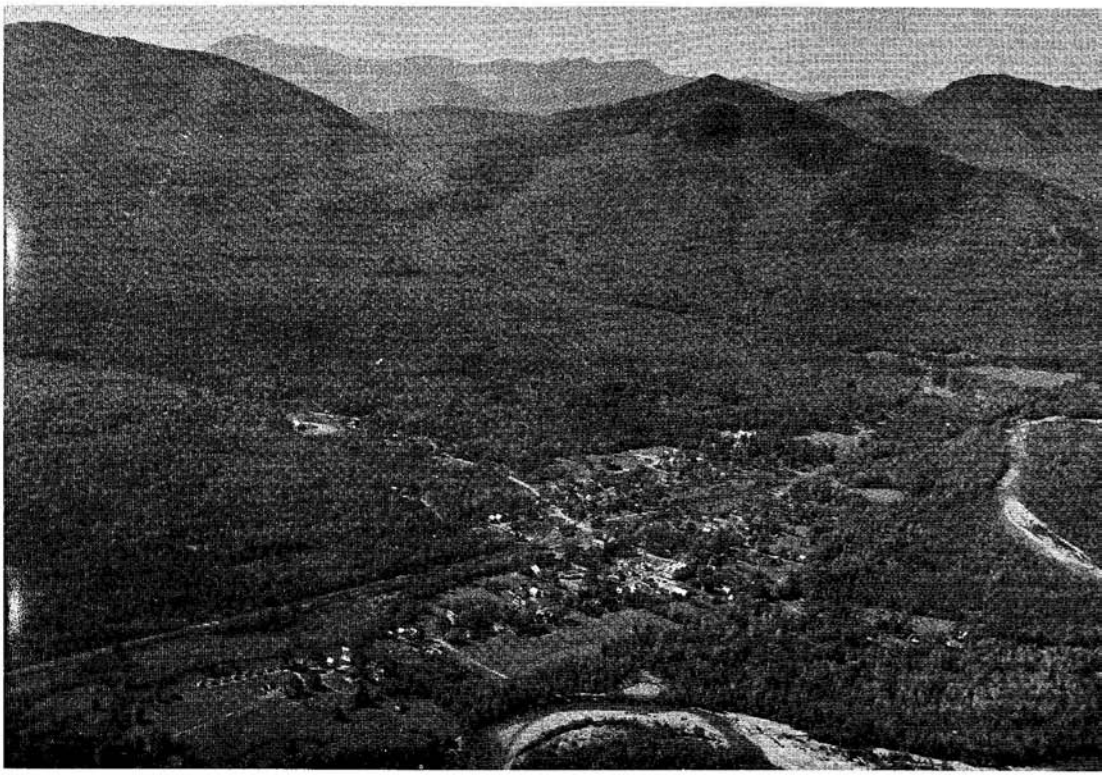
by Stanley M. Filip
and Elbert L. Little, Jr.

TREES and SHRUBS of the BARTLETT EXPERIMENTAL FOREST Carroll County, New Hampshire



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COVER PHOTO: Aerial view of the Bartlett Experimental Forest. Bartlett Village and Saco River in the foreground.

TREES and SHRUBS of the BARTLETT EXPERIMENTAL FOREST Carroll County, New Hampshire

Contents

THE BARTLETT FOREST

SIXTY-FIVE SPECIES of trees and shrubs have been identified as native on the Bartlett Experimental Forest. These species are listed in this paper to provide a record of the woody vegetation of the area.

The Bartlett Experimental Forest, part of the White Mountain National Forest, is adjacent to and south of the village of Bartlett, within the town of Bartlett, in the northwestern part of Carroll County in central New Hampshire (fig. 1). This 2,600-acre tract is located in the heart of the White Mountains, only 14 air-miles south of Mt. Washington, the highest peak in the Northeast, elevation 6,288 feet. Many forest conditions here are representative of 10 million acres of the northern hardwood forest ecosystem in New England.

The Bartlett Forest is one of the oldest experimental forests in the East. In 1928, when Congress authorized a comprehensive program of forest research, the Forest Service, U. S. Department of Agriculture, began establishing regional forest experiment stations and related research facilities throughout the United States. As part of this program, a segment of the White Mountain National Forest was set aside as the Bartlett Forest in 1931 for experimental purposes, with emphasis on basic and applied studies in ecology, silviculture, and management of northern hardwoods.

