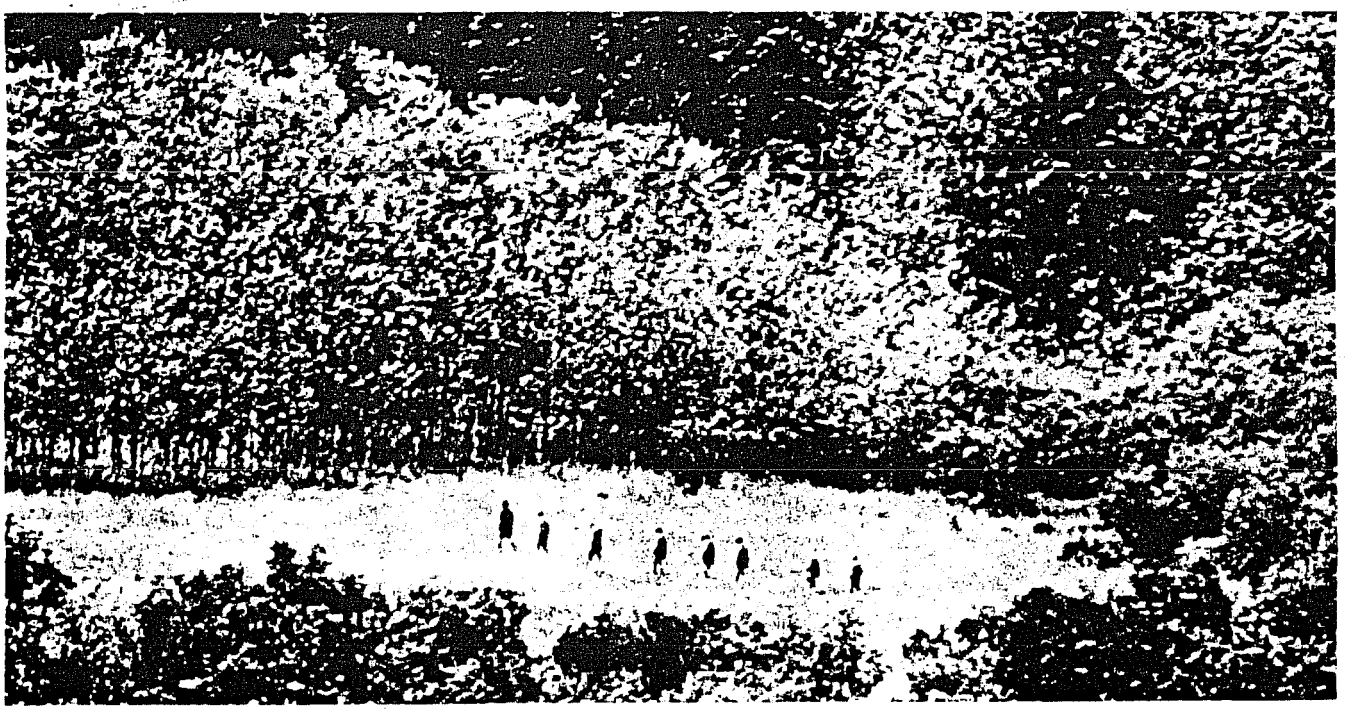
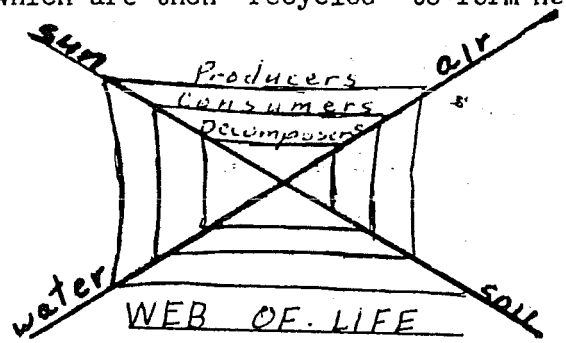
CHICKAMAUGA ENVIRONMENTAL TRAIL



CHICKAMAUGA ENVIRONMENTAL TRAIL

This trail is established and hopefully will be used by youth groups to gain an appreciation and an awareness of nature. It is only through this fostering of awareness that there is hope of saving wildlife, and perhaps mankind itself. Man must renew his awareness that the quality of his life can only be as good as the quality of his environment. Man is part of his environment, as are all other animals. He, too, is dependent upon the environment working in balance as a whole, complex system. To help nature maintain the balance necessary to sustain human life man must understand the workings of his environment; he must take his proper place among the other living organisms in his world.

