Forest Management Plan for the Cold River Camp

Property of the Appalachian Mountain Club

Rt. 113 Chatham, NH 77 acres.

April 2019

Prepared for the Appalachian Mountain Club

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Daniel Stepanauskas Date

Daniel A. Stepanauskas, Forester

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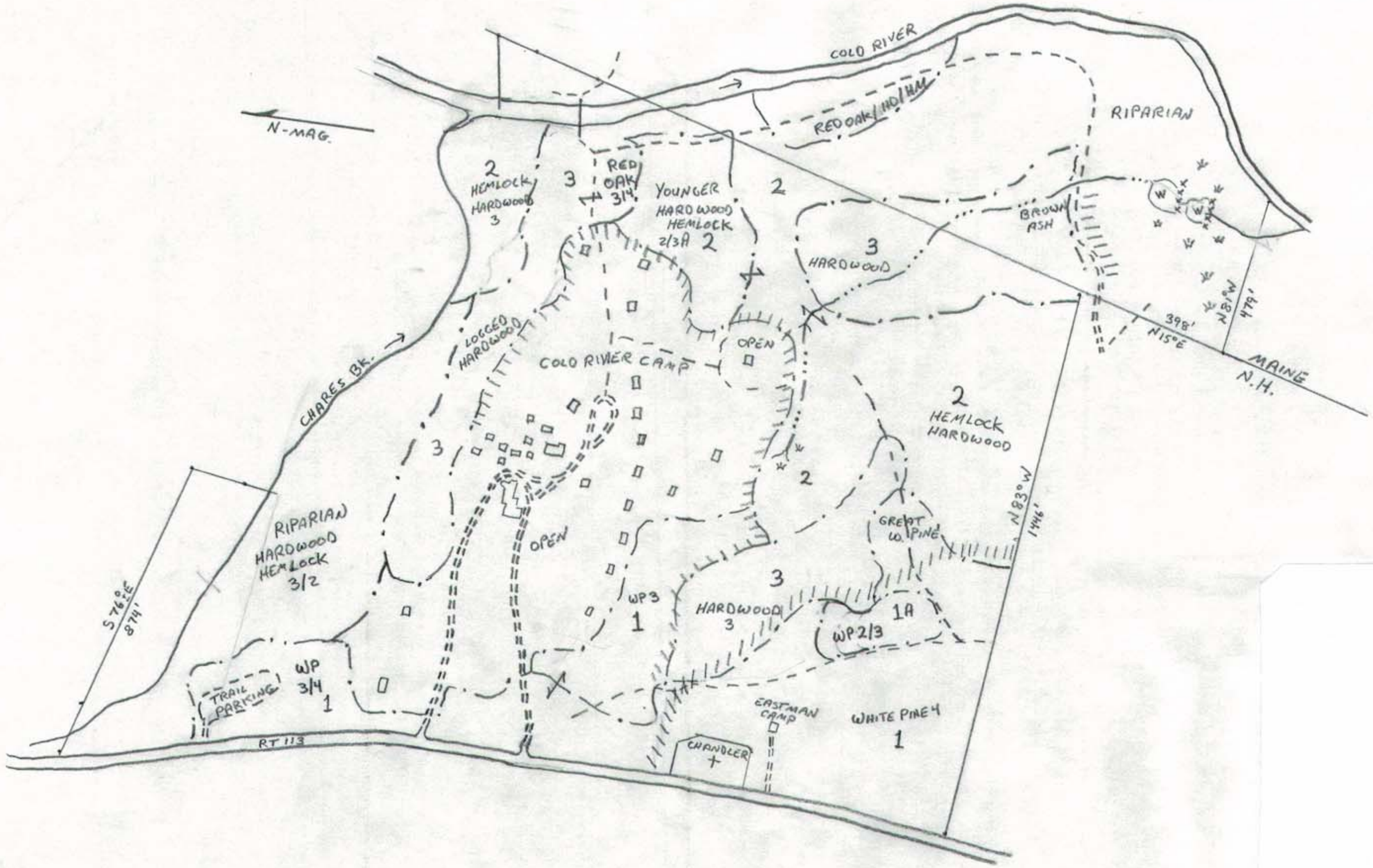
Stand Forest Timber Types	
1 White pine 4/3 hardwood 2/3 C	17.2 acres
1A White pine 2/3A	1.6 acres
2 Hemlock, red oak, hardwood 3B	17.9 acres
3 Hardwood, red oak 3/2/4B	12.9 acres
Managed Forest land	**49.6 acres**
Riparian & Floodplain	9 acres
Camping Area	18.4 acres
Total NH Stewardship Plan Lands	**77 acres**
Maine Riparian and Scenic Lands	**8.7 acres**
Total Acreage	**85.7 acres**



April 2019

Forest Stewardship Plan
Cold River Camp, Chatham, NH
Property of the Appalachian Mountain Club