The Bartlett Forest has been used for this purpose ever since. At present the Forest is managed by the Northeastern Forest Experiment Station's research project on growth, composition, and culture of northern hardwoods, headquartered at Durham, New Hampshire *(NE. Forest Exp. Sta. 1969)*.

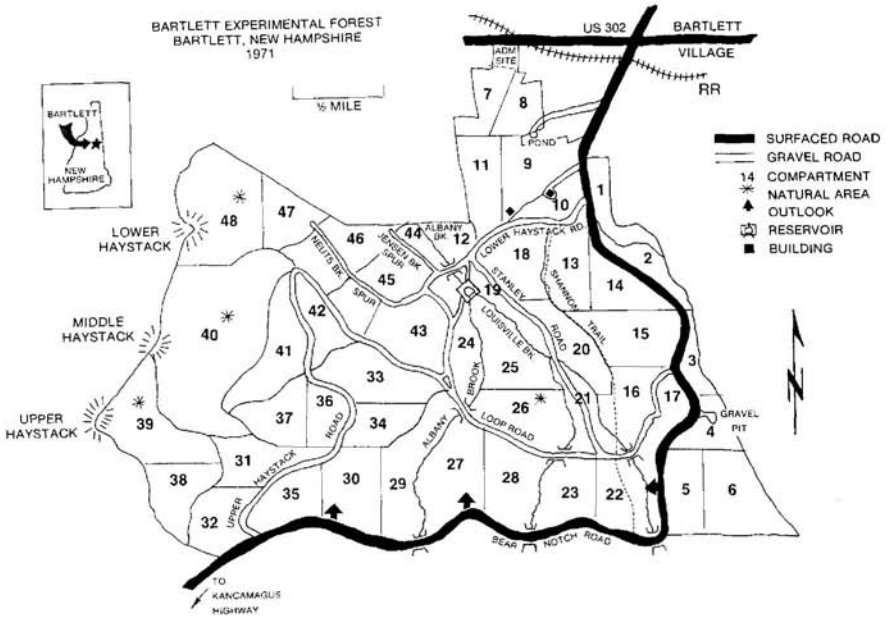

Figure 1.—Bartlett Experimental Forest, a part of the White Mountain National Forest, is located near the village of Bartlett, in central New Hampshire.

History

The earliest commercial logging on the Bartlett Forest took place about 1870. By 1900 the area had been logged several times. Only the best trees were taken in these operations. First the best spruce and white pine logs were taken. Later the best yellow birch and sugar maple were taken. Beech was seldom harvested, which increased the proportion of this species on the Forest.

During this early period, a logging railroad was built from the village of Bartlett up through the Forest. Many of the hardwood stands adjacent to this railroad were clearcut for fuel for the wood-burning locomotives. A few logging camps were established on the lower part of the Forest near Bartlett Village. The surrounding land was cleared and used for pasture, and some was cultivated.

Most of the desirable timber had been harvested by 1900. Then the logging ended, except for the harvesting of hemlock bark for tannin during World War I and some scattered cutting for fuelwood and paper birch millwood. After the railroad ceased operations, the cleared and pastured areas and the few cultivated areas reverted to forest.

Topography and Soils

The Bartlett Forest lies on the northern and eastern slopes of Bear Mountain (elevation 3,217 feet) and the Bartlett Haystack Mountains, recognized locally as the Lower, Middle, and Upper Haystacks. Elevations above sea level range from 680 feet at the lower end of the Forest to 2,995 feet at the summit of the Upper Haystack. The lower half of the Forest is gently sloping. The upper half is steep and rocky (fig. 2). Rock outcrops and ledges are common near the highest elevations.

