THE TUDOR RICHARDS
NATURAL HISTORY
AND
FORESTRY TRAIL

A Self-Guiding
Educational Tour

Beaver Brook Association
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The countryside becomes more meaningful and interesting as we learn more about its history and ecology, that branch of biology that studies interactions among all living things and their environment. Humans have always depended on the land and always will. It provides not only water, food, fiber and minerals but also scenery, fresh air and space. Now, with populations exploding and cities expanding relentlessly, we must make wiser use of our natural resources. We must also set aside some areas for the study of Nature's ways so that we can understand them better and work with rather than against them. This is what conservation is about.

Beaver Brook Association invites you to follow this Natural History and Forestry Trail slowly and thoughtfully. We suggest you not try to see everything on the first time but plan future visits to this and our other trails, and at different seasons. This guide is your "instructor" on the self-guiding walk.

Trail Explanation

This trail is about one mile long and can be walked in about 40 minutes, but to truly appreciate the many natural features, you should plan on spending at least twice that much time. The trail is marked by white arrows to avoid confusion with other trails, and all features have numbered markers to correspond with this guide.

Most of the items marked by signs can be seen at any time of year unless dormant or hidden by snow. There are many other things of interest that cannot be marked by signs. The bird life, for example, may be both varied and abundant during migration periods, but scarce in winter. Mammals from moles to moose live here but few are seen from the trail, most being largely or wholly nocturnal. The tracks of non-hibernating species can be found during the winter. The presence of dens, gnawed plant parts and scat (droppings) may tell us what kinds of mammals there are. Reptiles and amphibians also live here: snakes, turtles, frogs, toads, and salamanders. There are innumerable insects, most of them beneficial to human interests or at least harmless. For seasonal and unusual sightings, please check the kiosk at the trailhead for up-to-date information. At the end of this booklet there are pages for notes you might want to make while walking and observing. If you find additional interesting features or experiences along the way, please let us know.
Important Reminders

- While there are no poisonous snakes here, black flies, mosquitoes, and deer flies can be bothersome in late spring and in summer. Be alert also for ticks, some of which may carry Lyme disease. Insect repellent (non-aerosol) and proper clothing will be helpful. A careful body check at home after a walk will help to find and eliminate ticks.

- To protect yourself from disease, do not touch live or dead animals.

- The only contact-poisonous plant you are likely to encounter on this trail is Poison Ivy (see description #5) which is scarce along most of the trail.

- No flowers or other plants should be picked on Beaver Brook Association property. Nothing, in fact, should be disturbed.

- Please help us keep this area attractive by not leaving papers, cigarettes or other trash on the trails. Beaver Brook is a carry-in/carry-out facility. For safety, and out of consideration for others, do not smoke in the woods.

- Please remain on the trail and especially watch children where the trail is steep.

- Dogs must be leashed at all times.

About this Edition

This abridged fifth edition of *The Tudor Richards Natural History and Forestry Trail Guide Book* is one of four seasonal guides condensed to focus on seasonal changes occurring in both plant and animal life. While not one seasonal guide covers *all* the trail markers that you will encounter, some overlap exists as markers of particular importance are discussed throughout the series, such as poison ivy and invasive plants.

The complete edition of this guide book was originally created by Tudor Richards, the first director of Beaver Brook Association in the 1960s. In recognition and gratitude for his many and continued contributions to Beaver Brook Association, it is appropriate that this self-guided trail should be named in his honor.

Through the years many others have contributed to periodic revisions. Priscilla Kunhardt provided most of the illustrations. For this 2003 revision, Jack Carroll kindly redrew several new illustrations while Barbara Rottenberg cheerfully typed up the revised pages. The fifth edition, published in 2003, was revised and edited by Peter Smith, Janet MacFarland, Glenn Lloyd, Lorna Levi, Harriet Chaplin and Tudor Richards. In 2006, the fifth edition was edited into four seasonal guides by Alan Sauve’.

For the complete trail guide booklet, contact our office at:

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Office Hours: Monday – Friday, 9AM – 4PM
AREA A - SUCCESSION/STONE WALL

1. **Sapsucker Holes**
The horizontally drilled holes in this apple tree were made by a yellow-bellied sapsucker. The bird drills holes to release the sap and then returns to drink it. Other birds, such as titmice, hummingbirds and nuthatches, also enjoy the fresh flow of sap. This old apple tree is a valuable resource for many animals. Deer browse the twigs and eat the apples, and the cavities provide nesting and shelter for small mammals and birds.

2. **Scarlet Oak (Quercus coccinea)**
The Scarlet Oak is frequent in the lower Merrimack Valley of NH and is so called because of the brilliant color of its autumn leaves. It is a medium-sized tree of the forest and roadside with dark bark that is strongly fissured. The leaves are smooth with deeply cut lateral lobes, and its acorn cup is about half the length of the nut with scales not forming a fringe.

3. **American Elm (Ulmus americana)**
A native forest tree formerly common in swamps and once greatly valued as a shade tree that lined many town and city streets, the American Elm has been decimated by Dutch Elm disease, a fungus spread by a beetle. This specimen is unlikely to survive to full size. It is rare to see a full-grown elm today.

4. **Butternut (Juglans cinerea) and Black Walnut (Juglans nigra)**
Butternut is a native nut-producing tree valuable for many species of wildlife. The nut is enclosed in an oblong sticky husk. Black Walnut, which is not native this far north, is a very valuable timber tree. Its nuts have a spherical husk.

5. **Poison Ivy vine (Rhus radicans) growing up the tree**
Poison Ivy can confuse most of us with its many forms and colors. It starts as a small, non-woody plant and becomes a shrub or vine. Its compound leaves always have three leaflets with pointed tips. Poison Ivy leaflets can be shiny red in spring, bright green in summer and yellow or scarlet in the fall but are always in threes. Learn to identify the plant, its spring flowers and late summer white berries, which are eaten by over 60 kinds of wildlife.
**Sugar Maple** (*Acer saccharum*)

The Sugar Maple is one of the largest and most valuable of the maples for timber and sugar products in the northern states and Canada. There is concern that the Sugar Maple is on the decline due to a number of reasons including acid rain and global warming. This decline will certainly affect the maple sugar industry and may result in the loss of a spectacular fall foliage tree. The leaves of the Sugar Maple are easily recognized by their 5 lobes with deep u-shaped notches between the lobes. In winter look for brown pointed buds on brown twigs. The bark on the older trunks is grayish and shaggy. Also called rock or hard maple, this fine species is one of our most shade-tolerant trees (see #8).

