PLANNING

Mr. Charles E. Aguar
125 Dogwood Ln.
Athens, GA 30606

The Lookout Plateau

A Regional Planning Study



The University of Georgia

School of Environmental Design

609 Caldwell Hall
Athens, Georgia 30602-1845

DONATED BY
PROFESSOR CHARLES AGUAR
1998

t-it™ routing request pad 7664
EST
Yes call
in OCLC
→ IPC
5/2/12

THE LOOKOUT PLATEAU

A Regional Planning Study

c. 1976

ACKNOWLEDGEMENTS

Study edited and prepared by:
Garnet C. Chapin and Dwight C. Baker
Mountain School Workshop Coordinators

Major sections based on consultant reports by:

HYDROLOGY
Jack Milligan, Fresh Water Ecologist
Doye Cox, Fresh Water Ecologist

GEOLOGY
Richard Davis, Geologist
Fernbank Science Center

VEGETATION
Dr. Gene Van Horn, Biologist
University of Tennessee at Chattanooga

WILDLIFE
Jerry Bearden, Wildlife Biologist
Georgia Game and Fish Commission

VISUAL
Dwight C. Baker, Environmental Planner
Environmental Designs, Inc.

SOCIAL AND DEMOGRAPHIC
William Schultz, City Planner

LAND USE SUITABILITY
Garnet C. Chapin, City and Regional Planner
Environmental Designs, Inc.

ILLUSTRATIONS AND COVER DESIGN
Ellen Yates

REPORT PREPARATION

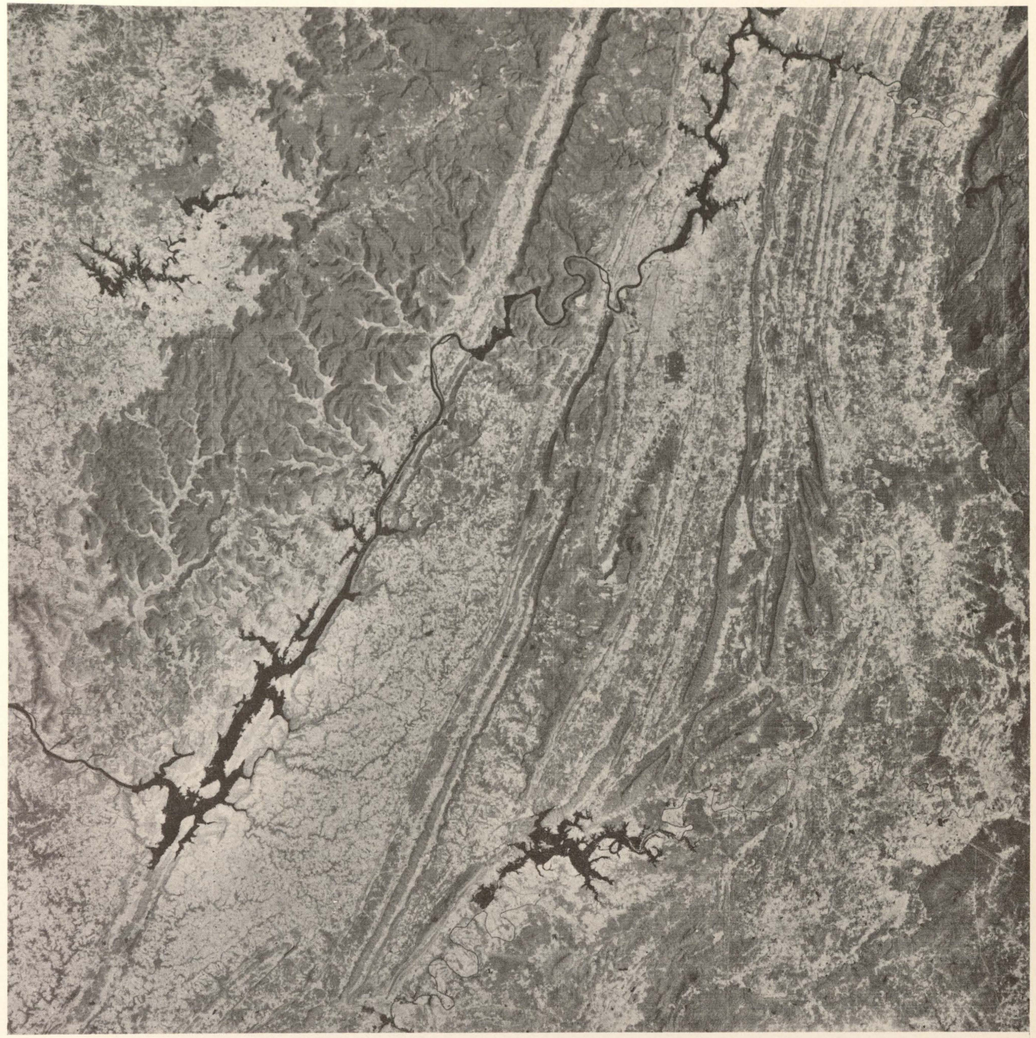
EDITORIAL ASSISTANCE
(Mrs.) Ellen Marie Moore, Director
Mountain School Workshop

TYPING
(Mrs.) Sheila McLaughlin

MAPPING
Dwight C. Baker
Environmental Designs, Inc.

RESOURCE ASSISTANCE
Dr. Alan Pardoen, University of Georgia, ICAD
Coosa Valley APDC
Tennessee Valley Authority

H. B. Owens Resource Center
School of Environmental Design
Caldwell Hall
University of Georgia
Athens, GA 30602-1845



Lookout Plateau and Surrounding Region
NASA Satellite Photo April 1973

Throughout time man has occupied and changed the land to suit his individual needs and desires, transforming it to express his particular ways of life. As form is the expression of content, let us seek to express our deep seated identity with the land in the creation of an environment in harmony with the best of our nature.

PREFACE

In a time of rapid change and the recognition of limited resources, one of the most pressing issues facing contemporary society is that of coordination of environmental and developmental goals. Rising environmental expectations impose strains on all modern industrial societies whether viewed in terms of protecting endangered wildlife, perserving those visual amenities which add so much to the quality of our lives, or preventing deterioration of human health. Environment now ranks high on the list of social priorities. At the same time, projections for continued growth into the twenty-first century and the pressing need for a strong economy demand concerned attention. In light of these needs for managing growth while reducing environmental disruption, it is necessary to examine the environmental implications of growth and development and bring those alternatives into public view.

In an age when man is plumbing the depths of the ocean and reaching far into space, it is recognized that his impacts on the environment often have far reaching effects. If we are able to conserve those natural resources which add so much to the quality of life on this planet, it will be necessary to assess the consequences of our actions on a broad scale and recognize the regional consequences of actions taking place on the local, site specific level.

The Lookout Mountain region is one abundant with natural resources and amenities, in many ways unique to the Tri-State area, offering recreational and open space opportunities to the entire southeast and the rest of the nation. Nevertheless, while it has managed for the most part to heal the wounds of man's past intrusions, such as over forestation and strip mining, it still faces the threat of unplanned growth and development.

While the region derives its basic identity from its distinctive natural landscape as the southern extremity of the Appalachian range, its complex character is, perhaps, best expressed by its people and their broad range of cultures and traditions. However, due to its prominent location in relation to the growing metropolitan area of Chattanooga, growth and change is inevitable. If its unique natural and human resources are to be preserved and developed, it is necessary that the people of the plateau consider their alternative futures. We must ask, how can the best of the past be preserved and built upon for the future?

As a result of these concerns over the proper use of the land and the protection and enhancement of the natural environment, the "community workshops on the environmental implications of alternative land use decisions" were formed with the following goals and objectives.

Short range goals include:

Educate the community about the environment in which they live.

Create a public awareness of the implications of growth and development in the Lookout Mountain region.

Identify community goals and priorities and communicate them to the appropriate decision makers.

Long range goals include:

Protection and enhancement of environmental quality.

Evolution of a participatory regional planning association.

Specific objectives which this program is directed toward accomplishing include:

The documentation of existing environmental conditions through the inventorying of physical, social, and economic factors.

Creation of participatory planning tools to aid in the effectuation of community goals and priorities.

During the course of the workshops, participants ranked the protection and enhancement of the natural environment as their highest priority with a specific response of "set criteria to ensure high quality growth and development." In order to carry out such a task, the Lookout Citizens Planning Group was formed. The following report is compiled as a recommendation to that group.

TABLE OF CONTENTS

INTRODUCTION ---------- VII

HYDROLOGY ---------- 1
- Hydrology of the Lookout Plateau ---------- 2
- Aquatic Ecology ---------- 3
- Hydrology Map ---------- 12

GEOLOGY ---------- 13
- Geology of Lookout Mountain ---------- 14

SOILS ---------- 18
- Soils of the Lookout Plateau ---------- 19
- Soils Association Charts ---------- 20
- Soils Map ---------- 34

VEGETATION ---------- 35
- Vegetation of Lookout Mountain ---------- 36
- Vegetation Illustrations ---------- 41
- Vegetation Map ---------- 45

WILDLIFE ---------- 46
- Wildlife of the Lookout Plateau ---------- 47

SLOPE ---------- 61
- Slope Map ---------- 63

VISUAL ---------- 64
- A Visual Analysis ---------- 65
- Landscape Inventory ---------- 70

CULTURAL ---------- 74
- Cultural and Aesthetic Resource Protection and Acquisition ---------- 75
- Historic Places ---------- 77
- Scenic Areas ---------- 81
- Unique Vulnerable Areas ---------- 82
- Cultural and Aesthetic Resource Map ---------- 83

SOCIAL ---------- 84
- Demographic and Service Survey ---------- 85
- Specialized Services ---------- 87

ECONOMIC ---------- 89
- Mineral Resources ---------- 90
- The Regional Economic Base ---------- 94

SUITABILITY ---------- 96
- Generalized Land Use ---------- 97
- Recommended Policies ---------- 99
- Environmental Impact Evaluation ---------- 101
- Future Land Use ---------- 105

INTRODUCTION

In meetings over the past twelve months which involved participants with a broad range of socio-economic backgrounds and interests, the problems of balancing concern for the environment and the inevitability of growth and change on the Lookout Plateau were addressed in open discussions. From this background, workshop coordinators with the aid of local and regional planning professionals, have compiled the following report. Concern was expressed over both the remedial environmental clean-up required by past neglect and the future environmental choices to be faced by a region in change. It is the latter question that this report primarily directs its attention to as the fit between the natural environment and the social, economic, and functional attributes of our community were examined. An attempt is made to separate fact from opinion and present information in a usable form to be used as the basis for informed decision making.

The first prerequisite in such an effort is the description of the natural systems. It is recognized that many of our natural resources are finite in nature and that their protection and enhancement require a conscientious stewardship. Cultural and esthetic resources also play a major roll in the determination of the growth and development of any region. These inventories coupled with present social and economic conditions can supply the broad overview necessary for dealing with the complex problems of preservation and growth.

This report examines the natural factors of hydrology, soils, geology, flora, wildlife, slope, and visual characteristics, as well as cultural and esthetic considerations and existing land uses. Every attempt is made to present up-to-date data which is place specific.