Cold River Camp Lot
Route 113
North Chatham, NH

Land Use Types

Stand 1: WP 4/3,HDWD2/3C- 17.2 Acres
Stand 1A: WP 2/3A- 1.6 Acres
Stand 2:HEM/RO/HDWD 3/4/2B 17.9 Acres
Stand 3: HDWD/RO 3/2/4B- 12.9 Acres
MANAGED FOREST LAND = 49.6 Acres
Riparian & Floodplain: = 9 Acres
Camping Area = 18.4 Acres
Total NH Forest Plan Lands = 77 Acres
Maine Riparian & Floodplain: = 8.7 Acres

TOTAL PROPERTY ACREAGE = 85.7 ACRES

MAP KEY

Timber Type Line —·—
Intermittent Stream —···→
Beaver Dam XXXX
Open Water W
Wetland
Stone Wall oooo
Wire Fence x—x—x
Truck Road = = = = =
Skid Road - - - - - -
Log Landing Area L

TIMBER TYPES
WP-white pine
RO- red oak
Hm- hemlock
Hdwd- mixed hardwood species

TREE SIZE CLASSES
1. saplings
2. poles 2-8 in Diameter Breast Height (DBH)
3. small sawtimber 8-14 in. DBH
4. large sawtimber 16+ in. DBH

FOREST STOCKING DENSITY
A= Overstocked
B= Well stocked
C= Understocked

(Example: WP RO 3A = white pine, red oak small sawtimber small, overstocked)

Scale: 1 inch = 225 FT.

Prepared by:

Daniel A. Stepanauskas 5/2/19
Daniel A. Stepanauskas Date

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SCALE:	APPROVED BY: 225'	DRAWN BY DS
DATE: 5/2/19		REVISED
		DRAWING NUMBER

Introduction

This ten parcels that comprise the 85.7 acres were purchased from 1919 - 1986. The selling families were: Robbins, Eastman, Charles, and Chandler, with the first purchase being made from Wilford Robbins in June of 1919.

The land contains 27 cabins, which are rented during the summer and early autumn. Many families who rent these cabins have been recurring tenants for many years, or for generations. Cold River Camp has 1900+/- feet of frontage on the Cold River in New Hampshire, along with roughly 1,000 feet of frontage on Charles Brook.

This plan addresses forest management for the 77 acres in NH. The 8.7 acres in Maine is either in the Cold River floodplain, or is in an area abutting the river with a popular scenic nature trail passing through it. There will be no forest management conducted in Maine.

Location

The tract is situated in a beautiful location east of the Baldface Range in the upper Cold River valley of North Chatham, New Hampshire, with eight acres along the river in Stowe, Maine. The northern and eastern boundaries of the land are bounded by Charles Brook and the Cold River.

Management Objectives

<u>The primary goals for this property are:</u>

- The preservation of the extraordinary, aesthetic qualities of this property, which has allowed people to appreciate the natural world for many years.
- Gentle management of the forest to ensure its long-term health. Forest management must also be beneficial to native wild creatures and plants, along with the use of the property by the campers.
- It is important that the Camp continue to maintain a fine view of the Baldface Mountains, to help ensure that the ownership provides for traditional recreational activities and aesthetic values.
- Maintain and improve favorable food and cover conditions for a variety of native plants and wildlife.
- Protect the water quality of streams, rivers and wetlands by designing appropriate management prescriptions to avoid runoff and erosion.

Recent History

A timber harvest was conducted in the central portion of the property to the east of the existing cabins in 1993+/-. This was in done in conjunction with the construction of additional cabins on the property. A few large white pines were harvested due to a blowdown event four years ago. These parcels have had numerous small timber harvests over the past seventy years. The most significant harvest occurred over fifty years ago. The structure of the hemlock/ hardwood forest in the low country, below the steep banks, developed its current forest condition at this time.

Topography and Soils

The high level portions of the land extending eastwards from Rt. 113 is a glacial outwash plain of granitic sands and gravel. The level plain upon which the camps are located has a steep cutbank slope with its edges separating

high level lands from the bottomlands along the Cold River and Charles Brook. The areas below the cutbanks have high water tables.

Riparian Wetlands- 9 acres

The property has an extensive riparian wetland area, which is directly connected with the floodplain of the Cold River and Charles Brook. There is also a small, pristine watershed along a small brook, originating on the property and flowing into the Cold River. There are slightly elevated areas in this zone that provide good sites on which to grow yellow birch and red oak, while most of the area is wet with a strong presence of eastern hemlock and red spruce.

Access

The parcel has excellent level access along existing roads on the east side of Rt. 113. The horseshoe shaped access roads to the Cold River Camp provide access for all land management needs on the property. There is also the possibility of a cooperative use of access points with the neighboring abutter to the south.

Aesthetics

This land has a high visual profile with over 2,200 feet of frontage on Rt. 113, along with views of the Baldface Range from the camp lodge for the camp's guests. Maintenance of the mountain views from the camp are a primary concern for the Appalachian Mountain Club, which is integral to the management of the growing white pine stand along Rt. 113. Gentle harvests of selected trees in these areas must occur periodically in order to maintain the camp's view of the White Mountains. Both the Cold River and Charles Brook are beautiful waterways. There is a trail leading from the camp to a river crossing at the old dam on the river. The sounds of the river are an important element adding to the aesthetic appeal of the land.

