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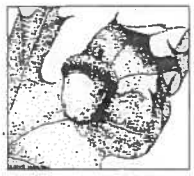
FOREST MANAGEMENT PLAN

Submitted to: Massachusetts Department of Conservation and Recreation
For enrollment in CH61/61A/61B and/or Forest Stewardship Program



CHECK-OFFS					Administrative Box			
CH61	CH61A	CH61B	STWSHP	C-S	Case No.	154-322	Orig. Case No.	FR 500
cert. ☐	cert. ☐	cert. ☐	new ☐	EEA ☐	Owner ID	401009	Add. Case No.	
recert. ☐	recert. ☒	recert. ☐	renew ☐	Other ☐	Date Rec'd	9-11-14	Ecoregion	221Ah
amend ☐	amend ☐	amend ☐	Green Cert ☐		Plan Period	2015-2024	Topo Name	W-burg
			Conservation Rest. ☐		Rare Spp. Hab.	Y25	River Basin	CT
Plan Change: _____ to _____			CR Holder _____					

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) MT Toby Friends Meeting
Mailing Address Long Plain Road, Leverett, MA 01054 Phone 413-548-9188

Property Location: Town(s) Leverett & Sunderland Road(s) Long Plain Rd. aka Rte 63

Plan Preparer Michael Mauri, Forester Mass. Forester License # 161
Mailing Address 20 West Street, South Deerfield, MA 01373 Phone (413) 665-6829

RECORDS

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A 61B *Excluded* Acres	Ch61/61A 61B **Certified** Acres	Stewshp *Excluded* Acres	Stewshp Acres
5 Lev	16	1331	177	108.4	67.4	41	108.4	0
8 Sund	10	1331	177	10.3	10.3	0	10.3	0
-	-	-	-	-	-	-	-	-
			TOTALS	118.7	77.7	41	118.7	0

Excluded Area Description(s) (if additional space needed, continue on separate paper)
NEW: All land is EXCLUDED, except the following 41-acre area located east of the power lines and known as Stand 1: INCLUDED: beginning in the NE corner of the property, at or near a corner pin, then W'ly along a barbed wire fence, with is the property boundary with abutter Cowls, to the eastern sideline of the power line ROW, then SE'ly along the power line ROW approximately 2,014' to a point at the edge of the ROW, then NE'ly to a corner now or formerly with Fitzpatrick, then continuing NE'ly at the same or at a similar bearing along the boundary of land now or formerly of Fitzpatrick then now or formerly of Herbert to the beginning.

HISTORY

Year acquired 1972 Year management began 1987

Are boundaries blazed/painted? Yes ☐ No ☐ Partially ☒

What treatments have been prescribed, but not carried out (last 10 years if plan is a recert.)?
stand no. 2 treatment pruning, harvesting reason *
(if additional space needed, continue on separate page)

Previous Management Practices (last 10 years)

Stand #	Cutting Plan #	Treatment	Yield	Value	Acres	Date
1	154-6666-14	selection	33 M, 61 cd	$2,044	25	1/2014

Remarks: (if additional space needed, continue on separate page)
*getting the work done in Stand 1 was difficult and consumed all the available time and attention -- Stand 2 is being removed from CH 61A at this time and will be enrolled in CH 61B with the other forest land excluded from CH 61A.

Stand	Type	Acres	MSD"	BA	Mbf / acre	Cords / acre	Site Index
1	HH	41.00	12.3	75	4.8	13	OR 55

HH= hemlock and hardwoods, mostly oaks and black birch

Average basal area (BA) is 75; the range is: 20 – 130.

Of the 4.8 Mbf per acre, approx. 3.0 consists of oaks, mostly red oak. The remainder is white pine, hemlock and black birch.

Of the 9 "cords" per acre, about 0.8 cords is hardwood growing stock, 1.6 cords is firewood, 1.1 cords is softwood pulp, and 4 cords is "habitat" trees consisting mainly of hemlocks 11"-21" that are nearly dead or dead.

Overstory (species and condition): Various numerical information is provided above. This section will interpret the numerical information and further describe the stand.

