SADDLER'S WOODS
Haddon Township, New Jersey

Junior Forest Ranger
Certificate Program

December, 2006

Prepared by the Saddler's Woods Conservation Association
(www.saddlerswoods.org)

for the **Haddon Township Environmental Commission,** supported by a grant from the **Delaware Estuary Grants Program of the National Fish & Wildlife Foundation** funded by the **US Fish and Wildlife Service** and the **William Penn Foundation.**

Haddon Township Environmental Commission
135 Haddon Avenue, Haddon Township, NJ 08108 envirocomm@haddontwp.com
http://www.haddontwp.com
(856)854-1176 x303

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Purpose:

This Junior Forest Ranger certificate program was developed by Saddler's Woods Conservation Association and the Haddon Township Environmental Commission for local community organizations, youth groups, and schools to incorporate into their science curricula. This program will build a student's understanding of forest ecosystems and foster an ethic of stewardship for Saddler's Woods that will ultimately transcend its borders. The program contains a series of eight lesson modules and activities appropriate for students grades 8–12; however any of the modules may be adapted to different age groups and it may also be used as a primer for the general user interested in learning more about Saddler's Woods and caring for forest ecosystems.

This program supports NJ Core Curriculum Standards 5.10 for environmental studies. All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.

Standard 5.10 Descriptive Statement: Creating an awareness of the need to protect, conserve, and preserve natural resources is a goal of science education. This standard calls for students to develop knowledge of environmental issues, including management of natural resources, production and use of energy, waste management, and the interdependence of ecosystems.

http://www.state.nj.us/njded/cccs/s5_science.htm#510

Facilitator Instructions:

First read this guide in its entirety. Second, to initiate the start of your program, take a guided tour with your Junior Forest Ranger. Tours are provided by appointment through Saddler's Woods Conservation Association (contact 856-869-7372 or janet@saddlerswoods.org). After completing your tour, submit your "start form" to Saddler's Woods Conservation Association. The Junior Ranger candidate will need a large binder with pockets and a hole puncher to maintain a central place to store their work. (Also, read each module activity for additional supplies needed such as a measuring tape, bags etc.) After the candidate successfully completes each module, the program facilitator signs and dates the module worksheet, certifying its satisfactory completion. The final module 8 includes a quiz to be given by the instructor and requires that the candidate give a tour. An answer key will be provided to the instructor, upon initiation of the program. Upon completion of all modules 1-8 the facilitator may award the candidate with a certificate. It is suggested that the certificate be awarded at the location of their special tree after completion of the tour they give. NOTE—The activities outlined must be completed within one year of the student initiating the program. While it is not imperative that the activities span all seasons, it does augment the candidate's appreciation for the seasonal changes in the forest ecosystem.

MODULE 1: Introduction and Tour

Saddler's Woods is a unique 25-acre urban forest of deciduous trees. It contains old growth, young woodlands, and wetlands. Saddler's Woods is in the Newton Creek Watershed and holds a rare example of the type of forests that once existed from the Atlantic Ocean to the Mississippi River, before Europeans settled here. Today, almost no old growth forest remains in the region; in fact less than 0.4% of the forest that remains in the Eastern U.S. can be classified as old growth. This is what makes Saddler's Woods special; this small pocket of forest has many trees between 100 and 300 years old and is one of the last old growth forests.

Saddler's Woods is a time capsule, showing visitors what the land was like when colonists first arrived on America's Eastern shores. Before European settlers arrived, the area around Newton Creek was heavily forested and inhabited by Leni-Lenape Indians. When Europeans arrived in the early 1600s the forests that covered the Newton Creek area were cleared for farms, lumber, and fuel. In the 1800s Haddon Township had a significant abolitionist Quaker population making it a destination for escaped and emancipated slaves.

In the nineteenth century, a Quaker farmer named Cy Evans sold the woodland tract to Joshua Saddler. Joshua Saddler was a former slave who escaped to the area. He protected the forest in his will, stating that none of his heirs could cut the trees for timber. It is in honor of Joshua Saddler, the woods first preservationist, that the tract has been named Saddler's Woods.

Because Saddler's Woods is a unique historic and ecological site, Haddon Township adopted a conservation easement permanently protecting the woods in April of 2003. (Ordinance #1108) This legal document preserves the woods in their natural state in perpetuity and restricts any development or activity that would compromise the forest ecosystem. The Haddon Township Environmental Commission manages the site for compliance with the conservation easement.

Guidelines for Use

Saddler's Woods is open without permit from sunrise to sunset. For your own safety, and so all may enjoy the woods please:

- Plan ahead; wear appropriate attire and bug spray.
- Use only marked trails.
- Leave no trace, take only photos, leave only footprints.
- Do not alter or disturb soil, wildlife, or vegetation.
- Leash your dog and clean up after your pet.

Prohibited Activities

- Paintball
- Dumping
- Littering
- Smoking
- Campfires
- Fireworks
- Vandalism
- Motor Vehicles
- Alcohol possession or consumption
- Damage to soil, plants and animals

To report violations call police dispatch: (856) 854–0011.

REMEMBER

Take nothing but photos,

leave nothing but footprints.

Instructions: After reading the introduction, schedule a tour with Saddler's Woods Conservation Association. The tour lasts approximately one hour. Some trails are wet, steep, and rocky so participants must wear sturdy waterproof shoes or boots in addition to appropriate attire for the weather. The trails and stream are not wheelchair accessible; however tours may be adapted to the requirements of students with special needs. On the tour you will adopt a tree. Upon completion of the tour, complete and submit the start forms. You have one year from this date to complete your program.

