Spring Fifth Grade Nature Walk: Quick Notes

Please read the complete walk guide for background. This doc is a summary and has extra notes.

Acton Arboretum has changed over time. It was previously a farm (orchards and livestock), however, the natural features of esker, kettle bog, and swamp have been here much longer. The interaction of people and natural progression of vegetation and animals have created unique habitats. Explore the habitats. All contain:

- **producers** -- Plants use photosynthesis to manufacture their own food. They are the lowest level in the food chains we discuss.
- **consumers** -- animals that eat plants/other animals
- **decomposers** -- plants and animals that feed and produce new soil

Student assignments

List/draw various plants & animals they discover on their worksheets. Think about food chains for various habitats. Start to understand interdependencies between elements in ecosystem, how people play a role, and actions cause reactions. You can talk about the assignment on the way to the Arboretum. They will use these categories for observations: **non-living** (rocks, walls), **plants**¸ **animals** (bugs, birds, evidence such as nests, home sites, or tracks), and **fungi**.

Major concepts to discuss

- Layers of the forest (page 7 of guide)
- Several ecosystems present (bog, forest, meadow, swamp, vernal pool, pond, stone walls). Students can relate these ecosystems to their ecoterriums made in class.
- Producers/consumers/decomposers (page 2)

Notes on ecosystems

Boardwalk/Kettle bog habitat: Bog formed by ice, water is acidic, with no outflow. See the Fall Walk Guide for details. You can review the bog concepts from the fall walk.

- *Plants*: pitcher plant, blueberry, sphagnum (peat) moss, leather leaf, poison sumac.
- *Animals:* swamp mites, peepers (frogs), ribbon snakes, water spiders, mosquitoes, owls, hawks.

Esker/Stonewall habitat: There are a number of stonewalls in the arboretum, with a prominent one on the esker. Most of these stonewalls are made with large stones, indicating the land inside the wall was pasture or orchard--if it was for growing crops, there would be smaller stones in the walls.

- *Decomposers:* Fungi & Lichen. Lichen grows on the rocks in the walls. Fungi (think mushrooms not green) and Lichen (algae & fungus) help break down decaying plants and rocks to create soil.
- *Plants:* usually start in ground adjacent & grow over.
- *Animals:* The walls are homes to mice, chipmunks, snakes, which attract foxes and predator birds

Pond habitat: The two adjacent ponds were used to wash fruit from an orchard. The ponds have flat stones on the bottom, indicating they were changed by previous owners. The upper pond (on the right when facing it) is spring fed and the lower pond is more seasonal (the upper pond can flow into the lower pond, if the water is high). This is a breeding area for salamanders. Other animals are frogs, snakes, water fowl. The pond has duckweed, one of the smallest plants.

Forest habitat: The forest here is in transition from orchard/pasture land. One white oak was left as a shade tree for the pasture animals long ago. This is described on page 4. As you are on the main Esker trail, you will see a path on the right. The oak with large spreading branches is shortly after this on the left about 75 feet into the woods;

Most of the remaining trees are less than 100 years old, except for a few pines that couldn't be easily cut into planks--ones where the top got damaged and side buds took over creating a forked tree. The pitch pines are almost gone, though there are few. Pitch pines have a shorter life span and are overshadowed by the white pines. The forest progression goes from shorter lived pines to hard woods such as maples.

Because not all the trees have leafed out, there is a lot of sun in the woods right now (mid May). The wildflowers are blooming because they get a lot of sun this time of year. Students may be surprised that the woods are so sunny.

Meadow habitat: The meadow has overgrown grasses and sumac. The sumac has hollow stems that were used to drain maple sap to make syrup. The meadow has field mice, voles and other seed eating critters that are 1st level consumers that attract the 2nd level consumers, fox, coyotes and predator birds such as owls and hawks.

Note that this area is a meadow because workers periodically cut it back. If not, it would eventually fill in as forest.

Interesting plants you might see on the walk

Pitcher plant	Lady Slipper	Jack-in-the-Pulpit
Star flower	Bear berry (small red berries)	Poison Ivy
Sarsparilla	Sumac	Celadine (bright yellow flowers)
Turkey Tail fungus	Shelf fungus	Blueberry blossoms
Solomon's Seal	Cinnamon Fern (fuzzy stem)	Leatherleaf
Ground Pine	Canada Mayflower	Fern

You may see ducks, salamanders, frogs, blue heron (large bird with long beak), chipmunks, garter snakes, a variety of bugs, (especially if you turn over a log), and a variety of small birds.

