Bethel Quarry Property
Forest Management Plan
2019-12-27

This forest management plan is a blueprint for responsible land stewardship. It is the result of a planning process that incorporated an assessment of the history and current conditions on the property, consideration of the various courses of future development that the forest could follow, and discernment as to which outcomes best suit my particular objectives.

By signing below, I certify that I approve of—and agree to manage my forestland according to—the following management plan. I further certify that any of my forestland that is enrolled in Vermont's Use Value Appraisal program is under active long-term forest management in accordance with the state's minimum acceptable standards for forest management. These standards include following Acceptable Management Practices to maintain water quality on logging operations.

Prepared by
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Owner
Rock of Ages Corporation
PO Box 482
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Property
328.4 acres woodland
Bethel, VT
SPAN 063-019-10832
Map delineation based on VMP
Photo(s) 4307212nw and 4307204sw

Effective date of plan
April 1, 2020

_____ _____
Landowner Date

_____ _____
Landowner Date

_____ _____
Landowner Date

_____ _____
Landowner Date

This forest management plan meets the standards promulgated by the Vermont Department of Forests, Parks and Recreation as required for eligibility in the Use Value Appraisal Program.

_____ _____
County Forester Date

Introduction

This plan Covers the ten year period from 2020 to 2029. It lays out the near- and medium-term actions that should guide the development of the Bethel Quarry Forest. It also qualifies the property for Use Value Appraisal (UVA) and commensurate reduction in property taxes.[1] Owners participating in the Use Value Appraisal program are obliged to manage their property according to the plan and to make any reasonable investments for improvement that the plan recommends.[2] Its recommendations were developed in accordance with the principles and practices of scientifically sound forestry, as described in the relevant management guidelines, textbooks and academic journals.

[1] Further information about UVA and current valuations can be found at the Vermont Tax Department's website: `https://tax.vermont.gov/property-owners/current-use`.

[2] UVA management plan standards are determined by the Department of Forests, Parks, & Recreation and are available at `https://fpr.vermont.gov/forest/your_woods/use_value_appraisal` or through a County Forester.

Property Description

Some 9 percent of the 328.4 acre Bethel Quarry property is productive forestland that will be managed according to this plan. Its elevations range from 1040 to 1400 feet above mean sea level. One unnamed stream crosses the southern portion of the property and flows into the Second Branch of the White River to the southeast. Boundaries are generally well marked, though some sections are confusing. One section in the southwest is marked by two conflicting survey lines, while the very southernmost boundaries are difficult to find. Soils, forest health, and other pertinent topics are discussed in the individual stand area descriptions that follow.

Principles, Goals & Strategies For Forest Management

Timber management

Management should provide regular returns from timber harvesting. Long-term value growth is provided by maintaining full site occupancy with investment-grade stems: healthy trees capable of producing high quality sawtimber or veneer and worth retaining in the stand until they reach their full, site- and species-specific target diameters. Tree species which yield sought-after, high-value wood should be promoted within each stand or, when regenerating a new stand, attention should be paid to providing the stand conditions which favor the establishment of those species. At a property-wide scale, a variety of species should be maintained, providing options for seizing future market opportunities and a hedge against species-specific market depreciation. Among desired species, additional preference should be given to individual trees of sufficient vigor and grade-potential for strong future value growth. Consideration of economic efficiency should inform the timing and coordination of infrastructure investments and stand

maintenance, improvement and harvest operations.

Visual and noise buffering

Areas should be identified where forest cover could or does provide a valuable privacy screen and/or noise buffer. In these areas, care should be taken to maintain adequate stocking for existing buffers to function effectively; or to create conditions that foster rapid tree growth so new buffers can become established quickly.

Stand Descriptions & Management Recommendations

Presented below are detailed stand-by-stand descriptions of the forest, the long-term structural, compositional and functional goals for each stand, and the near-term silvicultural treatments or management activities that have been prescribed to advance each stand toward those goals. The data presented in the following pages was obtained from a field examination of the property in August of 2019. General conditions were assessed qualitatively in conjunction with quantitative sampling. Observational notes and sample summary statistics together provide the basis for the area descriptions and management recommendations. All sampling was done using a systematic sample and variable radius plots. In stands with uneven-aged structures, all trees 6" dbh and larger were measured in each plot. In stands with even-aged structures, all main-canopy trees were measured in each plot.

