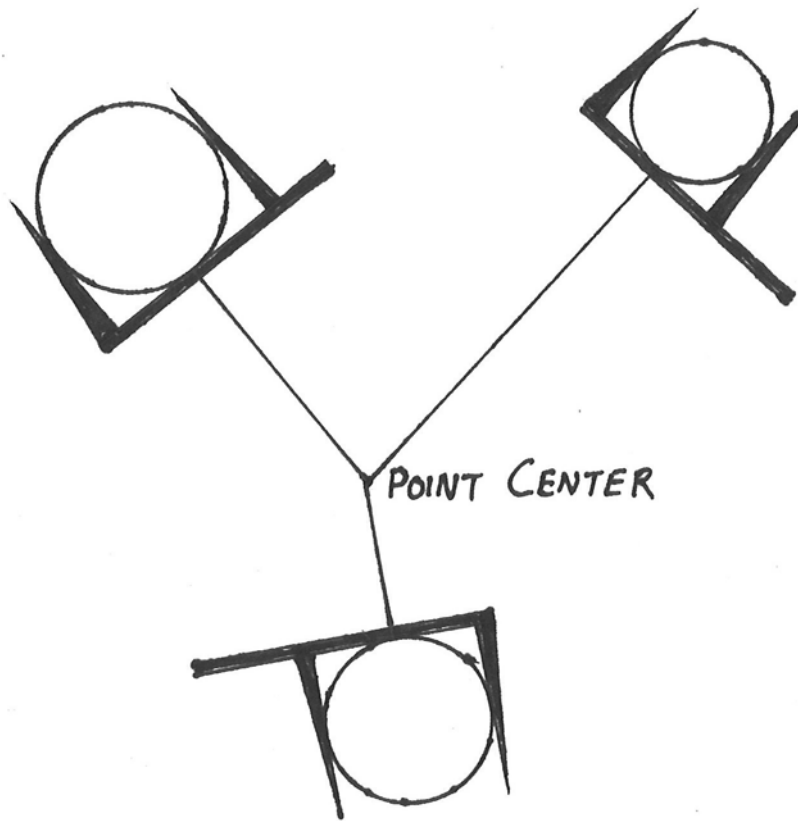
SAMPLE CRUISE CARD



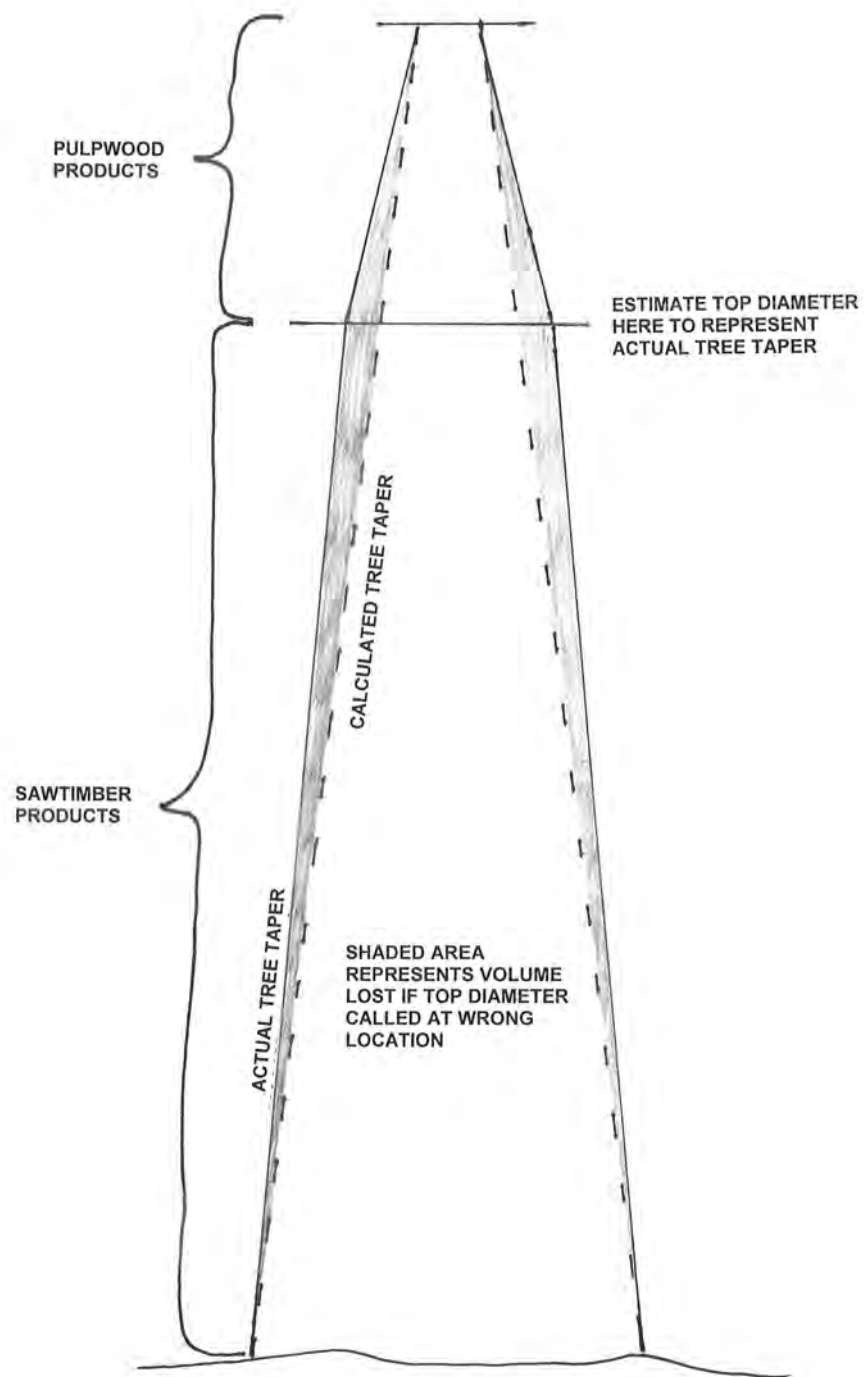
DBH ESTABLISHMENT EXAMPLES



CALIPER PLACEMENT



TOP DIAMETER DIAGRAM



SILVICULTURE CODES

CODE	DESCRIPTION
2SS	Two Stage Shelterwood
3SS	Three Stage Shelterwood
CGS	Combined Groups and Individual Tree
CLT	Cluster Thinning as Improvement
CTH	Crown Thinning
CTR	Crop Tree Release
FTH	Free Thinning
GPE	Group Cuts Even-Aged
GPS	Group Selection Uneven-aged
GSW	Group Shelterwood Even-aged
HRB	Herbicide
ITH	Improvement Thinning
ITS	Individual Tree Selection
NON	No Activity Required +/- 10 Years
OSR	Overstory Removal
PCT	Pre-Commercial Thinning (Brushsaw)
PLT	Planting
PTC	Patch Cuts
SAL	Salvage Harvest
SCC	Silvicultural Clear-Cut
STC	Strip Cuts
TFA	Thinning from Above
TFB	Thinning from Below
TSI	Timber Stand Improvement (Chainsaw)

INSECT & DISEASE CODES

CODE	DESCRIPTION
000	None
ANR	Anthraxnose
ARM	Armillaria Mellea
ASY	Ash Yellows
BBN	Beech Bark Nectria Complex
BFD	Beaver Flow Damage
BGM	Balsam Gall Midge
BIB	Bronze Birch Borer
BLK	Black Knot Fungi
BRF	Butt Rot Fungi Complex
BRR	Yellow Broom Rust Fungi
BSW	Bruce Span Worm
BTA	Balsam Twig Aphid
BWA	Balsam Wooley Adelgid
CNC	Cinder Conk
CSG	Cooley Spruce Gall
DBD	Deer Browse Damage
DRD	Drought Damage
EUC	Eutypella Canker
FPF	Fomes Pini Fungi
FRC	Fern Competition
FRD	Frost Damage
FTC	Forest Tent Caterpillar
FWW	Fall Web Worm
GHM	Ghost Moth Damage
GYM	Gypsy Moth
HWD	Hardwood Decline
HYC	Hypoxylon Canker
ICD	Ice Storm Damage
LEC	Lecaninum Scale
MBD	Moose Browse Damage
MLC	Maple Leaf Cutter
NEC	Nectria Canker
PBM	Paper Birch Miner
PFD	Porcupine Feeding Damage
PHD	Post Harvest Decline
PHS	Post Harvest Stress Decline
PRT	Pear Thrips
SBW	Spruce Budworm
SDP	Saddled Prominant
SMB	Sugar Maple Borer
SOC	Stand Opening Complex
SPD	Spruce Decline
SPM	Spruce Spider Mites
SPR	Spruce Root Rot Complex
SPS	Sap Sucker Damage
WNI	Winter Injury
WPA	White Pine Aphid
WPB	White Pine Blister Rust
WPW	White Pine Weevil
WTH	Wind Throw Damage
YBC	Yellow Birch Cinder Conk