Cultural Resources

The Cold River Camp has been in existence since 1919. There are old wire fences on the land. The camp's lodge is situated in an old field opening that has all of the hallmarks of an old pasture. The excluded Chandler Cemetery is surrounded by the camp property along Rt. 113. The heirs of the original grantors, the Eastman's, maintain a life lease on the seasonal cabin close to the cemetery.

Recreation

The property is primarily for the use of the Camp's guests. The property is not posted and people use it for various recreational activities year-round, such as fishing in the Cold River.

Forest Health

The health of this forest is not currently in jeopardy. The only invasive pathogenic species that are expected to impact this site over the next fifteen years may be the hemlock wooly adelghid and the emerald ash borer. It is likely that over this period of time the adelghid will cause hemlock trees in this forest to decline. This area is far enough north, along with being located in a cold valley bottom, both of these factors will keep the adelghid numbers low due to their susceptibility to cold mortality. Currently, the adelghid appears to be maintaining a sensitivity to temperature below -15 F. These temperatures are causing a steep decline in their populations for up to two years after each low temperature occurrence. There is no way to be certain how this will play out in a period of increasing temperatures, and the natural selection of the adelghid. The emerald ash borer is in Carroll

County and will kill all species of ash of larger than 8in. DBH+ in the decade to come. There are no significant invasive plants in this forest. The greatest invasive plant threats to the overall health of the forest are the European and glossy buckthorn. These tall shrubs can cover the forest understory and have a profound impact on the health of the forest ecosystem. If it is found on this land, please contact your forester immediately.

Water Resources

The water resources on this property are the Cold River, Charles Brook, along with a beautiful small un-named brook (above photo) which originates from some seeps on the property and flows into the river. This small brook

has pristine water in it, with a light grey fine sand and organic bottom. This grey sand (a higher level of calcium?) lends evidence to support a theory that this water source has a higher PH level than is common in our area. These are all clean cold water streams with native brook trout populations.

Endangered and Threatened Species

The report from the New Hampshire Heritage Bureau, found in the Appendix of this plan, showed that there were no nationally or state listed endangered or threatened species, or species of concern, known to exist on the land. The only unusual species found by the forester were brown ash trees growing in the wetlands. This tree's wood has always been, and continues to be, used by Native American peoples for basket making. The invasive emerald ash borer threatens the near to long-term viability of the species.

Wildlife

The wildlife species on the property encompass a broad array of creatures native to NH. The current black bear population in NH is higher than it has been in recent memory due to the prodigious mast (acorns and beech nuts) years during the previous two years. The complete lack of mast during the winter of 2018/19 will lead to a sharp decline in bear cub production and survival this spring. There was relatively light deer sign distributed over the property, with some use of the hemlock stands during the winter, where the snow levels remain lower due to the tree crowns holding the snow off of the ground.

Forests for the Birds

- An excellent forest bird habitat exists in the flood plain adjacent to the Cold River. There forested wetlands and ground vegetation with ferns and low shrubs provide ideal nesting habitat for the Canada warbler, veerys, and the yellow-bellied fly catcher.
- The intermediate to closed canopies of the hardwood stands have multi-layered tree and shrub canopies which greatly enrich bird habitats, along with sequestering higher volumes of carbon dioxide in the forest. These stands are found running parallel to the river in the somewhat higher locations. This forest type also provides a rich habitat for American redstarts, and black-throated blue warblers.
- The closed canopy northern hardwood and red oak stands along the lower section of the un-named brook, and to the west of the trail which parallels the Cold River, have an uneven forest floor with hummocks, hollows and ample leaf litter. The scarlet tanager, black throated green warbler, blue-headed vireo, and the Blackburnian warbler may all use these habitats. If additional softwood regeneration were to grow as a result of a thinning in the future, this would improve the habitats for the Canada warbler, the black-throated blue warbler, and the wood peewee.
- Mature, undisturbed red oak and beech stands provide the habitat needed for scarlet tanagers and oven birds. Productive hard mast (nut) trees can often be identified by bear claw marks on beech trees, and by old acorn cups on the ground and in the crowns of the red oak, or on the ground below these oak trees. All mast trees greatly benefit a multitude of wild creatures such as deer, bear, grouse, and turkeys, along with a large number of smaller birds and mammals. Timber harvests should encourage the release of trees with strong mast production allowing the development of large, broad canopied trees. Large, super-canopy trees provide a feeling of security for many arboreal species. During the autumn, bears spend time in the tops of both beech and oak trees eating nuts and acorns. Good forest management can encourage the proliferation of soft mast in the forest. Good sources of soft mast include black cherry, serviceberry, the genus- rubus species (raspberry, blackberry dewberry, and thimbleberry), along with blueberry, apple, hobblebush, viburnums, partridgeberry, bearberry and wintergreen etc. Think cedar waxwings.