Living organisms may be divided into three groups: the producers--green plants able to manufacture their own food through photosynthesis; the consumers--organisms that are dependent upon producers for their food source; and the decomposers--organisms that break down living and dead tissue to their mineral contents which are then "recycled" to form new producers. These organisms are in balance with the essential ingredients of sun, air, water, and soil in a "web of life." No part of this web may be disturbed without affecting another part.



Many questions in this folder require you to identify trees, and unless well acquainted with trees of the area it would be advisable to bring a tree identification book along. These can be purchased at the Visitor Center.

Remember you are in a National Park, and you are not permitted to molest or destroy plants, animals, or their habitats. A good rule to follow is "take nothing but photographs and leave nothing but footprints." You should, however, beware of certain irritating animals and plants that are a necessary part of our environment. Be alert for poisonous snakes in season. A good rule to follow is keep a safe distance from any snake you cannot identify. "Leaves of three, let them be" is an old saying that warns of the consequences of contact with poison ivy. Although this common plant is more noticeable during the summer it is poisonous at every season.

The trail begins at the extreme south end of the quarry, where the quarry road makes a sharp left turn, and winds through oak-hickory-pine- woods for 5.6 miles to terminate at the same area. Since the trail makes use of existing trails, roads, and new trails you must pay close attention to directions to avoid getting lost.

As you hike this trail proceed more slowly than on other trails. Pause often to observe the interdependence of everything around you. Consider why nature is changing, and adapting as it is. Consider man's involvment with his environment.

The trail begins from the right side of the quarry road in a slight depression with a low rock wall to the left. Examine some of the rocks of this wall and surrounding area. Something is happening; soil is being made! Very slowly, but being made all the same. Look around and find the scaly, green (may be black, light green, brown, or red) plant clinging to the rocks. The acids of these plants corrode the rocks, wearing them away. The plant also swells and contracts with varying moisture conditions and pulls up any of the rock that is loose. The rock fragments are mixed with organic material (decayed leaves, animal droppings, dead wood, etc.) to make soil. What is the name of this soilmaking group of plants? 1

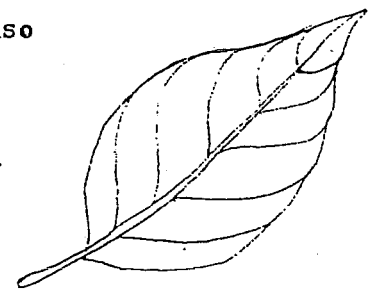
During the course of the hike you must recognize and record two birds seen or heard on the hike. These may be seen anywhere along the trail, but record them on the answer sheet in spaces 2 and 3.

The trail continues through a pine tree area where there are several dead stumps. Stop and look at a few of these stumps. When a tree dies, wood-eating insects attack it. Channels made by insects open passages that allow fungi to gain entrance and begin the final decaying process. The abundance of insects bring a population of animals to feed upon them, keeping the insects in check. What made the large holes? 4

The trail turns east and goes down a slight hill to younger pines. Notice how these pines seem to be all about the same size. Also note that the lower branches are dead or missing. This self prunning process is the lack of the leaves (needles in this case) to receive one of the basic essentials of the web-of-life. What essential factor is lacking in the growth of the lower limbs? 5

Notice the thick tangle of vines just off the trail. Try walking off the path a short distance. This vine is an exotic. An exotic is the term given to a non-native organism. Oftentimes the introduction of an exotic organism meets with disasterous results. For example, some exotics introduced are starlings, house sparrows, Norway rats, gypsy moths, fire ants, and Japanese beetles. This vine was introduced into the United States as a garden vine and as cover to help control erosion. The plant escaped, multiplied without natural controls, and crowded out native vegetation. It is, however, a good cover plant for wildlife and does provide food for the same. What is the name of this introduced vine? 6

