

## Station 1 - Objectives

Every landowner has one or more objectives for their land. They may wish to favor a certain type of wildlife they like. They may want the cleanest water possible for a lake or fishing spot. They may want to grow crops or raise livestock. They may desire recreation through camping, hiking, fishing, or hunting. They may wish to provide habitat for the largest diversity of flora (plants) and fauna (animals). They may wish to harvest timber for sale or for their own needs.

Many forest landowners are interested in timber production. Foresters help by managing the forest to meet the objectives of the landowner, often to produce the best quality products in the shortest period of time. This goal is similar to many other professions, but with forestry the time frame is measured in decades. Forty to one hundred years is commonly required to produce a marketable product. During that time, the forest needs to be kept free of disease, pests, competing vegetation, and fire. Also, the markets for wood products change, reflecting changing technology. Forestry is a business, a science, and an art, requiring experience, forethought, and a sense of social responsibility.

## Station 2 – Soils and Forest types

Soils, geology, and topography play a tremendous role in shaping the environment of a given site. For example, sandy, acidic, and infertile soils may be best suited for pine trees. Fertile, well-drained soils often become dominated by fast-growing hardwood trees such as yellow poplar. Gravelly or rocky ridges often will only support certain oaks or black birch, while floodplains may support white ash, sycamore, silver maple, and yellow birch.

Take a look at this area. On the sloping, well-drained soils, you see beech, oaks, yellow (tulip) poplar, and black birch. These trees grow best on these types of soils. On the wetter soils below, you see basswood, yellow birch, red maple, and white

ash. These trees can tolerate wet soil conditions that would kill most other trees. At the top of the mountain, you would find mostly oaks and hickories, which are adapted for the difficult conditions there. Knowledge of soils is critical in making decisions. For example, knowing about the soils in an area can help a forester understand what species of trees can grow best in an area. Also, on easily erodible soils, a forester must take care to prevent erosion from starting. Foresters also limit use of logging equipment on soils prone to wetness or compaction.

## Station 3 – White pine: cover and wood quality

**Take notice of the large, stately white pine trees growing between here and the swamp. These evergreen trees provide cover (shelter) for many types of birds during the winter, especially on cold, windy days. In dense branches, the bitter winter winds are held back. For other birds, these needles hide them from predators.**

**Also, take note of the dead branches and the remnants of dead branches in the middle and lower part of the tree trunk. These branches died years and years ago, leaving the dead wood. The tree trunk has been forced to grow around instead of over the dead branches. Were this tree to be cut for lumber, much of the wood will be almost worthless because of the knot-holes left behind. By properly pruning young pines, a forester can improve the value of a tree in the future.**

## Station 4 – Closed canopy forest & stocking

Look around you and then look straight up. Many, many trees are growing very closely. When this forest began growing, there may have been thousands of seedlings and saplings all competing for the same limited amount of sunlight. Over time, many or most of them lost the race for sunlight and have since died or are dying. Still the competition continues. In this section of forest there are about 226 trees per acre.

In fact, there are so many trees per acre and the competition is so fierce that the growth of the trees has actually slowed dramatically. Put simply, there are too many trees on the site to use the available sunlight efficiently. Were less trees located on this site, their upper branches could spread out and capture more sunlight. As the upper branches grow outwards, more leaves are added. More leaves means more energy for the tree from photosynthesis. More photosynthesis means more root growth, more growth of wood, and greater health of the individual tree.

## Station 5 – Exotic invasive species

This area was once dominated by exotic invasive plants. Such plants included Japanese barberry, Japanese stiltgrass, multiflora rose, garlic mustard, ailanthus, and mile-a-minute weed. These plants have begun to grow in portions of the camp, and were dense in this area. These plants and shrubs are undesirable as many have thorns, they occupy sites that would normally be occupied by native plants and shrubs, they inhibit new tree development and growth, and some produce chemicals that can alter the ecosystem.

It was recommended that these plants be brought under control or be eradicated before the problem grew worse. The camp used herbicide to kill the problem plants in this area. During that time, three small infestations of mile-a-minute vine were discovered. This vine has sharp, thorny barbs and can grow 23 feet per year! By treating problems when they are small, the camp can minimize the amount of chemicals it places into the natural environment.