Given the above information, an attempt is made to assess the land's suitability for conservation and/or development. Such choices are made on the basis of a system of data integration in which the map subjects are weighted in relation to each other. It is very difficult to quantify such issues as erodible soils versus ground water potential for example, and thus in the examination an assignment of values is necessary.

At the same time a given natural system is being described, it is necessary that an inventory of types and intensities of appropriate development be compiled and a general relationship between various types of development categories and development consequences upon nature be considered. For example, different intensities of buildings create different amounts of impervious surfaces and water run-off. Here the natural factors and human considerations must work hand in hand to create an accurate assessment of the cause and effect relationships between natural systems and man-made development. If we are capable of assessing the environmental implications of alternative land use decisions, it is necessary that the natural environment and development descriptions be closely coordinated. For example, an alteration in certain types of fresh water aquifer recharge areas with clay layers can result in surface subsidence. In turn, other natural systems, such as, wildlife and vegetation, will also be altered as will certain visual and productive characteristics of the area. It is such assessments that necessarily involve human value judgments upon which recommendations and decisions will be made.

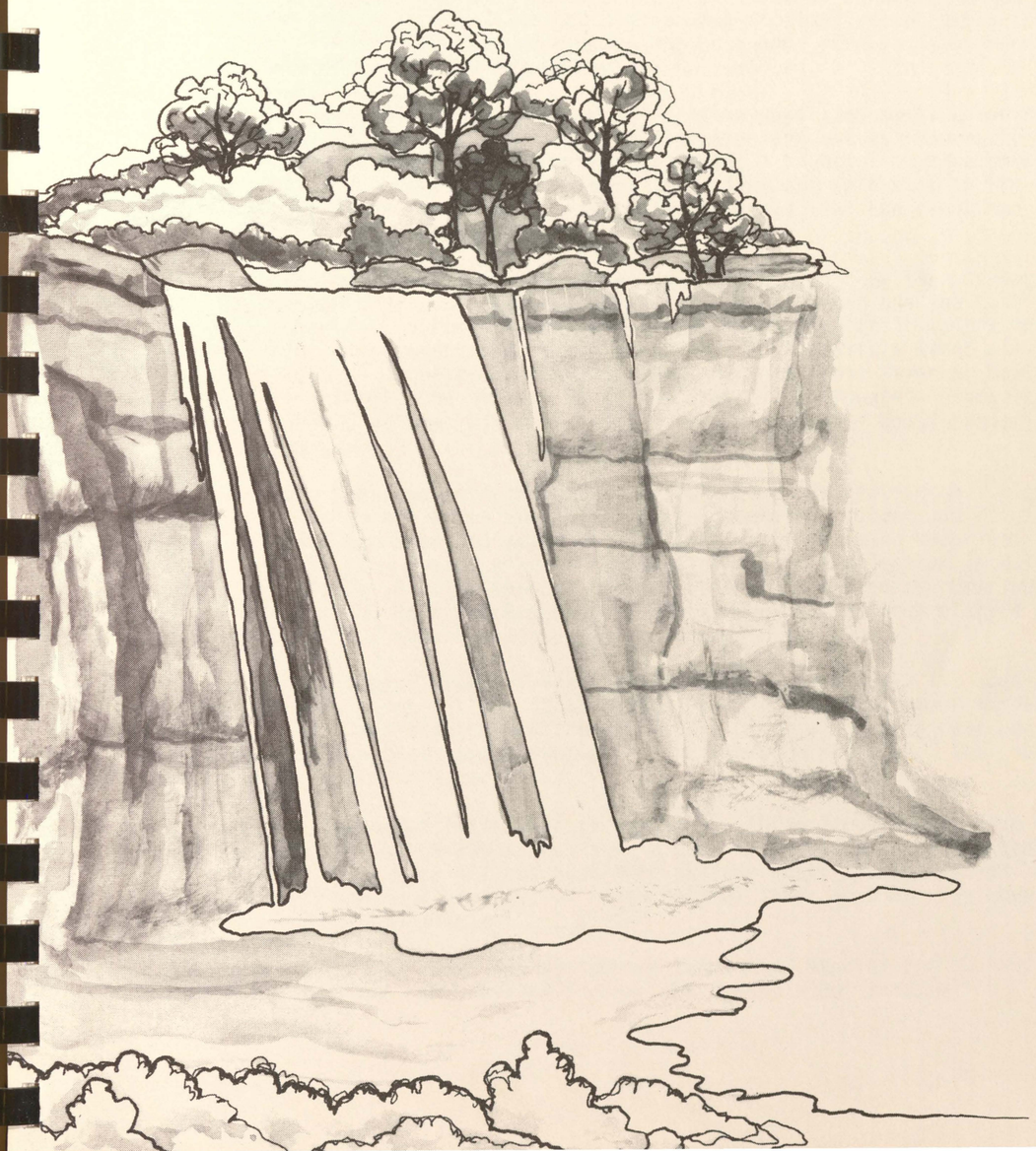
Such an approach allows not only the proposer of a development to know in advance what the natural environmental consequences of his development might be, but also identifies those areas of critical environmental concern so that the necessary precautions for their preservation can be undertaken. Environmental impacts can be determined in advance and those choices and trade-offs incumbent in any change in the environment can be calculated and open to public view. Alternatives can be examined in the light of factual data, which can serve as the basis for informed decisions as both the private and public sectors can assess the costs of various locational choices thereby enhancing the protection of natural systems and the building of safe and healthful environment for citizens of the plateau. These are the types of questions which the community addresses itself to if their concern for the environment is to be effective.

If we can accurately predict the consequences of alternative choices prior to their effectuation, we can manage the consequences of our impact on the natural environment, develop policies for land development which are consistent and fair for all, and encourage legislation which equally protects nature, the land owner, and the public.

With the development of these necessary tools and procedures, we can, with an understanding of our options and alternatives, create a more pleasant and more liveable environment. However, none of this can occur until confidence in such a system can be achieved. It is necessary that all citizens have access to information affecting the growth and preservation of their community resources.

With the public decision maker apprehensive of the multiplicity of information provided by the private sector and the private sector often questioning the accuracy and intent of the public sector, it may be necessary to create a quasi-public/private institution providing accurate information to the public and private sector alike. Perhaps the land management issue would be appropriate for such collaboration.

chapter 1
Hydrology



HYDROLOGY

The Lookout Plateau can be classified as a sandstone aquifer recharge area. The nature of sandstone as a parent material with the ability to filter, store, and transport water is characteristic of a large portion of the Lookout Mountain region. Below the sandstone layer cap lies a layer of shale which is much less porous and frequently forces water out of contact zones along the escarpments of the plateau. Beneath the layers of shale, limestone caverns exist which have been formed by water moving through cracks and fissures. Limestone is an easily erodible rock type that comprizes a large percentage of the bedrock in the surrounding valleys. The largest aquifers are found in the limestone areas.

Water manifests itself in many ways on Lookout Mountain. The area along the Tennessee - Georgia line where Dade and Walker counties meet, marks the highest annual rainfall in the region. This varies from 59 to 61 inches. During the late winter and spring, rainfall is at its highest and the local water table is raised appreciably. The rate of flow of primary and secondary streams is as much as 10 times as great as during the dry summer and fall months.

Springs and wells play an important part in supplying small quantities of water to residences on the plateau. A high iron content is frequently detected in water supplies due to the presence of hematite, a highly iron rich rock associated with the prevailing sandstone. Limestone and dolomites in the valley and ridge areas generally produce a larger water yield than the sandstone and shales on the plateau.

Major tributaries to the Tennessee River originate from the Lookout Plateau. South Chickamauga Creek, Chattanooga Creek and Lookout Creek are the main streams contained within the Lookout Plateau watershed, dispersing their waters into the Tennessee River. The west, middle and east forks of the Little River all supply appreciable volumes of water to the Weiss Resevoir and Coosa River in Northwest Georgia. Allen Creek, the primary watershed from Pigeon Mountain finds its confluence with the Chattooga River which again replenishes the Weiss Resevoir and the Coosa River.

Overland flow and surface runoff varies throughout the region. Higher quantities occur in the North where slopes are generally steeper and rainfall higher. Stream flow data has been collected for Chattanooga Creek which comprizes a total drainage area of 73.5 square miles. The gauging station is located in Walker County on Brunt Mill Road, .5 miles east of Blowing Spring. Two streams contribute significantly to the basin, Rock and Dry Creeks. Rock Creek has an area of 25.4 square miles, Dry Creek 6.2 square miles. (Refer to map).

The Lookout Creek drainage basin covers approximatly 145 square miles in Hamilton and Dade Counties, but it also finds part of its headwaters in DeKalb County, Alabama. Hurricane Creek from Johnson's Crook along with Bear and Daniel Creeks flowing from Cloudland Canyon are principle watersheds from the Lookout Plateau supplying the Tennessee River Basin.

Numerous man-made lakes spot the plateau. These impoundments have raised the temperature of the stream waters and in some instances have eliminated brook trout habitat. The trade off has been more surface water for recreation and the introduction of bass and blue gill. A few natural lakes such as Lula Lake and DeSoto Falls provide scenic amenities.

Water quality control and wastewater facilities studies are currently being conducted through the Environmental Protection Agency's 201 program.

AQUATIC ECOLOGY

Ecology is the relationship between an organism and its environment. An ecosystem is a community of organisms and their chemical and physical environment. Aquatic ecology deals with those organisms living on or in water. The ecology of an aquatic environment (ecosystem) is a subject of infinite complexity. The following discussion will outline only the fundamental principles necessary for a basic understanding of the effects of man's activities on the aquatic environment.

Water bodies can be divided into two large categories, running and standing water. Running waters include what are called brooks, creeks, branches, streams, and rivers. Standing waters are ponds, reservoirs, and lakes. Each of these categories may be characterized by different physical, chemical, and biological factors.

Some physical aspects of a river or lake that are important include the nature of the bottom material, depth, temperature, velocity, and turbidity. Chemical characteristics include such things as pH (acid content), dissolved gases, nutrients, water hardness, alkalinity, and dissolved minerals. The biological part of the aquatic environment includes fish, algae, amphibians, reptiles, insects, bacteria, and aquatic plants. The interaction of the physical and chemical components determines the types of organisms that will inhabit a particular body of water. For example, a clear cold stream in the Great Smokey Mountains would contain an entirely different assemblage of life than what would be found in a meandering warm water bayou along the gulf coast. Just as the physical and chemical aspects of a body of water determine the type environment that exists, so do they also determine different habitats within a particular environment.

What are the habitats that can exist in a river or lake and how are these habitats defined by the physical and chemical conditions therein? A section of river is normally a completely mixed body of water so chemical differences within the section are negligible. Thus the habitats present in a river section are solely defined by physical differences. However, a lake may exhibit marked differences in its chemical conditions from top to bottom and this will affect the quality of the habitats therein.The habitats found within a river and lake can be classified into four major types. These habitats include: (1) the bottom, (2) the open water, (3) the shoreline, and (4) the water surface (see figure 1).

