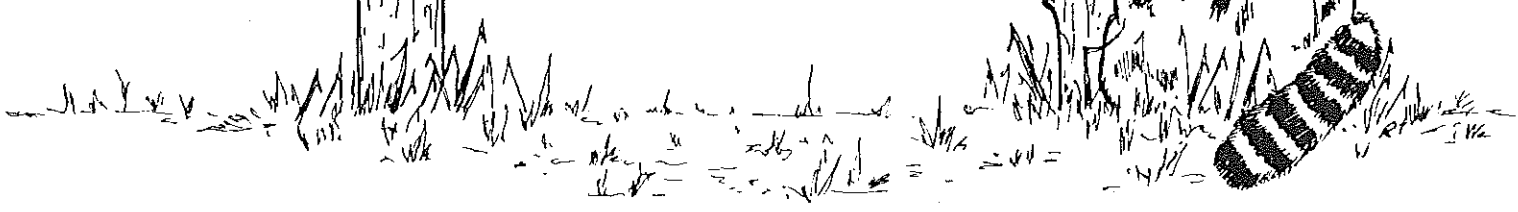


A
Guide To





State of New Jersey

DEPARTMENT OF
ENVIRONMENTAL PROTECTION
DIVISION OF PARKS AND FORESTRY
STATE PARK SERVICE

A

Guide To

Stokes State Forest

was originally printed in 1980
and reprinted in 1992

This is a reprint of the original Guide
as it appeared in 1980

Reprinted 2003

In the year 1907 the New Jersey Forest and Park Commission purchased 5,432 acres of land in the northwestern corner of the State and named it "Stokes State Forest" in honor of Governor Edward Stokes who had donated the first 500 acres. Some of the tracts included in the original purchase were acquired for one dollar per acre, a far cry from present day land prices. Subsequent acquisitions have slowly increased the total land area to its present size of over 15,000 acres. Stokes State Forest is managed as a multiple-use forest with the primary functions of protecting the natural resources while serving mankind at the same time.

Within its boundaries lie some of the finest mountain scenery, clearest fresh water streams, and natural scenic areas in the Garden State. The area is enriched with history, abounds with a vast diversity of flora and fauna, and offers many forms of recreational activities.

It is hoped that this guide will help make your visit to Stokes State Forest an enjoyable and rewarding experience for it is as Ralph Coursen described it, a paradise:

"On the Stokes State Forest Trail,
I am strolling tonight.
I can see the winding path
by the moon's silvery light,
The swift running brook,
and the tall swaying pines,
The laurel in bloom,
and the scent of hidden vines.
On the Stokes State Forest trail,
all my cares pass me by,
It's a bit of paradise
when the moon's in the sky."

CLIMATE

Less than 10,000 years ago, the area known as Stokes State Forest was buried beneath several thousand feet of glacial ice making its climate very similar to that of Greenland today. As the ice melted and retreated northward, the area was characterized by mean annual temperatures below freezing, strong winds, and permafrost. The summer months had temperatures averaging above freezing; however, there were many fluctuations above and below the freezing point and a continually cloudy sky with frequent sleet and snow storms. Gradually, the climate became warmer and drier until it reached a maximum, some 2,000 years ago. Since then, the climate has cooled and has become somewhat moister. Scientists have accurately recorded these climatic changes by analyzing pollen samples from the bottom of swamps and bogs in the area.

Today, the mean annual temperature of the area is 48° with extremes ranging from -32°F to 103°F. The growing season is 220 days long lasting from April 4 to November 10. The frost-free season is 150 days in length and lasts from May 7

to October 4. The annual rainfall equivalent is 44 inches and the annual snowfall is 55 inches. On many occasions 15 to 25 inches of snow falls in a single storm. During July and August, the wind is from the southwest but blows from the northwest the remainder of the year.

PHYSIOGRAPHY

Stokes State Forest is located in what is called the Ridge and Valley Province, a term used for an area exhibiting mountain ranges, valleys, plateaus, and rock outcrops. The Ridge and Valley Province extends from the St. Lawrence River lowlands through New Jersey and Pennsylvania and continues south for a total span of 1,220 miles before ending in northern Alabama.

Locally, the province is composed of Kittatinny Valley to the east and Delaware Valley to the west, the two being separated by Kittatinny Mountain. The Kittatinny Range starts about 10 miles southwest of the Hudson River, near Kingston, N.Y., and rises abruptly as an almost unbroken escarpment of the Shawangunk conglomerate. The ridge varies in elevation, with its highest point in New Jersey being 1,803 feet above sea level in High Point State Park. In places the mountain top is a double-crested ridge with the topography of the eastern slope being several hundred feet higher and more rugged than the western crest. At other times the ridge top exists as a plateau nearly four miles wide. The eastern face of the ridge drops abruptly into the Kittatinny Valley while the western face has a more gradual slope into the Delaware Valley. As the range nears the Delaware Water Gap, the ridge becomes narrow and single crested.

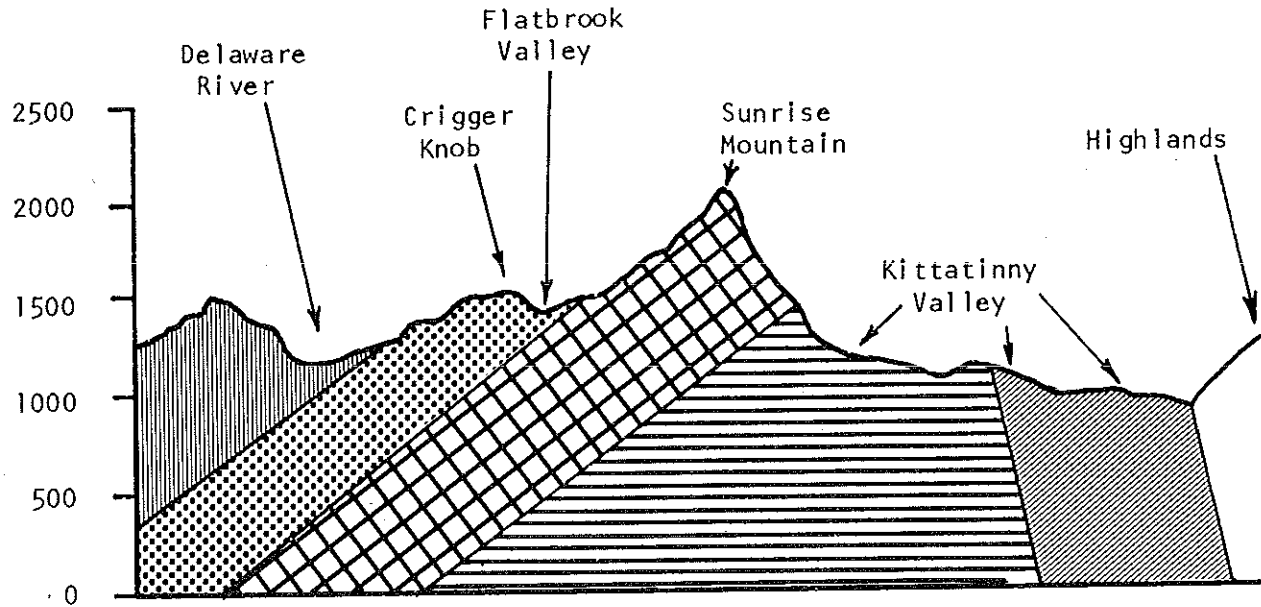
BEDROCK GEOLOGY

Stokes State Forest is underlain by two major geologic formations, both of which date back about 400 million years. The eastern section consists of Shawangunk conglomerate, a mixture of white quartz and reddish slate pebbles embedded in a grayish silicate matrix. The conglomerate, sometimes called "pudding stone," forms the crest of Kittatinny Mountain and its steep rocky southeastern slope. Excellent examples of the conglomerate can be observed along the Appalachian Trail, which leads to the summit of Sunrise Mountain.

West of the ridge crest the forest sits upon the High Falls formation, consisting of alternating red-green and olive colored sandstones and shales. In the higher elevations the softer red shales predominate, with the top layer being concealed by varying thicknesses of glacial till. The lower beds of the High Falls formation contain red quartzitic sandstones. Transition from the Shawangunk to the High Falls is not sharply defined but occurs very gradually. Excellent examples of the High Falls formation can be observed in the rock outcrops along Coursen Road and in Tillman Ravine.

To the east of Stokes State Forest, the Kittatinny Valley is underlain by two basic geologic formations, Cambrian age Kittatinny limestone and Ordovician age Martinsburg shale. Northwest of Beemerville at the base of Kittatinny Mountain lies an eroded dike of nepheline syenite. The volcanic syenite occurs along the contact zone between the Martinsburg shale and Shawangunk conglomerate formations.

PRESENT-DAY TOPOGRAPHY AND FORMATIONS



The layers of deposition shown above were formed horizontally, underwent geotamorphosis, were tilted, folded, faulted, uplifted, base leveled, uplifted again, and differentially eroded by water, wind, and ice. (Not to Scale)

Legend:



- Devonian limestones, shales, and sandstones
- High Falls formation
- Shawangunk conglomerates
- Martinsburg formation
- Kittatinny formation
- Pre-Cambrian formations

Figure 1

To the west of Stokes State Forest lies the Delaware Valley with early Devonian period formations of limestone, sandstone, and shale predominating.

The chronological order of geomorphic events which occurred in this area is as follows:

(1) 600 Million Years Before Present: The Kittatinny limestone was formed by lime-secreting algae living in a warm shallow sea. The limestone deposits covered the Pre-Cambrian formations found in the present-day Highlands region of New Jersey.

(2) 500 Million Years Before Present: The Martinsburg shale was formed from several thousand feet of silt that subsequently drifted into the sea burying the beds of limestone.

(3) 450 Million Years Before Present: The land was uplifted out of the sea exposing the Martinsburg formation. This upheaval required enormous amounts of heat and pressure that originated from the earth's inner core.

(4) 440 Million Years Before Present: The Shawangunk conglomerate was formed by deposition of sand and gravel material from streams, thus covering the shale beds.

(5) 420 Million Years Before Present: Encroachment of a very shallow sea onto the Shawangunk caused deposition of silt by feeder streams. Some of the debris was also deposited above sea level on land similar to that of present-day tidal marshes. The layers of silt combined to make up the High Falls formations.

(6) 400 Million Years Before Present: During the Devonian Period a warm shallow coral sea filled with many lime-secreting organisms formed the limestone beds that lie beneath the Delaware Valley to the west of Stokes State Forest.

These formations were deposited horizontally and later subjected to intense heat, pressure, and mountain-building forces. They were complexly folded, faulted, tilted, and uplifted into mountains that were as high as the Rockies of today. Approximately 80 million years ago erosion reduced these mountains to a flat, even surface known as the Schooley peneplain. From the summit of Sunrise Mountain one can see the remnants of this peneplain in the even-crested topography of the Highlands region to the east and the Poconos to the west.

A massive vertical uplifting of the peneplain occurred approximately 60 million years ago. Since that time, differential erosion by water, wind, and ice have created the topography of the region as it is today (Figure 1).

The formations in the New Jersey Ridge and Valley Province exhibit a north-west-southeast tilt so that the further one travels from the southeastern border of the forest the younger the area in terms of geologic history.

