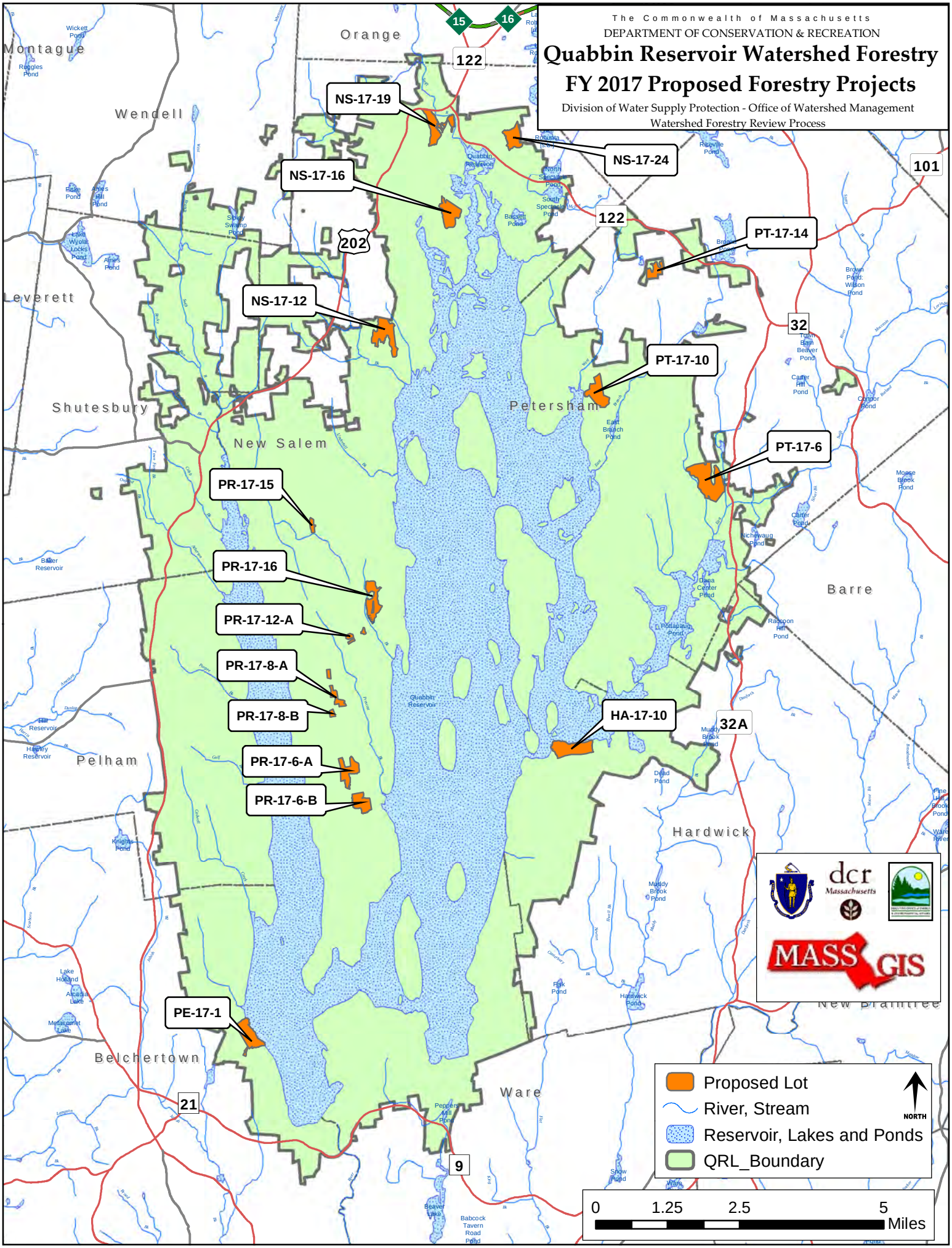

The Commonwealth of Massachusetts
DEPARTMENT OF CONSERVATION & RECREATION
Quabbin Reservoir Watershed Forestry
FY 2017 Proposed Forestry Projects
Division of Water Supply Protection - Office of Watershed Management
Watershed Forestry Review Process
NS-17-19
NS-17-24
NS-17-16
NS-17-12
PT-17-14
PT-17-10
PT-17-6
PR-17-15
PR-17-16
PR-17-12-A
PR-17-8-A
PR-17-8-B
PR-17-6-A
PR-17-6-B
HA-17-10
PE-17-1
Montague
Wendell
Orange
Leverett
Shutesbury
New Salem
Petersham
Barre
Pelham
Hardwick
Belchertown
Ware
122
202
101
32
32A
21
9
15
16
Quabbin Reservoir
Proposed Lot
River, Stream
Reservoir, Lakes and Ponds
QRL_Boundary
NORTH
0
1.25
2.5
5
Miles

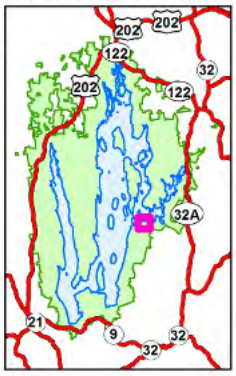
NORTH

FY2017 Proposed Forestry Project
HA-17-10

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



0 400 800 1,200 1,600 2,000 2,400 2,800 3,200 3,600 Feet

Map Scale- 1:5,000

File Path: W:\GIS\Projects\Forestry_Section\ProposedHarvestLots\QRPubRev2017.mxd

Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal HA-17-10 for Public Review

Lot Review Number **HA-17-10** **Date:** 4/7/2016 **Forester:** Wood

Watershed: QU **Acres** 97.1

Boundary Description: This lot is north of Shaft 12 Road, between the road and the shoreline of the reservoir. East end starts at the small brook that flows north into reservoir and crosses Shaft 12 Road just east of Fitzpatrick Road. The west end is delimited by another small brook 3350' west of the first brook. This one also flows northerly and ends in a small bay near where the old railroad grade enters the reservoir.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	White pine/oak	42.4	**Dominant**	Tree seedlings/saplings dominate site
Secondary	Oak/hardwood	16.6	**Secondary**	Mesic site - cinnamon fern, mixed hdwd
Other	Red pine	10.4		

Description of forest composition/condition:

The white pine stand north of the railroad has limited access and appears not to have had any treatments over the last 20 years. It is fully stocked with white pine with some hardwoods, mainly red oak and red maple. Towards the western edge there is about 3 acres of mixed white pine and hemlock. There is a fair amount of regeneration already present, mainly white pine with some hemlock and black birch. This section is even-aged, with limited structure, generally healthy and well formed but plenty of cavity trees and trees that are courser with emergent crowns.

The south side of the railroad is more diverse and has had three harvests over the last 25 years. The past treatments were mainly in the red pine stands with some additional work done in the surrounding white pine and mixed stands. Most of the red pine has now been treated at least twice. Lot 587 (28 ac.) was completed in 1992 and was mainly a thinning with small openings. Lot 684 (25 ac.) was completed in 1995 and was a seed cut of a shelterwood on mainly the red pine plantations. The last treatment lot 1007 (34 ac.) was completed in 2003 and was more of a group selection treatment with thinning between small openings. These past treatments established some regeneration, mainly white pine and black birch. Besides the red pine plantation there are pine/hardwood, pine/oak, oak/hardwood and mixed hardwood stands. White pine and/or red oak are the most common species and both the hardwood and softwood types have similar associated species - red maple, black and white birch, black cherry and black oak. There is also some ash, yellow birch and hemlock along the brooks and wetlands. Ferns and winterberry were also common here.

Judging from the many stonewalls, area of foundations and info on the real-estate sheet most of this area was farmed in the past, most likely use was pasture. The area was influenced by the 1938 hurricane and there are not many trees that appear to be over 100 years old. Some pit and mounding is still evident but could be from other storms.

Health of the stand appears generally good although decline and mortality is starting to show up in the red pine, undoubtedly from scale and root rot. No hemlock adelgid was noted but is assumed to be present along with hemlock scale. Gypsy moth defoliation was severe on islands not far from this area and a few egg masses were found.

The central section of the lot just south of the old railroad is a natural bowl which drains towards the west into the reservoir. This area has some large white pine and sections of mostly red maple both of which are on wetter soils. Much of this area has small puddles of standing water in the spring. The slopes leading down to this on the south are steep and difficult to work. Most of these areas will be avoided during the harvest. The best way to access the white pine stand to the north appears to be by skirting the eastern edge of this area, which is higher and drier, and is the only section where the railroad bed doesn't present a significant barrier. There is a wetland just to the east of this that is probably a vernal pool. The main skid trail is going to need to be within 200' of this but the area is dry and rocky so rutting should not be a problem.

The old railroad bed is a very interesting feature here. It was suppose to connect to the "Rabbit Run" but was never completed and doesn't show up on the real-estate sheets. It runs generally east/west. The road bed grade was just roughed in intermittently, there are breaks

where little to nothing was done. Across this proposal about 95% was put in, including pretty significant areas of cut and fill (up to about 50' deep). Most of the potential vernal pools are associated with this construction. There are also numerous large boulder piles and a small rock quarry that are interesting features and offer some unusual habitat.

Describe invasives present, assessment techniques used, and concerns:

The area south of the old railroad line where the cellar holes are is heavily infested with Japanese knotweed, Oriental bittersweet and some Japanese barberry. The knotweed is so thick that it shows up on the aerial photos. Some of these invasives have spread to surrounding stands especially towards the reservoir and the red pine to the northeast (this stand is not included in the proposal area). Japanese barberry is also present along many of the streams and wetter areas but isn't typically dominating the understory there.

SOILS

% Excessively drained soils:	0
% Well drained soils:	90
% Poorly to Very Poorly drained soils:	10

Further comments on soil

Montauk-Scituate-Canton association, extremely stony across whole lot. Surface stones are prevalent throughout the lot. Some of the areas would be difficult to operate machinery in but most of these are wet too so will be avoided.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	Yes	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

There are at least 10 potential vernal pools on the lot. All but one are associated with the railroad bed. That one is in the center of the lot and is small and shallow and probably dries up too quickly most years. There is an existing skid trail about 50' from this but it can be relocated out another 50'.

The north western pine stand is cut off from the rest of the lot by the railroad cut and can only be accessed by the eastern or western end and both would be within resource buffers. The western end is within 100' of the reservoir and would require at least 2 intermittent stream crossings and at least 100' of wet bouldery soil and is a poor choice. On the eastern end the skid trail would need to cross around 50' from a couple of small, deep potential pools and about 100' west of a third larger pool. This area is higher and stony and shouldn't be easily rutted so should have minimal impact to the pools if in fact they are used for breeding.

There are multiple wetlands on the lot, most associated with the streams. The largest is in the hollow located west of center of the lot. Appears will need 1 stream crossing on an intermittent stream. This stream enters the lot at a culvert in the road at about the mid point of the lot and flows north to the reservoir. The crossing will be at an existing stone culvert that was created for the railroad which appears to have been used for one of the previous sales.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	5
Acres in Regeneration cuts:	22
Average regen opening size:	1
Maximum regen opening size:	3

Description of advance regeneration in proposal area:

Some white pine, hemlock and birch regeneration is present under the fully stocked canopy north of the railroad bed. South of the rail bed, past harvests have resulted in the establishment of pine and birch as well.

DCR-DWSP Forestry Lot Proposal HA-17-10 for Public Review

General comments on silviculture proposed:

Intent is to regenerate approximately 1/4 of this lot through the creation of openings mainly 1/3-2 acres in size. Openings will be irregularly shaped other than where a stone wall is an edge. 5-20 sq ft of basal area will be retained in openings over 0.5 ac. The possible exception to this would be in the red pine stands which are receiving a final harvest cut. These stands are infested with red pine scale and root rot is probably also present and they are not expected to survive more than a few more years. The main portion of the red pine is about 3.6 acres in size which would be the largest opening but there is a wetland within it that won't be cut and some white pine and hardwoods around the edges that will be suitable to retain. The red pine stands have been cut twice before so there is already dense regeneration under most of these. Established acceptable regeneration will be protected as much as possible but some of this has gotten stagnant and some has been storm damaged or is so whippy that will be susceptible to future damage. These areas will be considered unacceptable regeneration.

The oak stand near the road has only been thinned before. The type map shows it as being oak-hardwood but now the overstory is mainly red oak with some white pine on the edges. 1/3- 2 acre openings will be created here to diversify age, species and structure. Seed sources will be retained as advance regeneration is almost exclusively white pine and black birch. Opening locations will depend on topography and condition of overstory. Areas with a higher proportion of poorly formed stems will be targeted although the stand is currently pretty uniform. The west edge of this stand transitions into mixed hardwoods and will be treated similarly except more thinning will be done here, partially because the overstory is more diverse already and also because of the wetter soils as you approach the brook. Wind throw is a possibility here.

The white pine stand (northwest corner of lot) hasn't been recently treated and is fairly uniform like the oak stand and will be treated similarly. The mixed stands along the road and around the red pine have been cut at least once with small openings and a fair amount of regeneration started. These openings will be expanded upon further releasing the regeneration present.

The stands that were previously cut should end up with 3 distinct age classes once this cut regenerates. The larger openings proposed here should encourage more oak and intolerant species to become established particularly on the northern half of the openings. Hopefully the powerline clearing completed in 2016 will help disperse and lessen the browse impact on the newly established regeneration.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
15	963	36.5	204.3	97.1

Additional comments on Subwatershed analysis

Harvests last 10 years were lot 1042 and about 1/2 of 1034. Also included is the powerline clearing which just took place.

HARVESTING LIMITATIONS

Forwarder required: ☑ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

A forwarder will probably be needed to transport wood from the section of red pine west of the intermittent stream, across the stone culvert. To access this section a u turn is required. A skidder would cause excessive damage here. There are some steep slopes on the lot but not for more than 200' and no main trails will be needed in these areas.

CULTURAL RESOURCES

Foundations?: None known **Stone Walls?:** Yes **Quarries?:** Known

Cellar holes?: Yes **Wells?:** None known **Dams?:** None known

Comments on Cultural Resources:
Surface stone and micro topography is common over most of the area and the area is almost totally rolling to steeper slopes other than the section of poorly drained soils in the bowl in center of the lot. Logging is not planned on the area of cellar holes shown as UpBr on the type map (this is also where the concentration of invasives is). The boulder piles, small quarry and other features associated with the old railroad bed and small settlement will be protected. There are several old stone culverts here too. One may be utilized for crossing a stream. If so a portable bridge will be required to protect it. DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

There are quite a few unusually features associated with the old railroad bed including potential vernal pools, large boulder piles, and a small quarry.

General Wildlife comments:
Coyote, bear, deer, raccoon, turkey and moose are some of the species known to frequent here. There are 2 separate spots where bear have denned here. Sow has died but is unknown if cubs are using either of these locations.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

The lot is bounded by small streams on both ends, another that bisects the lot and a couple of small intermittent streams that originate on the lot. Appears will need 1 stream crossing on the intermittent stream which flows into reservoir from culvert in road at about the mid point of the lot. There is an existing stone culvert that was created for the railroad which appears to have been used for one of the previous sales. Most of the intermittent stream has poorly drained soils along the edges, typically 25' or wider so even though the culvert is on the northern edge of the cut area using this crossing is probably the best choice. I don't think there is usually enough flow to sample this stream, sections of it spread out and others flow underground. A portable bridge could be required to reinforce the culvert.