Organisms interact with and affect other organisms within and outside their own habitat. Their interaction with other organisms will depend on their functional role in their environment. An organism's functional role involves its food source, where it lives, and its relationship to other organisms. Functional roles that exist in an aquatic ecosystem are (1) producers, those organisms that utilize sunlight to manufacture food, such as algae and green plants; (2) primary consumers, those organisms that feed on the producers, such as insects, crustaceans, and fish; (3) secondary consumers, organisms that feed on primary consumers and other secondary material; and (4) scavengers, organisms that feed on dead or decaying animal or plant material; and (5) reducers, organisms that change waste products from other organisms into food for the producers, such as bacteria and fungi. This organization of organisms is what is known as a food chain (see figure 2). Any component in a food chain is crucial to all other components. The disruption or elimination of one link in the chain would lead to the eventual elimination of the others.

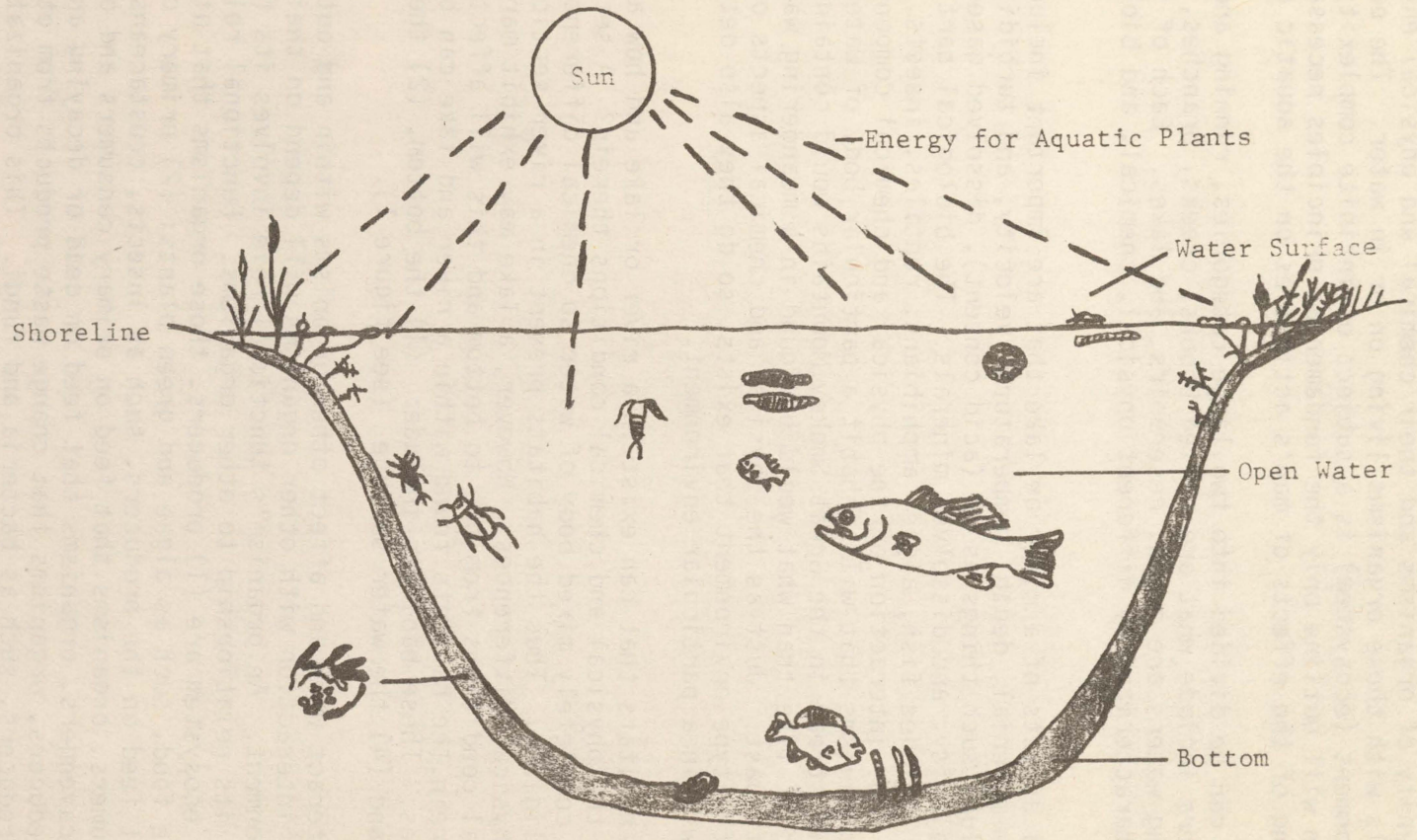


Figure 1

POND ECOSYSTEM

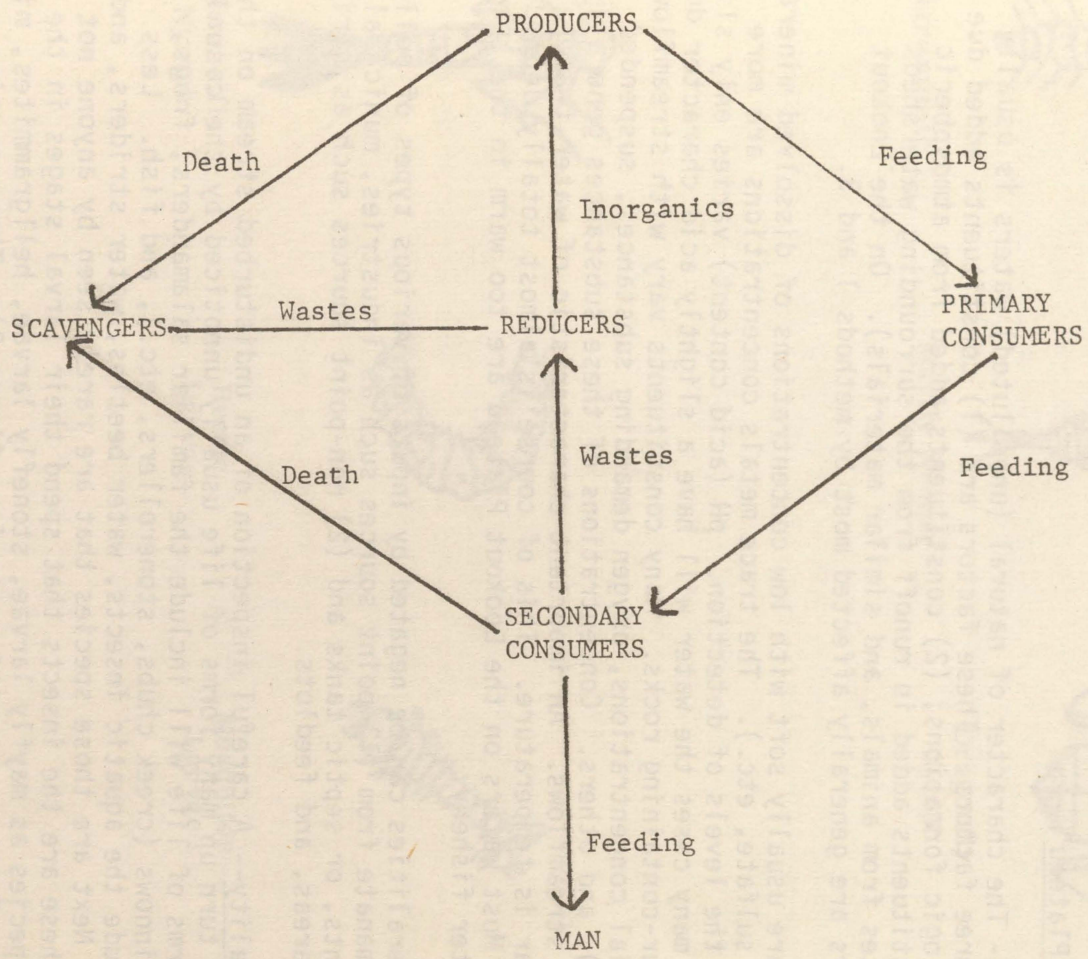


Figure 2

FOOD CHAIN

What factors can lead to the disruption or elimination of a part of an aquatic food chain? An organism's existance depends upon a complex arrangement of a number of physical and chemical factors all delicately balanced. Anything disturbing this balanced relationship between an organism and his environment would cause the organism to be adversely affected. Generally, but not always, these disturbances are a result of man's activities. However, more often than not, these man-made disturbances will result in the simplicication or change in the structure of the biological community. For example, the replacement of a game fish by a rough fish in a polluted water body is a common phenomenon.

Water on the Lookout Plateau

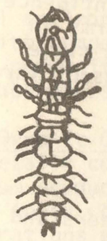
Water Quality-- The character of natural (unpolluted) waters is usually dictated by one of three factors. These factors are (1) constituents added due to weathering of geologic formations, (2) constituents added from atmospheric sources, and (3) constituents added in runoff from the surrounding watersheds (leaves, organic wastes from animals, and similar materials). On the Lookout Plateau natural waters are generally affected most by methods 1 and 3.

These waters are usually soft with low concentrations of dissolved minerals (calcium, magnesium, sulfate, etc.). The trace metals concentrations are more often than not below the levels of detection. pH (acid content) varies only slightly from neutrality. In many cases the water will have a slightly acid character due to contact with sulfur-containing rocks. Many constituents vary with streamflow. These include bacterial concentrations, oxygen demanding substances, suspended sediments (turbidity), and others. Concentrations of these substances generally increase with higher streamflows. An important characteristic of water that has not been considered so far is temperature. This of course is almost totally dependent on air temperature. Most waters on the Lookout Plateau are too warm in the summer to support a cold water fishery.

All these generalities can be negated by inputs of various types of pollution. This pollution can emanate from (1) point sources such as industries, municipal sewage treatment plants, or septic tanks and (2) non-point sources such as strip mines, construction areas, and feedlots.

Biological Quality-- A careful inspection of an undisturbed stream on the Lookout Plateau will turn up many forms of life usually unnoticed by the casual observer. Common forms of life will include the familiar salamanders, frogs, crayfish, turtles, minnows (creek chubs, stonerollers, etc.), and fish. Less obvious species include the aquatic insects, water beetles, water striders, and the water boatman, etc. Next are those species that are rarely seen by anyone not looking for them. These are the insects that spend their larval stages in the water. This includes such species as mayfly larvae, stonefly larvae, hellgrammites, midge larvae, and a variety of other common insects (see figure 3). These species serve as important fish food organisms in the adult and larval stages. Finally, there are the aquatic plants including both the microscopic, such as diatoms and algae, and the visible species, such as cattails, aquatic grasses, and lily pads, in the pool areas of streams.