WILDLIFE HABITAT CODES

CODE	DESCRIPTION	DETAIL
BEV	BEAVER DAMAGE/FLOODING	Evidence of active beaver use, dams, flooding, tree/shrub feeding, beaver sticks
BLB	BLACK BEAR MAST AREA	Bear scratched beech present, bear dens etc
BOG	BOG HABITAT AREA	Obligate soil, water and species found
CNT	CAVITY NESTERS	Evidence of snag or other trees that have excavated cavities
DWA	DEER WINTERING AREA	Spruce-fir, Hemlock, or cedar stands that show evidence of browse, pellet groups, even dead deer in evidence
EHZ	FOREST/FIELD EDGE HABITAT ZONE	Self Explanatory, but typically openings and forest intersections
ESF	EARLY SUCCESSIONAL FOREST HABITAT	Old fields or clear-cuts where early successional species are found or developing
FLW	FLOW HABITAT AREA	Flows associated with beaver and wetland considerations
MWY	MOOSE WINTER YARD	Generally upper elevation areas of Spruce-fir or mixed wood that have evidence of heavy browsing and moose droppings
MSH	MOOSE SUMMER HABITAT	Areas of mid and lower slopes, especially at wetland and softwood swamp edges where moose browsing is clearly evident
NON	NO UNIQUE HABITAT OR DAMAGE	Self explanatory
PPD	PORCUPINE DAMAGE	Self explanatory
RAP	RAPTOR TREES/NESTING SITES	Self explanatory
RFG	RUFFED GROUSE	Area that contain critical grouse habitat such as brood grounds in open hardwood, aspen stands for feeding, scattered softwood cover for winter roosts
RPZ	RAPARIAN ZONE HABITAT	Those areas clearly demonstrating the habitat features associated with waterways and their adjacent forested wetlands or riparian buffers
SGB	SONGBIRDS	Locating either a generalized or specific habitat, hearing of specific songs and or the location of nests, active or old
TES	THREATENED OR ENDANGERED SPECIES HABITAT	If there is an identified T & E and one comes across an example of the feature or species under consideration
VPA	VERNAL POOL AREA	As defined in our vernal pool guidelines
WTD	WHITE-TAILED DEER	Upland and areas of transition around deer wintering areas, or where summer browsing and bedding is found