The soils generally are sandy loams, derived through glacia-

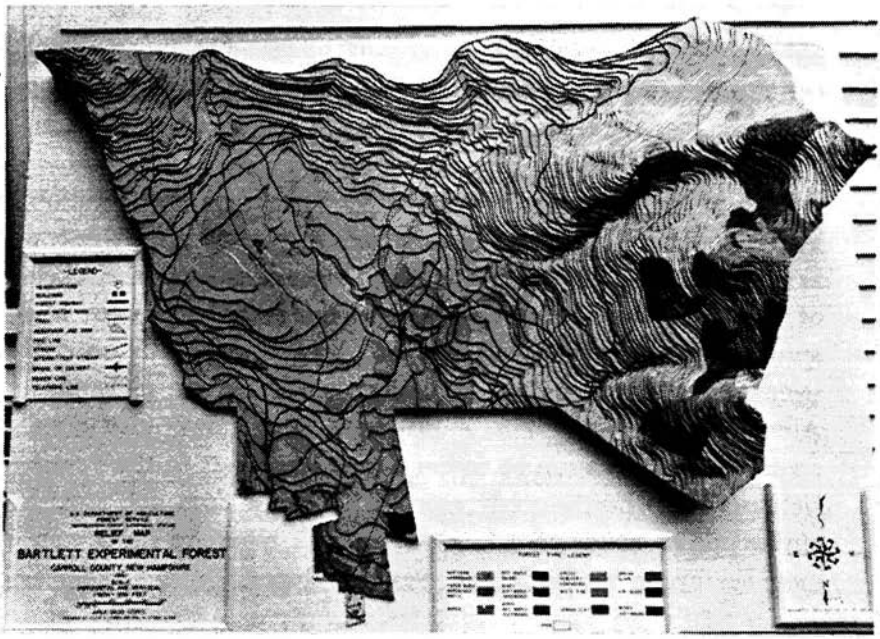

Figure 2.—Gentle lower slopes and steep upper slopes characterize the Bartlett Experimental Forest.

tion from granites and schists. Many of the soils are well drained, but some moderately well drained and poorly drained soils are interspersed, especially on lower elevations.

Climate

The average annual precipitation of about 50 inches is distributed fairly evenly throughout the year. About one-third of the moisture comes in the form of snow. As much as 5 to 6 feet of snow accumulates on the ground by the latter part of the winter and remains until mid-spring.

Average monthly temperatures range from 15° to 20° F. in January to nearly 70° F. in July. Temperature extremes range from about 35° F. below zero to the upper 90's. The growing season—the time between the first and last killing frosts—is a little over 100 days. Central New Hampshire is in Plant Hardiness Zone 4, which has average annual minimum temperatures of —30° to —20° F. *(U. S. Nat. Arboretum 1965).*

Vegetation

Nearly all of the Forest is now covered by high forest. The only exceptions are those areas recently subjected to experimental cuttings or occupied by roads, trails, gravel pits, brooks, and one small boulder field. A small amount of open meadow is found adjacent to one lower corner of the Forest.

The primary forest cover type is the sugar maple-beech-yellow birch type (fig. 3), classified by the Society of American Foresters as type 25 *(S. A. F. 1945)*. The upper elevations support thickets of spruce and fir. Softwoods such as hemlock, balsam fir, and spruce are commonly mixed with hardwoods, especially on cool steep slopes or on the poorly drained soils at lower elevations. Although white pine occurs mostly in stands at lower elevations, scattered specimens can be found over a large part of the Forest. Because of its northeasterly aspect, the Forest does not contain any extensive stands of oak. However, oak types are fairly common nearby on southerly and westerly slopes.

Figure 3.—From left to right: American beech, sugar maple, and yellow birch—the three characteristic tree species of the northern hardwood forest ecosystem in the Northeast.

NATURAL AREAS

Four compartments (26, 39, 40, and 48), in all about 500 acres, have been set aside as natural areas. These compartments, like the rest of the Forest, have been logged over in the past. However, no cutting has been done since 1900, and none is planned for the future. The sites, which vary from lowlands to upper slopes, will provide places for studying the development of the forest ecosystem under undisturbed conditions.

THE TREES AND SHRUBS

The list of trees and shrubs on the Bartlett Forest is based upon herbarium specimens collected by the authors in 1967, 1968, and 1969. Collections were made in the different forest types. Also, field trips were made on foot to the summit of Middle Haystack and to the saddle between Middle and Upper Haystacks.

The identifications were checked by Elbert L. Little, Jr. Scientific names of trees are those accepted in the U. S. Forest Service Check List *(Little 1953)*. Scientific names of shrubs follow Hodgdon and Steele *(1958)*.

Duplicate sets of about 115 specimens have been deposited in the Forest Service Herbarium now at Fort Collins, Colorado (formerly at Washington, D. C.), at the Bartlett Forest, and at the Herbarium of the University of New Hampshire, Durham, N. H. The Forest Service Herbarium also has 7 specimens collected from this by H. F. Morey in August-September 1934.