When contractors are used to implement silvicultural prescriptions, they should be highly skilled, properly equipped, fully insured, and closely supervised. A professional forester should prepare and administer commercial treatments, and logging operations should be timed to coincide with favorable weather conditions (working on wet soils only when they are frozen, for instance) and favorable timber markets. Use Value Appraisal program guidelines allow any management activities prescribed in this plan to be carried out up to three years before or after the date indicated. Landowners in the Use Value Appraisal program must file a Forest Management Activity Report with the County Forester by February 1st if any commercial logging occurred in the previous year.

The property should be reinventoried in 2029 and the findings brought to bear on a reassessment of the goals and strategies proposed in this plan, leading to a formal management plan update. At any point over the course of this management period, this plan may be updated to incorporate new information and to reflect any new thoughts, concerns or considerations on the part of the family or the

Management Schedule

2022

- Area 1: Group selection harvest

2029

- Reinventory property

foresters helping to manage their land.

Area 3

Mixedwood
16.64 legal acres | 14.51 measured acres

Site-specific information

- **Soils:**
  Buckland silt loam (very deep, moderately well drained, dense glacial till on footslopes)
  Glover-Vershire complex (shallow to moderately deep, excessively drained to well drained, loose, very rocky glacial tills on summits, shoulders, and backslopes)
- **Site Class:**
  II (determined from soil mapping and field assessment)
- **Access:**
  Less than 1 mile
- **Stand history:**
  Probably continuously forested, but used as wooded pasture. Older pines and hemlocks date to late 1800s. Younger cohort dates to 1930s maybe.

Current forest information

- **Age Class Structure:**
  Two-aged
- **Species (% stocking):**
  hemlock (28%), spruce (25%), yellow birch (13%), hard maple (10%), ash (8%), soft maple (5%), white pine (5%), hophornbeam (2%), aspen (1%), basswood (1%), paper birch (1%)
- **Regeneration:**
  Minimal spruce and hardwoods.
- **Forest health:**
  No exotic invasive plants noted. Ferns could impede regeneration in a few places.
- **Volume/ac:**
  0.5 MBF veneer, 12.8 MBF sawtimber, 1.8 MBF tie logs,
  10 cds pulp
- **Size class structure (%BA):**
  6-10": 15% | 11-16": 38% | 17-22": 36% | 23+": 11%

Inventory information

- 6 points, 10 BAF, August, 2019

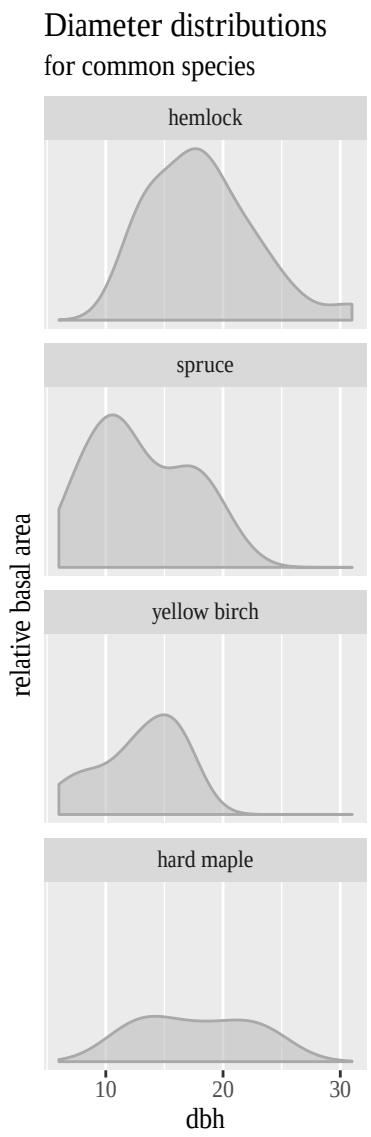

Figure 1: Distributions are approximated with kernel density estimation. Common species are those that account for at least 8 percent of the total stocking and areas under each curve represent species basal areas.