GLACIAL GEOLOGY

During the last million years Stokes State Forest was covered by three different continental glaciers, the most recent being the Wisconsin which traversed

Kittatinny Mountain approximately 10,000 years ago. As the ice sheet advanced south from the Hudson Bay region, it worked a two-fold operation on the landscape. First, it cut down much of the land and rock strata by erosion; second, it built up other areas with scoured material deposition. The material which was pushed forward and left behind when the glacial ice receded is called "till." Most of Stokes State Forest is blanketed with varying thicknesses of glacial till (up to one hundred feet in depth) with the thickest deposits occurring west of Kittatinny Mountain in the Flatbrook Valley region.

The topography was further altered by the floodwaters of the melting ice sheets. These streams and rivers eroded material and translocated it to other areas. Water deposited material is called "stratified drift," the various sizes in the layers being determined by the volume and velocity of water involved. Although little stratified deposits exist in the forest, some can be found along the Big Flatbrook.

The final alteration of the landscape during the Ice Age resulted from the many cycles of freezing and thawing of the soil. Generally speaking, the frost action tended to smooth out many surface irregularities by moving loose rocks and boulders downslope.

For those further interested in glacial geology, please refer to the self-guided tour section.

SOILS

Stokes State Forest lies within a climate tension zone. As a result, local environmental factors play a major role in soil development. The primary factors influencing the formation of soils are the parent material or bedrock, topography, climate, biology, and time. Generally speaking, the soils found in the forest are relatively young, having been formed during the past 10,000 years from weathered glacial till.

The majority of the soils are classified as true podzols or brown podzolics. The term "podzol" refers to a great soil group consisting of material formed in cool-temperature to temperate-humid climates under coniferous or mixed coniferous and deciduous forests. Podzol soils are acidic in nature and are characterized by a whitish-gray A₂ horizon (a layer found just beneath the surface).

In forested areas, temperature, rainfall, vegetation and other factors favor an abundant surface accumulation of organic matter called "duff." Fungi and other microorganisms decompose the duff into humus, a dark mixture of plant residues consisting of simple nitrates and sulphates. As moisture carries these organic acids downward through the soil horizons, the carbonates are dissolved and translocated. This process of percolation and translocation of nutrients is known as "leaching." When the rate of podzolization is rapid, the carbonates can be entirely removed from the upper soil layers, leaving behind a low range of pH levels (3.5 to 4.5 pH is commonly found in the soils within Stokes State Forest). Such soils are usually unsuitable for agriculture and are better left in forest.

The major soil type found within Stokes State Forest is Cattavaugus-Swartswood undifferentiated soil association which is formed primarily from glacial till. It occupies areas from ridge tops to valley floors, varies in thickness from a few inches to several feet, is generally well drained but can be locally poorly drained, and frequently exhibits rock outcrops. The one outstanding feature of this soil is its stoniness, which is one of the primary reasons the area is best suited as public open space. The soils formed from quartzose till (Swartswood) are brown in color while soils developed from the sandstone till (Cattavaugus) are reddish in color.

Along the Big Flatbrook and some of its larger tributaries occurs the Chenango-Atherton-Braceville soil association. These soils are primarily formed from stratified glacial material. They are on gently sloping land and although stony are much less so than the soils described above. Depending upon the height of the water table, these soils can be either wet or well drained. The most profitable farms that once occupied the forest were located on this soil association.

The final grouping of soils, the swamp association, consists of lowland soil where the water table is at the surface at least 10 months of the year. Swamp soils occur along sluggish streams and drainageways, in areas with poor surface outlets and a very high water table, and in areas surrounding natural ponds. The soil surface layer is typically dark gray to gray in color and usually high in organic matter content. Some areas are stony but rarely very stony. The swamp soils are usually localized and can be found in Tibbs Meadow and Swenson's Meadow areas of the forest.

VEGETATION

Stokes State Forest lies in the transition zone where the central forest formation of oak and hickory overlaps and begins to give way to the northern forest formation of beech, birch, maple, and hemlock. In such areas local environmental conditions, particularly microclimate and soil, influence the types of vegetation found. Normally, there will be progressive changes in ground cover and forest type from ridgetop to stream valley.

Seven different forest types can be found throughout the immediate area and each is briefly described:

(1) Pitch Pine-Scrub Oak:

The pitch pine-scrub oak community occurs on ridgetops where there are numerous rock outcroppings, a thin dry soil layer, and a very harsh climate which is characterized by high winds and extreme temperature fluctuations. The pitch pines are widely spaced, averaging about 18 feet in height, exhibiting broken tops, twisted branches, and gnarled trunks. The scrub oaks are smaller in height, usually growing less than 10 feet tall and often form a dense thicket. Sheep laurel is often found growing beneath the scrub oak canopy layer. Red maple and black birch are found in those stands where there is sufficient moisture for their survival.

A pitch pine-scrub oak stand can be observed on the summit of Sunrise Mountain surrounding the lookout shelter.

(2) Pine-Oak:

The pine-oak community occurs on the hilltops west of the Kittatinny Ridge. The pitch pines are the largest and tallest individuals in the stand. The oaks (white, scarlet, and chestnut) are the most abundant tree species but are all smaller in size. Black gum and sassafras are also present in small numbers in the understory.

The pine-oak forest cover type is rather restricted in size. One of its narrow ranges exist on Crigger Road 0.3 to 0.6 miles north of the Grau Road-Crigger Road intersection.

(3) Chestnut Oak:

The chestnut oak community is by far the most commonly found forest type in the State Forest, covering about 75% of the total area. Red oak is usually the co-dominant species, with fewer numbers of black oak, hickory, and black birch in the lower levels. You will notice more than one large chestnut oak growing from a single stump; these are sprouts which grew from trees were cut between 75 and 100 years ago. American chestnut sprouts are also common in the understory; chestnut was abundant prior to the blight attack of 1904.

A well defined region of chestnut oak domination can be observed along Sunrise Mountain Road, north of Stony Brook Trail (0-0.4 miles).

(4) White Oak-Hickory:

The white oak-hickory community is found on the more moist and fertile soils within the forest. The best stands are developed on old farm fields in the Big Flatbrook Valley. Other trees that might be found in the stand include red oak, chestnut oak, red maple, hickories, and American Beech. These stands are usually not of sprout origin but instead are good examples of natural regeneration.

Stands of white oak and assorted hickory species exist along Coursen Road 0.2-0.9 miles northeast of the white bridge.

(5) Mixed Oaks-Hardwoods:

On some sites there is no single dominant tree species but rather a general mixture of many varieties of trees. In this forest cover type white oak, red oak, white ash, red maple, and sugar maple are the most common trees. Others growing at the site include hickories, beech, black gum, tulip poplar, chestnut oak, black oak, black birch, scarlet oak, and chestnut sprouts. These communities are found on the lower slopes and adjacent valleys where soils are deep and rocky and where abundant moisture drains downslope.

A good example of this type of forest is located along Coursen Trail in the vicinity of its intersection with Stony Brook.

(6) Mixed Northern Hardwoods Without Hemlock:

This forest type is very restricted in its distribution; it is best developed in northwest facing coves and stream valleys. Often, much of the stand is flooded during the spring when melting snow and rain cause the streams to overflow their banks. The trees typically found are sugar maple, beech, yellow birch, and occasionally white pine, basswood, red oak, and black birch. American chestnut was also once abundant prior to the blight of 1904. This forest cover type is common in the New England States and explains why the maple syrup industry and "Yankee Clipper" shipbuilding industry were important.

An example of this forest type is found along Tuttle Brook on the northwest side of Shotwell Road for 0.2 miles starting at the bridge by the Stokes State Forest maintenance yard.

(7) Mixed Northern Hardwoods with Hemlock:

The forest cover type with hemlock is usually restricted to the steep, rocky northwest facing ravines. The most common species found are eastern hemlock, yellow birch, and rhododendron. Black birch, sugar maple, white pine, beech, and basswood can also be found on the upland slopes.

In addition to Tillman Ravine, a mixed northern hardwoods with hemlock stand can be found along Sunrise Mountain Road approximately 0.7 miles north of its intersection with Upper North Shore Road.

In addition to natural diversity, the vegetation patterns of Stokes State Forest have been modified by the past activities of man. Indians often set fire to the land to facilitate hunting and farming. With the arrival of European man, the areas suitable for agriculture were cleared of trees and shrubs and were plowed. Wood was in great demand for domestic and industrial fuel as well as for rough planking, railroad ties, and logs for building construction.

With the dawn of the Industrial Revolution, exploitation of the forest resource was intensified, with conversion of wood into charcoals. The discovery of iron deposits in nearby Franklin and Andover placed great demand on the forests since charcoal was the principal source of energy to smelt iron ore in the blast furnaces. In the year 1855 over 63,000 cords of wood or 6,500 acres of prime hardwood forest were burned for the iron industry along! Standing timber was felled regardless of size or vigor, and by 1865 the region was completely denuded of vegetation.

During the late 1850's and early 1860's, the majority of the cast iron was forged into lengths of rail which ironically led to the demise of charcoal making in this area. The railroad connected the rich anthracite coal fields in eastern Pennsylvania with the iron furnaces and the major industrial cities, supplying both with inexpensive and seemingly endless supplies of fuel.

The early farmers and homesteaders also used charcoal and charcoal soot. The dust was used as toothpaste, for water purification, storage of ice, in the making of gunpowder, packing of meats, and in the building of roads. Although almost everyone made charcoal for home use, the charring of larger amounts was considered a fine art - the vocation of a select group of men known as "charcoal burners." These burners were responsible for charring the mound of logs until only the wood ash remained (Figure 2).

