

**King Hill Reservation Forest Management Plan**

**January 16, 2022**

**Prepared for:**

**Sutton Conservation Commission**

**93 Main Street, Sutton, New Hampshire 03221**

**Prepared by:**

**Maslan Forestry LLC**

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*Leo Maslan*  
*Jul 17, 2022*



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## **Introduction**

At the request of the Sutton Conservation Commission, (SCC), this Forest Management Plan was created to accomplish two goals. The first was to identify the current condition of the forests of the King Hill Reservation (KHR). The second was to get professional guidance on long-term management strategies based upon the current condition and the goals and objectives of the SCC.

Since the Town of Sutton has acquired the KHR, several consultations with Foresters, Wildlife Biologists, and others have provided management guidance. This plan will attempt to consolidate recommendations from those previous consultations combined with current forest conditions.

## **Procedure**

On December 1, 2021, a contract was created between the Sutton Conservation Commission and Leo Maslan, owner of Maslan Forestry LLC, to create a Forest Management Plan for the KHR. This plan will meet the requirements of the Conservation Easement with the Ausbon Sargent Land Preservation Trust.

Members of the SCC located and marked the property boundaries. Charles Bolduc (SCC member) created the mapping for this report.

Maslan Forestry and associates used the Fox DS Cruiser created by the NH Division of Forests and Lands to inventory KHR forest stands. One hundred and two variable measurements plots were tallied by Maslan Forestry LLC. The resulting tree and plot data was processed. Tree species, diameter, merchantable volume, and quality were measured. Forest stand data including density, acceptable growing stock and trees exhibiting cavities was tallied. The eight segments of the KHR created in the "KHR Broad Conceptual Management Plan", draft dated April 20, 2000, were used as the management units. These are shown on the attached map.

On December 9, 2021, UNH Cooperative Extension wildlife specialist Matt Tarr, Tim Fleury Merrimack County UNH Cooperative Extension Forester, Leo Maslan and members of SCC toured the KHR identifying wildlife habitat conditions. Matt Tarr and Tim Fleury made recommendations related to long-term field management. A summary of this visit is included in the Appendix.

## **Sutton Conservation Commission Goals and Objectives for the King Hill Reservation**

- Maintain the natural plant and animal communities found within the KHR.
- Enhance and protect habitat for the variety of avian, terrestrial, and aquatic species found on the KHR.
- Continue to provide for low impact mixed use recreational opportunities for the public by maintaining and improving the existing hiking and former ski trails.
- Protect soil quality and quantity.
- Perform periodic harvests of forest products in designated sections of KHR in accordance with an approved forest management plan.
- Attempt to control existing invasive plant species and minimize introduction of additional invasive species.
- Maintain property boundaries.
- Protect the water quality of Lyon Brook and the Kezar Lake watershed by maintaining existing culverts and drainage features to prevent soil erosion and sediment runoff.
- Maintain and improve forest access roads, log landings, and trailheads to provide for future forest management, maintenance equipment access, fire suppression access, and parking for recreational.

## **Conservation Easement Commercial Forest Management Goals**

- Maintain soil productivity.
- Protect the water quality of Lyon Brook and the Kezar Lake watershed.
- Maintain or improve the overall quality of forest products.
- Conserve scenic quality.
- Protect unique or fragile natural areas.
- Protect unique historic and cultural features.
- Conserve native plant and animal species, and wildlife habitat.

*Additionally, the conservation easement stipulates that:*

*No cutting of vegetation for forestry management purposes shall be allowed within two hundred (200) feet of land abutting the Property, described as "Residential 1-25 Lots" and Residential #2-11 Lots" on the "King Ridge" Subdivision plans, dated October 23, 1998, revised March 5, 1999, prepared by Bristol, Sweet & Assoc. Inc. North Sutton, NH recorded in the Merrimack County Registry of Deeds. This does not preclude existing "open space" trails as defined on said Plan from being maintained.*

## History

This area was operated as the King Hill ski area from the early 1960's until it went out of business in the mid 1990's. The King Hill Reservation was created on April 21, 1999, when this 441-acre parcel was acquired by the Town of Sutton, NH from King Ridge LLC. The deed specified that the property was to be managed by the Sutton Conservation Commission. On the same date a Conservation Easement with the Ausbon Sargent Land Preservation Trust was granted. The purposes of the conservation easement can be summarized as follows:

- The assurance that the property will be retained forever predominantly in its scenic and open space condition.
- The preservation of open spaces, particularly the productive forest land, wildlife habitat, and water frontage along Lyon Brook, for the scenic enjoyment of the general public.
- The conservation and preservation of the Town of Sutton's open space lands, forests, and scenic resources.
- The continued conduct of outdoor recreational activities by the public.

KHR was once a portion of the King Hill Ski Area. Shortly after the sale of the ski area, portions of what is now the KHR were heavily logged by the previous owner. UNH Cooperative Extension Wildlife Specialist Matt Tarr has made multiple visits to KHR. The KHR Broad Conceptual Management Plan was created by the SCC with input from Matt Tarr in April 2000. He identified eight management segments within the KHR. These segments were referred to by Maslan Forestry LLC in creating this plan. A summary of his most recent visit in December 2021, can be found later in this plan.

Four years later Forester Brooks McCandlish completed a Woodland Examination Report with Forest Stewardship Recommendations. In his Summary of Recommendations, Brooks McCandlish recommends that consideration be given to harvests in segments 6, 8, and 5. Other recommendations include locating and blazing all boundary lines and improving wildlife habitat compatible with improvement to roads and trails.

The SCC has worked on various projects on the KHR since the Town's acquisition. These include creating hiking trails, periodic mowing of ski trails, maintaining trailhead access, and locating boundary lines. Periodic ski trail mowing has occurred for several years. David Carey has been contracted to mow designated ski trails on a rotation basis. The mowing is done late in the growing season to accommodate a variety of species that utilize the grass and brush habitat.

In the Spring of 2021, the SCC began the process of contracting with a Forester to develop a long-term stewardship plan for the KHR. The entire KHR was inventoried with regards to the current condition of the forest. A complete list of current Goals and Objectives is found on page four in this report.

## Soils

- Segment #1: Colton gravely sandy loam, 3 to 8 % slopes.  
Croghan loamy fine sand, 0 to 8% slopes.
- Segment#2: Marlow fine sandy loam 8 to 15% slopes, very stony.  
Colton gravely sandy loam, 3 to 8 % slopes.  
Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.
- Segment#3: Marlow fine sandy loam, 8 to 15% slopes, very stony.  
Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.
- Segment#4: Tunbridge-Lyman-Becket complex 25 to 60 % slopes, very stony.  
Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.  
Marlow fine sandy loam, 15 to 25% slopes, very stony.  
Marlow fine sandy loam 8 to 15% slopes, very stony.
- Segment#5: Tunbridge-Lyman-Becket complex 8 to 15% slopes, very stony.  
Marlow fine sandy loam, 15 to 25% slopes, very stony.  
Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.
- Segment#6: Marlow fine sandy loam 8 to 15% slopes, very stony.  
Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.
- Segment#7: Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.  
Lyman-Tunbridge rock outcrop complex, 15 to 35% slopes.  
Tunbridge-Lyman-Becket complex 25 to 60% slopes, very stony.
- Segment#8: Tunbridge-Lyman-Becket complex 15 to 25 % slopes, very stony.  
Lyman-Tunbridge rock outcrop complex, 15 to 35% slopes.  
Skerry fine sandy loam 8 to 15% slopes, very stony.

## Segment Description and Recommendations

### Segment #1:

Area: 41 acres

Stand Type: White pine, Red Oak, Hemlock, Red Maple

Size Class: Small sawlog, sapling, pole.

Mean Stand Diameter: 13" diameter breast height (d.b.h.)

Basal Area: 127.5 sq.ft./acre

Stand Volumes:

Sawlogs: 3.180 thousand board feet (m.b.f.)/acre

Pulpwood: 16 cords/acre

Stand total: 130.881 m.b.f.

657 cords pulpwood

4 cavity trees total

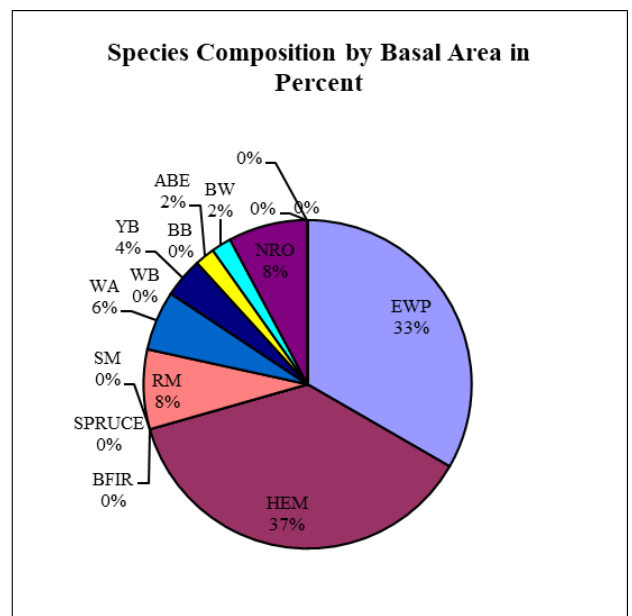
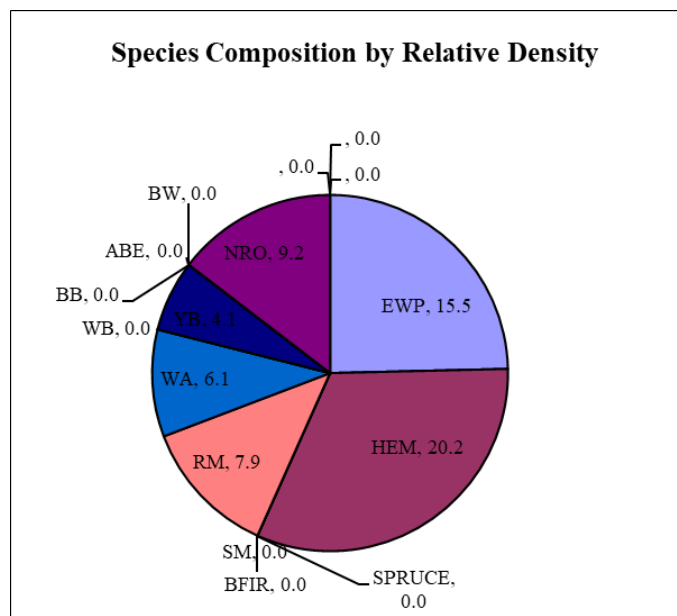
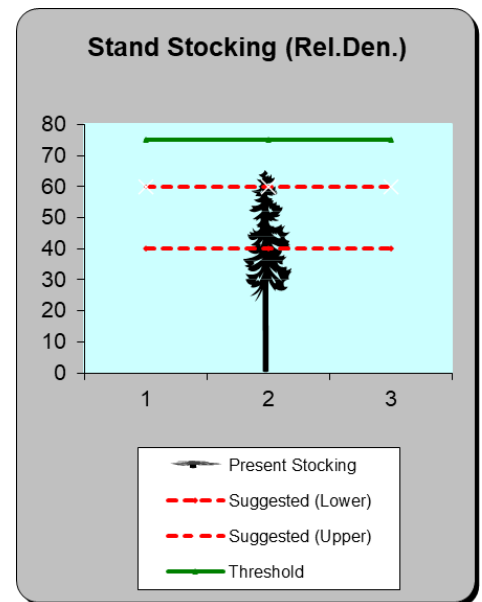
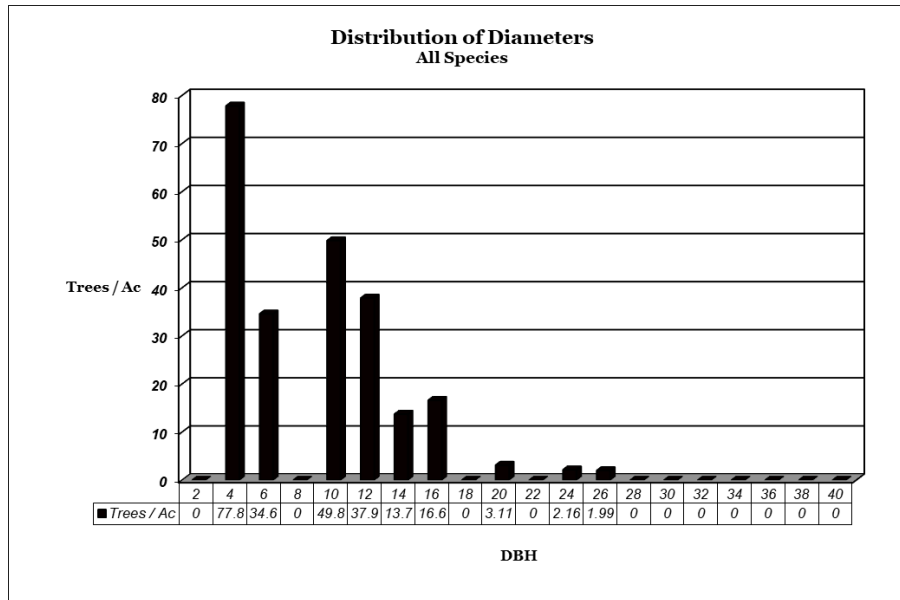
Management recommendation:

The current basal area of 127.5 sq.ft./acre is overstocked. The recommended basal area for this segment is between 90 and 100 sq.ft./acre. The last harvest removed the better-quality sawlog trees. A group selection type harvest would create openings by removing groups of trees in one area. These openings create diversity that will benefit a variety of wildlife species. This type of harvest would yield 32 m.b.f. of sawlogs and 164 cords of pulpwood. In segment one, any type of harvesting will remove low grade material releasing trees of better quality. The buffer along Lyon Brook must be left intact. The Red Oak stems should be released from competition as they produce hard mast. Four hardwood trees per acre with cavities were tallied. These should be retained.

Access:

Any commercial harvesting requires reliable access. The existing access road and landing area need improvement. It would benefit both forest management and recreation use. Perhaps the log landing area could become seasonal parking. Truck access to segment one would also access segments two, three, four, and possibly five.

King Hill	
Stand	1
Acres	41
# of BA Pts.=	8
12-Mar-22	





## **Segment #2**

Area: 19 acres

Stand Type: White pine, Red Oak, Hemlock, Red Maple

Size Class: Sapling, pole.

Mean Stand Diameter: 11" d.b.h.

Basal Area: 90 sq.ft./acre

Stand Volumes:

Sawlogs: 0 m.b.f./acre

Pulpwood: 13 cords/acre

Stand total: 0 m.b.f.

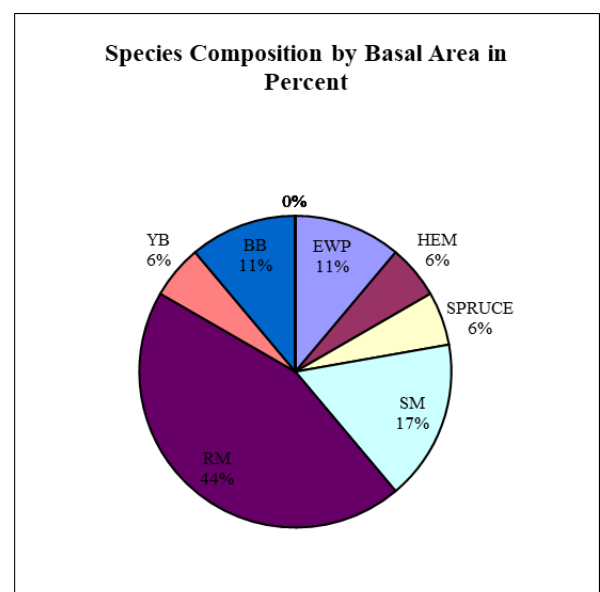
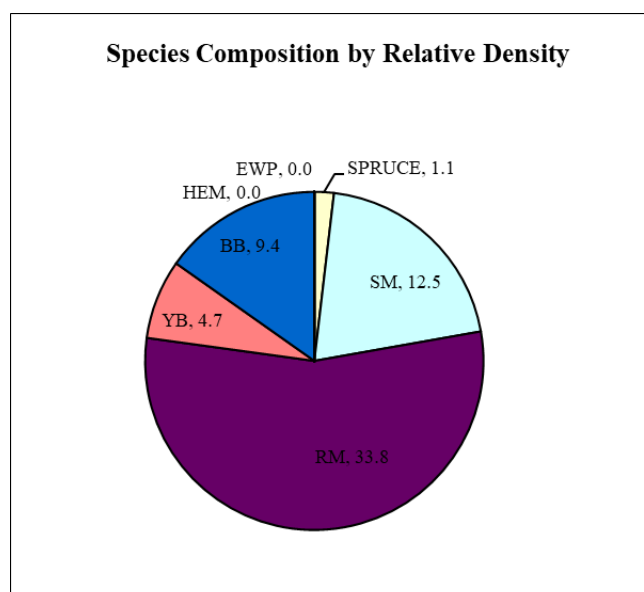
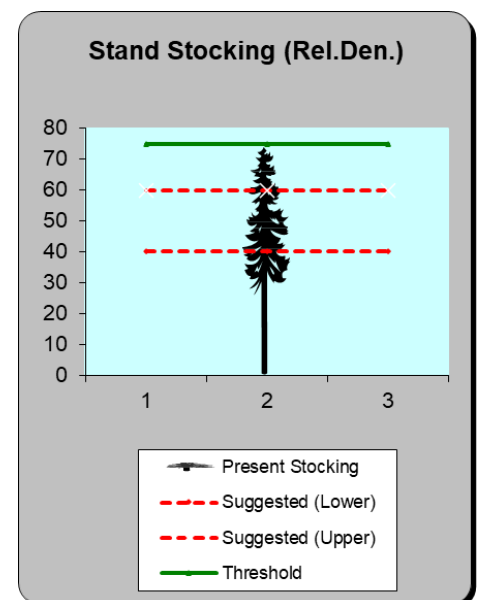
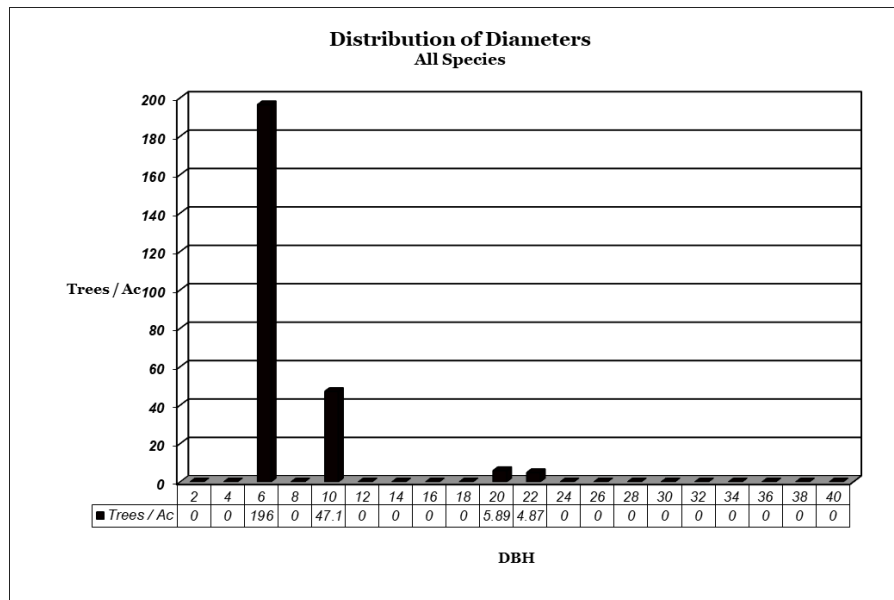
240 cords pulpwood

0 cavity trees total

Management recommendation:

Two 1-acre clearcuts of the lowest quality trees and if feasible single tree thinning in the remaining of the stand. The residual basal area in parts of this stand would be 50 sg. ft. /acre. This type of harvest would adhere to Matt Tarr's recommendations for habitat improvement. It would also create some early successional forest providing nesting sites and browse for deer and moose. If the openings are large enough, Red Oak may become established. This activity would only make economic sense when coordinated with work in adjacent segments.

King Hill	
Stand	2
Acres	19
# of BA Pts.=	4
12-Mar-22	



### **Segment #3**

Area: 20 acres

Stand Type: Black Birch, Beech, Red Maple, Red Oak, White Birch

Size Class: Sapling, pole, small sawlog.

Mean Stand Diameter: 12" d.b.h.

Basal Area: 94.3 sq.ft./acre

Stand Volumes:

Sawlogs: 0.600 m.b.f./acre

Pulpwood: 11 cords

Stand total: 12.000 m.b.f.