Junior Forest Ranger Certificate Program
Start Form

(Retain for your records)

Facilitator name:_____

Facilitator address, phone, email:_____

_____

_____

Tour / Start Date:_____

Tour guide name:_____

Junior Forest Ranger name: _____

Junior Forest Ranger address, phone, email:

_____

_____

_____

Adopted tree: _____

Location of adopted tree: _____

Junior Forest Ranger Certificate Program
(Copy)

(Submit to Saddler's Woods Conservation Association)

Facilitator name:_____

Facilitator address, phone, email:_____

_____

_____

Tour / Start Date:_____

Tour guide name:_____

Junior Forest Ranger name: _____

Junior Forest Ranger address, phone, email:

_____

_____

_____

Adopted tree: _____

Location of adopted tree: _____

Submit to:
Saddler's Woods Conservation Association
P.O. Box 189
Oaklyn, NJ 08107
janet@saddlerswoods.org

MODULE 2: What is a Tree?

The first plants were tiny, microscopic organisms that lived in the oceans and are classified as plants because they could use sunlight to grow. From these specks of plant life, the whole plant kingdom as we know it today has evolved. While many of the early plants remained in water, others started to grow on land. To do this, they needed a way to support themselves and hold themselves up. Some plants eventually developed a material called lignin, which made their stems tough and woody enabling them to grow taller. In time, plants with a giant single stem appeared and these were the first trees. Since then trees have evolved many times, in different families of plants.

In the National Audubon Society's Field guide to Trees of the Eastern Region, a tree is defined as *"a woody plant with an erect perennial trunk at least 3 inches in diameter at breast height (4 ½ feet high) a definitely formed crown of foliage, and a height of at least 13 feet when mature".*

Five thousand years ago, before the aggressive spread of agriculture, huge areas of Eastern North America were forests. Since then, much of the forest has been cleared to make way for people. Despite this, woodlands like Saddler's Woods with broadleaved trees such as oaks, hickories, beeches, and maples make up an extremely important natural habitat.

Broadleaved trees are so named because they have broad, flat leaves, quite unlike the needles and scales of conifers. They all produce flowers, and after pollination these flowers develop seeds. The seeds are often enclosed in a hard nut or a fleshy fruit. Many broadleaved trees are deciduous, that is they shed their leaves every autumn.

Worldwide, the number of tree species may exceed 50,000; of these, about 680 are native to the United States and Canada. There are over 50 tree species in Saddler's Woods.

Benefits of Trees:

- Trees help supply oxygen we need to breathe.
- Trees provide food and shelter for wildlife such as birds and squirrels.
- Trees shade us from the hot sun and act as a barrier against cold winds.
- Trees help absorb pollution and purify water.
- Tree roots help stabilize soil and prevent erosion.
- Trees beautify our communities and help conserve energy.
- Trees provide the material for many products including paper, food, cartons, film, and furniture for your home.
- Trees are fun. Forests provide places for recreation such as walking, biking, and picnicking.

Module 2 Activity: You will need a field guide to trees. On your tour you selected a tree to adopt. This will be a tree that you monitor for the duration of your ranger program.

Part 1: Once you have chosen the tree you want to adopt, use a field guide to identify the type of tree it is and document it here as well as on the start form. Then play detective and gather as much information about the tree as you can.

Tree Species Common Name _____Latin Name _____

Describe your tree.

Is it big or small compared to the other trees?_____

Does it have one central trunk or a divided trunk?_____

Will it have seeds, nuts, or berries? _____

Can you see any buds at the end of its twigs? _____

Is the bark light or dark compared to other trees? _____

Is the bark smooth or flaky?_____

What kind of flower does it get?_____

Describe your tree's location and growing conditions.

Is it on a slope? _____

Is the soil around your tree, sandy, clay like, dark, loose?

_____

Is there a lot of leaf matter at the base of your tree? _____

Is it in a dry area or wet area? Low near the stream, or high on an upland section?

_____

Part 2: Take a photo or draw a picture of your tree and include it in your notebook.

_____Activity Certification
(Instructor to sign and date)

MODULE 3: Life Cycle of a Tree

One of the best ways to learn about trees is to look at their life history. Trees, like all living things have a lifecycle that includes birth, growth, injury, disease, aging, and death. As trees go from birth to death, their physical form changes, as well as their role in the forest ecosystem. You can learn about past changes in environmental conditions by looking at the growth rings in a cross section of a tree. Even more can be learned about the tree's lifecycle by observing the tree from birth as it grows and develops throughout its life.

Most trees begin as seeds. Generally, trees are put into flowering and non-flowering categories. The angiosperms are flowering plants, including wildflowers, shrubs and many trees. Insects, bats, birds, and the wind pollinate angiosperms. Plants that have flowers also protect their seeds inside a fruit. Maple, oak, and all other broad–leaved trees are angiosperms. Gymnosperms (from Latin *gymno* meaning "naked") have seeds that are not enclosed in fruit or flowers.

Rather, most gymnosperms produce their seeds in cones and are pollinated by the wind. The most common type of gymnosperms is the cone-bearer or conifer, like redwoods, firs, pines, and other trees with needle-like leaves. Saddler's Woods does not have conifer stands.

If a seed lands in an area with favorable soil, climate, and nutrient conditions it will germinate (some remain dormant for long periods before sprouting). Usually, many more seeds will be produced than can possibly survive. Most seeds will be destroyed by fungi or other decomposers or eaten by birds or mammals leaving only a few sprouts to survive and become mature members of the forest community.

As part of the understory, young saplings must compete with other trees and plants for sunlight, nutrients, water, and space. In dense forests, many young trees must wait for years for older trees to fall and leave openings in the canopy for them to grow into. The length of time it takes a tree to reach maturity depends on the particular species of tree.

Trees have many different roles in the forest community depending on their age and size. Their leaves, bark, seeds, flowers, fruit, and roots provide food for many kinds of animals. Trees also provide roosts, shade, and shelter to many living things. For example, holes in older trees and around their roots provide shelters for nests and dens.

