FOREST MANAGEMENT PLAN

for the Town of Rollinsford's

SCOUTLAND

Rollinsford, New Hampshire
87.8± acres

Prepared for Landowner:
The Town of Rollinsford, New Hampshire

Prepared by:
Charles Moreno, LPF
Moreno Forestry Associates
PO Box 60, Center Strafford, NH 03815
(603) 335-1961

January 20, 2014

Charles Moreno, NH LPF #115
Consulting Forester
Moreno Forestry Associates

FOREST MANAGEMENT PLAN

for the Town of Rollinsford's

SCOUTLAND

Rollinsford, New Hampshire

87.8± acres

Photo: Tall pine and hemlock are found in the riverfront area of Scoutland. The cover page photo shows a pristine section of the Salmon Falls River along the *Scoutland* property.

January 20, 2014

The author of this forest management plan, Charles A. Moreno, certifies that the contents of the plan, except where footnoted, but including all written material, maps (base information referenced), plan format and organization, are original to the author.

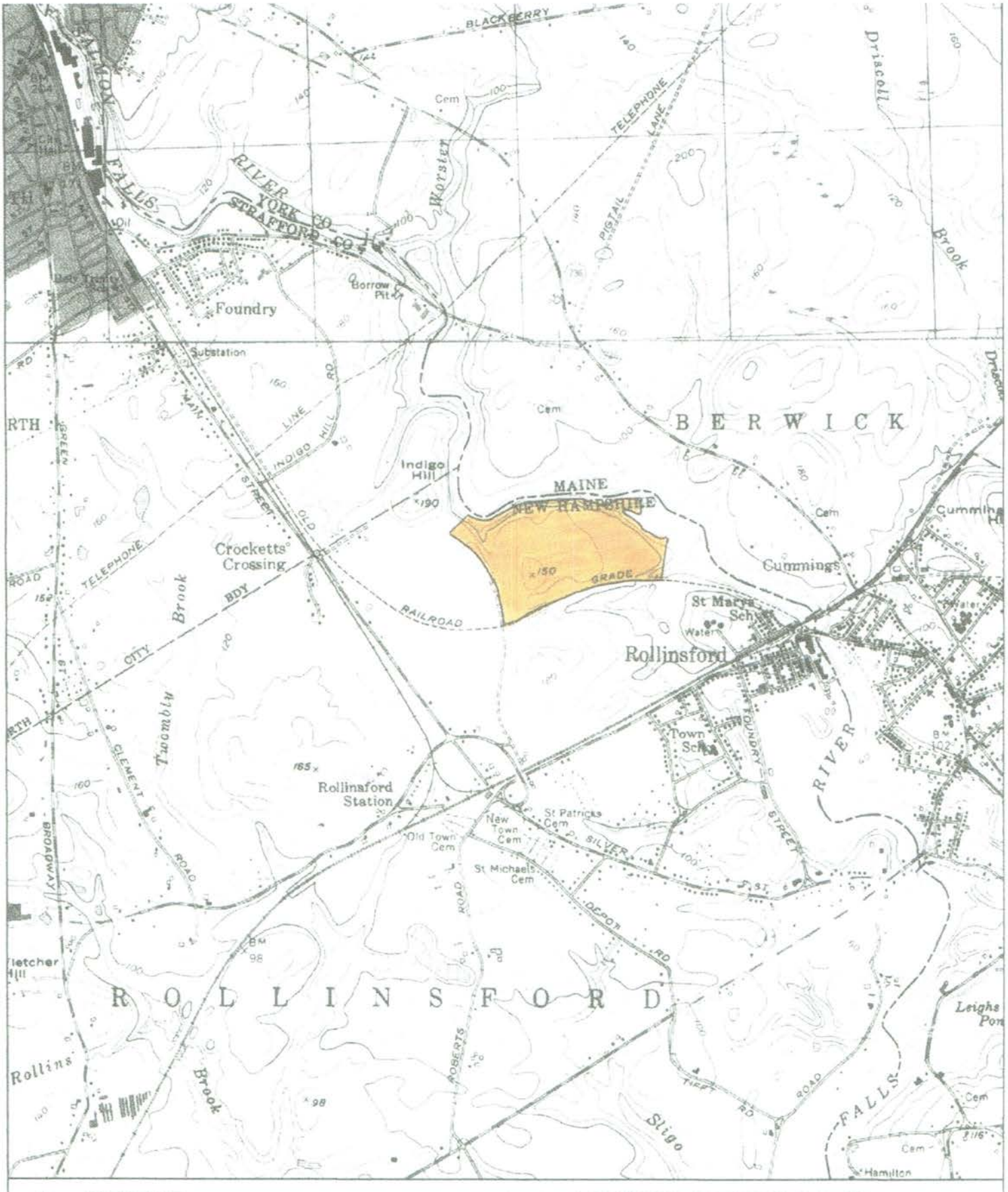
The purpose of this plan is to provide natural resources information and forest and wildlife management recommendations to the Town of Rollinsford, New Hampshire, the Rollinsford Conservation Commission Waste Management of New Hampshire, others interested in the management of the *Scoutland* property in Rollinsford, New Hampshire. This document is a work for hire done by Moreno Forestry Associates for the Town of Rollinsford. and may be used by the Town of Rollinsford for any purpose. No part of this plan, including all written material, maps, plan format and organization, is to be copied or reproduced for any other purpose, particularly commercial purposes, by anyone other than the Town of Rollinsford, New Hampshire without proper citation to the author, Charles A. Moreno, Consulting Forester.

Charles Moreno, Consulting Forester
Strafford, New Hampshire, (603) 335-1961

TABLE OF CONTENTS

Page

MAPS



Name: DOVER EAST
Date: 11/27/2013
Scale: 1 inch equals 2000 feet

Location: 043.2393800° N 070.8360366° W WGS84
Caption: Town of Rollinsford - "Scoutland"

