# Lake Ahquabi Nature Trail

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PARK RANGER LAKE AHQUABI STATE PARK R. R. 1 INDIANOLA, IOWA 50125 TELEPHONE 515-961-7101



#### Man's Impact

During the early formation of our country, man sought to conquer nature, in pursuit of the American dream. Man was not only able to overcome these natural obstacles, but was also able to reap the benefits of his endeavors as well.

It wasn't until the middle part of this century that man realized nature was in jeopardy. Man could no longer manipulate his environment in a destructive manner. Government, private enterprise, and individuals have worked hard to preserve our inherited environment. National, state, and county parks have been formed to help maintain some of our natural community. Educational and monetary programs have been set up to aid in the preservation of private lands.

Reflecting on nature in the past, present, and the future, here, or in any other time and place, could lead to consideration and actions by all, to help nature survive mankind.

# 1 Introduction: The Living Forest

As you begin your hike, stop for a moment and reflect upon the world you are about to enter. You will hear the sounds of forest birds such as the blue jay, black-capped chickadee, red-headed woodpecker, and others. The air will abound with the gentle buzzing sound of flying insects. If you are lucky, you will catch a fleeting glimpse of a fox. deer, mouse, or some of the other mammalian inhabitants of the forest. Changes in the physical environment will become apparent: sunlight will give way to shade: breezes will be stilled; and warmth will be transposed by a humid coolness - all subtle reminders that the forest possesses its own microclimate. But more noticably, you will become engulfed within a sea of luxurient, green vegetation ... welcome to the fascinating world of the deciduous forest. We hope your brief sojourn will be an interesting and rewarding sensory experience. Do not hesitate to stop along the way to observe, learn, and eniov.

# 2 Forest Structure: Layer Upon Layer

To the untrained eye, the mature forest resembles nothing more than a loose tangle of vegetation. However, upon closer observation, the forest can be found to be organized into five distinct layers. The uppermost layer, the canopy, consists of dominant tree species such as the oaks and hickories you are now viewing. The next layer down, the understory, is composed of smaller, shade tolerant tree species. The most common understory tree in this forest is known as ironwood. Below the understory, lies the shrub layer, which consists of multi-stemmed, woody plants; the herb layer, consisting of soft bodied vegetation; and finally, the forest floor. Pause for a moment and observe the forest floor. What do you see? The forest floor is a veritable wastebasket for all of the layers above it. Annually, about 2,000 to 3,000 pounds of leaves, branches, bark, fruits and nuts, feces, and animal carcasses rain down on each acre of forest soil. This resulting litter layer supports a microcommunity of mites, insects, earthworms, fungi and bacteria that constantly degrade the litter into simpler substances that can be recycled back into the protoplasm of the living forest. Without these tiny decomposers, the forest would smother in its own wastes.

# 4 Food Chains and Energy: The Flow Of Life

What powers the forest and its inhabitants? If you said solar energy, you are correct. Solar energy is trapped by plants and used to make the building blocks of tissuecarbohydrates and proteins. When plants are consumed by herbivores (plant eaters), much of the energy locked up within the molecular bonds of the plant tissues of the herbivore. This is known as an energy transfer from one trophic (food) level to another. It is this energy — originally derived from the sun — that powers the herbivore. If, in turn, the herbivore is eaten by a carnivore (meat eater), another transfer takes place, and the carnivore's energy demand is satisfied until the next meal. Ultimately, the carnivore will die and the energy trapped within its tissues will be utilized by other carnivores, or released to the environment via decomposing microbes.

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## Ecological Succession: The Transformation Of A Biotie Community

Ecological succession is the process whereby one plant community is gradually replaced by another. In upland areas of central lowa, land devoid of vegetation is rapidly invaded by broadleaf, herbaceous weeds (forbs). Eventually this forb community will be replaced by grasses, which in turn will give way to shrubs and intermediate tree species, such as, dogwood, locust, and elm. As the young forest matures, oak and hickory trees will become established, and will dominate, forming a climax forest. This final stage, or sere, in forest succession is often named after the dominate tree species; hence you are viewing an oak-hickory climax forest. Note the variety of oak and hickory tree species.

# 6 Weeds: A Plethora of Values

Weeds! What purpose do they serve? Beside being rampant garden pests, weeds often prove to be beneficial members of the natural community. Those very attributes that cause weeds to be troublesome to farmers and gardeners - rapid germiantion and growth - also make them valuable soil conservationists. Disturbed soils, barren of vegetation, are rapidly invaded by a multitude of weeds, each firmly anchoring the soils in place with an intricate network of roots. But weeds are only transient. Left to time, the weed community will be replaced by perennial forbs and grasses, then shrubs and trees - so goes succession. Weeds also serve another valuable function - that of food. It is the dried stems, leaves, and seeds of weedy forbs and grasses that provide the bulk, if not the entirety, of winter food for large numbers of birds and mammals. Without their life giving nourishment, the cold, winter wind would blow only a somber tune for many wildlife.