**Black Cherry** (*Prunus serotina*)/ **Sugar Maple** (*Acer saccharum*)

Growing in a close embrace, these two trunks appear to be one tree. Their contrasting bark is a give-away, however. The dark plates with upturned edges spell Black Cherry, while the paler, smoother bark indicates Sugar Maple. Both are valuable for their lumber, as ornamentals, and as generous providers of food and cover for wildlife. Notice the vigorous young poison ivy vines climbing this and another maple nearby.

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**#8 Storyboard - Succession**

This grove of trees was once part of an old orchard, as indicated by the few trees and sprouts still present. It has become overgrown naturally in the past fifty years because it was not kept mowed. This is typical of what has been happening to millions of acres of former farmland in the Northeast in the last century as people have moved off farms to pursue other livelihoods.

Abandoned fields, orchards and pastures usually go through several stages of plant succession. First come annual grasses and “weeds,” followed by herbaceous perennials, and then native shrubs and trees appear. The tree growth when undisturbed typically occurs in pioneer, intermediate, and climax stages.

As this little grove of trees has developed, woodland animals like ruffed grouse (partridge) and squirrels often visit. In early spring and autumn there may be a surprising variety of wood warblers and other migrating birds, and later in spring and summer, a few nesting birds.
Stages of Succession

Because the natural vegetation of New Hampshire is forest, abandoned open land tends to revert to forest. Over time, an area's plant and animal life changes in an orderly sequence. The change from open to forested landscape occurs in several stages.

The pioneer or initial tree stage consists mostly of trees that originate from wind-blown seeds, such as the aspens, gray and paper birches, and Pitch Pine, or from heavy seeds, like cherries, dropped by birds. These pioneer trees are usually fast growing, but relatively short-lived. They are generally unable to reproduce seedlings of their own kind in their own shade. Animal life includes grasshoppers, meadow voles, woodchucks, and song sparrows.

An intermediate stage tends to occur following the pioneer stage. Typical species are relatively long-lived trees like White Pine, Red Maple, White Ash, Black Birch and the oaks, which can develop in light shade.

A climax stage often follows consisting of trees that grow well in the shade of intermediate species and also in their own shade where it is not too dense. In much of southern and central New Hampshire, the most common "climax" species is Eastern Hemlock, one of the longest lived of our native tree species. Other major climax species of this region are Sugar Maple and American Beech. Where undisturbed for long periods, climax species succeed themselves, but sooner or later a bad storm or lightning-caused fire opens the forest floor to light and exposes mineral soil, encouraging the return of intermediate or even pioneer species.

As time goes on, intermediate and then climax tree species should gradually become more important here. The pioneer stage will most likely persist along the edges as long as the surrounding areas are kept open.

Hemlock (Tsuga canadensis)

Growing in pure stands or mixed climax forest with hardwoods, hemlock can reproduce in considerable shade and may live hundreds of years. Although its wood has limited value, its small cones stay on the tree throughout winter, providing seeds for several kinds of winter resident birds. In winter, twigs cut by porcupines may serve as winter browse for deer. For the cover it provides, especially in winter, hemlock could well be considered the most valuable tree for wildlife in southern New Hampshire. Used as an ornamental, hemlock can be trimmed to make an excellent hedge. It is in no way related to the notorious "poison hemlock."

An Exotic Pest

Our Eastern Hemlocks are threatened with an introduced pest as small as a pencil point. The culprit is an insect known as the Woolly Adelgid (Adelges tsugae). The Woolly Adelgid feeds by sucking the sap from hemlock twigs at the base of its needles. Heavy populations of the insect can cause severe damage and death to the trees. The adelgid arrived in this country from Japan and China where it is native. Many exotic pests and diseases find their way to the U.S. through global trade and travel. Examples of other well-known and damaging exotics are Gypsy Moths, Chestnut blight, Dutch Elm disease and White Pine blister rust. The Woolly Adelgid is currently damaging hemlocks along the East Coast and can be dispersed by birds, wind, and transplanted nursery stock. Attempts are being made to eradicate the pest before it spreads further into the New Hampshire forested areas.
Glacial Till

Weathering and natural erosion over millions of years have caused much rock to become pulverized into glacial till, which was spread by the glaciers over most of our land as soil. The warming climate enabled forests teeming with wildlife to reclaim the landscape.

Native Americans, probably following wildlife, not only cleared areas for their gardens, but also burned forests extensively to clear out the undergrowth, making travel and hunting easier.

Starting only about 250 years ago large acreages were cleared by settlers for fields, pastures, orchards, houses and roads. The maximum extent of this open land was reached in southern New Hampshire before 1850, when the forest was reduced mostly to small scattered woodlots and sugar bushes.

AREA B - LANDSCAPING FOR WILDLIFE

Dwarf or Common Juniper (Juniperus communis)

This low evergreen shrub is generally found in old pastures and overgrown fields and occasionally on open ledges. Its bluish black berries are relished by birds such as cedar waxwings and grosbeaks and have been used by humans as medicine and to flavor gin.
Dogwood and Shadbush

**Flowering Dogwood** (*Cornus florida*) is generally a rare native tree this far north, but fortunately common in Hollis. It is perhaps our most beautiful flowering tree. Its berries, along with those of our other native dogwoods, are relished by many kinds of birds and mammals. Though a shade-enduring species, once established it grows even better in the open.

**IN BACK: Chinese Chestnut** (*Castanea mollissima*) is a blight resistant Asian species closely related to the decimated, native American Chestnut (see #65). Attempts to cross this species to find a hybrid that combines the form and strength of the native chestnut are ongoing but as of yet, unsuccessful.

**Shadbush** (*Amelanchier canadensis*) also known as shadblow, serviceberry, juneberry, sugar plum, etc. Its berries are eaten by many birds such as catbirds, thrushes, waxwings, orioles, and grosbeaks as well as by foxes and squirrels. Beaver and deer often relish its bark or twigs. **Red Oak** (*Quercus rubra*) This is a fine example of our most widely distributed and our principal commercial oak. The age of this specimen is estimated to be a little over 100 years.

Oaks

Poor specimens of **Black Oak** (*Quercus velutina*), **Red Oak** (*Quercus rubra*) and **White Oak** (*Quercus alba*) growing in close enough proximity to invite comparison.

Red and Black Oaks have leaves with pointed lobes and are very similar in looks. Red Oak is usually the more valuable timber tree of the two and has larger acorns. The White Oak has leaves with rounded lobes and smooth, light colored bark. The acorns are usually smaller than the other two and are considered edible. An important timber tree, the wood is hard, strong, durable and attractive. It is used for tight barrels, furniture, flooring, finish wood and fuel.