Route

1. Leave Conant and follow Minot Ave to the Arboretum entrance across from Forest Street.
2. Go down the stairs and take boardwalk to the bog. You can review the bog concepts from the fall walk.
3. After boardwalk, follow yellow trail (Esker trail) along the esker and stone wall.
4. When you see a left and the sign for the Taylor Road parking lot, take this left and follow the trail down to vernal pool and pond.
5. After viewing the pond and vernal pool, follow the boardwalk to look at the wildflower garden.
6. At the end of the flower garden boardwalk, turn around and retrace your steps up to the Esker trail.
7. Follow the Esker trail until you see a trail that bears left to a meadow.
8. Follow this trail through the meadow. It will follow the edge of the bog and circle back to the starting point.

Note: To avoid crowding, some groups can do the walk backwards. That is, after the stairs, take a right and follow the path along the edge of the bog, meadow, etc. and end up at the bog boardwalk.

Supplies

- Students will have a clipboard with a sheet to complete. This is page 6 in the walk guide.
- You will have an "Acton Naturally" guide which lists the plants, animals, wildflowers, etc. you are likely to see in Acton. Many of the wildflowers listed in this guide are present along the walk. Feel free to bring your own field guides if you like.

Other notes

- Students should stay on the path. There are a lot of roots and stones, so no running.
- Students can touch trees, shrubs, etc .that they see, but watch out for poison ivy.
- No picking or destroying living plants. Can collect fallen items if desired.
- Feel free to turn over fallen logs and look for insects. There are many examples of fallen trees that are decomposing. Look for fungi and lichen on decomposing logs.

Grade Five Spring Nature Walk

This Grade Five Nature Walk explores the forest layers (the canopy, understory, the shrub, the herb and the forest floor) and the creatures and plant life that inhabit them. A variety of ecosystems or habitats will be explored on this one hour and 15 minute walk.

Objectives - The objectives of this walk are to help students:

- Explore and observe all of the layers of the forest.
- Record all plants, animals, fungi and non-living things they discover
- Demonstrate some understanding of food chains - producer, consumer and decomposer.
- Realize that the ecosystem they have observed and described is a constantly changing system of plants and animals interacting with themselves and with the non-living environment.
- Realize that everything is dependent on everything else.

Materials for each group:

Pencil, clipboard, worksheets
Baggies
Trowel
Bug box
(Leader should carry extra pencils)

The Walk

Please note that you primarily want the students to make observations and tell about them. Therefore, use questioning techniques, encourage observations and supply answers and terms when necessary so that accurate information is imparted and learned.

Walk the group across Minot Avenue to the Acton Arboretum. Explain to the students as you walk along that they will be recording on their worksheet everything that they discover in the forest in one of four categories: Non-living, Plants, Animals (evidence of animals such as home sites, tracks, etc. and count) and Fungi. They will further be discussing whether these are

producers, consumers or decomposers. They may write the proper names if known. If the name is not known by anyone in the group, then the student can write a description of the discovery.

Walk across the bog boardwalk and proceed to the top of the esker. As you walk past the bog, ask the students:

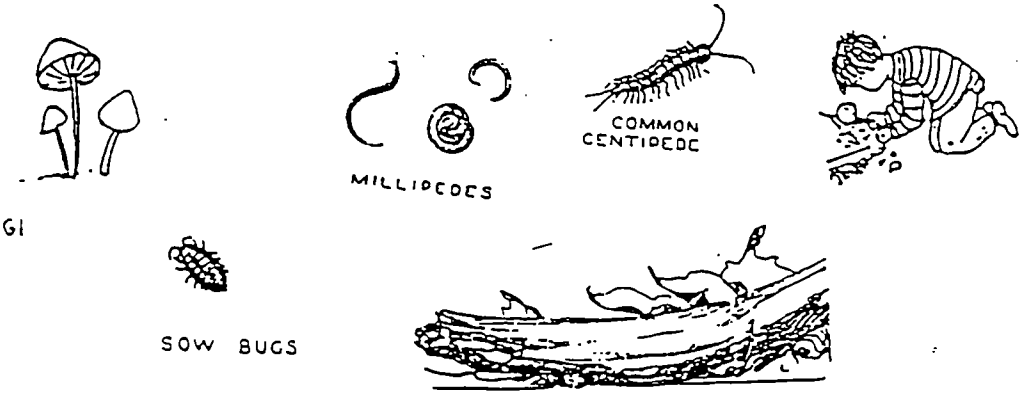
- **How was the bog formed?** The answer is that during the Ice Age, a huge block of ice sat in this area. As the ice receded, rivers of water flowed around the ice block, leaving deposits of sand and gravel . The large block of ice eventually melted and left a 16 ft. deep "kettle hole". Over the years, the hole was filled in with stagnant water. No stream feeds into the bog which makes the water acidic.
- **What lives in this ecosystem?** Pitcher plant, peat moss, peepers, ribbon snakes, water spiders.