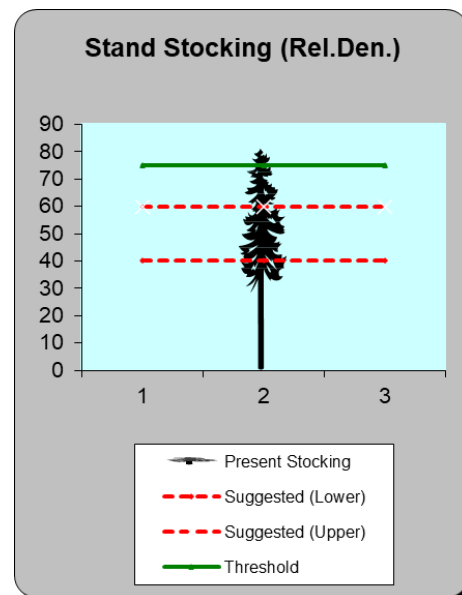
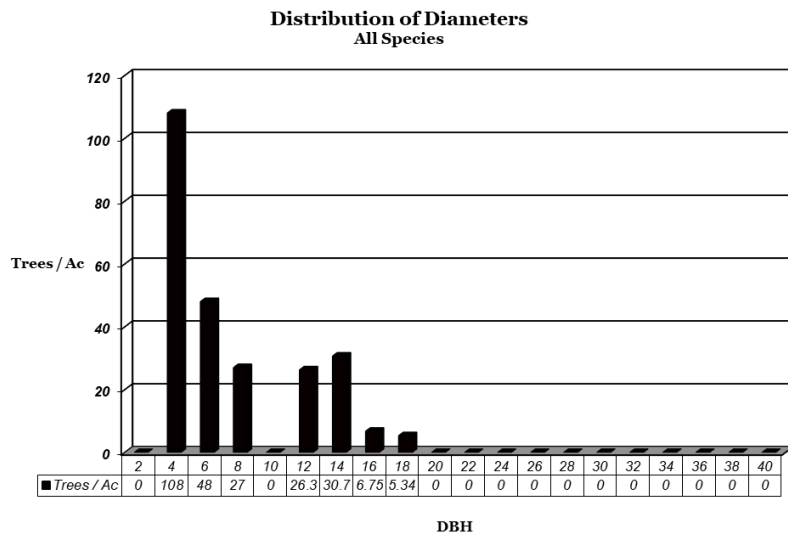
217 cords pulpwood

0 cavity trees total

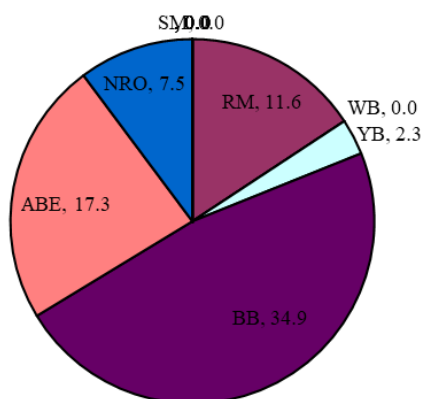
Management recommendation:

A very light single tree selection focusing on removing sixty percent of the white birch and ten percent of the sugar maple. Reducing the current basal area of 94.3 sq.ft./acre to between 60 and 70 sq.ft./acre is the goal. Estimated harvest volumes following these guidelines may produce 3 m.b.f. of sawlogs and 50 cords of pulpwood. Any harvesting needs to minimize damage to residual crop hardwood species trees. Again, retention of healthy Red Oak and Beech stems will maintain a potential hard mast crop. The trail corridor aesthetics are an important consideration anytime activity occurs in compartment three.

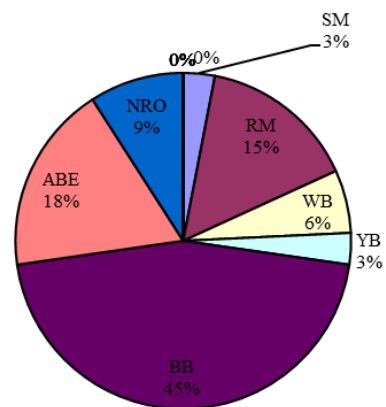
King Hill	
Stand	3
Acres	20
# of BA Pts.=	7
12-Mar-22	



**Species Composition by Relative Density**



**Species Composition by Basal Area in Percent**



**Segment #4:**

Area: 81 acres

Stand Type: White pine, Red Oak, Hemlock, Red Maple, Black Birch

Size Class: Large sawlog, small sawlog, and pole.

Mean Stand Diameter: 12.6" d.b.h.

Basal Area: 109 sq.ft./acre

Stand Volumes:

Sawlogs: 2.063 m.b.f./acre

Pulpwood: 11 cords/acre

Stand total: 167.133 m.b.f.

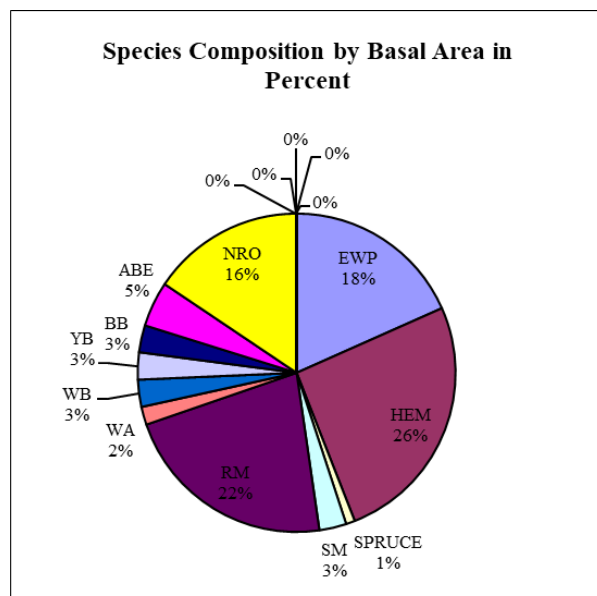
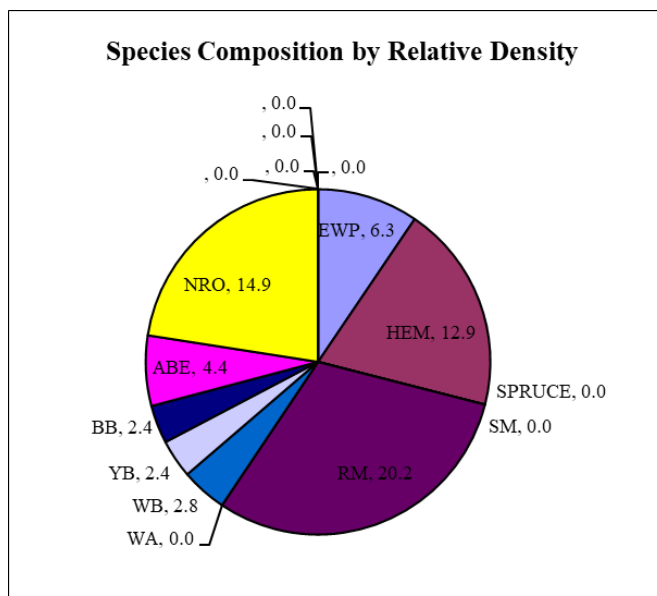
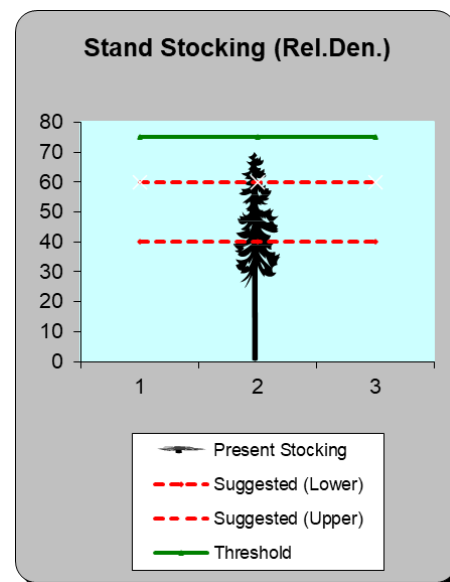
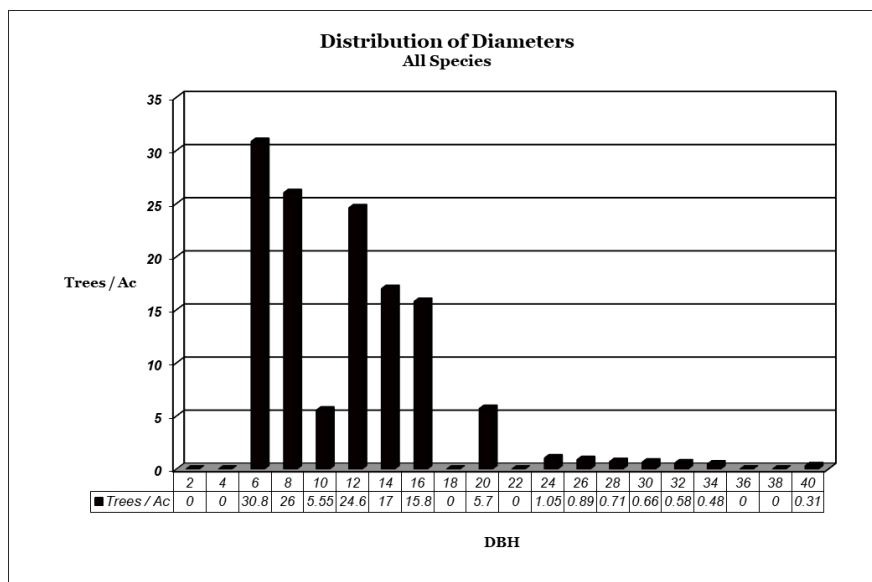
890 cords pulpwood

160 cavity trees

Management recommendation:

Segment four should be looked at for a selective single tree thinning. The ice storm damaged hardwoods should be salvaged. It is likely that the Red Maple trees have a high percentage of heartwood. The expanded heartwood in Red Maple greatly reduces its economic value. Clearing the margins of the ski trails to maintain the open fields can be coordinated with a commercial timber harvest. There are eight ski trails dissecting this stand. This poses a forest management challenge that will require careful planning if a commercial harvest occurs. An uneven aged stand can be attained by leaving some over mature stems. The residual density of this stand would have a goal of 80 to 90 sq. ft. / acre. The Nichols trail crosses onto an abutter's property. This access issue needs a resolution before any forestry activity commences involving the Nichols trail in segments four and five.

King Hill	
Stand	4
Acres	81
# of BA Pts.=	20
12-Mar-22	



## **Segment #5:**

Area: 82 acres

Stand Type: Hemlock, Red Maple, White pine, Spruce, Sugar Maple, White Ash, Beech

Size Class: Small sawlog, large sawlog and pole.

Mean Stand Diameter: 17.2" d.b.h.

Basal Area: 100 sq.ft./acre

Stand Volumes: 3.147 m.b.f./acre

9.52 cords pulpwood/acre

Stand Total: 258.000 m.b.f.

