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
James and Crystal Pierce
241 Lewis Creek Drive
Ferrisburgh, VT 05456

Property
40.7 acres and camp
Woodbury, VT
SPAN 780-248-10869
Map delineation based on VMP
Photo(s) 156212 and 156216

Effective date of plan
April 1, 2019

_____ _____
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 2019 to 2028. It lays out the near- and medium-term actions that should guide the development of the Pierce 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 91 percent of the 40.7 acre Pierce property is productive forestland that will be managed according to this plan. Its elevations range from 1190 to 1300 feet above mean sea level. The property surrounds Little Dog Pond and has frontage on Valley Lake (which flows into Little Dog Pond). Little Dog Pond's outlet flows through the property and under Valley Lake Road, into an adjacent wetland to the south. Many of the property lines are defined by shorelines or roads. The western line is flagged and fairly easy to find at present. Soils, forest health, and other pertinent topics are discussed in the individual stand area descriptions that follow.

Principles, Goals & Strategies For Forest Management

Conservation

The ecological functioning, productive capacity and biological diversity of the forest resource should be maintained or improved over time so as to provide opportunities for the current or future landowners to continue to enjoy and use the property. A management strategy that is sustainable in the long-term and viable in the short- and medium-terms offers a strong measure of protection against future development or conversion.

Grouse habitat

Areas of early successional forest should be maintained on the property by regularly cutting regeneration openings. Early successional forests have become much less common in the region, and grouse and other species depend on the herbaceous growth, soft mass, and low cover that they provide. Larger openings tend to make better habi-

tat for grouse; especially if aspens and soft mass bearing trees can be regenerated. Fallen logs should be retained in openings to provide drumming perches. Habitat quality declines drastically some 15 to 20 years after cutting, so new openings should be cut regularly; older openings nearby will still be useful to grouse for nesting. Ideally, areas of dense coniferous cover should be maintained near the openings as well, to provide winter cover.

Amenity values

Conscientious management can create or maintain a landscape that is attractive, accessible and conducive to reflection, exploration and appreciation. Attractiveness can be managed for by fostering diversity within the landscape: promoting the growth and development of the most appealing individual trees in some places; maintaining the look, feel and accompanying privacy provided by a dense forest in other places; and elsewhere creating occasional vistas out from the forest and improvements in depth of visual penetration within it. Carefully planned and deliberately located infrastructure should facilitate the satisfying use of the property, creating an appropriate balance between access and connectedness, on the one hand, and places of refuge and sanctuary, on the other. A system of roads and trails of various sizes, suited for various purposes, and interconnected with a broader trail network, provide for both enjoyable recreation and efficient operations.

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.

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 February 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 2028 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 foresters helping to manage their land.

Management Schedule

2022

- Area 1: Group selection harvest

2028

- Reinventory property

Long-term management system

Group selection[3]

A group selection system (in which groups of trees are harvested at each entry) will maintain the uneven-aged structure that is present, generate regular logging revenue, and provide early successional habitat for grouse and other species. Approximately $1/6^{\text{th}}$ of the stand area will be harvested in groups of 1/2 to 2 acres, every 15 years or so. This will allow groups to grow about 90 years before they are harvested. While these groups are on the small side for grouse habitat, they will be more aesthetically pleasing and will regenerate a diverse mix of hardwood and softwood species. Target diameters will be specific to species as follows: 24 inches for white pine, red spruce, sugar maple, yellow birch, and black cherry; 18 inches for other commercial hardwoods (with exceptions allowed for all veneer quality hardwood stems); 18 inches for hemlock; and 14 inches for fir.

Tending will be carried out in immature groups at each entry as well (those not being harvested), to promote the growth of the trees with the highest value-growth potential.

An uncut buffer should be maintained along Valley Lake and Little Dog Pond to protect water quality and for the coniferous cover it will provide for overwintering grouse.

[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.

Silvicultural prescription

Group selection harvest[4]

Year: 2022

About $1/6^{\text{th}}$ of the stand (6 acres) and not more than $1/5^{\text{th}}$ (7 acres) should be harvested in groups that are 1/2 to 2 acres in size. These groups should be located throughout the stand, and should be focused on releasing desirable advanced regeneration, removing concentrations of unacceptable growing stock, and triggering the establishment of new regeneration. Species targeted for release or establishment include sugar maple, spruce, yellow birch, black cherry, and some paper birch and aspen.

In the matrix between these group openings, a crown thinning should reduce the stocking to about 90 ft^2/acre. This is a bit below b-line on the mixedwood stocking guide, but the stand is already $2/3^{\text{rd}}$ hardwoods and we expect the thinning to push it further in that direction (b-line for a hardwood stand is about 70ft^2/acre). Sugar maple, yellow birch, and spruce should be favored for retention, but the focus will be on removing unacceptable and lower quality growing stock and releasing the stems with the highest value-growth potential.

No group openings should be cut within 100 feet of the ponds or within 50 feet of streams, and only very limited thinning should be

[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.

done in that area. In areas where the ground slopes steeply to the water, the buffer should be extended to prevent erosion and water sedimentation. Heavy equipment should be excluded from the pond buffers as well, except along the existing access road.