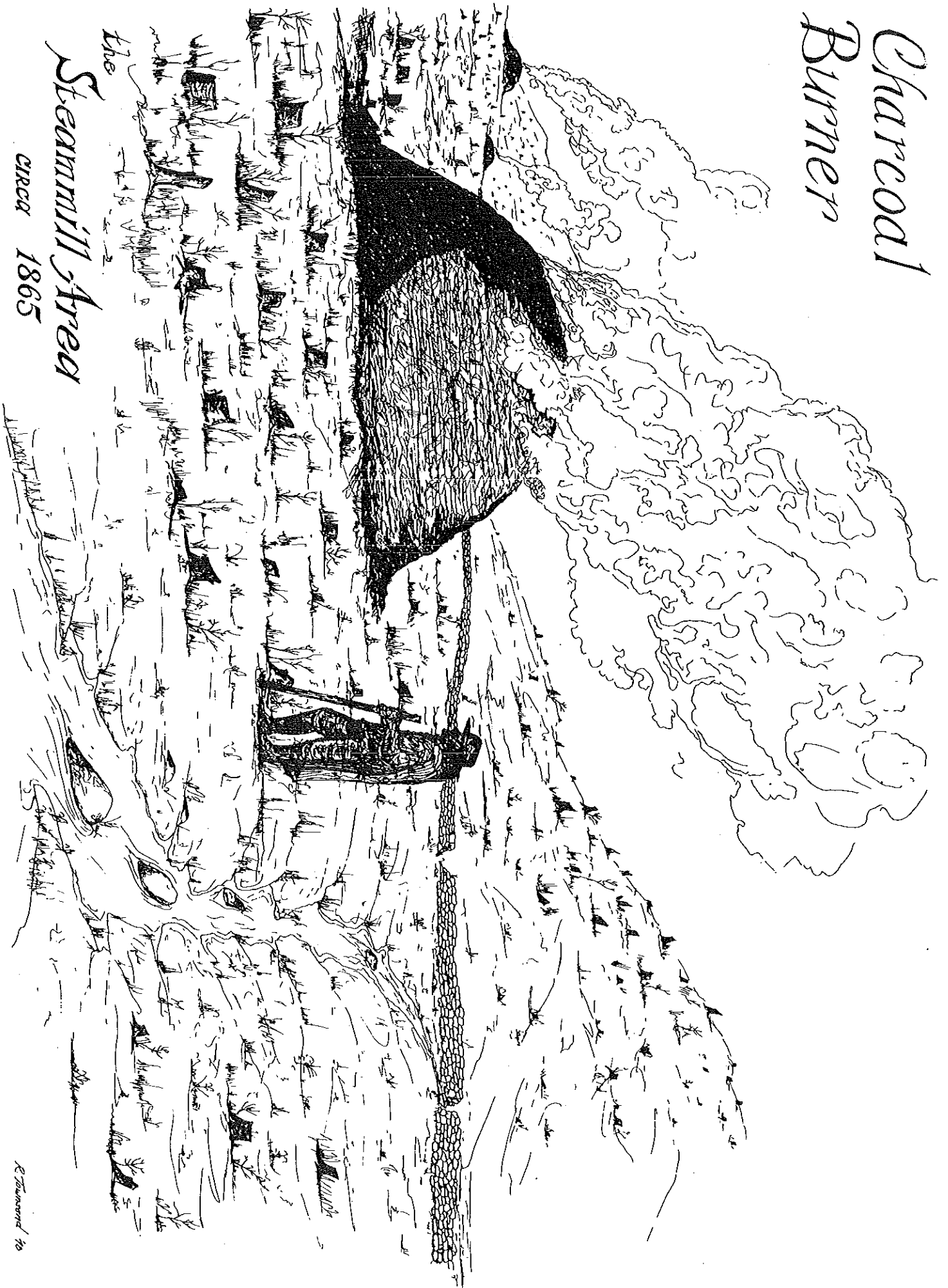
The log pile varied in dimension and volume but the typical burn consumed 25 cords of cut hardwood stock. The ground site was first cleared of combustible material and then a circular ditch was dug around a centerpoint. The base of the pile was constructed of large logs, each approximately 7 inches in diameter and 2 feet in length, with smaller dimension stock on top. The wood was carefully stacked to a height of 7 or 8 feet and covered with sod.

Once the pile was ignited, the flames were quickly extinguished with mud and water until only a blue-gray smoke emitted from the stack. If the mound rekindled, the burner would add more water to smother the flames. Sometimes the inexperienced or foolhardy burner would meet a cruel death while working on top of a burning pile, crashing down into the furnacelike heat. The burners usually lived in crude bark huts situated next to the mound, blackened by the soot and ash flying in the air. These dedicated workers risked their lives and lived in poverty while selling their charcoal for forty cents a barrel.

Nature and man have since combined efforts to reforest the region. From 1919 to 1942, the State Forest Service and the Civilian Conservation Corps (C.C.C.) planted 652,765 trees of 20 different varieties on the abandoned farm fields and open spaces within Stokes State Forest. The seedlings were planted in rows and have grown up into the many plantations that can be seen scattered throughout the area. Seven significant and unusual cover types have resulted from these efforts and an example of each with its respective location are listed below:

- | | |
|--------------------------|--|
| (1) Red Pine | Planted 0.2 miles west of the Struble Road-Rt. 206 intersection. |
| (2) Southern White Cedar | Located in the southwest corner of the red pine plantation described above. |
| (3) Norway Spruce | Located on the south side of Grau Road just north of the entrance to Lake Ocquittunk camping area. |
| (4) White Pine | Planted along Kittle Road just north of the entrance to the Group Camping Area. |

Charcoal
Burner



the
Steammill Area

circa 1865

Commonly Found Species:

Barnyard Grass (Echinochloa crus-galli)
Common Ragweed (Ambrosia artemisifolia)
Poverty Grass (Aristida dichotoma)
Yellow Foxtail (Setaria glauca)

Stage Two

The Perennials:

Typically lasts 2-5 years. Compete with the annuals and succeed due to a more stable regenerative capacity.

Commonly Found Species:

Broom Sedge (Andropogon virginicus)
Common Milkweed (Asclepias syriaca)
Blackberry (Rubus spp.)
Field Horsetail (Equisetum arvense)
Gray Goldenrod (Solidago nemoralis)

Stage Three

The Pioneer Trees and Shrubs:

Typically lasts 5-15 years. Shades out many of the preexisting vegetation. Many species have a fleshy, pulpy fruit which are consumed by birds and animals and later are distributed via droppings. Some species of trees often form pure stands (such as Eastern red cedar and gray birch).

Commonly Found Species

Black Cherry (Prunus serotina)
Red Cedar (Juniperis virginiana)
Gray Birch (Betula populifolia)
Quaking Aspen (Populus tremuloides)
Red Maple (Acer rubrum)
Staghorn Sumac (Rhus typhina)
Witch Hazel (Hamamelis virginiana)

Stage Four

The Young Forest Stand:

Typically lasting 15-75 years. Exhibits greater shade tolerance than those in the previous cycles. Exhibits increased growth and are able to "shoot up" past the third stage layer.

Commonly Found Species:

White Ash (Fraxinus americana)
American Beech (Fagus grandifolia)
Hickory (Carya spp.)
White Pine (Pinus strobus)
Yellow Poplar (Liriodendron tulipifera)

Stage Five

The Climax Forest:

17-175 years in duration. Often referred to as the "mature" forest.

Commonly Found Species:

American Beech (Fagus americana)
Black Birch (Betula lenta)
Yellow Birch (Betula alleghensis)
Sugar Maple (Acer saccharum)
White Pine (Pinus strobus)
Rhododendron (Rhododendron maximum)

Prior to the early 1900's, the American chestnut tree was an important member of the forest community. The nut provided food for both man and wildlife, the wood was strong, durable, and resistant to rot, and the tree itself had beautiful form. The wood from these trees was used extensively for fence rails, lumber, poles, and railroad ties.

In 1904, however, a shipment of European tree seedlings transported to the New York Botanical Garden carried a disease later termed the "chestnut blight", Endothia parasitica. the subsequent escape of the disease led to a devastating epidemic and within twenty-five years the massive stands of American chestnut were wiped out. Although the roots of older trees will resprout, the young chestnut saplings seen in the forest today will be killed back before they can reach any significant size. Rotting piles of chestnut logs and standing trunks, referred to by some as the "gray ghosts" of the woods, can still be found in Stokes State Forest.

Since the chestnut tree has been such a vital source of timber in American industry, the U.S. Bureau of Plant Industry funded a project aimed at collecting data on the viability of Oriental chestnut strains. In 1938, the Department of Agriculture cleared a one square acre "climatic plot" within Stokes State Forest and planted a total of 615 trees over a five year period. The species involved were Chinese and Japanese chestnuts, Asiatic red oaks, black locusts, white oaks, and evergreen oaks. The trees were marked for identification by strain number and genetic seed source on galvanized metal tags. A seven foot high fence enclosure, made with antive chestnut posts, surrounded the study area so the project could not be interfered with.

With the outbreak of the Second World War, the U.S.D.A. project was, for the most part, terminated. Of the 34 Asiatic chestnut plots originally planted throughout the eastern United States, only 16 were rated as being successful. The climatic plot at Stokes State Forest did not produce vigorous, blight resistant chestnuts, however, the Asiatic red oaks are presently competing with the invading native tree species. There is further evidence of Asiatic red oak regeneration on the forest floor. Ironically, the chestnut fence posts are still intact testifying to the durability of the American chestnut wood.

The climatic plot is located approximately 1/2 mile east of Steamhill Bridge on Crigger Road and 150 yards north along an old woods road.

Similar to the devastating effects of the chestnut blight, major outbreaks of insect-caused defoliation have periodically occurred since the early 1960's. The gypsy moth (Porthetria dispar) is perhaps one of the most widely known and controversial subjects relating to New Jersey's forest lands. Each year thousands of acres of prime hardwood stands are attacked by this pest and repeated defoliations of trees may have a deleterious affect on many tracts of northern forest.

Oaks, a primary food source of the gypsy moth, is a valuable resource not only from the economic viewpoint of being a commercial forest crop, but also as a major supplier of food for many species of wildlife.

So destructive are the gypsy moth caterpillars that a few dozen can strip a young oak tree bare of foliage.

If attempts made by man or nature at reducing the gypsy moth fail, the oak-hickory forest cover type in parts of New Jersey may yield to a less desirable red maple-black birch forest. Such a major change will alter the entire forest ecosystem with the greatest affects being on those species of wildlife dependent upon the acorns for food.

WILDLIFE

The woodlands, streams, lakes, ridges, and open spaces within Stokes State Forest provide a variety of habitats for a vast diversity of wildlife both seasonally and year round. Kittatinny Ridge with its loose rocks, ledges, and bold rock outcrops provide den sites for hibernating snakes such as the copperhead and eastern rattlesnake. Located along the Atlantic Flyway, Stokes also serves as a resting area for many transient, migratory bird species. Thousands of raptors and geese can be seen in the fall from Sunrise Mountain attracting scores of wildlife observers and photographers annually.

In the valley regions, shallow beaver ponds along the Flatbrook and its tributaries provide a haven for flycatchers, herons, woodpeckers, and their prey. Woodchucks and field mice abound in open areas. Coniferous woods shelter procupines, red squirrels, kinglets, and many other animals while the deciduous forest habitat serves white-tailed deer, rabbits, wild turkey, and many species of woodland birds. These are but a few examples of the diversity in habitats that one can find in Stokes State Forest.

When hiking along the trails and streambanks in the forest, please remember that you are a guest and practice active conservation. Never disturb a nesting site or destroy natural vegetation upon which wildlife depend for food and cover.

Check lists of birds, mammals, amphibians, fish, and reptiles representing those species found in and around Stokes State Forest are in the rear section of

this pamphlet. It is recognized that variations may exist and most extreme rarities, accidentals, and exotic species have been omitted from the lists.