This stand has been harvested two times in recent times, in 2002 and again in early 2014. Each harvest has been designed to improve the quality and growth of the remaining stand, with an emphasis on timber value enhancement, but within a framework of promoting forest diversity. Due to steep terrain, only 22 of 41 acres was cut in 2014; in 2002, the harvest extended further down the slope, but did not reach all areas. Unharvested areas have a basal area of about 130. As a result, the stand contains both harvested and unharvested areas. The harvesting was irregular in intensity, with the result that the overstory density is irregular, ranging from 50 to 100, with a few areas as low as 20. In an area with a basal area of 20, enough light is getting through the sparse canopy so that existing or future seedlings will be free to grow. Paper birch and black cherry may be among the seedlings. These appear as "small openings". In an area with a basal area of 130, the canopy is generally quite closed and even crowded, and the understory is sparse; few seedlings are able to grow. In an area with a basal area of 50-100, the overstory trees generally have good spacing and will be able to grow well over the next ten or more years; seedlings of many species and diverse vegetation will be able to become established in the understory. Currently, this stand has a broad range of overstory densities.

As hemlock has been harvested and as the remaining hemlock succumbs to hemlock woolly adelgid and elongate hemlock scale, the oak component is becoming more prominent: almost half of the basal area is oak, primarily red oak, with minimal amounts of white oak, black oak and chestnut oak. Several white oaks are quite large, with large crowns. There is a small amount of pignut hickory. Together, these trees provide an

important food source (nuts) that directly or indirectly benefits a diverse array of wildlife. These trees are healthy, and range in size from 8" to 24" diameter, with many oaks falling in the 16"-19" range.

White pine is present generally as impressive, scattered trees or in small groups of tall trees. With one or two exceptions, no white pine was cut in the recent harvest so that the seed source and diversity could be retained. One pitch pine was noted, and there are probably several others.

Hemlock will continue to weaken due to the aforementioned pests, and many, perhaps most, will die, possibly within the next several years. Currently, most hemlocks have very weak (thin) crowns, and thus their ability to photosynthesize is minimal. As these trees continue to weaken and die, they will provide habitat for a number of insect-seeking wildlife, such as woodpeckers, but also black bears. Chickades and certain other birds will be able to excavate nests in the rotten wood. The forest will resemble to a greater extent an old growth forest in its structure. Even within the harvest area, we did not (in 2014) cut all the hemlock, partly for the habitat benefits mentioned above, and in part on the chance that there could be a reversal.

Black birch is the other common hardwood. On this somewhat dry hilltop, black birch is severely constrained in its ability to grow to large size, with 16"-18" representing a "large" black birch. Black birch will probably become a lot more abundant in the future, and is likely to be a main component of the young trees that will seed in and take up the new growing space. All winter long, chickadees take seeds from the black birches, which slowly release their seeds throughout the winter.

Because of hemlock shade, and the heavy deer browsing, the understory is generally not well-developed, and consists largely of oak leaf and hemlock needle litter, although with the increased sunlight from the recent cutting, this is about to change. In some areas, the first signs of lowbush blueberry and huckleberry are emerging, as well as sedges. In many cases, these are starting to grow out from under the logging slash (i.e. the branches and other residue of logging), which provides a favorable microclimate and some protection from deer. There are scattered oak, red maple and black birch seedlings, though most exceeding 1' in height have been browsed back by deer. In a few patches there are taller black birch saplings, together with white pine, which were initiated after the 2002 cutting. Hayscented fern sometimes grows in thick patches, though this is not widespread. There is a small amount of striped maple, but with deer (and moose), this is not likely to proliferate.

In the lower slope areas, witch hazel is prevalent, along with some mountain laurel and beaked hazel.

This stand has high recreational value. Due to its somewhat remote location, it is quiet and peaceful, and there are partial views from some of the steep knobs. Currently, the stand is full of light and is interesting to see. The recent logging has not made it difficult to walk around the stand

Management options: Past management has led to the creation of the current conditions. At this writing, the stand is in a desirable condition and is well suited to allowing 10 years of growth to accumulate before re-visiting this question. Because conditions can change suddenly, it would be worth considering a periodic walk-through to check on conditions. If, for example, a strong windstorm occurred and a lot of the timber blew down, it would be good to know about this and consider changing the management recommendation to include salvaging some of the timber.