In ponds or lakes most of these organisms occur but in differing proportions. Also different species of an individual type of organism will exist in standing



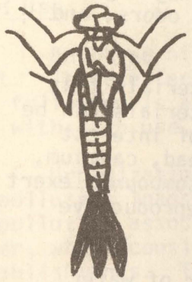
Hellgrammite



Mayfly Nymph



Dragonfly Nymph



Damselfly Nymph



Beetle Larvae



Mosquitoe Larvae

Figure 3

AQUATIC INSECT LARVAE

waters. Usually, standing waters will contain far more diatoms and algae than running waters. The same applies for other larger species of aquatic plants. In addition, a higher proportion of more tolerant species such as midge larvae than delicate species like stonefly and mayfly larvae will exist. Under the influence of pollution, however, these delicate species will give way to hardier forms in streams and lakes. These hardier species include mosquito larve, certain midge larvae, black fly larvae, and the rat tail maggot among others. These insect larvae are indicators of pollution.

Water Pollution

Before looking at the sources of pollution, it is necessary to understand the nature of specific types of pollutants.

Oxygen Demanding Substances--Most aquatic organisms require oxygen as part of their life process. Certain organic materials are used by aquatic bacteria as a food source. In processing this food substance, oxygen is required and if excess organic material is present in the water, the oxygen supply will be depleted. Organisms requiring oxygen will either leave, diminish in number, or perish.

Nutrients--Nutrients that are important with regard to water pollution are generally forms of nitrogen and phopshorous. An overabundance of these nutrients can lead to an unusually large percentage of producer organisms such as algae. Large populations of algae can deplete the oxygen in a water body during night time respiration. Also, algal blooms are unsightly, can produce foul odors, and may be toxic to other organisms, including livestock.

Inorganic Chemicals--There are a wide variety of inorganic materials that have adverse effects on aquatic life. In addition, many of these materials can be toxic to humans that consume fush from affected waters. Inorganics of interest include chlorides (salinity), metals (mercury, chromium, selenium, lead, cadmium, etc.), chlorine gas, ammonia, cyanide, sulfides, and others. These compounds exert a variety of effects including immediated death, body deformation, reproductive failure, and abberrant behavior.

pH (Acidity)--pH is an arbitrary measure of the acid character of water. Large changes in pH can be toxic to almost all forms of aquatic life. In addition, pH has an effect on the toxicity of many substances. For example, the toxicity of ammonia solutions increases with increades pH. The larval stages of aquatic insects and fish are particularly susceptable to pH changes.

Sediment--Sediment is essentially those solid materials carried by a stream and eventually deposited as bottom materials in pool areas or lakes. Sediment can consist of both organic and inorganic material. Inorganic materials include sand, silt, and clay. Organic material may be composed of a variety of materials both natural and man-made. Sediment in the water is important because of its effects of light penetration, temperature, and aquatic life. Sediment deposited as bottom material can cover bottom habitats. In addition, organic sediments can exert an oxygen demand.

Temperature--All aquatic organisms have upper and lower thermal tolerance limits, optimum temperatures for growth, and temperature limitations for migration,

spawning, and egg incubation. Any additions of abnormally hot or cold water to an aquatic system can disrupt breeding, limit natural migration, limit growth, and weaken or even kill the organisms. In addition, temperature changes affect the physical environment of water. Changes in viscosity, ice cover, and oxygen capacity occur with temperature variations. Temperature can also affect the composition of aquatic communities. Fish, for example, have been shown to be more susceptable to toxic substances and parasites in abnormally warm waters.

Organic Chemicals--Organic chemicals of importance include phenols, the organometalic compounds, pesticides, herbicides, polychlorinated biphenals, and petroleum products. These compounds generally act as toxic agents to aquatic life. Many of these compounds can be fatal or extremely harmful to organisms at lower concentrations when the organism is exposed over a long period of time. Each of these compounds affect organisms in defferent manners depending on concentration and the organism effected. They can affect egg fertility and feeding habits and can produce deformed off-spring.

Pathogenic Organisms--Pathogenic organisms found in waterways are those organisms capable of producing disease in man or animals. These organisms include bacteria, viruses, protozoa, worms, and fungi. All of these organisms are largely found in mumicipal sewage and animal wastes. They are of importance in aquatic ecology primarily in that they can produce diseases in man or animals.

Land Use

Any type of land use will have an associated effect on the aquatic environment. These effects can be minimized with proper land management or water treatment. The following is a breakdown of common land uses, types of pollution ususally associated with each use, and methods of minimizing their impacts on aquatic environment.

Urbanization--Population increases in an area are accompanied by increases in pollutant loads reaching streams serving the area. There are several sources of pollution associated with urbanization. One of these sources is municipal waste water, which consists of sewage generated in households and commercial and industrial establishments. The principal contaminants in municipal wastewaters include sediment, inorganic chemicals, nutrients, oxygen demanding substances, organic chemicals, and pathogenic organisms. This source of contamination can be controlled by proper wastewater treatment and planning. A second source is urban rain or storm water runoff. This source is, of course, dependent on precipitation and therefore intermittant. However, many times the load of pollutants in urban runoff are higher than municipal sewage. Urban runoff contains large amounts of sediments, bacterial contamination, inorganic chemicals including heavy metals, and organic chemicals, particularly pesticides. Measures for controlling urban runoff pollution consist of collection, storage, and treatment.

Agriculture--Agriculture, as addressed here, will include planting and harvesting of crops and animal husbandry. The most significant input of pollutants of animal husbandry origin are from feed lots. These pollutants are essentially the same as those found in municipal wastewaters. Again, the solution to this problem is efficient collection and treatment. Crop production may deliver sediment, nutrients, and organic chemicals, particularly pesticides, in significant quanities to surface waters. This problem can generally be minimized by soil conservation practices and proper fertilizer and pesticide application.

Industrial--The type of industrial process will dictate the pollutants produced. The broad spectrum of industrial uses of water make enumeration of individual systems and the characterization of their pollutants beyond the scope of this paper. However, some of the major problems associated with industrial wastes are pH, temperature, oxygen demanding substances, sediments, and organic materials (oil and grease). These problems can and have been effectively controlled by responsible industry. Control measures depend on the industrial waste.

Construction--Large earth-moving activities are almost always associated with construction. Thus, construction can result in large temporary input of sediment into adjacent waterways. Control of sediment is accomplished via sedimentation basins, grade stabilization, diversion ditches, and other practices designed to control sediment production.

Mining--The primary water quality problems associated with mining activities are pH, inorganic chemicals (iron, manganese, and sulfates), and sediment. In addition, these problems, unlike some other land use affects on water quality, can continue for long periods of time if proper reclamation and treatment are not carried out. These pollutants can be effectively controlled by proper recontouring and revegetation of the land. In addition, diversion of runoff during mining activities coupled with sedimentation basins have been shown to be an effective temporary treatment alternative.

Silviculture--Logging operations, logging road construction and maintenance, and site preparation for replanting are aspects of silviculture and timber harvesting operations that have the most potential for temporarily increasing the contribution of pollutants to surface waters. The primary water quality problem associated with silviculture is an increase in erosion potential causing large quantities of sediment to enter associated waterways. A problem of secondary importance occurs in some areas where modern high-yield forestry methods are employed. This problem arises when nutrients from wide-spread application of fertilizers reach streams that drain these cultivated forests.

Sediment yield can be reduced by proper installation and maintenance of sedimentation basins and by selective cutting rather than clear cutting.

Conclusion

This discussion is not meant to be an all-inclusive treatment of land use alternatives, the types of water pollution associated with these uses, or aquatic ecology. It is intended to act as a guide for decision makers so that they may be aware of a few of the water quality problems associated with common land use practices.

SELECTED REFERENCES

Ehlers, Victor M. and Ernest W. Steel. Municipal and Rural Sanitation. New York: Van Nostrand Reinhold Company, 1974.

Hutchinson, G. Evelyn. A Treatise on Limnology. New York: John Wiley and Sons, Inc., 1957, 1967

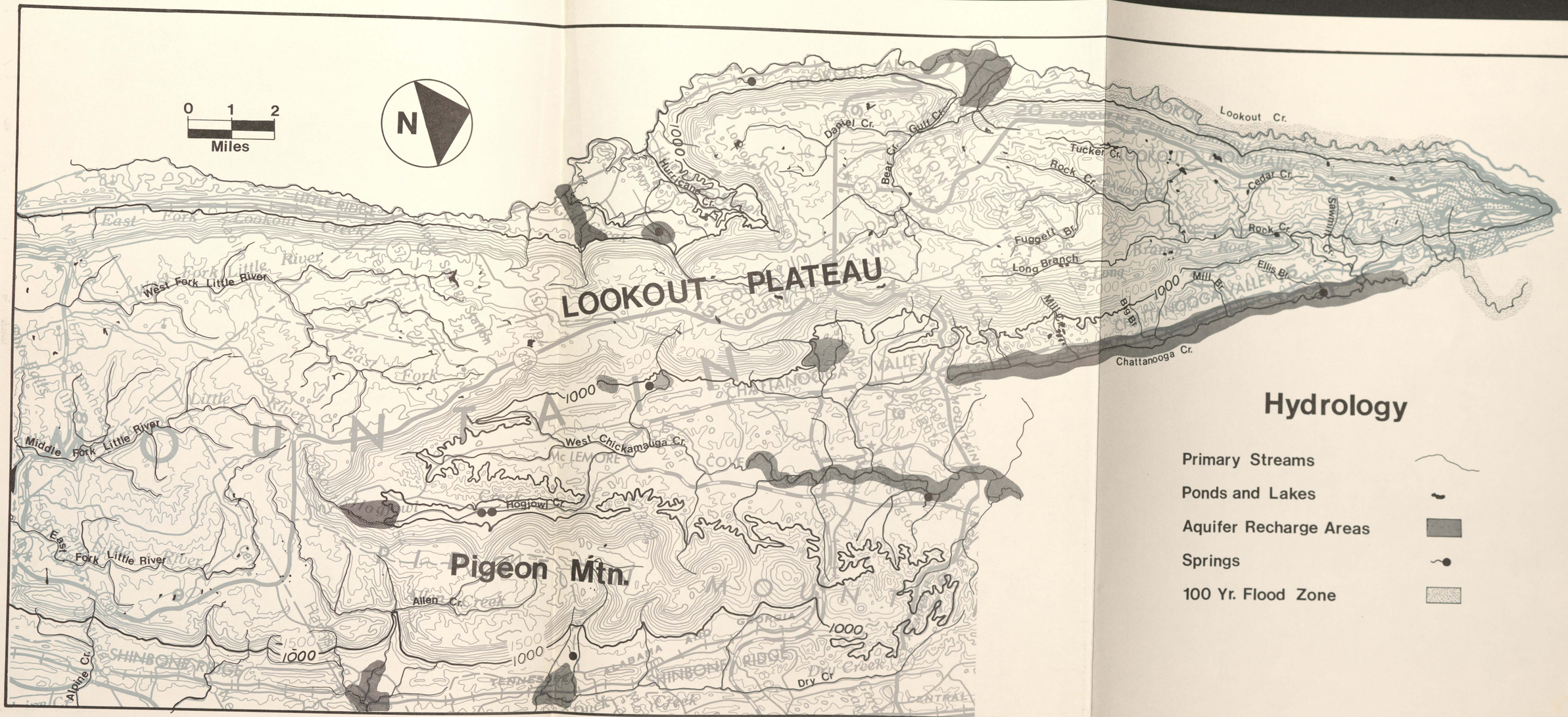
National Academy of Sciences. Water Quality Criteria 1972. Washington, D.C., U.S. Government Printing Office, 1972.