ANTHROPEIC HISTORY

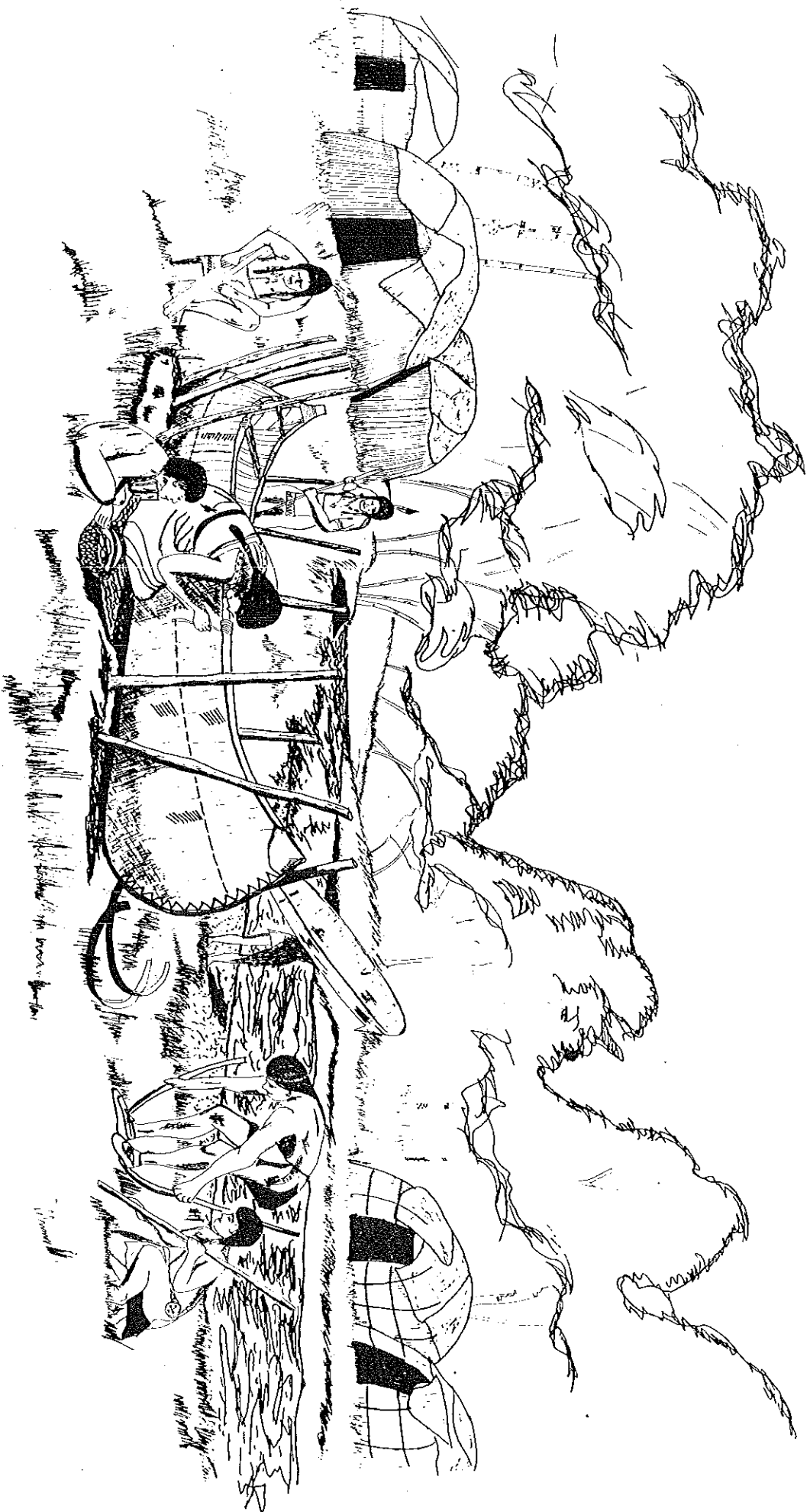
Stokes State Forest is steeped with history and the effects of man's activities are evident everywhere. Long before the first European journeyed into the region, stable Indian communities the Lenni Lenape- coexisted with the wildlife that abounded in the forest. The Minisi (wolf) clan inhabited the land which is now called Stokes Forest; they used fertile areas for small gardens growing crops such as maize (corn), pumpkins and tobacco, and used the forest-clad mountains for hunting bear, wolf, deer, and wild turkey. Large centers of Indian activities were located along the Delaware River and its tributaries (Figure 3).

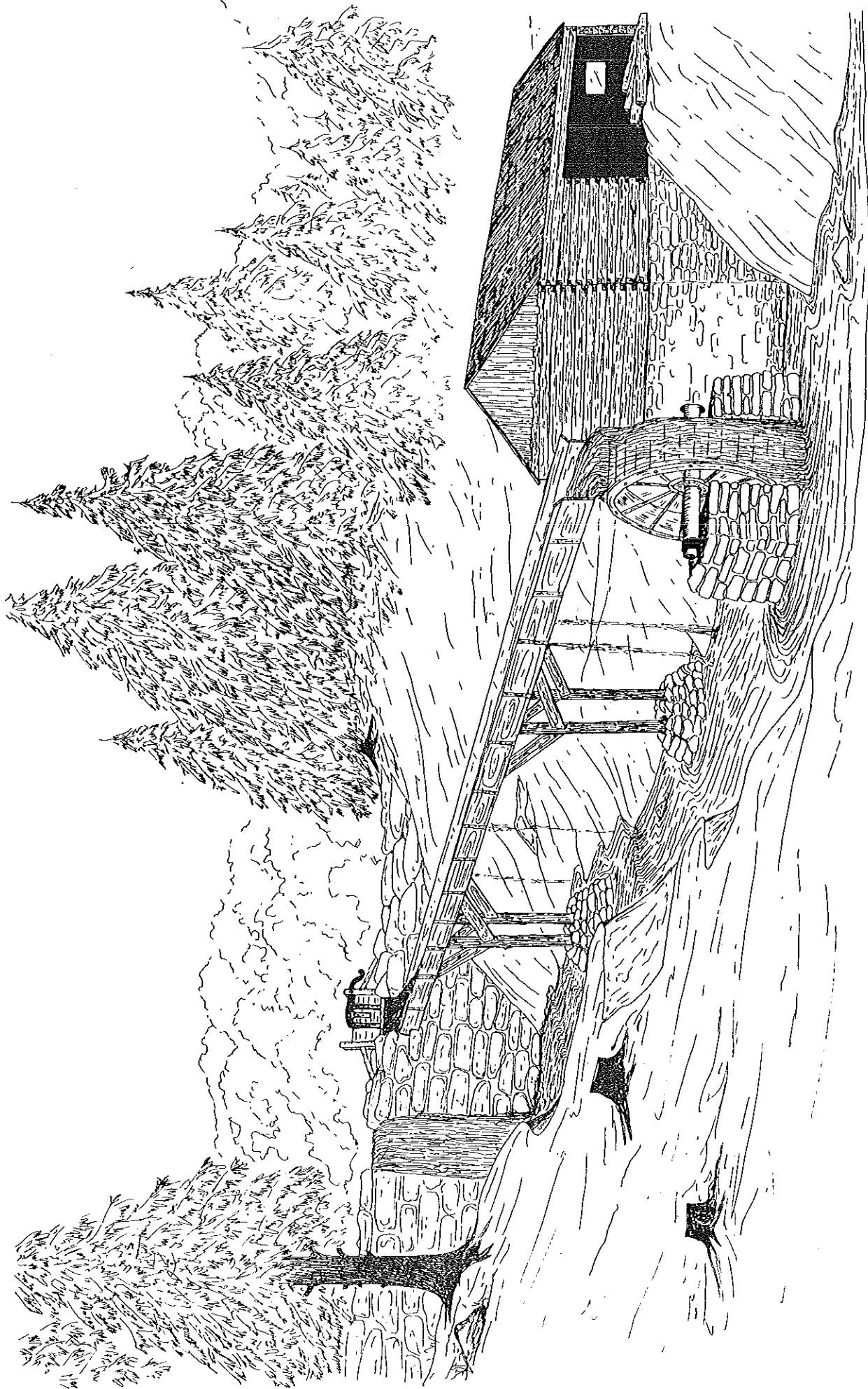
Although there is some evidence that Europeans were in the area, it was not until about the early 1700's that people of English and Dutch extraction were known to have farmed the area. These pioneers burned over vast areas for agriculture and cut the stands of virgin timber for its lumber. Miles of stone fences, foundations, overgrown fields, dams, and root cellars can be seen throughout the woodlands and along the winding brooks of Stokes State Forest. Some of the early homestead sites are marked only by a single stone wall, a depression in the ground, or rotting chestnut fence rails.

An early legend which has not been documented states that Dutch pioneers were the first Europeans to explore the area which is now Sussex County. The Dutch, originally seeking copper deposits, found a more valuable blend of iron, zine and manganese. Legend also has it that in 1650 Dutch engineers constructed the first highway in the New World-the Old Mine Road-extended from Esopus (Kingston), New York, to the mining site near the Delaware Water Gap in Pahaquarry, New Jersey.

Camping Along the Flatbrook

C-1492





Kettle Field Area c. 1840

Sawmill

SELF-GUIDED TOURS AND POINTS OF INTEREST

Several interesting sites have been developed into self-guided tours within Stokes State Forest. They can be located with the help of the following guide and by referring to the maps which are posted at the various parking lots and trails.

It is suggested that you read through the narrative of each tour prior to your departure in order to gain a more complete and comprehensive understanding of the area.

Kittle Field Area Tour: Park at Kittle Field and follow the marked trails as shown on posted map.

Snook Lumber Mill and Dam

In 1800 William A. Snook began construction of an up-and-down saw mill powered by the waters of the Stony Brook. A stone dam was built across the stream and as the water backed up, a large pond was formed. A wooden trough or sluice carried water from the pond to the sawmill site just a short distance downstream of the dam (Figure 4).

The water then spilled from the sluice onto an overshot waterwheel which was mounted on one side of the mill. The water continued on its course through the steep, rocky gorge and eventually fed the Big Flatbrook. Inside the mill, a single bladed saw cut the logs one at a time.