Daniel A. Stepanauskas, Forester

Habitat Features

A). There are some large white pine trees on the land providing good perch trees for ravens and raptors. There are some older hardwoods in the river bottom lands have developed into good den trees. These trees will be preserved for habitat purposes. The poor quality, large hardwoods greater than 18" DBH, along with other suitable den trees, should be identified and preserved during timber harvests, and given time to develop into trees exhibiting the traits of den trees. Girdling an occasional large tree that appears to have cavity potential is an effective way to create snags, which will often develop cavities. There is a distribution of aspen trees on the property. These trees decay easily and develop hollow centers that are well suited to cavity nesting birds and mammals. Aspen species are particularly well-suited to the development of excellent cavities and are easily excavated by birds due to their soft wood. A great many birds and mammals, such as fisher, marten, squirrels, chickadees, nuthatches, owls, chickadees, woodpeckers, flying squirrels, rodents and wood ducks, etc., use cavity nests to raise their young.

B). Downed woody material is referred to as coarse woody debris. There is currently a shortage of this material on the property. A management goal is to distribute woody debris throughout the forest during timber harvests by leaving the limbs in the forest when the logs are removed. During timber harvests, the cull (decayed) butt portions of logs are best bucked off in the forest, versus on the log landing in order to enhance the habitat throughout the forest. These large tree butts are valuable as den sites, shelter, and habitat for mammals, birds, reptiles, insects, and amphibians. Bears and woodpeckers use them extensively for feeding on grubs, they serve as drumming locations for ruffed grouse, and they provide direct and indirect food sources for all manner of forest creatures. Large woody debris is also very beneficial as a repository of symbiotic miccorhizal fungi.

C). Uneven-aged management, which encourages the growth and layering of vertical crown structure, is essential to the habitat requirements of many songbirds (See Vertical Structure and Crown Closure below).

- Management techniques such as thinnings and group selections will be employed to increase the amount of under and mid-story vegetation.
- Softwood regeneration, along with slash on the forest floor, will improve the habitat for Canada warblers, the black throated blue warbler, and the wood peewee.

Vertical Structure and Crown Closure

Vertical structure is the layering of both live and dead woody plant crowns within a forest stand. Over much of this forest the structure is quite strong due to the uneven-aged nature of the forest. The Cold River Camp's forest has a presence of tall, super-canopy white pine trees, along with dense hemlock stands, patches of spruce-fir forest, and northern hardwood/red oak overstories in both upland and alluvial settings. The degree of canopy layering varies, depending upon forest types and forest history. Un-even aged forests that are well stratified with layers of vertical structure will support a far greater array of plant and animal species than an even-aged uniform canopy of trees. Typical late successional over-stories in northeastern NH (a long-term goal) are composed of hemlock, spruce, beech, yellow birch, sugar maple, and red maple along with white ash, red oak, and basswood.

When harvesting trees in this forest it is important to regenerate an understory of both desirable future canopy tree species, along with shrub layers of species such as hobblebush, viburnums, hophornbeam, elderberry, and serviceberry. Species such as red spruce, hemlock, beech, yellow birch, and sugar maple are shade tolerant and can survive for many years in the understory (advance regeneration), and will begin rapid growth when a harvest or natural disturbance allows the sunlight to penetrate to the forest floor. The silvicultural methods used in the

thinning and harvesting of these stands will be designed to foster the regeneration of desirable timber species (see Stand Prescriptions), while the forest continues to develop a multi-layered canopy.

These stands develop as a result of subsequent light harvests over time, and from the death of older trees, resulting in the constant regeneration of trees in both the natural and man-made openings created in the stands. The goal of management with regard to vertical structure is to maintain diverse stands, layered canopies, and varying degrees of crown closure throughout the forest.

General Silvicultural Recommendations and Forest Health Considerations

The forests of northern New England are diverse in both age class and species distribution. Therefore, written silvicultural prescriptions are but generalizations, as the composition of each location in a forest stand varies. Only by carefully selecting of which trees to harvest can the best decisions be made for the management and regeneration of our heterogeneous forests. Higher site index locations with good moisture levels, rich soils, and favorable slope positions allow timber to be maintained at higher stocking levels, while conversely, lower site indexes should be maintained at lower ranges of the allowable stocking levels in order to grow quality trees at a healthy rate. During a stand harvest there must be areas in each stand which are not included in the harvest area. There are numerous benefits to leaving exclusion zones in a harvest area. These areas allow for the maintenance of lower quality trees in these uncut areas to fill out the volumes needed to conduct economically viable, and gentle timber harvests in the future. There is also the benefit of full crown closure and increasing numbers of standing snags, both of which are favored by numerous bird species. Light harvests allow for a sustainable yield in a forest stand over a very long period of time. A general rule of thumb is to leave a basal area of 80-90 square feet per acre in a harvested hardwood stand with 120 ft. in softwood stands.