As you walk along the esker, talk about the forest being in transition. 100 years ago there were many pitch pine and white birch trees (look at dying ones on the path). These have been replaced with mostly white pine and in another 100 years this will be replaced with hardwoods such as red and white oaks and hickory (see example of these along the path). These trees have a 200 year lifespan. (Please see attached esker cross section map). Note that the marsh is on one side of the esker and the bog is on the other.

Before you leave this area, talk about the interactive food chain between animals that inhabit the canopy of the forest and the bog. For example, one foodchain is the mites on the bog water eat the plants and spread pollen, bogspiders eat the mites, peepers eat the bogspiders, ribbon snakes eat the peepers, and the broadwinged hawks and owls eat the snakes. Use the terms producer, consumer and decomposer.

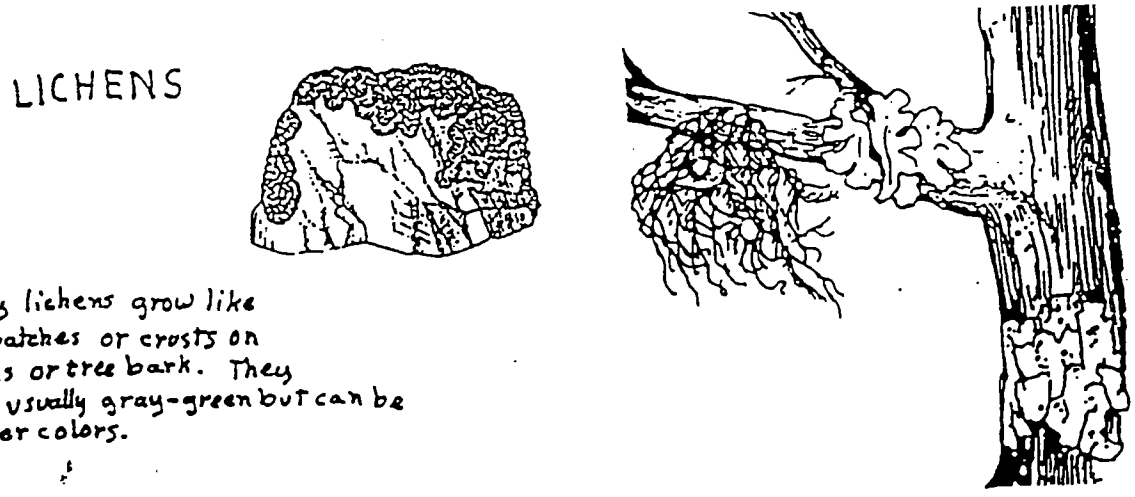
- **Producers** - plants because they produce their own food through photosynthesis. They make food from water, minerals, sun and air.
- **Consumers** - 1st level - animals that eat plants, 2nd level - animals that eat both plants and other animals or just other animals.
- **Decomposers** - both plants and animals that feed on dead plant and animal material turning them into soil which help new plants to grow.

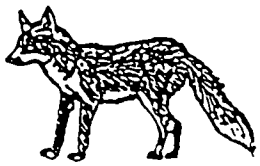
As you proceed towards the stone wall, stop on the path and talk about the dying birch trees with fungus on them. Look for the pile of dead logs to the left with turkeytail fungi and have the students turn one of the logs over and look for decomposers such as millipedes, centipedes and sow bugs.



In many areas, you will see fungi. Fungi are not green, they don't photosynthesize . Fungi live on dead or dying organic material. Shelf fungi are found in the forest year round on dead and unhealthy trees; they are so named because they grow parallel to the ground like a shelf. Many kinds of toadstools appear for a brief period according to seasons and weather; a toadstool is the spore producing part of a fungus which is growing under ground round as white filaments. Fungi play an important role in decomposition.

Lichens are another tiny plant always found in the forest. Lichens grown on trees, on rocks, on decomposing logs, and on poor soil. Lichens are a symbiotic combination of algae and a fungus growing together and totally dependent on each other. The fungus provides moisture and an anchor for the algae while the algae provides food through photosynthesis. Lichens on rocks produce a chemical which helps the rock decay, and they are also a decomposer on rotting logs. Students may remember the name lichen because the fungus and algae have a "liking" for each other.





As you come to the stone wall, ask the students what animals live there. Then, talk about how the stone walls are their own small ecosystem. The stone walls were built by farmers years ago while clearing fields but now the animals use them as roadways through the forest. For example, the chipmunks and mice that live in the wall attract hunters(2nd level consumers) looking for food - snakes, coyotes, foxes and skunks. Coyotes hunt in pairs, female and male, first one behind the other and then on either side of the wall to catch whatever they might spook out. Foxes hunt alone and walk on top of the wall. Snakes hunt mice and chipmunks in the wall but also go there to use the tight crevices to shed their skin.