As the trail makes a right turn look for a small tree inside the curve on the right. The bark, reddish brown to black in color, reminds a person of a jigsaw puzzle, and in the spring the showy white flowers are distinctive. The red berries also help to identify the tree and to feed wildlife in the fall. It is often planted as an ornamental but is native to the area. In Civil War days soldiers used the dried bark to treat fever and dysentary. Early farmers prized the very hard wood as wheel hubs and tool handles. The young twigs, stripped of bark, were rubbed against the teeth to keep them white and free from tobacco stain. What is the name of this tree? 7



The trail follows an abandoned road a short distance through a patch of ferns and then turns left to continue along an intermittent pond on the right. The pond is alive with sounds during wet periods of the year. As the trail winds through some mature pines notice how something has dug small holes around the base of the larger trees. The numbers and types of animals in an area depend largely on the abundance and kind of food found there. Foods include acorns, hickory nuts, berries, and many more fruits. All these food items are lumped together in ecology and called "masts". Look around you, what kind of masts can you see on the forest floor (note where some masts were dug up by unknown animals)? 8

This forest, like any area of land, can only produce enough mast for a certain number of animals. This is termed carrying capacity in ecological jargon. These carrying capacity laws are just as applicable and vital to man as they are to wildlife. Name a country of the world where man has exceeded the lands carrying capacity? 9

The trail splits to the left and to the right. The left fork continues the Quarry nature trail. The right fork continues the Chickamauga Environmental Trail and is the desired path for hikers using this pamphlet.

Just beyond the split in the trail the predominant tree of low swampy areas is prevalent. The tree always indicates a moisture condition. It prefers rich, moist bottomlands and floodplains. Sometimes called buttonwood, because of its round fruit, the tree is often planted as a shade tree along streets. The rough, moss-covered bark on the lower trunk of the tree is replaced by smooth white bark on the upper trunk and branches. Name this lowland tree. 10

The trail passes several large grape vines before reaching Cave Springs Creek where it parallels the bank. Cave Springs Creek is fed by a number of small springs and drains a portion of the south end of the park. It is an intermittent stream; that is, it does not flow in the dryer periods of the year. However, there are deep areas of the creek that do not dry up and keep the aquatic wildlife alive until the next wet period. The creek area is a good place to see wildlife either on the banks or in the water. Name one animal seen along the creek. 11

In ecological terms is the animal a decomposer, producer, or consumer? 12

The trail crosses, via a fallen tree to the other side and continues to the old sewer works structures. These structures were erected during World War I for Fort Oglethorpe, then a Cavalry Post. It was mandatory construction because a short time before a Typhoid epidemic broke out and caused a mass evacuation of the Post. In modern times we still struggle in an attempt to render our sewer wastes harmless, but we are finding that dumped sewage is causing our streams and lakes to die. Nature is slowly reclaiming this unused structure and will eventually reduce it to the components of soil. Measure by paces or feet the width and length of the taller structure. What is the width in feet? 13 What is the length in feet? 14

The trail climbs the hill behind the sewer works, along a fallen tree now in the final stages of decay, and under the branches of what may be the park's largest tree of its kind. The tree is representative of a mature climax forest. Left undisturbed this type of vegetation would remain indefinitely. As the older trees died, young trees of the same species would grow to fill their spaces. Many factors such as fire, logging, insect attack,

and disease can cause the plant succession cycle to start again. What is the family name of this tree? (For example, does it belong to the hickory, maple, oak, pine, elm, birch family, etc.) 15

When the trail intersects a well established trail hikers should turn right on this trail and approach Chickamauga Creek. Somewhere along the straight section of trail bordoring the creek walk out to the stream bank and estimate the distance across the stream. One way to do this is to select someone in your group wearing a billed cap.

1. Place the hat with a visor on your head.
2. Stand near the edge of the bank.
3. Place your chin on your chest and adjust the hat and visor so that your line of vision seems to meet the visor tip exactly at the far bank of the stream.
4. Turn your body, but keep your chin and head in the same position until you are looking down the trail.
5. Notice where your line of vision meets the visor and the ground. Have someone mark the spot and then measure or pace off that distance. You may wish to have several people do this and take an average.