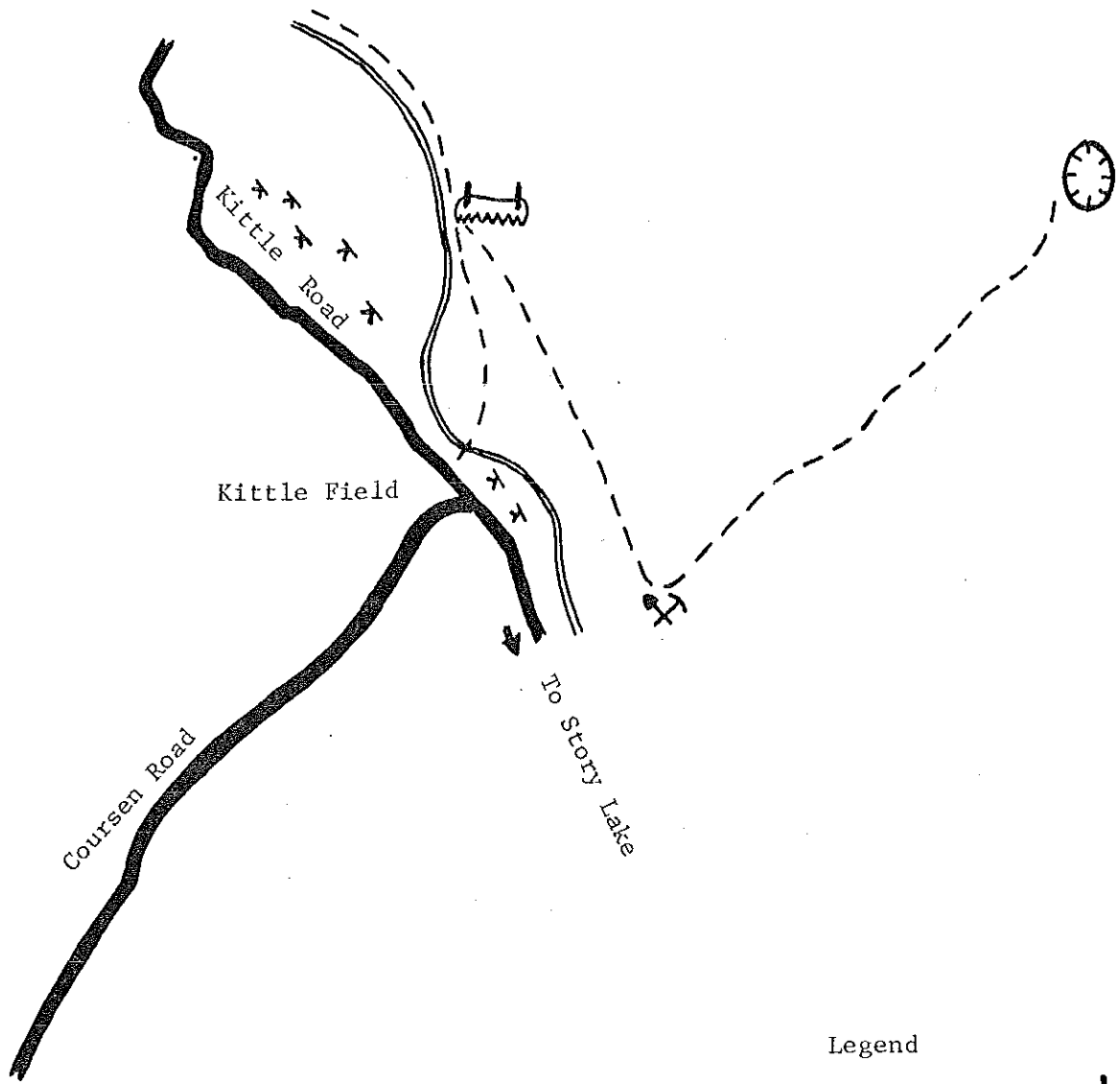
Along with the sluice, mill, and pond system, Snook erected a log cabin in which he and his family lived. A hand dug irrigation ditch carried pond water to the fields below and also served as a spillway. The aquaduct is about 2-1/2 feet deep and approximately 500 yards long.

The sawmill cut thousands of board feet of virgin forest into railroad ties. The milling process was extremely slow and tedious--so slow in fact that Snook and his men would often play a game of checkers or dominoes while waiting for the 16 foot log to be sawn in half. The sawmill was also very noisy, filled with the sounds of grinding machinery and meshing of gears.

Although only hearsay evidence exists, it is believed that the mill also ground apples and squeezed the pulp into apple cider. Buyers of this mash would then take it home and process applejack (apple whiskey) in their homemade stills. To the best of our knowledge, the Snook family was never directly involved in the operation of a still.

The original sawmill was abandoned in 1872 and moved to a new site a short distance downstream. The new mill was powered by the Stony Brook, but a circular saw made the cutting of logs easier and improved the quality of the sawed planks. The waterwheel was not of the overshot variety but was a fully enclosed turbine within the mill itself. Floodgates were raised and lowered depending upon the velocity of water and power desired. The mill operated at that site until 1950 with a total of seven generations of Snooks handling the lumber industry.

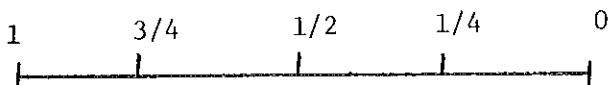
Kittle Field Area Tour



Legend

- | | | | |
|----------|--|-------------|--|
| Mine | | Saw Mill | |
| Dry Lake | | Picnic Area | |
| Brook | | Road | |

Scale



The original sawmill, pond, and log cabin have long since disappeared from the Stony Brook area. However, by observing the surroundings and the artist's conception, one can picture in his mind what the mill site looked like over 170 years ago.

The rock wall that crosses the brook served as Snook's dam and the depression found to the rear was the bed of the pond. The wooden sluice carried the water from the pond down to the sawmill which stood on stone foundations on the western bank of the stream. Approximately thirty yards upslope from the foundation lies the irrigation ditch.

The main trail leading from Kittle Road to the site served William Snook as the main logging road. The logs were first skidded behind a pair of oxen to the mill and after they were sawed the lumber was drawn to Branchville for sale.

Snook Silver Mine

On the lower slopes of a small hill located about 1/2 mile east of Kittle Field, John Snook discovered a large crack in a rock outcrop. Upon further investigation, he found traces of silver ore and in 1875 started a small mining operation (Figure 5).

Alternating a hand drill and hammer with explosive charges placed in strategic locations, Snook fashioned a rectangular shaft approximately 4' wide, 32' deep, and 10' long. In dealing with blasting powder, he drilled the holes into the rock, measured the powder charge, and tamped the fuses, he sent his younger children into the shaft to ignite the blast.

When he wasn't working the mine, Snook filled the hole with water to keep trespassers from extracting the ore. A small pitcher pump powered by hand was used to drain the shaft when operations resumed. A wooden beam structure covered the hole and a pulley system carried the dirt, stone, and ore out of the bottom. Oxen were used to cart the ore away from the mine for processing.

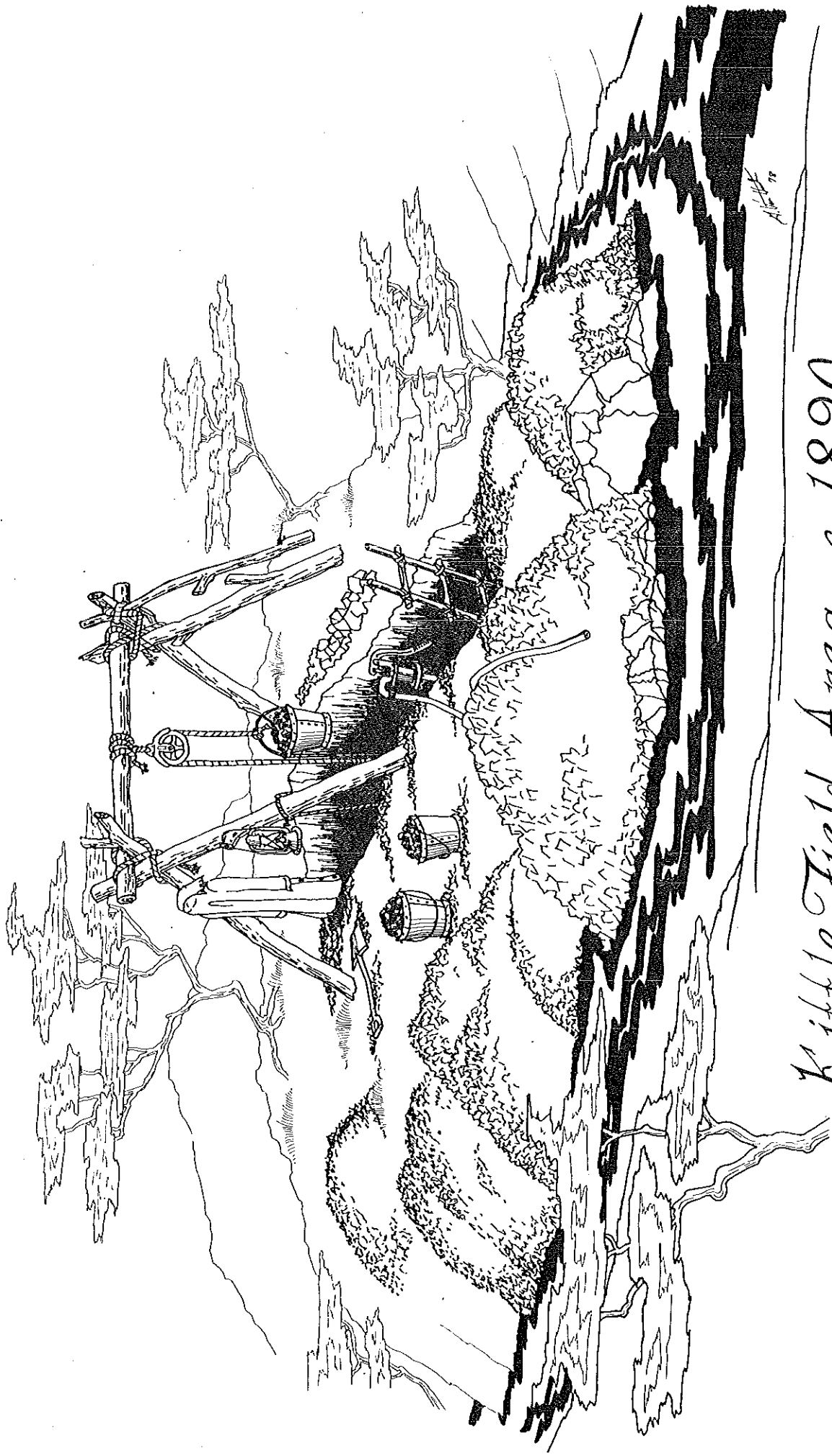
Recently, some of the mining tools were found wrapped in an oiled cloth beneath the roots of an old tree. Today the shaft is filled in with mud and water.

Snook's silver mine was reported to be profitable to the extent of his receiving \$75.00 per tone of ore. Several other mines have been found in the area containing traces of lead, gold, and copper; however, the finds were usually too insignificant for development.

Dry Lake

In 1928 Hiram Snook discovered a large bubbling spring in a lowland area approximately 1-1/2 miles northeast of Kittle Field. He conceived an idea of building a summer vacation resort complex where rich city dwellers could lease lakeshore homes.

Silver Mine



Al. 1890

Kettle Field Area c. 1890

The construction of the lake was a great undertaking. Using a gasoline powered steam shovel, he dredged the muck soil from the site. A ditch fourteen feet deep and 450 feet long was dug so that the dam would have extra support in its foundation from the surrounding soil and rock. The dam was framed with rough cut lumber and concrete and poured one section at a time from a small portable mixer. A portable rock crusher ground rock aggregates taken from family owned stone fences and the sand used in the concrete was taken from a nearby stream bank.

The length of the completed portion of the dam runs 212 feet, with its highest point above the ground being 14 feet. The width of the dam varies from 7 inches at the end to 12 inches at its midpoint. At the western edge, one can observe the original mold used in the operation. The foundation ditch continues to stretch westward for approximately 230 feet.

The development of hard times during the Great Depression forced Snook out of business, unable to finish his vacation resort. The dam can still be seen as he left it over forty years ago. Today it stands as a tribute to the vision and fortitude possessed by the area's former inhabitants.

Steammill Camping Area Tour: Park at the entrance to Parker Trail and follow directions on posted map.

The Perry Farm

On April 5, 1802 Elias Perry purchased eleven acres of land from Richard Edsall, Jr., and soon after established a farm near the Big Flatbrook. He lived in a roughly constructed log cabin covered by a bark slab roof and heated by a fireplace that had a clay and stick chimney. The few livestock that Perry owned were housed in a temporary barn, which consisted of a foundation dug into the hillside and protected with a leanto roof. For his supply of water, Perry had to dig a well thirty feet deep situated in front of the cabin. A root cellar was later added near the rear of the house.