Odum, Eugene P. Fundamentals of Ecology. Philadelphia: W.B. Saunders Company, 1971.

Reid, George K. Ecology of Inland Waters and Estuaries. New York: D. Van Nostrand Company, 1960.

Sax, N. Irving. Industrial Pollution. New York: Van Nostrand Reinhold Company, 1974.

Warren, Charles E. Biology and Water Pollution Control. Philadelphia: W.B. Saunders Company, 1971.



Hydrology

- Primary Streams
- Ponds and Lakes
- Aquifer Recharge Areas
- Springs
- 100 Yr. Flood Zone

chapter 2
Geology



SUMMARY OF THE GEOLOGY OF THE LOOKOUT MOUNTAIN AREA

I. PHYSIOGRAPHY AND LOCATION

Lookout Mountain is located at the southern termination of the Appalachian Plateau. The northernmost part of the mountain lies in Tennessee, near Chattanooga. From that point, the mountain continues to the southwest, across Dade and Walker Counties, Georgia, and into northeastern Alabams. Adjacent features include Lookout Valley and Sand Mountain to the northwest and McLemore Cove and Pigeon Mountain to the southeast.

Lookout Mountain is a relatively flat-topped mountain with elevations ranging between 1,700 - 2,000 feet above sealevel. Relief above adjacent valley floors ranges between 1,000 - 1,400 feet.

II. GEOLOGIC HISTORY

Lookout Mountain is part of the Appalachian Mountain System that was formed at the close of the Paleozoic Era approximately 280 million years ago. The oldest rocks exposed in the area are the Cambro-Ordovician limestones and dolomites of the Knox Group. The youngest rocks exposed in the area are capping Lookout, Sand and Pigeon Mountains.

During the Paleozoic Era, this area was submerged beneath a primitive ocean, and was actively receiving sediment that was being eroded from an adjacent landmass. Streams and rivers brought sand, gravel and clay to be deposited as relatively flat-lying layers of sediment on the ocean floor. The total sediment accumulation during this time interval was approximately 20,000 feet, of which almost half is exposed in the Lookout Mountain area. By the close of the Paleozoic Era, these sedimentary layers had been involved in the Appalachian Orogeny, and were folded, faulted and elevated above sea-level to become part of the Appalachian Mountain System. Extensive erosion has subsequently produced the topography characteristic of this region.

III. STRATIGRAPHY

The rocks of the Lookout Mountain area are all sedimentary. Types such as sandstone, limestone, shale and conglomerate underlie all of this region. The ages of these rocks ranges from Cambro-Ordovician to Lower Pennsylvanian. The youngest rocks are found capping the major mountains of the area, while the oldest are exposed along the valley floors. Fossils are abundant in most of the formations, and are reflective of the environment in which the sediment was deposited.

Cambrian and Ordovician Systems

Knox Group

The Knox Group consists of 4,000 - 4,500 feet of cherty limestone and dolomite. It is the oldest unit exposed in the Lookout Mountain area, and is classified as Cambro-Ordovician in age. Outcrops of the Knox are typically found in the valleys adjacent to the larger mountains. These rocks weather to a light colored, cherty residuum, and generally form a low, resistant ridge along strike, such as Missionary Ridge, east of Lookout Mountain.

Chickamauga Limestone

The Chickamauga Limestone outcrops in Lookout Valley and McLemore Cove. This formation consists of 1,000+ feet of gray, fossiliferous, clayey limestone.

Sequatchie Formation

The Sequatchie Formation is exposed along the flanks of Lookout, Pigeon and Sand Mountains. It consists of thin-bedded, silty and clayey, green and red limestones that weather to a finely laminated, red and yellow-brown, silty-clayey residuum. The Sequatchie is 75-80 feet thick in this area.

Silurian System

Red Mountain Formation

The Red Mountain Formation occurs in resistant ridges flanking Lookout Mountain. This unit consists of thin-bedded, gray-green siltstones and shales with a few thin beds of fossiliferous, oolitic hematite and limestone. The formation is aproximately 500 feet thick in this area.

Devonian and Mississippian Systems

Chattanooga Shale - Maury Shale

The Chattanooga Shale is a black, carbonaceous shale overlain by several feet of greenish-gray shale. This unit is approximately 20 feet thick in this area, and is exposed along the flanks of Lookout and Pigeon Mountains.

Mississippian System

Rocks of the Mississippian System exposed on Lookout and Pigeon Mountains are primarily limestones. The lowermost unit, the Fort Payne Formation, consists of cherty, fossiliferous limestone. The remainder of the units are fairly pure limestones, with the exception of the Hartselle and Pennington Formations, which are mostly sandstones and shales. These units outcrop on the flanks of Lookout and Pigeon Mountains, and constitute approximately 1,200 feet of sediment. The units in this system are:

Pennington Formation (youngest)
Bangor Limestone
Hartselle Formation
Gasper Formation
Ste. Genevieve Limestone
St. Louis Limestone
Fort Payne Formation (oldest)

Pennsylvanian System

The Pennsylvanian age rocks in this area are only found capping the major mountains of the area. Approximately 1,200 feet of sandstone, shale and conglomerate, with a few layers of coal, comprise the rocks of this system. The units are:

Rockcastle Sandstone (youngest)
Vandever Shale
Whitwell Shale
Lookout Sandstone (oldest)

IV. STRUCTURE

The major structures of this area are folds and faults. These structures were produced during the Appalachian Orogeny, when this area was subjected to tremendous deforming forces that produced the Appalachian Mountains.

Folds

Lookout Mountain, Pigeon Mountain, Lookout Valley and McLemore Cove are all fold structures. The mountains are synclinal in nature, while the valleys are anticlinal. All of the folds in this area plunge gently to the southwest.

Faults

There are several major and numerous minor faults in this area. The greatest majority of these faults are thrust faults, with the fault planes dipping toward the southeast. The major direction of movement along these faults has been toward the northwest. The trace of the faults on the surface generally follows a northeast to southwesterly strike direction.

V. ECONOMIC GEOLOGY

At present there is very little mining or quarrying activity in this area. Small scale operations produce shale, limestone and chert commercially. Also, small amounts of coal are being mined from Lookout Mountain.

Large amounts of sedimentary iron ore are present in the Silurian Red Mountain Formation. These ores were actively mined in the past throughout the entire area, but are not today considered economic deposits.

The Durham Coal District, located atop Lookout Mountain was a major coal producer in this area around the turn of the century, but most of the larger seams were worked out, and those remaining are only marginally commercial by modern standards.

VI. CONCLUSION

The Lookout Mountain area is a rather unique site for conducting outdoor field sessions in geology. The range in rock types, fossil materials, and general geologic structures and features found in this area makes it an ideal resource to be used in teaching Earth history and processes.

chapter 3
Soils



SOILS

The Lookout Plateau comprizes a variety of soil associations that impose restrictions on their relative suitability to support certain land use activities. Variations in soil properties affect how a soil will perform in terms of agricultural productivity, the ability to absorb sewage effluent, their erodability and potential to bear heavy loads. Soil associations for the Lookout Plateau have been divided into 14 soil areas.

The principle factors that influence soil formation are parent material (rock type), relief and time. A soil is classified by various characteristics such as color, texture, structure, consistence (tendency of the soil to crumble or stick together) and slope. An analysis of a soil's ability to absorb water, shrink and swell, depth to bedrock, internal drainage, depth to water table, flooding potential, permeability, and infiltration rate is necessary in determining its usefullness for certain land applications.

In the following pages, soil associations along with suitability classes have been outlined for the 14 areas as defined by the accompanying soils map. An attempt at determining the suitability of these 14 classifications for various land uses is purely general in nature. A detailed soil analysis or survey of an area in question due to a proposed project would be necessary to accurately assess its ability to tolerate a defined land use.

Soils on the Lookout Plateau tend to be shallow to moderately deep in nature. Due to the sandstone cap, most soils are rather sandy to sandy clay loam in nature. Many of the soils are mildly acidic which encourages the growth of scrub and short needle pine.

In a recent interview with a Chattanooga soil scientist concerning the soils on the Lookout Plateau, the following was stated:

"The Soils of the Lookout Plateau for the areas beginning at the 1000 Ft. contour line and above are generally: soils of the Hartsells, Muskingum series.

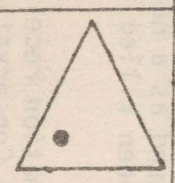
The Hartsell soil occurs a little below the 1000 Ft. contour and is a fine sandy loam. It covers a large part of the study area. Its surface soil and subsoil are thin sandstone fragments and are scattered over the surface and embedded throughout the soil mass. Outcroppings of bedrock, called tors, are common.

The Muskingum soil occupies steep slopes ranging from the 1000 Ft. contour line. The surface and subsoil are shallow, and in many places the surface soil rests directly on sandstone or conglomerate. Fragments of sandstone and boulders are strewn over the surface, and outcrops of sandstone and interstratified shale and sandstone are common. These areas support Virginia Pine. Forest fires have not allowed the accumulation of vegetable matter on the surface and are in a large measure responsible for erosion and gullying. These areas should remain in forest.

Lookout and Pigeon Mountain are rough strong land dotted with limestone outcroppings and great blocks of sandstone. In places where there is soil, it is gray friable silty loam underlain at a depth of about 5 inches by yellow or reddish yellow heavy clay. The best use of these soils should be continued as a natural forest. These areas have been burned and the young growth has been killed and all the trees retarded."

Regional soil associations have been collated from information received from the Hamilton County, Tennessee, and DeKalb County, Alabama, Soil Conservation Services Georgia associations were taken from Dr. Plummer's study for the Department of Natural Resources.

SOIL ASSOCIATION: #1 Piedmont / EXAMPLE: Chewacla, Congaree, Worsham

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strengtn)	Erosion Potential (if denuded of vege.)
 loam, sand clay loam	SM, ML ML-CL / A2, A4	loamy sediments from uplands	10-18"	G.T.4'	.6-2.0	low to moderate	4" + (depth to 40")	low	slight 'A' horizon

SUITABILITY CLASSES:

Highways- (poor) wetness

Reservoirs- farm ponds- (fair) moderate permeability

Embankments- (fair) fair stability

Foundations- (poor) wetness

Septic tank filter fields- (poor) wetness

Structures for industry- (poor) wetness

Agriculture productivity- (fair to good)

Woodland productivity- (excellent)

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

(not applicable) 'C' hor.