The native woody plants of the Bartlett Forest total 65 species in 43 genera and 21 plant families. However, 5 families together contain 36 species, more than one-half the total. Largest families are Rosaceae, with 6 genera and 11 species; Pinaceae and Capri foliaceae, each with 5 genera and 6 native species; Betulaceae, with 4 genera and 7 species; and Ericaceae, with 4 genera and 6 species. Thirteen families are represented by a single genus of woody plants, and 8 of these families by a single native woody species.

The largest genera of woody plants are *Acer, Betula,* and *Rubus,* with 4 species each, and *Salix* and *Prunus,* with 3 each. Only 4 varieties have been distinguished, and these are included in the species total. Two herbaceous species of woody genera are listed also, but are not counted in the totals. They are *Aralia racemosa* (spikenard) and *Cornus canadensis* (bunchberry).

Three introduced species add 2 genera and 1 family (Berberidaceae) to the totals above. These are *Pinus sylvestris* (Scotch pine), *Malus pumila* (apple), and *Berberis thunbergii* (Japanese barberry). All are rare on the Bartlett Forest. The first two are planted trees; the last is an introduced small shrub, possibly from seed brought in by birds.

These records will serve as a basis for future observations of introduced woody plants. Additional species now unknown here may be located or become established later.

Because this upland area has no permanent rivers or lakes and no peat bogs, woody plants of those wet sites are lacking. Also, this mountainous area in the White Mountains has a relatively colder climate than nearby areas along the Atlantic coast. Thus some southern species are absent here inland even though they extend farther northward near sea level. Also, the mountains are

not high enough for a timberline, so the dwarf shrubs of the subalpine and alpine zones are absent.

The recently published list of the trees and shrubs of the Penobscot Experimental Forest *(Safford et al. 1969)* provides a comparison. That area is located in Maine slightly farther north but near the coast at an altitude of 80-250 feet, and is bordered by a stream and a pond. Native woody plants of the Penobscot Forest total 98 species in 56 genera and 23 families. Thus the number of species is more than one and one-half times the total of 65 species found on the Bartlett Forest.

The relatively large number of plant families represented among the woody plant species of the Bartlett Forest and the small number of genera and species in a family may be of some significance. For example, the families average only 2 genera and 3 species of native woody species, and the genera have mostly 1 or 2 woody species.

Several species apparently are the northernmost or hardiest representatives of their genus or family in northeastern North America or in the northern hardwoods or eastern deciduous forests. For example, there is only 1 native species each of *Quercus, Ulmus, Crataegus,* and *Tilia.* Certain tree genera of the eastern United States are absent, not ranging so far north, at least in mountains. These include *Carya, Castanea, Celtis, Morus, Liriodendron, Magnolia, Sassafras, Liquidambar, Platanus, Robinia, Aesculus,* and *Nyssa.* No range extensions or unusual records were found at the Bartlett Forest. All the native woody plant species of the Forest have been cited previously from Carroll County by Foster *(1946),* Hodgdon and Steele *(1958),* Nehring and Leighton *(1967),* and Steele and Hodgdon *(1968).*

The woody plant species of the Bartlett Forest can be grouped conveniently into several classes according to size and growth form. These are large, medium, and small trees; large and small shrubs; and subshrubs. The 65 native species are:

Large Trees
(taller than 70 feet and 24 inches d.b.h. or larger; 8 species)

Pinus strobus
Tsuga canadensis
Acer rubrum
Acer saccharum
Betula alleghaniensis
Fagus grandifolia
Fraxinus americana
Quercus rubra

Medium Trees
(30 to 70 feet tall and 12 to 24 inches d.b.h.; 12 species)

Abies balsamea
Picea rubens
Pinus resinosa
Betula cordifolia
Betula papyrifera
Fraxinus nigra
Juglans cinerea
Populus grandidentata
Populus tremuloides
Prunus serotina
Tilia americana
Ulmus americana

Small Trees
(less than 30 feet tall and less than 12 inches d.b.h., commonly less than 6 inches d.b.h.; 13 species)

Acer pensylvanicum
Acer spicatum
*Alnus rugosa**
*Amelanchier laevis**
Betula populifolia
Cornus alternifolia
*Hamamelis virginiana**
Ostrya virginiana
Prunus pensylvanica
*Prunus virginiana**
*Rhus typhina**
*Salix discolor**
Sorbus americana