What is the distance across Chickamauga Creek? 16

Continue along the creek and up the bluff, being extremely watchful for snakes. The rocky bluff is fine habitat for copperheads. From the top of the bluff look back at the creek. The creek is polluted by industrial carpet and dye mills among other things. Good clean water is becoming a critical factor in man's pollution of the earth he lives on. Every man, woman, and child in the United States uses an average of 60 gallons of clean water a day. Our supply of that type water is limited, and the available amount stays the same; but the population continues to increase. Take another look at Chickamauga Creek. What color is the water? 17

Climb the bluff and watch for a tree on the left with a large hump on it near the base. The lump is a gall. A gall is an abnormal outgrowth of a plant resulting from an insect, bacteria, or fungus irritation. A similar growth might be a tumor in our body caused by cancer or other irritation. Galls may occur on stems, trunks, or leaves depending on the irritation and/or species of tree. Some galls are predictable as to cause such as the galls on goldenrod, maples, witch hazel, and ash which are all insect related. What family of trees (i.e., maple, oak, beech, etc.) does this large gall appear on? 18

When the trail enters a small clearing and makes a sharp right pause a few minutes and look for a Georgia monument. Note the scaly plant growth clinging to the top of the monument. This is an example of plant interdependence. The plant, a lichen, is really two plants living together each dependent on the other. This type interdependence where both partners benefit from the relationship is called symbiosis. One plant produces food (it is green and carries on photo-synthesis); the other plant provides protection as well as water and minerals. They have become so interdependent that neither can survive without the other. What are the names of the two plants represented here? 19 20 Incidently, lichens do not always grow on the north side of a tree. They do prefer a shady, wet habitat, but there are so many variables their location is not a reliable compass.

As you continue the hike, walk south on the trail that slopes gently and enters a stand of mature pines. While walking through this area stop and examine a pine cone. A pine cone is the gymnosperm's means of reproduction. Gymnosperms means "naked seed" and is so named because the seed is produced between the cone scales and is not "covered" like the seeds of an apple or walnut. Gymnosperms are characterized by the evergreen trees in todays forests. Evergreens do shed their leaves like deciduous trees as is evident from the deep carpet of pine needles under your feet. Their leaves are shed a few at a time however. Very carefully remove a pine cone scale and look for the flat seed or the impression where the seed fit into the scale. How many seeds are on each scale? 21

As the trail loses elevation plants begin to change and more broad leaf trees are found. Look for a tall, straight tree looking like a light gray telephone pole. That tree is the state tree of Tennessee. Its leaves are distinctive, and its wood is soft and easily worked making it a desirable wood for all kinds of construction. It belongs to the magnolia family and is also known as a tuliptree. What is its other name? 22

The trail turns left as it nears Chickamauga Creek, crosses a ditch-like stream through a wet area, and up a small rise with many mature pines on it.

Pine trees are one type of evergreen. These loblolly pine are similar in appearance to other pines, but pines are different in number of needles per fascicle (bundle) and in shape, color, and length of needles. Examine the needles on the ground. Since there are different numbers of needles per bundle on loblolly pines, count at least six bundles and take an average. Generally speaking, pines can be divided into white pines (5 needles per bundle), or yellow pines (3 needles per bundle) or red pines (2 needles per bundle). To what group does the loblolly pine belong? 23

Turn right when the trail enters the field and hug the treeline around to the opening between the field you are in and the one close to the creek. The trail in bare spots, or other places, may show "signs" left by animals. Indians and early hunters were experts in "reading" signs. Spend a few minutes in the area and look for signs of animals - owl pellets, scat, woodpecker holes, feathers, bones, galls, nests, chewings, etc. Name one sign you located. 24 What do you think made that sign? 25

The trail follows the treeline to the end of the field where it passes through some thick growth and over a sunken road, the Nashville- Atlanta-Augusta Mail Road. Hike directly across this clearing to the trail hiking sign. As you do so you will notice the long straight unpaved road to your left. This road leads to your right and Chickamauga Creek to Dalton's Ford, important during the Civil War as a crossing point for a portion of the 26 Army.