On the left, look for the huge oak tree that was not cleared by farmers as it was used for shade by the farm animals. Have students guess the age of the tree. (150 years old). Also, look for many trunked white pine trees also left untouched by the farmers because they could not be utilized for building. Ask the students why these trees are deformed. Then talk about the pine weavel that ate the bud out of the middle growing stem. So the alternate buds fought to be the leader stem which produced multiple trunks.

Proceed toward the pond. On the right side look for celadon plants and tear a leaf to show how the sap is yellow. Native Americans used this as a dye and today the plant is used as a ground cover. As you approach the pond, talk about it as another unique ecosystem. The primary difference between this and the bog is that the pond is fed by a fresh water stream. This contains oxygen and therefore sustains different forms of life.

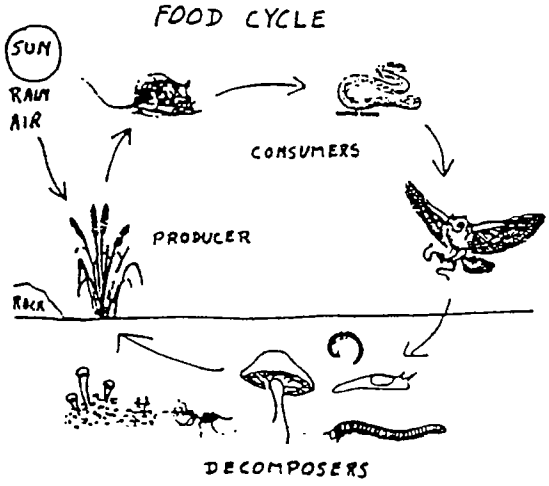
At the pond, note the duckweek floating on top of the water. It is the smallest flowering plant. Skunk cabbage is growing along the edge of the ponds. You may see turtles and frogs.

On the left side is the small pond which is really a vernal pool (not spring fed). Note the water movement is minimal. This serves as a mating ground and for the mole and spotted salamanders. Mole salamanders are large and are called mole salamanders because they live the rest of the year in side old mole tunnels on higher ground in the forest. They come down to the pond/vernal pool only to mate. The males go a few weeks before the females and excrete a sperm sack which sinks to the bottom. The females then

retrieve the sperm sacks from the bottom, externally fertilize their eggs and then attach the blob of fertilized eggs to a branch that suspends it in the water but won't allow it to sink to the bottom. This gives the eggs a better chance of survival from bottom feeding predators and from bacteria.

When going back, have students identify something that you have covered on the way out to the ponds. You will not backtrack the entire path as you take the left fork through the meadow. When in the meadow, note that it is a different ecosystem (i.e. different plants, different birds visit there). Note the staghorn sumac with its corky stem and red tasseled top. Break off a piece to examine the corky stem and show how Native Americans hollowed it out to use as a tool to obtain the sap from the sugar maple trees. Pull up on a plant stem and note how it is connected to the plant stem next to it. The reason is this is that staghorn sumac is essentially one big plant that keeps growing from its spreading rhisomes. Ask students if they know of other rhisome plants.

As you proceed through the backside of the bog, this is a great spot to see cinnamon ferns. Again ask students to identify plants, trees, fungi, etc as you travel back to keep their interest. Have them use new terms such as consumers, producers and decomposers. Have them identify the layers of the forest. Wrap up with asking if there are any further questions.



Discoveries on the Arboretum Walk

Write the name of your discovery or if unknown, a description under the appropriate category. Then identify whether it is a consumer, producer, or decomposer.

Plants

Animals

Fungi

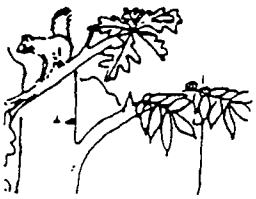
Non-living

LAYERS IN THE FOREST

CANOPY LAYER

The crowns of the dominant trees of a deciduous forest form the canopy layer. The top of the canopy receives the most sunlight energy. It also receives the strongest winds and rain. Few animals live at the very top.

Within the shade just below the top of the canopy fewer plants can survive, but a large number of animals use the cooler and more humid canopy for finding food and shelter. Leaf-eating insects, scarlet tanagers, orioles, some warblers, owls, hawks, and squirrels use this layer for food and to nest.



UNDERSTORY LAYER

Young trees and trees that grow to only 20 feet form the understory layer. Less sunlight reaches these trees. Almost all forest birds use this layer at least part of the time for singing or escape. The tree trunks team with insect life. Woodpeckers, nuthatches, some vireos and warblers spend most of their time here.

SHRUB LAYER

Shrubs that grow from 4 to 8 feet high serve as food for leaf hoppers,aphids, caterpillars, and leaf miners. Many birds nest here, such as catbirds, cardinals, wood thrushes, towhees, and many warblers. Deer use shrubs and small trees for browsing.