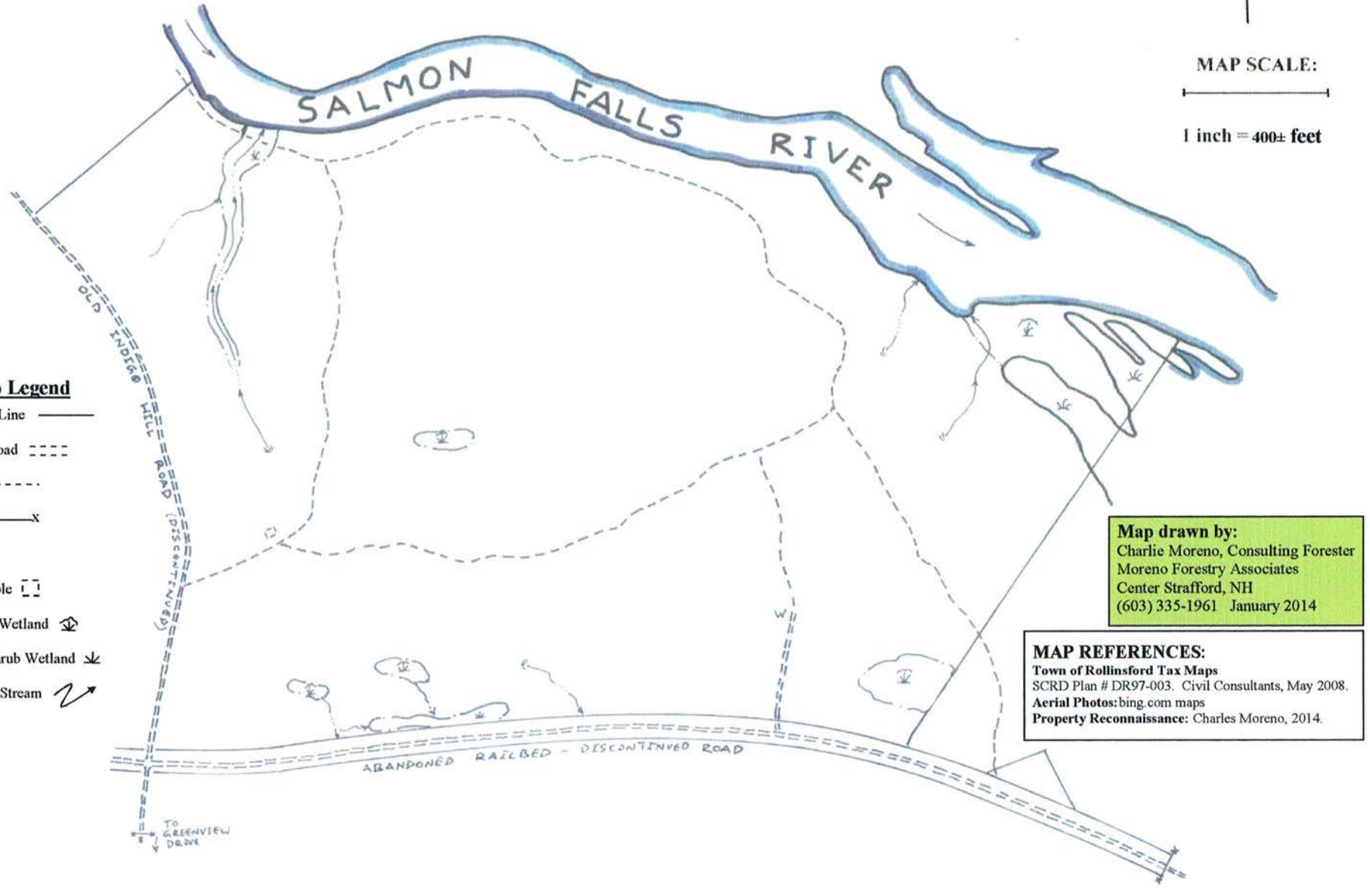
Physical & Natural Features Map

for the Town of Rollinsford's

SCOUTLAND

Rollinsford, New Hampshire

87.8± acres



MAP SCALE:

1 inch = 400± feet

Map Legend

- Property Line
- Gravel Road
- Trail
- Gate x——x
- Well **W**
- Cellar Hole
- Forested Wetland
- Marsh/Shrub Wetland
- Seasonal Stream

Map drawn by:
Charlie Moreno, Consulting Forester
Moreno Forestry Associates
Center Strafford, NH
(603) 335-1961 January 2014

MAP REFERENCES:

Town of Rollinsford Tax Maps
SCRD Plan # DR97-003. Civil Consultants, May 2008.
Aerial Photos: bing.com maps
Property Reconnaissance: Charles Moreno, 2014.

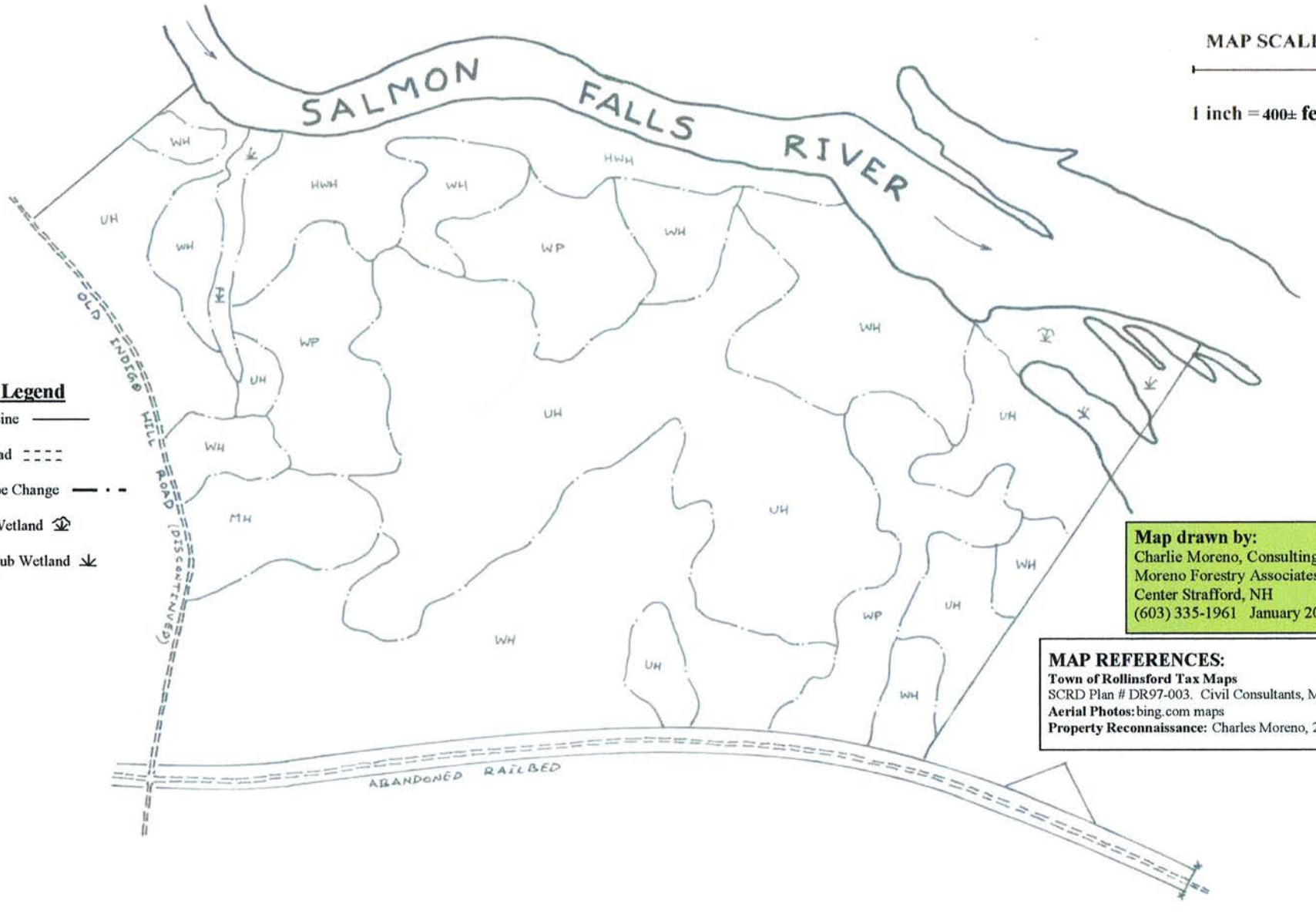
Forest Types Map

for the Town of Rollinsford's

SCOUTLAND

Rollinsford, New Hampshire

87.8± acres



MAP SCALE:

1 inch = 400± feet

Map Legend

- Property Line
- Gravel Road
- Forest Type Change
- Forested Wetland
- Marsh/Shrub Wetland

Map drawn by:
Charlie Moreno, Consulting Forester
Moreno Forestry Associates
Center Strafford, NH
(603) 335-1961 January 2014

MAP REFERENCES:
Town of Rollinsford Tax Maps
SCRD Plan # DR97-003. Civil Consultants, May 2008.
Aerial Photos: bing.com maps
Property Reconnaissance: Charles Moreno, 2014.