Currently, a leading silvicultural consideration is the warming of our climate. Many of our trees will take 80+ years to mature. There is a wide range of species projected to decline in the warming trend (fir, spruce, paper birch, aspens, etc.). The species that we wish to regenerate on the land will be the trees possessing genotypes and phenotypes projected to allow for their enduring or thriving in the projected warming scenario. This is silviculturally accomplished by the harvest or the retention of individual tree species, the season of harvest, the size of harvest openings, and the timing of harvests to coincide with the seed crops of desirable species. The US Forest Service's projection of the list of trees that will be resilient to the warming include: white pine, oaks, and the maples. Species management will be carried out to gently encourage the projected winners, versus gently reducing the stocking of the species more susceptible to decline as the climate changes proceed. Never-the-less, maintaining species diversity and maintaining high stocking levels is a fail-safe mechanism. Increasing storm severity will necessitate thick stands of trees lending support to each other in stands with trees that can lean upon one another in wind and ice storms.

Certain species of trees have already begun to decline, both due to the reduction of calcium levels in the soils as a result of past acid precipitation, along with the introduction of alien insects and pathogens. Paper birch no longer lives as long as it once did on less than optimal sites, due to soil acidification, drought cycles, and climate change. Mature white ash will not survive the emerald ash borer, an insect pest from Asia. The hemlock wooly adelghid is an Asian insect pest which currently (2018) has advanced to Wakefield, Tuftonboro, and Wolfeboro NH. The adelghid will cause this pivotal species to decline. There is hope for the hemlock with the introduction of biological predatory beetles to control the adelghid populations. Regardless, the hemlock decline will be gradual, aided by cold nights below -15F, which so far, greatly reduces the adelghid numbers for a year or two. Foresters in southern NH have stated that once the infestation is fully seated, the decline will lead to ensuing mortality in three to five years.

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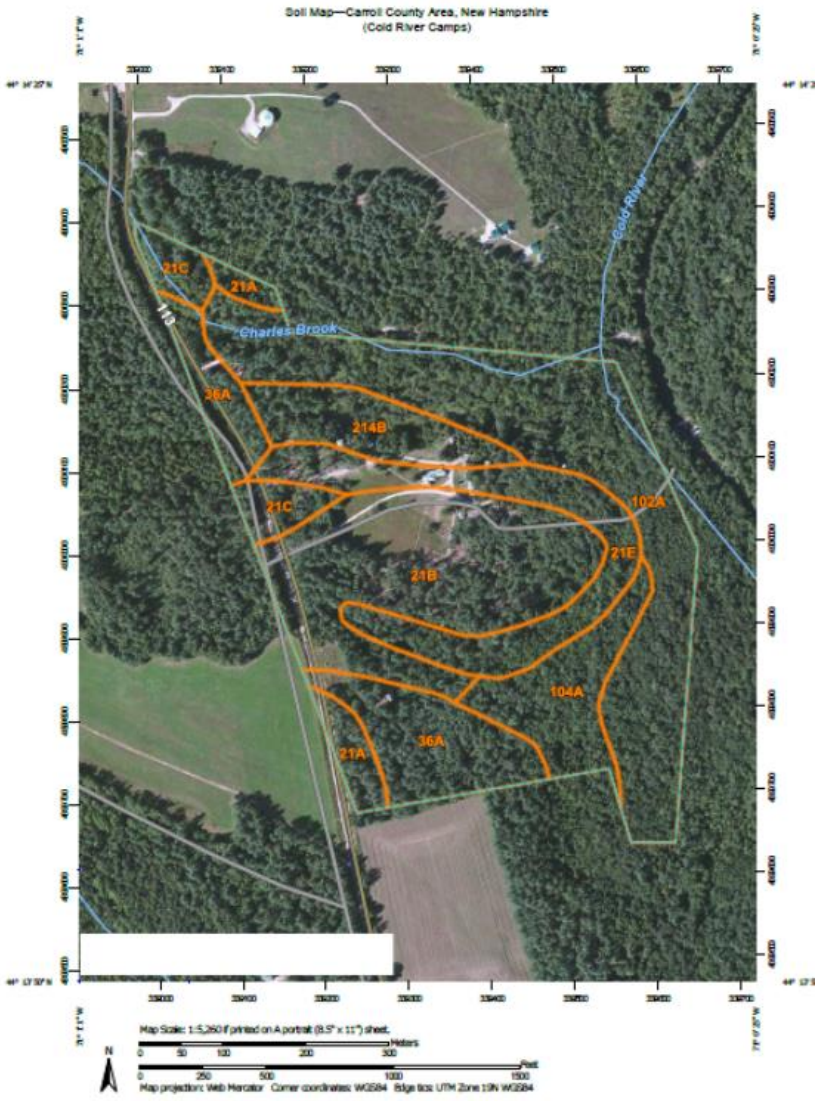
The Climate

In this era of a warming climate we are faced with a great unknown. In this scenario it is wise to take heed of the latest research from the Northern Institute of Applied Climate Science, along with research conducted at the University of Vermont, and to proceed cautiously. Thus far, the consensus is that the species poorly adapted to increasing threats such as summer drought, prodigious rain events, ice and wind events, along with the warming will not maintain their vigor for the next seventy years. This will necessitate the regeneration of the prognosticated 'winners', along the maintenance of diverse, well-stocked stands to defend against the unknowns. In the next seventy years the winners are expected to include red oaks, maples, white pine, and black cherry. There are mixed scenarios for many other species, and poor prospects for the white birch, balsam fir, and the aspens.