INDICATOR PLANT CODES

CODE	PLANT	SITE CLASS
000	N/A	0
BBY	Bunchberry	P
BKC	Black Cohosh	R
BLC	Blue Cohosh	R
BSW	Birdseye Speedwell	X
BWT	Bellwort	I
CBL	Cintonia or Blue-bead Lily	P
CMF	Canada Mayflower	I
CNV	Canadian Violet	I
CSF	Cinnamon and Sensitive Ferns	S
CWS	Common Wood Sorrel	R
DGS	Dwarf Ginseng	R
DRB	Dwarf Raspberry	I
EMR	Early Meadow Rue	R
EUC	European Columbine	X
FMF	Foam Flower	R
FSS	False Solomon Seal	X
GAL	Golden Alexanders	I
GNT	Golden Thread	R
HBB	Hobblebush	I
ICR	Indian Cucumber Root	R
JIP	Jack-in-the-Pulpit	R
JLW	Jewel Weed	D
LAT	Labrador Tea	S
LLF	Leatherleaf	S
MHF	Maidenhair Fern	R
MMC	Marsh Marigolds-Cowslip	S
OHW	Orange Hawkweed	X
PBG	Pointed Blue-eyed Grass	X
PLS	Pink Lady Slipper	X
PTR	Painted Trillium	P
RBA	Rhodora Bog Azaleas	S
RBB	Red Baneberry	I
RBE	Rosy Bells Elderberry	I
RTS	Rose Twisted Stalk	I
STF	Star Flower	I
STN	Stinging Nettles	D
THW	Toothwort	R
TMR	Tall Meadow Rue	D
TRR	Tall Rattlesnake Root	R
WDL	Wild Leeks	R
WSH	Witherod Swamp or Fly Honeysuckle	S
WSS	Wild Sarsaparilla	I
WWA	White Wood Aster	X
YLS	Yellow Lady Slipper	R

FLEX FIBER DESCRIPTION

Flex-Fiber Habitat Types

There are 6 Fiber Ecological Land Classifications. Each plot, or in some cases each stand type, needs to be classified based on these 6 general types. Following you will find the FF manuals description of these types. When making a habitat classification call please remember this call is based on the site, not necessarily what the current overstory represents. **The emphasis should be on the site characteristics in that the manner in which Fiber uses these calls varies by anticipated site factors, not necessarily the current overstory composition.** A Spruce-fir site high-graded or mined for Spruce and Fir that has remnant hardwoods remaining s/b classed as Spruce-fir (5). The cruiser needs to observe many factors, from soil, drainage, topographic location, regeneration, and indicator species. I have provided a more general suggestion of the type and what you would use as the Habitat Classification:

Habitat Type Considerations and Type Falling under this Classification

1 Beech-Red Maple Secondary hardwood sites and hardwood dominated mixed wood sites will often fall into this classification. The classic R types in Adirondacks and the Beech, Yellow Birch, Spruce sites in VT are examples. These will have more poorly drained or ledgy soils, and will often have a significant softwood component. (HW only)

2 Cedar-Black Spruce Our poorest site classification. You will more than likely get wet feet in these types. Found on flat and very poorly drained soils. These sites have the lowest growth rates and generally the poorest timber values. (SW only)

3 Oak-White Pine Southwestern Maine and many NH sites fall into these sandy outwash and often shallow bedrock sites. Many RO or P types would be found here (HS-SH)

4 Hemlock-Red Spruce More upland softwood sites and softwood dominated mixed wood types would fall into this category. Shallow soils or dry rocky soils can be found here. SH mixed wood types would typically fall into this classification (SW and SH-HS)

5 Sugar Maple-White Ash Types classified as 5 should be the best hardwood sites generally occupied by Northern Hardwoods, good Red Oak sites, etc. These are generally our most productive HW sites. Deep well drained soils, enriched sites within, excellent site quality. (HW only)

6 Spruce-Fir These are our classic spruce-fir stands found across the region. Dominated by a mix of Red spruce and Balsam fir, but can have components of Hemlock, Tamarack, White and Red pine, Northern White Cedar and a mix of Yellow birch and red maple as minor components. (SW and SH-HS)

The generalized forest type (in parenthesis) for each class represents how the stand typed with this Fiber Habitat Class will be considered by the growth modeler. Example: any plot/stand typed as a 1 will be considered a HW type into the future, even if it will carry softwood components as well.