Management Recommendations Map

for the Town of Rollinsford's

SCOUTLAND

Rollinsford, New Hampshire

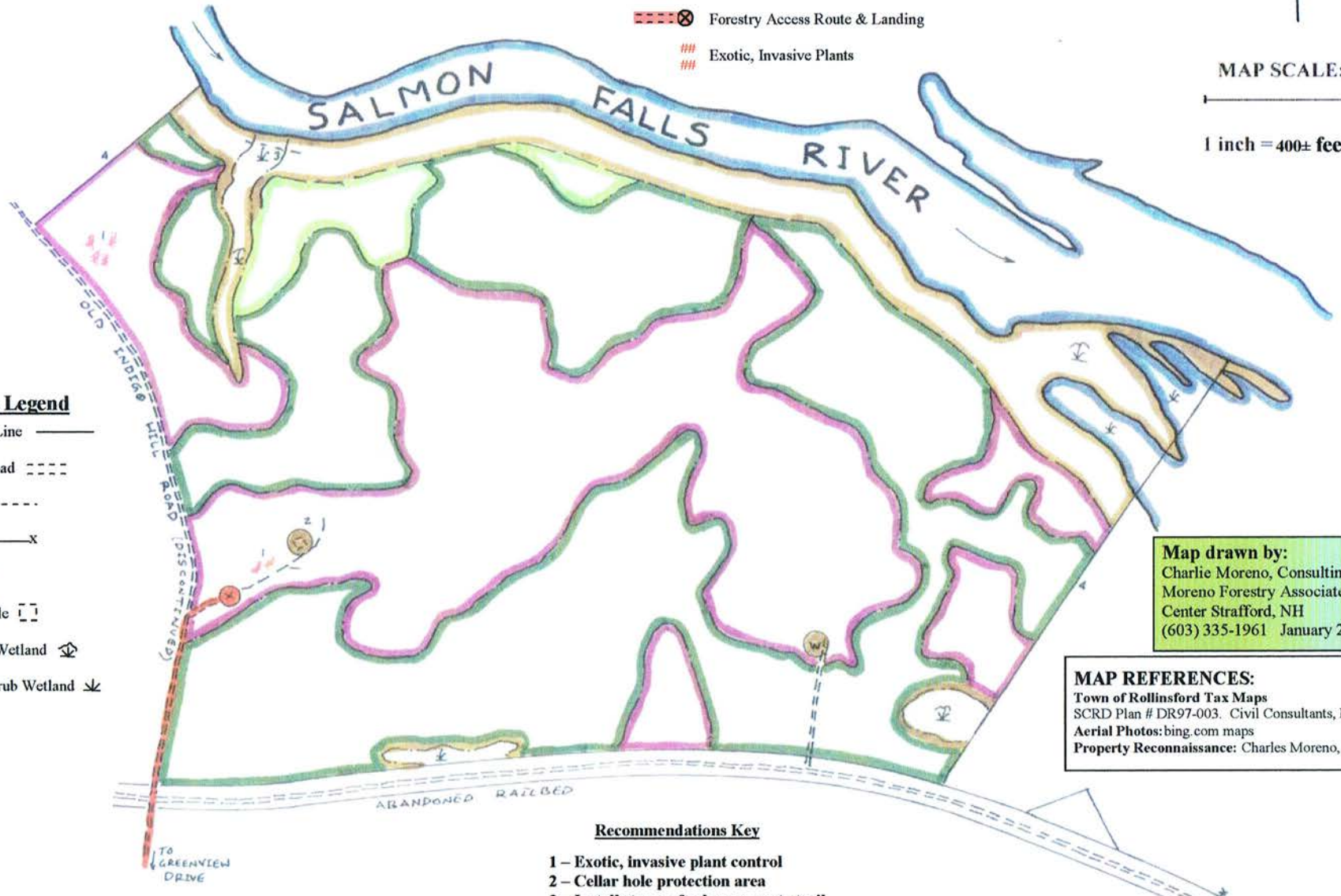
87.8± acres

Management Areas

- Crown Thinning & Improvement Cut
- Regeneration Harvest (Selection) & Improvement Cut
- Regeneration Harvest (Selection)/Hemlock Management
- River, Wetland, & Structure Protective Buffer
- Forestry Access Route & Landing
- ### Exotic, Invasive Plants

MAP SCALE:

1 inch = 400± feet



Map Legend

- Property Line
- Gravel Road
- Trail
- Gate
- Well W
- Cellar Hole
- Forested Wetland
- Marsh/Shrub Wetland

Map drawn by:
Charlie Moreno, Consulting Forester
Moreno Forestry Associates
Center Strafford, NH
(603) 335-1961 January 2014

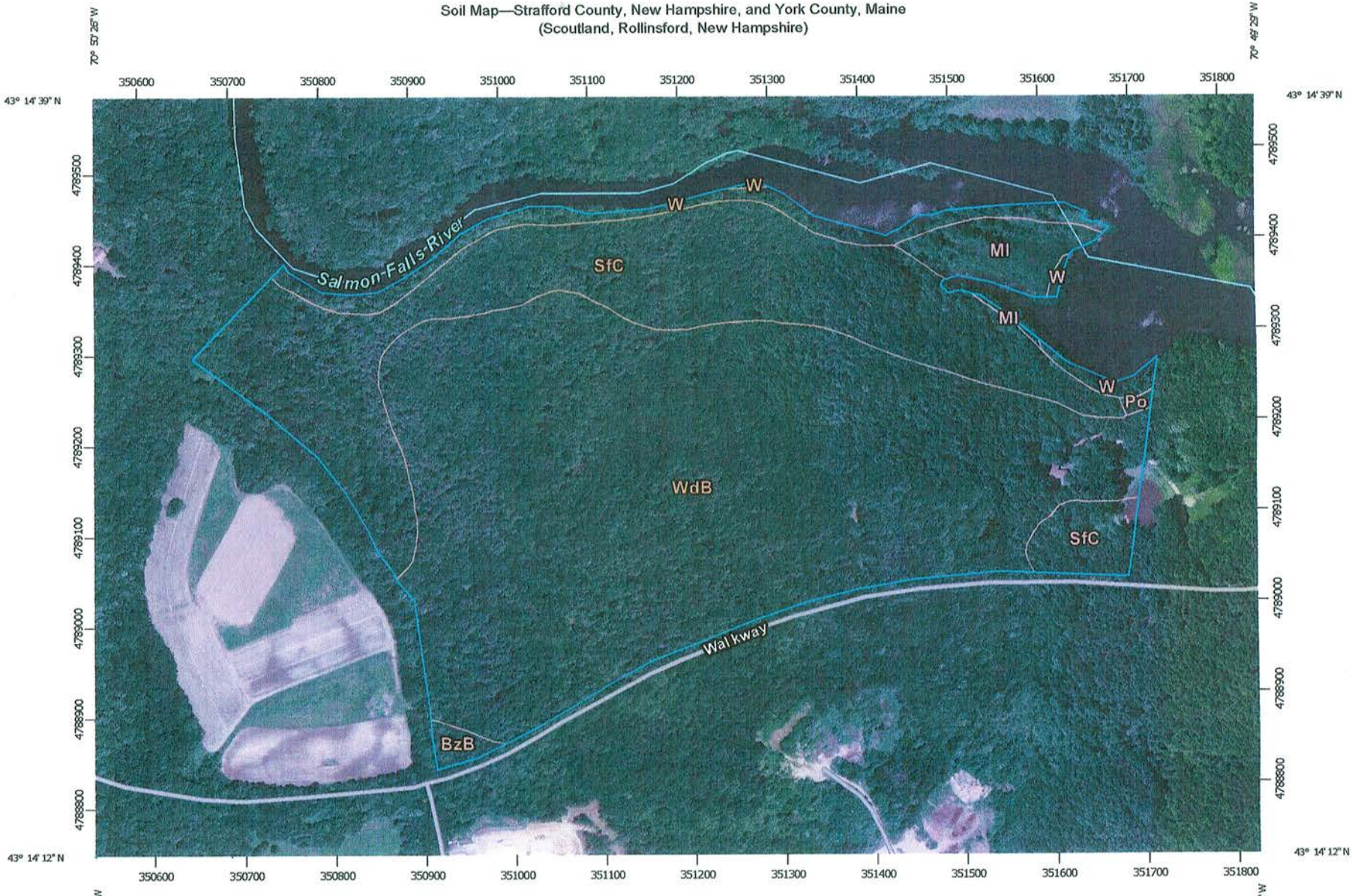
MAP REFERENCES:

Town of Rollinsford Tax Maps
SCRD Plan # DR97-003. Civil Consultants, May 2008.
Aerial Photos: bing.com maps
Property Reconnaissance: Charles Moreno, 2014.

Recommendations Key

1 – Exotic, invasive plant control
2 – Cellar hole protection area
3 – Install stream ford or re-route trail
4 – Locate, blaze, & paint bounds

Soil Map—Strafford County, New Hampshire, and York County, Maine
(Scoutland, Rollinsford, New Hampshire)



Map Scale: 1:5,890 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

INTRODUCTION

Forest Management Plan for the Town of Rollinsford's *SCOUTLAND*
Rollinsford, New Hampshire

INTRODUCTION

Encompassing 87.8± acres, *Scoutland* is a scenic forest property that is owned by the Town of Rollinsford, New Hampshire. Significantly, the property is located along a scenic, undeveloped stretch of the Salmon Falls River, providing valuable open space for watershed protection, wildlife habitat, and public recreational opportunities. The tract contains a variety of forest/wetland cover types and habitats.