The eastern boundary should be located and marked.

Town(s) Leverett Owner(s) MT Toby Friends Meeting

Explanation of Silvicultural Methods

"Silviculture" is the body of ideas and practices used by foresters to shape the forest. Ideally, the forester will mark the silviculture (by painting trees to be cut). A crucial aspect of success is to find a logger who is willing and able to carry out the marked cutting as the forester intends.

To the landowner: recommended silvicultural methods for your particular forest stands are referred to in Stand-level management practices on subsequent pages and are drawn from the following list. Silvicultural methods are broadly divided into two groups, **intermediate cuts** and **regeneration cuts**. Intermediate cuts focus on improving growth in existing overstory trees. Regeneration cuts focus on establishing and promoting new stands of trees. Please note that in considering or implementing any of the methods described below there are numerous factors that must be contemplated and addressed, such as competing vegetation, browse, optimal logging systems, woodlot access (roads, landings, etc.), time of year and ground conditions, and measures to protect state-listed species, watercourses and wetlands, etc.

Intermediate Cuts

Thinnings & Improvement Cuts: These reduce the density of trees to enhance the vigor of residual trees. An improvement cut is usually an initial treatment that removes trees of low quality or undesirable species. Thinnings are subsequent adjustments to continue focusing growth on selected trees. Intermediate cuts that are overly "heavy" (i.e. cuts that let in a lot of light) are classified as regeneration cuts: *proposed* (pending as of this writing) basal area thresholds are as follows: BA = 100 for conifer stands, BA = 60 for hardwood stands, BA = 80 for conifer-hardwood stands.

Regeneration Cuts

Regeneration cuts use existing stands of trees to create future stands of trees. The future stands of trees can be of a single age (known as "even-aged"), two ages (two-aged) or of three or more ages (uneven-aged). In regeneration cuts, particular attention is paid to seed sources and/or existing seedlings/saplings for the future stand, light conditions in the understory, and interfering factors (e.g. native or non-native competitor plants in the understory, browsing by deer or moose, etc.). A regeneration cut can be sudden and decisive (clearcutting, seed-tree, coppice, single-cut shelterwood), or a regeneration cut can be staggered (multiple cut shelterwood), or ongoing (uneven-aged, i.e. "selection system" or "irregular shelterwood").

Even-aged Regeneration Methods

Clearcut: All established trees are removed to allow new trees to grow from seed in full sun. Clearcutting is especially appropriate for early-successional species (e.g. paper birch, poplar and black cherry plus gray birch and pin cherry) and may grow with mixes of hemlock, red maple and other birches. Seeding is assumed to occur from edge trees or from seed stored in the soil (cherry). Clearcuts may be up to 5 acres, or, if artificial seeding or planting is used, up to 10 acres. Larger clearcuts require special permission. Clearcuts separated by more than 100 feet are considered separate. Clearcutting is sometimes confused with the final cut ("overstory removal cut") in a shelterwood system (see below), but the difference is that clearcutting is done to grow new trees from seed, whereas the overstory removal cut in a shelterwood system is done to release existing seedlings or saplings. Clearcutting is also sometimes confused with patch selection (see below); in fact, the distinction between two practices falls into a gray area.

Seed-Tree Cut: Similar to a clearcut except that (1) seed trees are retained to provide seed (and either cut later or leave) and (2) any species may be grown (i.e. desired regeneration does not have to be from light-seeded species or cherry). There is no acreage limitation. At least 4 seed trees (20-inch diameter or greater (BA = 10)) or 12 seed trees (14-20 inches diameter) (BA 20) must be retained per acre.

Shelterwood/ Shelterwood System: usually a multi-step approach to establish desirable trees in the understory in medium-light conditions before the overstory is eventually removed to release the seedlings. The final step in the shelterwood system is the overstory removal, which is done to release the established young trees. Used especially for oak, sugar maple (giving these species years to establish well-developed root systems) white pine and hemlock (giving these species years to establish competitive height). Black birch typically becomes abundant as well. Regeneration that is adequate for release must typically be 2 feet tall, well-distributed and abundant. Interfering vegetation must be identified and (ideally) controlled.