Large Shrubs
(taller than 5 feet; 10 species)

Cornus stolonifera
Corylus cornuta
Crataegus macrosperma
Ilex verticillata
Nemopanthus mucronata
Salix humilis
Salix rigida
Sambucus pubens
Viburnum alnifolium
Viburnum cassinoides

Small Shrubs
(shorter than 5 feet, often only 1 to 2 feet tall; 14 species)

Juniperus communis var. *depressa*
Taxus canadensis
Diervilla lonicera
Gaylussacia baccata
Kalmia angustifolia
Lonicera canadensis
Rhus radicans var. *rydbergii*
Ribes glandulosum
Rubus allegheniensis
Rubus canadensis
Rubus strigosus
Spiraea latifolia
Vaccinium angustifolium var. *laevifolium*
Vaccinium myrtilloides

*Often classified as a large shrub.

Subshrubs
(with creeping or trailing stems or with erect herbaceous stems slightly woody at base; 8 species)

Aralia hispida
Aralia nudicaulis
Chimaphila umbellata
Gaultheria hispidula
Gaultheria procumbens
Linnaea borealis var. *americana*
Mitchella repens
Rubus pubescens

These figures on growth forms show the effect of the colder northern climate on reduction of plant size. Of the 33 tree species, only 8 become large, the maximum size being about 90 feet in height and 30 inches d.b.h. Shrubs total 32 species: 10 large, 14 small, and 8 subshrubs. Thus there are relatively few species of large trees, many species of small shrubs, and a conspicuous element of subshrubs with creeping stems. Also, woody vines, with climbing or twining stems, though characteristic of warmer regions, are absent.

ANNOTATED LIST

PINACEAE: PINE FAMILY

Abies balsamea (L.) Mill. **balsam fir**

A medium-size tree, up to 14 inches d.b.h. Reaches best development on somewhat poorly drained softwood sites on lower slopes. Common as a small, sometimes stunted, tree in spruce-fir forests at elevations above about 2,500 feet.

Juniperus communis L.
var. *depressa* Pursh **oldfield common juniper**

A small spreading shrub, up to 4 feet tall. Found in old pastures and fields, it disappears from areas maintained in timberland. Not common. (Also placed in Cupressaceae, cypress family.)

Picea rubens Sarg. **red spruce**

Occurs in fair numbers as a medium-size tree on somewhat poorly drained softwood sites at lower elevations. Reaches largest size, up to 20 inches, in small groups, or as scattered trees, on northerly slopes in northern hardwood stands at

middle elevations. Occurs as a small tree in spruce-fir stands above about 2,500-foot elevation.

Pinus resinosa Ait. **red pine**

A medium-size tree, up to 24 inches d.b.h.; a scattered natural associate of white pine on sandy soils at lower elevations.

Pinus strobus L. **eastern white pine**

Reduced in numbers because of heavy cutting in the past; occurs mostly in small groups as a large tree, up to 30 inches d.b.h., in second-growth stands of softwoods or mixed softwood-hardwood stands at lower elevations.

Pinus sylvestris L. **Scotch pine**

Several planted trees of small size (6 to 8 inches d.b.h.) and low vigor are present on the northeasterly end of the Experimental Forest.

Tsuga canadensis (L.) Carr. **eastern hemlock**

A large tree that is abundant in somewhat poorly drained softwood sites at lower elevations, and a common associate in typical northern hardwood stands. Attains a diameter of 30 inches or more.

TAXACEAE: YEW FAMILY

Taxus canadensis Marsh. **Canada yew**

A small evergreen shrub, up to 3 feet tall. Common under both softwood and mixed hardwood-softwood stands on both lower and upper slopes of the Experimental Forest.

ACERACEAE: MAPLE FAMILY

Acer pensylvanicum L. **striped maple**

A small tree, up to 5 inches d.b.h. Bark on young trees is green-and-white striped. Fairly abundant, growing under older northern hardwood stands on middle and upper slopes.

Acer rubrum L. **red maple**

An abundant, very widely distributed tree of large size, up to more than 30 inches d.b.h. Commonly occurs as stump sprouts in cutover areas.

Acer saccharum Marsh. **sugar maple**

Largest and most valuable of the maples. Attains a breast-height diameter up to 30 inches. An abundant and characteristic component of northern hardwood stands.