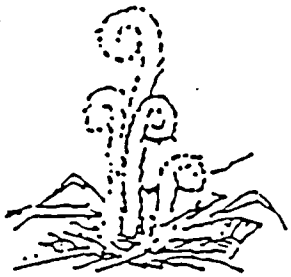
HERB LAYER

This layer is most conspicuous during spring before canopy leaves block out the sun. Then wildflowers bloom and ferns unfurl. Later, in the shade, flowers are few, but mosses, lichens, ferns, fungi, and some grasses thrive. Animals are chipmunks, mice, raccoons, deer, rabbits, fox, skunks, spring peepers.

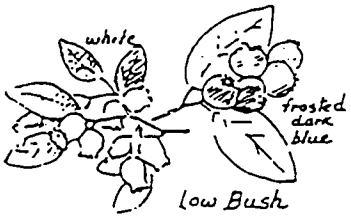
FOREST FLOOR LAYER

This layer is the waste basket for all the layers above. Leaves, animal droppings, dead trees, decaying plants and animals slowly decompose and become new soil. Many birds feed here and some, such as grouse and oven bird, nest. Land turtles, toads, wood frogs, salamanders, snakes, and hundreds of species of insects live within the litter on the surface. Below the surface, helping to break down the litter are earthworms, sow bugs, carrion beetles, molds, fungi, bacteria, spiders, shrews, moles, and numerous others.

Ferns and fern fiddle heads should be beginning to grow as well as Canada mayflower and other early spring wild flowers. You may find partridge berry still showing its red berries, striped winter green, or other tiny plants which stay green all winter. Small shrubs including blueberry may be leafing out.