Like all living things trees are subject to disease and injury. Physical damage may not kill the tree, but may provide holes and openings in which animals and insects can live and breed. Eventually trees weakened by injury and disease will die, fall down and be decomposed. When they die, trees return their nutrients and other elements back into the soil to be recycled through the forest ecosystem.

Module 3 Activity:
Look up the American beech tree *Fagus grandifolia* in a tree field guide and bring the guide with you to the woods. Using the self guided tree tour map which may be downloaded from www.saddlerswoods.org, go to post #10, and find the large American Beech tree with the tree cavity. Walk all around the tree and look at the base of its exposed roots. Using your field guide, look up what the seed of the Beech tree looks like.

Can you find any beech nuts or casings?_____

What do you think eats the beech nuts?_____

Looking again at the large beech tree's roots and base, you may see a small white plant, called a beech drop. Beech drops are usually 6-9 inches in height, are white, and have a thin purply pink outline to their leaves. They are a parasitic plant that grows on the roots of the beech tree, but they do not harm the tree in any way. After the beech drop plant peaks, it will turn black and decompose. Do you see any evidence of the beech drop plant?_____

Now looking nearby the large tree, do you see any smaller, younger American Beech trees?

_____

Take a walk around the area of the American Beech and look for a large fallen tree.

Where is it? _____

Can you tell what kind of tree it was or is it very decomposed?

_____

Is the trunk's wood soft and crumbly or hard and solid?_____

Fallen trees are also called nurse logs, because they can spring new life. As the log decomposes, other plants may grow from the log. Do you see any mushrooms, lichens, moss, or plants on or near your log?

_____

Describe any other life you see near your log (worms, ants, etc.)

_____

_____Activity Certification
(Instructor to sign and date)

MODULE 4: What is an Ecosystem?

An ecosystem is an interacting system of plants, animals, humans, and their surrounding physical environment. An ecosystem contains living and non-living organisms that each provide or contribute to a unique service or function that other organisms depend upon.

Most importantly, an ecosystem in not just a collection of organisms, it is a system of interrelationships, interactions, and processes. The flow of energy and the cycling of matter are two important processes in an ecosystem. Green plants capture and process solar energy, and through food webs animals transfer the energy throughout the ecosystem. Plants, animals, and chemical processes continually use and recycle organic material and nutrients in an ecosystem. As organisms are the result of many years of evolution, so are ecosystems.

Ecosystems can be defined by different scales or sizes from as small as a puddle or a decomposing log to a whole forest or the planet. All ecosystems are nested within a system of larger ecosystems.

For example, in Saddler's Woods a single hackberry tree *(Celtis occidentalis)* is an ecosystem inside the larger ecosystem of the woods. Hackberry trees tend to grow in drier areas and slopes but are quite adaptive to just about any condition. The hackberry is easily identified by its bumpy or wartlike bark. The fruit of a hackberry tree is an orange-red to dark purple rounded drupe. It ripens in the fall and stays on the branch or "persists" into winter. Because the fruit is available in winter, when other food sources are scarce, it then becomes an essential food for non-migrating birds. The birds in turn disperse the hackberry seeds through their droppings and contribute to the hackberry tree's wide distribution. But birds aren't the only species to benefit from the hackberry tree. The hackberry psyllid (pronounced sillid) is a small cicada-like insect that depends solely on the hackberry leaf for its larvae to develop, forming galls on the leaf.

Also dependent upon the hackberry tree is the spiny elm caterpillar, which later becomes the mourning cloak butterfly. The mourning cloak butterfly *(Nymphalis antiopa)* is one of the few butterflies that overwinters as an adult in New Jersey. In Saddler's Woods, the mourning cloak butterfly is often the first butterfly to emerge in early March, heralding the start of spring.

The hackberry tree is just one small example of how in an ecosystem, everything is related to everything else–and everything depends on something else for its survival, especially us! Humans need a healthy thriving set of ecosystems to continue to live healthy lives. It is important to understand that we are a part of the ecosystem and because of this interconnection; our actions can create long strings of consequences.

Module 4 Activity:

Go to your tree and look carefully at your tree as an ecosystem. Look for other organisms that are supported by your tree. There may be mushrooms or moss near its roots, or lichens or fungi on its bark. What type of wildlife do you think is supported by its seeds? If your tree has a cavity what do you think would use it? Do you see any insects on the bark? Do you see any nests in its branches? Do you see any woodpecker holes in any dead limbs?

Now make a list of all the plant and animal organisms supported by your tree.

_____Activity Certification
(Instructor to sign and date)

MODULE 5: Old Growth vs. Secondary Growth

Various tree species and ages, deep leaf matter, and dead wood on the forest floor are all signs of old growth in Saddler's Woods.

Saddler's Woods consists of Old Growth and Secondary Growth woodlands. This is what makes it an excellent model in which to learn these two distinct forest ecosystems. We learned in the introduction that Saddler's Woods is unique because it contains a stand of old growth trees, but what does the term "old growth" really mean? The term old growth refers to a forest and not just a single tree. The tree in an old growth stand may be old, or it may be young. What makes a stand of trees considered old growth are the characteristics of the forest in which the trees grow, characteristics that begin to develop when the forest approaches 200 years in age.

An old growth forest will consist of trees that may reach hundreds of years in age, but there will also be young trees that have grown where sun has penetrated the forest canopy. The canopy is the part of a tree that contains the branches and leaves. In a forest the canopy layer refers to the collection of individual tree canopies that cover the forest floor like an umbrella.

There are large, standing dead trees, called snags that provide homes for insects, rodents, and birds, and serve as perches for birds-of-prey like owls and hawks. Large dead trees crisscross the forest floor, and may lie there decaying for hundreds of years. This results in pit and mound topography. Pits are formed at the base of a tree that has fallen over and mounds of soil form where trees have fallen and decayed.