Acer spicatum Lam. **mountain maple**

A small tree, up to 3 inches d.b.h., fairly common under older northern hardwood stands, especially on rocky areas in the middle to higher elevations.

ANACARDIACEAE: CASHEW FAMILY

Rhus radicans L. var. *rydbergii* (Small) Rehd. **poison-ivy**

A small shrub, rare on the Experimental Forest; confined mostly to a moist area along the road in compartment 43.

Rhus typhina L. **staghorn sumac**

A small tree, up to 20 feet tall. Common in abandoned meadows or pastures adjacent to the Experimental Forest.

AQUIFOLIACEAE: HOLLY FAMILY

Ilex verticillata (L.) Gray **winterberry**

A large shrub, up to 10 feet tall, found in fair numbers under open second-growth northern hardwoods, usually on poorly drained soils.

Nemopanthus mucronata (L.) Trel. **mountain-holly**

A large shrub, up to 6 feet tall, found in fair numbers in second-growth northern hardwood stands at lower elevations.

ARALIACEAE: GINSENG FAMILY

Aralia hispida Vent. **bristly sarsaparilla**

A subshrub with stem slightly woody at base. Common in recent openings and dry rocky areas.

Aralia nudicaulis L. **wild sarsaparilla**

A subshrub, almost stemless, with leaf and flower stalk, up to 1½ feet tall, commonly found under second-growth hardwoods and mixed softwood-hardwood stands at the lower elevations.

Aralia racemosa L. **spikenard**

A stout perennial herb up to 3 feet tall. Common in rich, moist areas.

BERBERIDACEAE: BARBERRY FAMILY

Berberis thunbergii DC. **Japanese barberry**

A small shrub, rare on the Experimental Forest, confined mostly to a red maple swamp stand in Compartment 7. Introduced into the United States from Japan as an ornamental, escaped from cultivation and perhaps spread by birds.

BETULACEAE: BIRCH FAMILY

Alnus rugosa (Du Roi) Spreng. **speckled alder**

A small tree or large shrub, not over 15 feet tall, that grows in clumps or thickets along streams or other wet places, usually in the open or partial shade.

Betula alleghaniensis Britton **yellow birch**

One of the characteristic and most valuable trees in the northern hardwood forest ecosystem. The largest of all birches, up to 30 d.b.h., it is found in both typical hardwood as well as mixed softwood-hardwood stands. Occurs as a small tree at elevations above about 2,000 or 2,500 feet. (*B. lutea* Michx. f.)

Betula cordifolia Regel **mountain paper birch**

A medium-size tree resembling *B. papyrifera* in habit, but slower growing and more prevalent on middle to high slopes,

and usually on cool sites. (*B. papyrifera* Marsh. var. *cordifolia* (Regel) Fern.) Also called white birch and canoe birch.

Betula papyrifera Marsh. **paper birch**

A medium-size tree, up to 18 inches d.b.h., characterized by white bark, sometimes pinkish, on trees larger than 2 to 3 inches d.b.h. Found in hardwood and mixed hardwood-softwood stands, mostly on low to middle slopes. Valued highly for millwood and sometimes veneer logs. A valuable tree aesthetically. Also called white birch and canoe birch.

Betula populifolia Marsh. **gray birch**

A small short-lived pioneer tree, up to 6 inches d.b.h., that occurs in old fields, old burns, or as a scattered tree following clearcuttings in northern hardwood stands.

Corylus cornuta Marsh. **beaked hazelnut**

A large shrub in forest openings, uncommon on the Experimental Forest.

Ostrya virginiana (Mill.) K. Koch **eastern hophornbeam**

A small tree, up to 10 inches d.b.h., widely distributed—but not abundant—in second-growth northern hardwood stands.

CAPRIFOLIACEAE: HONEYSUCKLE FAMILY

Diervilla lonicera Mill. **bush-honeysuckle**

A small shrub, up to 4 feet tall, found in rocky areas and open woods. Distinguished from fly honeysuckle by the slightly serrate and larger leaves.

Linnaea borealis L.

var. *americana* (Forbes) Rehd. **twin-flower**

A subshrub with creeping stems and small rounded evergreen leaves. Occurs in cool moist areas at low to middle elevations.