As the trees were felled to clear the way for fields, rocks were neatly piled upon one another in rows of stone fences. These walls delineated the Perry Farm boundary as well as separated the animal yard from the rest of the homestead. The small garden, situated off to the side of the house, was probably tended by Perry's wife (Figure 6).

The Perrys lived on a subsistence agricultural economy raising crops, for food and animal fodder, and hunting the surrounding area for wild game. There was little need for money since they only purchased items that could not be grown or made at home (items such as salt, spices, sewing needles, etc.). Whenever possible, farmers would barter or trade for needed articles in fair exchange.

Elias Perry bought additional land for three dollars per acre and planted his pasture on the top of the hill where the soil was not as rocky as the valley below. A small corn crib was built alongside the house. As time progressed, a more permanent situation developed. Logs which were hand squared with an adze replaced the old log walls for a more sound and dry home. Wood shingles replaced the rotting slabs of bark of the roof, and some of the stones found in the fields were used to fashion a large chimney.

While the Perry family busied itself working the hard and rocky soil, the United States was growing in size with each new land acquisition. In order to expand the country's western horizon, Congress initiated several land policies - the majority of which failed to interest the public enough to make the journey. In 1862, however, Congress enacted the Homestead Act enabling thousands of eastern farmers to leave their small, unprofitable plots of land in search of the large fertile 160 acre tracts offered in the West. The transcontinental railroad made it possible to ship large amounts of goods and livestock east at lower prices than those being offered by the eastern farmer working the mountain soil.

Although the records do not indicate just how long the Perrys remained in the area, the original farm was willed to James Turner in 1883. It is speculated that the family might have moved West with other farming families seeking land with better soil than that which they left behind.

Deck Howell Dam and Sawmill

Just north of the point where Howell Trail crosses the Big Flatbrook lies the remains of a large stone and earthen dam built by Deck Howell almost 150 years ago. The dam is approximately 100 feet in length, 12 feet wide and is clearly visible from the Howell Bridge. The sawmill that accompanied the dam was situated at the base of the hill on the east side of the stream.

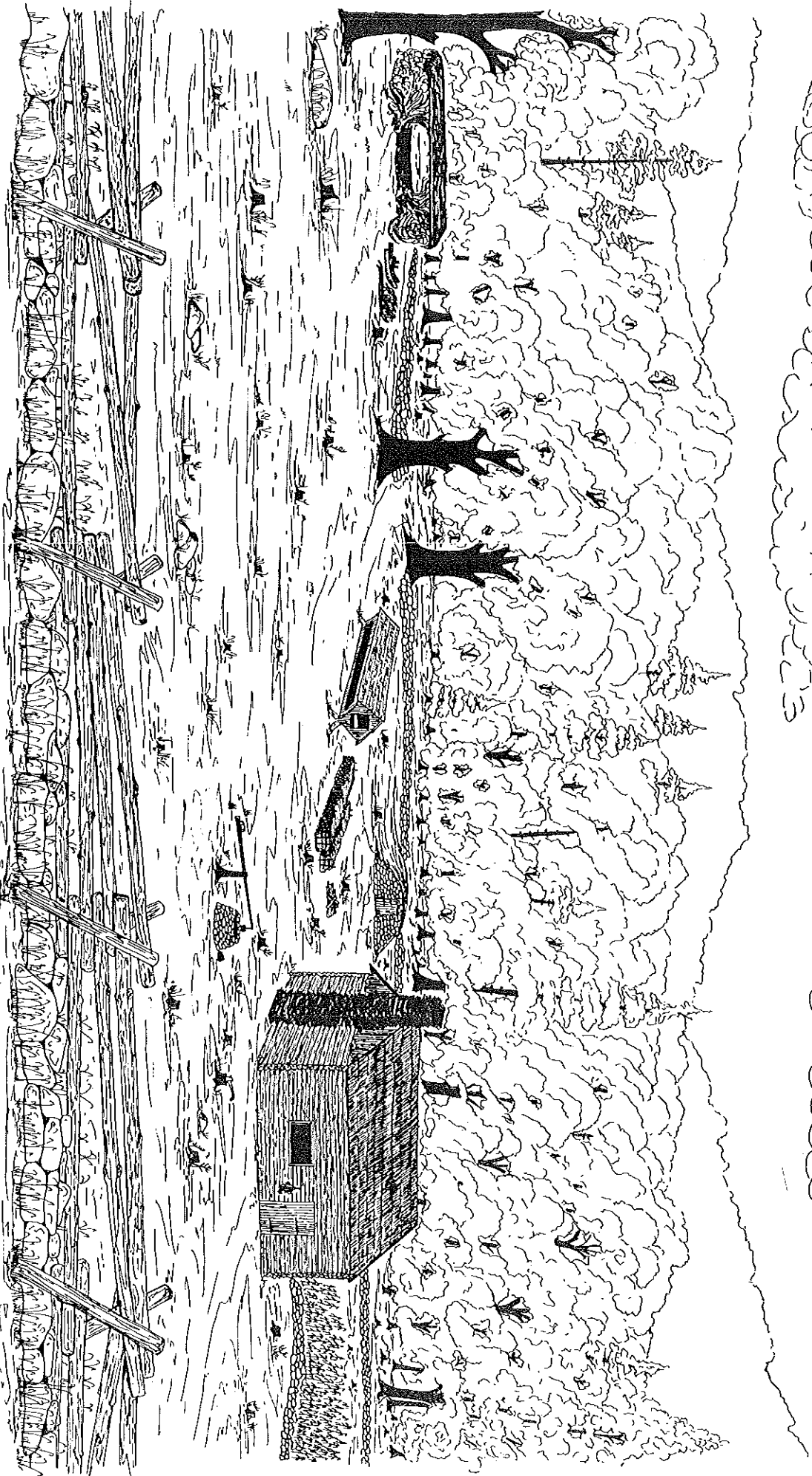
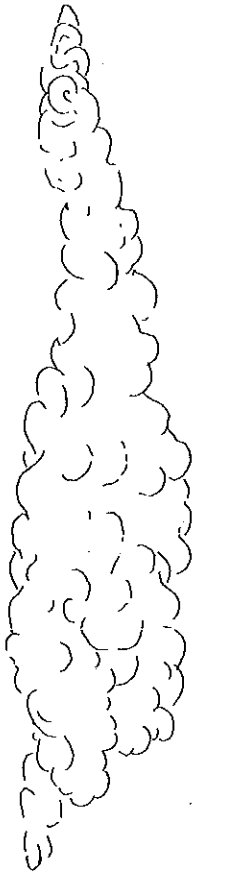
The mill was powered by an overshot waterwheel much in the same way the original Snook sawmill operated. The entire site was later abandoned because the flow of water was not sufficient enough to effectively run the mill.

On the opposite side of the stream, Howell dug foundations for a root cellar and a cabin. He also dug a well nearby to provide a constant supply of potable water. The absence of stone fences typically found on most homesteads in the area indicate that farming did not play a large role in the Howell family economy.

Deck Howell relocated his lumber operation downstream and established a stream driven sawmill in the vicinity of the Howell camping area.

The Fleming Farm: The Fleming farm is difficult to find and since there are no marked trails leading to it; only those skilled with map and compass should attempt to hike. It is located in the lower left-hand corner of the green rectangular plot northwest of Lake Ocquittunk (see Stokes State Forest map).

On August 2, 1849 a large tract of land was purchased by Joseph Fleming in what is now part of Stokes State Forest. The Fleming Farm was situated on a gently sloping ridge, bounded by stone walls ranging from one to three feet in height. The area was surveyed and measured using the Gunther chain, a method developed in Germany over 300 years ago and used as the standard in American mapping. The chain is 66.0 feet long and has 100 links, each link being equal to 7.92 inches. A line 80 chains long equals a distance of one mile, and a plot of land one chain square contains 43,560 square feet or one acre strict measure. In addition, in conjunction with the chain rule, farmers often used length units of called rods to mark their property lines and to lay out the foundations of buildings. A rod which is 16.5 feet, is 1/4 the length of a standard chain.



The Perry Farm c. 1825

Fleming used the rod measurement and chain measurement along with a magnetic compass in laying out his newly acquired property. The stone fences were laid at perfect right angles in distances of rod multiples. The walls were highest in those areas in which animals were contained because wire fencing and barbed wire had not yet been developed. The gateways separating the fences were either 1/2 or 1 rod wide. Even the root cellar, house, and barn were measured in this way.

Since there is no standing body of water within a short distance of the farm, Fleming constructed a cylindrical well from which potable water was drawn. A large V-shaped hole had to be dug until the water table was in sight. Then the well was built from the bottom up using rocks, stones, and soil. The well is approximately 2 feet in width and is still intact to this day.

It is believed that the Flemings like many other area farmers decided to abandon their marginal farm and move westward to take advantage of the Homestead Act. On May 28, 1861 the homestead was sold and the Fleming name does not appear again in the area ledger books.

Tillman Ravine:

Tillman Ravine is one of New Jersey's picturesque natural areas and is visited by thousands of people throughout the year. Taking any one of a number of trails will lead down to Tillman Brook which originates from a spring in the Kittatinny Mountains to the east. The stream flows swiftly past the massive red shale and sandstone walls that have been carved out by erosion through the years.

The tall majestic canopy of eastern hemlock and tulip poplar along with the spreading rhododendrons blanket the area with beauty during the spring and summer months. Ground juniper, mosses, varnish cork, and Christmas fern cover the forest floor along the trail system.

Enjoyed by naturalists, campers, hikers, and the active public in general, Tillman Ravine is a unique scenic area that is best displayed without signs of man's presence. When visiting the area, please refrain from smoking and stay on the marked paths while hiking. Picnic facilities are maintained for your use above the Upper Parking Lot.

By obeying the rules and regulations governed by Stokes State Forest, you will help insure that Tillman Ravine will remain the remembered spot of past visits as well as the anticipated ones of the future.

Sunrise Mountain Scenic Overlook:

The crest of Sunrise Mountain is one of the areas in Stokes State Forest most frequently visited each year by campers, hikers, and the general public. The mountain top provides a breathtaking view at an elevation of 1,653 feet above sea level, a panoramic vista incorporating the Highlands of New Jersey to the east and the Pocono Mountains of Pennsylvania to the west. High Point Monument, the highest elevation in New Jersey, is visible to the north. The expanse of farmlands and foothills surrounding Sunrise Mountain cover the ground below like a green carpet of velvet.

Some of the interesting facts about Sunrise Mountain include:

- (1) The trail leading to the summit is part of the Appalachian Trail system that runs from Maine to Georgia.
- (2) Millions of years ago a flat plain spread from Sunrise Mountain to the hills visible to the east and west. Erosion by water, wind, and ice carved the valley now separating the two ridges. Evidence of this "peneplain" is seen in the fact that the mountain tops are all about the same elevation.
- (3) Ten thousand years ago Sunrise Mountain was covered by several thousand feet of glacial ice. Grooves carved in the rock by these moving ice sheets can be seen at the overlook and on the trail leading to the summit.
- (4) Monarch butterflies and hawks use the Kittatinny Ridge as part of their migratory flight soaring on the warm thermal currents.
- (5) The largest rattlesnake den in New Jersey is located at the base of Sunrise Mountain. It is a rare occurrence that these snakes are found at such high elevations.
- (6) Rain falling on the east side of Sunrise Mountain eventually finds its way to the Hudson River while rainfall on the western slope flows into the Delaware River.
- (7) Sunrise Mountain Road and the Pavillion at the summit were built in the late 1930's by the Civilian Conservation Corps. Materials were transported to the mountain top via a stationary steam powered rail system. The deadman and eyebolt to which the cables were attached are still visible just north of the Pavillion.