Pits, or depressions in the forest floor, gather water and form vernal ponds, temporary water holes. Downed wood from a fallen tree provides shelter and food for many more plants, animals, and fungi. As the wood decays it acts like a slow-release vitamin for the soils of the forest. In addition, when branches and leaves fall into forest streams, the decaying wood and leaf matter provides food for algae and aquatic insects, which in turn are food sources for other organisms.

A secondary growth forest is the forest that grows up after some type of disturbance. This disturbance can be human-caused like clear cutting for development, logging, a forest fire, or it can be a natural disturbance such as an insect infestation or a wildfire. When European settlers arrived to the Eastern United States, the forests were cleared for farming and later for industry. Trees were used for fuel, home construction, and home furnishings. Today the majority of forests in New Jersey are younger woodlands called secondary growth.

Secondary growth is dominated by trees younger than what is typically found in an old growth stand. Secondary growth often lacks characteristics of an old growth forest such as a multi-layered canopy, large snags, and large downed wood both on the ground and in the streambeds. Secondary growth will eventually mature and if the right conditions exist, may begin to have old growth characteristics in 200–500 years.

In Saddler's Woods, the secondary portion is approximately 30 years old and through a process called succession, the secondary growth is transforming from a meadow to a wooded area. The secondary growth portion in Saddler's Woods provides a protective buffer to the old growth portion of the woods.

Old Growth	Secondary Growth
• Large trees, diverse species. • Small trees several canopy layers. • Standing dead trees (snags). • Large rotting wood on the forest floor. • Pit and mound topography.	• Small trees of similar species and ages. • Single canopy layer, trees of similar heights. • Few if any snags. • Fewer and smaller-sized rotting wood on the forest floor. • Level topography.

Module 5 Activity:

1) Go to your tree. Do you think it is an old tree or a young tree?

   _____

2) Using a large measuring tape, measure the circumference of your tree. Are the circumferences of the trees near your tree similar or are there a variety of tree sizes?

   _____

3) Is your tree in the old growth section or a secondary growth section? _____

_____Activity Certification
(Instructor to sign and date)

MODULE 6: Non-Native Invasive Plant Species

Foreign invasive plant species overtake species native to our area. It is important to prevent invasive plant species from overtaking our natural open spaces in order to sustain a healthy habitat for wildlife.

In Saddler's Woods we strive to protect the native plants, animals, and communities that live there. Invasive plant species interfere with this objective. Non-native invasive species decrease the native biodiversity and are a threat to the quality of our woods ecosystem.

Invasive species are those that have been spread from human settings (gardens, agricultural areas, etc.) into the wild. Once in the wild, invasive species may continue to reproduce and displace native species. In the US, non-native species are typically defined as those that arrived since the time of European contact and are only appropriate to their range. So for example a California poppy growing in the southern New Jersey would be considered non-native.

The ability of humans to travel anywhere on earth and their propensity to carry animals and plants with them has allowed organisms to inhabit areas they may never have reached otherwise. Often with new suitable habitats opened to an exotic or non-native species, its populations rapidly expand.

The most prevalent invasive plant species in Saddler's Woods such as Japanese knotweed, Japanese honeysuckle, multiflora rose, Japanese stilt grass, garlic mustard and English ivy, have all been introduced into North America from Asia or Europe. The new environment poses fewer restrictions to population growth than its original habitat. Because there are fewer predators or competitors providing checks and balances, the result is a population "explosion" and the organisms become "pests."

In their native habitats, these species are quite often found in small, well-behaved populations. This is because they occur with other organisms that keep the plant populations in balance. It is not until the species are removed from their habitat that their invasive characters emerge. Invasive species reproduce rapidly because as invaders they are usually non-native species. Free from the herbivores and parasites that keep them in check in their native range, they reproduce rapidly. They increase their numbers, unfettered by natural controls. They displace the native plants. When the populations of native plants are reduced, the animals that depend upon them may perish. The functions of the entire ecosystem are disrupted. Invasive species are truly a form of biological pollution.

Invasive species harm biodiversity when dense growths of non-native weeds displace the native plants that once provided food and shelter for the native animals. As weed populations rise, native species populations fall. The worst weeds even change the character of the entire habitat by changing important processes like nutrient flow. Garlic mustard is found to inhibit mycorrhizal fungi in the soil. This fungus is essential for hardwood tree seedlings to grow. So an increased population of garlic mustard, reduces the viability of the soil to support new hardwood tree populations.

Another invasive species found in Saddler's Woods is multiflora rose which is a thorny bush prevalent in previously disturbed areas and edges of Saddler's Woods. Multiflora rose was introduced to the U.S. from Japan in 1886 as an under-stock for ornamental roses. In the 1930s, the Soil Conservation Services advocated the use of multiflora rose for erosion projects and as a way to confine livestock. Hedges of multiflora rose have also been used as a crash barrier and to reduce headlight glare in highway medians.

Unfortunately, it can severely overtake the native woods habitat. The seeds remain viable for a number of years and due to its thorns, it is difficult to remove by hand.

Keep in mind that not all invasive species are plants. Some examples of invasive animal species in Saddler's Woods are European starlings, European house sparrows, and rock doves or pigeons.

Most people don't consider the earthworm as a threat to New Jersey's ecosystems, but this little-studied organism is starting to get attention as some consider it the biggest threat to our hardwood forests. New Jersey has no native earthworms - they died off during the last glacial period across the region—hence our forests developed without them. The first earthworms probably arrived in our region with ships traveling from Europe which used rocks and soil as ballast which then was dumped ashore when no longer needed. Recently, as fishing has become more and more popular as a hobby, the use of non-native worms for bait has spread them to all corners of the state. Common bait worms include those sold as "night crawlers," and "angle worms."