780 cords pulpwood

131 cavity trees

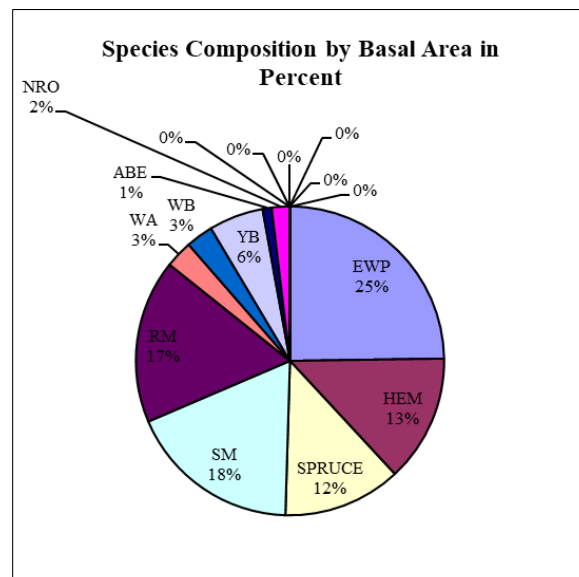
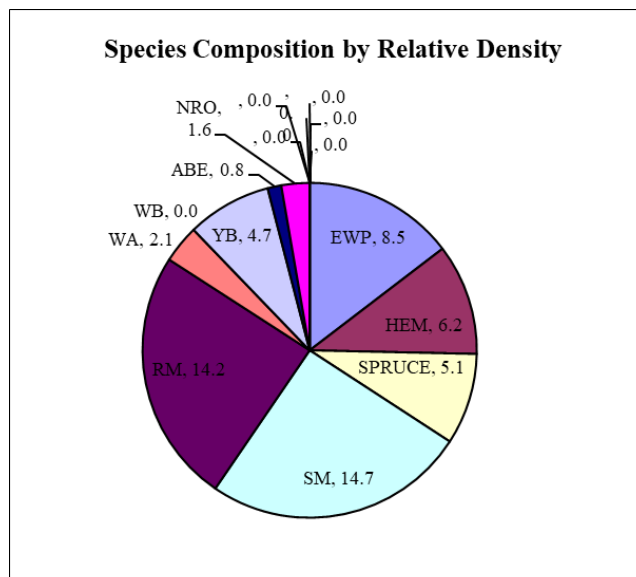
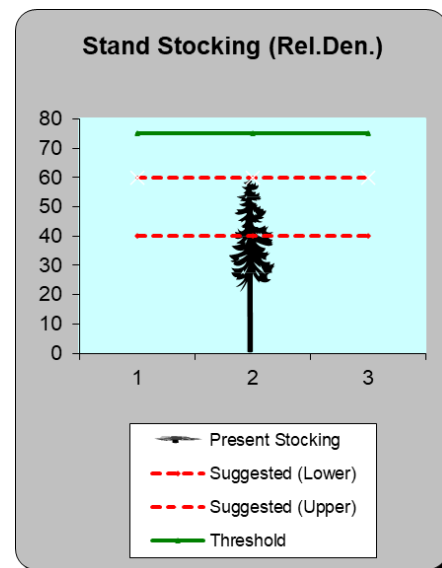
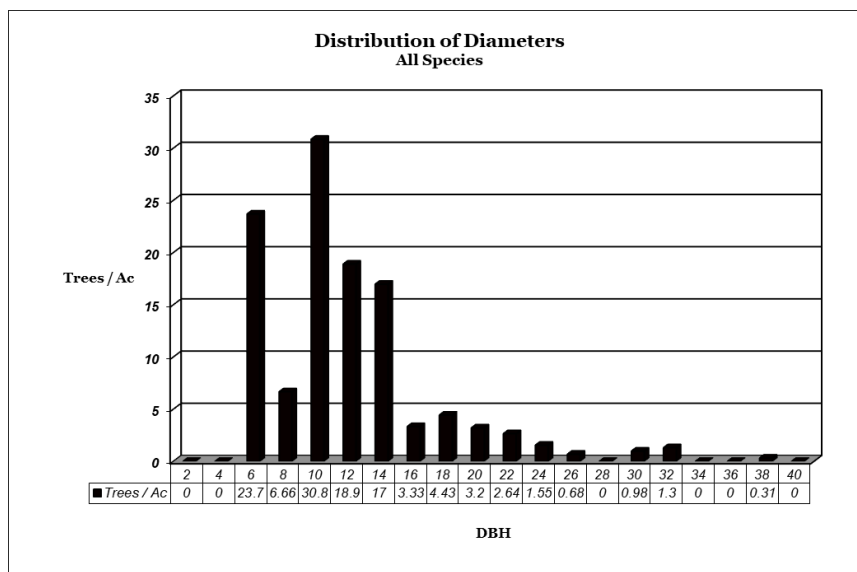
### **Management recommendation:**

Segment five has the largest volume of hardwood sawlogs per acre. The stand is mature and over mature. A single tree selection harvest would serve several purposes. They include realizing a financial return from the sale of sawlogs, releasing the best quality stems from competition, and encouraging an understory of mixed hardwoods. There are some very large Red Oak specimens which should be retained in the stand for mast production. Due to the threat of the Emerald Ash Borer, the White Ash component should be harvested soon. As much of the Red Spruce in this and segments six, seven and eight is mature and declining, it should be salvaged soon. A thinning of both hardwood and softwood may generate 80 m.b.f of sawlogs and 160 cords of pulpwood. Post a single tree thinning the goal would be to retain the density between 70 and 80 sq. ft. /acre.

### **Access:**

Segment five was not harvested when adjacent segments were logged the last time. This is likely due to accessibility issues. From the log landing in segment one, it is over one mile to the beginning of segment five. There have been discussions as to the possibility of getting permission from abutting landowners to forward wood through their land. There is a vacant lot on Route 11 that could work well as a log landing area. The other option is to improve the Nichols trail or create a parallel skid trail to the landing off Hominy Pot Trail. The advantage is that an investment in KHR infrastructure will have guaranteed future use. Investing in access on abutter's land does not guarantee future use.

King Hill	
Stand	5
Acres	82
# of BA Pts.=	21
12-Mar-22	





**Segment #6:**

Area: 58 acres

Stand Type: White Pine, Hemlock, Red Maple, Yellow Birch

Size Class: Large sawlog, small sawlog

Mean Stand Diameter: 15" d.b.h.

Basal Area: 113 sq.ft./acre

Stand Volumes:

Sawlogs: 5.509 m.b.f./acre

Pulpwood: 9.4 cords/acre

Stand total: 319.533 m.b.f.

545 cords pulpwood

35 cavity trees total

Management recommendation:

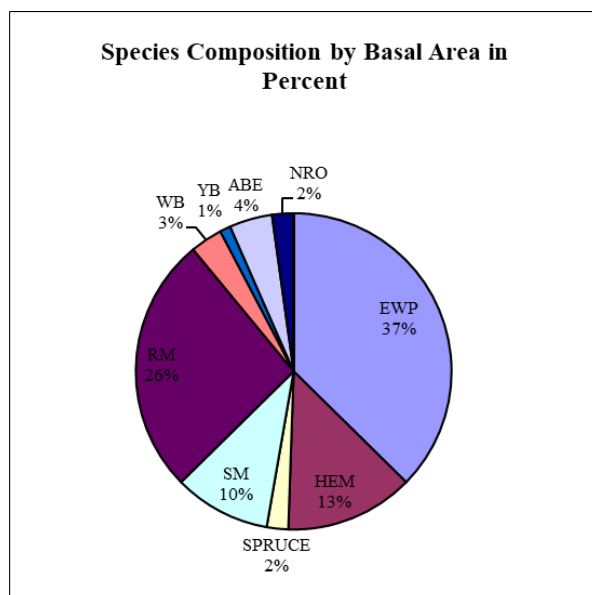
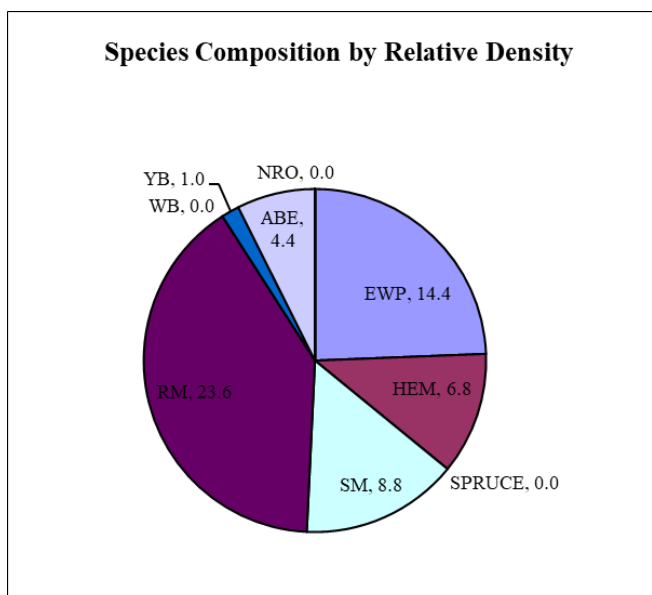
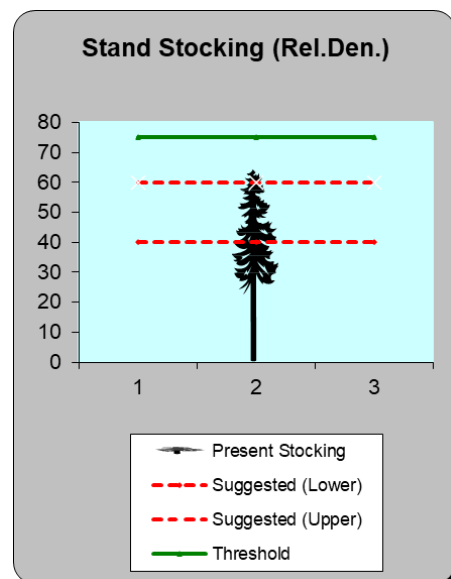
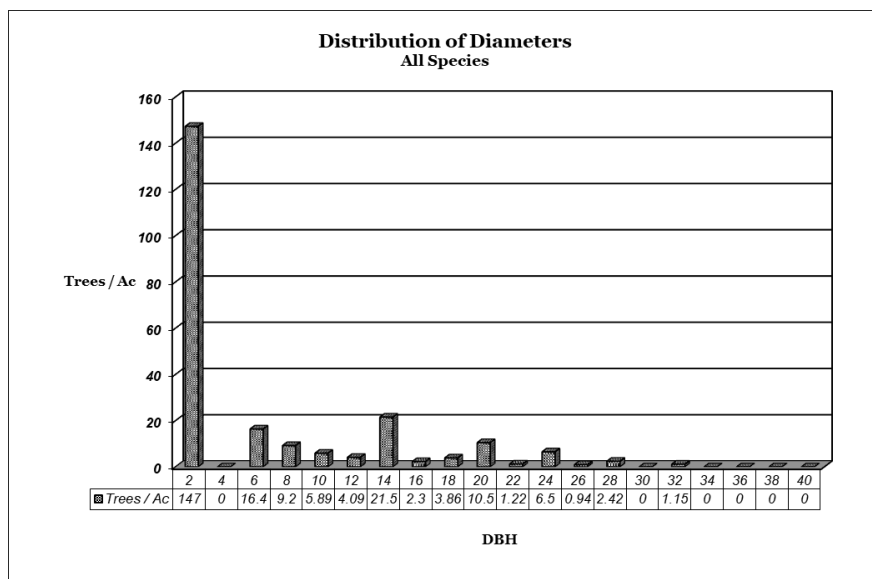
Segment six is predominantly a mature stand of White Pine. The mean diameter at breast height of the White Pine is nineteen inches. Many of the stems exhibit external signs of decay typically called "red rot". This defect significantly reduces a pine sawlogs commercial value. The hemlock present varies from possible sawlog trees to strictly pulpwood stems. A Shelterwood type harvest would retain the most vigorous pine while releasing saplings. A Shelterwood harvest method is a series of two or three harvests that gradually open the stand and stimulate natural reproduction creating a new even aged stand. If approximately fifty percent of the pine trees were removed, the harvest volume may be 115 m.b.f. of pine alone. The hemlock and mixed hardwood component would be thinned at the same time. The total harvest volume would be in the range of 150 m.b.f. of sawlogs and 260 cords of pulpwood range. The residual stand would eventually be a sapling, pole, and sawlog matrix with a density of 80 to 90 sq. ft. / acre. Retention of as many cavity trees as possible is important.