The mast (fruits and nuts of trees and shrubs) from mature oaks is of major importance for wildlife. Acorns are rich in carbohydrate, fat and vitamins and are the "staff of life" for many of our native wildlife species including deer, turkeys and squirrels.
All wildlife needs **food**, **cover**, and **water**. Green plants support the **food chain**, using the energy of the sun to make sugar from water and carbon dioxide. Plant eaters convert the sugar into **protein** and **fats**. Predatory insects, birds and mammals feed on the plant eaters. This web of food links would collapse without its foundation of green plants. For a variety of wildlife, a wide diversity of seed, berry, and foliage plants is needed.

**Cover** is used for general protection from predators, resting and foraging, for roosting or rearing young, and for escape or travel routes. The naturally available cover can be increased or improved by planting or pruning vegetation. Constructed cover such as brush piles, nesting boxes, rock piles, or log piles may benefit many types of wildlife.

Beaver Brook is fortunate in having an abundance of natural wetlands, ponds and streams to meet wildlife's need for **water**. Where water is limited, sources ranging from a simple birdbath to a hand-made pond can be provided.

**Elliptical Holes**

The shape and size of the holes in this old pine snag (a dead or dying standing tree) tell us they were made by a **Pileated Woodpecker** seeking **Carpenter Ants**. This woodpecker is not rare but generally shy. Almost crow-size and largely black, it has a flaming red crest and much white on the neck and under the wings. Its loud call is much like that of the **Common Flicker**.

**Pitch Pine** (*Pinus rigida*)

This coniferous tree with a rather scrubby, contorted look grows to a height of up to 80 feet. Its rigid, often twisted needles are in bundles of three. Adapted to fire, the tree has thick bark that protects the trunk from burning, and some of the cones remain closed until singed, when they release seeds that
germinate well on burned-over soil. In early days Pitch Pine was a source of turpentine, resinous knots for torches, and charcoal for wood-burning locomotives.

Note another specimen of Pitch Pine ahead on the left hand side of the trail. The best specimens of this species can be confused with Red Pine (Pinus resinosa), which has similar bark but only two needles to a cluster.

**Brush Pile**

A strategically located brush pile, close to a fence row, woodland edge, field corner or other travel lane, may be used by rabbits, woodchucks, chipmunks, mice, voles, many small birds, and some kinds of snakes. Arranging the brush over a stump or heavy tree limb creates "apartments" inside, and prolongs the useful life of the pile by slowing its decay. One practical design calls for a pile about 5 feet high and 12 feet across, with a few heavy branches on top to prevent damage by wind.

**SEASONAL NOTE:**

In spring look for tent caterpillar nests in the crotches of trees; in autumn, the caterpillar nests enveloping whole branches are made by fall webworms.

Eastern tent caterpillars overwinter in "varnished" egg masses around twigs. The caterpillars hatch in early spring and make their silk tents in the crotches of limbs. They leave their tents for feeding, and return only to rest. Apple and cherry are the most common food plants.

Fall webworms are social caterpillars that spread their webs over the foliage of deciduous trees and feed on the leaves inside the web. Their eggs are laid on the undersides of leaves, and the pupae overwinter in cocoons. Both of these caterpillar species do little or no serious damage.

**Threats to Native Habitats**

Invasive plants continue to pose a threat to the native plant habitats of New England. Many crowd out and smother native plants by shading them from sunlight, choking them of nutrients, or changing the pH balance of the soil. Several prevalent invasive plants found in this area are described here.

**Oriental Bittersweet (Celastrus orbiculatus)** is a woody vine that produces attractive orange-yellow berries which split to reveal fleshy scarlet seeds consumed and spread into nearby woods by birds. This prevalent vine with its bright orange roots overwhelms native shrubs and trees and blocks sunlight from plant life below with its rounded leaves. **Autumn Olive (Elaeagnus umbellata)**, with its nitrogen-fixing ability, interferes with the nitrogen cycle of native plant life in successional areas. This shrub can be identified by the silvery white scales on the undersides of its smooth elliptical leaves, tiny silvery scales on the stems and buds and when in season, pinkish red berries with silvery scales. In unmanaged fields, **Multiflora Rose (Rosa multiflora)** often flourishes to form thorny thickets that overtake other plants with its arching stems or runners. In early summer, white flowers with yellow stamens bloom to form bunches of red fruit in late fall. Two species of the invasive **Honeysuckle (Lonicera spp.)** found either as a shrub with red berries or a vine with black berries both grow rapidly to engulf and smother smaller plants and saplings. Another fast grower, the **Common Buckthorn (Rhamnus cathartica)** has opposite pointy twigs and shiny black berries. Once established, these invasive plants are extremely difficult to eradicate.
#18 Storyboard – Invasive Plants

Standing here and looking around, you find yourself surrounded by enemy aliens: honeysuckle, autumn olive, multiflora rose, buckthorn, bittersweet.

Invasive aliens pose a great threat to native New England plants. Many were introduced as garden plants, for medicinal purposes, livestock fodder, wildlife habitat, or accidentally as hitchhikers. In most cases they were not pests at home and only a minority has made pests of themselves here. But a few bad-actors, removed from the natural checks and balances they grew up with, may flourish out of control. Their invasive habit reflects certain traits: they thrive in disturbed areas, are prolific seeders with effective seed dispersal methods, grow fast, have extensive root systems, and compete aggressively, even creating toxic soil conditions for other plants. Unchecked, they can out-compete native species and transform an entire ecosystem.

Control may be achieved by digging or hand-pulling, mowing to prevent seed formation, using biological controls such as a beetle or a disease from the plant’s native habitat, or applying herbicides under certain conditions. It is important to reestablish native species promptly to fill the space vacated.

What can you do? Even if you do not live near a natural area, avoid buying invasive species for your garden. Plants easily spread along roadsides, by birds eating the fruit, or by furbearers picking up hitchhiking seeds.

**Multiflora Rose**

**Autumn Olive**

**Hawthorn** (*Crataegus*)

This small tree is used by more than 20 kinds of birds and mammals. Its thorniness, dense branching and heavy foliage provide nesting and cover. The fruits, which stay on the tree through winter, are especially favored by cedar waxwings, fox sparrows and ruffed grouse, and the flowers provide nectar for butterflies, bees and hummingbirds.
Hawthorn's attractive flowers, fruit, and colorful fall foliage, as well as its drought resistance, make this native a good choice for home landscaping. Of the numerous species, Washington Hawthorn (*Crataegus phaenopyrum*) is most resistant to hawthorn rust disease.