Woodlands suffer when the chemical and biological structure of the forest floor is changed. Without worms, fallen leaves decompose slowly, creating a spongy layer of organic "duff." Most of our native hardwood forest tree seedlings, wildflowers, and ferns grow best in these conditions. This duff also provides habitat for ground-dwelling animals and helps prevent soil erosion. Invading earthworms eat the leaves that create the duff layer and are capable of eliminating it completely. Big trees survive, but many young seedlings perish, along with many ferns and wildflowers.

DID YOU KNOW?

Invasive plant species contribute to the decline of 46% of the imperiled or endangered species in the U.S.

Module 6 Activity

Part 1: Contact Saddler's Woods Conservation Association to arrange this activity. Go to your tree with a representative of the conservation association and see if you can identify any non-native species near your tree. If there are no invasive species near your tree, go for a walk and look for invasive species.

What did you find? _____

Where did you find it? _____

Do you think the area has been disturbed? _____

What impacts do you think it is having on the woods?_____

_____

Japanese Knotweed

Garlic Mustard

Japanese Stilt Grass

English Ivy

Periwinkle

Phragmites

Part 2 Perform one hour of invasive species removal with a representative from Saddler's Woods Conservation Association.

_____Activity Certification
(Instructor to sign and date)

_____SWCA Certification

MODULE 7: Stewardship

"In wilderness is the preservation of the world."
- Ralph Waldo Emerson

It is imperative that we take care of our native ecosystems not only for the benefit of the plants and animals that live there, but for our own health and viability. To put it simply, a healthy natural world equals a healthy human population. Unfortunately, there are many threats to Saddler's Woods and natural ecosystems.

In order to survive, plants and animals have basic needs that include food and shelter. Habitat provides for these needs, however, it is generally declining at a rapid rate for most species and is the main reason both plant and animal populations are declining.

In NJ, about 42 percent of the state's 4.75 million acres are forested. To maintain the health and sustainability of nearly 2 million forested acres, we must overcome many challenges. Primary threats to NJ forests are urban development, habitat loss and fragmentation, and pollution.

We have already learned how non-native invasive species threaten forested areas like Saddler's Woods. Another threat to ecosystems is fragmentation. Fragmentation is often one of the root issues behind invasive species thriving due to the increase of edge areas and canopy voids.

The viability of an ecosystem is degraded when it becomes fragmented due to development. Saddler's Woods is a fragment of what was once a large forest ecosystem. Remaining natural areas are continually threatened by expanding development, recreational activities and the impacts of surrounding land uses. Now, there are only small areas of quality habitat available, and these remaining habitat patches are becoming smaller and further apart.

This makes interactions between organisms living in different patches much more difficult. A minimum population size for plants or animals needs to be maintained for genetic variability and population viability. Local extinction of a species can occur if the population size drops below the minimum threshold. If a species experiences local extinction in many locations, this can eventually lead to global or permanent extinction.

The red-shouldered hawk and the wood-turtle are two animal species listed as threatened in NJ that reside in Saddler's Woods making it a critical habitat for them. Maintaining habitat is also important for animals that migrate every year. New Jersey serves as a main flyway for neotropical migrating birds. If the habitat that these birds require is lost at any point on the migration path, the species is negatively impacted. Saddler's Woods is a stopover for many species of migrating warblers.

Another threat to healthy ecosystems is pollution. Pollution causes stress and damage to people, plants, and animals. Forms of pollution include air, noise, water and chemical. In

urban areas, air pollution is a main concern for plants and animals including people. Air pollution can build up over time and cause smog which causes severe health problems for all living organisms. Camden County has some of the poorest air quality in the nation. According to the EPA and independent ranking agencies, Camden County has the highest possible air quality pollution ranking. It is in the 90-100th percentile of dirtiest counties in the US. New Jersey is also ranked number one for federally mandated Superfund sites with a total of 116 superfund sites awaiting remediation and cleanup.

Noise pollution is another threat to healthy ecosystems. Noise pollution, such as the high decibels generated by airplane traffic of nearby Philadelphia International Airport, often scares animals and pushes them away from their original territory. Noise pollution may also interfere with vocalizations/response essential for animal's family bonding and mating. Animals are not necessarily accustomed to the sounds of air traffic, construction, cars, or people. To escape the noise, some animals may be forced to use habitat that is less suited for their needs, making survival even more difficult.

Water pollution is another threat to an ecosystem's health. In particular, non-point source pollution from diverse sources such as storm water runoff is a leading water quality problem. In the area surrounding Saddler's Woods, lawn fertilizers negatively impact Saddler's Run, the stream that flows through the woods and into Newton Lake. The excessive nitrates from lawn fertilizers feed aquatic plants causing an overabundance of algae. Other aquatic life suffers, because sunlight is blocked by the large numbers of plants such as algae. When the plants die, the decaying material absorbs high levels of oxygen from the water and suffocates other aquatic life. Other pollutants in the water are absorbed by fish downstream and stored in their flesh, harming or eliminating the species and making them unsafe for human consumption. Non-point source pollution is extremely difficult to control because the actions of everyone in the area contributes to the problem.

Maintaining Saddler's Woods and restoring it into as healthy an ecosystem as possible not only benefit the plants and animals that live there, but humans too. Saddler's Woods provides many benefits to humans, helping to offset many of the threats discussed above.

For instance, as a forested area, Saddler's Woods helps to control flooding during storm events, and the plants and trees help to filter our water and provide oxygen for us to breathe. Saddler's Woods minimizes the impact of air pollution, noise pollution, light pollution and water pollution. And it does it all for free! All we have to do is take care of it so it can continue to provide these benefits to us.

Module 7 Activity:
Part one: On behalf of yourself and all the plants and animals in the woods that need your tree, write a one page thank you letter to your tree. Identify the services that the tree is providing such as shade, food, oxygen, flooding control, or just being nice to sit under. Be sure to put the letter in your notebook. Feel free to draw pictures on your letter if you wish to illustrate your points.