SITE CLASS DESCRIPTION

Site Indicator Species Flex-Rider		
Site Class	Habitat Class	Species
Rich -R-	5	Blue Cohoosh*, Dwarf Ginseng, Indian Cucumber Root, Foam Flower*, Black Cohoosh, Maidenhair Fern*, Early Meadow Rue, Common Wood Sorrel, Golden Thread, Toothwort, Tall Rattlesnake Root, Yellow Lady Slipper*
Intermediate -I-	1 & 4	Rose Twisted Stalk, Wild Sarsapilla, Star Flower*, Canada Mayflower*, Canadian Violet*, Rosey Bells, Elderberry, Hobblebush, Red Baneberry, Bellwort, Dwarf Raspberry, Golden Alexanders
Dry Xeric -X-	3	White Lady Slipper, False Solomon Seal*, Birdseye Speedwell, White Wood Aster, Orange Hawkweed, European Columbine, Pointed Blue-eyed Grass
Rich/Deep Organic Wet -D-	5	Jewel Weed*, Stinging Nettles*, Tall Meadow Rue
Poor, Acidic Sites -P-	6	Clintonia or Blue-bead Lily*, Bunchberry*, Painted Trillium
Swamp/VP Drained -S-	2	Marsh Marigolds-Cowslip Rhodora Bog Azaleas, Yellow Lady Slipper*, Witherod, Swamp or Fly Honeysuckle, Labrador Tea, Leatherleaf, Cinnamon and Sensitive Ferns*

* Indicates Color Picture Available in Guide

LIMITING DISTANCE

The basic formula for calculating Limiting Distance is:

$$LD = DBH \text{ (to 0.1") } \times \text{Slope Correction Factor} \times \text{Limiting Distance Factor}$$

However, there are acceptable variations on the formula to save time.

Variation 1:

Utilizes Table LD 1 below to eliminate one multiplier. This method is most useful on flat ground where the Slope Correction Factor is rarely needed.

$$LD = (A) \times \text{Slope Correction Factor}$$

Where (A) is (DBH x LDF) from the appropriate cell from Table LD 1

Variation 2:

Utilizes the column labeled "MULT" (multiplier) in Table SC 1.

$$LD = DBH \times (B)$$

Where (B) is (SCF x LDF)

Table SC 1

LIMITING DISTANCE TO CENTER					
<div>10</div>		BAF			
LD = DBH x Multiplier					
Slope %	SCF	MULT	Slope %	SCF	MULT
0-9	1.00	2.750	68-69	1.21	3.328
10-17	1.01	2.778	70	1.22	3.355
18-22	1.02	2.805	71-72	1.23	3.383
23-26	1.03	2.833	73-74	1.24	3.410
27-30	1.04	2.860	75	1.25	3.438
31-33	1.05	2.888	76-77	1.26	3.465
34-36	1.06	2.915	78-79	1.27	3.493
37-39	1.07	2.943	80	1.28	3.520
40-42	1.08	2.970	81-82	1.29	3.548
43-44	1.09	2.998	83	1.30	3.575
45-47	1.10	3.025	84-85	1.31	3.603
48-49	1.11	3.053	86	1.32	3.630
50-51	1.12	3.080	87-88	1.33	3.658
52-53	1.13	3.108	89	1.34	3.685
54-55	1.14	3.135	90-91	1.35	3.713
56-57	1.15	3.163	92	1.36	3.740
58-59	1.16	3.190	93-94	1.37	3.768
60-61	1.17	3.218	95	1.38	3.795
62-63	1.18	3.245	96-97	1.39	3.823
64-65	1.19	3.273	98	1.40	3.850
66-67	1.20	3.300	99-100	1.41	3.878