This forest management plan is intended to guide stewardship of *Scoutland's* natural resources. Management objectives are based on detailed forest analysis in concert with the Town's stewardship goals. The plan is a "working" document; over time it will likely require updating to reflect ongoing management activities, as well as unforeseen natural disturbances and conditions.

PROPERTY INFORMATION

LOCATION

Scoutland is located within an undeveloped area immediately northwest of Rollinsford's downtown, and along a pristine ½+ mile segment of the Salmon Falls River. The river forms the northern property boundary. The main access point to *Scoutland* is via a discontinued town road that lies over an abandoned railroad bed from Church Street in downtown Rollinsford. The old railbed serves as the southerly property line. A second access route is from the discontinued section of Old Indigo Hill Road (aka "Greenview Drive"), which constitutes the western tract bound. Other town-owned property lies adjacent to *Scoutland*, including a 15± acre field.

GEOGRAPHY

Scoutland lies approximately 12± miles inland from the Atlantic Ocean in New Hampshire's coastal area where climate is tempered by the ocean. The land is situated along the transition between the Gulf of Maine Coastal Lowland and the Gulf of Maine Coastal Plain,[1] and lies at the northerly extent of the Appalachian oak-pine forest.[2] Soils in this region were formed from glacial tills, outwash, and marine sediments, and are underlain by both igneous and metamorphic bedrock. Excepting steep embankments along the Salmon Falls River, topography is generally level to mildly rolling, with elevations (above sea level) ranging from about 50± feet along the river to 150± feet on a knoll in the southwestern portion of the *Scoutland* property.

---

[1] Keys, J.E. and C.A. Carpenter. 1995. Ecological Units of the Eastern United States: First Approximation. U.S. Department of Agriculture, Forest Service.
[2] Sperduto, D. D. and W.F. Nichols. 2004. Natural Communities of New Hampshire. New Hampshire Natural Heritage Bureau and The Nature Conservancy.

REFERENCE INFORMATION

Deeds: Strafford County Registry of Deeds Book 490, Page 286.

Survey: "Standard Property Survey, Land of the Town of Rollinsford, Old Indigo Hill Road & Salmon Falls River, Town of Rollinsford – Strafford County – New Hampshire," by Civil Consultants, dated May 28, 2008, SCRD Plan # DR97-003.

Tax Maps: Rollinsford Tax Map 2, Lot 13

Acreage: TOTAL – 87.8± Acres

Forest: Upland, established – 82.8± acres

Wetlands: Forested swamp – 1.6± acres
Floodplain forest -- 2.1± acres
Shrub/scrub swamp-- 1.3± acres

FOREST MANAGEMENT OBJECTIVES

Recommendations for the management of the *Scoutland* are based on natural resource findings and long-term management objectives, which the Rollinsford Conservation Commission (RCC) has considered for the property. These objectives include:

- **Protect water quality and wetland/stream integrity**. Protecting the Salmon Falls River's water quality and any potential underground (stratified-drift) aquifer is a high priority purpose for maintaining the *Scoutland* open space. Strategies include retaining healthy forest cover on *Scoutland* especially along the river embankments, and the application of NH Best Management Practices (BMP's) in silvicultural management areas to prevent stream siltation

- **Manage for public recreational uses.** *Scoutland* is a popular outdoor destination for local recreationists. The property's internal trail network traverses 1.25± miles and is used for walking (including dog walking), snowshoeing, cross-country skiing, mountain biking, trail running, and snowmobiling. ATV's travel on the discontinued roads which border *Scoutland*, though some interior trail use was also noted. Bird watching, nature study and photography, and fishing are other potential activities. The Town has not emphasized one recreational use over another, and intends to balance recreational usage with natural resource protection.

- **Sustainably manage the timber resource.** *Silvicultural management* is recommended for the majority of the parcel's acreage, with the objectives of: a) growing large diameter, healthy, valuable timber and b) restoring natural forest conditions, i.e., a mixed-age, structurally diverse forest of tree and plant species adapted to the growing site. A natural management approach depends on the forest's innate ability to self-plant and regenerate. In addition to encouraging and guiding natural regeneration, periodic harvests help maintain forest health, enhance wildlife habitat, and improve forest growth.

- **Maintain and enhance wildlife habitat.** The silvicultural recommendations in this plan are intended to complement and enhance woodland habitat over time. The overall objective is to manage and improve the property's forest habitats for the benefit of a broad variety of wildlife. Increasing the forest's structural complexity is fundamental to long term habitat improvement.

- **Foster outdoor education and community interest.** *Scoutland's* trails provide access to the forest and river front to serve as a community outdoor classroom. There is potential to periodically schedule educational walks lead by natural resource educators such as UNH Cooperative Extension, natural resource professionals, conservation group personnel, or classroom teachers. Topics may range forest ecology and management to wildlife habitat, birding, and watershed protection, etc. Target audiences include local schools, conservation groups, landowners, and town officials.

- **Control/exclude exotic, invasive plants.** Most of the *Scoutland's* forest appears to be currently free of exotic invasive plants. Removal of incipient infestation—glossy buckthorn was noted in a few areas—is critical for the property's long-term integrity. Continued monitoring is also important to avoid a resurgence of non-native plants. Exotic, invasives have the capacity to interfere with forest regeneration and disrupt habitat, biodiversity, ecological functioning, and forest scenic qualities over time.

LOGISTICS & RECOMMENDATIONS

BULLETED RECOMMENDATIONS

- Protect Salmon Falls River water quality.
- Do not expand trail network. Work with local trail stewards to maintain trails which currently exist. Install one stream ford on riverfront trail.
- Practice careful silvicultural management of the forest. Implement a 12 to 15 year improvement harvest cycle.
- Manage wildlife habitat via the silvicultural management of the forest.
- Promote outdoor education by encouraging or sponsoring forest events, tours, and workshops.
- Implement aggressive control of exotic, invasive plants.

SPECIFIC FORESTRY/WILDLIFE RECOMMENDATIONS:

- Over time, expand forest age diversity to include old trees (150+years), abundant mid-aged growth (50 – 125+ years), and ample young growth (0 – 40+ years).
- Maintain the forest's mast resources. In time, consider the re-introduction of American chestnut, which likely once populated this site.
- Release naturally-planted seedlings, particularly white pine, red oak, white oak, shagbark hickory, black birch seedlings.
- Release promising sapling growth (pine and hardwood).
- Monitor and manage *Scoutland's* hemlocks, mindful of the upcoming Hemlock Wooly Adelgid infestation.

PROPOSED SCHEDULE of MANAGEMENT ACTIVITIES

Year	Season	Activity	Whom
2014	Winter	Forest Management Plan preparation.	F
	Spring/Summer	Develop invasive plant control strategy.	F/RCC
	Summer	Prepare fall/winter forest harvest.	F
	Late summer	Implement invasive plant control.	F/C
	Fall/Winter	Conduct forest harvest.	C/F
2015	Winter	Plan stream ford and other trail improvement, as needed.	RCC/V
	Spring (late April)	Invasive plant control primarily by locating and uprooting new plants or those missed where previously treated, as well as scattered plants.	F/RCC/V
	Late Spring/Summer	Install trail improvements.	V/RCC
	Fall (October)	Continue invasive plant control (buckthorn) by uprooting any new seedlings.	F/RCC/V
	Fall	Host a community open house or educational workshop on *Scoutland.*	RCC/V
2016-2018	Spring/Fall	Continue invasive plant monitoring and spot control as needed.	F
2027-2030±	Late spring, summer, fall or winter	Conduct second phase silvicultural harvest in all managed areas.	F & C
2030±	Spring or Fall	Plant disease-resistant American chestnut in Stands B & D.	F/RCC/V

KEY: C = Contractor; F = Forester; RCC = Rollinsford Conservation Commission
V = Community Volunteers (Ex.: Snowmobile club, Scouts, etc.)

Forestry & Wildlife Recreation Invasive Control Educational

FOREST MANAGEMENT ACCESS

Silvicultural management of the forest requires truck access to a landing site. The "landing" is the location where harvested trees are gathered, processed, and loaded on trucks for marketing. For *Scoutland*, one landing is likely to be adequate to access the entire property.