USDA/SCS SLOPE CLASSIFICATIONS

0-2% X

2-6%

6-10%

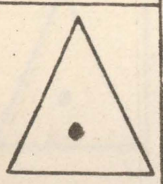
10-15%

15-25%

25-40%

40-60%

SOIL ASSOCIATION: #2 Cumberland and Lookout Plateaus / in Alabama EXAMPLE: Muskingum - Hartsells

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 Loam		Sandstone		1-2'		Low			High "A" horizon

SUITABILITY CLASSES:

Highways (Poor) Steep slopes Low strength

Reservoirs (Poor to Fair) Moderate permeability

Embankments (Fair)

Foundations (Poor) Medium compressibility

Septic tank filter fields (Poor) Steep slopes

Structures for industry (Poor) Steep shallow to bedrock

Agriculture productivity (Poor) Rock, clayey

Woodland productivity (Fair) Steep, rocky, clayey

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6%

6 - 10%

10 - 15%

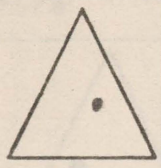
15 - 25%

25 - 40% X

40 - 60% X

SOIL ASSOCIATION: # 3 Cumberland and Lookout Plateaus / in Alabama

EXAMPLE: Apison, Pottsville, Muskinghum

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
	A-6 A-7 CLCH ML	Sandstone Shale	20+'	1'-3½'		Moderate			Moderate

SUITABILITY CLASSES:

Highways (Good) Well drained, shallow

Reservoirs (Poor) Highly Permeable

Embankments (Fair)

Foundations (Good) Shallow to bedrock

Septic tank filter fields (Poor) Shallow

Structures for industry (Poor) Shallow to bedrock

Agriculture productivity (Poor) Shallow

Woodland productivity (Fair)

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

Moderate

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6% X

6 - 10% X

10 - 15%

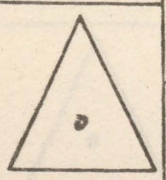
15 - 25%

25 - 40%

40 - 60%

SOIL ASSOCIATION: #4 Cumberland and Lookout Plateaus/ in Alabama

EXAMPLE: Muskingum, Hartsells, Philo

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 Loam		Sandstone		3-4'				Low	Moderate

SUITABILITY CLASSES:

Highways (Good) High strength

Reservoirs (Fair) Moderate permeability

Embankments (Good) Medium compressibility

Foundations (Good) Medium compessibility

Septic tank filter fields (Moderate) Shallow depth to bedrock

Structures for industry (Good) Minimal shrink-swell

Agriculture productivity (Moderate) Slope

Woodland productivity (Good)

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6% X

6 - 10% X

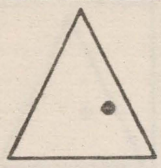
10 - 15% X

15 - 25% X

25 - 40%

40 - 60%

SOIL ASSOCIATION: #5 Cumberland and Lookout Plateaus / in Alabamb EXAMPLE: Allen Hermitage

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 Silty Clay Loam	A-4 A-6 A-7 ML CL MH CH	Limestone	20+	4'-10'					High "A" horizon

SUITABILITY CLASSES:

Highways (Fair) Moderate strength

Reservoirs (Fair) Moderate permeability

Embankments (Good) Compressible

Foundations (Fair) Slope

Septic tank filter fields (Fair) Moderate permeability

Structures for industry (Fair) Slope

Agriculture productivity (Good) Bottomlands fertile

Woodland productivity (Good) Productive

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

Moderately Stable

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6% X

6 - 10% X

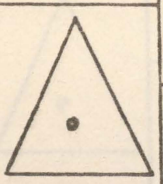
10 - 15% X

15 - 25%

25 - 40%

40 - 60%

SOIL ASSOCIATION: #6 Cumberland and Lookout Plateaus

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 Loam		Sandstone Limestone		1" to 1'		Low		High	Low AB & C hor.

SUITABILITY CLASSES:

Highways (Poor) Steep slopes

Reservoirs (Poor) High permeability

Embankments (Poor) Large boulders

Foundations (Poor) Low compressibility

Septic tank filter fields (Poor) shallow to bedrock

Structures for industry (Poor) Steep slopes

Agriculture productivity (Poor) Rocky

Woodland productivity (Poor) Steep, Rocky

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

Unstable

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6%

6 - 10%

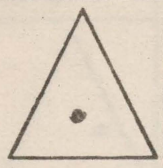
10 - 15%

15 - 25%

25 - 40% X

40 - 60% X

SOIL ASSOCIATION: #7 Cumberland and Lookout Plateaus EXAMPLE: Muskingum, Hartsells, Philo

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 Loam		Sandstone		3 - 4'				Low	Moderate

SUITABILITY CLASSES:

Highways (Good) high strength

Reservoirs (Fair) Moderate permeability

Embankments (Good) Medium compressibility

Foundations (Good) Medium compressibility

Septic tank filter fields (Moderate) Shallow depth to bedrock

Structures for industry (Good) Minimal shrink-swell

Agriculture productivity (Moderate) Slope

Woodland productivity (Good)

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6% X

6 - 10% X

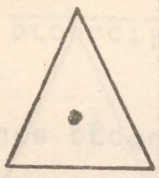
10 - 15% X

15 - 25% X

25 - 40%

40 - 60%

SOIL ASSOCIATION: #8 Cumberland and Lookout Plateau EXAMPLE: Muskingum, Hartsells

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 Loam		Sandstone		1 - 2'		Low			High "A" horizon

SUITABILITY CLASSES:

Highways (Poor) steep slopes low strength

Reservoirs (Poor to Fair) Moderate permeability

Embankments (Fair)

Foundations (Poor) Medium compressibility

Septic tank filter fields (Poor) Steep slopes

Structures for industry (Poor) Steep shallow to bedrock

Agriculture productivity (Poor) Rock, clayey

Woodland productivity (Fair) Steep, rocky, clayey



SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

Unstable A & B hor.

USDA/SCS SLOPE CLASSIFICATIONS

0 - 2%

2 - 6%

6 - 10%

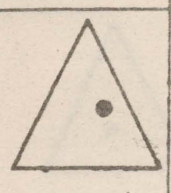
10 - 15%

15 - 25%

25 - 40% X

40 - 60% X

SOIL ASSOCIATION: # 10 Southern Appalachian Ridge & Valley / EXAMPLE: Whitwell, Wolftever, Capshaw

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
									
silt loam 1	ML, ML-CL, CL / A-2, A-4	old alluvium	2-4'	4-10'	.06-2.0	low	5" +	low	moderate
clay loam 2 silty clay loam silty clay	ML, CL MH / A-4, A-6, A-7					low to moderate			'A' horizon

SUITABILITY CLASSES:

Highways- (poor) low strength

Reservoirs- (farm ponds)- moderate permeability (fair)

Embankments- (fair to good)- medium compressibility

Foundations- (poor)- medium compressibility

Septic tank filter fields- (poor)- possible flooding, moderate permeability

Structures for industry- (poor)- possible flooding, moderate shrink-swell

Agriculture productivity- (good)

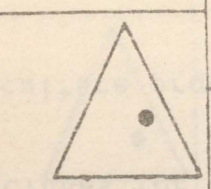
Woodland productivity- (good)

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE (moderately stable) 'C' hor.

USDA/SCS SLOPE CLASSIFICATIONS

0-2%	X
2-6%	X
6-10%	
10-15%	
15-25%	
25-40%	
40-60%	

SOIL ASSOCIATION: # 11 Southern Appalachian Ridge & Valley / EXAMPLE: Etowah, Wolftever, Holston

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
									
silt loam 1 sandy loam	ML, CL A-4, A-2 / ML, CL A-4, A-6	old alluvium	G.T. 6'	5-10'	.6-2.0	low	6.0" +	low-medium	moderate
clay loam silty clay loam						low			'A' horizon

SUITABILITY CLASSES:

Highways- (fair) low strength, slope

Reservoirs- (farm ponds)- (fair) moderate permeability

Embankments- (fair) medium compressibility

Foundations- (good)

Septic tank filter fields- (good)

Structures for industry- (good)

Agriculture productivity- (excellent)

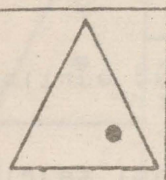
Woodland productivity- (good)

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE (stable) 'C' horizon

USDA/SCS SLOPE CLASSIFICATIONS

0-2%	X
2-6%	X
6-10%	
10-15%	
15-25%	
25-40%	
40-60%	

SOIL ASSOCIATION: #12 Southern Appalachian Ridge & Valley / EXAMPLE: Minvale, Fullerton, Decatur

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 cherty silt loam, loam --- cherty silty clay loam	ML,CL ML-CL A-4,A-2 --- CL,ML GM,GC A-4,A-6,A-7	cherty limestone	G.T.10'	G.T.6'	.6-2.0	low --- low	4" +	medium-low	moderate 'A' horizon

cherty caly loam

SUITABILITY CLASSES:

Highways-(fair) low strength

Reservoirs-(farm ponds)-(poor) moderate permeability

Embankments-(fair) coarse fragments, medium compressibility

Foundations-(good)

Septic tank filter fields-(good)

Structures for industry-(fair) slope

Agriculture productivity-(fair) coarse fragments, slope

Woodland productivity-(fair) coarse fragments

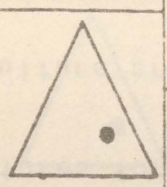
SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

(stable) 'C' horizon

USDA/SCS SLOPE CLASSIFICATIONS

0-2%	
2-6%	X
6-10%	X
10-15%	
15-25%	
25-40%	
40-60%	

SOIL ASSOCIATION: #13 Southern Appalachian Ridge & Valley / EXAMPLE: Conasauga, Fullerton, Decatur

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 silt loam, loam[1] --- silty clay, clay[2]	ML, ML-CL A-4 --- CL,CH MH,ML A-6,A-7	shale, cherty limestone	2-10'	2-6'	.06-2.0	low --- moderate	5" +	low	moderate (slope, moderate permeability) 'A' horizon

SUITABILITY CLASSES:

Highways-(poor) shrink-swell

Reservoirs-(farm ponds)-(fair) moderate pereability

Embankments-(poor) poor compressibility

Foundations-(fair) moderate shrink-swell

Septic tank filter fields-(poor to fair) moderately slow permeability

Structures for industry-(fair) moderate shrink-swell, slope

Agriculture productivity-(good)

Woodland productivity-(fair) chayey subsoil

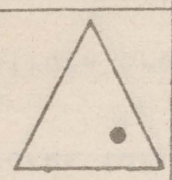
SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

(stable) 'C' horizon

USDA/SCS SLOPE CLASSIFICATIONS

0-2%	X
2-6%	X
6-10%	
10-15%	
15-25%	
25-40%	
40-60%	

SOIL ASSOCIATION: #15 Southern Appalachian Ridge & Valley / EXAMPLE: Minvale,Fullerton,Decatur

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 cherty silt loam, loam	ML,CL ML-CL A-2,A-4	cherty limestone	G.T. 10'	G.T.6'	.6-2.0	low	4"	medium	severe (slope)
cherty silt clay loam, cherty clay	CL,ML,GM, GC A-4,A-6, A-7	old valley fill				low			'A' horizon

clay

SUITABILITY CLASSES:

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

(moderately stable) 'C' hor.