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**AREA C - MEADOW/WOODS**

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**#20 Storyboard – Meadow**

A meadow can be defined as an open area made up mostly of non-native grasses and other herbaceous plants. The meadow here, as in most of the Northeast, persists because of periodic mowing. It would soon be taken over by shrubs and then young forest if left untouched. The most obvious plants in the meadow are the grasses. Grasses have fibrous root systems that allow the plants to grow in thick clumps. The roots of other plants, such as asters, goldenrods, hawkweeds and Queen Anne’s lace, compete by working their roots into the soil between the grass clumps.

The full sun in a meadow allows for the greening of plants early in the spring. Insects abound. Browsers visit. Birds find food, cover and nesting material. Who are the wild inhabitants in a meadow? Woodchucks (also called groundhogs) and deer will forage here, but more numerous are the meadow mice, voles, and insects such as crickets, grasshoppers, leafhoppers, a variety of caterpillars, aphids, praying mantis and many more. The numerous insects attract birds, shrews and snakes, which in turn attract fox, skunks and birds of prey. The meadow is a continuous food chain using energy from the sun to support a wide variety of plant and animal life. We also enjoy its beauty, fragrances and open space.

**The Eastern Bluebird**

Bluebirds are attractive and beneficial insect eaters. To attract them, nest boxes with the required 1½” opening are placed in suitable habitat on the edges of fields, orchards or pasturelands. Several boxes have been placed here. Listen for the birds’ soft melodious warble.

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**20 Bluebirds**

Few birds are as well known and liked as the **bluebird**. The bird is not as common as it once was in the state. Habitat changes brought on by reforestation of open fields, increasing development, the loss of natural cavity nesting sites, competition with tree swallows and non-native birds, such as house sparrows and starlings, and suburban spraying programs have all taken their toll.
Fortunately, the bluebird responds to human help and will generally use nest boxes placed in suitable habitat, as seen here in the meadow. Beaver Brook volunteers maintain about 60 such boxes to encourage the return of bluebirds. The male Eastern Bluebird is a bit larger than a sparrow, a brilliant blue with a rusty breast. The female is similar but duller in color. Bluebirds appear round-shouldered when perched on wires and fences. They often raise two broods per year. Their diet consists of insects and berries and they can often be seen swooping down to the ground to find insects. Song is a sweet melodious warble.

#21 Storyboard – Field Edge

Field edges show us the transition from a field community to a forest community through the process of succession. Shrubs, young trees and herbaceous growth form a natural wildlife path from field to forest. This varied natural edge is maintained to provide nesting, shelter and escape areas that are valued by many species of wildlife, creating cover for both predator and prey. The plants that establish themselves here provide wildlife with a rich resource of food such as berries, nuts and seeds. Plants common in the New England field edge are: sumac, dogwood, oak, poplar, viburnum, hazelnut, elderberry, milkweed, pokeweed and goldenrod.

22 Lightning Tree

Lightning, because of its awesome beauty, grips us with an elemental fascination. Lightning also grips us with an element of fear because of its awesome power and potential for death and destruction, an example of which is the tall pine in front of you. It is dead because it has been struck by lightning on at least two separate occasions. A lightning stroke typically begins when powerful negative electrical charges start to zigzag toward earth to be met by upward flowing "streamers" that are positive charges that have been concentrated in the tallest objects beneath the cloud. When the two charges meet a pathway is established for the return stroke and it is this second stroke that we see as a flash of lightning. The temperature of this second stroke can be as much as 50,000 degrees or hotter than the surface of the sun. Indeed, this intense heat can cause sand to melt into glass and the cells in trees to vaporize causing them to explode.

A good lesson to learn from this is that if you cannot avoid being outside in the open during an electrical storm, CROUCH down, do not lie down, and NEVER, EVER seek shelter under a tall tree or be near utility poles, fence posts, flag poles or other similar objects.

23 Black or Sweet Birch (Betula lenta) and Canada Mayflower (Maianthemum canadense)

A fairly common tree in southern NH, up to 60 feet in height, Black Birch is often confused with Black Cherry. It grows well on many of the better soils and is also characteristic of ledgy areas like this. It can stand a moderate amount of shade and often mixes with hemlock. Its outer bark is smooth and slate colored when young, maturing to dark scaly plates. Its inner bark has a strong wintergreen smell and once had commercial value. Black Birch is relished by beaver.
In season Canada Mayflower, also known as wild lily-of-the-valley, blooms here and carpets many areas of the forest. New plants have a single green leaf and no flower. Older plants have two to three leaves and a white flower in a feathery cluster.

**Witch Hazel** (*Hamamelis virginiana*)

Witch Hazel is a coarse shrub or small irregular tree up to 15 feet. It is frequent throughout northern New England woods, thickets and open areas. Leaves are oval and lopsided at the base. The flowers have thin yellow, half-inch curving petals growing in clusters and blooming in September though often persisting through the fall until winter. An oil is extracted from the bark, diluted in alcohol and sold as an astringent.

**Shingle Pile**

It is roughly estimated that this pile of discarded shingles was placed here more than 60 years ago. They are still in evidence and easily identifiable after all this time. The pile has been left undisturbed to illustrate the long life and negative environmental impact of various trash materials.

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**Area D – Natural Area**

**White Pine/Hemlock Forest**

This extensive area, except for its trails and signs, is to be kept in its natural state for the study of natural history, ecology and the enjoyment of its scenery. No cutting or timber management will be done in this natural area except to maintain trails. This, barring natural catastrophe, should allow some of the trees to get very old and very large.

Because the slope here faces northwest - away from the sun - the **microclimate** here is cooler and moister than the area you just passed through. This favors plants that require more moisture.

**White Pine** and **Eastern Hemlock** are two of the most common trees in southern New Hampshire. Both have soft wood, as do most needle-leaved, cone-bearing trees or **conifers**. Of the two, hemlock is the more important for wildlife, primarily because it provides somewhat better cover and abundant winter browse for deer. White Pine, however, is also important for cover and food; its seeds are eaten by a variety of birds and mammals.

In southern New Hampshire, White Pine (see #40) is near the center of its climatic range; consequently, it grows well and abundantly in a variety of soil conditions from dry and shallow to wet and deep. Hemlock prefers cooler, moister sites on average, than does White Pine and the oaks. Hemlock’s range extends hundreds of miles south of here along the Appalachian Mountains, but it is limited there mainly to cool, moist ravines.
Mounds - caused by roots of trees felled by windstorm
Such uprootings help to mix the topsoil and the subsoil. Most likely these trees were felled at the same time in the great hurricane of 1938. Wind gusts of well over 100 miles per hour created extensive blow downs in the New England area. About a quarter million acres of forestland were leveled.