Table LD 1

Limiting Distance to Tree Center

BAF 10

Limiting Distance Factor 2.75

DBH	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1	2.75	3.03	3.30	3.58	3.85	4.13	4.40	4.68	4.95	5.23
2	5.50	5.78	6.05	6.33	6.60	6.88	7.15	7.43	7.70	7.98
3	8.25	8.53	8.80	9.08	9.35	9.63	9.90	10.18	10.45	10.73
4	11.00	11.28	11.55	11.83	12.10	12.38	12.65	12.93	13.20	13.48
5	13.75	14.03	14.30	14.58	14.85	15.13	15.40	15.68	15.95	16.23
6	16.50	16.78	17.05	17.33	17.60	17.88	18.15	18.43	18.70	18.98
7	19.25	19.53	19.80	20.08	20.35	20.63	20.90	21.18	21.45	21.73
8	22.00	22.28	22.55	22.83	23.10	23.38	23.65	23.93	24.20	24.48
9	24.75	25.03	25.30	25.58	25.85	26.13	26.40	26.68	26.95	27.23
10	27.50	27.78	28.05	28.33	28.60	28.88	29.15	29.43	29.70	29.98
11	30.25	30.53	30.80	31.08	31.35	31.63	31.90	32.18	32.45	32.73
12	33.00	33.28	33.55	33.83	34.10	34.38	34.65	34.93	35.20	35.48
13	35.75	36.03	36.30	36.58	36.85	37.13	37.40	37.68	37.95	38.23
14	38.50	38.78	39.05	39.33	39.60	39.88	40.15	40.43	40.70	40.98
15	41.25	41.53	41.80	42.08	42.35	42.63	42.90	43.18	43.45	43.73
16	44.00	44.28	44.55	44.83	45.10	45.38	45.65	45.93	46.20	46.48
17	46.75	47.03	47.30	47.58	47.85	48.13	48.40	48.68	48.95	49.23
18	49.50	49.78	50.05	50.33	50.60	50.88	51.15	51.43	51.70	51.98
19	52.25	52.53	52.80	53.08	53.35	53.63	53.90	54.18	54.45	54.73
20	55.00	55.28	55.55	55.83	56.10	56.38	56.65	56.93	57.20	57.48
21	57.75	58.03	58.30	58.58	58.85	59.13	59.40	59.68	59.95	60.23
22	60.50	60.78	61.05	61.33	61.60	61.88	62.15	62.43	62.70	62.98
23	63.25	63.53	63.80	64.08	64.35	64.63	64.90	65.18	65.45	65.73
24	66.00	66.28	66.55	66.83	67.10	67.38	67.65	67.93	68.20	68.48
25	68.75	69.03	69.30	69.58	69.85	70.13	70.40	70.68	70.95	71.23
26	71.50	71.78	72.05	72.33	72.60	72.88	73.15	73.43	73.70	73.98
27	74.25	74.53	74.80	75.08	75.35	75.63	75.90	76.18	76.45	76.73
28	77.00	77.28	77.55	77.83	78.10	78.38	78.65	78.93	79.20	79.48
29	79.75	80.03	80.30	80.58	80.85	81.13	81.40	81.68	81.95	82.23
30	82.50	82.78	83.05	83.33	83.60	83.88	84.15	84.43	84.70	84.98
31	85.25	85.53	85.80	86.08	86.35	86.63	86.90	87.18	87.45	87.73
32	88.00	88.28	88.55	88.83	89.10	89.38	89.65	89.93	90.20	90.48
33	90.75	91.03	91.30	91.58	91.85	92.13	92.40	92.68	92.95	93.23
34	93.50	93.78	94.05	94.33	94.60	94.88	95.15	95.43	95.70	95.98
35	96.25	96.53	96.80	97.08	97.35	97.63	97.90	98.18	98.45	98.73
36	99.00	99.28	99.55	99.83	100.10	100.38	100.65	100.93	101.20	101.48
37	101.75	102.03	102.30	102.58	102.85	103.13	103.40	103.68	103.95	104.23
38	104.50	104.78	105.05	105.33	105.60	105.88	106.15	106.43	106.70	106.98
39	107.25	107.53	107.80	108.08	108.35	108.63	108.90	109.18	109.45	109.73
40	110.00	110.28	110.55	110.83	111.10	111.38	111.65	111.93	112.20	112.48

CHECK CRUISE SCORING

LANDVEST, INC. TIMBERLANDS
LV CRUISE TALLY SHEET

CLIENT ID: 70000
TOWN: 1234
BLOCK: 56H
STAND: 052510
POINT #: 052510
CRUISER
DATE

OVERSTORY
TYP SZ STK
H 4 C
H 1 A

UNDERSTORY
TYP SZ STK
H 1 A

OPERABILITY: 4 B P ROCKY
REGEN: NS BC RH NC
ELEV. 11 I

SILVICULTURE
1 OSR 1 F S F
2 ✓ ✓ ✓ ✓ ✓
3 ✓ ✓ ✓ ✓ ✓

WILDLIFE
1 F S F
2 ✓ ✓ ✓
3 ✓ ✓ ✓

INSECT/DISEASE
1 DBD 1 C N V
2 ✓ ✓ ✓ ✓ ✓
3 ✓ ✓ ✓ ✓ ✓

INDICATOR PLANTS
1 C N V
2 ✓ ✓ ✓
3 ✓ ✓ ✓

COMMENTS:

0 ERRORS FRONT OF CANO

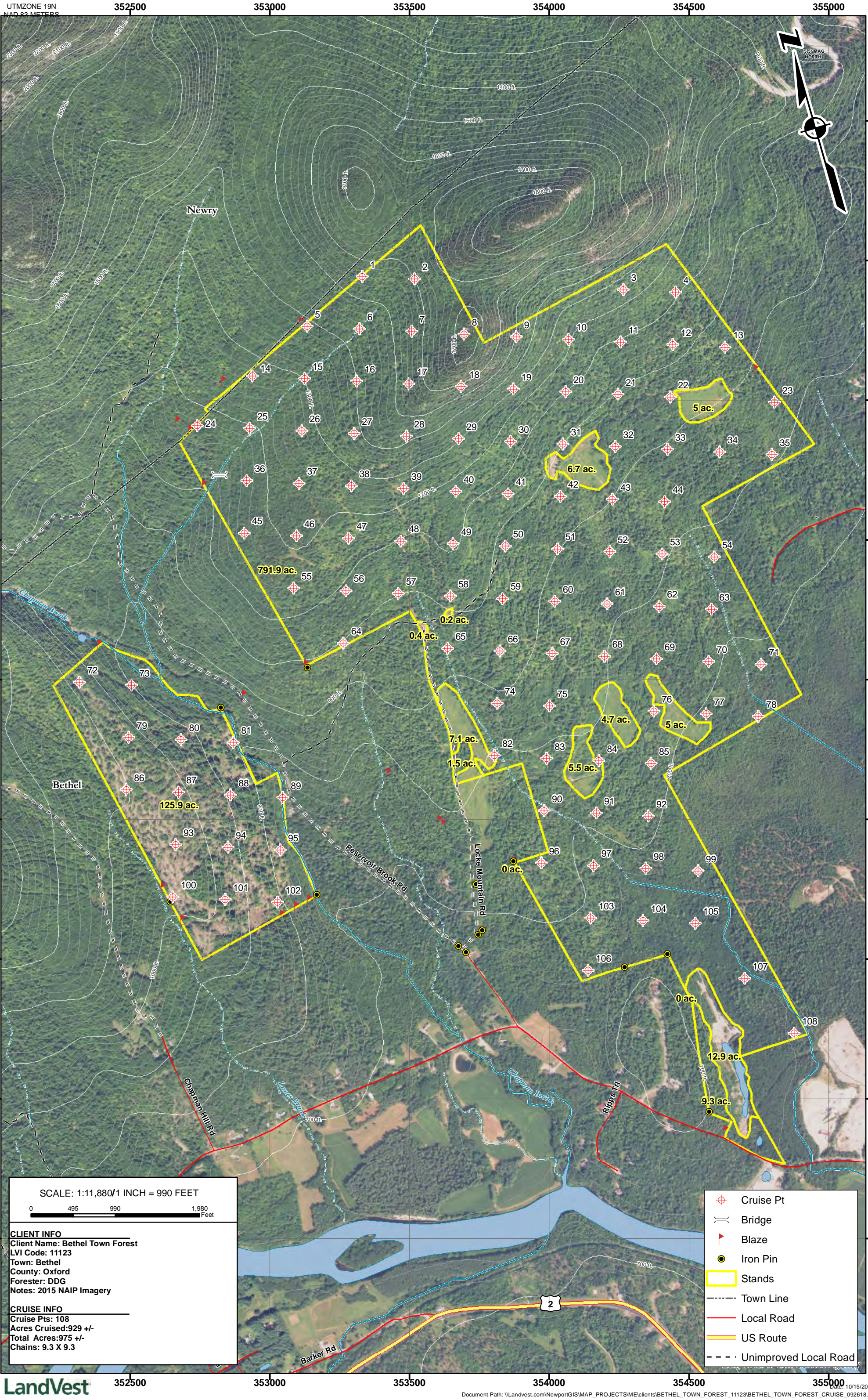
LANDVEST LVCRISE TALLY SHEET

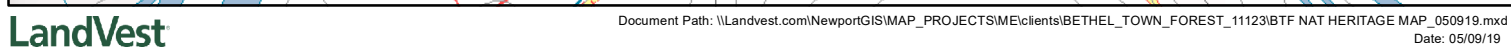
T# 3 Height TD 4 BEARING 48° DISTANCE 22.5'
Hgt Tree 3 PC to T1 4

CLIENT ID: 70000 PNT: 11234

TR	SP	DBH	1	2	3	4	5	6	7	8	9	10	11	12	TD	N
1	RM	19	✓	2	2	2	3	5	5	5						4
2	BM	19	U	7	3	3	3	5	5							4
3	RM	17	A	2	2	2	2	5	5							4
4	RM	15	U	5	5	5	5	5	5							4
5	RM	17	A	2	2	2	2	3	3	5						4
6	BC	17	A	2	2	2	2	3	3	5						4
7	BC	1	A	10	1											4
8	BC	2	A	20	1											4
9	YB	14	U	7												4
10	RM	10	A	6	6	5	5									4
11	RM	24	A	2	2	2	2	2	3							4
12	RM	11	3	6	6	5	5									4
13	RM	8	U	5	5	5	5									4
14	RM	6	U	5	5	5	5									4
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																