Follow the trail into the woods again. Much of the area was at one time home for a family who lived there. Such early northwest Georgia pioneers led hard lives in contending with seasonal elements that modern man largely

overlooks. What was the primary occupation of these pioneers? 27

Coming into the next open field notice that along the edges of the wood the excellent ground cover for wildlife. Although animals such as quail (Bobwhite) and rabbits depend on open areas for food, they equally need good cover for survival against predators like the fox. Farmers should be encouraged to leave areas of brushy growth as wildlife shelter. Name one of the plants in this border area? 28

This field remains a field because it is mowed by farmers as a hay crop. If the field was abandoned it would grow up in brush, and then forest, in a predicted plant succession. The forest constantly pushes in on the field from all sides and has to be trimmed back periodically. Common field animals are the mole, mouse and meadowlark. Name an animal 29 and a plant 30 that would live in a field habitat.

Turn left and head for the enclosed Hunt Cemetery. The early pioneers knew the meaning of conserving all they could and they carried that understanding to the grave. Because graveyard space and markers were sometimes hard to come by, the same stones were used by more than one member of the clan. Under the tallest marker, how many people are buried here using the same stone? 31 What was his name and in what early American war did one of the deceased participate? 32 33. Name the material most likely used for the first enclosure around this cemetery. 34

Observe the thick carpet of green inside the cemetery. Europe is the

home of this hardy little evergreen vine, Common Periwinkle. This exotic plant was planted as an ornamental ground cover around early homesites, gardens and cemeteries. The latter habitat has given it the local name "graveyard myrtle" or "graveyard grass". Name one plant other than "graveyard grass" that you think might be found at old, abandoned homesites. 35

Continue on the trail north of the cemetery. As you hike look for outcroppings of barren rocks on the path and examine them for mosses. When a thin layer of soil has been built up, for example by the decay of and soil formation of lichens, mosses will grow. As the mosses die, they in turn add to the soil thickness and larger plants find a footing. Mosses reproduce by spores and are spread by the wind. When they are in the reproductive stage a thin, single cap sticks up above the moss carpet. Examine the moss growing on the rocks near the trail. Is it in the reproduction stage? 36

Follow the trail until you come to the open field. Years ago these fields were sprayed with chemicals to help kill insects. Unfortunately some of the insecticides were "hard" or persistent. This means that they did not break down into harmless chemicals. The hard pesticides remain unchanged as they pass from animal to animal in the food chain and even collect in extremely high concentration in the top consumer of the chain, killing it or having other dangerous effects. Man is a top-level consumer and he too carries some hard pesticide material in his body. The Park no longer allows use of these chemicals. Name one 37

Once on the field turn left past the Thedford Ford sign and hike uphill to the tall oak tree. Notice the circle of logs. What manner of animal do you think left these in this position? 38

Follow the unpaved but maintained road back into thw woods. You are now marching on the same road basically as another portion of the Confederate Army did back in September of 1863. Back then these men were heading into battle. Today you are enjoying the road much more than they did. Name one emotion that would have been going through your mind if you were in that long Gray line of so long ago. 39

Walk the road until you come to the split in it. Here you will come upon one more of the Park's many wayside signs. Identify the Confederate unit which entered the battle from this point. 40

Continue on the same road as you were on before. Look for a tree that has a peeling, shaggy bark and hollow base. It is not an evergreen, however. This tree produces a nut prized by wildlife and man. The wood is one of the best for smoking meats, giving them a special flavor. What is the name of the tree? 41

Watch on the left side of the road for some piles of dirt with vegetative growth on them. Here the trail turns left. Walking the trail you will come to a large log on the right side. Rotting, the tree is home to a whole community of organisms. The log eventually becomes humus and returns to the soil. What color is the fungi on this log? 42

The trail makes a sharp right turn at the log and starts down a slope.

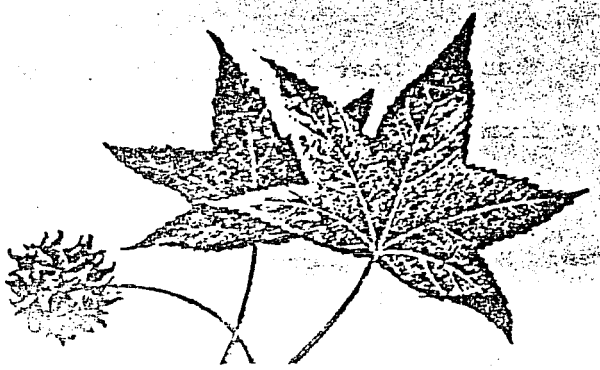
Notice that although the slope is fairly steep erosion of soil has not taken place. What ground cover is preventing this erosion? 43