The thin soil and harsh climate characteristic of Sunrise Mountain creates a selective environment in which few plants can survive. Mountain laurel, wild blueberry, pitch pine, and scrub oak are among the natural vegetation found throughout the area. Since the area is frail and could be easily destroyed through human negligence, camping and fires are not permitted.

Bubbling Spring:

Hidden deep within Stokes State Forest, one can find several fresh water springs rising up to the ground surface. From these openings the water flows along a downhill gradient and thus forms a small brook or stream.

Often homesteaders were fortunate enough to find a spring near their claims to serve the household with potable water. However, the majority of farmers had to dig deep down through the soil and rock to reach the groundwater table. Hand dug wells in this area range from a few feet to 30 feet deep.

Along Woods Road in the southeastern section of Stokes State Forest lies a large bubbling spring. The pool is approximately 10 feet in diameter and 2 feet in

depth. The source of the spring probably exists in a gravelly-sand stratum (different from the bedrock source of most springs in this area). As the water rises to the ground surface, the transported sand particles are suspended in solution, a condition termed "quicksand" by some. The physical bubbling is caused by the force of the water as it breaks through the surface layer. The sand that is deposited has a high degree of porosity, not nearly as dense as the sand found at the New Jersey seashore. The actual depth of deposit has not been determined.

Ruins of an old farm homestead and stone fence can be seen nearby on the east side of Woods Road about 200 yards south of the location of the spring. The spring is best displayed from late March until mid May when the groundwater table is at the highest level.

Tinsley Trail Geological Area

On the western slope of Sunrise Mountain exists an interesting complex of Pleistocene and post-Pleistocene surficial geological features. Scoured bedrock, drift deposits, and intermittent ponds in various stages of succession have resulted from geomorphic processes that occurred during and subsequent to the Pleistocene Age approximately 10,000 years ago.

This region typifies a recessional moraine that was formed by the deposition of material from a retreating ice sheet that temporarily stagnated. The moraine consists of irregular hummocks, paralleled ridges, and many kettle holes, all in contrast to the relatively smooth ground surface just south of the site. Most of the material in the moraine was derived from the underlying High Falls formation and the Shawangunk conglomerate, but some syenite boulders are present.

Some of the geologic features present are briefly described below:

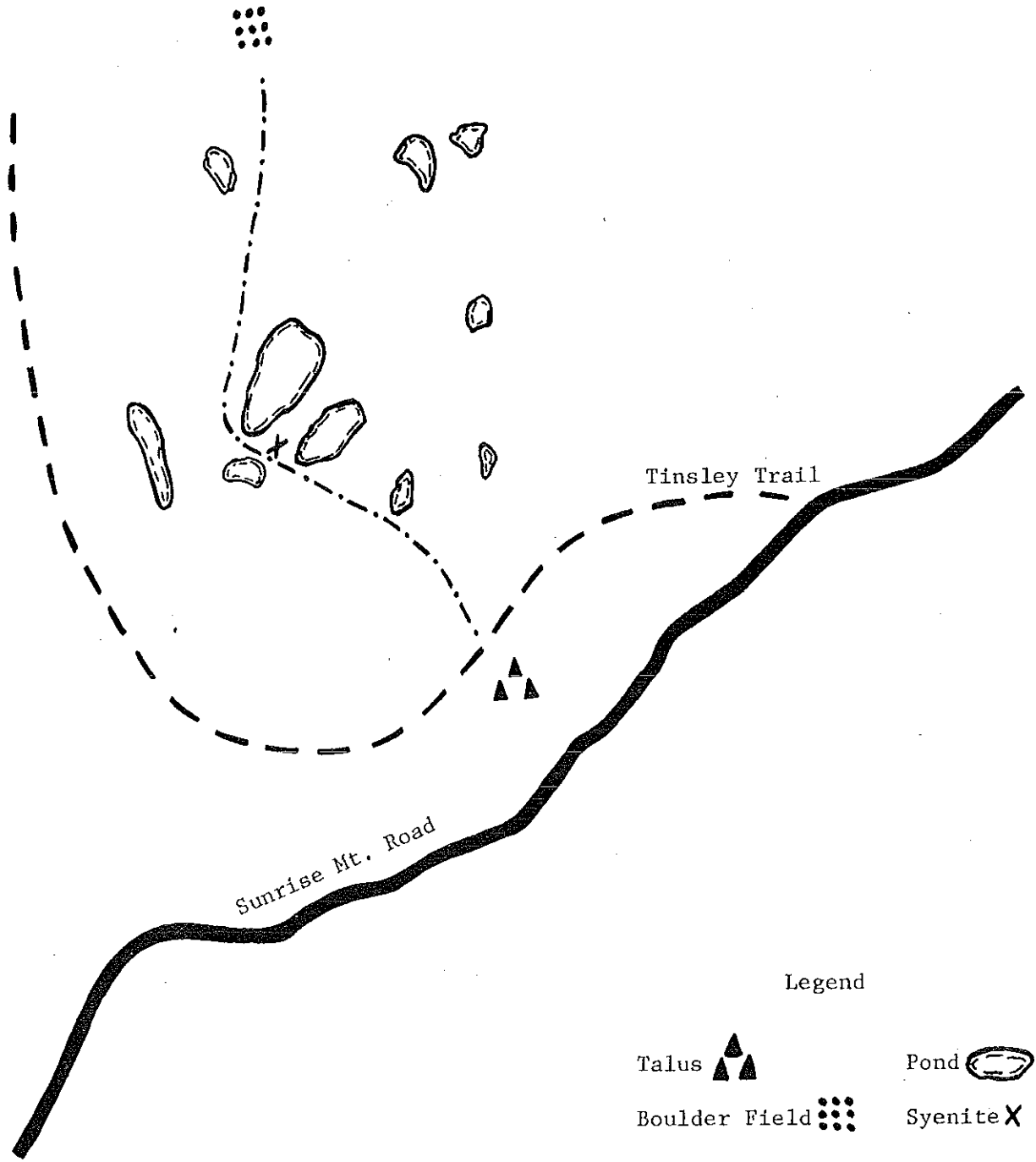
(1) Talus Slope

Talus slope refers to an area of rock accumulation or deposition caused by the combined action of frost and gravity. The alternate freezing and thawing of moisture in rock crevices cause exfoliation which reduces large boulders to many pieces of rock rubble. When the moisture that is trapped between the ground surface and a rock freezes, an ice crystal forms. As the ice crystal expands, it does so perpendicular to the ground thus pushing the rock upward and outward. Upon thawing, the particles fall vertically, moving downhill, if the ground has any slope. Most of the talus has sharp rough edges typical of material broken apart.

(2) Kettle Holes

Throughout the area exist several depressions in the ground surface which are filled with water during the spring months when melting snows and frequent showers raise the local water table. These kettle holes were created by detached blocks of ice which were trapped or buried by rock and soil debris. As the ice melted, the material above it sank into the depression. Leaves and other debris cover the surface of the depressions below which is about 6 feet of silt that covers the till. This indicates that the ponds have gradually been filling in and were once deeper than they are today.

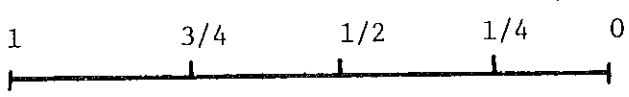
Tinsley Trail Geological Area



Legend

- | | | | |
|------------------------|--|---------|---|
| Talus | | Pond | |
| Boulder Field | | Syenite | X |
| Road | | Trail | |
| Glacial-Geologic Trail | | | |

Scale



(3) Nepheline Syenite

The forces driving the glacier forward was of an incomprehensible enormous magnitude. Evidence of the power of the ice sheet lies in a nepheline syenite boulder (adjacent to the concrete marker post) which was transported out of Kittatinny Valley and deposited on the west side of Kittatinny Mountain. The ice lifted this particular boulder to a height of at least 220 feet and moved it horizontally no less than four miles.

(4) Boulder Fields

Several local accumulations of boulders can be found on the moraine. These boulders were pushed to the surface from far below by the action of untold numbers of intensive freezing and thawing cycles. This stirring by frost is called congeliturbation and probably occurred during the retreat of the glacier.

The boulders are semirounded which is typical of material that was "ground" as the ice pushed it forward.

The area along Tinsley Trail near the western slope of Sunrise Mountain is unique indeed, for there are only a few such areas outside of the Arctic region. The features discussed above have been carefully mapped on a posted display at the intersection of Sunrise Mountain Road and Tinsley Trail. It is strongly suggested that the hiker wear good, sturdy footwear when walking through the rock-strewn site.

CALENDAR OF NATURAL EVENTS

January and February: Beautiful ice formations exist along Tillman Brook and other streams in the area. Northern species of birds can be observed in the conifer stands throughout the forest.

March and April: Animal activity increases with the coming of warmer weather.

May and June: Female aquatic turtles leave the water and deposit their eggs in underground incubation chambers which they scoop out with their clawed feet. After the eggs are laid, the turtle will cover them with soil and return to the water. The incubation period of the eggs is about 3 months. Flowering dogwood and azalea burst into full bloom. The spring panorama is further enhanced by brightly colored wood warblers and other songbirds as they pass through or arrive to stay for the summer. The hardwood forests turn the once brown and barren woodlands into a leafy green paradise. Waterfowl activity is increased in the nearby swamplands. Fawns and parent white-tails emerge from the woods seeking green, fresh grass and other fodder. Trailing arbutus, Junesberry, lupine, wild violets, as well as other scenic wildflowers add color and beauty to the forest floor. Higher up in the stratum, mountain laurel can be seen in bloom - a spectacular sight perhaps second to none in the Garden State. For those who enjoy bird songs, early morning excursions will interest people wishing to brush up on field identification. During the early evening hours, the meadows and stream edges fill the air with the sounds of calling frogs.

July and August: Summer wildflowers, fungi, and birds abound in the forest surrounding the many beaver ponds.

September: Along the Appalachian Trail and on the summit of Sunrise Mountain, the annual fall hawk migration can be observed. Thousands of these fascinating birds can be seen and photographed as they soar on the thermals along Kittatinny Ridge. Late blooming wildflowers and mushrooms blanket the moist woodland sites.

October: The hawk migration continues with the peak in numbers of sharp-shinned hawks, red-tail hawks, and American kestrels. The vivid reds and yellows of a changing deciduous forest is a sight to behold from the top of Sunrise Mountain. Canadian geese begin their southerly migration often landing on the beaver ponds to rest.

November: As the hawk migration draws to a close, the woods turn somber under a cool fall sky. Deer, squirrel, rabbits, and hibernating animals can be seen feeding heavily in order to build up their fat content for the long winter ahead.