FOREST ACCESS ENGINEERING

Gravel needed: ☑ **Work needed on permanent bridges:** ☐
Landing work needed: ☑ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing landings will be utilized and should be sufficient other than western most which was suppose to have been used before but no improvement work was apparent. The landings are roadside and should only need a gravel pad to park a log truck on.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

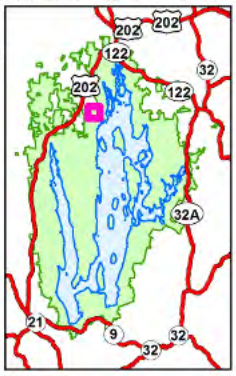
NORTH

FY2017 Proposed Forestry Project
NS-17-12

Quabbin Reservoir Reservation Proposed Forestry Lot Review

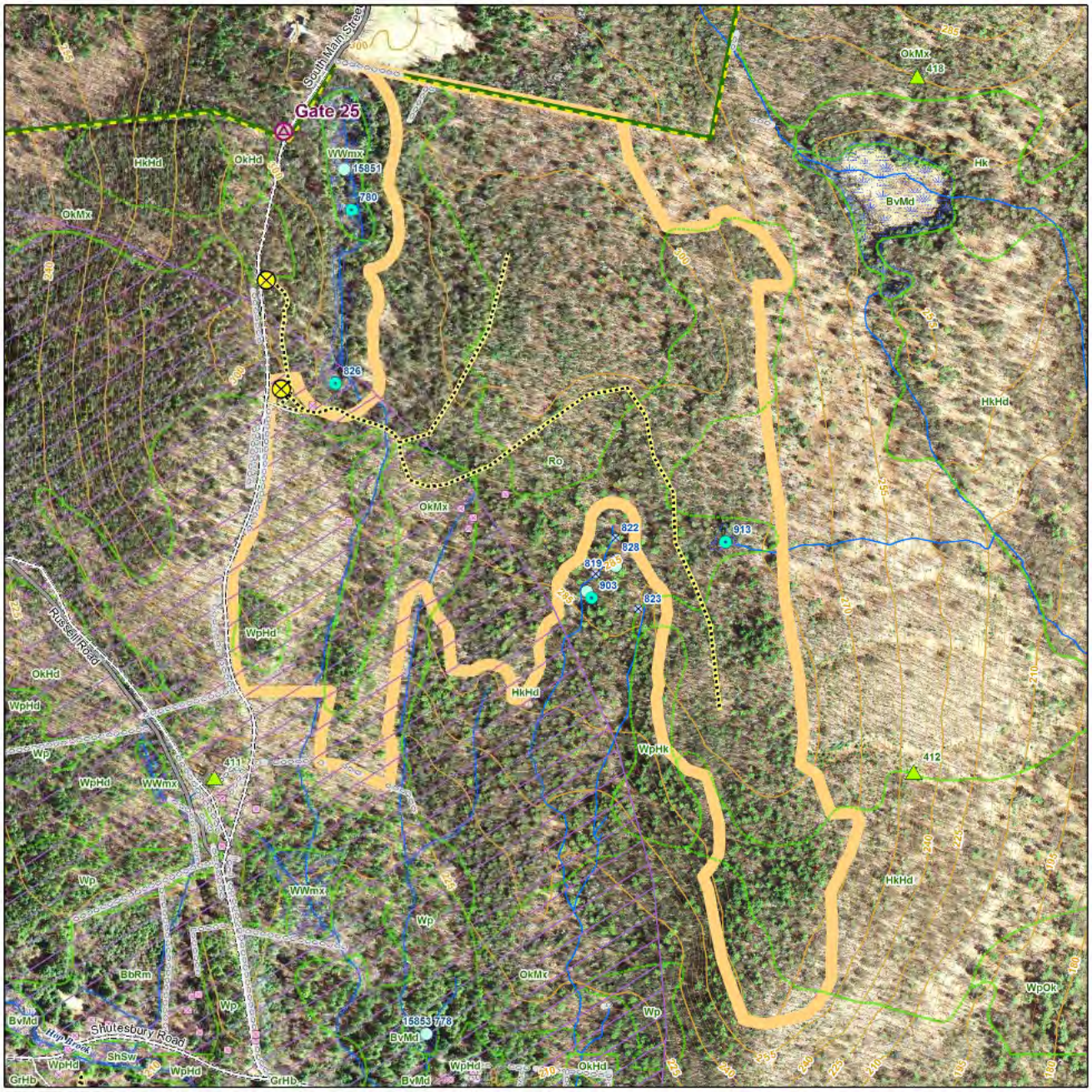
- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



0 400 800 1,200 1,600 2,000 2,400 2,800 3,200 3,600 Feet

Map Scale- 1:5,000



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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal NS-17-12 for Public Review

Lot Review Number NS-17-12 **Date:** 2/19/2016 **Forester:** Johnson

Watershed: QU **Acres** 94.3

Boundary Description: This lot is the eastern, uncut portion of Proposed Lot NS-15-12. It is being resubmitted in order to clarify application of vernal pool protections, and to adjust the silviculture to allow larger openings. There is slight overlap between this lot and the area being cut (Lot 3139) in order to allow space for a landing along the Gate 25 access road. The following boundary description is unchanged except for the parts in capital letters:

STARTING AT THE DWSP BOUNDARY 100 FEET EAST OF THE WETLAND NEAR GATE 25, follow the boundary east ~1000 feet to edge of timber lot 3070, which was cut in 2006. Follow the west boundary of lot 3070 to the south end of that lot. Continue southward down and around a spur, following the upper limit of operability (due to steep slopes). After rounding the spur follow the upper edge of operability in a generally westward direction, going generally downward but never descending onto the relatively flat area to the south. Round a second major spur to the south, then go northwest, crossing two streams before arriving at the east end of a stone wall. Follow the wall northwest and then west to the end. Continue along the same bearing, following short fragments of wall another 545 feet or so to the access road. GO NORTH ALONG THE ROAD, STOPPING ~100 FEET NORTH OF AN OLD SKID TRAIL. GO EAST ~110 FEET, THEN GO SOUTH, EAST, AND NORTH AROUND THE WETLAND, STAYING AT THE OUTER EDGE OF A 100 FOOT BUFFER. CONTINUE TO FOLLOW THIS BUFFER/FILTER STRIP NORTH, BACK TO THE STARTING POINT.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	Hemlock/hardwood	38.2
Secondary	Northern red oak	37.8
Other	Oak, mixed - dry site	18.3

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site
Secondary	Other

Description of forest composition/condition: This is primarily an oak stand, with red oak dominant to the north, transitioning to a mix of various oaks and other hardwoods to the south. A large portion of the area is typed as hemlock-hardwood, but hemlock is not as dominant as it was in the cut area to the west. Hemlock in this area has generally good form, but mortality is high due to a combination of hemlock wooly adelgid, hemlock looper, and/or hemlock elongate scale.

The remainder of this description is unchanged from NS-15-12:

Oaks become increasingly common to the east and south, phasing to red oak dominated ridge tops in the east, and mixed oak (mostly red and white oak, with some black and chestnut oak) in the rocky ravines to the south. White pine is a common associate to the east and south, ranging in size from saplings to medium sawtimber. The mixed oak stand has the greatest tree species diversity on the lot, with black and paper birch, red maple, hickory, and occasional red maple and white ash, in addition to oaks and occasional white pine and hemlock. These hardwoods are mostly pole and small sawtimber size, with some medium sawtimber sized red and white oak. There are nectria cankers on some of the black birch, and the white ash can be expected to decline or disappear due to emerald ash borer and/or the various diseases afflicting white ash in this area.

Basal area ranges from 90 to 200, averaging 168 in hemlock and 128 in oak stands. Most of the lot has a fully closed canopy.

Describe invasives present, assessment techniques used, and concerns: This description is unchanged from NS-15-12:

Very limited Japanese barberry was found in the following areas in a systematic inventory of the lot:

•near the wetland along the east boundary
•near the stone piles near the two westernmost streams (see notes on cultural features)
•near the southern end of the easternmost stream

There will be no harvesting and no skid roads in these areas.

Barberry is more prevalent immediately to the south where the terrain is flatter and moister. This area has been deliberately excluded from the lot.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil
The breakdown in the Quabbin soils layer is as follows:

Well Drained Thin Soils w/Bedrock Outcrops 76.6 acres
Well Drained Thick Fine Sandy Loam 17.7 acres

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	No
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

The two wetlands in the stream-wetland complex immediately outside the lot to the northeast have been verified as vernal pools. These pools and their 100 foot shade zones have been excluded from this lot. The primary access to the lot is via a well established existing skid trail to the south of these vernal pools, including a short section within the 100-200 foot low ground disturbance zone for the southernmost pool. Due to difficult topography, moving the road outside of the low ground disturbance zone would cause increased soil compaction and erosion, possibly resulting in sedimentation of the nearby stream. Since there are no other viable access points, DWSP has approved the use of the existing skid trail in order to make it possible to regenerate this area while protecting the stream and soils.

There is one verified vernal pool just inside the lot boundary to the west, and another just outside the lot boundary to the southeast. These will be protected by 100 foot shade zones and 200 foot low ground disturbance zones, consistent with the Quabbin Land Management Plan.

The remainder of this description is unchanged from NS-15-12:

All streams are intermittent. The westernmost stream flows the length of the lot starting from the wetlands near Gate 25; this will need to be crossed in order to access the acreage to the east. The crossing will be bridged whenever water is present, and either bridged or poled when dry. There will be no logging in filter strips, and skid roads in filter strips will be limited to the stream crossing. All but the westernmost stream appear to be unregulated (i.e. not associated with a bordering vegetated wetland).

SILVICULTURE

Acres in Intermediate cuts: 14

Description of advance regeneration in proposal area:

Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	24
Average regen opening size:	0.75
Maximum regen opening size:	2

Regeneration is dominated by white pine saplings and poles. Hemlock seedlings are present to a lesser degree, and have been heavily browsed. Black birch saplings are more common where hemlock dominates the overstory in the western portion of the lot.

Overall, regeneration is patchy, and where it exists it frequently lacks diversity and is overtopped by mature trees. In many areas there are few tree seedlings or saplings and little understory of any kind. Almost two-fifths of sampled plots had no significant understory. On the plots with tree regeneration, percent cover averaged 36%.

Mountain laurel is quite dense in some areas in the northeastern part of the lot. This will be knocked down/driven over when it occurs within or around the perimeter of an opening. Striped maple and witch hazel are also present, but not in sufficient numbers to be a significant concern. Other understory species include low bush blueberry, wintergreen, and various species of clubmoss.

General comments on silviculture proposed:

Maximum opening size has been changed to 2 acres, regeneration acreage has been reduced proportionally to lot size, and intermediate treatment acreage has been reduced relative to regeneration treatments. Otherwise, this description is unchanged from NS-15-12:

Small group/patch selection with irregularly shaped openings up to 2.0 acres. Openings will be smaller where slopes are relatively steep. Groups will be located where there are clusters of trees that are diseased, declining, or have poor stem structure, and where there is advance regeneration that needs to be released.

Declining hemlocks will be the top priority for removal, as will other diseased trees, such as nectria infected black birch. The healthiest hemlocks will be retained. Particular attention will be given to removal of hazard trees in close proximity to the access road, which is heavily used for recreation. High quality red oak will be favored for retention, as will species that are uncommon locally or regionally, such as hickories and white and chestnut oak. In addition to contributing to biodiversity, these species provide hard mast and thus are important for wildlife.

Trees on the perimeter of openings will have large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if cut in the future. Thinning around openings will improve the vigor and seed production of perimeter trees, and will make them more windfirm after a few years. These intermediate treatments will also give openings a more irregular shape.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
78	3444.3	22	839.1	58.3
91	329.2	1	81.3	36

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

none

CULTURAL RESOURCES

Foundations?:	None known	**Stone Walls?:**	Yes	**Quarries?:**	Unknown
Cellar holes?:	None known	**Wells?:**	None known	**Dams?:**	None known

Comments on Cultural Resources:

There are "thrown" stone walls along the access road and along the south boundary of the lot. These will be protected.

In the middle of the lot there is a small shallow pit with a short rock-lined trench running downhill. Both are dry, but suggestive of a shallow well, possibly once used for watering livestock. Although this area is very dry now, the water table would have been higher when the area was cleared, probably in the mid-1800s. Near one of the streams there are numerous small human-made rock piles that appear to be arranged in a zig-zag pattern. One such pile was found near another stream. These are all within the filter strips, so no logging will take place in these areas.

There is a shallow excavated area closer to the access road that appears to have been used for more recent "borrowing" material. There is no stonework apparent around this area. The main skid road is immediately adjacent on the south side.

There are more cultural features in the flatter areas to the south and southwest, including a well, two cellar holes, and substantial stone walls. These will be well outside the harvest and staging areas, and thus will be protected. DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: None known

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

Coyote, moose, turkey, and ruffed grouse signs (tracks, scat, browse, rubs, and sightings) have been identified on this lot. The low ground disturbance zone around the vernal pools will prevent the development of deep ruts that would be barriers to salamanders.

The remainder of this description is unchanged from NS-15-12:

Protection and enhancement of wildlife habitat features will be an integral part of the silviculture and job layout on this lot. Diverse mast-bearing species will be retained and the healthiest specimens released to improve seed production, which will benefit wildlife directly as well as promoting regeneration. Snags, large logs, current and potential den trees, and potential nest trees (i.e. those with 3-way forks or similar canopy structures) will be retained wherever possible as valuable habitat. No stick nests were observed during the inventory, but if found they will be protected. Streams, wetlands, and vernal pools will be protected for water quality as well as for wildlife. The silvicultural objective of salvaging dying hemlock will benefit wildlife by promoting regeneration diversity; this will be balanced by retention of some of the healthier large diameter hemlocks for their current and future wildlife habitat value.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity. DWSP staff and other experts are monitoring some uncommon plant species in the lot proposal area; harvesting activities will avoid these until further management recommendations are received.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

NORTH

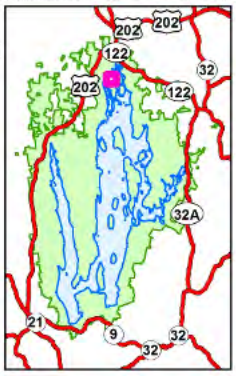
FY2017 Proposed Forestry Project

NS-17-16

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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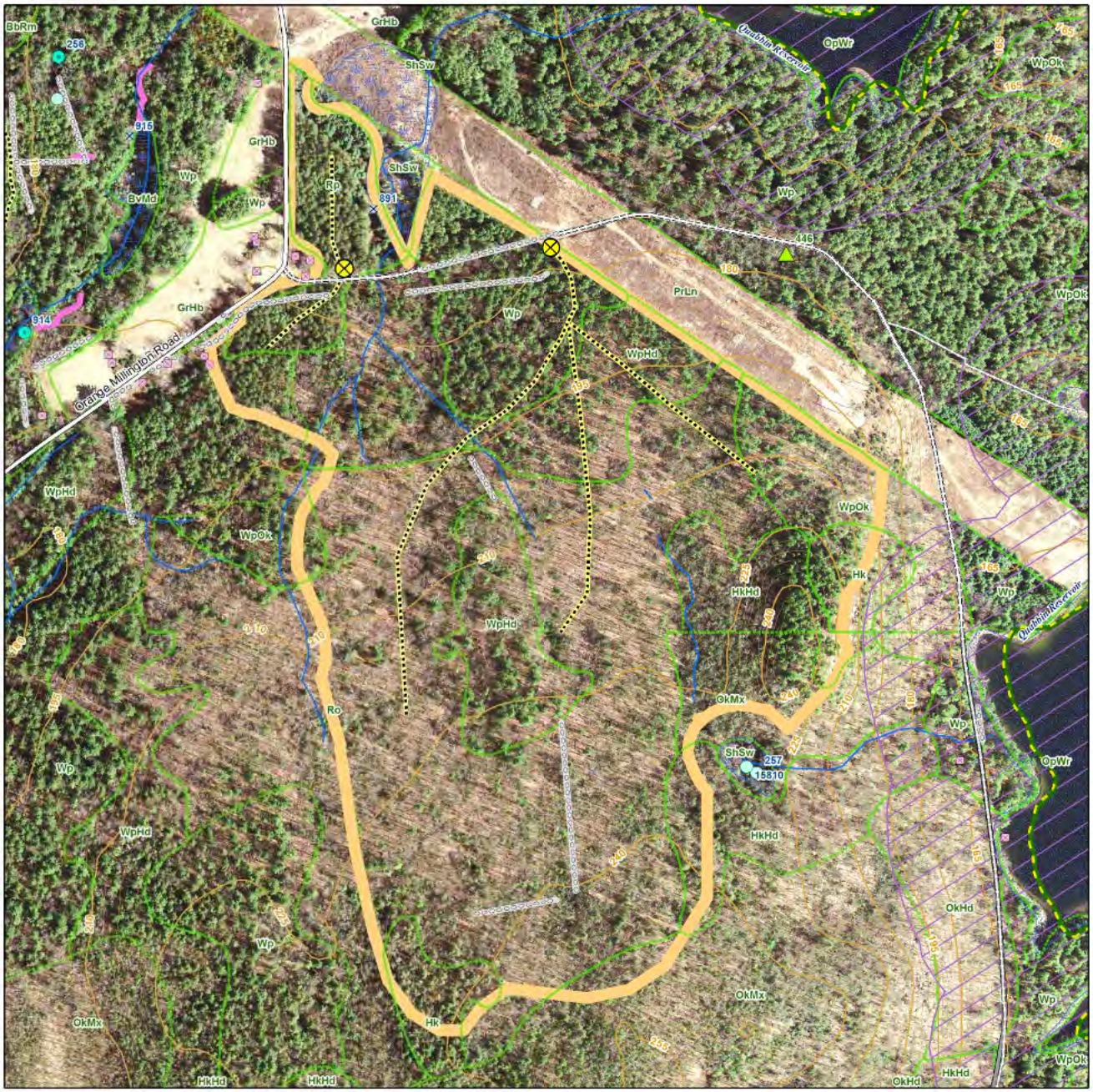
Map Scale- 1:4,000



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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal NS-17-16 for Public Review

Lot Review Number NS-17-16 **Date:** 12/3/2016 **Forester:** Johnson

Watershed: QU **Acres** 75.6

Boundary Description: This lot is bordered by the power line and a wetland and to the northeast, the Gate 29 access road and a sugar maple tap lot to the northwest, an intermittent stream channel to the west, and a wetland and the peak of Rattlesnake Hill to the southeast. A connecting road between the Gate 29 access road and the power line runs through the lot near the northern tip.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	Northern red oak	45.3
Secondary	White pine/oak	18
Other	White pine	7.3

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site
Secondary	Other

Description of forest composition/condition: Not included in the numbers above is a 4.9 acre red pine plantation in the northwest corner of this lot. It is still healthy but at risk of rapid mortality due to red pine scale. White pine is the primary associate, and to a lesser degree red and sugar maple and black cherry, which are more common around the perimeter of the plantation.

The overstory in the remainder of the lot is predominantly white pine to the north, transitioning to a predominantly red oak overstory to the south. In some places there are scattered white pine emergents above the red oak. Hemlock is an occasional associate in the overstory, often with good form but thin crowns, probably due to hemlock woolly adelgid, elongate hemlock scale, and/or hemlock looper. White pine form is generally good, but occasionally branchy and less commonly sweepy or forked due to weevil damage. All white pine crown classes are present, from dominant/co-dominant to suppressed. Red oak form is variable, sometimes with sweep, low forks and/or dead branches, others with clear straight stems. Variability of form is most evident in the area closest to the road, where there have been no known past treatments.

Throughout the white pine and red oak dominated areas there is a strong midstory of hardwood poles. Species are more mixed than in the overstory, including black birch, paper birch, red maple and mixed oak, as well as sugar maple, black cherry and white ash near the streams. Scattered hemlock is present as well, often with very poor form.