Access:

If the decision is made to improve the Penacook Path to log trucking capabilities, segment six is essentially at the existing log landing. The property boundary on the eastern edge of the landing needs to be located, blazed, and painted prior to any harvesting. With access to segment six, segments seven and eight will then have improved access. It would be wise to coordinate harvesting in segment six with harvesting in segments seven and eight. Segment six is the most attractive to a timber harvester and can be leveraged to complete the less attractive

work in seven and eight. If six is harvested separately, it reduces the incentive to revisit the site to work on seven and eight.

KHR	
Stand	6
Acres	58
# of BA Pts.=	16
12-Mar-22	



## **Segment #7**

Area: 32 acres

Stand Type: Spruce, Red Maple, Yellow Birch

Size Class: Large sawlog, small sawlog,

Mean Stand Diameter: 16.8" d.b.h.

Basal Area: 86 sq.ft./acre

Stand Volumes:

Sawlogs: 3.095 m.b.f./acre

Pulpwood: 3.8 cords/acre

Stand total: 99.05 m.b.f.

126 cords pulpwood

0 cavity trees total

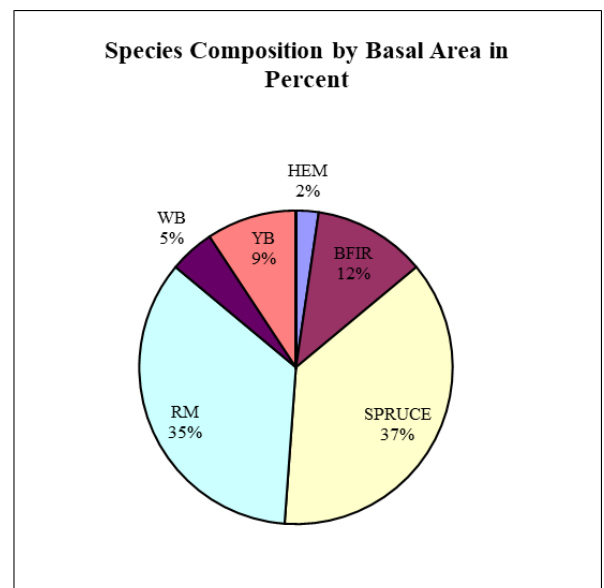
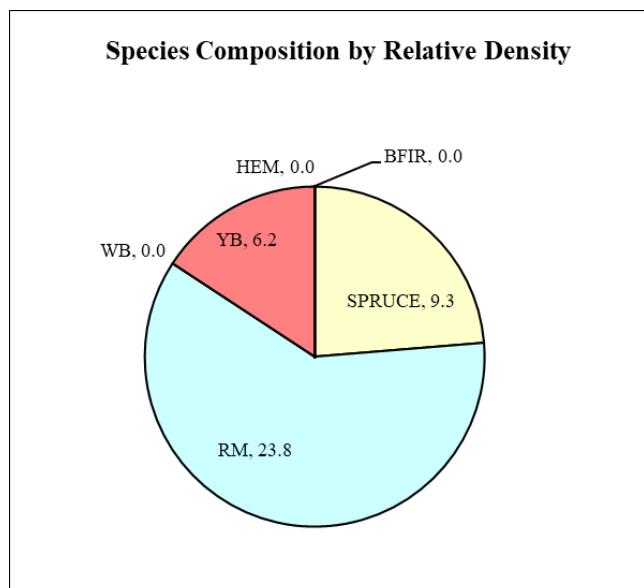
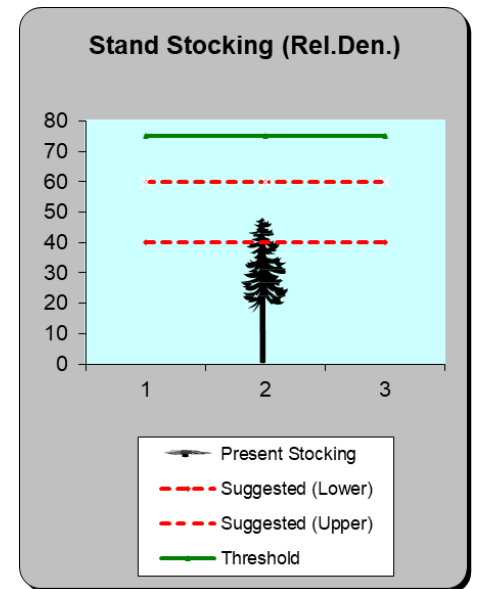
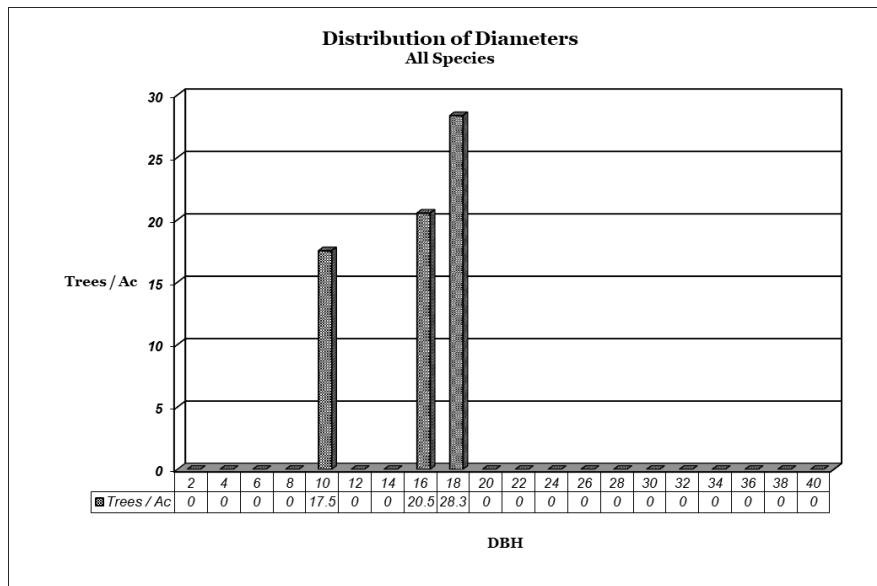
Management recommendation:

At least thirty percent of the mature Red Spruce stems have been lost to wind throw or decay. As the Red Spruce has reached maturity and is in decline, removing all the remaining 77 m.b.f. of sawlogs should be considered. As there are sapling Red Spruce present, they will be released by removing the overstory. These trees and the residual hardwoods will ease the aesthetic impact. The understory Red Spruce will provide cover for birds and small mammals. The Red Maple and Yellow Birch should be thinned by individual tree selection. Many of the hardwoods exhibit some amount of ice storm damage. The residual stand density would be light initially with a basal area average of 50 sq. ft. /acre. The saplings currently present in the stand will increase their growth rate shortly after the harvest.

Access:

The nearest landing site is likely the existing one in segment six at the terminus of the Penacook Path. The distance from the landing to the timber affects its value. The distance to segment seven is not ideal considering in part the steep terrain encountered in segment eight.

KHR	
Stand	7
Acres	32
# of BA Pts.=	10
12-Mar-22	



**Segment #8:**

Area: 114 acres

Stand Type: Spruce, Yellow Birch, Red Maple, White Ash, Sugar Maple, White Pine

Size Class: Small sawlog

Mean Stand Diameter: 13.7" d.b.h.

Basal Area: 97.1 sq.ft./acre

Stand Volumes:

Sawlogs: 3.563 m.b.f. /acre

Pulpwood: 4.5 cords/acre

Stand total: 406.232 m.b.f.

515.8 cords

137 cavity trees total

Management recommendation:

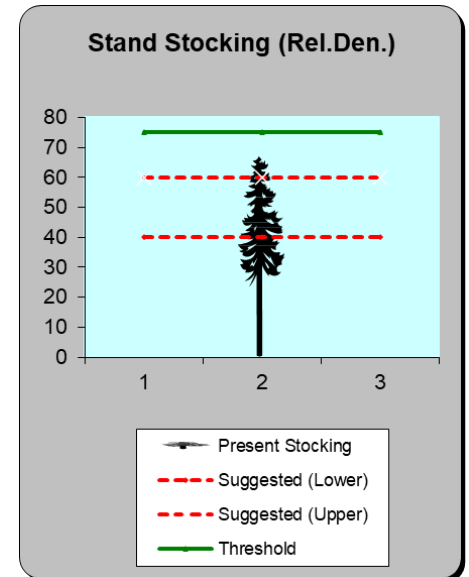
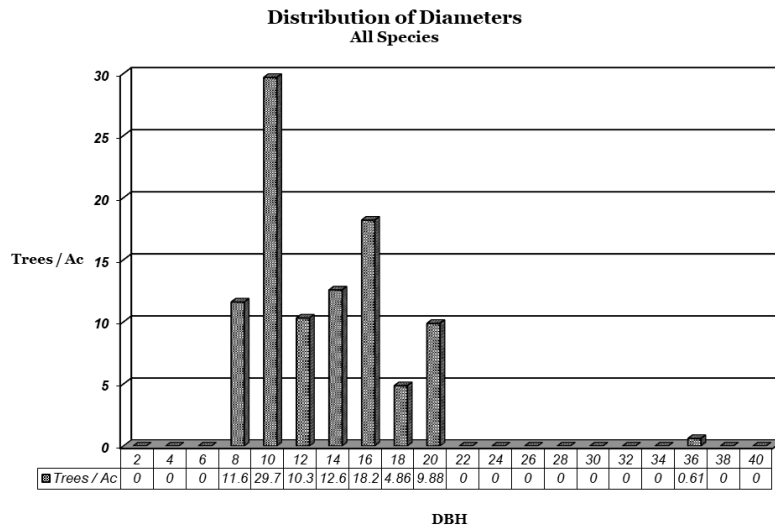
The current basal area of 97.1 sq.ft./acre is overstocked. The recommended basal area for this mixed stand is 72 sq. ft./acre. Attaining the preferred stocking can be achieved by single tree selection of the hardwoods and salvaging the Red Spruce exhibiting decline. The sawlog volume estimate from such a thinning would be 130 m.b.f. of sawlogs and 200 cords of pulpwood.