Chestnut Oak (Quercus prinus) - Here, growing near its northern limit
This uncommon species likes ledge areas and has distinctive bark and chestnut like leaves. The rounded lobes of the leaves tell us this species belongs to the White Oak group. Its large acorns provide food for wildlife.

Polypody ferns (Polypodium vulgare) and Rock Tripe lichen (Umbilicaria mammulata)
Note the Polypody ferns on top of the rock ahead and the Rock Tripe lichen on the side. Polypody, one of our relatively few evergreen ferns, characteristically grows on rocks. All lichens are combinations of algae and fungi living together in "symbiosis." They produce chemicals that help break down the rock into soil, allowing other plants to get a foothold.

Pincushion Moss
Pincushion Moss forms dense whitish cushions on moist, humus-rich soil or decayed stumps. Rarely producing spores, it multiplies by fragmentation due to scratching by birds or disturbance along forest trails.

Scenic Area
The steep cliff to the right drops 100 feet to the valley floor. The stream or brook known as "Beaver Brook" cut a narrow valley following an ancient fault in the bedrock. The valley was expanded by thousands of years of erosion including wear by the last glacier and by Beaver Brook itself when its waters swelled from the melting of the ice.

Bedrock Exposure
In the outcropping of bedrock on the left, you see layers of light gray and darker rock. Originally laid down hundreds of millions of years ago as silt and mud deposited in a shallow sea, compression under its own weight transformed it into sedimentary rock, one of three general types of rock recognized by geologists. Much later, due to intense heat and pressure at great depth, it was further transformed into metamorphic rock (the second main type of rock). After millions of years of uplifting and erosion, it was exposed in its present position. The many cracks in the rock are called "joints."
To the left notice the -Hemlock (sec#9) and to the right an old Black Birch (see #23)

Beyond is a big hemlock growing on top of a rock, which illustrates how trees grow well even under harsh conditions.

White Pine naturally pruned and producing knot free, clear wood

Knots are the remains of branches and in saw logs for lumber, very large or loose knots are considered structural defects. So, in theory at least, clear, knot free wood is more valuable than wood containing knots. However, good knotty pine lumber with small tight knots (the remains of live branches) is used extensively.

Trees growing in open conditions may have branches nearly to ground level that can remain alive for years and grow to be very large. In contrast, trees growing close together tend to produce smaller branches that die off due to shading. These small, dead branches start to break off over time, leading to knot free wood growing over the branch scars.

In managed stands of young White Pine, it is often a good forestry practice to use a pole saw to remove the live or dead lower branches on well spaced promising specimens within the stand. This treatment is usually done in combination with a thinning operation.

Hardwoods, unless they are specimen trees, are usually not pruned by hand because under forest conditions their lower branches tend to be pruned off naturally at an earlier stage.

Black Oak sprout clump that has been attacked by Fomes fungus

This oak clump sprouted from the stump of a former oak that was probably cut for firewood. Unlike the fruiting bodies of most other fungi, those of the genus Fomes go on living for years, adding a new layer each growing season. Ahead, on the right, is another Black Oak under attack by the fungus. Note the fungus fruiting body about 12 feet up the tree. Most of the fungus is actually inside the tree.

SEASONAL NOTE:
Look for Pink Ladyslippers (Cypripedium acaule) in bloom here in early May.
This flower, New Hampshire's state wildflower (the lilac is the state flower), is our best known, orchid in eastern North America. It has two broad basal leaves and a pouch-like pink flower that attracts pollinators with a nectar-like scent. The plant requires acidic soil and is most often seen in oak or pine forests. The germinating seeds of the ladyslipper form a symbiotic relationship with a special fungus in the soil and take several years to mature.
Ground Covers
Here we have a ground cover of various true mosses, two kinds of club moss, evergreen wood ferns, trailing arbutus, partridge berry and checkerberry (also known as wintergreen). The **Trailing Arbutus, or Mayflower**, has creeping evergreen stems with tiny pink fragrant flowers blooming early in the spring, sometimes before the snow has melted and certainly before the new leaves unfold in June. **Partridge berry** (*Mitchella repens*) has tiny leaves opposite each other on trailing stems, white flowers that bloom in early summer and bright red berries that often last through the winter. **Checkerberry** (*Gaultheria procumbens*) has rather round leaves that are generally shiny on top and a wintergreen aroma. Small white flowers bloom in summer and a single red berry may be found in the fall.

Cut-over Area
This area, before it was owned by Beaver Brook, was largely stripped of its timber in about 1950 and obviously not according to the recommendations of a forester. Now it is part of the natural area and has partially recovered.

Sunscald
**In Back:** A tall white pine showing the effects of severe sunscald caused when two trees that had been shading it were removed. The tree's tender bark was unable to withstand sudden and prolonged exposure to strong sunlight. The sunscald damage attracted and allowed entry to carpenter ants which in turn attracted woodpeckers. Even in managed stands, potentially valuable den trees like this are worth leaving for wildlife homes.

Glacial Erratic
Note the boulder in the back, a **glacial erratic** (see Storyboard #10) of granite representing the third general type of rock, **igneous rock** (see #32), derived from molten magma.
Forestry Area
Most of the lumber we use comes from southern United States, southern Canada, and the West Coast. With an ever-increasing population, forestry in the East is becoming more important.

Forestry, in the broad sense, is the same as forest conservation or "wise use" of forests as opposed to mere preservation, which is sometimes called for. In the narrow sense, forestry is often used interchangeably with the term "timber management," with emphasis on growing more and better timber. To do this calls for "silviculture," that branch of forestry concerned with growing and reproducing forest trees according to certain accepted, scientific practices, including selective cutting. Forestry of this sort would be practical and economical on much of New England's present woodland, especially with current use assessment taxation on land. If silviculture replaced the destructive sort of logging that is sometimes still seen, it could eventually more than double present production and also greatly improve its quality.

Incidentally, New Hampshire and Maine lead the United States in the proportion of forest area, about 87%. This demonstration shows several different types of silviculture practiced on one part or another of Beaver Brook Association woodland.
Thinning and Pruning White Pine
White Pine is central New England's most important lumber species. Because of its abundance, regenerating capacity, fast growth, and the very high quality softwood it can produce, White Pine is potentially one of the finest timber trees in the world. It often does fairly well on its own, but it usually responds to management. Thus, even intensive treatment may be practical.