BASE TREES
 $\frac{1}{5} + \frac{5}{126} = \frac{6}{131} = 4.6\%$



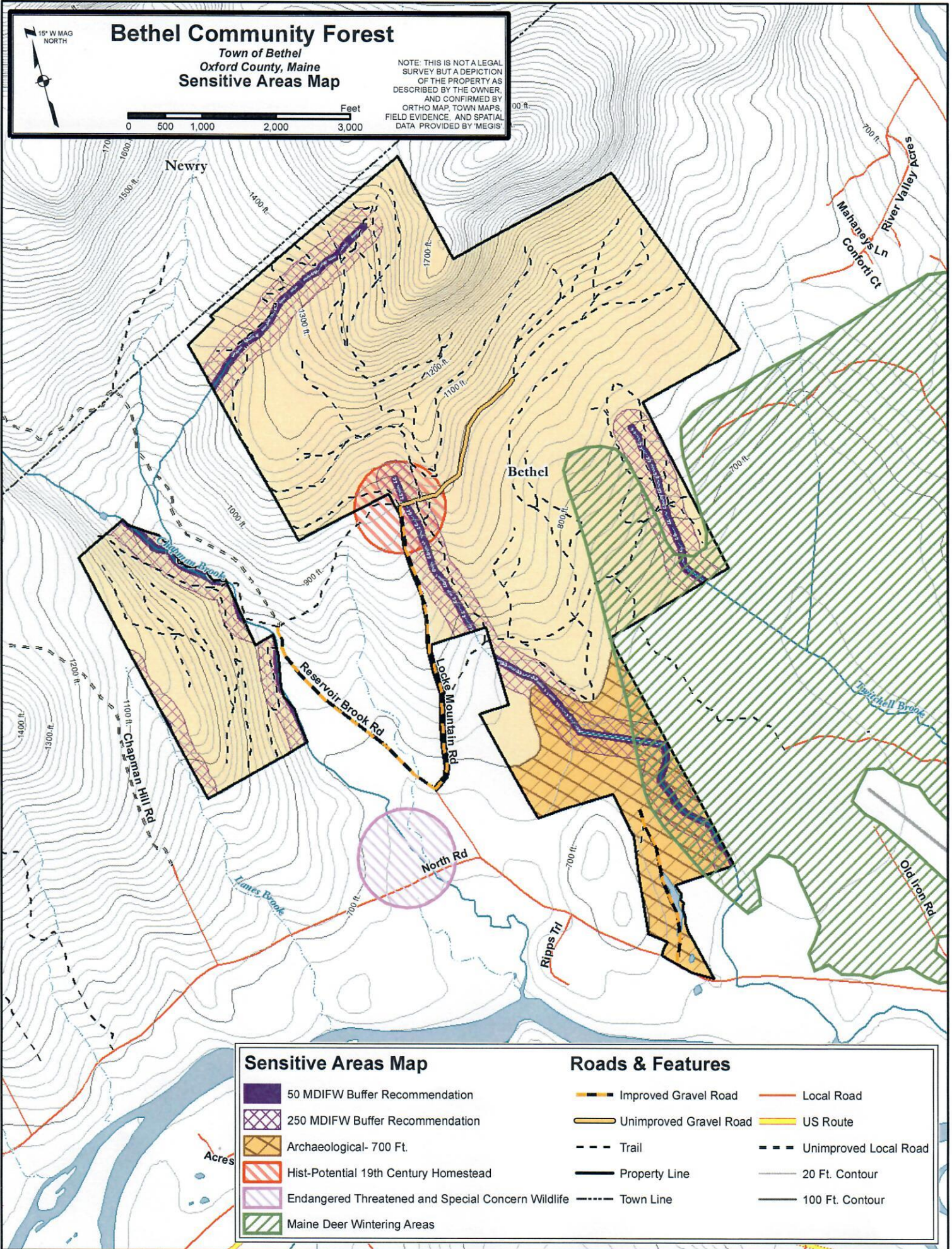


Bethel Community Forest

Town of Bethel
Oxford County, Maine

Sensitive Areas Map

NOTE: THIS IS NOT A LEGAL SURVEY BUT A DEPICTION OF THE PROPERTY AS DESCRIBED BY THE OWNER, AND CONFIRMED BY ORTHO MAP, TOWN MAPS, FIELD EVIDENCE, AND SPATIAL DATA PROVIDED BY 'MEGIS'.