There are challenges to implementing a harvest in segment eight. The steep grade, intermittent streams and three ski trails are factors that need to be considered. In addition to a commercial thinning, reclaiming the margins along the ski trails and enhancing the long-range vistas may be among the goals for the KHR.

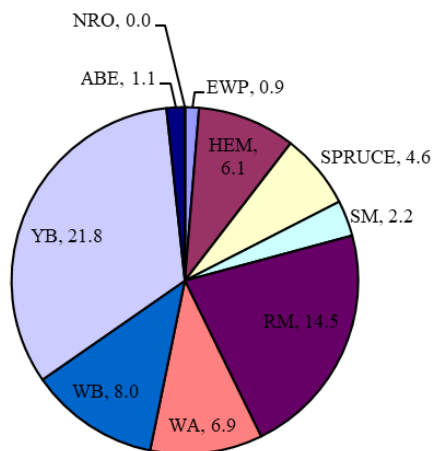
Access:

Like segment seven, the distance to the landing is viable but not ideal. Market demand for sawlogs, ground conditions and the type of harvesting operation affect the timing and value of a harvest in segment eight.

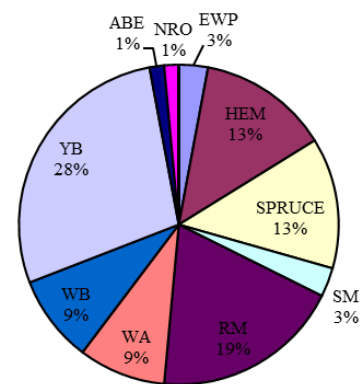
KHR	
Stand	8
Acres	114
# of BA Pts.=	14
12-Mar-22	



**Species Composition by Relative Density**



**Species Composition by Basal Area in Percent**



## **Wildlife Habitat**

A parcel of land as large and diverse as the KHR provides a variety of habitats. The recent land use as a ski area has increased the diversity of habitats typically found within a four-hundred-acre forest. Some of the old ski trails are in a state of early successional forest as the margins begin to close in. The mowed trails attract ground nesting bird species. They also provide hunting sites for raptor species. There are hardwood trees throughout the forest that have cavity nesting sites for both avian and mammalian species.

Highly oxygenated water flowing from the Lyon Brook watershed likely supports a Brook Trout, *Salvelinus fontinalis*, population. Lyon Brook and other riparian zones need the protection that riparian buffers provide. Any forest related activities need to protect them as much as is feasible.

Wildlife habitat is discussed in the attached “Long-Term Field Management Summary” dated December 9, 2021, which is a comprehensive report of the visit by Matt Tarr and Tim Fleury of the UNH Cooperative Extension to the KHR. This report appears in the Appendixes of this report.

## **Summary**

The overarching goal of managing the King Hill Reservation is to preserve the natural environment for future generations. As the KHR is utilized by an array of stakeholders, the impacts of one use should not result in degrading the other benefits it provides. Providing for a rewarding visitation by the public is a primary goal. Habitat protection and enhancement for the current resident and transient wildlife populations are of equal importance. How to meet these objectives is the challenge. In order to remain relevant, management plans need to remain fluid to respond to predictable and unforeseen events.

With careful planning and public education, forest management can be practiced successfully.

This forest management plan provides a baseline of the current forest condition. The data provides a basis upon which decisions for future management of the KHR can be made.

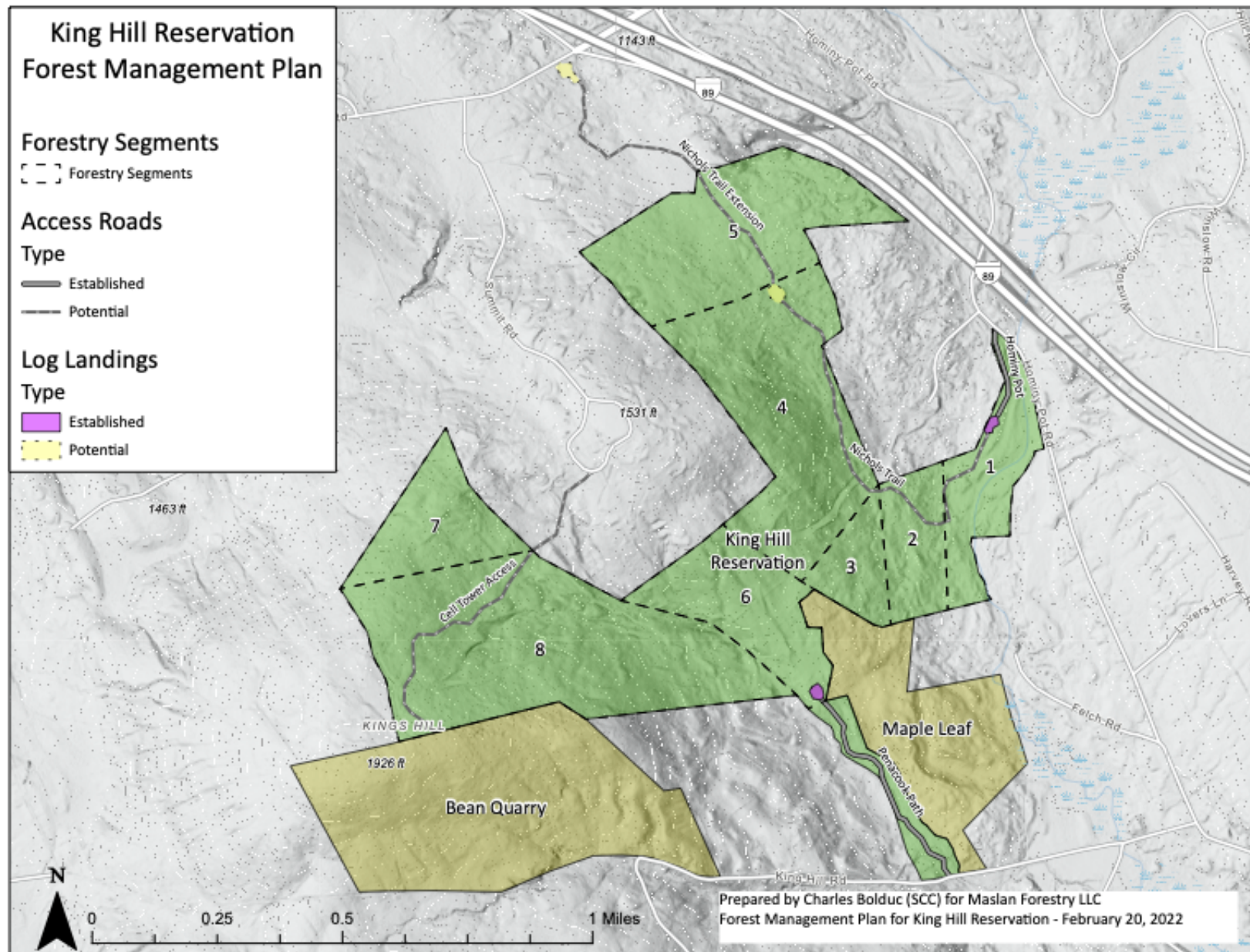
## **Potential Implementation Schedule**

1. 2022-2025: Improve access to landing to Segments #1-5 or to Segments #6-8.  
Salvage Spruce in Segments 7, thin Segments 6 & 8.  
Selective thinning in Segment 5, patch cuts & thin Segments 1 & 2.
2. 2024-2027: Release crop trees, single tree thinning in Segments #3 & 4.

## **Appendixes**

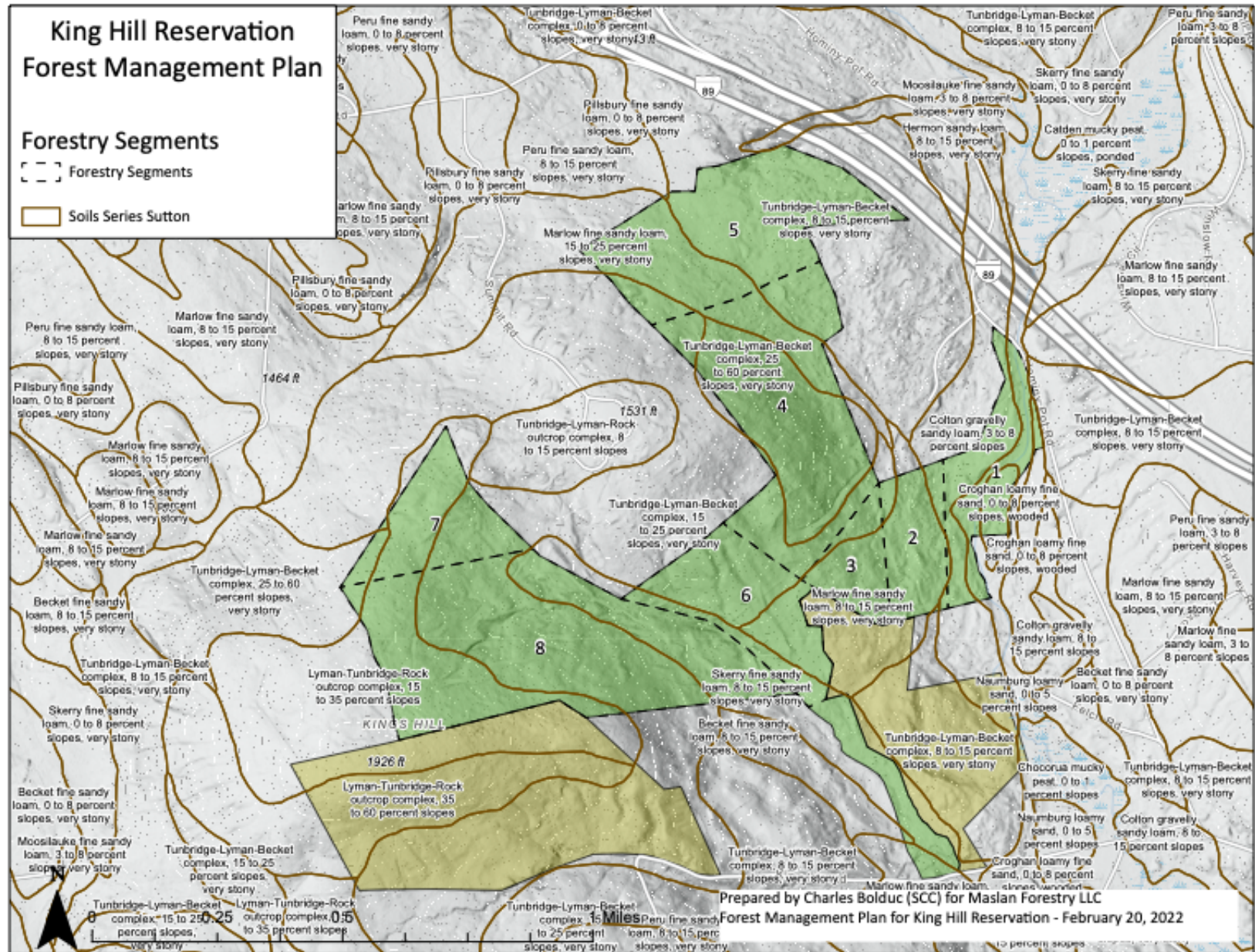


## KHR Segments and Forestry Access Map





## KHR Soils Map



# Long-Term Field Management Summary

**Date of Site Visit: December 9<sup>th</sup>, 2021**

**Attending:** Matt Tarr, UNH Cooperative Extension/ NREN

Tim Fleury, UNH Forestry Field Specialist

Leo Maslan, Maslan Forestry Management

Glen Pogust, King Ridge Homeowners Association

Chuck Bolduc, Sutton Conservation Commission

Bonnie Hill, Sutton Conservation Commission

Henry Howell, Sutton Conservation Commission

## **Current Management Approach and History:**

The general practice of management since the late 1990's, since SCC took ownership of the property, has been to mow with a tractor pulled brush hog on a three-year cycle. Mowing was intended to happen every year on a third of the trails, allowing the trails to grow in for three-years before being mowed again. Mowing was done in the fall to late fall to limit disturbance to nesting wildlife and flowering plants. Some years, and sometimes multiple years, mowing was missed due to wet conditions, early snow, or scheduling issues. In some years more than a third of the trails were mowed to make up for missed years.