When you near the small creek that is dry most of the year, select a site away from the trail and carefully remove a small amount of ground cover. Notice that the lower you go in the litter, the more decayed the leaves become. Soil is a combination of weathered rock fragments and organic matter such as leaves. Also observe the thin white lines running through and around the most decayed leaves. Is the white material a producer, decomposer, or consumer? 44

Hike up the slope from the stream to the small trash pile at the right of the trail. There is no waste in nature. All materials are recycled into the system to become nutrients for new plant growth. Many man-made discards are foreign to the biological world and cannot be recycled in their present form. Here is a pile of man-made discards, all of them foreign but some of them slowly disappearing back into nature. Of the plastic, aluminum, and steel containers, which seems to be disappearing the fastest? 45 Please leave this litter pile so others may not enjoy it.

The trail continues up the slope until it meets a well established trail at the Hall House finger board sign. Turn right and follow the well established trail. Nature is not a static thing but always in the process of change. A good place to see this change is in plant succession. For example, a barren farm field will go through a series of plant stages (succession) and eventually end as a climax forest (a fairly static stage). However, on its predicted path to that climax stage, it may be constantly altered by man and nature with fires and farming. After a field is abandoned a mixture

of low plants, followed by shrubs, and finally small trees and saplings, will appear. Look for the star shaped leaves or ball-like fruit from the trees on either side of the trail. They are a pioneer species, one of the first trees to appear in the natural plant succession. What is the name of this pioneer species? 46



The trail enters a small open field and continues along the left side of the field. Flowering plants, angiosperms, evolved after gymnosperms and developed in connection with insects ability to pollinate them. Gymnosperms depended on wind for pollination, but flowering plants depend on animals. Insects visit a flower to collect nectar. In the process of obtaining this material it rubs some pollen from the stamen (male portion of the plant) onto its body and transfers it to the pistil (female portion) of the same or another flower insuring complete pollination. Examine several flowering plants in the field until you find a pollinator. What kind of insect pollinator did you find, or might you expect to find in this habitat? 47

The trail enters the woods again, crosses two small ditch-creeks, and just as it enters Vinyard Field takes a sharp left into the flood plain of Cave Springs Creek. Look for fungus on decaying logs near the creek. Would this fungus be a producer, decomposer, or consumer? 48

After crossing the creek on a log turn to the right and continue along the bank of the stream. Climb the slope and watch for a shrub with waxy green stems. It grows in rich woods, ravines, and stream courses. The wild