Coppice: a complete "cutting off" of small or medium-sized hardwoods, especially oaks, hickory, red maple) to cause these to re-sprout and form a new stand from the same root systems. This is an old system that sometimes occurs inadvertently, and is useful for reliably producing firewood or whips (i.e. saplings used for any number of purposes).

Two-aged Regeneration Methods

Clearcut, Seed-tree, Shelterwood with "reserves": Same as methods described above but with retention of trees (12 inches diameter or larger) (possibly for timber, seed source, habitat or aesthetic reasons, but not for the purpose of managing understory light conditions).

Uneven-aged Regeneration Methods (Selection/Irregular Shelterwood)

In an uneven-aged stand there will always be trees in a range of size and age classes that are *free to grow*. Often current conditions will be an approximation of this, but over time a true multi-aged stand can be created and maintained. A selection cut is a mix of thinning and creating or enlarging openings. Openings are defined either as groups or patches; new openings generally do not cover more than 50% of the stand area.

Group Selection: openings may range from single-tree-size up to 1/4 acre (e.g. equivalent to a circle about 120 feet in diameter in size, which is about 1.5 times the mature height of many trees (80'-100')). No special provisions are needed to prepare the understory for this more conservative opening size, though, to achieve the ideal outcome, it may be necessary to control competing vegetation (native vegetation such as beech or striped maple, or non-native invasive vegetation such as bittersweet, buckthorn, etc.).

Patch Selection: openings may range up to 2 acres (e.g. equivalent to a circle about 333 feet in diameter). Interfering vegetation (if present) should be identified and ideally controlled so that seedlings can be established/released. Please note: in Massachusetts, patch cuts will appear identical (to the public) as clearcutting.

Continuous-Cover Irregular Shelterwood: (see "The Irregular Shelterwood System", Journal of Forestry, December, 2009) is used to "create and maintain an unbalanced, multi-aged stand for a long and indefinite period of time by successive regeneration fellings." This system is perhaps the most complex, but is the most versatile for creating or maintaining complex forest conditions. In this system, elements of thinning, shelterwood, and group selection are combined and applied in ways that reflect the current conditions and ultimate potential of specific woodlot areas, and strongly reflect the judgement and vision of the forester. A forest managed in this way will not have an "industrial" feel and should be rewarding for people with a wide range of interests ranging from on-going timber production to contemplative enjoyment of nature. This system is not used when the landowner wants to maximize short-term income or dramatically alter the landscape (for this see "Even-Age Regeneration Methods" above).

Management Recommendations 2014-2024

(1) prepare a CH 61 Plan in 2014 and recertify in 2024

(2) research, locate and paint/repaint the southern/eastern boundary with durable paint (2014-2015).

(3) monitor informally for any early establishment of oriental bittersweet or other non-native invasive plants. If these are detected, try to control these. The first attempt should be by hand (carefully pulling the plant roots and all) followed by monitoring over subsequent years. If follow-up pulling does not seem adequate, an herbicide-based control effort might be needed. With adequate training, this activity lends itself to being done by volunteers.

(4) monitor informally the condition of the overstory and re-evaluate if anything changes dramatically (e.g. major storm damage, arrival of a new/unforeseen pest, etc.). With adequate training, this activity lends itself to being done by volunteers.

(5) continue to offer periodic forest/foresty walks for the MT Toby membership and possibly outside groups (e.g. UMass forestry).

STAND DESCRIPTIONS

Notes Applying to All Stands

Boundaries: The northern boundary of Stand 1 (with WD Cowls) is blazed and painted. The eastern boundary has not been confirmed in some time, but is known to be at the foot of very steep land. The southern and western boundaries are part of the larger parcel under this same ownership, and are excluded from CH 61.

Stand Objectives: For Stand 1, the objective is enrollment in Chapter 61.