Steep middle sections of the trails north of Trail 12 'White Rabbit' have always been left to grow-in due to mowing difficulty. Where the ski trails continue onto private property, a buffer of vegetation has generally been allowed to grow in to establish natural boundaries. Over time, the edges of all the ski trails have encroached, and hardwood species have established in the middle of trails to a varying degree. This is most common on the trails north of Trail 12 'White Rabbit', where mowing has generally been less frequent, trails are narrower, and middle sections were already being allowed to grow in. It has also occurred along the three longest trails (Trails 1-3), where the drainage features have become overgrown and are less able to prevent washout and erosion.

Recreational use at the KHR has increased dramatically over the past few years. Backcountry skiing has become an increasingly popular activity. With the increased use, skiers and hikers passing onto private property has been an issue. Rotational mowing has caused the recreation to rotate as well, following the most recently mowed trails.

**Purpose:**

The Sutton Conservation Commission (SCC) invited Matt Tarr to visit the King Hill Reservation (KHR) to discuss management of the old ski trails and open field areas. The SCC was interested in improving the current management practices to achieve the following goals:

- Preserve and improve the habitat for wildlife that utilize fields and early successional areas.
- Improve conditions for winter recreation that remain consistent year to year.
- Concentrate recreational uses to limit disturbance to wildlife, discourage passing onto private property, and create shared opportunities for backcountry skiers, snowmobilers, and other users of the KHR.
- Engage volunteers to assist with trail maintenance and/or participate in wildlife improvement projects.
- Raise donation funds from recreational users to help with trail maintenance and habitat improvement.
- Control invasive species.

**Site Visit Notes:**

The group walked from the Hominy Pot trailhead along the Hominy Pot trail to the White Rabbit ski trail 12. The group then walked the Nichols Trail, which passes the base of ski trails 13-18, to the Mock Turtle ski trail 19. The following topics were discussed, and advice was given by Matt Tarr and Tim Fleury:

- Most of these trails are too narrow to support wildlife that lives in open fields (except trail 19 “Mock Turtle”)
- They are beneficial in making sunlit corridors throughout the forest, similar to logging corridor cuts.
- They enable birds and bats non-cluttered flyways.
- They benefit predator birds to hunt mice, chipmunks & other small rodents, snails and frogs.
- Certain frogs, toads, snakes, rodents, including the endangered New England Cottontail Rabbit, and plants benefit from such a forested “skylight”.
- Downed trees and brush piles in the fields create a nucleus site for invasive species to take hold and should be cleared.
- Pollinator Habitats:
  - These trails serve as excellent, *natural* (non-human-made) pollinator habitats due to their native growing plant species, such as: goldenrod , young red maple, black locust, and cherry tree flowers, wild strawberry & blueberry, deer vetch, asters, buckeyes, serviceberry, bunchberry, violets, purslane, joe-pye weed, yarrow, sneezeweed, cinquefoil, milkweed, wild bergamot, lady slippers, ferns--cinnamon, interrupted, hay-scented, marginal, *et al--*, Dutchman’s breeches, wild

bleeding heart, flowering spurge, cotton grass, purple love grass, oak-leaf hydrangea, iris, winterberry, --and the list goes on...

- Because there is so much naturally occurring pollinator-friendly native plants that are likely to grow in these narrow-yet-open, shaded ski trails, there is little need to create a specialized pollinator “garden”. However, a small manmade pollinator garden might be created for public education on this wildlife issue.
- The Mock Turtle ski trail 19 is unique in this area of the KHR:
  - Because this trail is wide enough to qualify as a field, it can serve a different purpose for wildlife promotion than trails 13-18.
  - According to the Audubon Society, such grassland habitats are an increasingly rare site in New Hampshire, yet more than 70 species of wildlife use these open areas of fields and wildflowers to meet their needs for food, cover, or breeding. The Audubon Society recommends, “Enlarging fields by reclaiming field edges. Mow encroaching woody growth during the off nesting/foraging season, taking care to control invasive species. Remove hedgerows and tree lines between fields to increase the functional size of available grassland habitat.”
  - Birds that benefit from and are common to open fields of New England are the Vesper Sparrow, Grasshopper Sparrow, Robbins, Bobolink, Eastern Meadow Lark, Eastern Bluebird, breeding Woodcocks, Quail, Pheasant, wild turkey, Cowbird, Lapland Longspur(?) and predator birds such as the Northern Harrier, Broad winged & Red-tailed hawks, Barred & Great Horned Owls.
  - Birds that thrive *next to* open fields are robins, blue jays, Common Yellowthroat, Yellow Warbler, Red Crossbill, catbirds, Indigo Bunting, and Mourning Dove.
- Recreational uses in this area of the KHR are more limited but it is an important section of the KHR trail system that could benefit from maintenance and development of new hiking trails.
  - Except for the Mock Turtle, the ski trails in this area have grown in and are not wide enough for backcountry skiing.
  - The upper and lower sections of these ski trails continue onto neighboring properties and increase the likelihood of recreational users entering private property.
  - The Nichols Trail used to serve as an access road for the ski area. It is in disrepair, utilizes an easement across neighboring properties, and is not currently effective for maintenance equipment access to this area of the KHR.
  - The Nichols Trail continues beyond the Mock Turtle to some important historic cellar holes.

The group then walked back on the Nichols Trail and up the White Rabbit to the junction with the Walrus ski trail. This walk provided a limited view of the areas that have the highest value for recreation, but time did not allow a complete walk. The old triple ski trails (Trails 1-3) that go up to the cell towers at the top of King Hill were discussed but not observed. The following topics were discussed, and advice was given by Matt Tarr and Tim Fleury:

- Maintaining fields with low-growth vegetation for recreation still provides valuable habitat and is an important part of the diversity at the KHR.
- Low growth vegetation, such as ferns, have the benefit of shading out higher-growth vegetation. Trimming hardwood shoots throughout the season can maximize this benefit.
- These trails can be mowed annually late in the season (even with light snow on the ground if someone can be found to do it) for recreation while still providing habitat benefit.
- Mowing twice a year (early season and late season) could be done to establish grassland habitat in the fields. Additionally, it would provide better hiking in the summer months and winter recreation opportunities with less snow cover, which is the trend due to climate change. However, this would take consistent mowing over the course of a few years. Undertaking this level of management would depend on funding and whether that type of habitat and recreation is a priority.
- Clearing the edges of the ski trails with a Brontosaurus mower periodically would be beneficial to maintain the width of the fields and keep the drainage features functioning to prevent erosion and washout.
- Oriental Bittersweet is present in the upper sections of trails 7-9. Control of this invasive should be done immediately to prevent spread. Mowing Oriental Bittersweet can spread it around the property and should be avoided.

### **Summary:**

Nothing in this area, or in most areas of NH, is truly natural due to a long history of logging, farming, and human management. However, the KHR provides an incredible benefit to wildlife because of its large undeveloped acreage with a diversity of forest types, fields, vernal pools, waterways, and topography. The KHR also provides wonderful recreational and educational opportunities for the residents of Sutton and the Kearsarge area with a network of hiking trails, old ski trails, and historic cultural features. It is the goal of the SCC to maintain and improve all these wonderful wildlife benefits and recreational opportunities at the KHR.

In general, different approaches to management will provide benefits to different species and there is no singular approach. Based on recommendations from Matt Tarr and Tim Fleury, and the goals of the SCC, the following management plan for the King Hill Reservation is recommended.

### **I. Division of Use Areas**

- Ski Trails 1-13 and 19 to be prioritized for recreation
- Ski Trails 14-18 to be prioritized for the promotion of wildlife

This prioritization is a general guideline and can be adjusted at the discretion of the Sutton Conservation Commission. Management of wildlife areas will depend on volunteer efforts.

Mowing and maintaining the ski trails will depend on funding and volunteer efforts. Feedback from neighboring property owners, recreational users, clubs, schools, and other interested parties will help determine the management priorities.

## **II. Ski Trails for Recreational Use:**

- Trails 1-13 and 19: These trails should be maintained for low impact recreation, including hiking, backcountry skiing, and snowshoeing.
- Snowmobiles are allowed on Trail 10 “The Walrus” (also called Penacook Path), Trail 12 “White Rabbit”, and Hominy Pot Trail, which allows for the continuity of the regional snowmobile trail network. Other trails could be open to snowmobile use with the involvement of the Sutton Ridgerunners and input from other recreational users.

### *Recreational Trail Management Objectives:*

- Keep vegetative growth low to improve winter recreation for backcountry skiing.
- Clear downed trees and large tree branches from the edges of the trails to allow for mowing and to prevent areas where invasive species can take hold.
- Mow the entire width of ski trails annually in the late fall with a brush hog. On the wider trails, a swath on one side can be left un-mowed and this can be alternated each year.
- Mow a narrow path with a brush hog once or twice a summer as needed to maintain a hiking path. This applies to Penacook Path / The Walrus and White Rabbit.
- Additional mowing at the beginning of the season could be done to keep vegetation low, begin to establish grassland habitat, and improve year-round recreation.
- Trail 19 “Mock Turtle” Mowing Objective:
  - This trail is much wider than the other ski trails (approximately 30-40 yards wide) and is uniquely suited to different wildlife species that benefit from large fields.
  - Mow annually in late fall with a brush hog but leave approximately ¼ of the width of the trail along the side un-mowed.
  - Alternate each year the side of the trail that is left un-mowed.
- Maintain culverts and drainage features to prevent erosion and washout.