Timber Inventory and Fieldwork

This inventory was conducted using a systematic grid pattern of 32 sample points using a 20 factor prism on the 85.7 acres sampled. At each point location a timber inventory was measured using the 20 factor prism. A visual study of sample points included extensive notes, drawing the forest type map, and noting of land features, and wildlife habitats.


Soil Map—Carroll County Area, New Hampshire
(Cold River Camps)
Cold River
Charles Brook
113
21C
21A
36A
21B
102A
21E
104A
Map Scale: 1:5,260 if printed on A portrait (8.5" x 11") sheet.
Meters
Feet
Map projection: Web Mercator
Natural Resources
Web Soil Survey
5/3/2019

Soils

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
21A	Colton gravelly loamy fine sand, 0 to 3 percent slopes	2.2	3.1%
21B	Colton gravelly loamy fine sand, 3 to 8 percent slopes	16.2	23.0%
21C	Colton gravelly loamy fine sand, 8 to 15 percent slopes	2.9	4.2%
21E	Colton gravelly loamy fine sand, 15 to 60 percent slopes	9.0	12.8%
36A	Adams loamy sand, 0 to 3 percent slopes	8.8	12.4%
102A	Sunday loamy fine sand, 0 to 3 percent slopes, occasionally flooded	20.9	29.7%
104A	Podunk fine sandy loam, 0 to 3 percent slopes, frequently flooded	5.5	7.8%
214B	Naumburg loamy sand, 0 to 8 percent slopes	4.9	6.9%
Totals for Area of Interest		70.6	100.0%

Soils Descriptions and Features

Colton gravely loam soils- 30.3 acres comprises the largest soil types on the property. These very well drained soils are typical for a glacial outwash plain. Fourteen acres of these soils are under the developed camp portion of the land. Most of the Colton soils on the property are nearly level, although the 21E soil comprises the steep cutoff bank leading form the outwash plain down to the Cold River lowland area.
Colton soils were washed clean of organic material by water from the melting glacial ice pack, and are composed of granite fragments, with low levels of fertility and available moisture. Therefore, from a tree growth perspective, they are well suited to growing the least nutrient needy softwood species. In this case, they are red spruce, red pine, and white pine, which will grow very well on these soils. Other tree species will also grow here, although they will grow slowly, be truncated, and will not have good form.

Sunday loamy fine sand- 20.9 acres is a level river bottom soil that is occasionally flooded. Despite its shallowness to the water table, this soil has the capacity to grow beautiful trees due to a moderate level of fertility, its porous nature, and the small mineral particles of which it is comprised. Small particles provide more soil surface area from which trees can draw nutrients. These soils are best suited to growing softwoods, such as white pine and red spruce, although the drier portions will grow high quality yellow birch and red oak.

Adams loamy sand- 8.8 acres. The soil is fine textured and sandy. The nutrient availability in this soil is relatively low, making the soil primarily a softwood site. However these sites will also grow the less demanding hardwood species into trees of good quality. The hardwoods that will do well here include red oak, and red maple.

Naumberg loamy sand- 4.9 acres. All of this soil type is in the riparian/floodplain land type. Portions of the area are too wet to be managed for forestry management purposes. In the higher sections of this soils type there are some good red oak, red maple and yellow birch stands, which could be gently thinned to foster good tree growth.

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Podunk fine sandy loam- 5.5 acres. All of Podunk soils on this tract are in the floodplain. These soils can grow fine stands of spruce/fir and moisture tolerant hardwoods such as red maple, silver maple and yellow birch. These sites will all be left as reserve lands on this ownership.

<u>Stand I White pine/hardwood 4/3C - 17.2 Acres</u>

Stand Description

This stand is situated on a glacial outwash plain upon which Rt.113 is located. It is a level sand plain with a very well drained Colton soil consisting of a shallow layer of organic soil, underlain by sand and fine gravel. These dry, low nutrient level soils are more conducive to the growth of white pine, spruce and fir, than to hardwood species. Over long periods of time, with only minor disturbances, the trees growing in a forest will tend to increasingly become dominated by the species that are favored by the site (soils, moisture, aspect) conditions of the forest. This site favors white pine and red spruce. The forest inventory discloses that the average basal area of the stand is 104 $ft^{2/}$ acre. The stand is understocked with large white pines that have been lightly harvested over the decades. The trees are large, healthy and are growing at a slowing pace. There are occasional trees with developing decay, from both age stress and past logging injuries. The crown closure in the stand is sufficient to

limit the regeneration in the stand to primarily shade tolerant spruce, striped maple, and hemlock, along with occasional red maples, red oak and white pine.

Prescriptions

Despite its understocking, stand one has a relatively high volume of 14,585 board feet/acre, along with 1,000 of low grade pallet volume. This timber volume is 98% white pine. This will remain the mid-term future condition of this stand, as the aesthetics of this stand are integral to the character of the Cold River Camps. A small harvest will take place in the near future to reclaim some of the Baldface Mountain views from the vicinity of the camp lodge. During the process, a light selection of trees will take place in this stand to remove trees with health or spacing issues.