USDA/SCS SLOPE CLASSIFICATIONS

Highways- (poor) slope

Reservoirs- (farm ponds)-(poor) slope, moderate permeability

Embankments- (fair) coarse fragments, medium compressibility — 0-2%

Foundations- (poor) slope — 2-6%

Septic tank filter fields- (poor) slope — 6-10%

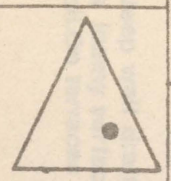
Structures for industry- (poor) slope — 10-15% X

Agriculture productivity- (fair) coarse fragments, slope — 15-25% X

Woodland productivity- (fair) coarse fragments, moderate productivity — 25-40%

40-60%

SOIL ASSOCIATION: #16 Southern Appalachian Ridge & Valley/ EXAMPLE: Townley,Montevallo

Dominant USDA Texture	Unified AASHO	Parent Material	Depth to W.T.	Depth to B.R.	Inches Hour Permeab.	Shrink Swell Poten.	Avail. Water Capacity	Shearing Stress (strength)	Erosion Potential (if denuded of vege.)
 silt loam, shaly silt loam		shale	G.T. 6'	1-3'	.06-2.0	low	1" +	medium	severe (slope)
silty clay, clay shaly clay loam						low to moderate			'A' horizon

SUITABILITY CLASSES:

SOIL STABILITY CHART BY NATURAL ANGLE OF REPOSE

(stable) 'C' horizon

USDA/SCS SLOPE CLASSIFICATIONS

Highways- (poor) slope

Reservoirs- (farm ponds)-(fair) slope

Embankments- (fair to poor)-poor compaction — 0-2%

Foundations- (poor) slope — 2-6%

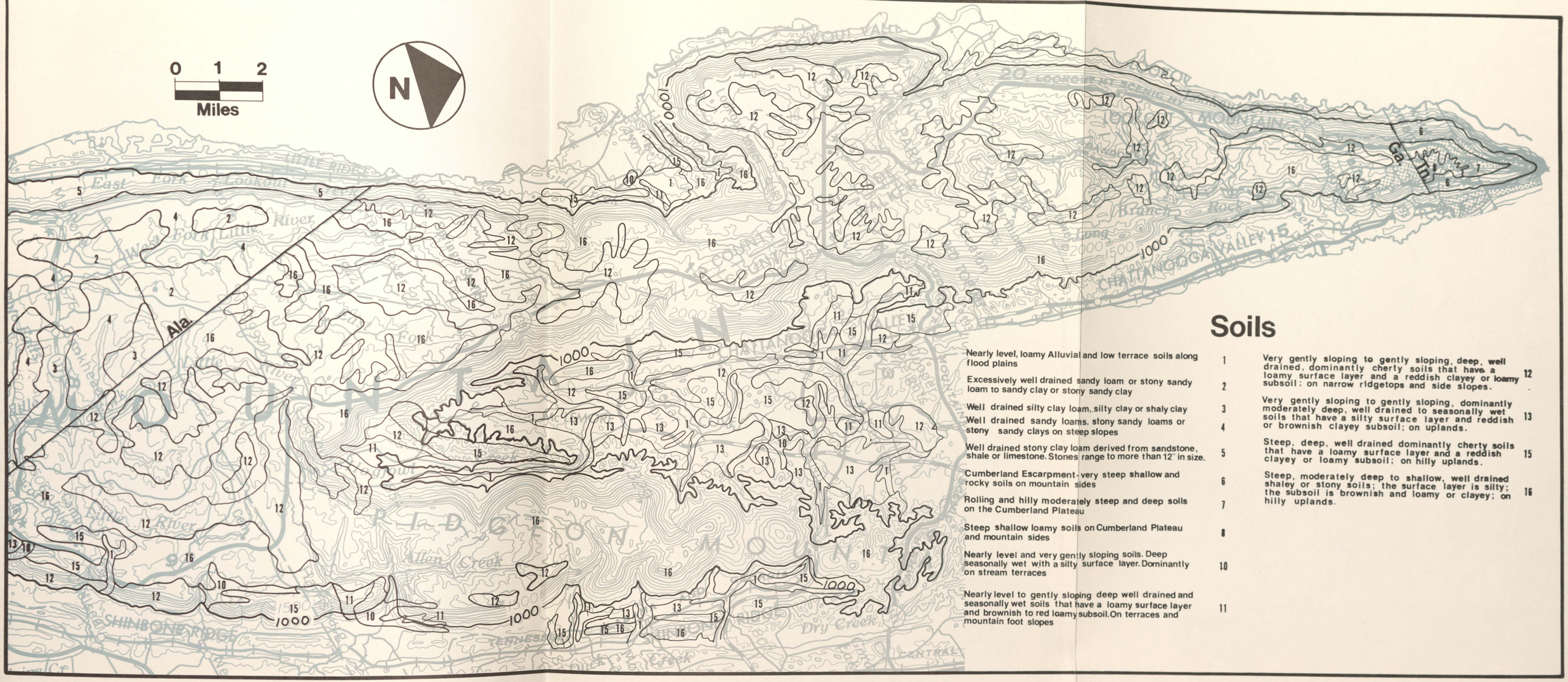
Septic tank filter fields- (poor) slope, shallow soil — 6-10%

Structures for industry- (poor) slope — 10-15%

Agriculture productivity- (poor) shallow soils — 15-25% X

Woodland productivity- (fair) shallow soils, shaly — 25-40% x

40-60%



Soils

Nearly level, loamy Alluvial and low terrace soils along flood plains	1	Very gently sloping to gently sloping, deep, well drained, dominantly cherty soils that have a loamy surface layer and a reddish clayey or loamy subsoil: on narrow ridgetops and side slopes.	12
Excessively well drained sandy loam or stony sandy loam to sandy clay or stony sandy clay	2	Very gently sloping to gently sloping, dominantly moderately deep, well drained to seasonally wet soils that have a silty surface layer and reddish or brownish clayey subsoil; on uplands.	13
Well drained silty clay loam, silty clay or shaly clay	3	Steep, deep, well drained dominantly cherty soils that have a loamy surface layer and a reddish clayey or loamy subsoil; on hilly uplands.	15
Well drained sandy loams, stony sandy loams or stony sandy clays on steep slopes	4	Steep, moderately deep to shallow, well drained shaley or stony soils; the surface layer is silty; the subsoil is brownish and loamy or clayey; on hilly uplands.	16
Well drained stony clay loam derived from sandstone, shale or limestone. Stones range to more than 12" in size.	5		
Cumberland Escarpment - very steep shallow and rocky soils on mountain sides	6		
Rolling and hilly moderately steep and deep soils on the Cumberland Plateau	7		
Steep shallow loamy soils on Cumberland Plateau and mountain sides	8		
Nearly level and very gently sloping soils. Deep seasonally wet with a silty surface layer. Dominantly on stream terraces	10		
Nearly level to gently sloping deep well drained and seasonally wet soils that have a loamy surface layer and brownish to red loamy subsoil. On terraces and mountain foot slopes	11		

chapter 4
Vegetation



THE VEGETATION OF LOOKOUT MOUNTAIN

Lookout Mountain lies within the Eastern Deciduous Forest Biome. Of the various sections of the Eastern Deciduous Forest, Lookout Mountain is on the southern edge of the Mixed Mesophytic Forest region (Braun, 1967). Since the Oak - Pine region is adjacent, some areas of Lookout Mountain have a flora which represents a transition from the Mixed Mesophytic Forest region to the Oak - Pine region. Lookout Mountain is characterized by a diverse number of dominant trees and a great number of herbaceous plants, so the area is botanically quite complex. Different species predominate at the base of the mountain, on the slopes, and on the ridges and plateau. One study in progress indicates that Lookout Mountain Park alone has a minimum of 351 species of vascular plants (Van Horn, unpublished). The 351 species are composed of 43 species of trees, 55 species of shrubs and woody vines, and 253 species of herbs. Lookout Mountain Park has an area of 2,750 acres which is estimated to be less than five percent of the surface area of Lookout Mountain.

The vegetation of the Eastern Deciduous Forest has been divided into five layers: an upper canopy of trees 75 to 175 feet tall, a secondary layer of trees 20 to 35 feet tall, a shrub layer, an herbaceous layer, and a moss and lichen layer (Billings, 1970). On Lookout Mountain, development into these five layers only occurs on the slopes where there is sufficient moisture and soil.

The upper layer of trees consists of such species as are listed below. The nomenclature throughout this report follows that of Radford, Ahles, and Bell (1973) or Gleason (1963).

American Beech Fagus grandiflora Ehrh.
Chestnut Oak Quercus prinus L.
Red Oak Quercus borealis Michx. f.
Scarlet Oak Quercus coccinea Muenchh.
White Oak Quercus alba L.
Sweetgum Liquidambar styraciflua L.
Mockernut Hickory Carya tomentosa (Poir.) Nutt.
Pignut Hickory Carya glabra Sw.
Tuliptree Liriodendron tulipfera L.
Black Gum Nyssa sylvatica Marsh.
White Ash Fraxinum americana L.
Sycamore Platanus Occidentalis L.
Basswood Tilia heterophylla Vent.

The secondary layer of trees consists of such species as:

Ironwood Carpinus caroliniana Walt.
Flowering Dogwood Cornus florida L.
Persimmon Diospyros virginiana L.
Sourwood Oxydendrum arboreum (L.) DC
Redbud Cercis canadensis L.
Black Locust Robinia pseudoacacia L.
Sassafras Sassafras albidum (Nutt.) Nees
Service Berry Amelanchier arborea (Michx. f.) Fern.

The various shrubs include:

Winged Sumac Rhus copallina L.
Carolina Allspice Calycanthus floridus L.
Maple-leaf Viburnum acerifolium L.
Mountain Laurel Kalmia latifolia L.
Wild Quinine Lindera benzoin (L.) Blume
Buckthorn Rhamnum carolinianus Walt.
Wild Hydrangea Hydrangea arborescens L.

As mentioned previously, ther are many species of flowering herbs and ferns on Lookout Mountain. The majority of the flowering herbs bloom in the Spring before the deciduous trees develop their leaves and shortly thereafter. The following list is representative of the diversity. Species were selected from a variety of families and from a variety of habitats.

Star Grass Hypoxis hirsuta (L.) Cob.
Jack-in-the-Pulpit Arisaema triphyllum (L.) Schott.
Spiderwort Tradescantia subaspera Ker.
Sedges Carex spp.
Little Barley Hordeum pusillum Nutt.
Panic Grass Panicum boscii Poir.
Solomon's Seal Polygonatum biflorum (Walt.) Ell.
Golden Alexanders Zizia aptera (Gray) Fern.
Ragweed Ambrosia artemisiifolia L.
Aster Aster paternus Cron.
Groundsel Senecio smallii Britt.
Pepper Grass Lepidium virginicum L.
Flowering Spurge Euphorbia corollata L.
Pencil Flower Stylosanthes biflora (L.) BSP.
Skullcap Scutellaria elliptica Muhl.
Indian Pink Spigelia marilandica L.
Sundrops Oenothera tetragona Roth.
Phlox Phlox amoena Sims
Spring Beauty Claytonia virginica L.
Loosestrife Lysimachia quadrifolia L.
Buttercup Ranunculus hispidus Michx.
Meadow Rue Thalictrum dioicum L.
Cinquefoil Potentilla canadensis L.
Partridge Berry Mitchella repens L.
False Foxglove Aureolaria virginica (L.) Pennell

Speedwell Veronica arvensis L.
Horse Nettle Solanum carolinese L.
Bird-foot Violet Viola pedata L.
Wild Pansy Viola rafinesquii Greene

Two of the ferns found in the driest sites are Mountain Spleenwort (Asplenium montanum Willd.) and Cliff Brake (Pellea atropurpurea (L.) Link). Ferns requiring more moisture include Christmas Fern (Polystichum acrostichoides (Michx.) Schott.), Ebony Spleenwort (Asplenium platyneuron (L.) Oakes), Interrupted Fern (Osmunda claytonia L.), and Bracken Fern (Pteridium aquilinum (L.) Kuhn.). Resurrection Fern (Polypodium polypodioides (L.) Watt) grows as an epiphyte on various trees.