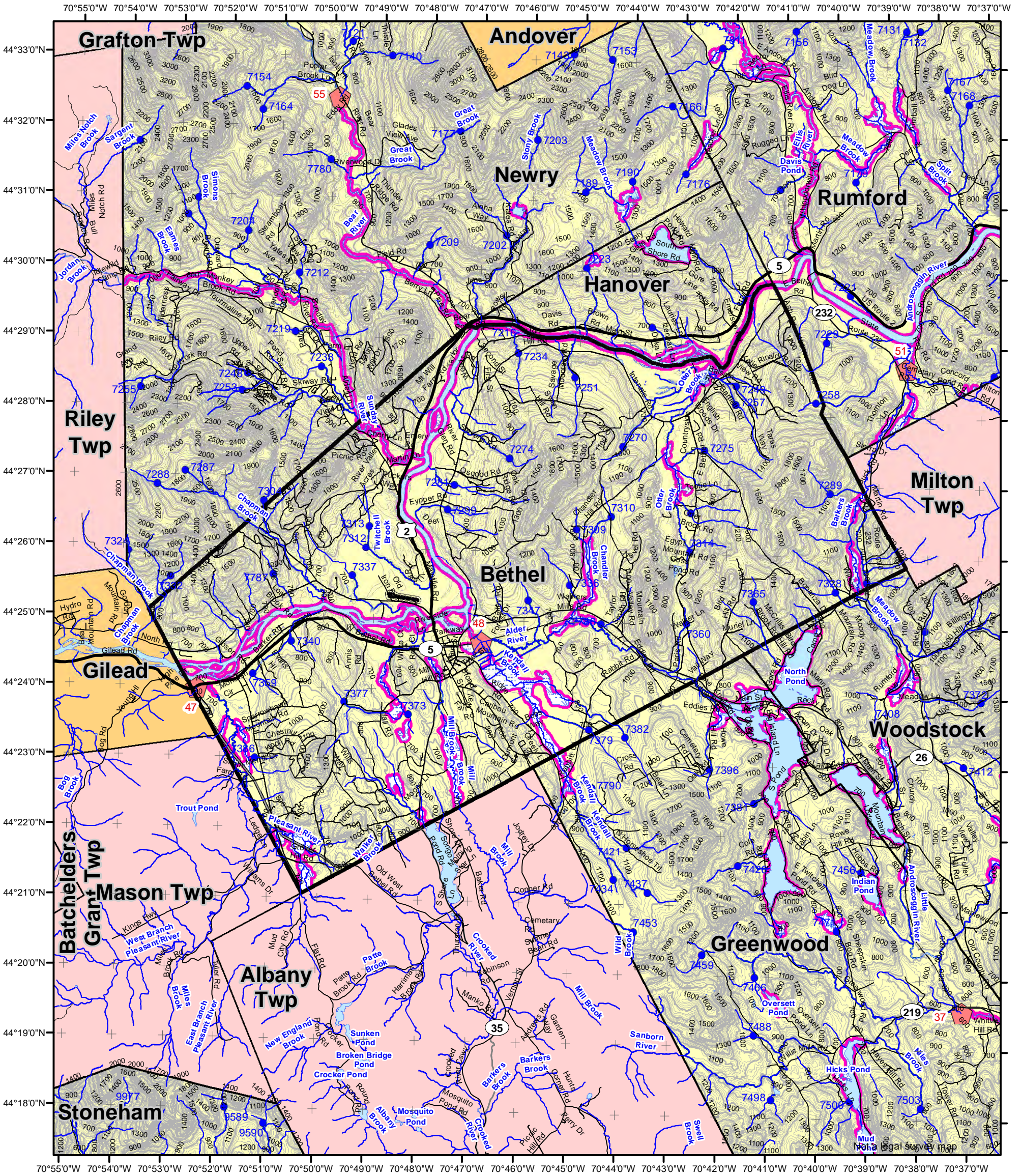
Sensitive Areas Map

- 50 MDIFW Buffer Recommendation
- 250 MDIFW Buffer Recommendation
- Archaeological- 700 Ft.
- Hist-Potential 19th Century Homestead
- Endangered Threatened and Special Concern Wildlife
- Maine Deer Wintering Areas

Roads & Features

- Improved Gravel Road
- Unimproved Gravel Road
- Trail
- Property Line
- Town Line
- Local Road
- US Route
- Unimproved Local Road
- 20 Ft. Contour
- 100 Ft. Contour

Statewide Standards for Timber Harvesting in the Shoreland Area* Map



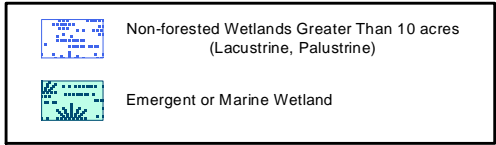
This map is **ADVISORY**, for planning purposes only. Actual ground conditions and water body locations determine where and how MFS timber harvesting rules apply. Contact the MFS for additional information/assistance from a MFS Forester.

Forest Operation Notification & Shoreland Area* Map

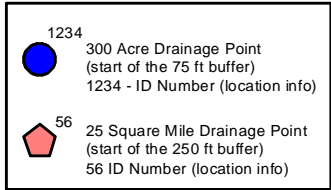
Bethel

LO Last Name _____
LO First Name _____
Prepared By _____
FONS # _____
Date _____

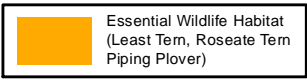
Wetlands



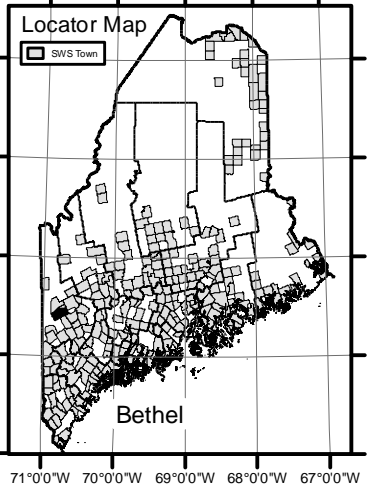
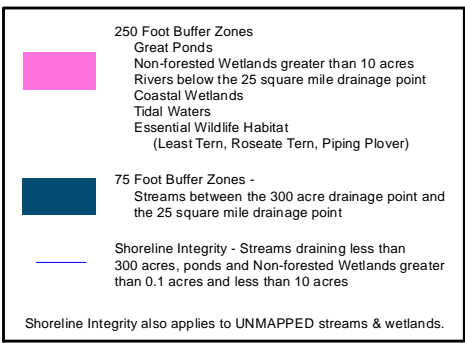
Drainage Points



Habitat



Buffers



Department of Agriculture, Conservation and Forestry
Maine Forest Service

Maine Forest Service

For additional information, please contact the MFS at:
1-207-287-2791 or 1-800-367-0223 (in-State)

Email us at: forestinfo@maine.gov

or on the web at: www.maineforestservice.gov

*See MFS Rule - Chapter 21 for additional information.

G.T.Miller E:\s\sws\Town Final Map July 2019 11 x 17.mxd