One primary goal on this property is to create layered overstories in the stands in order to enhance avian habitats (see Wildlife). Light thinnings in the existing overstory will allow enough light into the understory to grow shade tolerant trees and shrubs creating layers of foliage, seeds, and soft mast from the ground to the mid-story of the forest.

<u>Stand 1A White pine 2/3A- 1.6 acres</u>

This small stand regenerated exceptionally well when it was clearcut, or an abandoned pasture, over 55-60 years ago. It regenerated into a dense stand which allowed the trees to grow relatively free of white pine weevil damage. The trees have small knotted straight stems and pruned themselves due to their neighbor's shading effect. During the last 20 years the stand has thinned itself. Those trees that did not get enough light are lying in the stand. This small stand is a picture perfect scenario for how to grow a natural white pine stand. In twenty years the stand can be thinned.

<u>Stand 2 Hemlock/spruce/white pine/hardwood 3/2B- 17.4 acres</u>

Stand Description

This stand is situated below the cut-bank along the eastern edge of stand one. The stand is located is on a gently undulating level area with a high water table. It had a significant harvest conducted over fifty years ago, which largely created the current stand conditions. The post-harvest stand had too much of a residual overstory stocking of small hemlock trees and the harvest was not conducted during desirable species seed years, which predetermined that the regeneration would be dominated by shade tolerant hemlock trees. These young hemlock saplings never did receive enough light, and therefore have stagnated in the understory for all these years.

This is a rather disorganized stand of mixed species and size classes stand which is adequately stocked at 129 $ft^{2/}$ acre. The current sawlog volume per acre is 8052 board feet/acre. The stand's species composition is mirrored by its sawlog volumes with 3.7M bd. ft. of hemlock/acre, 2.1M bd. ft. of red spruce, and 1.36M bd.ft. of white pine, the rest is comprised of mixed hardwood species. The majority of this stand is growing very slowly, with the exceptions of the young white pines, and red oaks.

Prescriptions

Portions of this stand would be well served with a light thinning to improve the growth rate of the stand's trees, and to replace the stagnated hemlock trees with some vigorous hardwoods and white pine. This would involve only reducing the basal area from 129 to 100 $ft^{2/}$ acre. The nature of this thinning in a stand such as this will be to harvest the trees with the slowest growth rates and the poorest prospects to give the sunlight to neighboring trees with good growth potential. The harvesting will involve group selection harvests in areas of suppressed hemlock, along with individual trees harvested to release neighboring trees. When small openings are created, a goal will be to regenerate species well positioned for a warmer climate such as, red oak, white pine, and red spruce (which is likely to do well on this site). Virtually the entire lineup of species in the stand will join in with successfully regenerating in these openings. By conducting the harvest during desirable species seed years there

will be an assurance of having the preferred candidates be a part of the mix in the next stand. These openings need not be larger than .3 acres in size.
The next step in this stand will be another low level light harvest of mature trees twenty years after this one, while maintaining highly stocked diverse stands.

Stand 3

Northern Hardwood, red oak, hemlock 3/2/4B- 12.9 acres

Description

This stand's composition and soils vary widely. The sites in this stand range from dry red oak forests to yellow birch and red maple stands with a water table within one foot of the soil's surface. However throughout the stand's various sites, the presence of red oak is nearly ubiquitous. The basal area of the stand shows it to be adequately stocked at 80 $ft^{2/}$ acre with species in order of decreasing occurrence being red maple, red oak, yellow birch, hemlock and white pine. The lower situated Sunday and Naumberg soils site have a richer soil, due to a history of seasonal flooding by the Cold River, which has enabled the growth of higher quality hardwoods. There is a good distribution of mid-story trees and shrubs in the stand's understory which enriches the neo-tropical bird habitats.

Daniel A. Stepanauskas, Forester

Prescriptions

Due to the small scale of both the stand's acreage, along with the low intensity with which the stand will be managed over time, any harvesting/thinning in the stand will only take place in conjunction with activity taking place in stand #2. Minor adjustments to the stands content and crown closure in order to make incremental improvements to the health of both the existing overstory and understory can be done. Poor quality tree species to be harvested will include paper birch, red maple and hemlock. Goals will be to partially release large, healthy hardwoods such as the red oaks and yellow birches, and to grow more soft-mast trees such as serviceberry and black cherry, while also enhancing the ground cover with hobblebush, trout lilly, wintergreen, and partridgeberry.

Riparian and Floodplain Zones

These areas are adjacent to either the Cold River or Charles Brook. A riverfront nature trail runs along the river and rises back to the highlands on the neighboring Fink property to the south. These lands will not have any forest management activities carried out on them, other than for trail maintenance. All of the 8.7 acres in Maine also fall into this group. There are patches of high ground in this area, with a higher area along portions of the Cold River bank top which is either an oak forest in places, or a hemlock hardwood forest in the lower elevations. Most of this land is a slow-growing hemlock/hardwood forest with a water table within a foot of the surface. As one goes further south on the parcel, the land tends to get wetter. The land south of the trail becomes a flooded red maple wooded swamp with active beaver ponds, making a great kingbird habitat.