Part two: Go to your tree and clean up any litter that maybe around the area. Once that area is clear of litter, continue to walk the paths and pick up any litter you may find. Perform one hour of litter clean up. Be sure to separate any recyclable materials and bring the bag home for disposal with your regular pickup.

_____Activity Certification
(Instructor to sign and date)

MODULE 8: Become a Junior Forest Ranger

Module 8 Activity:

Part one: By now, you have been given a lot of information and been on many walks in the woods. Now it is time to test your knowledge to see if you are ready to be a Junior Forest Ranger! Take some time to review all of the modules and any notes you have taken. Then, when you're ready, ask your instructor to give you the quiz. Keep in mind that you must answer 70% correctly to qualify for your certificate and you must complete the entire program within one year of your start date.

_____Quiz Grade

Part two: With your instructor, take a family member or friend to the woods and show them your tree, then go for a walk and give them your own tour!

_____Tour Participant Name

Part three: Submit your packet for final approval to your instructor and receive your certificate!

_____Activity Certification
(Instructor to sign and date)

Sources Cited:

These sources were referenced in the compilation of this activity guide and are recommended for further study:

Websites:

NJ Tree Foundation, http://www.charityadvantage.com/njtf/home.asp

The Nature Conservancy, http://tncweeds.ucdavis.edu/methods.html

Scorecard, http://www.scorecard.org

Environmental Protection Agency, http://www.epa.gov/

NJ Forest Service, http://www.nj.gov/dep/parksandforests/forest/njfh2005.pdf

Reference books:

The Once and Future Forest by Leslie Jones Sauer and Andropogon Associates 1998

Tree by David Burne 1988

National Audubon Society Field Guide to Trees Eastern Region, by Elbert L. Little 1980

Ecology and Field Biology by Roger J. Lederer, California State University 1984

Trees of New Jersey and the MidAtlantic States by the NJ Forest Service Fourth Edition 2000

Junior Forest Ranger Quiz

1. The woods are named, "Saddler's Woods." Why?

2. Paintball is permitted in Saddler's Woods. **True / False**.

3. Saddler's Woods is in the _____watershed.

4. Name three benefits trees provide to humans:

    4a.

    4b.

    4c.

5. Name two benefits trees provide to wildlife.

    5a.

    5b.

6. I am part of an ecosystem. **True / False**.

7. Name three non-native invasive plants in Saddler's Woods.

    7a.

    7b.

    7c.

8. Earthworms are good for the forest ecosystem because they decompose leaves.

    True / False.

9. The most interesting thing I learned about my tree was…

10. Name three things you can do to help take care of Saddler's Woods and promote an appreciation for it.

10a.

10b.

10c.

11. The canopy is the lowest layer of the forest ecosystem. **True / False.**

12. A standing dead tree is called a _____.

13. Neotropical warblers need Saddler's Woods as a stop over during migration.

True / False.

C E R T I F I C A T E

Saddler's Woods

Junior Forest Ranger

I hereby certify that _____

successfully completed the Junior Forest Ranger program for Saddler's Woods on _____
(date)

_____

(Instructor's Signature)

Field Notes

Instructions: You can help in our ongoing efforts to inventory all of the flora and fauna species that live or migrate through Saddler's Woods. If you have identified a species not currently listed (see species list), please complete this form and send to:janet@saddlerswoods.org or Saddler's Woods Conservation Association P.O. Box 189 Oaklyn, NJ 08107. Please call 856-869-7372 if you have any questions.

Date:_____

Name (s):_____

Address: _____

Telephone: _____

Email: _____

Please list species sited and locations.

Examples: Species Sited: Baltimore Oriole Location: Meadow area
Species Sited: Jack in the Pulpit Location: Post 12

Species Sited: _____ Location:_____

Species Sited: _____ Location:_____

Species Sited: _____ Location:_____

Species Sited: _____ Location:_____

Species Sited: _____ Location:_____

Time sited:_____

Weather:_____

Moon Phase: _____

*Please attach any photos. *(If by email 5 MB maximum file size)*

Thank You!

12/13/06

SPECIES LIST - 293

Below is a working document outlining the species identified in Saddler's Woods, Haddon Township since January 2001. The common names are used.

* Non native to region – includes introduced / naturalized species
** Local native / non-native status under review by SWCA

BOTANICAL NAME	COMMON NAME	NOTES
Canopy & Small Trees -52		
Fagus grandiflora	American Beech	
Ulmus Americana	American Elm	
Ilex Americana	American Holly	
Myrica cerifera	Bayberry	
Populus	Big-toothed Aspen	
Betula populifolia	Birch, Grey	
Aronia melanocarpa	Black Chokeberry	
Prunus serotina	Black Cherry	
Robinia pseudoacacia**	Black Locust **	
Quercus velutina	Black Oak	
Juglans nigra	Black Walnut	
Acer negundo	Boxelder	
Platanus americana	Buttonwood (Sycamore)	
Halesia carolina	Carolina Silver Bell	
Catalpa sp.	Catalpa **	
Quercus montana	Chestnut Oak	
Prunus	Choke Cherry	
Malus sp.	Crabapple	
Magnolia acuminata	Cucumber Magnolia	
Aralia spinosa**	Devil's Walking Stick**	
Cornus florida	Dogwood	
Forsythia sp.	Forsythia	
Fraxinus pennsylvanica	Green Ash	
Celtis occidentalis	Hackberry	
Gleditsia triancanthos	Honey Locust	
Carpinus caroliniana	Hornbeam (Ironwood, Musclewood)	
Albizia julibrissin*	Mimosa*	
Carya tomentosa	Mockernut Hickory	
Quercus rubra	Northern Red Oak	
Acer platanoides	Norway Maple*	
Carya glabra	Pignut Hickory	
Quercus palustris	Pin Oak	
Paulonia tomentosa*	Princess Tree*	
Aronia arbutifolia	Red Chokeberry	
Acer rubrum	Red Maple	
Morus rubra*	Red Mulberry*	
Sassafras albidum	Sassafras	