Area 1

Mixedwood
36.88 legal acres | 36.8 measured acres

Site-specific information

- **Soils:**
  Tunbridge-Lyman complex (shallow to relatively deep, loose, very rocky glacial tills on backslopes, shoulders, and summits)
- **Site Class:**
  II (determined from soil mapping and field assessment)
- **Access:**
  Less than 1 mile; steep in places; western section only accessible through right-of-way on neighboring property
- **Stand history:**
  Probably continuously forested; periodic logging—most recently c. 1979

Current forest information

- **Age Class Structure:**
  Uneven-aged
- **Species (% stocking):**
  hemlock (16%), spruce (16%), hard maple (16%), paper birch (15%), soft maple (15%), yellow birch (9%), white pine (4%), ash (3%), beech (3%), aspen (2%), fir (1%)
- **Regeneration:**
  Decent spruce, fir, hemlock and yellow birch in many places.
- **Forest health:**
  Minor eutapella canker on maples; no exotic invasives noted
- **Volume/ac:**
  0.2 MBF veneer, 5.6 MBF sawtimber, 1.8 MBF tie logs, 13 cds pulp
- **Size class structure (%BA):**
  6-10": 41% | 11-16": 47% | 17-22": 9% | 23+": 3%

Inventory information

- 10 points, 10 BAF, February, 2019

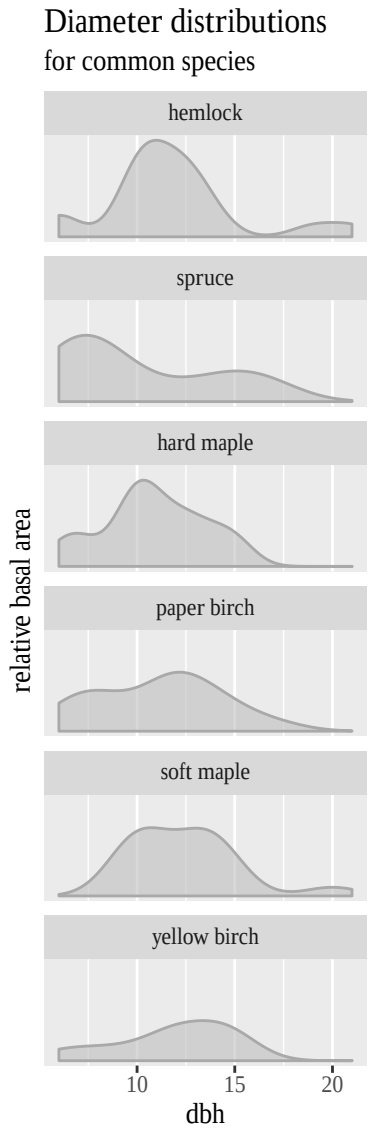

Figure 1: Distributions are approximated with kernel density estimation. Common species are those that account for at least 8 percent of the total stocking and areas under each curve represent species basal areas.

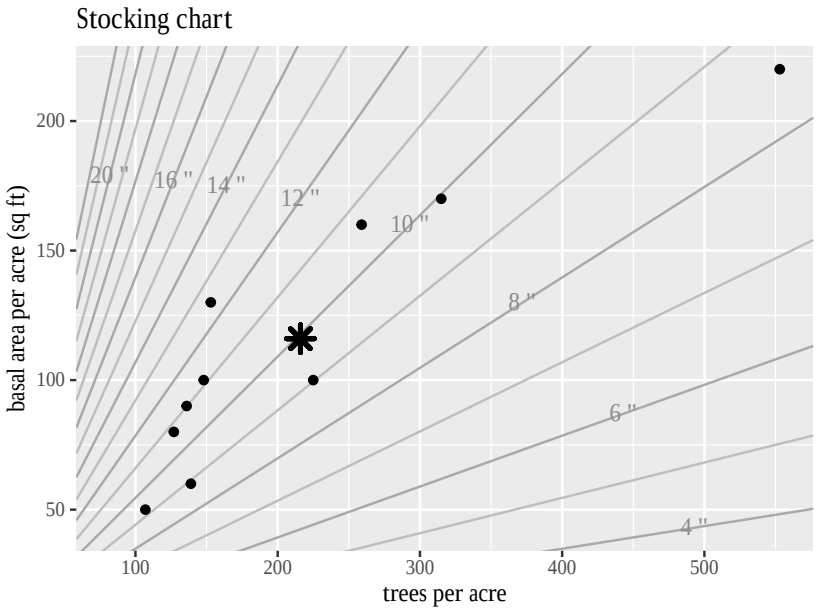

Figure 2: Points represent individual plots. Asterisk represnts stand average. Radial lines are quadratic stand diameters.

	Total	Acceptable	Investment-grade
Basal area (sqft/ac)	116	92	44
QSD (in)	10	10	10
Stems/ac	216	172	92

Table 1: Measures of stocking for all live trees (total), acceptable growing stock, and investment-grade growing stock (which is a subset of acceptable growing stock).