This area was part of an old potato field some 75 years ago. White Pine just happened to seed in abundantly after the field was abandoned. As a demonstration, half of the dense stand has been left untouched and half has been managed (between 1966 and 1988) by thinning, pruning and weeding. The first thinning would have been made well before 1966 if Beaver Brook Association had then owned this area.

The "thinning" concentrated on the poorer specimens, especially the smaller, suppressed trees. Mostly too small to have commercial value, these were left where they were felled. This thinning let in more daylight and thus kept the lower parts of the live crowns of the remaining trees from dying back any further and allowed them to expand sideways as well as upward. With larger crowns developing, these remaining trees will grow faster.

The "pruning" consisted of using a pole saw to remove the lower dead branches from the better specimens of crop trees. This eliminates knots from the future growth of the pruned portions of these trees. Knots are the remains of branches, and clear or knot -free lumber is usually much more valuable than knotty lumber.

Ideally, pruning is started when the trees are only 20-25 feet tall and still have some lower branches that are alive. Pruning should be done in several stages to avoid removing too many branches at one time, which would slow the trees' growth and expose them to damage from sunscald, etc.

While no more pruning is practicable in the timber stand you see here, the most effective thinning is done as lightly and frequently as possible, about every five to ten years. Future thinning here will be mostly of trees large enough to use or sell.

The last thinning before the crop trees are harvested should open up the stand enough to let a new crop of seedlings get established underneath. Thus, no planting should be necessary in the future. If the seedlings come in much before this, they are likely to interfere with future thinning of the present stand and be damaged or destroyed. Seedlings of other trees and shrubs may have to be eliminated by "weeding" to favor the growth of young White Pines. In this stand, most of the seedlings are Eastern Hemlock, a climax forest species. If left to grow, the hemlocks will block too much light for pine regeneration and the pine will disappear from this site.

As the years go by, the contrast between the managed and unmanaged stands will become more extreme. Compared to the managed stand, the unmanaged trees will not do as well, gradually falling behind both in quality and in average size, and the more suppressed trees will continue to die naturally.
Clubmosses

These small, evergreen, trailing woodland plants are related to the ferns, despite their misleading names such as Clubmoss, Ground Pine, Ground Cedar and Running Pine. They have horizontal, often underground stems, from which erect foliage shoots grow. The small, scale-like leaves overlap to cover the stem completely. In the reproductive stage, spores are produced either at the bases of the leaves or in cones at the tips of the stems. Clubmoss spores were once used to make photographic flash powder. Clubmosses have become rare in many places due to careless collecting for Christmas greens.

In prehistoric times, before the rise of flowering plants, tree-sized Clubmosses were a major component of the widespread swamp forests, whose fossil remains have been converted into coal.

Sphagnum Moss

Sphagnum moss forms the pale green or reddish spongy mats characteristic of bogs and swamps. Sphagnum grows rapidly at the tips, leaving behind dead leaves still attached to the stems. This accumulation of dead parts over time results in the organic deposits known as peat. Dried sphagnum moss can absorb many times its weight in water, and this absorbency along with antibacterial properties has made it useful in the past for surgical dressings as well as for diapers. Rich in carbon, dried peat is used as fuel in Ireland and Scandinavia. It is also used in horticulture.

Ferns

A variety of common woodland ferns can be found in this little clearing. They vary in color and texture and through simple observation can be identified. There are two that are evergreen, Christmas fern and Wood fern. The Christmas fern is characterized by dark shiny leaflets that look a bit like a Christmas stocking when turned to the side. The wood fern has slightly darker leaflets. The Lady fern seen in season has lighter green delicate feathery fronds and will die back in the fall months. Look for the young ferns emerging in the spring as furry coiled fiddleheads. The edible fiddleheads that people enjoy in the spring are from the Ostrich fern which is more common in moister, less acid soils.

White Pine Forestry Area

This area shows the results of silviculture practices with pruned crop trees, young saplings, etc., in groups. Note on left, the exceptional clump of Partridge Berry (#36).

White Pine Stump still growing after nearly 20 years

The "rolled" edge on the cut is the stump's attempt to cover the wound with callous tissue. This growth is possible because the roots of the stump and the roots of nearby pines grew together. This natural occurrence, known as a root graft, allows the stump to continue to grow using nutrients manufactured and supplied by its living neighbors.
**Stand of Mountain Laurel** *(Kalmia latifolia)*

A handsome flowering shrub abundant in southern New Hampshire, but near its northern limit, this is one of our few broad-leaved evergreen shrub species.

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**AREA F – WETLANDS**

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### #46 Storyboard – Beaver

This beaver pond alternates as a beaver meadow. Note the dam at left built about 1968 and now well overgrown with young saplings and shrubs. The lodge is located across the pond on the opposite bank. Beavers move on to new sites when they have depleted their food supply or if the lodge no longer feels secure from predators. This lodge may not still be occupied but in altering the environment to suit their own needs, beavers created a habitat here that continues to support a diverse community of plants and animals.

Beavers are found throughout North America almost anywhere there is a year-round source of water. Beavers are well adapted to aquatic habitats, with webbed hind feet, a broad flat leathery tail used as a rudder, and membranes inside the nose and ears that close when the beaver dives and swims. Their bright orange incisors allow them to gnaw on plants and saplings as well as large trees. Beavers prefer plants such as aspen, birch, maple and willow. Food for the winter is cached by submerging tree and shrub branches next to their lodge.

Our largest North American rodent (30-75 lbs.), beavers are monogamous and mate in February. A family usually consists of an adult pair, the young of the year (kits), and the young of the previous year (yearlings). Two-year-olds leave the colony late in the spring to establish new colonies.

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**Beavers**

The search for beaver and its valuable pelt for trade and fashion was one of the early factors that led to European exploration of North America. When colonial settlers first arrived in New Hampshire, beavers were plentiful. But by the late 1800s due to extensive trapping, beaver populations were virtually eliminated from the New England states. New Hampshire Fish and Wildlife began a restocking program in 1926 releasing six beavers and then in 1940 releasing 48 more. The population today is at or beyond the carrying capacity and beaver dams and lodges are readily seen in most wetland areas.
Although beaver ponds tend to be focal points for much of the wildlife in their vicinity, such as other furbearers, waterfowl, deer, etc., they are also valuable in water conservation.

#46 Storyboard – Wetlands

Wetlands are areas that are flooded or saturated with water for varying periods of the growing season, creating conditions that favor the growth of specially adapted plants and provide habitat for a wide variety of wildlife species. Virtually all waterfowl depend on wetlands for nesting, shelter and food.