Quercus coccinea	Scarlet Oak	
Carya laciniosa	Shellbark Hickory	
Acer saccharinum	Silver Maple	
Nyssa sylvatica	Sour (Black) Gum	
Quercus falcata	Southern Red Oak	
Quercus bicolor	Swamp White Oak	
Prunus	Sweet Cherry	
Liquidambar styraciflua	Sweet Gum	
Ailanthus altissima*	Tree of Heaven*	
Fraxinus Americana	White Ash	
Morus alba	White Mulberry	
Quercus alba	White Oak	
Quercus phellos	Willow Oak	
Hammamelis virginiana	Witch Hazel	
Liriodendron tulipifera	Yellow Poplar (Tulip Poplar)	
Shrubs - 11		
Rubus (ID needed)	Blackberry	
Clethra alnifolia	Summersweet	
Cornum amomum spelling?	Silky Dogwood	
Forsythia sp.	Forsythia	
Kalmia Latifolia	Mountain laurel	
Rhododendron periclymenoides (nudiflorum)	Pinxterbloom azalea -	
Rhus glabra	Smooth Sumac	
Rhus copallinum (copallina)	Winged (Shining) Sumac	
Rosa multiflora	Multiflora Rose	
Sambucus canadensis	Elderberry	
Viburnum dentatum	Arrowwood Viburnum	
Grasses, Sedges & Rushes - 7		
Carex pennsylvanica	Penn Sedge	
Carex stricta	Tussock Sedge	
Digitaria sp. (ID needed)	Crab Grass	
Juncus tenuis	Path Rush	
Microstigium vimineum*	Japanese stilt grass*	
Phragmites australis*	Giant Reed*	
Rumex sp.*	Sheep Sorrel*	
Lawn grasses not ID'd		
Herbaceous Perennials, Annuals, Parasitic		
Alcea rosea*	Hollyhock*	
Ambrosia artemisiifolia	Annual Ragweed	
Apocynum sp.	Dogbane	
Arisaema triphyllum	Jack in the pulpit	
Asclepias syriaca	Common Milkweed	
Aster divaricata	White Woodland Aster	
Chimaphila umbellata	Pipsissewa	
Clinopodium? (ID needed)	Wild Basil	

Daucus carota*	Queen Anne's Lace*	
Duchesnea indica*	Indian strawberry, (Yellow)*	
Epiphegus Americana	Beech drops	
Erigeron annuus	Daisy Fleabane (annual)	
Eupatoriadelphus (Eupatorium) sp.	Joe Pye Weed	
Eupatorium perfoliatum	Common Boneset	
Helianthus annuus	Common Sunflower	
Hieracium sp*	Hawk Weed*	
Impatiens capensis	Jewelweed	
Lamium sp.*	Henbit, mint*	
Maianthemum canadense	Canadian Mayflower	
Maianthemum racemosum	False Solomon's Seal	
Need to ID w/ botanical name	Marsh marigold	
Oenethera biennis	Evening Primrose	
Ornithogalum umbellatum	Star of Bethlehem*	
Oenethera biennis	Evening Primrose	
Osmorhiza longistylis	Aniseroot (type of Sweet Cicely)	
Polygonatum biflorum	True Solomon's Seal	
Polygonum pensylvanicum	Pennsylvania Smartweed	
Pterospora andromedea	Indian pipe	
Sisynrinchium montanum	Common Blue-eyed Grass	
Solidago sp.	Goldenrod	
Symplocarpus foetidus	Skunk cabbage	
Trifolium pretense*	Red clover*	
Trifolium repens*	White clover*	
Tussilago farfara*	Coltsfoot*	
Uvularia sessilifolia	Sessile-leaf Bellwort	
Viola sp (ID needed)	White Violet	
Viola sp. (ID needed)	Blue Violet	
?	Ladies Thumb	
Ageratina altissima	White Snakeroot	
Oenethera biennis	Evening Primrose	
Ferns		
Thelypteris noveboracensis	New York Fern	
Onoclea sensibilis	Sensitive fern	
Osmunda regalis	Royal Fern (Planted 2006)	
	*mystery fern by dirt hill	
	*Mystery fern in gully – have photos.	
Mushrooms - 17		
	Beefstake polypore	
	Brick Tops	
	Common Split Gill	
	Crown Tipped Coral	

	Destroying Angel	
	Devil's Urn	
	Fawn Mushroom	
	Half free Morel	
	Hen of the woods	
	Jack o lantern	
	King Bolete	
	Old Man of the woods	
	Orange Mycena	
	Stalked Scarlet Cup	
	Tacky Green Russula	
	Thick Maze Oak Poly	
	Violet Toothed Polypore	
Vines - 6		
	Bittersweet nightshade	
	Catawba grape	
	Native honeysuckle	
	Japanese honeysuckle	
	Poison ivy	
	Sweet pea	
	Partridgeberry (Squaw Vine)	
Birds – 55		
Empidonax virescens	Acadian Flycatcher	
Corvus brachyrhynchos	American Crow	
Carduelis tristis	American Goldfinch	
Turdus migratorius	American Robin	
Icterus galbula	Baltimore Oriole	
Poecile atricapilla	Black Capped Chickadee	
Cyanocitta cristata	Blue Jay	
Certhia Americana	Brown Creeper	
Molothrus ater	Brown headed cowbird	
Cardinalis cardinalis	Northern Cardinal	
Thryothorus ludovicianus	Carolina Wren	
Bombycilla cedrorum	Cedar Waxwing	
Chaetura pelagica	Chimney Swift	
Spizella passerina	Chipping Sparrow	
Quiscalus quiscula	Common Grackle	
Accipiter cooperii	Cooper's Hawk	
Picoides pubescens	Downy Woodpecker	
Sturnus vulgaris	European Starling	
Tyrannus tyrannus	Eastern Kingbird	
Otus asio	Eastern Screech Owl	
Dumetella carolinensis	Gray Catbird	
Bubo virginianus	Great Horned Owl	
Myiarchus crinitus	Great Crested	