Past harvests in this area include a 1979 shelterwood prep cut on the upper western slopes, an intermediate thinning on the upper eastern slopes in 1982, and a 2002 selection cut in the small triangle between the power line, wetland, and connector road.

Describe invasives present, assessment techniques used, and concerns: Invasives are a concern in the northwest corner, near an old cellar hole in the northern portion of the red pine plantation. Species identified here include Japanese barberry, glossy buckthorn, honeysuckle, and bittersweet. All were found along the Gate 29 access road just north of the road that connects to the power line, and all are easily accessible small populations. If the adjacent red pine is removed, invasives will be cut at the time of harvest, and mechanical control will be continued in subsequent years. (Chemical control would be more effective, but is currently not in use at the Quabbin section of DCR-DWSP.)

To the south of the connecting road a few small Japanese barberry plants were found near streams within the forest. These are not numerous or large enough to be a significant concern. They will be avoided and/or uprooted.

SOILS

% Excessively drained soils:	6
% Well drained soils:	94
% Poorly to Very Poorly drained soils:	0

Further comments on soil

The breakdown in the Quabbin soils layer is as follows:

Well Drained Thick Fine Sandy Loam 31.1 acres
Well Drained Thin Soils w/Bedrock Outcrops 12.3 acres
Moderately Well Drained Fine Sandy Loam 27.4 acres
Excessively Drained Deep Glacial Outwash 4.8 acres

Most of the soils on this lot are well drained. The thinner well drained soils are on the upper slopes of Rattlesnake Hill. The excessively drained soils are in the northwest corner near the road, coincident with the red pine plantation. The moderately well drained soils are concentrated around the streams leading to the wetland at the northern tip.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

A three acre wetland overlapping the powerline at the northern tip is outside the harvest area, as is a half acre wetland 100 feet south of the lot that has been identified by NHESP as a Potential Vernal Pool. Much smaller bordering vegetated wetlands occur along the stream channels within the lot. Streams transition from intermittent to perennial as they approach the northern wetland. On the highest slopes there are occasional intermittent drainages that disappear underground shortly after they surface. The latter are mostly unregulated but will be given filter strips nevertheless. The areas where water is underground will be utilized for skid roads in order to minimize the need for crossings. The one proposed crossing is on an intermittent stream, and will be bridged whenever water is present.

Generally there will be no harvesting in filter strips, because the regulatory requirement of leaving 50% of well distributed basal area precludes making regeneration openings in these areas. However, some openings may slightly overlap the outer edges of filter strips, and trees may occasionally be cut in filter strips in order to make space for felling trees in nearby groups.

SILVICULTURE

Acres in Intermediate cuts:	15
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	25
Average regen opening size:	1
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

In the red pine stand there is dense regeneration, mostly of white pine saplings and small poles, with scattered hemlock, oak, black cherry and black birch seedlings and saplings, mostly near the periphery. Most of the regeneration was probably initiated by a thinning that took place in 1983. Groundcover species include hay scented fern, woodfern, Christmas fern and dewberry. Grape and high bush blueberry are prevalent near the wetland at the northern tip.

Under the pine and oak stands regeneration is highly variable. In many areas there is no significant regeneration. Where it is present, the dominant species is white pine. Hemlock, black birch and red maple are present but less common. Size varies widely, from seedlings less than knee high to saplings of 40 feet or more. Distribution is extremely patchy. Browse is

most evident on hemlocks near the stream channels, probably due to moose.

Understory species include mountain laurel, witch hazel, hay scented fern, cinnamon fern, Christmas fern, wintergreen, partridge berry, and blueberry. Mountain laurel is a minor, patchy presence on the lower slopes, but becomes increasingly dense, tall, and numerous in the southwest corner, where it is likely to present an obstacle to regeneration. Hay scented fern may be a problem in the northern portion of the red pine plantation, particularly due to the presence of invasives.

General comments on silviculture proposed:

Small group/patch selection. The red pine plantation and associated poor quality white pine poles may be removed as a single 4.5 acre group, but only if it is believed that the invasives to the north of the connector road can be dealt with suitably. All other openings will be a maximum of 2 acres, with an average of 1 acre. Openings will be irregular in shape, and will be located where there are clusters of trees that are diseased, declining, or have poor stem structure, and where there is advance regeneration of high quality (healthy, well formed, and suited to the site) that needs to be released. Other than the red pine plantation, the largest openings will be in areas where white pine is the dominant species. Five to ten square feet per acre of basal area of sawlog- and pole-sized trees will be retained in openings =½ acre.

All tree species will be retained, and those that are uncommon locally or regionally will be particularly protected. There will be no openings where there are clusters of high quality oaks and other hardwoods. Oaks will also be favored for retention within openings, since oak seed does not disperse very far. Den trees, potential den trees, snags, large logs, trees with stick nests, and potential nest trees (i.e. those with 3-way forks or similar canopy structures) will be retained wherever possible as valuable wildlife habitat.

Trees on the perimeter of openings will have large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if cut in the future. Thinning around openings will improve the vigor and seed production of perimeter trees, and will make them more wildfirm after a few years. These intermediate treatments will also give openings a softer, more irregular shape.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
3	546.3	0	136.6	63.4
93	261.7	0	65.4	12.2

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☑ **Steep slopes present?** ☑

Feller/processor required: ☐

Comments on harvesting limitations:

A forwarder will be required where the connector road must be crossed. This is necessary because options for landing sites are limited by streams, stone walls, steep slopes along the road, and the high tension power line. A skidder will also be necessary for removal of timber from the steeper slopes.

Slopes are generally 20% or less, with the exception of a small area at the peak of Rattlesnake Hill. Steeper areas will be avoided whenever possible. When it is not possible, both the degree of slope and the length of sloped sections of road will be minimized. BMP water bar requirements will be enforced.

CULTURAL RESOURCES

Foundations?:	None known	**Stone Walls?:**	Yes	**Quarries?:**	Unknown
Cellar holes?:	Yes	**Wells?:**	None known	**Dams?:**	None known

Comments on Cultural Resources:
There are several "thrown" stone walls on this lot, mostly near the roads. Skid roads will go through existing barways where it is not possible to avoid walls altogether. Loggers will be directed to protect walls as much as possible.

To the north of intersection of the Gate 29 access road and the road that connects to the power line there are remnants of two shallow "cellar holes" (only marginally underground) in poor condition. A third cellar hole is located in the center of the lot, near remnants of walls that enclose what may have been a cultivated area. Nearby are a couple of stone piles that are 3-4 feet tall and about 15 feet in diameter. Downhill there is a short series of small stone piles in a zig-zag formation. These features will be flagged, and avoided as much as possible.

DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

The bedrock outcrop at the top of Rattlesnake Hill is an Acidic Rocky Outcrop Natural Community, a type of habitat that's unusual in Massachusetts. Associated vegetation includes lowbush blueberry, Pennsylvania sedge and little bluestem. According to NHESP Restoration Ecologist Chris Buelow, this area may support rare Lepidoptera (butterflies and moths).

General Wildlife comments:
Moose pellets and browse are common along the streams south of the connector road. A porcupine was also seen in this area. Deer pellets were seen occasionally but are much less common.

This harvest will protect and enhance wildlife habitat. Removal of pine around the summit of Rattlesnake Hill will help to maintain/restore the rare Acidic Rocky Outcrop community. This treatment would also be beneficial on the summit itself if it were possible, but that area is probably inaccessible for logging equipment. Release of oaks throughout the lot will result in increased mast production. Stick nests, high quality potential nest trees, and large diameter snags, cavity trees and logs will be protected wherever possible. Regeneration in the openings will result in small patches of early successional habitat.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity. NHESP will also be consulted to ensure that this harvest is beneficial to uncommon species, particularly in the Acidic Rocky Outcrop Natural Community at the top of Rattlesnake Hill.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

NORTH

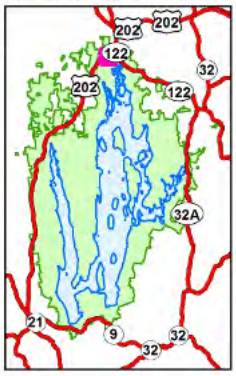
FY2017 Proposed Forestry Project

NS-17-19

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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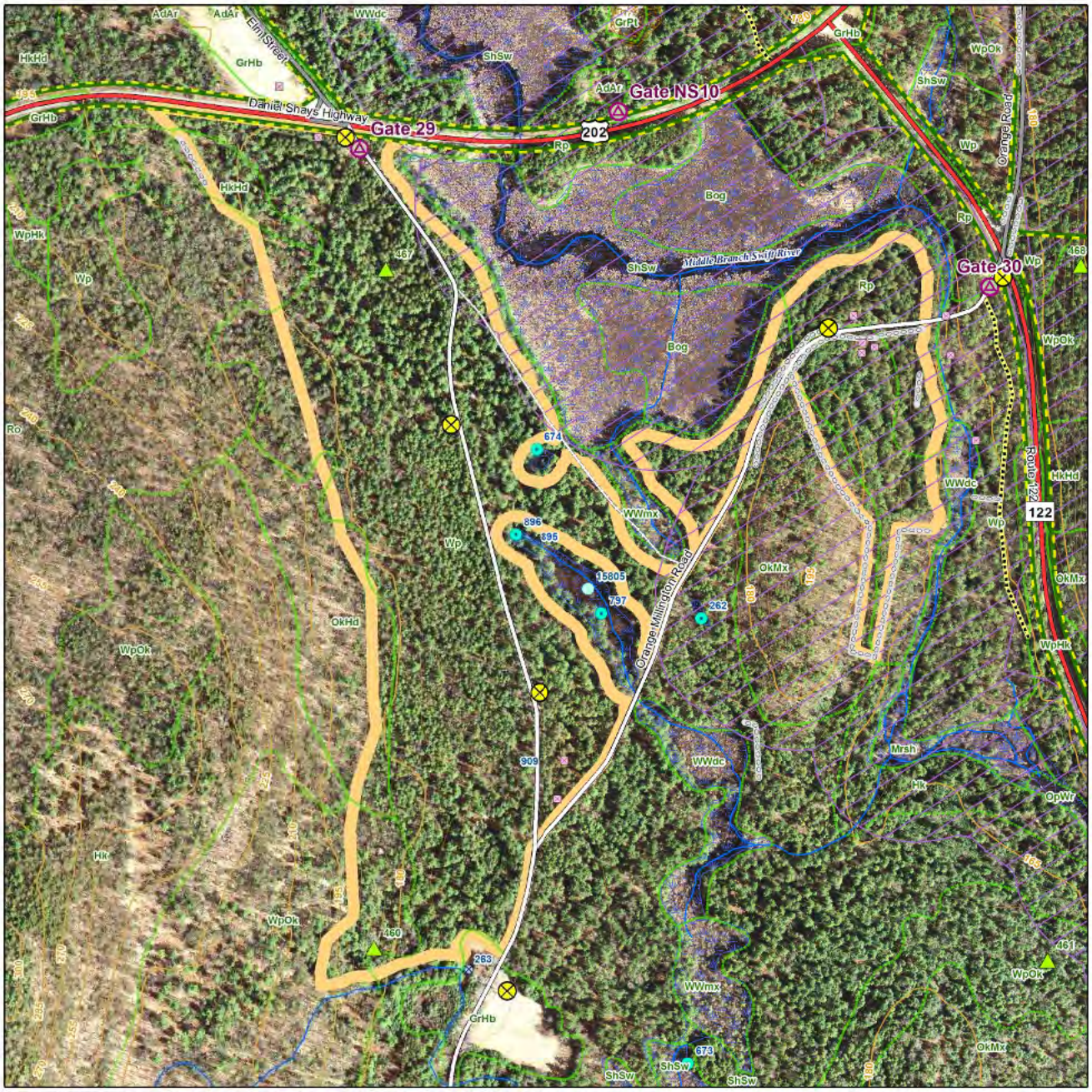
Map Scale- 1:5,000



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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal NS-17-19 for Public Review

Lot Review Number NS-17-19 **Date:** 12/7/2016 **Forester:** Johnson

Watershed: QU **Acres** 80.2

Boundary Description: This lot is bordered to the north by Route 202 in the vicinity of Gate 29. The west boundary follows the lower edge of the slope of Harris Hill to the west of Gate 29 access road. The southernmost boundary is a stream that drains the southeast slope of Harris Hill, and a field on the west side of Gate 29 road. The southeast border follows the northwest sides of Gate 29 and Gate 30 access roads, detouring north around a shrub swamp about 700 feet northeast of the road intersection. Near the east end of Gate 30 road the lot boundary follows a stone wall south, east, north, and east again. It then follows the Middle Branch of the Swift River and associated wetlands north and west back to Gate 29.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	White pine	73.8	**Dominant**	Tree seedlings/saplings dominate site
Secondary	Red pine	6.4	**Secondary**	
Other				

Description of forest composition/condition: White pine dominates most of this lot, in both the overstory and the understory. There are red pine plantations on either side of the Swift River crossing at Gate 30. Residual red pine from a plantation that was cut is scattered amid the white pine near Gate 29. Oaks, and to a lesser degree hemlock, red maple and other hardwoods, are a minor element of both the overstory and the understory. These occur with greatest frequency near the roads, at the base of Harris Hill in the west, and around the stone walls in the east. Form of all species is most variable at the east end of the lot, which has not been managed in forty years. Overall health and vigor is good in the rest of the lot, but red pine mortality is likely in the near future due to red pine scale.

Describe invasives present, assessment techniques used, and concerns: There is bittersweet and glossy buckthorn near Gate 30, particularly to the west of the Swift River.

SOILS

% Excessively drained soils:	68
% Well drained soils:	28
% Poorly to Very Poorly drained soils:	4

Further comments on soil

The breakdown in the Quabbin soils layer is as follows:

Excessively Drained Deep Glacial Outwash 54.9 acres
Well Drained Thick Fine Sandy Loam 10.0 acres
Well Drained Thin Soils w/Bedrock Outcrops 4.0 acres
Moderately Well Drained Fine Sandy Loam 8.3 acres
Poorly/Very Poorly Drained Sandy Loam/Muck 3.0 acres

Most of this lot is excessively drained, which gives pine a competitive advantage over hardwoods. The poorly drained soils in the Quabbin soils GIS layer are around the periphery of the wetland, and are probably a result of imprecise mapping. The wetland will be carefully delineated on the ground after spring leaf out.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	No
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

The boundaries of this lot have been drawn to exclude the main wetlands in this area, namely a large (20 acre) wetland bordering the Middle Branch of the Swift River, a 2 acre shrub swamp / verified vernal pool at the headwaters of a tributary to the Middle Branch of the Swift, and a small verified vernal pool southwest of the Swift. There is a third verified vernal pool adjacent to the lot on the southeast side of Gate 30 road, and a potential vernal pool to the west of the Gate 29 access road near the south end of the lot. DWSP management guidelines will be applied to all vernal pools, whether verified or potential, namely a 100 foot shade zone and a 200 foot low ground disturbance zone.

Generally there will be no harvesting in filter strips, because the regulatory requirement of leaving 50% of well distributed basal area precludes making regeneration openings in these areas. However, some openings may slightly overlap the outer edges of filter strips, and trees may occasionally be cut in filter strips in order to make space for felling trees in nearby groups. Red pine will be removed from filter strips within the limit of the law.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	26
Average regen opening size:	1
Maximum regen opening size:	4.5

Description of advance regeneration in proposal area:

Regeneration is dense white pine with a minor component of oaks, hemlock, red maple and other hardwoods, resulting primarily from a selection harvest that was completed in 2000. In addition, shelterwood prep cuts were completed to the west of Gate 30 road in 1967 and again in 1985, and south of Gate 30 road in 1976-1979. The regeneration needs to be released at this time in order to remain vigorous and healthy.

General comments on silviculture proposed:

Small group/patch selection with thinning between openings, for the dual purpose of removing as much as possible of the remaining red pine plantations, and releasing as much as possible of the excellent regeneration that resulted from previous harvests.

Openings in red pine will be a maximum of 4.5 acres; all others will be a maximum of 2 acres. Openings will average 1 acre and will be irregularly shaped. Five to ten square feet per acre of basal area of sawlog- and pole-sized trees will be retained in openings =½ acre.

Priority areas for openings will meet one or more of the following conditions:

- concentrations of red pine,
- clusters of trees that are diseased, declining, or have poor stem structure, and/or
- presence of advance regeneration that needs to be released.

All tree species will be retained, and those that are uncommon locally or regionally, if found, will be particularly protected. Den trees, potential den trees, snags, large logs, trees with stick nests, and potential nest trees (i.e. those with 3-way forks or similar canopy structures) will be retained wherever possible as valuable wildlife habitat.

Trees on the perimeter of openings will have large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if cut in the future. Thinning around openings will improve the vigor and seed production of perimeter trees, and will make them more wildfirm after a few years. These intermediate treatments will also give openings a softer, more irregular shape.