Freshwater wetlands act as natural flood regulators by temporarily storing floodwaters and slowly releasing the stored waters downstream, as well as recharging aquifers that provide drinking water. As wetlands hold onto and slow the flow of water, nutrients are collected and transformed into food energy for the many species of wildlife that use the water as a home and breeding ground.

These wetlands are home to beaver, muskrats, herons, wood ducks, hooded mergansers, turtles and frogs as well as numerous insect species. The nesting structure observed here is the wood duck nest box. This type of box is designed to mimic the natural tree cavities that the wood ducks and mergansers prefer as nesting sites.

Characteristic wetland plant species include the Reed (Phragmites communis), Dark Green Bulrush (Scirpus atrovirens), Tussock Sedge (Carex stricta), Arrow-head (Sagittaria latifolia), Cattail (Typha latifolia), White Water Lily (Nymphaea odorata), Pondweed (Potamogeton spp.) and Coontails (Ceratophyllum spp.).

47  **Girdled Tree**

Girdling is an intentional easily carried out forestry management practice to kill undesirable competing trees while allowing them to remain standing. Girdled trees support live trees by acting as a buffer and possible sunscreen. The dead trees attract insects which in turn attract woodpeckers and other birds and eventually provide nesting sites. A girdled tree can remain standing for many years.

48  **Note the Low Ridge to your right**

The low ridge to your right was thrown up by a plow at the edge of a field when this was all farmland early in the 20th century.

49  **"Bank Beaver"**

Beaver, at times, may live in a burrow or tunnel which it digs in the bank. These burrows are usually for emergency or temporary use and have underwater openings just like a typical lodge. Many times, as demonstrated here, the burrow was excavated so close to the surface of the ground that the roof is nothing more than soil held in place by shallow roots that after time collapses.
Northern Wildflowers

In season look for the Clintonia or blue bead lily (Clintonia borealis) on the left and Bunchberry (Cornus canadensis) on both sides of the trail ahead. Both bloom in May but are more typical of the White Mountains, where they flower much later.

Nursery Stump

This decaying stump of what was probably a white pine, has a rich combination of humus and nutrients that provides a "nursery" for young seedlings. A young hemlock and black birch have sprouted in this protected spot. Eventually, if they thrive, they should grow to a size where they will compete with each other for light, water and nutrients.

AREA D – NATURAL AREA

Pine With a Crook

The crook in this pine was probably caused by snow or the white pine weevil killing the leader. This tree is still a good potential specimen for timber. It should produce good straight logs both below and above the crook with only a little waste in between. White pine weevils cause most of the crooks and forks in white pines and are our most serious forest insect pests.

Woodpecker Holes

This dead tree is known as a snag (as long as it remains standing). It continues to provide food and shelter for living creatures. It is riddled with woodpecker holes made in the bird's search for insects living within the tree. The holes now provide potential nesting cavities for other birds such as chickadees, nuthatches and screech owls.

Goldthread (Coptis groenlandica)

Note the little evergreen plants with shiny, slightly toothed leaves in groups of three. This is Goldthread, a northern plant with bright orange-yellow roots, which accounts for its English name.

Talus-slope

The talus-slope to the right is the base of the steep bank you recently angled down. Here it is true talus, consisting of loose rocks that over the centuries have broken off the ledges just above by frost action and natural erosion. Note the old stone wall marking the edge of former farm fields you have just crossed.
An Unusually Fine Specimen of Red Maple (*Acer rubrum*)
This particular specimen indicates how well a tree can grow under favorable conditions. To the right is a hemlock killed by porcupines chewing off its bark and twigs.

White Oak Competing with Hemlocks
The Oak is almost bound to lose out eventually unless the hemlocks are killed by porcupines or insects, hemlock being both longer lived and more shade tolerant than the oak.

Porcupine Dens
This small area is ideal for porcupines, providing a favorite food (hemlock), shelter in the dens and water from nearby Beaver Brook. If the dens are currently occupied, there may be manure in them and also around the several hemlocks killed or deformed by the porcupines. These rodents do not hibernate and so spend much of their time in the winter chewing the twigs and young bark off hemlock trees, using the dens for resting and in some cases for raising young. Porcupines are most active at night, at least during the warmer months. Although often considered harmful (they chew items containing salt, such as sweaty tool handles, as well as trees), the porcupines in this natural area are regarded by Beaver Brook Association as interesting and important members of the ecosystem. They sometimes attract fishers, large, mink-like predators that prey on them.

Above the middle cave, note the mixture of Polypody (see #29) and Marginal Wood Fern (*Dryopteris marginalis*), both among our few evergreen species.

Paper Birch (*Betula papyrifera*)
Our state tree, White or Paper Birch, is recognized by its chalky white bark which separates into layers of varying thickness and is marked by black, narrow, horizontal lenticels; the inner bark is orange. Of medium stature (up to 60' tall) and short-lived, this northern species is used for pulp, lumber, snowshoe frames and turned articles. Its bark was of major importance to Native Americans for containers, dishes such as bowls, cooking utensils, covering for wigwams, canoes, kindling and many other uses. Bark should never be peeled from standing trees.

Big Hemlock
This tree is even more unusual for the three trunks it had originally than for its size. Either each of three seeds grew into a tree, or something happened to one tree to make it develop three trunks very early in its life. The extremely large live crown, apparently good growing site, and lack of very rough bark, suggest that this tree has grown fast throughout most of its life. It is therefore probably not very old for its size, perhaps in the vicinity of 150 years. Hemlock trees may attain the age of 300 to 400 or more years. In the spring of 1984, one of the three trunks of this tree fell during a heavy ice storm. The second trunk fell during February of 2006. The fallen hollow trunks now offer possible shelter for animals. If the tree had remained sound, it might have contained more than 2000 board feet of lumber!
Note on the Left and Ahead the Canada Yew (*Taxus canadensis*)

This plant that looks like a hemlock seedling is actually a shrub. Yew can be distinguished from hemlock by the light green color instead of white lines on the undersides of its needles (compare with hemlock on the right side of trail). In season, birds relish its red "berries," the seeds of which are said to be poisonous to humans. Its foliage is a favorite winter food for deer. Unfortunately, this shade-enduring shrub is not very common. Note also, in season, the variety of ferns, including New York, Sensitive, Cinnamon, Marsh, Royal and Bracken, from here on for 100 feet or more.

Typical Swamp Scene

Note the alders (Alnus spp.) following Beaver Brook, and the pines killed by beaver-caused flooding.