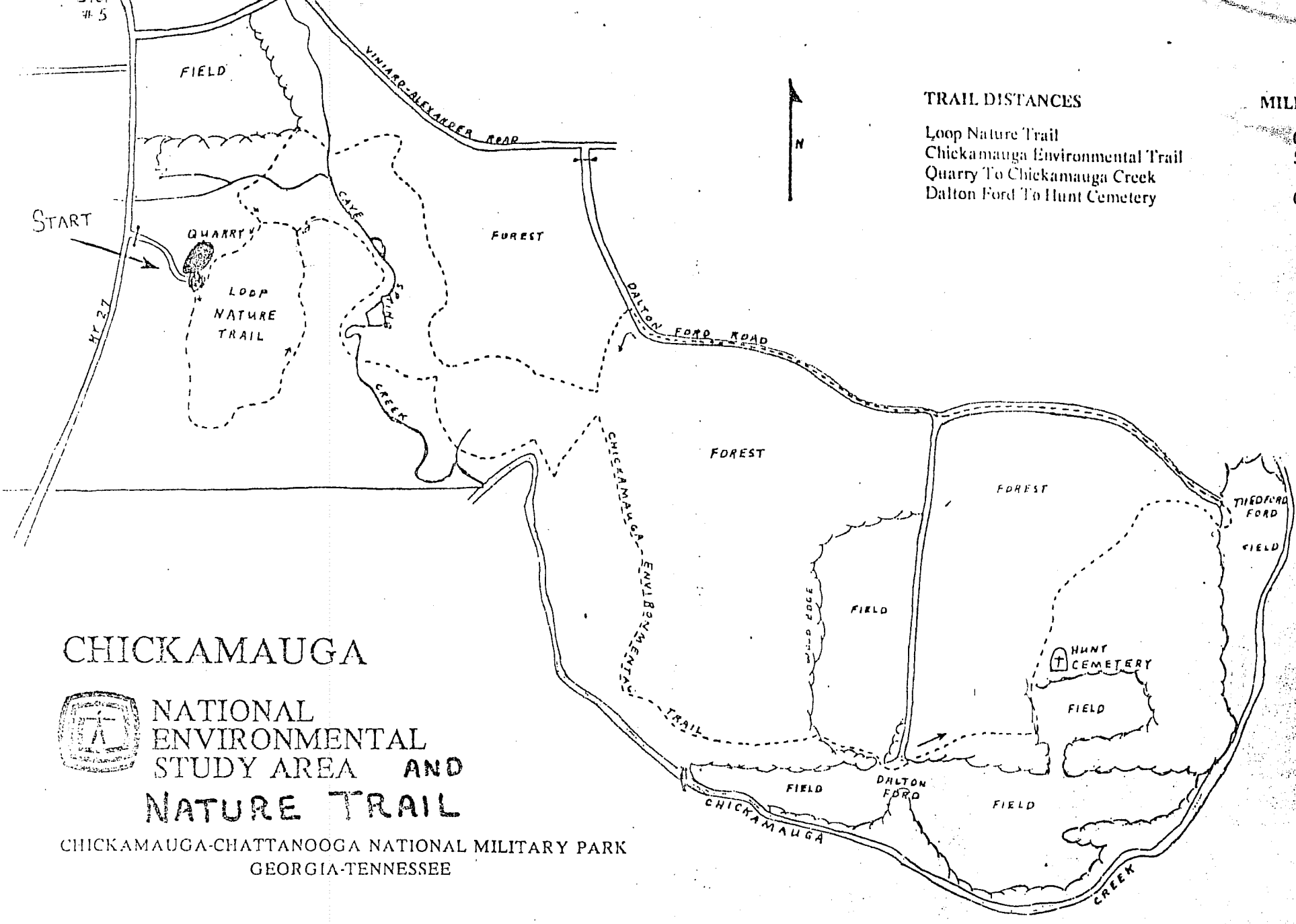
strawberry bush produces a seed capsule that splits open exposing bright, glossy red seeds. Locally the shrub is known as "hearts-a-bustin' with love." Would the shrub be a producer, consumer, or decomposer? 49

The trail winds through some mature pines and descends slightly to rocky surfaces. Watch on the left for an evergreen not seen before. Plants live in places for certain reasons just as people do; however this small conifer is out of place. It prefers cool, moist slopes in mountain regions and sometimes takes 250-300 years to mature. Its scientific name is Tsuga canadensii. What is its common name? 50

The Quarry, skirted by the trail, served as a source of limestone building material for the park. The limestone was laid down during the Ordovician Period when the area was covered with a vast shallow inland sea. Chickamauga limestone, as geologists have named it, is a pure gray-blue, thin-bedded limestone underlying all of Chickamauga and appearing as outcroppings at the foot of Missionary Ridge. A great number of sea animals, such as corals, crinoids, and brachiopods, are preserved in the formation. Examine some of the rocks for evidence of animals. What are these preserved plants and animals called? 51

Continue around the quarry to your starting point and the end of the trail.

During this hike you have seen evidence of man's use and misuse of his world, of his introduction of uncontrolled exotics, and of his destruction of the land that assures him life. This evidence proves man must learn to work with nature, not against it. He must help nature maintain a life sustaining balance. Only by learning to live harmoniously in the "Web of Life" can Man expect to survive.



TRAIL DISTANCES	MILES
Loop Nature Trail	0.9
Chickamauga Environmental Trail	5.6
Quarry To Chickamauga Creek	1.5
Dalton Ford To Hunt Cemetery	0.4

CHICKAMAUGA

NATIONAL ENVIRONMENTAL STUDY AREA AND NATURE TRAIL

CHICKAMAUGA-CHATTANOOGA NATIONAL MILITARY PARK
GEORGIA-TENNESSEE

CHICKAMAUGA ENVIRONMENTAL TRAIL

ANSWER SHEET

UNIT _____ DATE _____

UNIT MEMBERS _____ _____

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