A good potential landing site is in the small existing clearing near the cellar hole. Old Indigo Hill Road would serve as the truck access to the landing from the end of the Greenview Drive cul-de-sac. It appeared that few improvements to the discontinued road are necessary, though the entrance into the small clearing needs minor widening.

The property's recreational trails divide the property interior into several sections, or polygons. To access the "polygon" interiors, skid trail crossovers on recreational trails are needed, requiring reconnaissance and pre-planning to minimize their number. Fortunately, *Scoutland* contains few seasonal streams and no stonewalls, thus crossovers are limited to trails, while stream crossings can be entirely avoided.

RECREATIONAL USE

RECREATIONAL USES

The Town of Rollinsford maintains *Scoutland* open to the public for low-impact recreational use. Trail-based recreation predominates. The property contains over a mile of internal trails, and is easily accessed via the two scenic, discontinued roads that form the property's boundaries. The roads are gated to prevent unauthorized travel by large vehicles.

There are no major management concerns regarding current recreational use, with the exception of the need for a stream crossing on the trail adjacent to the Salmon Falls River in the northwestern area of the property.

It is recommended that the existing trail system not be expanded. An overabundance of trails may be disruptive to wildlife, in addition to increasing impacts to the parcel's soils and surface water features, including the river.

ACCESS and RECREATIONAL USE RECOMMENDATIONS

Forest Management

- Utilize one landing off of Old Indigo Hill Road to stage silvicultural activities.
- All stream and wetland crossings can be avoided when staging a forest harvest.
- Minimize the number of skid trail crossovers by using pre-planned routes.
- Stream crossings and erosion control measures on trails should follow NH Best Management Practices (BMP's) guidelines.
- Use a 100-foot no-harvest buffer along the Salmon Falls River.
- Post-harvest, retire use of forest management trails.

Recreational Use

- Keep current trail footprint. Do not create additional recreational trails.
- Monitor trails for erosion. Install erosion control measures when needed.
- Install one steam ford on the riverside trail.

NATURAL RESOURCES

NATURAL RESOURCE SUMMARY

SOILS PROFILE

UPLAND SOILS

Windsor (WdB) – This soil, underlying nearly two-thirds of the property, is characterized as a deep, well-drained outwash sand, which is highly permeable. The soil is highly productive for pine and hardwood growth, and is operable almost year round.

MESIC or WETLAND SOILS

Buxton (BzB) – This soil is characterized as a silty clay loam with slow water permeability. The soil is dry during droughty periods, but prone to seasonal wetness. *Buxton* soils tend to run deep; bedrock is not found anywhere near ground surface. This soil underlies a *very small* pocket in the southwestern corner of the woodlot along Old Indigo Hill Road. *Buxton* is productive for both white pine and hardwood growth.

Mixed Alluvial (MI) – Underlies floodplain areas along the Salmon Falls River. These soils, deposited by the moving waters of the river, vary from silt loam to sand and gravel. Sand is evident on the ground surface following springtime flooding. This soil type will generally not support travel by logging equipment.

Podunk (Po) – This moderately well-drained soil is found on level flood plain sites and is frequently flooded. The soil is formed in deep, water-sorted sand and underlies a *very small* pocket along the Salmon Falls River.

Suffield (SfC) – This soil, formed from thick marine clay and silt, occupies the terrace break (sloping areas) paralleling the Salmon Falls River. A small pocket of this soil is also found in the extreme southeastern corner of the property.

WATER RESOURCES

Scoutland lies entirely within the Salmon Falls River watershed, with all *surface* waters flowing towards the river. The river forms the property's northern boundary. At the Scoutland location, the Salmon Falls River is fully freshwater, with brackish waters found just ½ mile downstream below the Rollinsford dam. The confluence of the Salmon Falls and Cocheco Rivers lies 2.5± miles downstream, where the tidal Piscataqua River begins and ultimately flows to the Atlantic Ocean.

Scoutland has relatively few surface water features, partly due to a preponderance of highly permeable soils. Aside from the ½ mile of river frontage, the property interior's most significant water feature is a seasonal stream that forms a ravine in the parcel's northwest. The stream emanates from a seep that has a capped well (in the vicinity of the cellar hole site). A narrow wetland follows the stream to where it flows into the Salmon Falls River.

Several other small seasonal streams are also found, as illustrated on the *Physical Features Map*. Small pockets of forested wetland are scattered about the property. Red maple and highbush blueberry are indicators of these pockets generally on poorly drained soils.

Another interesting surface feature is a section of floodplain forest and corresponding shrub/scrub swamp along the Salmon Falls River on the parcel's northeast corner. Red maple and red oak are found in this seasonally flooded area, along with a dense understory of winterberry holly, ironwood, highbush blueberry, and occasional alder.

Due to its extensive sandy soils, Scoutland may also contain a subsurface stratified-drift aquifer, or serve as a recharge area for nearby aquifers.

WILDLIFE HABITAT

COMMUNITY CONTEXT

Scoutland is the core parcel within a relatively small surrounding open space area, covering approximately 250± acres. Significantly, the Town of Rollinsford owns at least two other adjacent properties, which include an adjacent, 15± acre agricultural field. While small in area, these parcels protect a long undeveloped segment of the Salmon Falls River and provide valuable and diverse habitat, including extensive upland mast forest, fieldland, and riverfront.

CORE HABITATS

Scoutland has several core habitats including: a) The river-riparian; b) Floodplain forest and shrub/scrub swamp; c) Upland mast forest; d) Softwood-hardwood mix; and e) Softwood thermal forest. These habitats are enhanced by specific features such as seeps, small forested wetlands, tree snags, forest floor woody debris. Vernal pools are found nearby on adjacent properties.

Riparian Habitats

River Riparian— *Scoutland*'s river frontage provides exceptional habitat. The river provides a flyway for bald eagle, osprey, and red-shouldered hawk, which may occasionally roost on river front trees. Red-shouldered hawks may also nest in the tall softwoods along the river edge. Great blue heron, green heron, and belted kingfishers also utilize the riverfront. Mammals such as bats, mink, otter, and beaver use the riparian area as a travel corridor.

Floodplain Forest and Shrub/Scrub Swamp—Nestled on a river bend, dense shrub vegetation is an important aspect of this seasonally-flooded habitat. Winterberry holly and highbush blueberry provide valuable food sources, in addition to cover for songbirds and mammals. Waterfowl and wading birds likely utilize the protected shrub/scrub area.

Forest Habitats

Mast forest – Red oak is the primary source of hard mast—acorns—on the property. White oak, and shagbark hickory are also important mast sources, while black oak and beech (beechnuts) provide secondary sources. The white oak acorn contains less tannin and is favored by wildlife. Acorns rank among the most important wildlife foods in our local forests, utilized by a great variety of animals (turkey, blue jays, deer, flying squirrels, black bear, etc.). Older oaks with a

well-developed, spreading crown are important for copious acorn production. Habitat features include cavity trees, mostly in mid to large diameter hardwoods. Another feature is an abundance of fruit/mast-producing upland shrubs such as maple-leaf viburnum, hawthorn, and beaked hazelnut. In the Forest Management Area, the most prolific mast-production is represented by Forest Types B and D.

Softwood-hardwood mix - Includes established forest with combined mast hardwoods and light softwood cover such as Forest Type B. Red oak remains an important species, with white oak and beech providing supplemental mast. White pine is found individually and in groups; the generally open foliage provides light thermal cover. Scattered hemlocks contribute more appreciable wildlife cover. Wildlife will often use individual hemlocks as waypoints while traveling. Cavity trees and hollow downed woody debris enhance this habitat for flying squirrels, opossum, and gray fox.

Softwood thermal forest – Includes areas with moderate to heavy hemlock stocking—particularly where hemlock is found in all canopy layers—overstory, mid-story, and understory. White pine is present as a secondary softwood species. Forest Type C (Hemlock/Pine/Hardwood) typifies this habitat. Snow depths are mitigated under the thick foliage of hemlocks, encouraging deer, grouse, and snowshoe hare to settle under their canopy. Mid-summer temperatures are also moderated under the cooling shade. Light thermal forest is found as Forest Types A and B (White Pine). Both forest types are enhanced by limby or tall pines that provide perch sites (barred owls, for example) and occasional cavities.