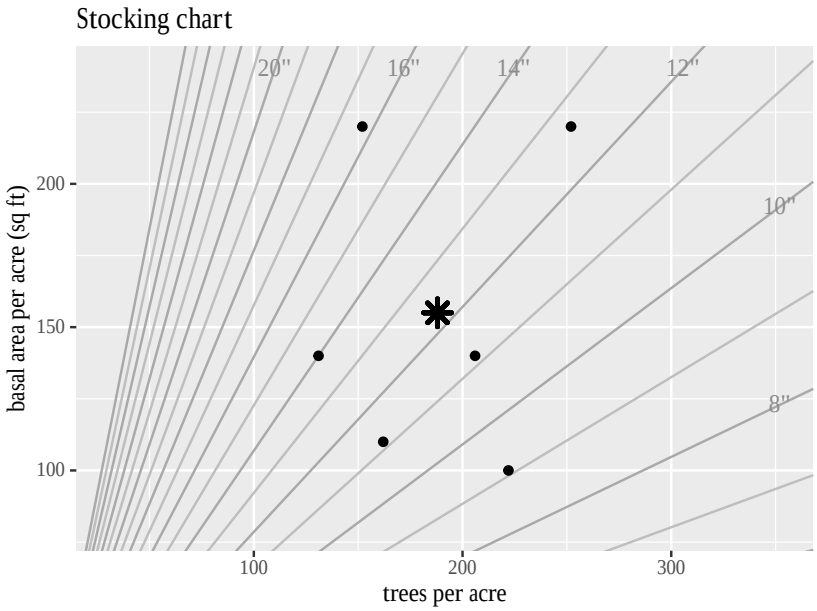

Figure 2: Points represent individual plots. Asterisk represnts stand average. Radial lines are quadratic stand diameters.

	Total	Acceptable
Basal area (sqft/ac)	155	125
QSD (in)	12	13
Stems/ac	188	131

Table 1: Measures of stocking for all live trees (total) and acceptable growing stock.

Long-term management system

Even-aged management[3]

Silvicultural prescription

Shelterwood establishment[4]

Year: 2022

[3] Leak, W.B., M.Yamasaki, and R. Holleran. 2014. Silvicultural Guide for Northern Hardwoods in the Northeast. USDA For. Serv. Gen. Tech. Rep. NRS-132.

[4] Leak, W.B., M.Yamasaki, and R. Holleran. 2014. Silvicultural Guide for Northern Hardwoods in the Northeast. USDA For. Serv. Gen. Tech. Rep. NRS-132.

Area 4

Mixedwood
11.87 legal acres | 10.35 measured acres

Site-specific information

- **Soils:**
  Buckland silt loam (very deep, moderately well drained, dense glacial till on footslopes)
  Cabot silt loam (very deep, poorly drained, very stony, dense glacial till on toeslopes and drainageways)
  Glover-Vershire complex (shallow to moderately deep, excessively drained to well drained, loose, very rocky glacial tills on summits, shoulders, and backslopes)

- **Site Class:**
  II (determined from soil mapping and field assessment)

- **Access:**
  Less than 1 mile

- **Stand history:**
  Probably continuously forested, but may have been used as wooded pasture. Periodic logging left a number of distinct irregularly arranged cohorts. Evidence of heavier logging in or around the 1960s. The most recent entry was probably in the 90s.

Current forest information

- **Age Class Structure:**
  Uneven-aged

- **Species (% stocking):**
  hemlock (59%), ash (10%), spruce (10%), hophornbeam (7%), paper birch (7%), black cherry (3%), hard maple (3%)

- **Regeneration:**
  Moderately well established maple, ash and birch.

- **Forest health:**
  A handful of exotic honeysuckle plants were seen on the old landing in the south and in one other wet area.