Field method for volume per acre: For all forested stands, a point-sampling cruise was conducted using a BAF-10 prism. Product volumes were calculated in an Excel spreadsheet using formulas published in Mawson and Rivers.

Field method for site index: Site index is a rough measure of soil fertility for species-specific tree growth. The site index is considered to be the height, in feet, of a vigorous, free-to-grow tree at age 50. A higher site index represents greater soil fertility for the species in question. Because of variability within each stand, an estimated average expected site index will be assigned to each stand based on site indices published in the USDA NRCS Web Soil Survey.

Overview of Soils: Overview of Soils: The USDA NRCS Web Soil Survey indicates Yalesville-Holyoke and Holyoke-Yalesville complex soils for this property. These are loamy supra-glacial tills formed from conglomerate or sandstone. These soils may be as shallow as 10", and as deep as 20" or more, and there can be ledge exposures. The water table is not near the surface, and the soils are considered "somewhat excessively drained", i.e. droughty with low water storage. Published site indices range from 47 to 60. Actual fertility for tree growth will vary considerably at the microsite level, influenced by soil depth and moisture at that location (e.g. fertility may be much greater at the bottom of a ledge outcrop than at the top). Though these soils are somewhat droughty, an advantage is that oak and hickory seedlings can compete effectively with black birch and red maple. These soils are conducive to logging as long as normal precautions are taken to avoid damage (i.e. the ground is dry or frozen at the time of logging).

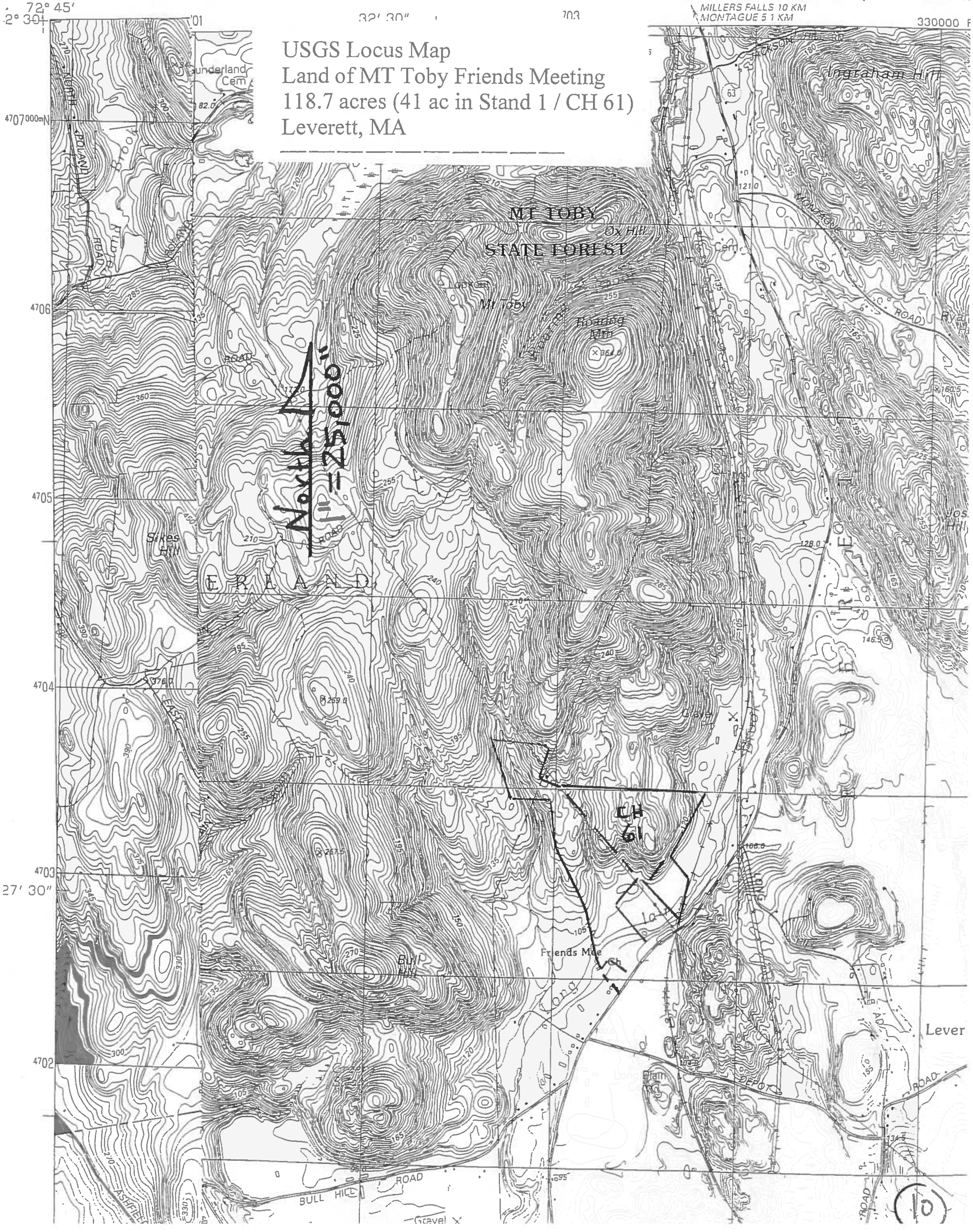
Deer/moose browse: White tailed deer and moose are expected to browse heavily once any regeneration is established, tending to prefer oaks, maples, ash and cherry over beech and witch hazel.