## Station 6 – Riparian forests and water protection

As you hopped on rocks across the stream, did you notice the living things under your feet? Perhaps looking closer, one would find crawfish or salamanders under the rocks, or perhaps tadpoles or the immature larvae of black flies swimming in the water, maybe if you were still and quiet you

would see a deer or fox walk to the stream and drink. Looking closely, what about the moss or slimy algae on the surface of the rocks? All animals require water, food, shelter, and living space in order to survive. Some animals require particularly clean water.

People require very clean drinking water. This forest has been providing clean drinking water for years and years. In this area, settlers drew water from a shallow spring just downstream. In fact, farmers lived in this area up until the mid-1800's. Foresters protect water quality by protecting stream banks, avoiding activities which may muddy the water, and by harvesting overmature trees in stream corridors, which would otherwise die and contribute unwanted nutrients into the water. After leaving the camp, Jacksonburg Creek flows into the Paulins Kill, and then the Delaware River, both very important waterways for trout and other fish.

## Station 7 – Hard mast, wildlife and forest stand improvement

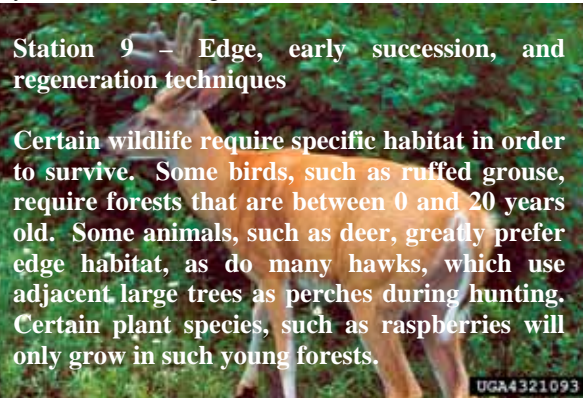
**The oaks and hickories in this area produce very important food for wildlife. Oaks produce acorns, and hickories produce hickory nuts as seed. This type of food is known as “hard mast.” A wide variety of animals depend on nuts and acorns, including squirrels, chipmunks, and wild turkeys.**

**Suppose a forest landowner wanted to improve the turkey in his forest. In an overstocked area dominated by oak, hickory, and red maple trees, he might cut some of the red maple. In this way, the remaining oaks and hickory would grow wood faster, healthier, and produce more nuts and acorns, resulting in more turkeys. The careful and selective cutting of undesirable trees is what we call “forest stand improvement.” In the area you just walked through, forest stand improvement was cut in 2004. This included most of the land between here and the swamp.**

## Station 8 – Forest pests and tree growth rings

The forest is sometimes attacked by various insects, fungus, and bacterial diseases. Gypsy moths will eat many or all of the leaves of oak trees, and sometimes white pine trees. By losing its leaves, the tree cannot make the sugars and other chemicals it needs from photosynthesis. After two or three consecutive years of attack by gypsy moths, the tree is often sick enough that it is unable to defend itself from pests it would normally be able to fight off, and may die.

If a tree's growth and health are reduced, one can see this best by looking at the growth rings of a tree. When a tree has been weakened, less wood is produced and the growth rings are closer together. A severe drought may cause a temporary slowing of growth. Greater threats such as major tree diseases and overstocking will show up as many years of slow tree growth.



## Station 9 – Edge, early succession, and regeneration techniques

Certain wildlife require specific habitat in order to survive. Some birds, such as ruffed grouse, require forests that are between 0 and 20 years old. Some animals, such as deer, greatly prefer edge habitat, as do many hawks, which use adjacent large trees as perches during hunting. Certain plant species, such as raspberries will only grow in such young forests.

Clearcuts and shelterwood cuts are common methods to regenerate new forests. Both resemble natural events that create new forests. Shelterwood harvests resemble ice storms, major tree disease infestations, and other events that leave some large trees behind to “shelter” the developing seedlings and saplings. At a later point, the large trees can also be removed. Clearcuts resemble tornadoes, catastrophic fires, and other events that result in the removal of all previous trees. In this part of New Jersey, clearcuts are limited to small areas, to

closely resemble these natural events. Such disturbances are neither good nor bad, but merely inevitable. This area was not a clearcut. It was the old shooting sports area, now regrown.