Lonicera canadensis Marsh. **fly honeysuckle**

A small shrub with straggling habit, fairly common in rocky areas, in open woods. Leaves are entire, in contrast to the bush-honeysuckle.

Sambucus pubens (Michx.) Koehne **red-berried elder**

A large shrub, up to 10 feet tall. Common but not abundant along roads and in other open places. (*S. racemosa* L. var. *pubens* (Michx.) Koehne).

Viburnum alnifolium Marsh. **hobblebush**

A common and abundant large shrub, up to 10 feet tall, characterized by its bright red berries. Grows in thickets under closed or partially opened hardwood and softwood stands. Also called witch-hobble.

Viburnum cassinoides L. **withe-rod**

A large shrub, up to 6 feet tall, that is fairly common in swamps and poorly drained areas at lower elevations. Also called wild-raisin.

CORNACEAE: DOGWOOD FAMILY

Cornus alternifolia L. f. **alternate-leaf dogwood**

A small tree, up to 20 feet tall, found in small numbers in moist areas, usually in somewhat open hardwood stands.

Cornus canadensis L. **bunchberry**

A small perennial herb, less than 8 inches tall, characterized by a whorl of dogwood-like leaves. Common under cool moist softwood and mixed hardwood-softwood stands throughout a wide range in elevation.

Cornus stolonifera Michx. **red-osier dogwood**

A large shrub, usually not over 6 feet tall, that forms small thickets in meadows or open woodlands. Uncommon on the Experimental Forest.

ERICACEAE: HEATH FAMILY

Gaultheria hispidula (L.) Bigel. **creeping snowberry**

A subshrub with wiry creeping stems and minute evergreen leaves. Occurs mostly in softwood stands at low to middle elevations (*Chiogenes hispidula* (L.) T. & G.)

Gaultheria procumbens L. **wintergreen**

A small creeping evergreen subshrub, occurring in patches under either dense or partially open softwood or mixed softwood-hardwood stands.

Gaylussacia baccata (Wang.) K. Koch **black huckleberry**

A small shrub up to 2 feet tall, found on rocky sites at high elevations.

Kalmia angustifolia L. **lambkill**

An evergreen shrub, usually less than 3 feet tall, that occurs in small pockets of moist soil under partially open second-growth hardwood or mixed softwood-hardwood stands.

Vaccinium angustifolium Ait. var. *laevifolium* House **lowbush blueberry**

A small shrub up to 1 foot tall, found at low and middle elevations in well-drained and often rocky sites.

Vaccinium myrtilloides Michx. **blueberry**

A small shrub up to 2 feet tall. Common in open and partially timbered areas, under a wide variety of conditions ranging from moist soils at lower elevations to rocky sites at higher elevations.

FAGACEAE: BEECH FAMILY

Fagus grandifolia Ehrh. **American beech**

A large tree, up to 30 inches d.b.h., and one of the characteristic and most abundant in the northern hardwood forest ecosystem. Widely distributed throughout a range of soils, elevations, and timber types.

Quercus rubra L. **northern red oak**

A widely scattered tree on the Forest, except on one small area having a southerly aspect. Here it is more abundant. Nearly pure stands occur adjacent to the Experimental Forest on southerly and westerly slopes. Occasional trees are large, up to 80 feet tall and 28 inches d.b.h., and well formed (*Q. borealis* Michx. f.)

HAMAMELIDACEAE: WITCH-HAZEL FAMILY

Hamamelis virginiana L. **witch-hazel**

A small tree or large shrub, up to 15 feet tall, reasonably common in somewhat open second-growth hardwood stands at lower elevations.

JUGLANDACEAE: WALNUT FAMILY

Juglans cinerea L. **butternut**

Represented by one observed tree, about 10 inches d.b.h., and a few seedlings, near a logging road in Compartment 1. Not common in this area, especially on the north-facing aspects. Possibly introduced.

OLEACEAE: OLIVE FAMILY

Fraxinus americana L. **white ash**

A large and well-formed tree, up to 26 inches d.b.h., found on moist rich sites in northern hardwood stands. A common though not abundant tree of appreciable commercial importance.

Fraxinus nigra Marsh. **black ash**

A medium-size tree, up to 14 inches d.b.h., found in a few areas at low elevations on poorly drained soils.

PYROLACEAE: PYROLA FAMILY

Chimaphila umbellata (L.) Bart. **common pipsissewa**

A subshrub with short stem, a few inches high, and evergreen leaves. Found mostly in dry areas, especially in sandy soil. Also called prince's pine.