Non-native invasive plants: None were observed in Stand 1. Given its somewhat drier/poorer soils, and its remote location from the lower part of the property, which is heavily infested with non-native invasive vegetation, this is not a total surprise, but is also a relief.

Town(s) Leverett Owner(s) MT Toby Friends Meeting

WILLIAMSB

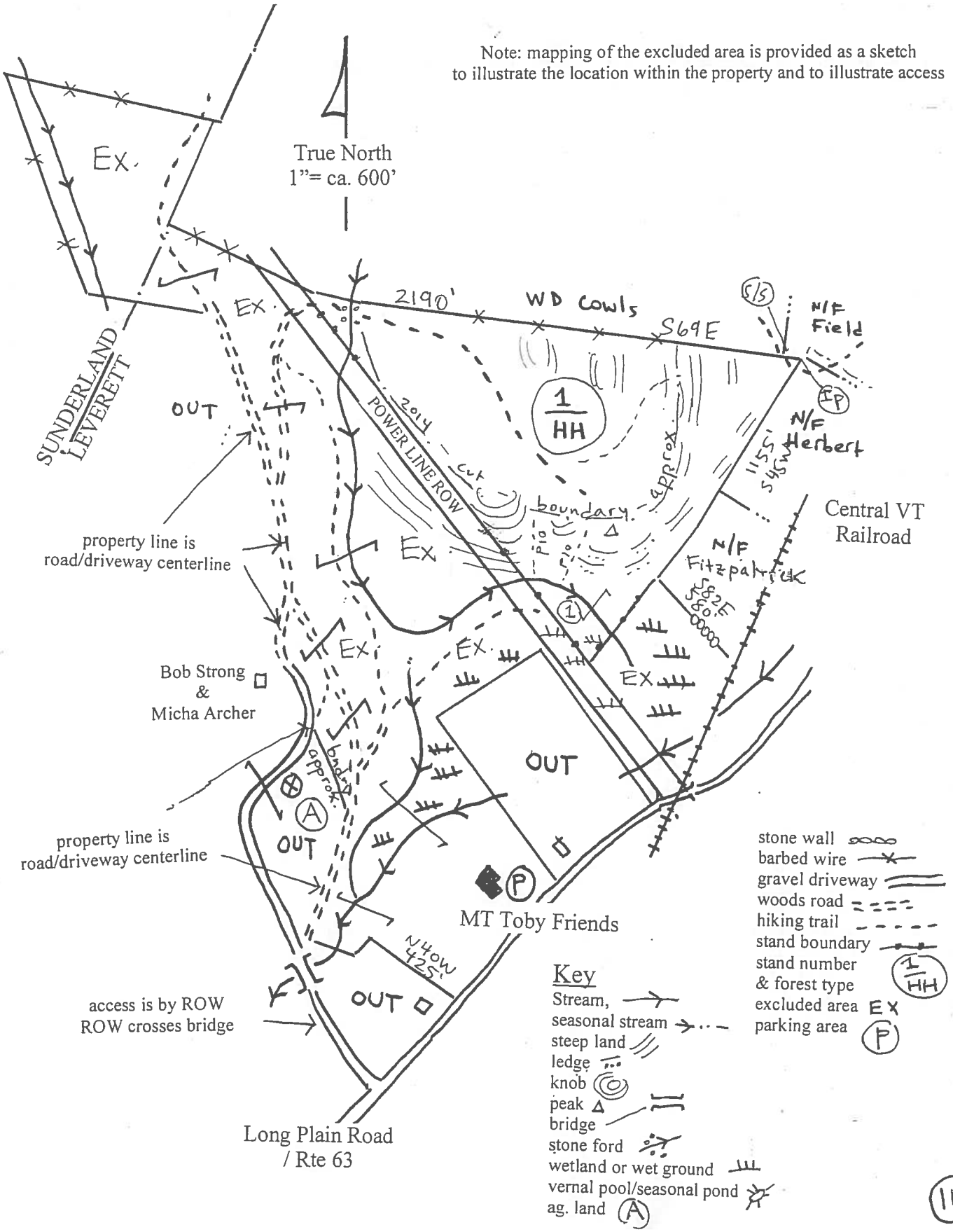
7.5 X 15 MINUTE SERIES (TOPOGRA



Forest Stand & Boundary Map
Land of MT Toby Friends Meeting
118.7 acres (41 ac in Stand 1 / CH 61)
Leverett, MA

Map by Michael Mauri, L.F.
20 West St., S. Deerfield, MA, 01373
(413) 665-6829 based on 1994 CH 61
map by Karl Davies, and fieldwork 8/2014.
This map is for forestry purposes only.

Note: mapping of the excluded area is provided as a sketch
to illustrate the location within the property and to illustrate access



Signature Page

Please check each box that applies.

☒ **CH. 61/61A Management Plan** I attest that I am familiar with and will be bound by all applicable Federal, State, and Local environmental laws and /or rules and regulations of the Department of Conservation and Recreation. I further understand that in the event that I convey all or any portion of this land during the period of classification, I am under obligation to notify the grantee(s) of all obligations of this plan which become his/hers to perform and will notify the Department of Conservation and Recreation of said change of ownership.