	Flycatcher	
Picoides villosus	Hairy Woodpecker	
Carpodacus mexicanus	House Finch	
Passer domesticus	House Sparrow*	
Troglodytes aedon	House Wren	
Junco hyemalis	Dark eyed Junco	
Zenaida macroura	Mourning Dove	
Colaptes auratus	Northern Flicker	
Mimus polyglottos	Northern Mockingbird	
Contopus virens	Eastern Pee Wee	
Dryocopus pileatus	Pileated Woodpecker	
Carpodacus purpureus	Purple Finch	
Sitta canadensis	Red Breasted Nuthatch	
Melanerpes carolinus	Red Bellied Woodpecker	
Vireo olivaceus	Red Eyed Vireo	
Buteo lineatus	Red Shouldered Hawk	
Buteo jamaicensis	Red Tail Hawk	
Agelaius phoeniceus	Red Wing Blackbird	
Columba livia	Rock Dove, Common Pigeon*	
Pheucticus ludovicianus	Rose Breasted Grosbeak	
Pipilo erythrophthalmus	Rufous-Sided Towhee	
Regulus calendula	Ruby crowned kinglet	
Piranga olivacea	Scarlet Tanager	
Melospiza melodia	Song Sparrow	
Tachycineta bicolor	Tree Swallow	
Baeolophus bicolor	Tufted titmouse	
Cathartes aura	Turkey vulture	
Catharus fuscescens	Veery	
Sitta carolinensis	White Breasted nuthatch	
Zonotrichia albicollis	White throated sparrow	
Troglodytes troglodytes	Winter wren	
Scolopax minor	Wood Cock	
Hylocichla mustelina	Wood thrush	
Sphyrapicus varius	Yellow bellied sapsucker	
Birds – Warblers – 16		
Dendroica castanea	Bay Breasted Warbler	
Mniotilta varia	Black And White Warbler	
Dendroica striata	Blackpoll Warbler	
Dendroica caerulescens	Black Throated blue Warbler	
Wilsonia Canadensis	Canada Warbler	
Dendroica pensylvanica	Chestnut Sided Warbler	
Dendroica dominica	Common Yellowthroat	

	Warbler	
Dendroica magnolia	Magnolia	
Dendroica coronata	Myrtle Warbler , Yellow rumped warbler	
Parula americana	Northern Parula	
Seiurus aurocapillus	Ovenbird	
Dendroica palmarum	Palm Warbler	
Setophaga ruticilla	American Red Start	
Wilsonia pusilla	Wilson's Warbler	
Dendroica petechia	Yellow Warbler	
Insects,worms,spiders - 30		
Malacosoma americanum	American Tent Caterpillar	
	Bark Beetle	
	Black flies	
	Carolina Praying Mantis	
	Chinese Praying Mantis	
	Cicada	
	Cicada Killer	
	Centipede	
	Crickets	
	Carrion beetle	
	Cylindrical Hardwood Borer	
	Common black Ground beetle	
	Divergent Metallic Wood borer	
	Eastern Daddy-Long legs	
	Earthworm, nightcrawler	
	Eastern Wood Tick	
	Forest Wolf Spider	
	Goldsmith Beetle	
	Green Grasshopper	
	Ground bees	
	Honeybees	
	Katydid	
	Lady bug	
	Metaphid Jumping Spiders	
	Pennsylvania Firefly	
	Red flat bark beetle	
	Red tailed bumble bee	
	Tiger Mosquitoes	
	fungus gnats	
	Yellow Jackets	

Butterflies and moths - 25		
	Black swallowtail	
	Cabbage white	
	Clouded sulpher	
	Eastern Comma	
	Eastern Tailed Blue	
	Eastern Tiger swallowtail	
	Gray Hairstreak	
	*Gypsy Moth - invasive	
	Hackberry Butterfly	
	Harvester	
	Hickory Hairstreak	
	Isabella tiger moth	
	Least Skipper	
	Monarch	
	mourning cloak butterfly	
	Pearl Crescent	
	Peck's Skipper	
	Polyphemus moth	
	Red admiral	
	Red Banded Hairstreak	
	Silver spotted skipper	
	Small Copper	
	Spice bush swallowtail	
	Spring (Summer) Azure	
	Virginian Tiger Moth	
Marsupial - 1		
	Virginia opossum	
Mammal - 11		
	Big Brown bat	
	Eastern chipmunk	
	Eastern cottontail rabbit	
	Eastern spotted skunk	
	Gray squirrel	
	Muskrat	
	Raccoon	
	Red fox	
	Short tailed shrew	
	White footed mouse	
	Woodland vole	
Reptiles and Amphibians - 8		
	American Eel	
	Bullfrog	

	Common garter snake	
	Green tree snake	
	Eastern red backed salamander	
	Eastern box turtle	
	Rat snake	
	Wood turtle	
Invasive - 19		
	Ailanthus	
	Black Locust	
	*Devil's Walking Stick- MAY JUST BE NORTHERN MOST RANGE	
	Earthworm, nightcrawler	
	Elm, Chinese	
	English Ivy	
	Garlic Mustard	
	Gypsy moth	
	Japanese Honeysuckle	
	Japanese Knotweed	
	Japanese Stilt Grass	
	Maple, Norway	
	Mimosa	
	Multiflora Rose	
	Paulownia	
	Periwinkle	
	Phragmites	
	Red Mulberry	
	Wisteria	