HABITAT MANAGEMENT

Species of Concern/Natural Communities

The New Hampshire Natural Heritage Bureau was consulted in December 2013 about the potential presence of rare species (plant or animal) or exemplary natural communities on the subject property. A database check did not indicate the presence of any species or natural communities of concern on the property; however, Big Bluet (*Enallagma durum*), a locally rare damselfly, was observed in the vicinity in 2010. Northern beggar-ticks (*Bidens* hyperborea) and greater fringed-gentian (*Gentianopsis crinita*), small plants, were last reported in this area of Rollinsford in 1923 and 1987, respectively. In addition, the Salmon Falls River may contain rare species (spotted turtles for example), and the river corridor likely attracts passing rare birds such as osprey. There were no unusual natural communities noted in the forest.

Silvicultural Management and Reserves

Silvicultural management will benefit habitat on the property. Carefully planned, periodic harvesting (as specified in the Forest Type prescriptions) promotes complex forest structure over time: mixed-aged forest, stratified forest canopy, increased herbaceous layer, and greater diversity of tree and shrub species adapted to site conditions. Forest complexity and diversity correspond well to habitat richness.

Silviculture is well-suited for accessible areas that are not too wet or steep, or adjacent to the river. These areas, which include forested wetlands, the floodplain forest, the ravine and a 100-foot river riparian buffer, are recommended to be reserved from management. These areas are

generally to be left to the course of nature, though control of invasive plants and salvage of trail-side hemlocks lost to HWA are possible future interventions.

Wildlife Habitat Recommendations – Summary

- In established forest areas, continue the development of multi-generational forest through silvicultural management. Forest age differentiation should occur both as groups or small pockets of trees, and as dispersed individual trees. Substantial older growth should be retained.
- Manage for large-crowned, mast-producing oaks and hickories.
- In time, attempt to introduce disease resistant American chestnut to diversify the forest's mast resource.
- Retain softwood thermal cover, particularly in Hemlock/White Pine/Hardwood stands.
- Retain cavity trees, snags, and large coarse woody debris for wildlife.
- Retain some trees that provide good vertical structure, such as large pasture pine.
- Allow the accumulation of forest floor woody debris.
- Silviculturally create small canopy openings, to stimulate a diversity of young forest growth.
- Encourage the growth of native fruit-bearing shrubs.
- Maintain similar 100 foot no-cut buffer along the Salmon Falls River.
- Control exotic, invasive plants.
- Maintain trail-less areas to allow undisturbed habitat for breeding, nesting, and denning.

FOREST RESOURCES

SPECIES COMPOSITION

While a few species dominate the property's tree species composition, *Scoutland* contains a substantial array of tree species for the area.

A qualitative approximation of the property's forest overstory tree species abundance is:

Abundant	– White pine, red oak.
More Common	– Red maple,
Common	-- Shagbark hickory, white oak.
Less Common	– Black birch, beech, hemlock, black oak.
Scarce	– Ironwood, yellow birch, big-tooth aspen, white birch, pitch pine.
Rare	– Basswood, pignut hickory, American elm, sugar maple, white ash, black cherry.

The compositional character of a forest is dependent on soil types and available moisture, the age of the forest, and its natural history. *Scoutland* is primarily upland with well-drained soils, thus upland hardwoods and white pines dominate species composition. Wetland species such as elm, and ubiquitous red maple, are found in the tract's moist soils. The property's generally lacks enriched soil pockets.

FOREST STRUCTURE

The physical structure of a forest is shaped by its history of establishment and physical disturbances that occur in the woodlands over time. *Scoutland's* present forest was established from field and pasture land; pasture abandonment began about 1900±, with various pasture areas deserted later; therefore the age of various *sections,* or "stands", in *Scoutland* varies. At the time of establishment, each particular forest stand was same-aged, or "even-aged"; over time, if disturbances create large enough canopy openings, or "gaps", new generations of trees will grow and persist, establishing additional age groups or "cohorts".

Presently, forest stands in *Scoutland* range from even-aged to two-aged, depending on stand age and location. Over the past century, at least one major disturbance has shaped present forest structure, with mild disturbances having relatively undiscernible effects. This major disturbance was likely logging of white pine, partially in Forest Type B, and more completely in Forest Type D. Logging likely took place about 1940±, perhaps in response to World War II, or possibly as salvage to the Hurricane of 1938.

Over time, the amount of natural woody debris on the forest floor accumulates, particularly in well-stocked, dynamic stands. Woody debris recycles into the earth, adding valuable nutrients to the soil, and providing important habitat for microorganisms and wildlife. Decaying trees, while not valuable as timber, supply valuable habitat for cavity-feeding/nesting birds. Remnant old trees may provide denning sites for mammals such as flying squirrels and porcupine.

FOREST MANAGEMENT

MANAGED AREAS and RESERVES

Silviculturally managed areas and reserves are defined in the *Wildlife Habitat* section of this study. The *Forest Recommendations Map* shows the location of these areas in the T.R.E.E. Forest Management Area. Reserve areas are treated passively, with minimal intervention. Managed areas are treated systematically, with a scheduled series of treatments applied over time.

SILVICULTURAL PHILOSOPHY

The intent of silvicultural management on the property is to enhance wildlife habitat, diversify tree species mix, add to the structural complexity of the forest, promote the growth of healthy trees and valuable timber, and control invasive plants. The continuum of silvicultural prescriptions in this management plan conforms to these objectives. On-the-ground silvicultural decisions by a professional forester should regularly consider forest structure and wildlife habitat, and will ultimately reflect the degree of management success.

Habitat enhancement in an established forest includes maintenance of a varied mast resource, augmentation of forest canopy layers, and encouragement of fruit-bearing shrubs.

A new generation of trees will grow naturally in the openings created by each periodic harvest. Over time, through natural disturbance and harvesting a mixed-age forest will develop. A mixed-aged forest is structurally more complex than an even-aged forest. Silviculture will reflect the natural disturbance regime of New Hampshire's seacoast area.

The control of non-native, invasive plants is critical because most of these species disrupt the inherent ability of native plants and trees to regenerate. Habitat is degraded by the increasing monoculture of exotics. Some plants, such as bittersweet, have the ability to smother large trees. It is critical that the plants do not continue to spread towards the property's interior areas, as complete degradation of the property's environment will result. Invasive plant management is a major focus of silvicultural management. Timber harvest proceeds may be used to help pay for invasive plant control.

HARVEST CYCLE

Silvicultural treatment of the *Scoutland* is planned on a 12-15± year harvest interval. With the exception of salvage harvests, the property should not be harvested more than once within this interval. Silvicultural prescriptions are detailed under the forest type descriptions, which follow this section. The prescribed harvests are on a sustainable level: The timber (chipwood, cordwood, pulp, sawlogs) removed should not exceed the forest's capacity to re-grow this timber volume over the intervening growing-cycle (15±) years.

HARVEST LOGISTICS

One landing site, as detailed in the "Forest Management Access" section, is needed for the prescribed harvests in *Scoutland*. Harvesting may be conducted as mechanized biomass harvesting, cut-to-length (CTL), or conventional harvesting. While harvesting should be avoided during spring thaw, most other times of year are likely possible due to the well-drained sandy soils.

TREATMENT SCHEDULE

The silvicultural treatment schedule for the *Scoutland* is projected for the future 40± years as follows:

Harvest Schedule	*Timeframe*	*Elapsed Time from Present*
Present (1st)	2014 – 2016±	0± years
Future (2nd)	2027 – 2030±	13 - 14± years
Future (3rd)	2040 – 2045±	25 - 30± years

FOREST TYPES & PRESCRIPTIONS

FOREST TYPES – INTRODUCTION

As with most forests, *Scoutland* varies considerably in species composition, and to a lesser degree, in structure. Forest types define the distinctive character of various forest areas: A ***forest type*** represents a section of homogeneous forest that results from similar soils, hydrology, land uses, and disturbance history.