December: New fallen snow in the hemlock stands makes for excellent photography in contrasts of green and white. Spectacular ice formations in the Stony Brook and Tillman Brook occur when the temperature is cold enough to freeze the flowing water.

WILDLIFE LISTS

The bird listing that follows has been constructed in the order of evolutionary events, beginning with the oldest species. The legend below will allow easy, accurate interpretation of the given data:

Relative Abundance

C..... Common
U..... Uncommon
R..... Rare
blank..... Absent

Seasonal Key

S - Spring: March through May
S - Summer: June through July
F - Fall: August through October
W - Winter: Novembr through February

Due to flight patterns and variations in the behavior of bird populations, seasonal occurrence does not follow man's traditional conception of the calendar year.

BIRDS

<u>S</u>	<u>S</u>	<u>F</u>	<u>W</u>		<u>S</u>	<u>S</u>	<u>F</u>	<u>W</u>	
U		U		Common Loon	U		U		Oldsquaw
R		R		Red-throated Loon	R		R		Ruddy Duck
R		R		Red-necked Grebe	U	R	U		Hooded Merganser
U		U		Horned Grebe	U	R	U		Common Merganser
U		U		Pied-billed Grebe	C	C	C	R	Turkey Vulture
R		R		Double-crested Cormorant	U		U	R	Goshawk
C	C	C		Great Blue Heron	C	R	C	R	Sharp-shinned Hawk
	U	U		Common Egret	R	R	U	R	Coopers Hawk
	U	U		Snowy Egret	C	C	C	C	Red-tailed Hawk
	R	R		Little Blue Heron	U	R	U	R	Red-Shouldered Hawk
C	C	C		Green Heron	C	C	C		Broad-winged Hawk
R		R		Black-capped Night Heron	R		R	R	Rough-legged Hawk
R	R	R		American Bittern	R		R		Golden Eagle
	R			Least Bittern	R		R	R	Bald Eagle
C	C	C		Mute Swan	C		C		Osprey
		F		Whistling Swan	R		R		Peregrin Falcon
C	C	C	U	Canada Goose	U		U		Merlin
U		U		Brant	C	C	C	C	American Kestrel
U		U		Snow Goose	C	C	C	C	Ruffed Grouse
C	C	C		Black Duck	U	U	U	U	Bobwhite
U		U	R	American Widgeon	U	U	C	U	Ringnecked Pheasant
U		U		Pintail	C	C	C	C	Wild Turkey
U		U		Green-winged Teal	R	R	R		Virginia Rail
U		U		Blue-winged Teal	R	R	R		Sora Rail
C	C	C	R	Wood Duck	R	U	R		Common Gallinule

BIRDS

<u>S</u> <u>S</u> <u>F</u> <u>W</u>		<u>S</u> <u>S</u> <u>F</u> <u>W</u>				
R	R	Redhead	U U U	American Coot		
U	U	Ring-necked Duck	C C C U	Killdeer		
R	R	Canvassback	C C C	American Woodcock		
R	R	Lesser Scaup	C R C	Common Snipe		
U	U	Golden-eye, Common	C C C	Spotted Sandpiper		
U	U	Solitary Sandpiper	U U U	Least Flycatcher		
U	U	Lesser Yellowlegs	C C C	Wood Pewee		
U	U	U	U	Herring Gull	U U U	Olive-side Flycatcher
U	U	Ring-billed Gull	R R R R	Horned Lark		
R	R	Bonaparte's Gull	C C C	Tree Swallow		
R	R	Common Tern	U U U	Bank Swallow		
C	C	C	C	Mourning Dove	C C C	Rough-winged Swallow
C	C	C	Yellow-billed Cuckoo	C C C	Barn Swallow	
C	C	C	Black-billed Cuckoo	U U U	Cliff Swallow	
U	U	U	R	Barn Owl	C C C C	Common Bluejay
C	C	C	C	Screech Owl	C R	Common Raven
U	U	U	U	Great Horned Owl	C C C C	Common Crow
U	U	U	U	Barred Owl	R R	Fish Crow
U	R	U	R	Long-eared Owl	C C C C	Black-capped Chickadee
R	R	Short-eared Owl	C C C C	Tufted Titmouse		
R	R	R	Saw-whet Owl	C C C C	White-breasted Nuthatch	
U	Whip-poor-will	C R C C	Red-breasted Nuthatch			
C	U	C	Common Nighthawk	U U C C	Brown Creeper	
C	C	C	Chimney Swift	C C C	House Wren	
U	U	U	Ruby-throated Hummingbird	U R C U	Winter Wren	

BIRDS

<u>S</u>	<u>S</u>	<u>F</u>	<u>W</u>		<u>S</u>	<u>S</u>	<u>F</u>	<u>W</u>	
C	C	C	U	Belted Kingfisher	R	R	R	R	Carolina Wren
C	C	C	U	Common Flicker		U			Long-billed Marsh Wren
C	C	C	C	Pileated Woodpecker		R			Short-billed Marsh Wren
R	R	R	R	Red-bellied Woodpecker	C	C	C	C	Mockingbird
C	R	C	U	Yellow-bellied Sapsucker	C	C	C		Brown Thrasher
C	C	C	C	Hairy Woodpecker	C	C	C		Catbird
C	C	C	C	Downy Woodpecker	C	C	C		Wood Thrush
C	C	C		Kingbird	C	U	C		Hermit Thrush
C	C	C		Great-crested Flycatcher	C		C		Swainson's Thrush
C	C	C		Eastern Phoebe	C		C	R	Gray Thrush
U	U	U		Adler Flycatcher	U	U	U		Veery
U	U	U		Eastern Bluebird	C	U	C		Cerulean Warbler
U	U	U		Blue-gray Gnatcatcher	C	U	C		Blackburnian Warbler
C	R	C	C	Golden-crowned Kinglet	C	C	C		Common Yellowthroat
C		C	U	Ruby-crowned Kinglet	C	U	C		Chestnut-sided Warbler
C		C		Water Pipit	U		U		Bay-breasted Warbler
C	C	C	U	Cedar Waxwing	C		C		Blackpoll Warbler
		R	R	Northern Shrike	U	R	U		Pine Warbler
R		R	R	Loggerhead Shrike	U	U	U		Prarie Warbler
U	U	U	U	Starling	C		C		Palm Warbler
R		R		White-eyed Vireo	C	C	C		Ovenbird
U	U	U		Yellow-throated Vireo	U	U	U		Northern Waterthrush
U	U	U		Solitary Vireo	U	U	U		Louisiana Waterthrush
C	C	C		Red-eyed Vireo	R		R		Kentucky Warbler
R		U		Philadelphia Vireo	R		R		Connecticut Warbler

BIRDS

<u>S</u> <u>S</u> <u>F</u> <u>W</u>		<u>S</u> <u>S</u> <u>F</u> <u>W</u>	
R R R	Warbling Vireo	R R	Mourning Warbler
C C C	Black and White Warbler	R R R	Yellow-breasted Chat
R R R	Worm-eating Warbler	R R R	Hooded Warbler
R C R	Golden-winged Warbler	U U	Wilson's Warbler
U C U	Blue-winged Warbler	C C C	Canada Warbler
C C	Tennessee Warbler	C C C	American Redstart
R	Orange-colored Warbler	C C C C	House Sparrow
U U U	Nashville Warbler	R R	Boblink
C R C	Parula Warbler	C C C	Eastern Meadowlark
C C C	Yellow Warbler	C C C U	Red-winged Blackbird
C R C	Magnolia Warbler	C C C	Northern Oriole
U U	Cape May Warbler	U U	Rusty Blackbird
U U	Black Throated Blue Warbler	C C C U	Common Grackle
C C	Yellow Rumped Warbler	C C C C	Brown-headed Cowbird
C U C	Black-throated Green Warbler	C C C	Scarlet Tanager
C C C	Rose-breasted Grosbeak	C C C C	Cardinal
C C C	Indigo Bunting	U U C	Evening Grosbeak
C R C C	Purple Finch	U U U U	House Finch
R R R	Pine Grosbeak	C C C C	American Goldfinch
U	Common Redpoll	U U U	Pine Siskin
R	Red Crossbill	R	White-winged Crossbill
C C C	Rufous-sided Towhee	C R C	Savannah Sparrow
R	Grasshopper Sparrow	U U U	Vesper Sparrow
C R C C	Dark-eyed Junco	C C C	Tree Sparrow

BIRDS

<u>S</u>	<u>S</u>	<u>F</u>	<u>W</u>	
C	C	C		Chipping Sparrow
C	C	C		Field Sparrow
U		U	R	White-crowned Sparrow
U	U	C	C	White-throated Sparrow
C		C	R	Fox Sparrow
U	U	U		Swamp Sparrow
C	C	C	C	Song Sparrow
			R	Lapland Longspur
			U	Snow Bunting

MAMMALS

Opposum	Gray Fox
Smoky Shrew	Red Fox
Masked Shrew	Bobcat
Least Shrew	Woodchuck
Shorttail Shrew	Eastern Chipmunk
Longtail Shrew	Eastern Gray Squirrel
Eastern Mole	Red Squirrel
Starnose Mole	Southern Flying Squirrel
Hairytail Mole	Beaver
Big Brown Bat	Deer Mouse
Little Brown Bat	White-footed Mouse
Silver-haired Bat	Eastern Wood Rat
Red Bat	Red-backed Vole
Hoary Bat	Meadow Vole
Small-footed Myotis (Bat)	Pine Vole
Keen Myotis (Bat)	Meadow Jumping Mouse
Black Bear	Woodland Jumping Mouse
Raccoon	Southern Bog Lemming
Shorttail Weasel	Porcupine
Longtail Weasel	Norway Rat
Mink	House Mouse
River Otter	New England Cottontail Rabbit
Striped Skunk	Eastern Cottontail Rabbit
Coyote	Snowshoe Hare
White-tailed Deer	

AMPHIBIANS

Frogs and Toads

Eastern Spadefoot Toad	Gray Treefrog
American Toad	Bullfrog
Northern Cricket Frog	Green Frog
Upland Chorus Frog	Pickerel Frog
Northern Spring Peeper	Northern Leopard Frog
Wood Frog	

Salamanders

Marbled Salamander	Four-toed Salamander
Spotted Salamander	Northern Red Salamander
Red-spotted Newt	Northern Two-lined Salamander
Northern Dusky Salamander	Allegheny Mountain Salamander
Red-backed Salamander	Jefferson Salamander
Slimy Salander	

REPTILES

Snakes

Easter Worm Snake	Smooth Gree Snake
Northern Black Racer	Northern Brown Snake
Northern Ringneck Snake	Red-bellied Snake
Black Rat Snake	Eastern Ribbon Snake
Eastern Milk Snake	Eastern Garter Snake
Eastern Hognose Snake	Northern Copperhead*
Northern Water Snake	Timber Rattlesnake*

*Denotes venomous species.

REPTILES

Turtles

Eastern Box Turtle

Eastern Painted Turtle

Mud Turtle

Wood Turtle

Snapping Turtle

Spotted Turtle

Stinkpot

FISH

Largemouth Bass

Smallmouth Bass

Bluegills

Catfish

Eels

Minnows

Rainbow Trout

Yellow Perch

Chain Pickerel

Suckers

Sunfish

Brook Trout

Brown Trout



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