- **Volume/ac:**
  0 MBF veneer, 7.5 MBF sawtimber, 1.7 MBF tie logs,
  7 cds pulp

- **Size class structure (%BA):**
  6-10": 34% | 11-16": 52% | 17-22": 14% | 23+": 0%

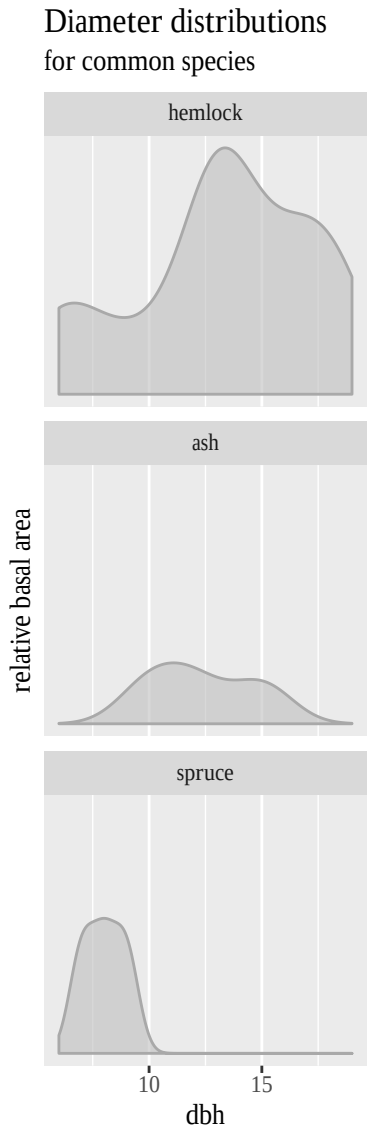

Figure 3: Distributions are approximated with kernel density estimation. Common species are those that account for at least 8 percent of the total stocking and areas under each curve represent species basal areas.

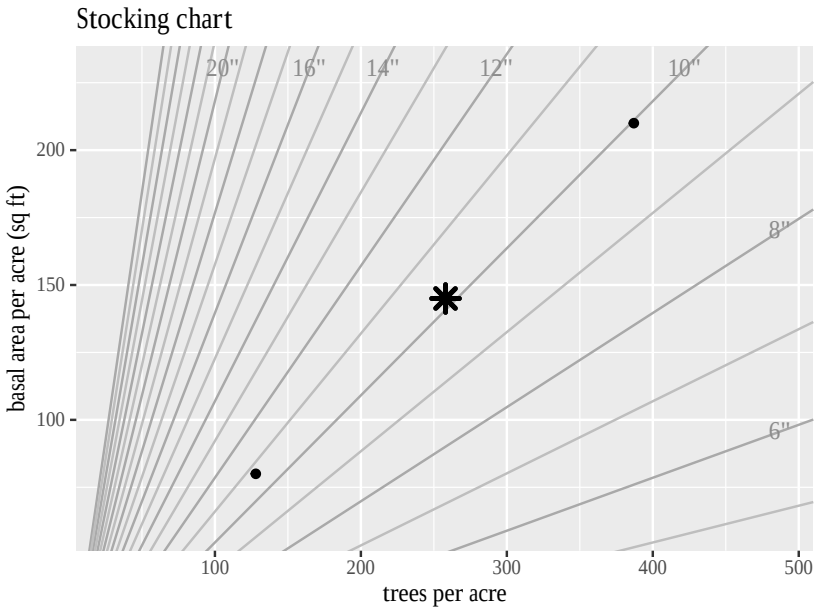

Figure 4: Points represent individual plots. Asterisk represnts stand average. Radial lines are quadratic stand diameters.

	Total	Acceptable
Basal area (sqft/ac)	145	125
QSD (in)	10	10
Stems/ac	258	218

Table 2: Measures of stocking for all live trees (total) and acceptable growing stock.

Inventory information

- 2 points, 10 BAF, August, 2019

Long-term management system

Even-aged management[5]

Silvicultural prescription

Shelterwood establishment[6]

Year: 2022

[5] Leak, W.B., M.Yamasaki, and R. Holleran. 2014. Silvicultural Guide for Northern Hardwoods in the Northeast. USDA For. Serv. Gen. Tech. Rep. NRS-132.

[6] Leak, W.B., M.Yamasaki, and R. Holleran. 2014. Silvicultural Guide for Northern Hardwoods in the Northeast. USDA For. Serv. Gen. Tech. Rep. NRS-132.