ROSACEAE: ROSE FAMILY

Amelanchier laevis Wieg. **Allegheny serviceberry**

A small tree or large shrub, up to 6 inches d.b.h., widely scattered throughout hardwood stands on the Experimental Forest. Also called shadbush.

Crataegus macrosperma Ashe (?) **large-seed hawthorn**

A large shrub found in openings and dry rocky soil. Rare on the Experimental Forest.

Malus pumila Mill. **apple**

A few trees planted in, or escaped to, openings at the edge of the Experimental Forest.

Prunus pensylvanica L. f. **pin cherry**

A small short-lived pioneer tree, up to 8 inches d.b.h. Rare in undisturbed older woods, but occurs in abundance, sometimes in thickets, following old burns or clearcutting of hardwood stands. Extends to higher elevations in the spruce-fir forest. Also called fire cherry.

Prunus serotina Ehrh. **black cherry**

Occurs in small numbers, especially on moist sites at lower elevations, as a medium-size tree up to 14 inches d.b.h. and 50 feet tall.

Prunus virginiana L. **common chokecherry**

A small tree or large shrub. Occurs in openings and edges of clearings at lower elevations. Uncommon on the Experimental Forest.

Rubus allegheniensis Porter **common blackberry**

A small shrub up to 4 feet tall. Invades abandoned fields, large clearcut areas, abandoned logging camps, etc., where it remains abundant for several years, eventually giving way to other shrubs and tree species.

Rubus canadensis L. **thornless blackberry**

A small shrub similar in habit to *R. allegheniensis,* but having nearly thornless canes.

Rubus pubescens Raf. **dwarf red blackberry**

A subshrub with stems mostly creeping. Occurs on abandoned fields and clearcut areas.

Rubus strigosus Michx. **red raspberry**

A small shrub, easily recognized by the whitish lower leaflet surfaces. Abundant for a few years on abandoned fields and clearcuttings. (*R. idaeus* L. var *strigosus* (Michx.) Maxim.)

Sorbus americana Marsh. **American mountain-ash**

A small tree, up to 5 inches d.b.h., usually found in small numbers on rocky slopes at higher elevations. (*Pyrus americana* (Marsh.) DC.)

Spiraea latifolia (Ait.) Borkh. **meadowsweet**

A small straight-stemmed shrub up to 3 feet tall. Common in meadows or abandoned pastures adjacent to the Experimental Forest.

RUBIACEAE: MADDER FAMILY

Mitchella repens L. **partridge-berry**

A subshrub with creeping perennial stems. Common under softwood and mixed hardwood-softwood stands at lower elevations.

SALICACEAE: WILLOW FAMILY

Populus grandidentata Michx. **bigtooth aspen**

A well-formed medium-size tree, up to 24 inches d.b.h., found as a scattered tree in second-growth hardwood stands that have originated after clearcutting or land clearing. Locally called popple.

Populus tremuloides Michx. **quaking aspen**

A medium-size tree, up to 14 inches d.b.h., sometimes poorly formed and cankered, found in groups in second-growth hardwoods originating after clearcutting or clearing. Locally called popple.

Salix discolor Mühl. **pussy willow**

A small tree or large shrub, up to 15 feet tall, found in open woodland along streams or even in dry areas.

Salix humilis Marsh. **upland pussy willow**

A large shrub found in open woodlands and dry areas.

Salix rigida Mühl. **heartleaf willow**

A large shrub, up to 6 feet tall; occurs in clumps in wet areas and along streams. Distinguished by the slightly heart-shaped leaf base. (*S. cordata* Mühl.)

SAXIFRAGACEAE: SAXIFRAGE FAMILY

Ribes glandulosum Grauer **skunk currant**

A small shrub, up to 2 feet tall among boulders at high elevations. (*R. prostratum* Gray.)

TILIACEAE: LINDEN FAMILY

Tilia americana L. **American basswood**

A medium-size tree, up to 14 inches d.b.h. Sparsely scattered throughout second-growth northern hardwood forests in moist areas at the lower elevations.

ULMACEAE: ELM FAMILY

Ulmus americana L. **American elm**

Occurs in small numbers in second-growth hardwood stands, usually as a medium-size tree, up to 14 inches d.b.h.

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