Subwatershed Analysis

DCR-DWSP Forestry Lot Proposal NS-17-19 for Public Review

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
95	1429.7	24.9	332.5	77.2

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐
Feller/processor required: ☐
Steep slopes present? ☐

Comments on harvesting limitations:
None

CULTURAL RESOURCES

Foundations?: None known
Cellar holes?: Yes
Stone Walls?: Yes
Wells?: None known
Quarries?: Unknown
Dams?: None known

Comments on Cultural Resources:
Thrown stone walls form part of the boundary of the lot in the northwest and southeast corners. In the southeast some of the walls form a narrow slot near what records say was an old sawmill. A small cellar hole was found near the south end of Gate 30 road. DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: None known

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:
Wildlife habitat features will be protected, including stick nests, high quality potential nest trees, and large diameter snags, cavity trees and logs. Release of regeneration and initiation of new regeneration in the openings will result in small patches of early successional habitat. Release of oaks near the perimeter of the lot will result in increased mast production.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

NORTH

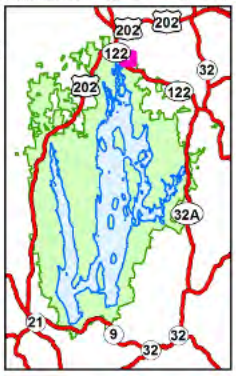
FY2017 Proposed Forestry Project

NS-17-24

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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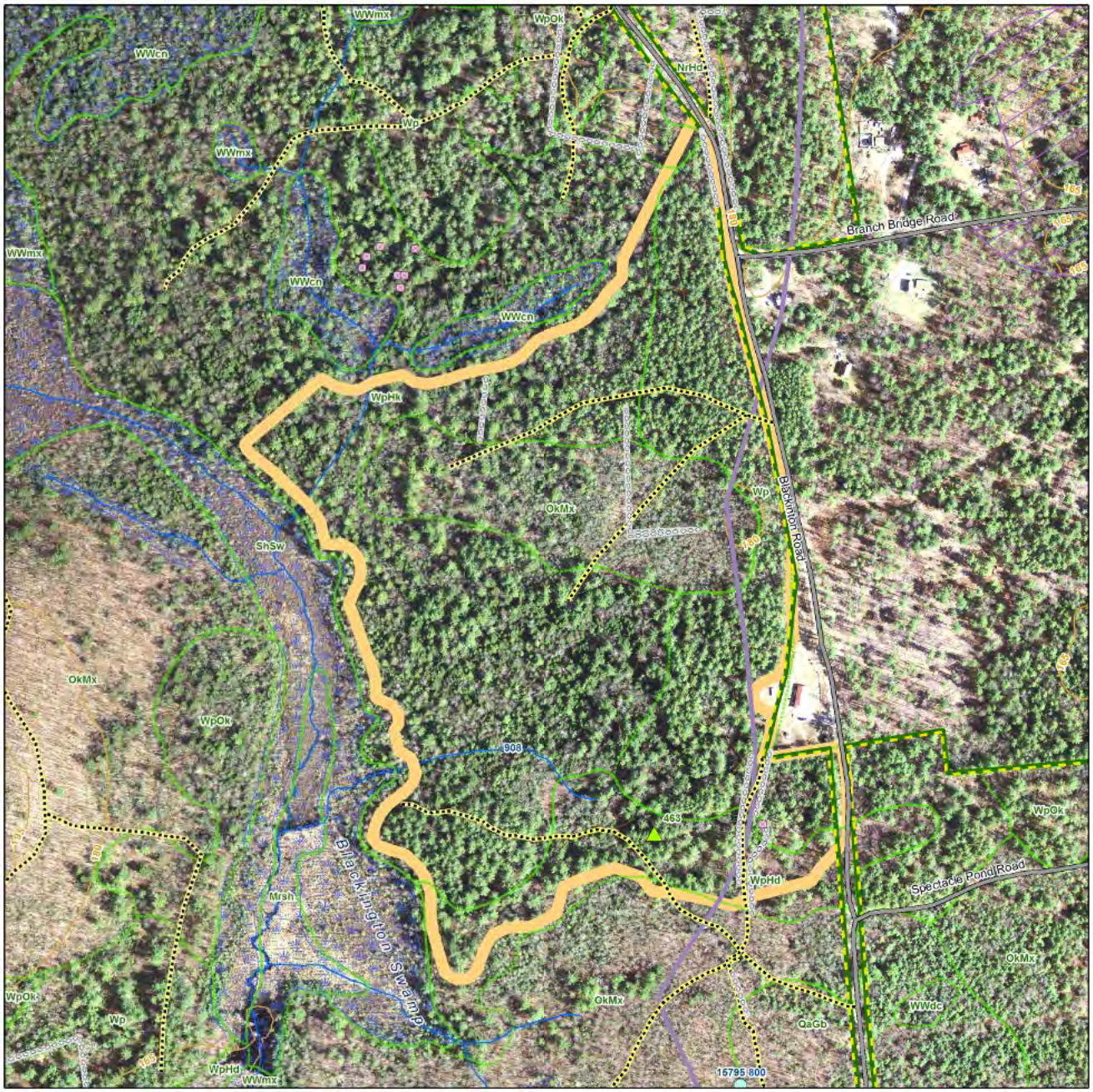

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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal NS-17-24 for Public Review

Lot Review Number NS-17-24 **Date:** 12/7/2016 **Forester:** Johnson

Watershed: QU **Acres** 56.9

Boundary Description: This lot is bordered to the east by Blackington Road, from the private road that leads to the north shore of North Spec Pond to about 400 feet north of Branch Bridge Road. The north border of the lot is a stream-wetland complex that flows westerly into Blackington Swamp, which forms the west edge of the lot. The boundary to the south is the transition from white pine mixed with hardwoods to pure hardwoods.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	White pine/hemlock	26.6
Secondary	White pine	20.9
Other	Oak, mixed - dry site	9.4

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site
Secondary	

Description of forest composition/condition: The upper canopy near Blackington Road is dominated by white pine, with hemlock sawlogs and poles increasing in prevalence and sometimes becoming dominant as one approaches Blackington Swamp. Less common species include hardwood poles, most commonly red maple, red oak, and black oak, and occasional pitch pine sawlogs near the Swamp. Overstory density is highly variable, from widely scattered to tightly spaced. Where basal area is lowest, midstory poles are dominant. In medium density areas the pine is often branchy and/or forked. Where white pine is densest all crown classes are present, from dominant/co-dominant to suppressed. White pine crowns are often thin, possibly due to one or more of the needle drop funguses, which are common in this area. Surprisingly, much of the hemlock in this lot is in relatively good condition, with straight clear stems and healthy crowns compared to hemlocks elsewhere on the Quabbin watershed.

Past harvesting in this area included shelterwood prep cuts in 1974 and 1985, each covering about 13 to 14 non-contiguous acres. There is no record of past harvests for the remaining 30 acres.

Describe invasives present, assessment techniques used, and concerns: None found.

SOILS

% Excessively drained soils:	39
% Well drained soils:	43
% Poorly to Very Poorly drained soils:	18

Further comments on soil

These percentages are based on the quabsoil shapefile, which appears to be inaccurate for this area. Most notably, although there are localized wetlands within the lot they are very small, occupying far less than the 10 acres of poorly drained soils predicted by the GIS data. A more comprehensive evaluation will be done after leaf out in the spring. In any case, there will be no harvesting in wetlands, and skid roads will be located on stable soils. All work throughout the lot will be done when soils are sufficiently dry or frozen to support logging equipment without damage. Both landings are in areas with well drained to extremely well drained soils.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	No
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

DCR-DWSP Forestry Lot Proposal NS-17-24 for Public Review

Further comments on wetlands:

The short above ground channel in the middle of the southern half of the lot leads to a wetland which could be a vernal pool. This will be protected according to guidelines in the Quabbin management plan, including a 100 foot shade zone and a 200 foot low ground disturbance zone.

Generally there will be no harvesting in filter strips, because the regulatory requirement of leaving 50% of well distributed basal area precludes making regeneration openings in these areas. However, some openings may slightly overlap the outer edges of filter strips, and trees may occasionally be cut in filter strips in order to make space for felling trees in nearby groups.

Amphibian egg masses found in one potential vernal pool; it will be treated as if verified.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	19
Average regen opening size:	1
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

Regeneration of white pine and hemlock seedlings and saplings is dense in many areas, but patchy overall. In places where there is little tree regeneration the understory tends to be mostly open, with a few scattered ferns, clubmoss, tea berry, and wintergreen. Browse did not appear to be a major problem here, although deer may have contributed to the dominance of pine and hemlock and the openness of the understory where regeneration is absent.

General comments on silviculture proposed:

Small group/patch selection. Openings will be a maximum of 2 acres, with an average of 1 acre. Openings will be irregular in shape, and will be located where there are clusters of trees that are diseased, declining, or have poor stem structure. Where possible, healthy, well formed advance regeneration that is suited to the site will be released. Five to ten square feet per acre of basal area of sawlog- and pole-sized trees will be retained in openings >=½ acre.

All tree species will be retained, and those that are uncommon locally or regionally, such as pitch pine, will be particularly protected. Den trees, potential den trees, snags, large logs, trees with stick nests, and potential nest trees (i.e. those with 3-way forks or similar canopy structures) will be retained wherever possible as valuable wildlife habitat.

Trees on the perimeter of openings will have large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if cut in the future.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
38	654.4	10.32	153.3	51.1

Additional comments on Subwatershed analysis

The remaining 5.8 acres are along Blackington Road and are outside the Quabbin watershed. They drain east and north to Lake Rohunta, and thence to the Millers River.

HARVESTING LIMITATIONS

Forwarder required: ☐

Feller/processor required: ☐

Steep slopes present? ☐

Comments on harvesting limitations:

None

CULTURAL RESOURCES

Foundations?:	None known	**Stone Walls?:**	Yes	**Quarries?:**	Unknown
Cellar holes?:	None known	**Wells?:**	None known	**Dams?:**	None known

Comments on Cultural Resources:

There are a few "thrown" stone walls on this lot. Skid roads will go through existing barways where it is not possible to avoid walls altogether. Loggers will be directed to protect walls as much as possible. DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: None known

Comments on any Unique or Unusual Sites or Habitats on the Lot:

None known.

General Wildlife comments:

Wildlife habitat features will be protected wherever possible, including stick nests, high quality potential nest trees, and large diameter snags, cavity trees and logs. Regeneration in the openings will result in small patches of early successional habitat.

This area is also being considered as a possible site for the creation of larger patches of early successional habitat. If this goes forward, it would require a new proposal with a separate review process.

RARE/ENDANGERED SPECIES

At the time of posting all available NHESP maps and data had been consulted and there were no Estimated or Priority Habitats for listed species found in the lot proposal area. Should new information become available DWSP will follow recommendations as needed.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed:	☐	**Work needed on permanent bridges:**	☐
Landing work needed:	☐	**Beaver Issue:**	☐
Culverts needed:	☐		

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

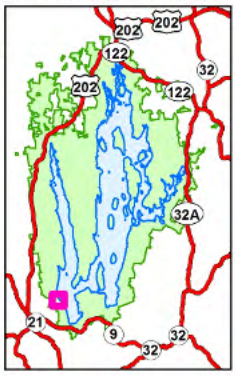
NORTH

FY2017 Proposed Forestry Project
PE-17-1

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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Map Scale- 1:5,000

File Path: W:\GIS\Projects\Forestry_Section\ProposedHarvestLots\QRPubRev2017.mxd

Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PE-17-1 for Public Review

Lot Review Number **PE-17-1** **Date:** 4/7/2016 **Forester:** Wood

Watershed: QU **Acres** 80.4

Boundary Description: Lot runs between the shoreline and powerline, north edge is a brook about 660' south of Old Enfield Rd. The southern edge is another brook that runs east and empties into the reservoir.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	White pine/hardwood	37.1	**Dominant**	Tree seedlings/saplings dominate site
Secondary	Oak/hardwood	21.3	**Secondary**	
Other	Red maple - wet	14.2		

Description of forest composition/condition:

We have records of 2 previous harvests on this proposal area over the last 25 years. Lot 2007 was a harvest of remaining red pine on about 7 acres just north of the vernal pool. The second harvest, lot 2019, was on the southern pine-hardwood stand covering about 12 acres of this proposal. Treatment here was a group shelterwood regenerating about 1/4 of the stand to mainly white pine and black birch.

The remaining red pine stand (never cut) died from scale infestation between 2010-2014 releasing some nice white pine regeneration.

The oak-hardwood and mixed oak stands are similar with overstory dominated by red oak with some white and black oak, red maple and scattered, white pine, black cherry and white, yellow and black birch. Along the brooks and in the central part of the lot are red maple dominated stands. This latter area might have some hard pan and is not as well drained. The remaining hardwood stand is northern hardwoods and is located just north of the landing. This stand is dominated by sugar and red maple and transitions into red maple, white birch, white pine and scattered red pine as you move towards the powerline.

The remaining stands were typed as white pine-hardwood but now contain more oak than other hardwoods. Associated species are the same as on the oak stands along with scattered Norway spruce and red pine.

All the stands other than the red pine are generally healthy with vigorous dominant trees. The form and soundness is not impressive though. Red maple is common throughout and this species is prone to rot and storm damage. Much of the harvested volume will be firewood and pallet logs.

Describe invasives present, assessment techniques used, and concerns:

Some invasives around the cellar holes near the main landing. A few scattered small patches of Japanese barberry along the brooks, nothing else noted on walk through or during inventory.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil

Most of lot is Scituate fine sandy loam, extremely stony. Northeastern third is Gloucester gravelly fine sandy loam, extremely stony. Some of the areas, especially the areas with mostly red maple in the overstory, have a less stable soil surface and there is some rutting evident from one of the past harvests. These areas might have a hard pan which is interfering with drainage.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	Yes
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	Yes	**Is logging in wetlands planned?:**	No

Further comments on wetlands: 2 stream crossings required with possibly a third if northern landing is used. All are on old woods road and appear to have been forded in the past. Portable bridges will be required. There is also a short wet section above an intermittent stream in this road which will be crossed (wetland crossing). This location will most likely be moved west of existing old road to a better location which will be reinforced with poles.

There is only 1 known vernal pool on lot and was previously confirmed as such by NR (#398) but it was totally dry on sight visit on 4/6/16.

SILVICULTURE

Acres in Intermediate cuts:	5
Acres in prep/establishment cuts:	10
Acres in Regeneration cuts:	20
Average regen opening size:	1
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

Understory under most of the hardwoods is white pine mixed in with some red maple and black birch and sparse oak, chestnut sprouts and beech. Shrubs include low and high bush blueberry and viburnums. Various ferns and some princess pine are also present. There are some areas with out much regeneration but a lot of ferns. It is expected all areas will successfully regenerate barring heavy browse by moose. Understory under the white pine/hardwoods stands is mainly white pine with areas mixed with red maple and black birch but not much oak or other more desired hardwood.

General comments on silviculture proposed:

The only harvesting that has occurred on this lot recently was on the southern quarter where the small red pine plantation was mostly removed and later part of the white pine-hardwood stand was cut as a group shelterwood. Currently basal areas range 50-180 with 150 being typical on uncut areas. Basal area of acceptable quality overstory was variable, ranging 20-90, averaging 44. There is a lot of poorly formed and low vigor red maple particularly in the hardwood and pine-hardwood stands.

Along the woods road west of the powerline is a small area of northern hardwoods and some birch-maple that could be improved with a firewood thinning. This is the only area that should need an intermediate cut.

A couple areas with better formed overstory could use prep cuts with openings, if any, being smaller than 1/3rd acre. Some of the filter strips along cut areas will be thinned. For all treatments well formed, vigorous red and white oak, white pine, sugar maple and hickory will be favored for retention but some individuals of all species present will be retained for seed. Additionally any active cavity trees, some large course trees for future cavity formation and course woody debris, and some of the emergent white pines will be retained for habitat and to diversify structure.

The rest of this lot (majority of acreage) will have openings from 1/3-2 acres created, with 5-10 sq. ft. of basal area retained on the openings over 0.5 acre. On the areas that had been previously cut existing openings will be expanded upon with new openings when they fit and are appropriate. Once regenerated these areas should have at least 2 well developed age classes. Goals include diversifying species, age and structural composition. The white pine type and understory throughout are not currently very diverse.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
5	683.2	69	101.8	80.4

Additional comments on Subwatershed analysis

Acreage above includes 11 acres on lots which were sold but aren't harvested yet. Lots 1033 and 2019 were cut in 2007 and would be coming out of calculation next year (32 acres).

DCR-DWSP Forestry Lot Proposal PE-17-1 for Public Review

HARVESTING LIMITATIONS

Forwarder required: ☐ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

No equipment restrictions should be necessary for this proposal. The northern landing is smaller so if it is used a forwarder would work out better.

CULTURAL RESOURCES

Foundations?: None known **Stone Walls?:** Yes **Quarries?:** Unknown

Cellar holes?: None known **Wells?:** None known **Dams?:** None known

Comments on Cultural Resources:

The only cellar holes known are just off the southern landing, there is also a well in the landing area across the road. These will be well marked with flagging and will be avoided during harvesting. DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

Nothing noted.

General Wildlife comments:

Deer, moose, eagle, raccoon, bobcat and coyote are some of the species known to frequent here.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

2 stream crossings required with possibly a third if northern landing is used. Appears none have enough flow year round to sample. All are on the old woods road and it is unclear what protections measures were used in the past. Portable bridges will be required. There is also 1 small wet area above an intermittent stream that will be a wetland crossing and will be reinforced with poles to avoid rutting.

FOREST ACCESS ENGINEERING

Gravel needed: ☑ **Work needed on permanent bridges:** ☐

Landing work needed: ☑ **Beaver Issue:** ☐

Culverts needed: ☐

Further comment on access needs:

The 2 landings are existing but may need additional gravel to allow trailer access. The landing off Old Enfield Road is a small roadside landing that might not be used as it would require an additional stream crossing.