### *Recreational Use Management Objectives:*

- Create hiking and kiosk maps to clearly show the recreation trails, their allowed usage, private property boundaries, cultural and historical features, and unique natural areas.
- Maintain boundary signage to reduce passing into private property and post snowmobile signs to keep snowmobiles on the allowed trails.
- Maintain trailhead parking areas to provide recreational access.

## **III. Ski Trails for the Promotion of Wildlife:**

- Trails 14-18: These trails are maintained for promotion of wildlife
- Limit foot traffic to the Nichols Trail along their lower section
- No motorized vehicles other than those authorized by the SCC for maintenance

#### *Habitat Areas Objectives:*

- Allow vegetative growth to grow approximately 3 feet.
- Selectively cut woody growth to 3-4 feet by hand or with a brush saw, leaving grasses and soft plants to flourish.
- Selective cutting to be done every 1-3 years in late fall. Frequency should be such that the woody growth doesn't take over.
- Brush hog mow rarely and only as a last resort to keep trail free of young tree growth.
- Clear downed trees and large tree branches to prevent areas where invasive species can take hold.

#### **IV. Volunteer Development:**

- SCC should leverage the high level of recreational use at the KHR to build a volunteer base.
- Recreational users (hikers, backcountry skiers, snowmobilers, etc.) have expressed an interest in helping at the KHR to keep the trails in good condition.
- Kearsarge Regional School District and Colby-Sawyer College students and classes are often looking for community project to get involved with.
- Local clubs interested in habitat and wildlife have a unique opportunity to get involved with the new KHR management objectives of creating wildlife areas.
- Currently, these interested parties lack an easy way to volunteer or get involved. Better information, high quality maps, and contact information at the trailheads could connect the SCC with more volunteers and benefit the community.

#### **V. Fundraising:**

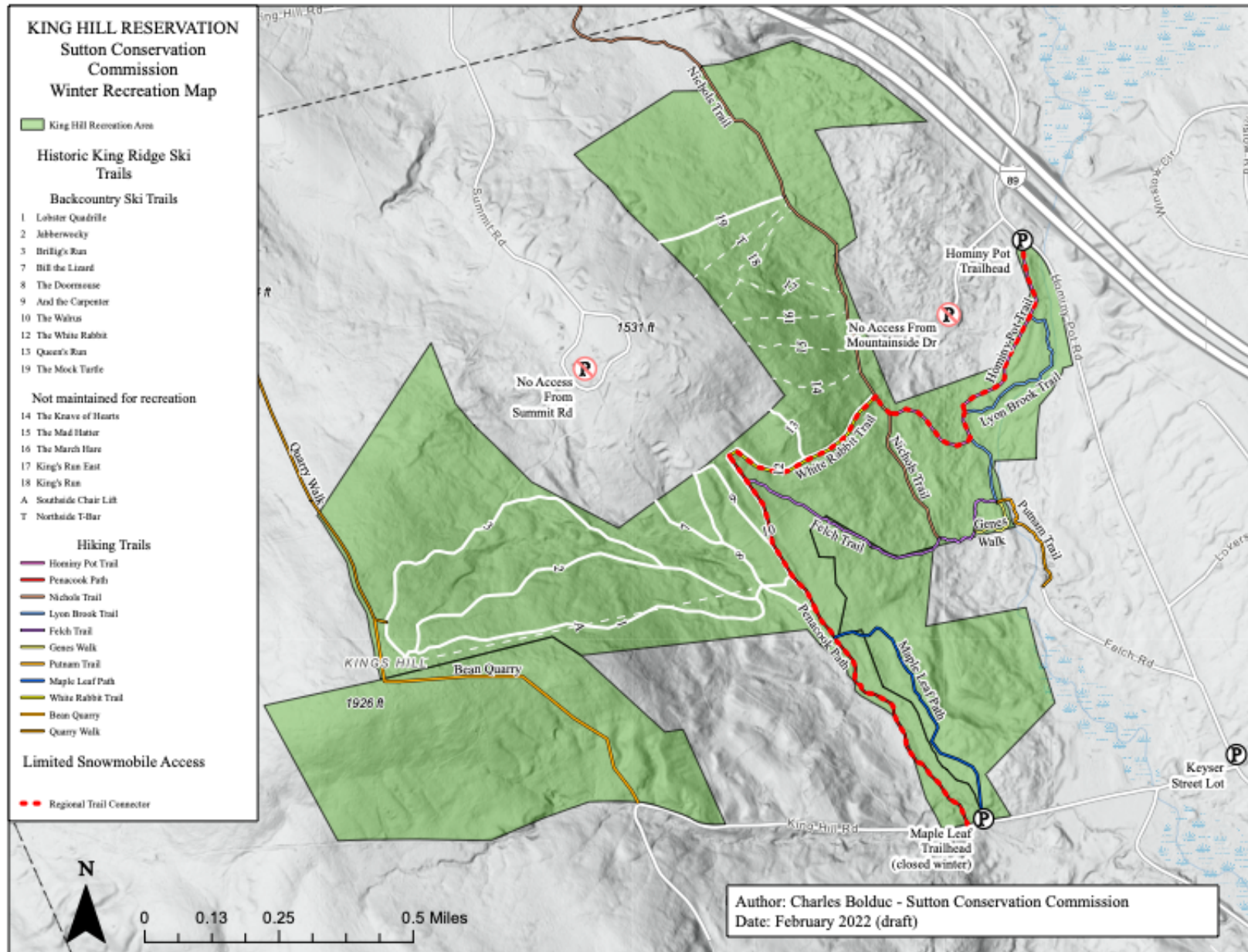
- Backcountry skiers and hikers have asked for an easy way to donate small amounts of money for the maintenance of the trails when they visit the KHR.
- The SCC should establish a trailhead donation system, like ones now set up by SPNHF at their trailheads.
- Larger donation campaigns could be leveraged to pay for one-time high-cost projects.

#### **VI. Publicity and Education:**

- Create accurate, detailed, and informational trail maps for the kiosks and make digital versions available online for printing or viewing on mobile devices.
- Publicize uses of the reservation.
- Write a 'Pocket Guide' that describes the flora, fauna, geology, and history along the hiking trails.



# KHR Trails Map



## Average Stumpage Value List

Suggested for the CENTRAL region of N.H.

October 1, 2021 - March 31, 2022

Available at [www.nh.gov/revenue](http://www.nh.gov/revenue)

LOW VALUE: LARGE LOGGING COSTS, POOR ACCESSIBILITY OR LOW GRADE TIMBER

HIGH VALUE: SMALL LOGGING COST, GOOD ACCESSIBILITY, OR HIGH GRADE TIMBER

SAW LOGS	MBF LOW	MBF HIGH
White Pine	\$100.00	\$220.00
Hemlock	\$25.00	\$90.00
Red Pine	\$15.00	\$70.00
Spruce/Fir	\$80.00	\$165.00
Hard Maple	\$200.00	\$450.00
White Birch	\$60.00	\$180.00
Yellow Birch	\$80.00	\$265.00
Oak	\$200.00	\$525.00
Ash	\$80.00	\$300.00
Soft Maple	\$75.00	\$200.00
Beech/Pallet/Tie Logs	\$25.00	\$100.00
Pine Box	\$5.00	\$30.00

Stumpage values for species not listed are available from the DRA @ (603) 230-5950

PULPWOOD	TONS LOW	TONS HIGH
Spruce/Fir	\$0.00	\$0.50
Hardwood/Aspen	\$1.00	\$5.00
Pine	\$0.00	\$1.00
Hemlock	\$0.00	\$2.00
Biomass Chips	\$0.00	\$1.00
MISCELLANEOUS	TONS & CORDS LOW	TONS & CORDS HIGH
High Grade Spruce - TONS	\$20.00	\$30.00
Cordwood - CORDS	\$8.00	\$20.00


NOTE: The assessing officials may use the average stumpage value list provided by the Department of Revenue

Administration and shall take into consideration the location of the timber, the quality of the timber, the size of the sale and other factors necessary to harvest the wood or timber that may affect the value of timber being cut.

The assessing officials may consider the stumpage price paid or may conduct an inspection of the property, use the above stumpage value list, or other stumpage value information that they deem appropriate.

This is only an AVERAGE stumpage value range list. The assessing officials may go above or below the ranges.

Prepared by: Rick Evans

Rick Evans, NH LF 

Department of Revenue Administration

This stumpage value forecast is compiled from a survey two weeks prior to printing.

Values may change during this period.

October 1, 2021

## **Current Merchantable Timber Values**

### **Segment #1**

Sawlogs:

White Pine \$15,200.00

Hemlock \$383.00

Red Maple \$5,330.00

Red Oak \$14,350.00

Pulpwood \$2,460.00

**Total for Segment #1: \$24,633.00**

### **Segment #2**

Sawlogs: N/A

Pulpwood \$867.00

**Total for Segment #2: \$867.00**

### **Segment #3:**

Sawlogs:

Red Maple \$640.00

Sugar Maple \$260.00

Black Birch \$1,070.00

Red Oak \$1,400.00

Pulpwood: \$716.00

**Total for Segment #3: \$4,096.00**

**Segment #4:**

Sawlogs:

White Pine \$14,175.00

Hemlock \$1,782.00

Red Maple \$486.00

White Ash \$2,350.00

Black Birch \$1,053.00

Red Oak \$7,000.00

Pulpwood: \$3,240.00

**Total for Segment #4: \$30,086.00**

**Segment #5:**

Sawlogs:

White Pine \$24,600.00

Hemlock \$575.00

Spruce \$4,900.00

Sugar Maple \$9,000.00

Red Maple \$900.00

White Ash \$1,300.00

Red Oak \$2,460.00

Pulpwood: \$2,747.00

**Total for Segment #5: \$46,482.00**

**Segment #6**

Sawlogs:

White Pine \$35,670.00

Hemlock \$2,300.00

Spruce \$980.00

Red Maple \$2,090.00

Pulpwood \$2,900.00

**Total for Segment #6: \$43,940.00**

**Segment #7**

Sawlogs:

Balsam Fir \$1,820.00

Spruce \$8,640.00

Red Maple \$2,560.00

Pulpwood: \$770.00

**Total for Segment#7 \$13,790.00**

**Segment #8**

Sawlogs:

White Pine \$4,845.00

Hemlock \$2,166.00

Spruce \$15,730.00

Sugar Maple \$9,450.00

Red Maple \$12,700.00

White Ash \$8,200.00

Yellow Birch \$26,790

Red Oak \$4,674.00

Pulpwood \$4,275.00

**Total for Segment #8: \$84,555.00**

**Approximate total stumpage on all KHR forestland: \$240,000.00**

(The stumpage values used are the mean value found on the "Current Stumpage Value List" Central Region Oct. 2021- March 2022. The stumpage values are not adjusted for merchantable timber located within the 200' no cut buffer along property lines, buffers along trails and riparian zones.)