☐ **Forest Stewardship Plan.** When undertaking management activities, I pledge to abide by the management provisions of this Stewardship Management Plan during the ten year period following approval. I understand that in the event that I convey all or a portion of the land described in this plan during the period of the plan, I will notify the Department of Conservation and Recreation of this change in ownership.

☐ **Green Certification.** I pledge to abide by the FSC Northeast Regional Standards and MA private lands group certification for a period of five years. To be eligible for Green Certification you must also check the box below.

☐ **Tax considerations.** I attest that I am the registered owner of this property and have paid any and all applicable taxes, including outstanding balances, on this property.

Signed under the pains of perjury:

Owner(s) George Mungo, Trustee Date 9/8/14

Owner(s) Dave Ahfeldt Date 9/8/14

I attest that I have prepared this plan in good faith to reflect the landowner's interest.

Plan Preparer [signature] Date 9-11-14

I attest that the plan satisfactorily meets the requirements of CH61/61A and/or the Forest Stewardship Program.

Approved, Service Forester [signature] Date 9-18-14

Approved, Regional Supervisor Jennifer H Fish Date 9/22/14

In the event of a change of ownership of all or part of the property, the new owner must file an amended Ch. 61/61A plan within 90 days from the transfer of title to insure continuation of Ch. 61/61A classification.