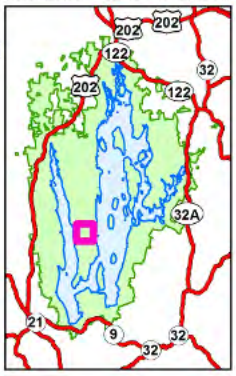
NORTH

FY2017 Proposed Forestry Project
PR-17-6-A & B

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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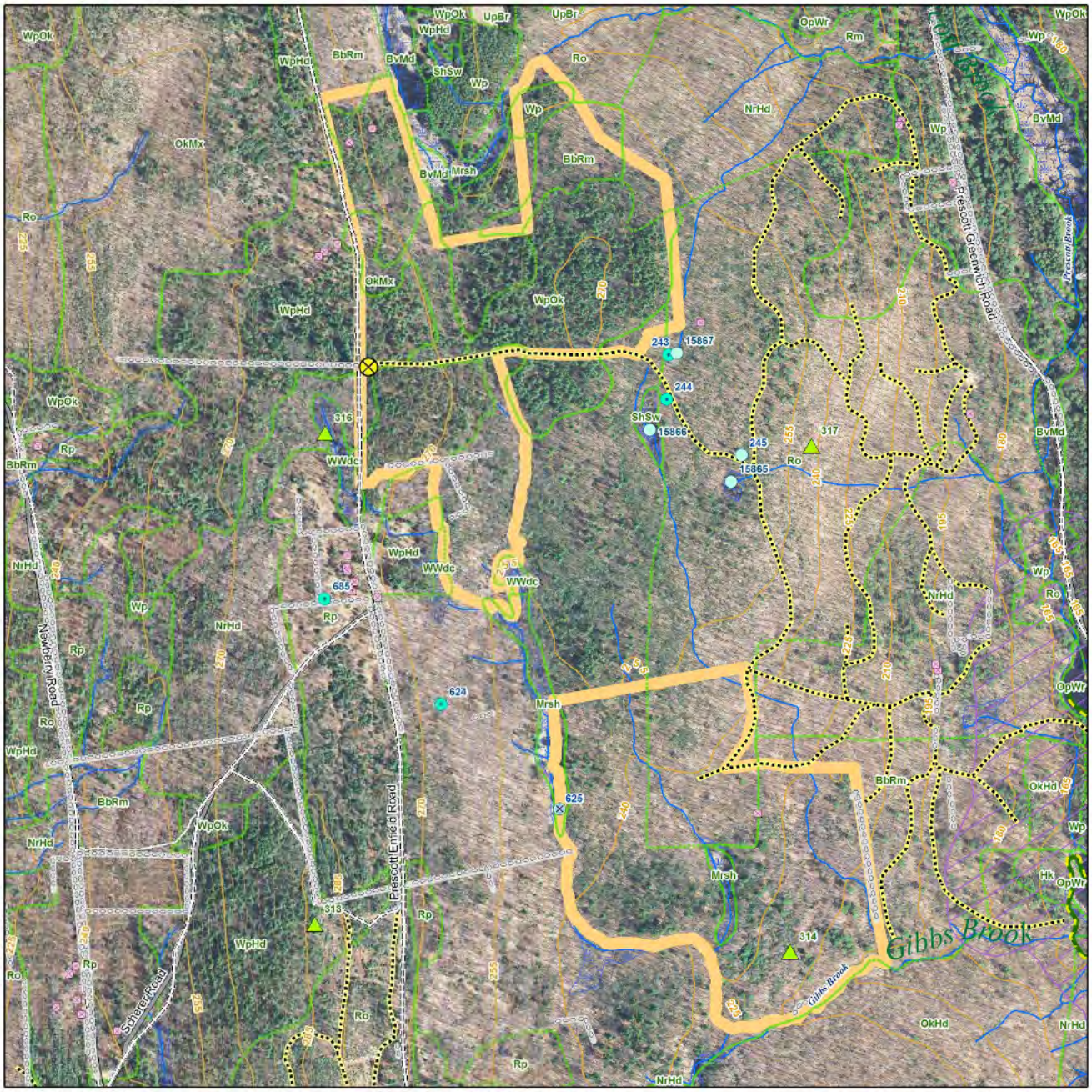

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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PR-17-6-A-B for Public Review

Lot Review Number PR-17-6-A-B **Date:** 2/1/2016 **Forester:** Beard

Watershed: QU **Acres** 115

Boundary Description: The area is situated on the east side of the gate 17 road just north of the intersection with Sherer Road. It extends east to the brow of the slope. The south end of the east side is a stone wall. A small portion of the north boundary is Griswold brook. The south boundary is Gibbs Brook. The western boundary is a wetland complex that eventually meets up with the gate 17 road.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	Oak/hardwood	71	**Dominant**	Tree seedlings/saplings dominate site
Secondary	White pine	34	**Secondary**	
Other	Red pine	10		

Description of forest composition/condition:

The proposal area encompasses three distinct forest types. The largest, at 60 acres, has an overstory of predominately red maple followed by a mix of oak, black birch and hickory. Timber quality is fairly poor amongst the maple and average to above average for the oaks, birch and hickory. Scattered pockets of large white pine, some with very poor form known as wolf pine, harkens to the open growing conditions following agricultural abandonment. Given the dense overstory, the mid canopy presence is light containing a scattering of suppressed maple, hickory and birch. The same cannot be said for the regeneration layer which boasts a fairly dense covering of white pine seedlings and saplings. Interestingly, much of the pine understory developed without timber harvest manipulation. Serpentine and small groups of black birch saplings sprung up in the eastern quarter of the forest type following a 1988 oak thinning completed by the MDC logging crew. This type makes up all of section B and about 18 acres of section A.

The second forest area is a 34 acre stand of white pine. This type makes up the entire eastern half of section A and smaller pockets in the western part of the section. The overstory varies from a thinned condition to full crown closure. The fully stocked section (eastern 2/3s) is composed of average to below average sawtimber with no meaningful mid canopy presence. The understory is represented by a robust layer of white pine seedlings and saplings. This area is home to a number of large poor formed pine indicative of an open growing environment following agricultural abandonment. The thinned area has a well spaced better quality white pine sawtimber overstory and an understory of black birch sapling/poles resulting from a 1991 harvest.

The final forest type is a 10 acre red pine plantation. The plantation originates from the 1940s when significant portions of open space were planted to trees to better capture and filter precipitation entering the watershed and provide a future timber supply to the local/regional forest products industry. This plantation has already fulfilled that mission twice from thinnings in 1991 and 1996. The resulting composition consists of well spaced good quality red pine sawtimber with scattered good quality white pine sawtimber over a layer of black birch poles of varying quality. Presently the plantation does not show stress or major mortality from the scale infestation that moved through the area several years ago.

Describe invasives present, assessment techniques used, and concerns:

The inventory picked up barberry as the main invasive in both sections. In section A it is concentrated in the red pine and has a scattered composition. In section B the barberry is concentrated around moist mesic areas. There areas tend to be along the section's two intermittent brooks.

SOILS

DCR-DWSP Forestry Lot Proposal PR-17-6-A-B for Public Review

% Excessively drained soils:	10
% Well drained soils:	80
% Poorly to Very Poorly drained soils:	10

Further comments on soil

Gneiss derived, well drained Montauk rocky fine sandy loam. Canton-Chatfield-Hollis complex which is a rocky till derived from both gneiss and schist and varies between well drained and excessively well drained (Hollis). There is a vein of Ridgebury gravely, fine sandy loam which is poorly drained.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	No
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	Yes	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

In section A, all water resources are on the edge of the area. Section B has two intermittent brooks which flow south to Gibbs brook. The westerly one enters a wetland just before meeting Gibbs brook.

There is a complex of vernal pools just beyond the eastern boundary of the section A. I believe the most northerly pool may have been studied by Bob Brooks through the 80s and 90s. There is also one on the southwestern edge of section B (Quabbin verified 625) that I will like to check.

I believe the area can be operated without any stream crossings. However the main skid trail accessing both sections does travel through a low spot (in section A where the vein of poorly drained Ridgbury soil runs) which may need to be armored with poles or a skid bridge.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	22
Average regen opening size:	1.5
Maximum regen opening size:	9

Description of advance regeneration in proposal area:

Dense white pine regeneration exists under the hardwood and white pine overstory types, especially in the previously unharvested areas. Black birch regenerated in areas where thinning occurred in 1988 and 1991. Under the red pine stand a layer of black birch poles has developed following two thinnings.

General comments on silviculture proposed:

There is a dual silvicultural approach for the area. One is focused on reducing forest health risk and structural diversity and the other solely on structural diversity.

Except for the red pine, much of the area is well stocked (3000 - 5000 stems per acre) with advanced white pine regeneration ranging between seedling and sapling size. The highest density is found in the eastern half of section A. Regeneration in section B is less dense and is mostly in the sapling size class. Releasing a quarter to a third of the regeneration in openings will allow for the continued recruitment of the young forest layer. Locating sections with vigorous, dense seedling regeneration coupled with low quality overstory will be first priority. The seedling class is more pliable and better equipped to survive timber harvesting then the more rigid sapling. Sapling areas will also be treated, but not likely as successfully as seedling areas. There will also likely be scenarios where regeneration may be lacking but the overstory is of low quality and would merit removing.

Having been thinned twice, section A's red pine plantation is well positioned for an overstory removal. Harvesting should also avert loss from the red pine scale which, beginning in the mid 2000s, infected and killed many of the red pine plantations close to the reservoir. Currently the stand is showing little sign of infestation which maybe due to its upland location. Pending commissioner approval the approach will be to remove all red pine in an approximately 9 acre opening. The 9 acre section has a well distributed small pole/pole size black birch layer awaiting full release. In addition to the black birch there are singular and small groups of fairly good quality overstory white pine. Between the two this part of section A should have enough structural diversity following the removal of the red pine. Hopefully, the red pine removal harvest will trigger some new regeneration other than black birch. Maintaining woody habitat (live/dead snags, den trees and down

logs) will also complement future forest complexity for the entire proposal area.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
74	1694	16	393	40
89	417	12	92	75

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐
Feller/processor required: ☐
Steep slopes present? ☐

Comments on harvesting limitations:

Cut-to-Length is preferred. However, a biomass operation may be appropriate for the volumes of low quality white pine in the eastern half of section A.

CULTURAL RESOURCES

Foundations?: Yes
Cellar holes?: Yes
Stone Walls?: Yes
Wells?: None known
Quarries?: Unknown
Dams?: None known

Comments on Cultural Resources:

There is a cellar hole and barn foundation located in the northwest corner of section A (along the gate 17 road). DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed:	☑	**Work needed on permanent bridges:**	☐
Landing work needed:	☑	**Beaver Issue:**	☐
Culverts needed:	☐		

Further comment on access needs:

Some improvements to an old landing may be required to get trucks off the road.

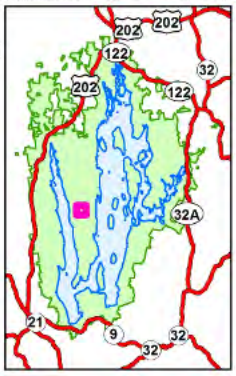
NORTH

FY2017 Proposed Forestry Project
PR-17-8-A & B

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PR-17-08-A for Public Review

Lot Review Number **PR-17-08-A** **Date:** 2/19/2016 **Forester:** Beard

Watershed: QU **Acres** 23

Boundary Description: The area encompasses red pine south of the old UMASS observatory and approximately 400 ft west of the gate 17 road. The east and south boundaries are a mix between plantation edge and stone wall. The west boundary is along the Daniel Shays paired watershed study area, a small section of a harvest completed in 2015 and a harvested completed in 1999. The north boundary is stone wall.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	White pine/Red Pine	23	**Dominant**	Tree seedlings/saplings dominate site
Secondary			**Secondary**	
Other				

Description of forest composition/condition: Planted Red Pine and White Pine cover this area of the watershed. Prior to state ownership, the site was used for crops (arable) and/or improved pasture. Believing that forest cover is the best filterer and conservator of water, early watershed managers were quick to reforest these open areas with a monoculture of mainly Red Pine, White Pine, Spruce or a like combination. Most of these watershed plantations were seeded in the late 1930s through the early 1940s (the CCC era).

The area has had three forest management entries; a 1991 thinning, a 1996 thinning covering all but the southeastern 1/3 and a 1999 overstory removal with reserves covering the western central part of the area (about 4 acres). Basal area averages 140 square feet; with the northern quarter being the densest (190 sqr. Feet) and mid section thinned in '99 the sparsest at 65 sqr. Ft. Pure pockets of red pine are concentrated in the mid section with a more equitable mix of white and red pine to the north and south.

Describe invasives present, assessment techniques used, and concerns: Evaluation was a combination of systematic cruise and general walk through. Most common invasive is japanese barberry. Bittersweet and honeysuckle were also observed. This group of invasives are fairly common in areas where soils were plowed or became improved pasture.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil
Component soils of the area are: Montauk, Scituate and Henniker sandy loams which are fairly stony. They are all Gneiss derived and mostly well drained.

WETLANDS

Wetlands present?:	No	**Are stream crossings required?:**	No
Streams present?:	No	**Are wetlands crossings required?:**	No
Vernal pools present?:	None known	**Is logging in filter strips planned?:**	No
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands: Just outside and mid way down the east boundary is an old spring.

SILVICULTURE

Acres in Intermediate cuts: 0 **Description of advance regeneration in proposal area:**

Acres in prep/establishment cuts:	8
Acres in Regeneration cuts:	15
Average regen opening size:	15
Maximum regen opening size:	15

The series of cuts triggered black birch regeneration which is now in the large sapling/small pole size class. The northern quarter has very little regeneration due to the high basal area. Interestingly, the southeastern quarter is home to a scattering of spruce regeneration. Hay scented fern is fairly consistent and dense, particularly in the northern quarter, which is typical of agriculturally modified soils. Wild grape is also fairly well established through the middle and southern sections of the area. The grape tends to arbor regeneration which can effect form and lead to mortality from collapse under snow load or heavy wind.

General comments on silviculture proposed:

Removing Red Pine, the primary host of the Red Pine Scale insect, is the main forest management goal. Pending commissioner approval, this would be accomplished by creating one 15 acre opening encompassing the red pine (north and mid-section of proposal area). The opening would have overstory retention averaging atleast 5 sqr. ft. of basal area per acre. Most of the retention will be well formed white pine but may include others species like white ash in the absence of white pine. There is also a well developed mid canopy of pole size black birch. Where possible, groups of well formed black birch should be retained which will contribute to the overall structural diversity. Basal area of the red pine section is approximately 140 sqr. feet per acre. The opening's residual basal area would be brought down to between 5 and 10 sqr. feet per acre.

The southeastern 1/3 of the area (about 8 acres) is roughly 60% stocked with fairly well formed white pine sawtimber with the remaining 40 percent being mostly red pine. Single tree and small group selection would be used to remove most of the red pine and some (mostly poor formed) white pine. This section of the area has a basal area of approximately 160 square feet. The proposed silviculture would result in approximately 135 sqr. ft. per acre residual basal area composed mostly of well formed white pine sawtimber.

Conserving live/dead snags, cavity/den trees, and course woody debris for wildlife would compliment the silviculture and add to future forest diversity.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
74	1694	16	407	23

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☑
Feller/processor required: ☑
Steep slopes present? ☐

Comments on harvesting limitations:

A Cut to Length harvesting system is ideal for the majority of the timber likely to be harvested.

CULTURAL RESOURCES

Foundations?:	None known	**Stone Walls?:**	Yes	**Quarries?:**	Unknown
Cellar holes?:	None known	**Wells?:**	None known	**Dams?:**	None known

Comments on Cultural Resources:
DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Harvested timber will be forwarded to the landing used for timber lot 3135 on the east side of the gate 17 road. This section of the road was improved with gravel in spring/summer of 2015.

DCR-DWSP Forestry Lot Proposal PR-17-08-B for Public Review

Lot Review Number PR-17-08-B **Date:** 2/26/2016 **Forester:** Beard

Watershed: QU **Acres** 6

Boundary Description: The area sets just south and east of timber lot 3135, the red/white pine area that was harvested in Autumn 2015. Specifically, the are is confined by stone wall on all but the west side. The area likely would have been included with the proposal for timber lot 3135; however it was part of the Griswold Brook watershed study area that has now been discontinued.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	Red Pine/White Pine	6
Secondary		
Other		

	Understory Type(s)
Dominant	Hayscented fern prevalent
Secondary	

Description of forest composition/condition: This proposal area is similar to section A. It's a mixed red pine/white pine plantation originating from the 1930s/40s. It differs from section A in that it has only been thinned once (1991). There does not appear to be any significant forest health issues; although there has been some mortality due to competition and weather events. Tree quality is uniformly good for the red pine and variable for the white pine. With a basal area of 185 square feet, the canopy is quite closed.

Describe invasives present, assessment techniques used, and concerns: Field inventory discovered small pockets of japanese barberry. Landing area has honeysuckle and bittersweet and barberry

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil
Gneiss derived Montauk fine sandy loam that is fairly stony.

WETLANDS

Wetlands present?:	No
Streams present?:	No
Vernal pools present?:	None known
Seeps present?:	None known

Are stream crossings required?:	No
Are wetlands crossings required?:	No
Is logging in filter strips planned?:	No
Is logging in wetlands planned?:	No

Further comments on wetlands:

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	4.5
Average regen opening size:	4.5
Maximum regen opening size:	4.5

Description of advance regeneration in proposal area:
Due to the shaded condition the regeneration layer is sparse; limited to a scattering of mostly maple and ash. The ground layer is fairly thick with hay scented fern. Patches of barberry are also present.