## The Eastern Red Cedar: A Forest Paradox?

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The eastern red cedar is Lake Ahguabi's atypical, typical tree. Atypical, because it is central lowa's only native conifer, breaking the rule of deciduousnous for the woody vegetation of the area. Typical, because it, like the deciduous vegetation, posseses values that are of great import to the wildlife of the forest. Forest ecosystems contain two highly interdependent living components the plant and the animal components. Plants provide animals with food, cover, and housing. Animals often act as dispersal agents, carrying plant seeds in their fur, feathers, or digestive tracts to sites of deposition, and ultimate germination. The eastern red cedar's value to wildlife is twofold. Cedar fruits and browse provide wildlife with valuable nourishment and energy, while cedar boughs benefit wildlife with excellent nesting and winter cover. In turn, wildlife, in conjunction with the wind and gravity, aid with cedar seed dispersal.

#### 8 The Lowland Deciduous Forest: A Different Mix

Upon entering this part of the forest, did you notice any significant changes in the composition of the woody vegetation? Hopefully you did, because you are now standing amidst what is known as a lowland deciduous forest.

The mix of trees here is quite different than what you encountered in the upland forest. Why? Trees, as well as other forms of vegetation, tend to grow where they are best adapted; that is, trees are environment specific. The trees of lowland forests typically require conditions of high soil moisture for germination and/or continued vigorous growth; hence lowland trees are often restricted to poorly drained valleys and flood plains. Other environmental factors that affect plant distribution include soil fertility, availability of sunlight, and temperature.

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#### The Stump: A Tale Of Old

A cross section of a tree can reveal an interesting history of its life. Annual rings of growth will be noticeable on the cross section. Each one of these rings contain many cells. The inner rings are usually larger cells, indicating a period of growth when the water supply was in abundance. Smaller cells shows a reduction in water supply, usually occurring in the summer months.

Some of the older white oaks pump as much as three hundred gallons of water a day through these cells up to their crowns.

By counting the number of rings, the age of the tree can be determined. Width of the rings indicates how suitable weather conditions were during their period of growth.

#### 10 Limestone Outcroppings: Rock Of The Ages

From the ancient seas that covered the continents, coral, worms, crinoids, mollusks, and protozoa, along with algae, settled to the bottom, creating sediment. After vast periods of time, these remains, along with natural elemental conditions formed sediamentary rock layers, called strata.

Limestone rock was used in the creating of Lake Ahquabi's lodge, bathhouse, and south shelter house. During the early 1930's when the park was established, much of the work was done by the Civilian Conservation Corp, better known as the C.C.C. program. They used a limestone quarry that was in the southern part of the park. From the quarry, limestone was extracted and chiseled into blocks of various sizes and shapes for the construction of the buildings.

Careful inspection of the stones in the buildings will reveal the chisel marks made by the stonecutters, as well as various skeletal forms of primitive life.

#### 11 The Rotting Log: A Microcosm

Consider the fallen log before you. Once it stood erect, supporting a great crown of branches and leaves. Now, in death, it performs a different function. Insects, centipedes, millipedes, and other tiny invertebrates have invaded the aging log, securing a safe place to live and reproduce. Other animals such as amphibians, reptiles, and mammals may also use the log's hollow recesses as refuge from predators and the elements. Eventually bacteria, fungi, and other microbes will decompose the log, returning the nutrients locked up within the woods fibrous tissues to the soil, and thence to the forest ecosystem. Nature budgets itself well — nothing wasted, nothing lost.

#### 12 Animal Signs: Nature's Signature

Who lives here? During your brief hike you no doubt have observed the "signatures" of numerous animals. Telltale signs of animal activity such as tracks, feces, partially eaten plants, and burrows are subtle reminders that a vast array of wildlife frequent the environs of the Lake Ahquabi area.

As you encounter each animal sign, try to identify its "author." Are some signs found only in certain habitats? Why?

EQUAL RECREATIONAL OPPORTUNITIES: All persons are entitled to full and equal enjoyment of the recreational opportunities, privileges and advantages available in Iowa's great outdoors.

State park maintenance and operation funds are derived solely from legislative appropriation and receipts from camping and concession revenue, cabin and lodge rental and boat dock fees.



IOWA CONSERVATION COMMISSION WALLACE STATE OFFICE BLDG. DES MOINES, IOWA 50319



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BENCH BRIDGE INTERPRETIVE TRAIL LENGTH I.25 Mile STATIONS I2 TIME TO WALK I HOUR, APPROX.