5 broad forest types were defined and delineated in *Scoutland* as part of the forest assessment phase of this management plan. These are illustrated in the "Forest Type Map", and described in detail in the upcoming pages of this chapter. Descriptions of each forest type explain their distinctive characteristics and natural history. Wildlife, ecological, and timber attributes for each forest type are also described. The forest type descriptions are followed by a prescription section which specifies silvicultural objectives for each forest type, and recommended treatments.

A ***stand*** is a pocket of a particular forest type, which is located separately from other pockets of the same forest type. In the Forest Type Map, the forest types are delineated as stands with cumulative acreage calculated for each forest type. Silvicultural prescriptions are generally the same for all areas of one forest type, though there are exceptions for inaccessible or strongly variant areas. Though prescriptions vary between different forest types, all forest types/stands within one management area are usually treated concurrently during a harvest, each to their own specification.

Please refer to the "Forest Type Map" for the locations of each forest type.

FOREST TYPES – Descriptions and Prescriptions

A. White Pine – 12.2± acres

Description – This forest type is distinct because white pine constitutes at least 75% of overstory stocking. Found as three stands, some areas contain an overstory that is almost exclusively white pine. The pine is mostly sawtimber-sized (12"+ DBH). This forest type's stands developed from abandoned pasture, with the matrix forest consisting of trees 80 to 100± years of age.

Species Composition –
Primary – White pine.
Secondary – Red oak and red maple.
Uncommon – White oak, beech, black birch, yellow birch, pitch pine.
Regeneration (seedlings/saplings) – Beech, black birch, red oak, shagbark hickory, white pine saplings.

Forest Structure –

Composition	**Stand Structure**	Even-aged with two-aged pockets
	Successional Stage	Late-intermediate
	Stand Age	80-100± years (openings with <70 year growth)
Tree Size	**DBH range**	10 - 21± inches
	Mean DBH	16.5± inches
	Avg. Maximum Height	95± feet
Stand Density	**Relative Stocking**	Considerable
	Basal Area/Acre	180± sq. ft./acre
	Trees/Acre	120± trees
	Canopy Closure	80 - 100± %
Ecological	**Canopy Stratification**	Good – understory and mid-story, with a well-developed overstory.
	Woody debris	Good accumulation – including some large blowdowns following a February 2010 gale.
	Invasive Plants	Areas with emerging glossy buckthorn..

Forest Type A – Prescription

Objectives – Favor finest quality, healthiest white pines in all stands. Grow large-diameter, straight timber. Retain substantial stocking to serve as a seed source. Encourage white pine regeneration, so that future stands consist of at least 40 to 50% white pine. Diversify stand structure by favoring young growth and multiple tree generations.

Silvicultural Sequence: Even and two-aged (present)→ Multi-aged (2050)
Harvest Cycle: 12 - 15± years

-Continued-

Forest Type A – Prescription

Silvicultural Treatments:

2014-2016±: ***Invasive plant control.***

2014-2016±: ***Single-tree selection/Improvement cut/Liberation*** (of existing regeneration).

2027-2030±: ***Single-tree/ micro group selection/Liberation*** (of regeneration).
FSI: Inter-sapling and pole wood release, if ready.

2040-2045±: ***Single-tree selection/ Expanded micro group selection/Liberation*** (of regeneration).
FSI: Inter-sapling and pole wood release.

B. White Pine/Hardwood – 31.5± acres

Description – *Scoutland's* most extensive forest type includes a white pine and upland hardwood mix, with red oak and red maple consistently common. Shagbark hickory and white oak are variably present. This forest type contains a substantial and diverse mast resource (acorns, nuts) for wildlife.

Species Composition

Primary – White pine, red oak, red maple, and shagbark hickory.
Secondary – Black birch, white oak.
Uncommon – Pignut hickory, black oak, hemlock, pitch pine, white birch.
Regeneration – Beech, red maple, red oak, black birch, white pine.

Forest Structure –

Composition	**Stand Structure**	Even-aged and Two-aged.
	Successional Stage	Late - intermediate
	Stand Age	55-75//80 – 110± years
Tree Size	**DBH range**	8– 22± inches
	Mean DBH	16± inches
	Avg. Maximum Height	80± feet
Stand Density	**Relative Stocking**	Considerable
	Basal Area/Acre	135± sq. ft./acre
	Trees/Acre	95± trees
	Canopy Closure	80-100± %
Ecological	**Canopy Stratification**	Good – all canopy layers variably present, including supercanopy.
	Woody debris	Good accumulation, including larger trunks.
	Invasive Plants	Low incidence: not observed, but likely present.

Forest Type B -- Prescription

Objectives –Continue to develop quality white pine and red oak sawtimber. Retain and encourage the regeneration of the diverse mast species in the stands including the oaks and hickories.

Silvicultural Sequence: Even-aged/Two-aged (present)→ Multi-aged (2050)
Harvest Cycle: 12 - 15± years

Silvicultural Treatments:
2014-2016±: ***Single-tree selection/Improvement cut.***

2027-2030±: ***Single-tree/micro-group selection/Liberation*** (of regeneration).
FSI: Inter-sapling if ready.

2040-2045±: ***Single-tree/Expanded micro-group selection/Liberation***
FSI: Inter-sapling release and pole wood release, as needed.

C. Hemlock/White Pine/Hardwood – 6.9± acres

Description – This forest type is characterized by the presence of hemlock in the overstory, which imparts a scenic, shaded appearance to the woods. White pine is also common, with variable proportions of hardwood species. The forest type is found along the shaded north-facing slope along the Salmon Falls River.

The dense foliage of this forest type provides riverbank protection. Hemlock, particularly in combination with oak, also provides valuable wildlife cover. Unfortunately, the hemlock wooly adelgid (HWA), a minute scale insect, is now expanding into southern New Hampshire and will soon threaten the property's hemlocks, young and old.

Species Composition
Primary – White pine , hemlock
Secondary – Red maple, red oak, black birch.
Uncommon – Beech.
Regeneration – Hemlock saplings. Heavily shaded areas do not contain understory growth.

Forest Structure –

Composition	**Stand Structure**	Even- aged
	Successional Stage	Late-intermediate
	Stand Age	80-110± years
Tree Size	**DBH range**	10– 26± inches
	Mean DBH	15± inches
	Avg. Maximum Height	110± feet (white pine)
Stand Density	**Relative Stocking**	Dense
	Basal Area/Acre	220± sq. ft./acre
	Trees/Acre	180± trees
	Canopy Closure	100%
Ecological	**Canopy Stratification**	Fair to good – patchy understory, some midstory, and well-developed overstory.
	Woody debris	Good accumulation, including larger trunks.
	Invasive Plants	Not observed.

Forest Type C -- Prescription

Objectives – Management of this forest type is greatly influenced by the impending arrival of HWA. Reduction in the proportion of hemlock, and encouragement of mixed species regeneration, are overall strategies until HWA appears. At that time, the approach shifts to salvage of affected hemlocks including saplings, while retaining most hardwoods and pines, in addition to any healthy hemlocks. Retention of healthy, large diameter oaks and pines will help maintain scenic qualities.

In new forest openings, promote mixed species regeneration. Expand these small openings over time to encourage the regeneration of pine, black birch, and oak. Effective regeneration openings

must allow enough light to reach the forest floor (remove groups of 6 to 12± trees), and lie near, or adjacent to, seed trees.

Maintain a 100± foot no-harvest buffer along the river bank, especially in steep areas. Attempts to salvage HWA infested hemlocks will likely be unfeasible along the Salmon Falls River.

Silvicultural Sequence: Even-aged (present)→Three-aged (2050)
Harvest Cycle: 12 - 15± years

Silvicultural Treatment (outside of river buffer area):
2014-2016±: ***Single-tree/Micro group selection.***
Salvage HWA-infested hemlocks.

2027-2030±: ***Single-tree/Expanded micro group selection/Liberation*** (of regeneration).
FSI: Inter-sapling release (release white pine and hardwood).

2040-2045±: ***Single-tree selection***
FSI: Inter-sapling and pole wood release, as needed.

D. Upland Hardwoods – 29.4± acres

Description – Covering much of the central interior of the tract, this oak-dominated forest type developed after much of the former pine stocking was harvested. There are at least two stand age classes resulting from this past, partial harvesting. Nearly all areas of this forest type are on dry, high ground. The stand contains a substantial mast (acorns, nuts) resource for wildlife.