General comments on silviculture proposed:

Removing Red Pine, the primary host of the Red Pine Scale insect, is the main forest management goal. This will be accomplished with one opening not exceeding 4.5 acres. The opening will have reserve stocking of singular or small pods of well formed white pine. Red pine may have to be retained to meet the residual basal area goal of 5 to 10 square feet per acre. There could be locales with higher retention due to pods of good quality white pine. Because the area is small and

rectangular; there may be concern that the harvest will look cookie cutter. However varying retention should allow for visual complexity.

Accounting for other values such as wildlife will also be important. Live/Dead snags, cavity/den trees, and course woody debris will be conserved.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
74	1694	16	407	5
31	855	7	207	1

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐
Feller/processor required: ☐
Steep slopes present? ☐

Comments on harvesting limitations:

The cut-to-length and forwarder harvesting system is ideal for the uniform red pine which will be the focus of the harvest.

CULTURAL RESOURCES

Foundations?: None known
Cellar holes?: None known
Stone Walls?: Yes
Wells?: None known
Quarries?: Unknown
Dams?: None known

Comments on Cultural Resources:

The landing used for the 1991 thinning (which will be used for this operation) is in close proximity to an old homestead. DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during

the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

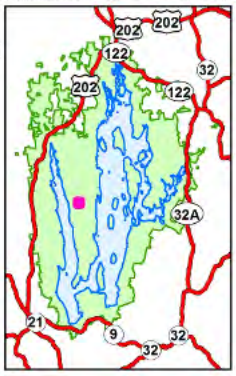
NORTH

FY2017 Proposed Forestry Project
PR-17-11

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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Map Scale- 1:2,000

File Path: W:\GIS\Projects\Forestry_Section\ProposedHarvestLots\QRPubRev2017.mxd

Date: 9/1/2016

DCR-DWSP Forestry Lot Proposal PR-17-11 for Public Review

Lot Review Number PR-17-11 **Date:** 2/26/2016 **Forester:** Beard

Watershed: QU **Acres** 6

Boundary Description: The area is directly north of the old UMASS observatory. It is confined by stone walls to the north, east and west. South boundary is the type change from forest to field.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	White pine/Red pine	6
Secondary		
Other		

	Understory Type(s)
Dominant	Hayscented fern prevalent
Secondary	Tree seedlings/saplings dominate site

Description of forest composition/condition: This proposal area is a red pine/white pine plantation with an origin dating back to the 1930s/40s. There is a sparse overstory stocking of hardwood; mostly ash, hickory and maple. Timber quality is uniformly good for the red pine and average to above average for the white pine and hardwood. No major forest health issues were observed during the field exam. There is no record of any forest management; but the field exam discovered some trees were harvested to assist in a silviculture/regeneration/browse study decades ago.

Describe invasives present, assessment techniques used, and concerns: Patches of barberry where seen in the interior of the area. The south edge along the old observatory site field is home to a variety of invasives including barberry, honeysuckle and bittersweet.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil
Gneiss derived Metacomet and Henniker fine sandy loams. Generally found on uplands and are considered moderately well drained.

WETLANDS

Wetlands present?:	No	**Are stream crossings required?:**	No
Streams present?:	No	**Are wetlands crossings required?:**	No
Vernal pools present?:	None known	**Is logging in filter strips planned?:**	No
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	4.5
Average regen opening size:	4.5
Maximum regen opening size:	4.5

Description of advance regeneration in proposal area:
Past cutting did trigger some regeneration composed of seedling ash, sugar maple, hickory and oak. The ground layer consists of rubus, hay scented fern and scattered patches of barberry and blueberry.

General comments on silviculture proposed:

Removing Red Pine, the primary host of the Red Pine Scale insect, is the main forest management goal. This will be accomplished with one opening not exceeding 4.5 acres. The opening will have reserve stocking of singular or small pods of well formed white pine and hardwood (ash, maple, oak). Red pine may have to be retained to meet the residual basal area goal of 5 to 10 square feet per acre. There could be locales with higher retention due to pods of good quality white

pine and hardwood. Because the area is small and rectangular; there may be concern that the harvest will look cookie cutter from an aerial view. However varying retention should allow for a level of spatial randomness.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
74	1694	16	407	6

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐
Feller/processor required: ☐
Steep slopes present? ☐

Comments on harvesting limitations:

Cut-to-Length and forwarder harvesting system is best for red pine which will be the majority of the timber harvested.

CULTURAL RESOURCES

Foundations?: None known
Cellar holes?: None known
Stone Walls?: Yes
Wells?: None known
Quarries?: Unknown
Dams?: None known

Comments on Cultural Resources:

DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental issues for the proposed activity. Specific requirements and BMPs for reducing the

potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

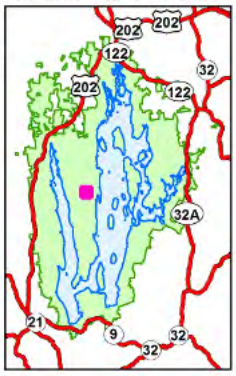
NORTH

FY2017 Proposed Forestry Project
PR-17-12-A & B

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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Map Scale- 1:3,000

File Path: W:\GIS\Projects\Forestry_Section\ProposedHarvestLots\QRPubRev2017.mxd

Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PR-17-12 for Public Review

Lot Review Number **PR-17-12** **Date:** 2/29/2016 **Forester:** Beard

Watershed: QU **Acres** 12

Boundary Description: The area is situated in the Mount Pleasant area of the Prescott Peninsula. Its specifically located on the east side of Doubleday Road a.k.a Mt. Pleasant Road. There is an A and B section. The A section is right along the road. The B section is approximately 700 ft east of section A. A is bounded on the north, east and south by stone wall. The B section is a hilltop bounded to west by a small wetland, south by an old lot line (some of which is stone wall) and north and east by decending slope.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	Red Pine/White Pine	12	**Dominant**	Hayscented fern prevalent
Secondary	Norway spruce		**Secondary**	
Other				

Description of forest composition/condition: The proposal area is a red pine plantation likely established by a Quabbin based Civilian Conservation Corp camp during the 1930s. The corp had many missions; one being the reestablishment and conservation of national and state forests often degraded by excessive lumbering, natural disasters and insect/disease outbreaks. This area is one of many amounting to thousands of acres of softwood plantations at the Quabbin. The area is an in holding to a much larger norway spruce plantation established around the same time. Its confined by stone wall; a tell tale sign of an agrarian past involving a mix of arable, pasture and wood land. Composition is 3/4s red pine followed by white pine and norway spruce with a per acre basal area of 170 square feet. Combined with an average diameter of 13 inches the stand falls on the upper range of well stocked for a red pine stocking guide. The red pine is of typical quality and form. To date it does not exhibit sign of scale infestation. The white pine has fair form but appears to be growing very vigorously with very smooth tight bark, a typical characteristic on younger trees; but not common on older sawtimber which generally has a fissured somewhat plated bark appearance. The norway spruce has a similar characteristic as the white pine; tight potato chip type bark suggesting healthy growth. Forest management records indicate the area has been thinned once in 1993.

Describe invasives present, assessment techniques used, and concerns: Invasives identified during the field cruise are: Japanese barberry, tree of heaven and honeysuckle. Although not found, it would not be surprising to find bittersweet in the vicinity. Most are present in section A. Section B has some scattered barberry. Management of tree of heaven is a concern.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil

Soils are a combination of Montauk fine sandy loam and the Millsite-Woodstock complex. Both the Montauk and Woodstock soils are gneiss derived rock tills that are well to excessively well drained. The millsite series is a schist derived, well drained rock till.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	None known	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

DCR-DWSP Forestry Lot Proposal PR-17-12 for Public Review

Further comments on wetlands: Accessing section B requires crossing a brook. Farmers of this area built a stone causeway across the brook that was used in the 1993 harvest. The wetland will likely have a 50 foot filter where 50% or more of the stocking will be retained.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	9
Average regen opening size:	3
Maximum regen opening size:	4.5

Description of advance regeneration in proposal area:

Given that the stocking is on the higher end of the well managed range, crown closure is fairly dense limiting the amount of sunlight reaching the forest floor and effecting regeneration development. Understory composition is a scattering of white ash, black cherry and norway spruce. Ground cover is composed of a dense layer of hay scented and wood fern along with pockets of rubus.

General comments on silviculture proposed:

Removing red pine, the primary host of the Red Pine scale is the primary silvicultural objective. The insect originally found in Connecticut in the 1940s has steadily moved northward and infested many red pine plantations throughout Massachusetts and southern New Hampshire. The microscopic insect completes two breeding cycles annually of both flight and flightless offspring. During their life cycle they burrow under bark scales and insert their stylus to feed upon nutrients flowing through the cambium. A sure sign of infestation is gradual browning of needles from a healthy green to a rust brown. Mature red pine plantations can succumb to intense infestation in as little as two to three years. Thankfully this area is not showing sign of infestation, however many of the surrounding plantations have died at the hand of the scale. Red Pine will be removed in up to 4.5 acre openings. Individual and pods of well formed overstory white pine, norway spruce and red pine will be left along with live/dead cavity/den trees adding to the complexity of the future forest structure. Openings will be separated by segments of current composition. Some thinning in these segments may be possible if there is a high basal area condition which fosters stagnation in crown development and higher probability of insect/disease infestation from a lack of air flow. Removing the red pine will hopefully allow a greater diversity of native tree species to re-colonize the area.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
74	1694	16	407	12
49	595	8	141	2

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

Cut-to-length and forwarder are an ideal harvest system for softwood plantations such as this area.

CULTURAL RESOURCES

Foundations?:	Yes	**Stone Walls?:**	Yes	**Quarries?:**	Unknown
Cellar holes?:	Yes	**Wells?:**	Yes	**Dams?:**	None known

Comments on Cultural Resources:
An old homestead was found along Doubleday Road (west edge of section A). There appears to be a cellar hole (mostly filled in), field stone well and either a barn foundation or paddock area. DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:
The area appears to have a healthy red squirrel population evidenced with numerous piles of cone scales at the base of norway spruce and the classic aggressive tree top chatter. Also discovered some red pine and larch used by black bear as scent marking trees.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☑
Landing work needed: ☑
Culverts needed: ☐
Work needed on permanent bridges: ☐
Beaver Issue: ☐

Further comment on access needs:

May need gravel to stabilize the landing area.

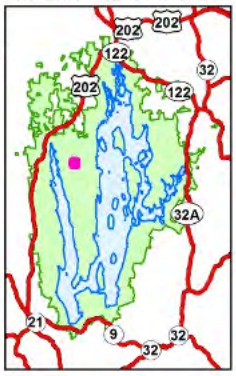
NORTH

FY2017 Proposed Forestry Project
PR-17-15

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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Map Scale- 1:2,000

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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PR-17-15 for Public Review

Lot Review Number PR-17-15 **Date:** 3/17/2016 **Forester:** Beard

Watershed: QU **Acres** 11

Boundary Description: The area is situated on the west side of the gate 20 road (aka North Prescott Rd.) slightly north of the intersection with Barnes Road. It is a red pine plantation. Its bounded by stone wall and plantation edge.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	Red pine	10	**Dominant**	Hayscented fern prevalent
Secondary	White pine	1	**Secondary**	Tree seedlings/saplings dominate site
Other				

Description of forest composition/condition: The area is a monoculture red pine plantation sown during the CCC era of the 1930s/40s. There is a scattering of white pine which may have naturally seeded in. Two thinnings in 1975 and 1989 have had modest regeneration success, mostly patchy black birch saplings. Generally, this is a typical regeneration result when working on significantly modified soil used for crop production during an earlier era. Some mortality was found, but hard to determine whether from root rot or red pine scale. None the less, the scale has ravaged much of the red pine regionally. Thankfully this stand is mostly intact.

Describe invasives present, assessment techniques used, and concerns: The field review found patches of barberry and Multiflora Rose. They were mostly concentrated around cultural features (cellar holes/foundations) and low lying spots.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil

Canton-Chatfield-Hollis complex: A well drained upland rocky gneiss/schist derived loamy till over a sandy till of the same parent material.

The soil conservation service soil survey is not fine tuned enough to pick of the vein of wetter soil along the road. Its hard to know if this characteristic has been there for along time or it has developed overtime with the transition from field to forest.

WETLANDS

Wetlands present?:	No	**Are stream crossings required?:**	No
Streams present?:	No	**Are wetlands crossings required?:**	No
Vernal pools present?:	None known	**Is logging in filter strips planned?:**	No
Seeps present?:	Yes	**Is logging in wetlands planned?:**	No

Further comments on wetlands: Mid way down the west edge there is a seepy vein that flows south eventually crossing the 20 road via a culvert.

SILVICULTURE

Acres in Intermediate cuts: 0 **Description of advance regeneration in proposal area:**

DCR-DWSP Forestry Lot Proposal PR-17-15 for Public Review

Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	9
Average regen opening size:	4.5
Maximum regen opening size:	4.5

Ground cover is mostly hay scented fern with scattered highbush blueberry. Wild grape is also prevalent (particularly along the west edge which is somewhat seepy. Patchy distribution of black birch saplings resulting from past thinnings.

General comments on silviculture proposed:

The silvicultural goal is to reduce the monoculture of red pine and regenerate with a greater diversity of native species. The goal can best be accomplished by making canopy openings that allow direct sunlight to the ground. As previously mentioned, these soils are very difficult to regenerate. At a minimum, success would be breaking up the fern layer with rubus. Colonization of rubus over time generally evolves to forest regeneration. These openings will be fairly large, but will have irregularity from pods of retention, live/dead snags and legacy trees. Most of the work will be focused on the east half of the area which is drier. The western edge is somewhat seepy and has a higher concentration of invasives.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
57	2571	95	539	11

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐
Feller/processor required: ☐
Steep slopes present? ☐

Comments on harvesting limitations:

A cut to length system is well suited for this type of harvest.

CULTURAL RESOURCES

Foundations?:	Yes	**Stone Walls?:**	Yes	**Quarries?:**	Unknown
Cellar holes?:	Yes	**Wells?:**	None known	**Dams?:**	None known

Comments on Cultural Resources:

The area appears to be home to some cellar holes and foundations. It is hard to know but they may have been filled in. This may be the case because the area was transitioned to a plantation. You can see spots that appear to have been a dwelling but are covered over with dense growth. Working around these spots will be possible. DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☑ **Work needed on permanent bridges:** ☐
Landing work needed: ☑ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

May need gravel to stabilize the landing. Road drainage should be checked (ditches and culverts).

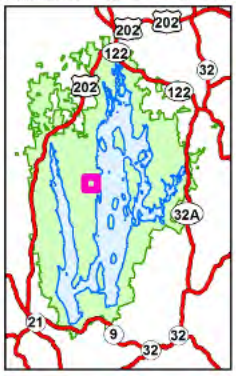
NORTH

FY2017 Proposed Forestry Project
PR-17-16

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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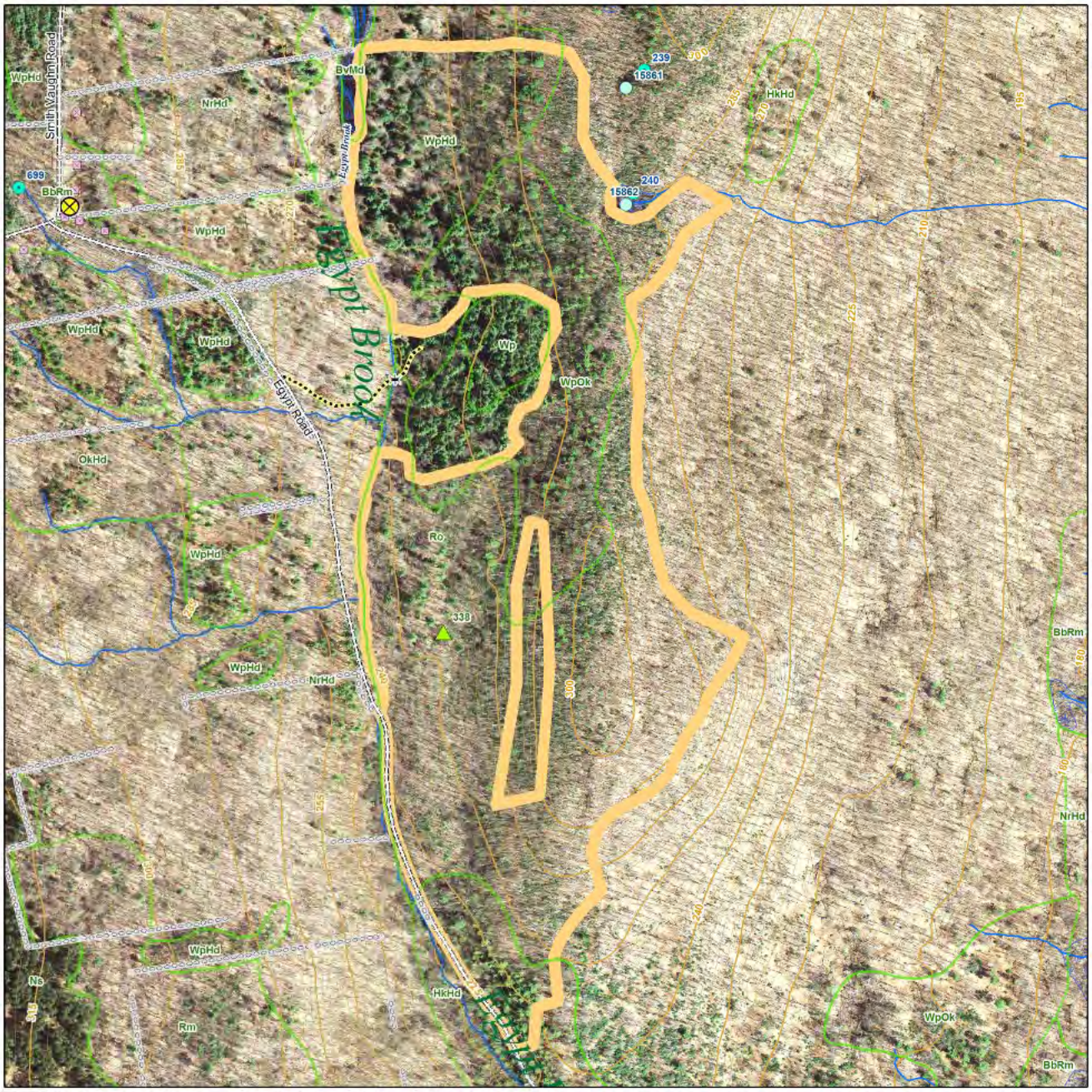
Map Scale- 1:5,000



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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PR-17-16 for Public Review

Lot Review Number **PR-17-16** **Date:** 3/15/2016 **Forester:** Beard

Watershed: QU **Acres** 73

Boundary Description: The general location of this proposal is east and south of the intersection of Egypt Brook road and end of the Gate 21 road. Specifically it sets along the east side of Egypt Brook and ascends eastward over a height of land to a steep east facing slope. It is bounded to the west by Egypt Brook, to the north by an old lot line, to the east by a vernal pool (Quabbin vernal pool 240) and steep slope and to the south by Quabbin harvest 3063 (completed in 2005)

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres		Understory Type(s)
Dominant	Oak/hardwood	60	**Dominant**	Tree seedlings/saplings dominate site
Secondary	White pine/oak	13	**Secondary**	Dry site - blueberry/huckleberry
Other				

Description of forest composition/condition: The oak/hardwood portion approximately covers the southern 3/4s of the lot. Overstory consists red oak, white oak, black oak, scarlet oak and hickory. Basal area averages 130 sqr. Feet per acre. Timber quality decreases as ascending the slope. Red oak is found throughout but there are higher frequencies of black and scarlet oak on the upper slopes. There are scattered pockets of hemlock which are in poor health due to adelgid.