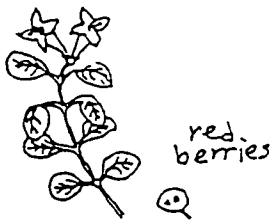


Fiddlehead Ferns
Cinnamon Ferns have brown fuzz on stems
Look for spore fronds

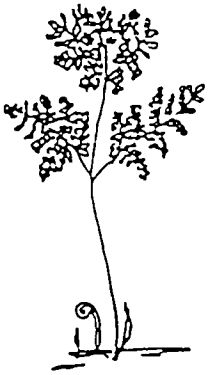


Blueberry
Twigs are green

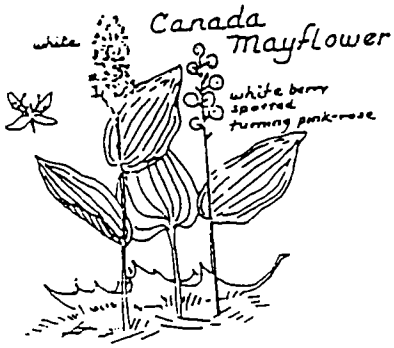
Poison Ivy



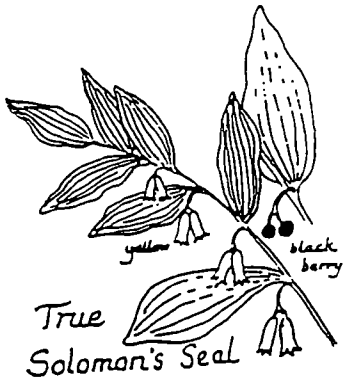
Partridgeberry
white flowers
evergreen



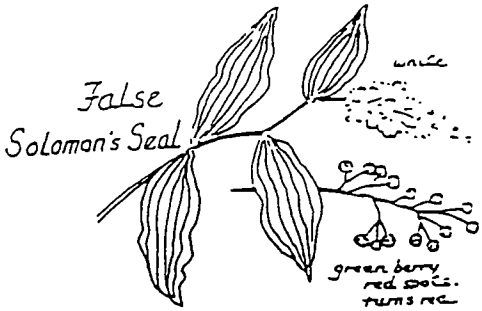
Bracken Fern



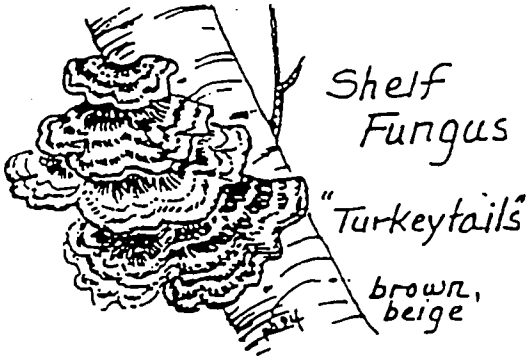
Canada Mayflower



True Solomon's Seal

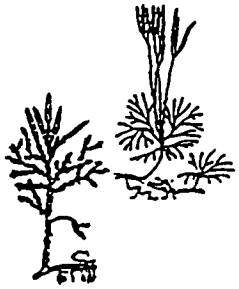


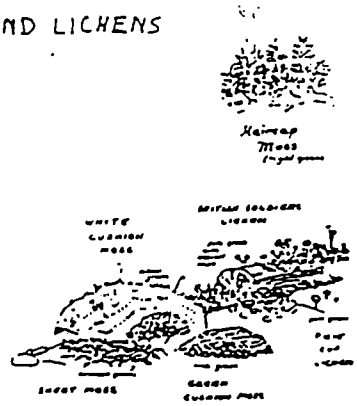
False Solomon's Seal



Shelf Fungus
"Turkeytails"
brown, beige

GROUND PINE, MOSSES, AND LICHENS