Black and White Birch

This twin trunk is an excellent comparison of the two species. Unlike the White or Paper Birch (see #59), the Black Birch (see #23) is relatively long-lived and more shade tolerant.

Hobblebush or Witch Hobble (*Viburnum alnifolium*)

The twigs of this shade-tolerant shrub form a major winter food for deer farther north. In the spring it has unusually attractive white flower clusters with small, perfect blossoms encircled by larger, imperfect ones. The berries usually turn red a little later on, the leaves pinkish-purple later still.

American Chestnut (*Castanea dentata*)

In the early 1900s, the American Chestnut was one of the most abundant and useful of all native trees. By the 1920s, the species had been eliminated as a commercially valuable tree by a fungus blight accidentally introduced into this country in 1904.

The Chestnut survives because of its strong sprouting capacity and a root system resistant to the fungus. This sprout will almost certainly die before it gets much larger. Hopefully, by re-sprouting again and again, American Chestnut may eventually build up a resistance to the disease.

Yellow Birch (*Betula lutea*)

This birch species is more common in Northern NH where it grows larger and can reach 80 feet in height. Young trees are silver gray to yellowish in color maturing to a reddish brown bark with a much rougher texture. This is a commercially valuable species for furniture, veneer and other wood products. Its buds are relished by ruffed grouse, and as with all birches, its leaves turn a bright yellow in the fall.
SEASONAL NOTE:
Black Alder or Winterberry (*Ilex verticillata*) is neither black nor an alder but rather a deciduous holly. A common and upright shrub that seldom exceeds 10' in height, Winterberry is generally found growing in swamps and bogs and other moist conditions. It is best known for its conspicuous, bright red berries that often persist on the plant well into winter. The berries not only add color to its natural environs but also are an important wildlife food, prized by many small mammals and more than 20 species of birds. Consequently, one should not pick it too heavily for Christmas decorations and never without permission on property other than one's own.

**AREA D – NATURAL AREA**

**67 Beech** (*Fagus grandifolia*)
There are several specimens here, all having the smooth and very gray bark so typical of the species. Like hemlock and sugar maple, this is a climax species able to reproduce in relatively dense shade. Its nuts, which are produced every two or three years, are valuable for wildlife. Unfortunately, many of our forests' beeches continue to be killed by Nectria canker, an introduced, apparently uncontrollable, disease.

**68 Beech Drops** (*Epifagus virginiana*)
Beechdrops have stiff, erect branching stems about 12-18" tall, yellowish or purplish brown in color with a few scale-like leaves and small flowers scattered over the branches. A parasite on roots of Beech trees, its impact on the host plant is slight.

A few flowering plants like beech drops, Indian pipes and pinesap, which have no chlorophyll, are unable to manufacture their own food and must absorb nutrients from other sources. A *saprophyte*, such as the Indian pipe and pinesap, uses humus and dead animal matter for nourishment. A *parasite*, such as beech drops, consumes the tissues of living organisms, in this case the roots of the beech tree. It is however, the fungi who are the champions of the saprophytic-parasitic lifestyle.

**69 Note in the background the beautifully formed White Pine**
All these trees may be the same age, the larger one having found a bigger opening. It has therefore developed a larger crown and grown faster than the others but also developed more taper. During the colonial period many of the finest white pines of the then virgin forest were used for masts by the British Navy. The largest masts were over three feet thick and one hundred feet tall. Many were carried across the Atlantic in special ships. In forests still belonging to the king, the larger, finer pines were marked as
potential mast trees by a "broad arrow." This was one of the lesser causes bringing on the Revolution since many of the settlers wanted the trees for their own uses.

**American Hornbeam** (*Carpinus caroliniana*)

Also called blue beech or ironwood, this is a low spreading small tree common in moist woods and along stream banks. The trunk of the tree has smooth, blue-gray bark that is distinctive because of the projecting ridges that give the tree a fluted and "muscular" appearance. The tree has no real commercial value but in times past, the strong, hard wood was useful around the farm for levers, tool handles, wedges and mallets.

**Large White Oak** (*Quercus alba*) (see #13) and behind it, a large Pignut Hickory (*Carya glabra*)

Hickory is a medium-sized (50-75') scattered forest tree with dark, ridged gray bark that rarely peels off and leaves that are compound with 5-7 leaflets. The fruit, valuable for wildlife, is a thick-shelled bitter-tasting nut enclosed in a pear-shaped husk that splits only about half way. The wood is hard and strong and may be used for tool handles, smoking meat and fuel.

**Hop Hornbeam** (*Ostrya virginiana*)

This is an unusually large specimen for these parts. Because of its toughness, the wood of this species was often used for tool handles, parts of wagons and log scoots or sleds.

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**AREA E – RED MAPLE MANAGEMENT**

**Sugar Maple**

The large open-grown sugar maple off to the left is evidence of former pastureland. Probably standing alone in the field, the spreading branches of the tree once provided shade for livestock in the open farmland that defined the landscape at one time here.

**Red Maple Management**

This is an experiment to upgrade the quality of Red Maple. This species is generally not highly regarded as a timber tree, but it is the most common broad-leaved tree species in New Hampshire. At its best it can produce quality wood and has potential as a commercial tree. Here the better specimens, even though they started too far apart to develop really good form (tall and straight), have been pruned of some of their lower branches. These are the crop trees, or trees that will be raised to maturity if they develop well enough. The other trees will be cut periodically for firewood to allow more growing space for the crop trees.
Many people wonder why more attention in forestry is not paid to hardwoods, as our deciduous, broad-leaved trees are usually called (the wood of most of them being relatively hard compared with that of our needle-leaved, mostly evergreen conifers or softwoods). The main reason is that hardwoods have a low production rate; the trees generally are farther apart, making fewer per acre. Hardwoods also produce one or two logs, on the average, compared with two or three or more in the case of conifers, especially White Pine. Nevertheless, hardwood management has great possibilities, especially for high-quality lumber and veneer, which, on a board foot basis, are worth more than pine lumber, especially in the case of Red Oak and White Ash.

TRAIL NOTES
MAP FOR SELF-GUIDING TRAIL

KEY

Area A — Succession / Stonewall
Area B — Landscaping for Wildlife
Area C — Meadow / Woods
Area D — Natural Area
Area E — Forestry
Area F — Wetlands
Oooo — Stonewall
———— — Woods Road
— Trail

Start

BROWN LANE BARN
FARMHOUSE
WOODCOCK MGT. AREA
BROWN LANE (town road)