## Station 10 – Wood and the global environment

**We know that the trees in the forest originate from seeds, such as acorns, nuts, and fruits, but where does their wood come from? The primary building blocks of their wood do not come from the soil, but rather from the thin air. The carbon dioxide that the trees absorb during photosynthesis is converted and often stored as wood fiber. Since wood is formed from air, built within a natural factory called a tree, and can be regrown or replaced within 40 to 100 years, it is thought of as the most environmentally-responsible raw material. This is particularly true compared to crude oil, which stored carbon deep within the earth, and takes millions of years to form.**

Some believe that increasing levels of carbon dioxide in the air is responsible for “global warming.” Rapidly growing trees remove more carbon dioxide from the air than mature and overmature trees. By harvesting overmature trees for durable wood products such as lumber, carbon dioxide is prevented from returning to the air. In addition, the young, fast-growing trees that replaced those harvested are removing even more carbon dioxide.

## Station 11 – Group selection and uneven aged management

Different species of trees have different requirements for establishing themselves after a disturbance. At the camp, this starts with seeds from many different species of trees falling on good soils underneath a forest. Some seed will sprout underneath the shade of the forest and grow, given just enough light. These trees are described as “shade tolerant.” Other seeds will not sprout until large amounts of light reach the forest floor.

Once this occurs, they grow very fast toward the available sunlight. These trees are described as “shade intolerant.”

By varying the size of disturbances, foresters can try to control the species of trees that will come to dominate an area. The opening within the forest canopy that is planned for here is called a “group selection.” Smaller openings will favor shade-tolerant species such as sugar maple, while larger openings will favor shade-intolerant species such as yellow poplar and aspen.

## Station 12 – The Plan for the camp and sustainable forestry

One of the objectives at the camp is to create habitat for and attract the greatest diversity of wildlife for viewing by Scouts visiting the camp. We aim to do this by creating a mosaic of areas of different ages and tree species. Forest management activities seek to mimic natural processes from establishment to stand development and proper stocking to eventual replacement by a new forest.

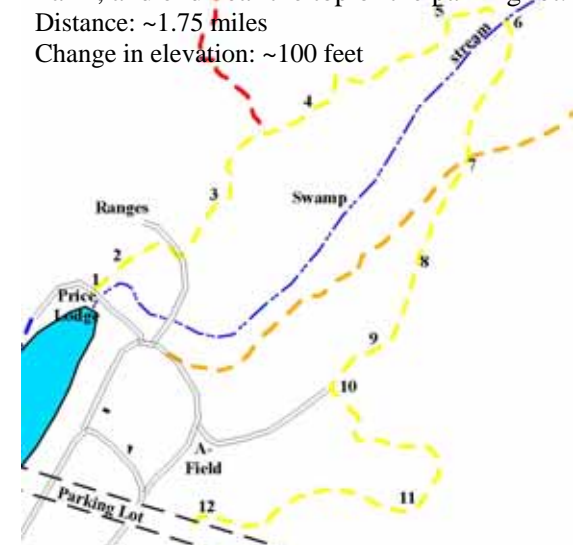
By only harvesting wood at the rate that the forest can produce the wood, and by constantly ensuring that new trees are growing in harvest sites, this forest is sustainable. Put simply, it will never “run out” of wood or suitable wildlife habitat. Left in its original state, the forest was almost all one age, with almost no early successional or edge habitat. As oaks died, they were being replaced by red maple and black birch, which provide lower quality food for desired habitat. The challenge of forestry is to develop a plan which meets every objective of a landowner, here diverse wildlife, sustainable wood production, and clean water.



For further information, please visit [www.njbsa-conservation.org](http://www.njbsa-conservation.org)

# Camp No-Be-Bo-Sco Ecology and Forestry Interpretive Trail

Follow the yellow trail from Price Lodge, past Blackfoot campsite, around the swamp, back to Lenape campsite, then to the Mountain Farm, and end near the top of the parking lot. Distance: ~1.75 miles  
Change in elevation: ~100 feet



Please re-use this pamphlet by returning it to the trailhead. Thanks!

Written and edited by Northern NJ Council, BSA Conservation Committee (Last revised March 2007)

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