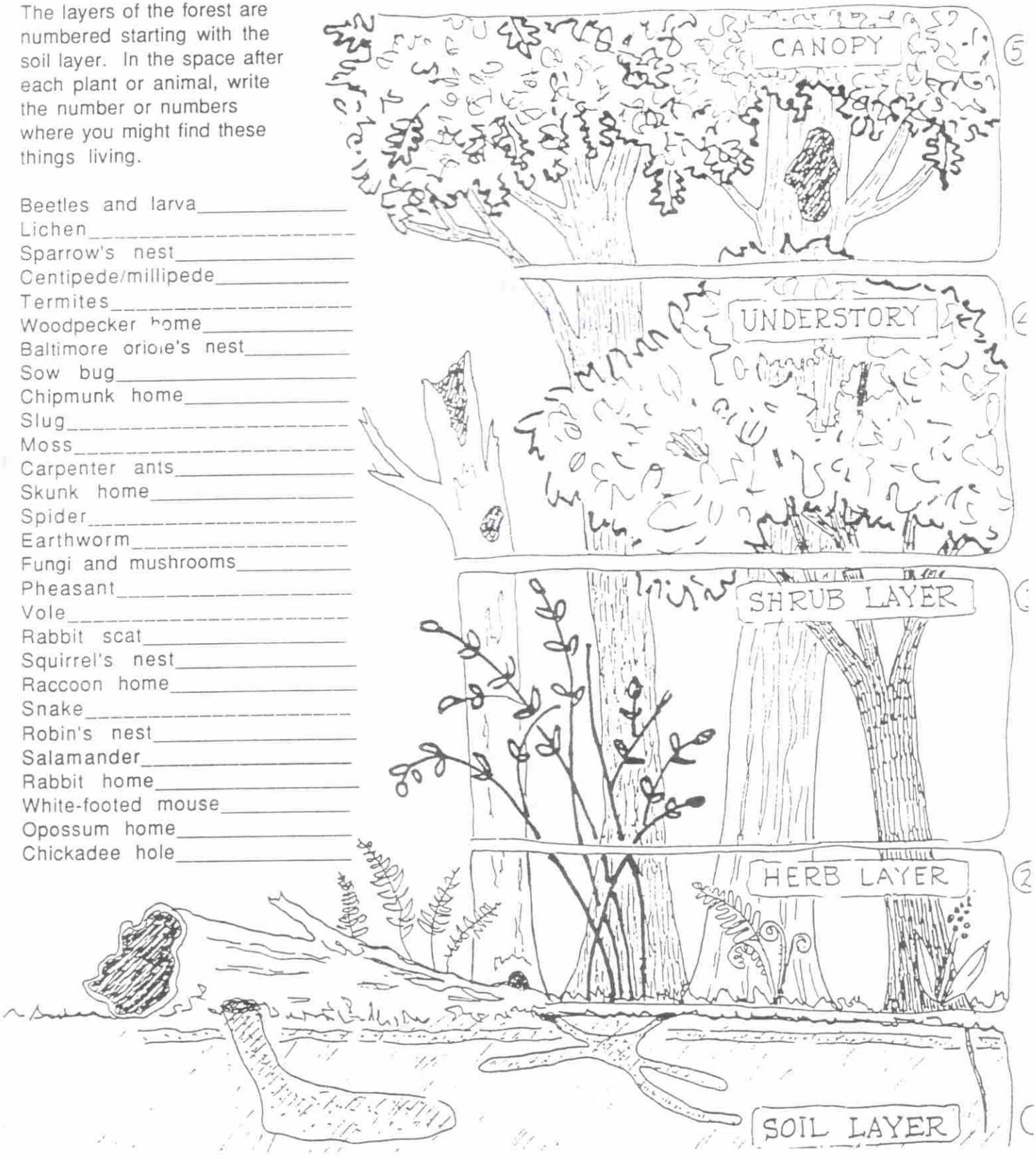


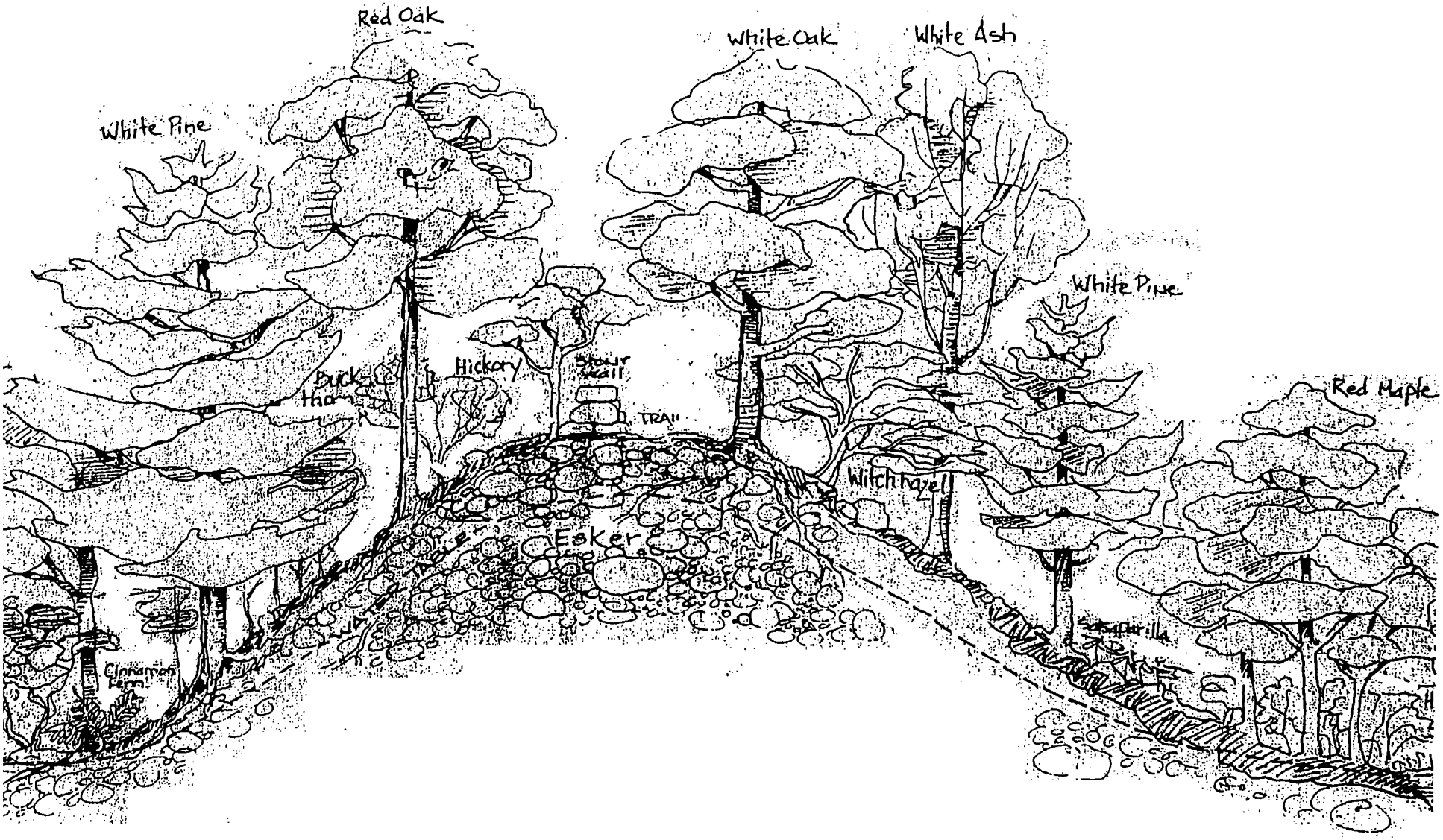
THE FOREST COMMUNITY

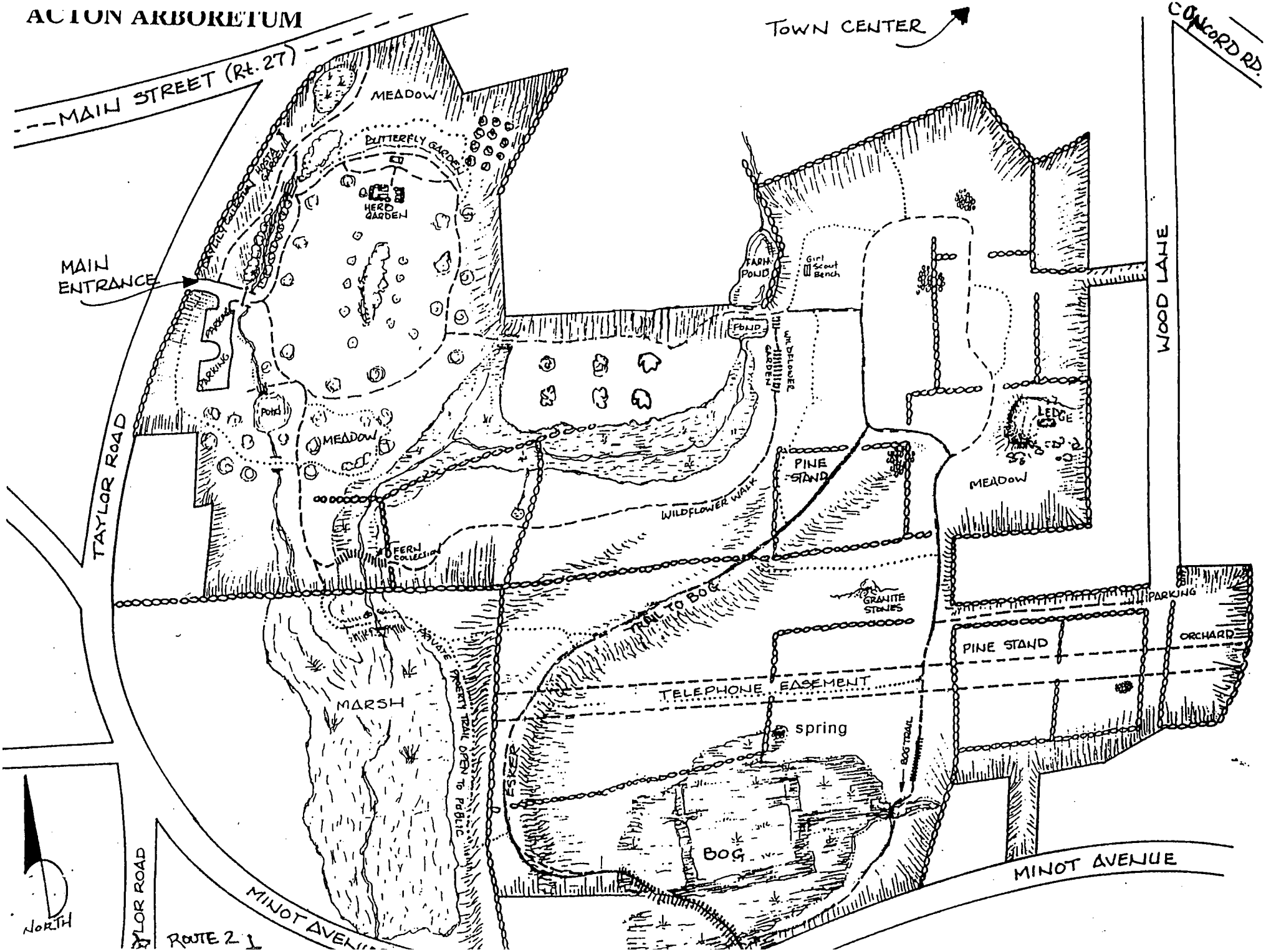
• • • THE LAYERS AND INHABITANTS • • •

The layers of the forest are numbered starting with the soil layer. In the space after each plant or animal, write the number or numbers where you might find these things living.

Beetles and larva_____
Lichen_____
Sparrow's nest_____
Centipede/millipede_____
Termites_____
Woodpecker home_____
Baltimore oriole's nest_____
Sow bug_____
Chipmunk home_____
Slug_____
Moss_____
Carpenter ants_____
Skunk home_____
Spider_____
Earthworm_____
Fungi and mushrooms_____
Pheasant_____
Vole_____
Rabbit scat_____
Squirrel's nest_____
Raccoon home_____
Snake_____
Robin's nest_____
Salamander_____
Rabbit home_____
White-footed mouse_____
Opossum home_____
Chickadee hole_____




Red Oak
White Pine
White Oak
White Ash
White Pine
Red Maple
Hickory
TRAIL
Witch Hazel
Esker


ACTON ARBORETUM
MAIN STREET (Rt. 27)
TOWN CENTER
CONCORD RD.
MEADOW
BUTTERFLY GARDEN
HERB GARDEN
MAIN ENTRANCE
PARKING
POND
FARM POND
Girl Scout Bench
WILDFLOWER GARDEN
WOOD LANE
LEDGE
PINE STAND
MEADOW
TAYLOR ROAD
WILDFLOWER WALK
FERN COLLECTION
GRANITE STONES
PARKING
TRAIL TO BOG
ORCHARD
PINE STAND
TELEPHONE EASEMENT
MARSH
PRIVATE PROPERTY TRAIL OPEN TO PUBLIC
spring
ESKER
BOG TRAIL
BOG
MINOT AVENUE
NORTH
ROUTE 2