Owner(s): MT Toby Friends Meeting Town: Leverett

dcr

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Conservation and Recreation

Certificate for Chapter 61/61A Forest Lands

Case Number 154.322

Owner(s) MT Toby Friends Meeting

Mailing Address Long Plain Road, Leverett, MA 01054

Pursuant to Chapter 61A of the General Laws, I/We request 41 acres of forestland of the 108.4 acres of land covered by a deed recorded in the Franklin County Registry of Deeds in Book 1331, Page 177, for property located in the Town/City of Leverett that the State Forester issue a Certificate of Management to cover those forested acres. The tract can further be described as Map # 5 Leverett, Lot # 16 Leverett, on the Town/City Assessors Maps. Excluded from certification are 67.4 acres, which are described as follows (continue on back page if additional space is needed):

NEW: All land is EXCLUDED, except the following 41-acre area located east of the power lines and known as Stand 1: INCLUDED: beginning in the NE corner of the property, at or near a corner pin, then W'ly along a barbed wire fence, with is the property boundary with abutter Cowls, to the eastern sideline of the power line ROW, then SE'ly along the power line ROW approximately 2,014' to a point at the edge of the ROW, then NE'ly to a corner now or formerly with Fitzpatrick, then continuing NE'ly at the same or at a similar bearing along the boundary of land now or formerly of Fitzpatrick then now or formerly of Herbert to the beginning.

I/We have read the various provisions of Chapter 61/Chapter 61A as well as the Rules and Regulations under which said Chapter is administered and agree to comply with the same.

Submitted the 10th day of Sept, year of 2014

Signed by Owner(s) George Munger, Trustee 9/8/14

David Ahlfeld 9/8/14

DEPARTMENT USE ONLY

The Department of Conservation and Recreation, 251 Causeway Street, Boston, Massachusetts, acting by and through its State Forester pursuant to the authority of Chapter61/Chapter61A of the General Laws hereby certifies that the described land is being managed under a planned program to improve the quantity and quality of a continuous forest crop. This certifies that the above listed acres of forestland, owned by the above, are being managed under an approved Forest Management Plan.

Certification is in effect from January 1, 2014, to December 31, 2024.

Signed by State Forester Jennifer H Fish Date 9/22/14

ASSESSOR'S USE

The Board of Assessors have recorded the above acres of Classified Forest Land, and will cause evidence of a lien to be duly recorded in the Registry of Deeds. No recording is necessary for a recertification.

Signed by Chairman _____ Date _____

Landowner Goals

DRAFT
5/27/14

Please **check** the column that best reflects the importance of the following goals:

Goal	Importance to Me			
	High	Medium	Low	Don't Know
Enhance the Quality/Quantity of Timber Products*	✓			
Generate Immediate Income			✓	
Generate Long Term Income		✓		
Produce Firewood				✓
Defer or Defray Taxes			✓	
Promote Biological Diversity	✓			
Enhance Habitat for Birds	✓			
Enhance Habitat for Small Animals	✓			
Enhance Habitat for Large Animals	✓			
Improve Access for Walking/Skiing/Recreation	✓			
Maintain or Enhance Privacy			✓	
Improve Hunting or Fishing				✓
Preserve or Improve Scenic Beauty		✓		
Protect Water Quality	✓			
Protect Unique/Special/ Cultural Areas		✓		
Attain Green Certification Other:				✓

*This goal must be checked "HIGH" if you are interested in classifying your land under Chapter 61/61A.

In your own words, describe your goals for the property:

Protect ecological values while enhancing potential for high quality forest products in the long term. We also want to share and enhance recreational access.

Stewardship Purpose

By enrolling in the Forest Stewardship Program and following a Stewardship Plan, I understand that I will be joining with many other landowners across the state in a program that promotes ecologically responsible resource management through the following actions and values:

1. Managing sustainably for long-term forest health, productivity, diversity, and quality.
2. Conserving or enhancing water quality, wetlands, soil productivity, carbon sequestration, biodiversity, cultural, historical and aesthetic resources.
3. Following a strategy guided by well-founded silvicultural principles to improve timber quality and quantity when wood products are a goal.
4. Setting high standards for foresters, loggers and other operators as practices are implemented; and minimizing negative impacts.
5. Learning how woodlands benefit and affect surrounding communities, and cooperation with neighboring owners to accomplish mutual goals when practical.

Signature(s): _____ **Date:** _____

Owner(s) (print) _____

(This page will be included with the completed plan.)