Species Composition
Primary – Red oak and white oak.
Secondary – Shagbark hickory, black oak, red maple, beech.
Uncommon – Beech.
Regeneration – Beech, black birch, red maple, white pine.

Forest Structure –

Composition	**Stand Structure**	Even-aged/Two-aged
	Successional Stage	Mid to late-intermediate
	Stand Age	Even-aged areas: 70 - 90± years; Two-aged areas: <70 years & 75 – 100+ years
Tree Size	**DBH range**	7– 18± inches
	Mean DBH	12.5± inches
	Avg. Maximum Height	70± feet
Stand Density	**Relative Stocking**	Considerable/Dense
	Basal Area/Acre	120± sq. ft./acre
	Trees/Acre	140± trees
	Canopy Closure	80 - 100± %
Ecological	**Canopy Stratification**	Good – patchy understory, mid-story, and well-developed overstory.
	Woody debris	Moderate to good accumulation.
	Invasive Plants	Low/no incidence.

Forest Type D -- Prescription

Objectives – Manage species mix to favor good-quality red oak and other hardwoods, particularly white oak, shagbark hickory, and black birch. Upgrade overall stand quality and provide adequate growing space. Manage towards a multi-aged structure. Regenerate white pine and upland hardwoods.

Silvicultural Sequence: Even/Two-aged (present)→Three-aged (2050)
Harvest Cycle: 12 - 15± years

-Continued-

Forest Type D – Prescription

Silvicultural Treatments:
2014-2016±: ***Crown thinning/Improvement cut.***

2027-2030±: ***Single-tree selection/Liberation*** (of regeneration).
FSI: Inter-sapling release (release white pine).

2040-2045±: ***Single-tree/Expanded micro group selection/Liberation*** (of regeneration).
FSI: Inter-sapling and pole wood release.

E. Mixed Hardwoods – 2.8 acres

Description – The mixed hardwood type is found as one small stand occupying fertile soils in the vicinity of the old cellar hole. The central area of this stand contains a major trail and is still open, with edges of sapling growth. While red maple is the most common species, a variety of other hardwood species, including ironwood, are also found on the moister soils of this stand.

Species Composition

Primary – Red maple.
Secondary – Big-tooth aspen, red oak, black cherry, and white pine.
Uncommon – Sugar maple.
Regeneration – Red maple, red oak.

Forest Structure –

Composition	**Stand Structure**	Two-aged
	Successional Stage	Mid-intermediate
	Stand Age	30± years and 60-85± years
Tree Size	**DBH range**	3 - 20± inches
	Mean DBH	14± inches
	Avg. Maximum Height	70± feet
Stand Density	**Relative Stocking**	Considerable/Dense
	Basal Area/Acre	160± sq. ft./acre
	Trees/Acre	140± trees
	Canopy Closure	80-100± %
Ecological	**Canopy Stratification**	Good to excellent – substantial understory and mid-story.
	Woody debris	Good accumulation.
	Invasive Plants	Emerging incidence – monitor for buckthorn.

Forest Type E -- Prescription

Objectives – Maintain free of invasive plants. Provide growing space to promising trees to improve their growth. Retain mixed species composition, including species valuable to wildlife such as aspen and black cherry.

Silvicultural Sequence: Two-aged (present)→Multi-aged (2050)
Harvest Cycle: 12 - 15± years

Silvicultural Treatments:
2014-2016±: ***Monitor invasive plants and treat if found.***
Improvement cut/Crown thinning.
2027-2030±: ***Single-tree selection.***

2040-2045±: ***Single-tree selection/Liberation*** (of regeneration).

APPENDICES

NEW HAMPSHIRE NATURAL HERITAGE BUREAU

DRED - DIVISION OF FORESTS & LANDS
PO BOX 1856 -- 172 PEMBROKE ROAD, CONCORD, NH 03302-1856
PHONE: (603) 271-2214 FAX: (603) 271-6488

To: Charles Moreno, Moreno Forestry Associates
PO Box 60
Center Strafford NH 03815

From: Sara Cairns, NH Natural Heritage Bureau
Date: 2013-12-05
Re: Review by NH Natural Heritage Bureau of request dated 2013-11-27

NHB File ID: 1737 **Town:** Rollinsford
Project type: Landowner Request **Location:** Scout Land (Tax Map 2, Lot 13)

I have searched our database for records of rare species and exemplary natural communities on the property(s) identified in your request. Our database includes known records for species officially listed as Threatened or Endangered by either the state of New Hampshire or the federal government, as well as species and natural communities judged by experts to be at risk in New Hampshire but not yet formally listed.

NHB records on the property(s): **None**

NHB records within one mile of the property(s):

	Last Reported	Listing Status		Conservation Rank	
Invertebrate Species		**Federal**	**NH**	**Global**	**State**
Big Bluet (*Enallagma durum*)	2010	--	--	G5	S1
Plant species		**Federal**	**NH**	**Global**	**State**
northern beggar-ticks (*Bidens hyperborea*)	1923	--	E	G4	SH
greater fringed-gentian (*Gentianopsis crinita*)	1987	--	T	G5	S2

Listing codes: T = Threatened, E = Endangered SC = Special Concern
Rank prefix: G = Global, S = State, T = Global or state rank for a sub-species or variety (taxon)
Rank suffix: 1-5 = Most (1) to least (5) imperiled. "--", U, NR = Not ranked, B = Breeding population, N = Non-breeding. H = Historical, X = Extirpated.

A negative result (no record in our database) does not mean that no rare species are 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.

NOTE: This review *cannot* be used to satisfy a permit or other regulatory requirement to check for rare species or habitats that could be affected by a proposed project, since it provides detailed information only for records actually on the property.

CHARLES MORENO, LPF
Consulting Forester, Forest Ecologist

New Hampshire Licensed Professional Forester #115
Maine Forester License #2000

EDUCATION

B.S. FORESTRY – University of New Hampshire, Magna Cum Laude, May 1980
SAF Study Tour of France – Three-week study of French silvicultural methods, September 1983

PROFESSIONAL SERVICE and AFFILIATIONS

Forest Stewards Guild – Board of Directors (1999-2005), Chair (2005)
Society of American Foresters (SAF) – NH Chairman (1996)
New Hampshire Tree Farm Program – Executive Committee (1984-87)
Society for the Protection of New Hampshire Forests

WORK EXPERIENCE

1980 - Present	FORESTRY CONSULTANT, founder and proprietor of Moreno Forestry Associates. Thirty-three years' experience managing private and public forests in New Hampshire. Projects include forest and wildlife management planning and implementation, ecological assessments, forest inventory and appraisals, timber sales, mapping, forest taxation and litigation, forest improvement and habitat enhancement, and conservation plans for towns, conservation organizations, and private landowners. 40,000+ acres under management.
1984- Present	TOWN FOREST MANAGER for the Towns of Exeter, Londonderry, Candia, Plaistow, Brentwood, East Kingston, Deerfield, Epping, Brentwood, Sandown, Rye, Pittsfield, Chichester, Derry, Northwood, Dover, Madbury, Strafford, and Rochester developing/implementing multiple-use plans for publicly-owned forests.
1985- 1992	ALTON TOWN FORESTER. Consultant to the Town on Current Use Assessment and NH Timber Tax matters.
1980- 1988	K-F TREE FARM, Forest Manager. Experience in all areas of woodland and wildlife management in this intensively managed, 700-acre property in Alton, New Hampshire. Selected as 1988 Belknap County Tree Farm of the Year.

PROFESSIONAL RECOGNITION

New Hampshire Outstanding Forester Award (Society of American Foresters) -- 2001
National Outstanding Tree Farm Inspector Award -- 1999
Austin Cary Practicing Professional Award – (New England SAF, 1998)
NH Wildlife Stewardship Award – 1995
Outstanding New Hampshire Tree Farm Award 1987, 1992, 2002, & 2006
NH Tree Farm Inspector of the Year – 1985, 1990, 1992, 1993, 1998
Xi Sigma Pi (Forestry Honor Society, 1978)
Eagle Scout (1976)