New Hampshire Natural Heritage Bureau

To: daniel stepanauskas
135 high st.
silver lake, NH 03875

Date: 5/1/2019

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 5/1/2019

NHB File ID: NHB19-1325 Applicant: daniel stepanauskas

Location: Tax Map(s)/Lot(s): map 7 lot 12
Chatham

Project Description: Forest stewardship plan

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

This report is valid through 4/30/2020.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301

ALL SPECIES LEVEL = ALL Trees

DIAMETER CLASS	SAWLOG INT. 1/4" VOLUME	PULP CORDS VOLUME	PINE PT INT. 1/4" VOLUME	PALLET INT. 1/4" VOLUME	VENEER INT. 1/4" VOLUME	VOLUME
8	6389	186	0	0	0	0
10	12474	125	0	0	0	0
12	30237	128	0	0	0	0
14	47885	124	0	956	0	0
15	3086	3	0	0	0	0
16	85191	109	697	981	0	0
18	47184	42	474	3685	0	0
19	5834	2	558	0	0	0
20	37604	10	396	0	0	0
22	31808	2	1768	0	0	0
24	40125	5	3474	0	0	0
26	53433	7	7983	0	0	0
28	43978	4	3261	0	0	0
TOTAL	445227	748	18610	5622	0	0
S.E.	± 16%	± 14%	± 34%	± 124%	± 0%	± 0%

VOLUME TOTALS FOR ALL SPECIES LEVEL = ALL Trees

SPECIES	SAWLOG INT. 1/4" VOLUME	PULP CORDS VOLUME	PINE PT INT. 1/4" VOLUME LOW GRADE	PALLET INT. 1/4" VOLUME	VENEER INT. 1/4" VOLUME	VOLUME
WHITE PINE	279451	90	18610	0	0	0
HEMLOCK	70735	253	0	0	0	0
SPRUCE	36687	10	0	0	0	0
BEECH	0	22	0	0	0	0
RED OAK	35093	52	0	4666	0	0
RED MAPLE	1348	193	0	0	0	0
WHITE ASH	2421	14	0	0	0	0
YELLOW BIRCH	18098	70	0	956	0	0
WHITE BIRCH	1393	45	0	0	0	0
ALL SOFTWOODS	386874	353	18610	0	0	0
ALL HARDWOODS	58353	395	0	5622	0	0
ALL SPECIES	445227	748	18610	5622	0	0

GLOSSARY

BASAL AREA - The square footage of stump area/acre at 4 and 1/2 feet above ground level.
BOARD FEET - A measure of wood volume. One board foot equals 1/12 cubic foot of sawn lumber.
CORD - A unit of measurement to determine cubic volume of fuel or pulp wood. Technically equal to 128 cubic feet.
CROP TREE - A tree selected in a stand or plantation to be carried through to maturity.
CRUISE - A survey of forest land to assess timber volumes, values, species, product distinctions, sizes classes, and densities and stocking levels.
CULL TREE - a tree of little or no economic value.
DBH - Diameter Breast Height (4 and 1/2 feet from ground).
FOREST STAND OR FOREST TYPE - A group of trees occupying a specific area, uniform in composition, species, age arrangement and condition, as to be distinguished from adjoining forested areas.
HARDWOODS - Broad-leaved tree species, as opposed to conifers or needle-leafed trees.
IMPROVEMENT CUT - A cutting made in a stand, past the sapling stage, for the purpose of improving its composition and stocking level.
LANDING OR YARD - A place where logs are assembled for loading and transporting to a mill.
MATURE - Describes a tree at its peak economic value or biological maturation when viewed purely from an economic perspective.
OVERMATURE - That period in the life cycle of trees and stands when net growth, and/or valuable products, are declining.
PATCH/CLEAR CUT - The removal of the entire stand in one cut.
POLE TIMBER - Trees 4 - 10 inches DBH.
PULPWOOD - The merchantable portion of a tree, whose best use is as a raw material in the paper industry; often included in this category are trees used as fuelwood. These products are the poorest grades of trees and logs which are not suited for higher uses.
REGENERATION - Young forest trees produced naturally from the seed of existing trees or from the sprouting of hardwoods resulting from harvesting activities.
SAPLING - Trees 2 - 4 inches DBH.
SCARIFICATION - Exposing the soil by mechanical means used to encourage the regeneration of certain tree species.
SEEDLING - A very young tree grown from seed. The term is restricted to trees smaller than saplings. In nursery practice, a tree which has not been transplanted in the nursery.
SHELTERWOOD - A system of regeneration whereby a maturing stand is harvested in more than one stage, with several years between each stage, thereby providing partial shade to encourage the regeneration of new seedlings of a particular species .
SILVICULTURE - The art of producing and tending a forest; the application of the knowledge of silvics in the treatment of a forest establishment, composition and growth.