The area has two exclusions; the northerly one covers an eight acre white pine area that may be in the early stage of developing old growth characteristics. The trees are tall, fairly large diameter and the boles exhibit some bark plating which is a sign of advancing age. There is not much mortality, but there is some with likely more to come. There is a regeneration layer consisting mostly of suppressed white pine triggered from either the 71 or 82 thinning. There is no planned silviculture (hence exclusion), however some light cutting may occur around the edges to help positively impact advanced regeneration. Furthermore, planned access to the surrounding proposal area will travel through it as in the past. The second exclusion just to the south covers an area that may not be manageable due to steep slope.

The area does encompass approximately 30 acres designated (internally) as exceptional forest. The criteria for such designation is somewhat loose, but several areas of big, tall and fairly good quality trees have been identified and mapped throughout the reservation. In this case, the white pine exclusion area includes trees that may fit this description, and to the south on the toe of the slope up from Egypt brook there are a number of large fairly good quality oak (mostly red but some white). However, a good portion of the exceptional forest area covers the upper slopes where the majority of the oak would be classified as dry site and is fairly small in diameter.

Describe invasives present, assessment techniques used, and concerns: Most of the area is free of invasives. The exceptions are the moist soils along Egypt brook which are home to some barberry. The main skid road leading to the lot from Egypt brook road has some dense patches of barberry. The proposed landing also has some invasive issues.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil

Chatfield-Hollis complex: A well drained rocky till derived from gneiss and schist found on uplands and upland slopes.

Canton-Chatfield-Hollis complex: A well drained upland rocky gneiss/schist derived loamy till over a sandy till of the same parent material.

Chatfield-Canton complex: A well drained rocky till derived from gneiss and schist with a sub layer of sandy till found on uplands and upland slopes.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands: The area is bounded on the west by Egypt brook which also have some wetlands from current or past beaver activity. The vernal pool bounds the area in the north east corner.

The stream crossing is an old stone causeway. A temporary skid bring can span it which will ensure maintenance of water quality.

SILVICULTURE

Acres in Intermediate cuts:	5
Acres in prep/establishment cuts:	5
Acres in Regeneration cuts:	10
Average regen opening size:	1.5
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

Understory varies with slope position. Witch hazel, seedling/sapling size black birch, white pine, red maple and highbush blueberry occupy the toe of the slope. The upper slopes have a dense covering of white pine, followed by black birch and red maple. Huckleberry, lowbush blueberry and which hazel dominate the shrub layer. Much of the understory developed from thinnings completed in 1971 and 1982.

General comments on silviculture proposed:

The silvicultural goal is to release and/or spur a young forest age class. Most of the regeneration work will happen on the upper slopes covered with thick white pine regeneration. Thinning and small openings will be done in amongst the large oak on the lower slope. This will upgrade the timber quality of this section as well as spur some regeneration. Oak stocking guides indicate that the 125 basal area is fairly close to fully stocked. The harvest goal will be to reduce the basal area to round 95 to 100. This will bring stocking to around the B line which will allow for regeneration development as well as crown and diameter growth on the better quality overstory. Incorporating a portion of the diseased hemlock into openings will also be a priority; however regeneration in these areas is lighter making it less of a priority. Within the regeneration work retention of live trees, live and dead snags, legacy trees and coarse woody debris will contribute to future forest complexity.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
49	595	8	141	57
9	600	2.5	147	16

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐ **Steep slopes present?** ☑
Feller/processor required: ☐

Comments on harvesting limitations:

A forwarder is preferred given that timber will travel on Egypt brook road for about 1,000 feet to get to the landing. The area does have some steep slope. Portions of them may be worked from the top or bottom; but no skid road will traverse its entirety.

CULTURAL RESOURCES

Foundations?: None known **Stone Walls?:** No **Quarries?:** Unknown
Cellar holes?: None known **Wells?:** None known **Dams?:** None known

Comments on Cultural Resources:
DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

The proposal area does include a stream crossing which could provide a water monitoring opportunity.

FOREST ACCESS ENGINEERING

Gravel needed: ☑ **Work needed on permanent bridges:** ☐
Landing work needed: ☑ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

The landing is planned at the intersection of Egypt brook road and the end of the gate 21 road (intersection 20-8). The landing area requires mowing and some additional gravel for stability. Logging equipment (a forwarder) will have to travel about 1,000 ft of Egypt brook road to get to the landing. Assuring that this part of the road drains properly will be important, which may require cleaning existing culverts and cleaning/improving the side ditches.

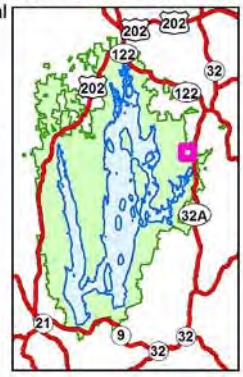
NORTH

FY2017 Proposed Forestry Project
PT-17-6

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Rare Plant
- Vegetation Type
- Protected Bird Site
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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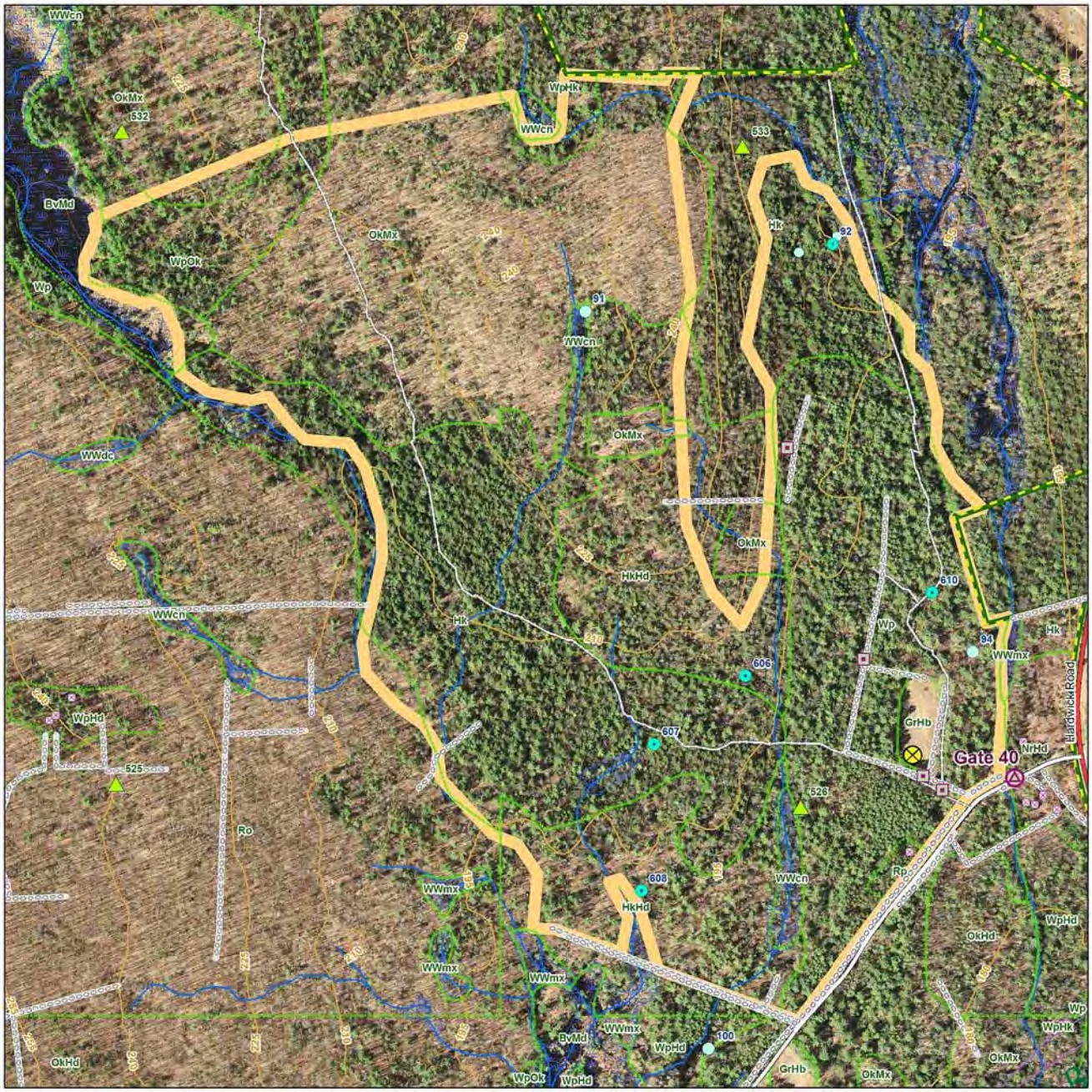
Map Scale- 1:5,000



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Date: 2/23/2016

DCR-DWSP Forestry Lot Proposal PT-17-6 for Public Review

Lot Review Number PT-17-6 **Date:** 3/31/2016 **Forester:** Wood

Watershed: QU **Acres** 158.4

Boundary Description: See map, edges of lot are (clock wise from southeast corner): Petersham Road, stone wall, brook and wetlands, easterly line to small wetland and boundary, along top of steep slope southerly to base of slope and intermittent brook, back northerly to wetland, along wetland and brooks to boundary, south along boundary to road.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	Hemlock	42.6
Secondary	Oak, mixed - dry site	41
Other	White pine	31.8

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site
Secondary	

Description of forest composition/condition:

There have been at least 6 treatments since 1970 here. They occurred from 1970-1983 and were lighter shelterwood prep type cuts which varied in intensity from thinning to small openings under 1/4 acre, and weren't evenly applied over the respective cut areas. The field where landing will be situated was created in 1983. Due to these past harvests, succession and insect infestations (hemlock adelgid and scale, possible looper in past) hemlock type now has a fair amount of hardwood and white pine in overstory, and white pine type now has some hardwood and areas with hemlock in overstory. Cuts were light so area is still mostly even-aged.

All ages of hemlock are taking a beating here. Moose are heavily browsing anything they can reach, adelgid and probably scale are present throughout the stands and looper has probably infested stand in past. Hemlock, especially on the drier and poorer sites has started to drop out. Numerous snags are present but most are still hanging on, though growth and overall health has declined. One of the goals of proposed treatments is to salvage some of this wood before it dies, increase the vigor of remaining stems and start or release some more vigorous regeneration. White pine is the most common associated species, with some oak, red maple and all 3 birches present in overstory.

The pine types are on a better site and are vigorous were they have been thinned and generally healthy. Associated species are the same as on the hemlock stands. These stands don't have many of the large boulders which are common on the hemlock stands. White pine, hemlock, red maple and black birch make up most of the regeneration. There is a small section of red pine along north side of Dana Common road. The red pine is probably infested with red pine scale. Most of this area was thinned and has thick white pine regeneration that is starting to stagnate.

The oak types are mainly on well drained average sites. Red oak is main species in overstory with associated species including black oak, red maple and scattered white pine, white oak and black birch. These stands are generally healthy but not vigorous other than the occasional emergent crown. Gypsy moth populations were building to the south in 2015 but no egg masses were seen on this lot. They are expected to expand and will probably start affecting the stand in this year or next.

Describe invasives present, assessment techniques used, and concerns:

No invasives were noted during field visits but there are many to the south around Dana Common and some around the brook at gate 40. Expect there is some Japanese barberry, honeysuckle and bittersweet around, most likely along streams and walls. Impact to regeneration should be minimal.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil

Most of the lot is on Charlton-Chatfield-Hollis association, thin and very rocky. The eastern edge is on Montauk-Scituate-Canton association, extremely stony and thick. The flat just north of Petersham Road is on Hinckley loamy sand.

DCR-DWSP Forestry Lot Proposal PT-17-6 for Public Review

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	Yes	**Is logging in wetlands planned?:**	No

Further comments on wetlands: 11 vernal pools have been verified on the lot and there is at least 1 other potential pool, plus one location classified as Not a Pool. There is one existing intermittent stream crossing on the old woods road. A portable bridge will be required here.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	10
Acres in Regeneration cuts:	40
Average regen opening size:	1
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

Beneath the hemlock types the understory is mixed in composition and quantity at least partially dependant on past treatment and moisture availability. Hemlock, white pine and the birches make up most of the regeneration but are fairly sparse other than in the small openings where the regeneration tends to be much thicker although most is no longer vigorous. Beneath the pine types the regeneration is mainly white pine, red maple, and black birch, with dense white pine beneath the small red pine stand along Dana Common Road.
The oak types typically have moderately dense regeneration. White pine, red maple and black birch are most common, with hemlock, oak and yellow birch scattered.

General comments on silviculture proposed:

Intent is to regenerate around 1/4 of this lot using 1/3-2 acre openings. 5-10 sq. ft. of basal area will be retained in openings over 1/2 acre as required. Retention will be mainly in small groups if suitable stems are present. Retention will be mainly healthy, vigorous, well formed oak, white pine and hemlock but individuals of all species will be represented. Sub-canopy hemlock will be retained where present to shade the boles of retention in the larger openings.

Some of the filter strips near openings will receive a prep cut to establish or release regeneration. At least 50% of basal area will be retained in these areas. Hemlock is a significant component on all except in the drier oak type. Moose have had a significant impact on the hemlock regeneration throughout the lot and there are not many that haven't been heavily browsed. One of the goals is to establish more vigorous regeneration in these important riparian areas.

A few areas, particularly the eastern 1/3 of lot have some better quality white pine that could benefit from some treatment between the openings. The areas around the vernal pools and some of the wetlands also are more suited to prep cuts than openings.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
41	745.9	0	186.5	83.2
28	886.3	4.5	217.1	16.3
40	329.7	0	82.4	60.3

Additional comments on Subwatershed analysis

Very little was cut in last 10 years on these sub-sheds so limits won't even be approached.

HARVESTING LIMITATIONS

Forwarder required: ☐ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

No reason to require equipment restrictions were noted during walk through. The existing woods road which will be the main skid road is narrow north of the stream crossing and may be difficult to traverse with larger equipment. There are also numerous areas with large surface boulders which will also be hard to work around with large equipment.

There are some steep slopes on and around the lot but no more than 100' or so will be worked on. The excluded section down the center of the proposed area is steep and very rocky.

CULTURAL RESOURCES

Foundations?: None known **Stone Walls?:** Yes **Quarries?:** Unknown

Cellar holes?: None known **Wells?:** None known **Dams?:** None known

Comments on Cultural Resources:

Surface and boulders are prevalent on most of the lot. Boulders are so common on about 1/2 the lot that operability will be limited. Doubtful that these areas would have been used for Pre-Contact camp sites or settlements. The southern flat along Petersham road (Dana Common Road) does not have as much surface stone and few boulders. There was a vault located here called "Snow's cemetery" in our records. This contained Asa Snow and his wife and daughter and was exhumed. Not sure if evidence of site still exists. DCR's Archeologist has identified this lot as Potentially Sensitive, mainly due to the records of the burial vault, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: None known

Comments on any Unique or Unusual Sites or Habitats on the Lot:

The central part of proposed area, especially the excluded section is very steep and bouldery and may offer some unusual habitat.

General Wildlife comments:

Deer, moose, turkey, snowshoe hare, bobcat and coyote are known to frequent here. Due to the extent of relatively undisturbed forest assumed many of the native interior forest birds visit here too.

RARE/ENDANGERED SPECIES

At the time of posting all available NHESP maps and data had been consulted and there were no Estimated or Priority Habitats for listed species found in the lot proposal area. Should new information become available DWSP will follow recommendations as needed.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

1 intermittent stream crossing on woods road which is going to serve as the main skid road. The flow here is minimal and is somewhat spread out due to rocks. Doubtful that this area has enough depth to sample during most of the year.

FOREST ACCESS ENGINEERING

Gravel needed:	☑	**Work needed on permanent bridges:**	☐
Landing work needed:	☑	**Beaver Issue:**	☐
Culverts needed:	☐		

Further comment on access needs:

Access road to small field off of Petersham Road needs to be improved to allow trailer access.

Department of Conservation - Division of Water Supply Protection - Office of Watershed Management

NORTH

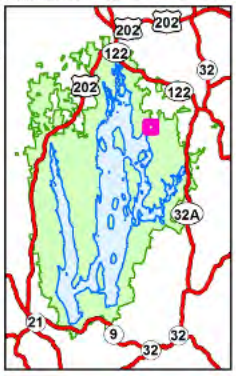
FY2017 Proposed Forestry Project

PT-17-10

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



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Map Scale- 1:4,000

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Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PT-17-10 for Public Review

Lot Review Number **PT-17-10** **Date:** 12/7/2016 **Forester:** Johnson

Watershed: QU **Acres** 68.2

Boundary Description: The north boundary of this lot is roughly parallel to the Gate 37 access road, which is about 500 feet to the north. To the southwest it is bounded by a DWSP access road that intersects Gate 37 road, except for approximately 3 acres between that road and the Reservoir. The southeast end of the lot follows a stream and the northeast side is bounded in part by stone walls.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	White pine	33.6
Secondary	Oak, mixed - dry site	26.6
Other	Hemlock/hardwood	8.1

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site
Secondary	Other

Description of forest composition/condition: The lower slopes of this lot are dominated by white pine in both the overstory and understory. As one moves upslope, oaks and particularly red oak become more dominant in the overstory, but white pine remains the primary species of regeneration. There are scattered red pines near the access road. On the lower slopes the white pine in the overstory is sometimes densely spaced with variable form. In these areas a range of crown classes are present, from suppressed trees with failing crowns to vigorous co-dominants. In areas that have been treated in the past, the pine is less crowded and has better form. The midstory throughout the lot includes black birch, red and sugar maple, with increasing red, black and white oak as one moves upward. Regeneration is mostly white pine and black birch, and is densest at the south end of the lot and on upper slopes that were given a selection treatment in 1987. Oak regeneration is less common, but vigorous and in need of release. Hemlock is an associate in all levels of the canopy. Shrub and ground cover species include witch hazel, partridge berry and Christmas fern.

To the northwest hemlock becomes more common in the overstory, mixed with white pine on the lower slopes and oak as one moves upward. Overstory hemlocks typically have good form but crowns are sometimes thin. White pine is emergent in some areas. There's a pole size class that is dominated by hemlock, black birch, and red maple, but has diverse associates including oaks, white ash, sugar maple, black cherry and yellow birch. Midstory hemlocks more often have poor form, but sometimes better crowns than the overstory. The hemlock is dense in places, resulting in a mostly open understory. In areas where hemlock is less dense there is patchy hemlock and white pine regeneration, often in old skid roads. Understory species include winterberry in the wetter areas, as well as the species listed above.

To the west, the area between the reservoir and the access road contains a 1/3 acre red pine plantation with an understory of well developed regeneration of mixed species. Although the red pine is likely to die in the near term due to invasive red pine scale, the decision has been made to allow it to die in place rather than disturbing the soil at the edge of the reservoir in order to salvage the wood. Additional red pine to the north along this road was not included in this lot despite the beginnings of mortality because of the presence of numerous invasives, including bittersweet, Japanese barberry, honeysuckle and glossy buckthorn. There are scattered red pines along the access road to the east, which are also expected to decline precipitously due to red pine scale, and will be included in this harvest.

Describe invasives present, assessment techniques used, and concerns: None found within the main area of the lot. Bittersweet and honeysuckle are present along the road to the northwest, and in the landing to the east.

SOILS

% Excessively drained soils:	6
% Well drained soils:	94
% Poorly to Very Poorly drained soils:	0

Further comments on soil

The breakdown in the Quabbin soils layer is as follows:

Excessively Drained Deep Glacial Outwash 4.1 acres
Well Drained Thick Fine Sandy Loam 35.6 acres
Moderately Well Drained Fine Sandy Loam 28.5 acre

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	Yes	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

The red pine plantation in the northwest lies between the reservoir to the west and a wetland and intermittent stream to the south and east. Another intermittent stream with associated bordering vegetated wetlands runs through the northwestern portion of the lot. A third stream borders the far east end of the lot. There are established culvert crossings for all of these streams on the DWSP access roads. There will be no stream crossings within the harvest area.

There will be little harvesting in filter strips, because the regulatory requirement of leaving 50% of well distributed basal area precludes making regeneration openings in these areas. The primary exception will be the plantation by the reservoir, where as much of the red pine as is allowed by the regulations will be removed. Red pine may also be removed from the easternmost filter strip. Occasionally harvested groups will slightly overlap the outer edges of filter strips. Trees may also occasionally be cut in filter strips in order to make space for felling trees from nearby groups.

There are one or two potential vernal pools near an existing landing immediately southeast of this lot, which eliminate use of this landing for this lot. There are also several verified vernal pools in the area, but all are too far from the harvest area to impact this lot. See the Wildlife section of this proposal for further details.

SILVICULTURE

Acres in Intermediate cuts:	0
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	22
Average regen opening size:	1
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

Regeneration under the white pine stand is mostly white pine and black birch, and is densest at the south end of the lot and on upper slopes that were given a selection treatment in 1987. Oak regeneration is less common, but vigorous and in need of release. Regeneration is abundant and well-developed under the red pine stand near the reservoir shoreline. The hemlock stand supports a midstory layer of pole-sized hemlock and mixed hardwoods.

General comments on silviculture proposed:

Small group/patch selection with thinning between openings. Openings will be a maximum of 2 acres, averaging 1 acre. Openings will be irregular in shape, and will be located where there are clusters of trees that are diseased, declining, or have poor stem structure, and where there is viable advance regeneration that is suited to the site and needs to be released. Five to ten square feet per acre of basal area of sawlog- and pole-sized trees will be retained in openings >=½ acre.

Red pine will be particularly targeted for removal, within the limits of regulatory restrictions. All other tree species will be retained, and those that are uncommon locally or regionally, if found, will be favored for retention. Den trees, potential den trees, snags, large logs, trees with stick nests, and potential nest trees (i.e. those with 3-way forks or similar canopy structures) will be retained wherever possible as valuable wildlife habitat.

Trees on the perimeter of openings will have large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if cut in the future.

Subwatershed Analysis

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
82	5557.2	24	1365.3	15.5
11	282.1	0	70.5	52.7

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☐ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

None.

CULTURAL RESOURCES

Foundations?: None known **Stone Walls?:** Yes **Quarries?:** Unknown

Cellar holes?: None known **Wells?:** None known **Dams?:** None known

Comments on Cultural Resources:

There are stone walls in some places around the boundary of the lot, but none in the interior. These will be protected during the harvest. DCR's Archeologist has identified this lot as Potentially Sensitive, with recommendations to minimize soil compaction and disturbance through the use of appropriate BMP's, to protect forwarding roads with slash when possible, and to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

General Wildlife comments:

There is a DCR Quabbin potential vernal pool, as well as an NHESP potential vernal pool, just outside the southeastern corner of the lot. These are mapped as points about 200 feet apart, and probably represent the same pool. There is a verified vernal pool across the access road from the southernmost boundary of this lot. The GPS point is about 125 feet from the road, but based on field work and orthophotos it may be farther away. All vernal pools will be treated as verified; however, this will have little to no impact on this lot since they are not within the harvest area.

This harvest will protect and enhance wildlife habitat. Stick nests, high quality potential nest trees, and large diameter snags, cavity trees and logs will be protected wherever possible. Release of oaks will result in increased mast production. Regeneration in the openings will result in small patches of early successional habitat.

RARE/ENDANGERED SPECIES

NHESP has determined that certain state-listed sensitive species or habitats may exist within the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed activity.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

Existing infrastructure is expected to accommodate all access needs for this activity.

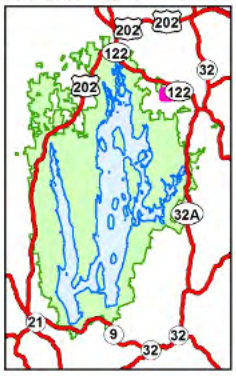
NORTH

FY2017 Proposed Forestry Project
PT-17-14

Quabbin Reservoir Reservation Proposed Forestry Lot Review

- DCR Gate
- Barway
- Landing Site
- Wetland Crossing
- Skid Trail
- Proposed Lot Opening
- Proposed Lot
- DCRW Property Boundary
- CFI Plot
- Vegetation Type
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pool
- DCR Verified Vernal Pool
- Potential Vernal Pool
- Pool, not vernal
- Seeps & Springs
- Stream
- Open Water
- Wetland
- Watershed Boundary
- Cultural Site
- Cultural Site: Railroad, Canal
- Stone Wall
- Major State Route
- Town Paved & Gravel Road
- All-Weather Access Road
- Seasonal Access Road
- Cart road
- Gravel Pit

Locus Map:
Quabbin Reservoir Reservation



0 400 800 1,200 1,600 2,000 Feet

Map Scale- 1:3,000

File Path: W:\GIS\Projects\Forestry_Section\ProposedHarvestLots\QRPubRev2017.mxd

Date: 8/31/2016

DCR-DWSP Forestry Lot Proposal PT-17-14 for Public Review

Lot Review Number **PT-17-14** **Date:** 1/22/2016 **Forester:** Johnson

Watershed: QU **Acres** 34.7

Boundary Description: The proposed harvest area is bounded to the south and east by DWSP property boundary. The north boundary follows fingers of upland, staying out of the lower, wetter areas that drain from south to north. The west boundary approaches but does not go all the way to Monson Turnpike Road, again staying on the upper slopes. This lot is the southeast portion of the former New England Box Company's Edwards-Hildreth property, as shown on Quabbin Real Estate Taking sheet 532 parcel 1.

GENERAL LOT DESCRIPTION

	Overstory Type(s)	Acres
Dominant	Oak/hardwood	26.8
Secondary	Hemlock/hardwood	7.9
Other		

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site
Secondary	Other

Description of forest composition/condition: The upper canopy is dominated by red oak sawlogs. Common overstory associates include black birch, paper birch and hemlock, with yellow birch, beech, and white ash in the lower areas. There are occasional white pines, as well as a few white oaks in the southwest corner of the lot. Hemlock is most common in the northwest portion where the type changes to hemlock-hardwood. The midstory throughout is mostly hardwood poles of mixed species, including black, yellow and paper birch, red and sugar maple, oaks and hemlock. In some areas the overstory basal area is low and the midstory is dominant.

Several diseases are having a significant impact on this area. Although much of the overstory hemlock has good form, all size classes have thin crowns, indicating the presence of hemlock woolly adelgid, elongate hemlock scale, and/or hemlock looper. White ash is also likely to decline or disappear in the next decade, after emerald ash borer reaches the area. Most of the beech is in moderate to severe decline due to beech bark disease, and nectria canker is common on the birches. A few individual beech trees and numerous birches seem to be disease resistant, opening the possibility of improving the genetic base of the stand through silviculture. Red oak is generally healthy but form is variable, ranging from straight and clear, to individuals with sweep, forks, dead branches, and other defects.

The only known past harvest was a 5 acre thinning approximately 30 years ago in the northernmost portion of the lot.

Describe invasives present, assessment techniques used, and concerns: None found.

SOILS

% Excessively drained soils:	0
% Well drained soils:	100
% Poorly to Very Poorly drained soils:	0

Further comments on soil

The entire area is mapped in the Quabbin soils layer as well drained thick fine sandy loam. Field inspection found some small areas of poorly drained soils, as indicated by the presence of sphagnum moss and other wetland indicator vegetation. These wetter areas will be protected and avoided as much as possible.

WETLANDS

Wetlands present?:	Yes	**Are stream crossings required?:**	Yes
Streams present?:	Yes	**Are wetlands crossings required?:**	No
Vernal pools present?:	None known	**Is logging in filter strips planned?:**	Yes
Seeps present?:	None known	**Is logging in wetlands planned?:**	No

Further comments on wetlands:

As noted above, there are some small areas that appear to have moderately to poorly drained soils, based on the presence of wetland indicator vegetation such as sphagnum moss. Some of these areas have poorly defined drainages downslope. Although these areas may not meet the legal definitions of wetlands and streams, they will be protected as if they were regulated. One of these wet areas reaches up to the south boundary and will need to be crossed. The boundaries of the lot have been drawn to stay out of the perennial streams on the lower slopes.

There will be little if any harvesting in filter strips, because the regulatory requirement of leaving 50% of well distributed basal area precludes making regeneration openings in these areas. However, some openings may slightly overlap the outer edges of filter strips, and trees may occasionally be cut in filter strips in order to make space for felling trees in nearby groups.

SILVICULTURE

Acres in Intermediate cuts:	20
Acres in prep/establishment cuts:	0
Acres in Regeneration cuts:	12
Average regen opening size:	1
Maximum regen opening size:	2

Description of advance regeneration in proposal area:

In some places there is little or no tree regeneration in the understory. Where it exists, species include hemlock, birch, red maple, beech, and white pine. Much of the hemlock has been browsed, probably by moose. American chestnut is present as sapling and pole sized stump sprouts. Other understory species include blueberry, huckleberry, witch hazel, mountain laurel, striped maple, hay scented fern, cinnamon fern/interrupted fern, Christmas fern, and clubmoss. The species that could inhibit regeneration (mountain laurel, witch hazel, striped maple, and hay scented fern) are patchy and localized enough that they will not present a major problem.

General comments on silviculture proposed:

Small group/patch selection with thinning between groups to improve the overstory oak. Openings will be a maximum of 2 acres, averaging 1 acre, with the largest openings in the flatter areas near the north end of the lot. Openings will be irregular in shape, and will be located where there are clusters of trees that are diseased, declining, or have poor stem structure. Declining hemlock and nectria infected birch will be particularly targeted for removal. Where there is healthy, well formed regeneration that is suited to the site it will be released. Five to ten square feet per acre of basal area of sawlog- and pole-sized trees will be retained in openings >=½ acre.

Trees on the perimeter of openings will be healthy with large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if cut in the future. Thinning between and around openings will improve the vigor and seed production, and will give openings a softer, more irregular shape.

All tree species will be retained, and those that are uncommon locally or regionally will be particularly protected. Den trees, potential den trees, snags, large logs, trees with stick nests, and potential nest trees (i.e. those with 3-way forks or similar canopy structures) will also be retained wherever possible as valuable wildlife habitat.

Subwatershed Analysis

DCR-DWSP Forestry Lot Proposal PT-17-14 for Public Review

Sub-Watershed Number	Total DCR-owned Acres in this Sub-Watershed	Acres Regenerated on DCR Land in the last 10 years in this Sub-Watershed	Total DCR-owned Acres Remaining for Regerating Up to the 25%/10 Year Limit for this Sub-Watershed	Acres in this Sub-Watershed that are part of this proposed lot
44	2859.9	15	700	34.7

Additional comments on Subwatershed analysis

HARVESTING LIMITATIONS

Forwarder required: ☑ **Steep slopes present?** ☐

Feller/processor required: ☐

Comments on harvesting limitations:

A forwarder is recommended to facilitate maneuvering around stone walls. In addition to protecting cultural resources, this will reduce damage to the residual overstory.

CULTURAL RESOURCES

Foundations?: None known **Stone Walls?:** Yes **Quarries?:** Unknown

Cellar holes?: None known **Wells?:** None known **Dams?:** None known

Comments on Cultural Resources:

The only cultural features found on this lot are "thrown" stone walls along the border closest to the road. Skid roads will go around stone walls ,through existing barways, or over sections of wall that are already degraded, using the route and method that best protects these and other resources. Loggers will be directed to protect walls as much as possible. Protection of walls would be facilitated by requiring a forwarder. DCR's Archeologist has identified this lot as Not Sensitive, with recommendations to flag, map and avoid any cultural resources that may be located.

WILDLIFE RESOURCES:

Nests?: Stick nests

Comments on any Unique or Unusual Sites or Habitats on the Lot:

None known.

General Wildlife comments:

This harvest will protect and enhance wildlife habitat. Release of oaks will result in increased mast production. Stick nests, high quality potential nest trees, and large diameter snags, cavity trees and logs will be protected wherever possible. Regeneration in the openings will result in small patches of early successional habitat.

RARE/ENDANGERED SPECIES

At the time of posting all available NHESP maps and data had been consulted and there were no Estimated or Priority Habitats for listed species found in the lot proposal area. Should new information become available DWSP will follow recommendations as needed.

ENVIRONMENTAL QUALITY ENGINEERING

Comments on EQ Issues:

No expected water/environmental quality issues for the proposed activity. Specific requirements and BMPs for reducing the potential threats from erosion or pollution will be included in the harvesting permit.

FOREST ACCESS ENGINEERING

Gravel needed: ☐ **Work needed on permanent bridges:** ☐
Landing work needed: ☐ **Beaver Issue:** ☐
Culverts needed: ☐

Further comment on access needs:

This lot will be accessed through the property of abutters Michael and Michele Brennan, which is immediately south of the lot and has frontage on Birch Drive. The Brennans have agreed to allow DCR-DWSP to use their existing log landing, which was stabilized with gravel during a harvest about a decade ago. As a courtesy for allowing use of their property, DCR-DWSP will grade the landing and the skid trail leading to the DCR-DWSP boundary after logging is complete. An access agreement has been drafted and is under review.