EVERGREEN PLANTS

There are relatively few evergreen plants on Lookout Mountain. The most common evergreen trees are Yellow Pine (Pinus echinata Mill.), Scrub Pine (Pinus virginiana Mill.), Hemlock (Tsuga canadensis (L.) Carr., and Red Cedar (Juniperus virginiana L.). Common evergreen shrubs include Mountain Laurel, several species of Vaccinium, and Wild Hydrangea. Hemlock is found in the damp coves and the other foregoing species are usually restricted to the rocky ridges and upper portion of Lookout Mountain where the shallow soils and the dry conditions inhibit the formation of typical deciduous forest. Japanese Honeysuckle (Lonicera japonica Thunb.) is one of the few evergreen vines found in the forest and as is mentioned later and is due to its ability to destroy the native vegetation. Other evergreen vines include Greenbriers (Smilax spp.) and Cross Vine (Anisostichus capreolata (L.) Bureau).

RARE, THREATENED, AND ENDANGERED SPECIES

As cities expand their borders and as new roads are constructed the habitats of many species are destroyed. In addition, some species are naturally more uncommon than other species. A number of publications are available that list the rare species such as that of Duncan (1970) and Sharp (1974). Some of the rare, threatened, and endangered plant species known to occur on Lookout Mountain are:

Ginseng Panax quinquefolium L.
Toothwort Dentaria multifida Muhl.
Round-leaved Catchfly Silene rotundifolia Nutt.
Trailing Arbutus Epigaea repens L.
American Columbo Swertia carolinensis (Walt.) Kunze
Nodding mandarin Disporum maculatum (Bulkely) Britt.
Dwarf Milkwort Polygala nana (Michx.) DC.
Smaller Red-root Ceanothus ovatus Desf.

INTRODUCED SPECIES

During the collecting of specimens in Lookout Mountain Park the cultivated plants around the various buildings were ignored. In spite of that, 50 species, or about 14 percent of the species collected to date are introduced. Most of the introduced species such as Dandelion (Taraxacum officinale Wiggers) and Chickweed (Stellaria media L.) only do well in the disturbed areas such as along trails and in lawns. Thus, these species are not a great threat to the native flora.

There are other species which are a distinct threat to the native flora and these are altering the habitat where they are growing. The worst of these are Kudzu (Pueraria lobata (Willd.) Ohwi.) and Japanese Honeysuckle. The foregoing species grow over almost anything and kill herbs, shrubs, and trees. Controlling these species will take large sums of money and it is doubtful if anything more than spot control will be attempted with those populations that have already been planted.

Kudzu and Japanese Honeysuckle should not be planted anywhere on Lookout Mountain for any reason. Erosion control can be accomplished by use of other species which will not grow past the problem area into the surrounding vegetation and then cause more destruction and economic liability than the original problem would have caused if left alone.

Two species which do destroy native plants but at a slower rate are Ivy (Hedera helix L.) and Periwinkle (Vinca minor L.). Other introduced species can reduce the frequency of native species but this is not so obvious and complete within a given area.

A variety of introduced species are enjoyed by people who do not realize that the species are not native. Examples of these are Princess Tree (Paulownia tomentosa (Thunb.) Steud.), and Dayflower (Commelina communis L.). These species are found in many places on Lookout Mountain and thus have been naturalized. They compete well with the native species in disturbed areas but not to the point of greatly reducing populations of the native species.

The great majority of introduced species do not compete well with the native species and their irregular planting is not a problem. The ability of an introduced species to displace native species should always be taken into consideration before planting.

LITERATURE CITED

Billings, W.D. 1970. Plants, Man and the Ecosystem. Wadsworth Publishing Co., Inc., Belmont, California 160 pp.

Braun, E. Luch. 1967. Deciduous Forests of Eastern North America. Hafner Publishing Co., Inc., New York 596 pp.

Duncan, Wilbur H. 1970. Endangered, Rare and Uncommon Wildflowers. U.S. Dept. of Agriculture, Forest Service, Southern Region 20 pp.

Gleason, Henry A. 1963. The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada. Hafner Publishing Co., Inc., New York 3 vols.

Radford, Albert E., Harry E. Ahles and C.Ritchie Bell. 1973. Manual of the Vascular Flora of the Carolinas. University of North Carolina Press, Chapel Hill 1183 pp.

Sharp, A.J. 1974. Rare Plants of Tennessee, The Tennessee Conservationist 40(7):20-21.

Van Horn, Gene S. (unpublished). A Checklist of the Vascular Plants of Chickamauga and Chattanooga National Military Park.

Trees



American Beech
Fagus grandiflora



Chestnut Oak -- quercus prinus



Red Oak -- quercus borealis



Scarlet Oak
quercus coccinea



White Oak -- quercus alba



sweetgum -- liquidambar styraciflua



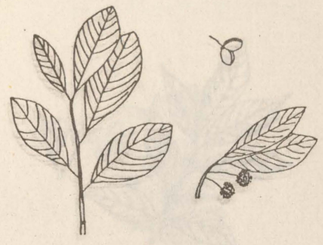
Mockernut Hickory
carya tomentosa



Pignut Hickory
carya glabra



Tuliptree
Liriodendron tulipfera



Black Gum
nyssa sylvatica



White Ash -- fraxinus americana



Sycamore
platanus occidentalis



Basswood
tilia heterophylla



Ironwood
carpinus caroliniana



Flowering Dogwood
cornus florida



Persimmon
diospyros virginiana



Sourwood
oxydendrum arboreum



Redbud .. cercis canadensis



Black Locust .. robinia pseudoacacia



Sassafras .. sassafras albidum

Shrubs



Service Berry .. amelanchier arborea



Winged Sumac .. rhus copallina



Carolina Allspice
calycanthus floridus



Maple-leaf Viburnum
viburnum acerifolium



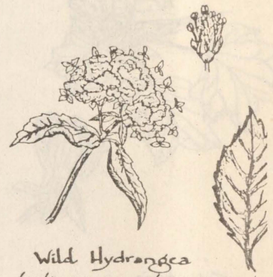
Mountain Laurel
kalmia latifolia



Wild Quinine .. linders benzoin



Buckthorn
rhamnus caroliniana

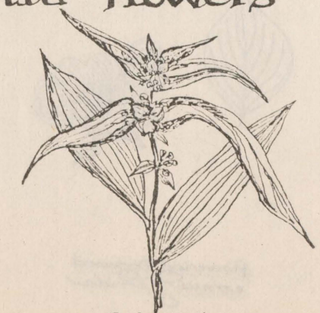


Wild Hydrangea
hydrangea arborescens

Wild Flowers and Ferns



Jack-in-the-Pulpit
arisaema triphyllum



Spiderwort
tradescantia subaspera



Solomon's Seal
polygonatum biflora



Groundsel
senecio smallii



Flowering Spurge
phorbia corollata



Scullcap
scutellaria elliptica



Indian Pink
spigelia marilandica



Sundrops
oenothera tetragona



Loosestrife
lysimachia quadrifolia



Buttercup
ranunculus hispidus



Partridge Berry
mitchella repens



False Foxglove
aureolaria virginica



Horse Nettle
solanum carolinense



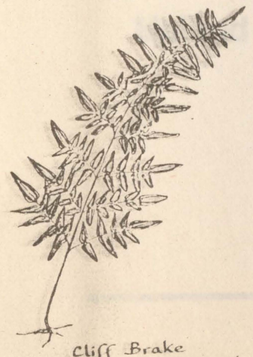
Bird-foot Violet
viola pedata



Wild Pansy
viola rafinesquii



Phlox
phlox amoena



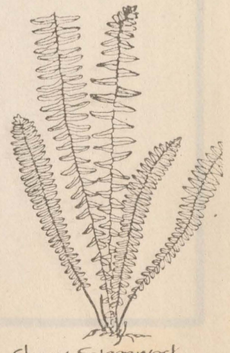
Cliff Brake
pellea atropurpurea



Mountain Spleenwort
asplenium montanum



Christmas Fern
polystichum acrostichoides



Ebony Spleenwort
asplenium platyneuron

Rare and Endangered Species



Interrupted Fern
osmunda claytonia



Ginseng
panax quinquefolium



Toothwort
dentaria multifida



Round-leaved Catchfly
silene rotundifolia



Trailing Arbutus
epigaea repens



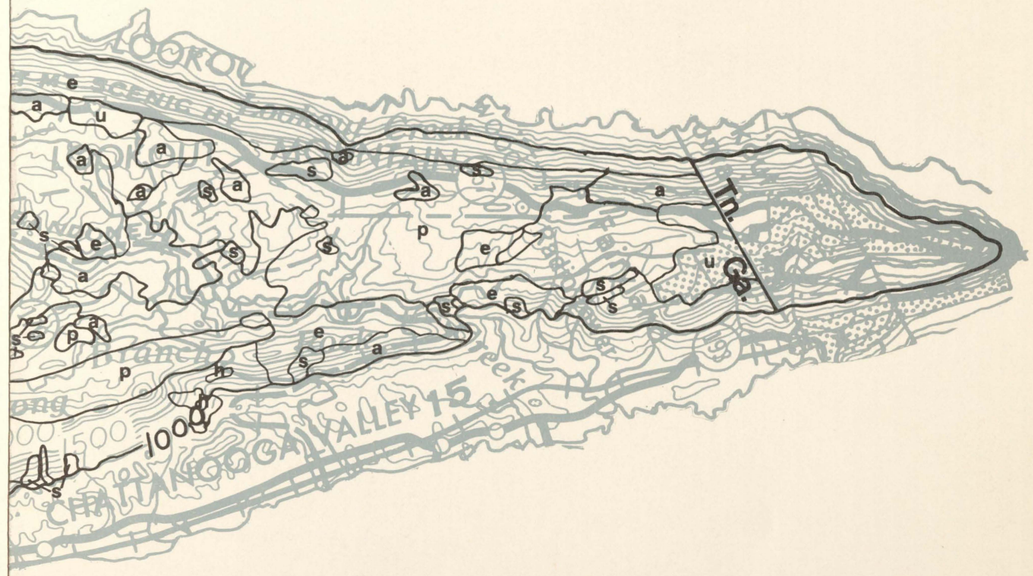
American Columbo
swertia carolinensis



Nodding Mandarin
disporum maculatum

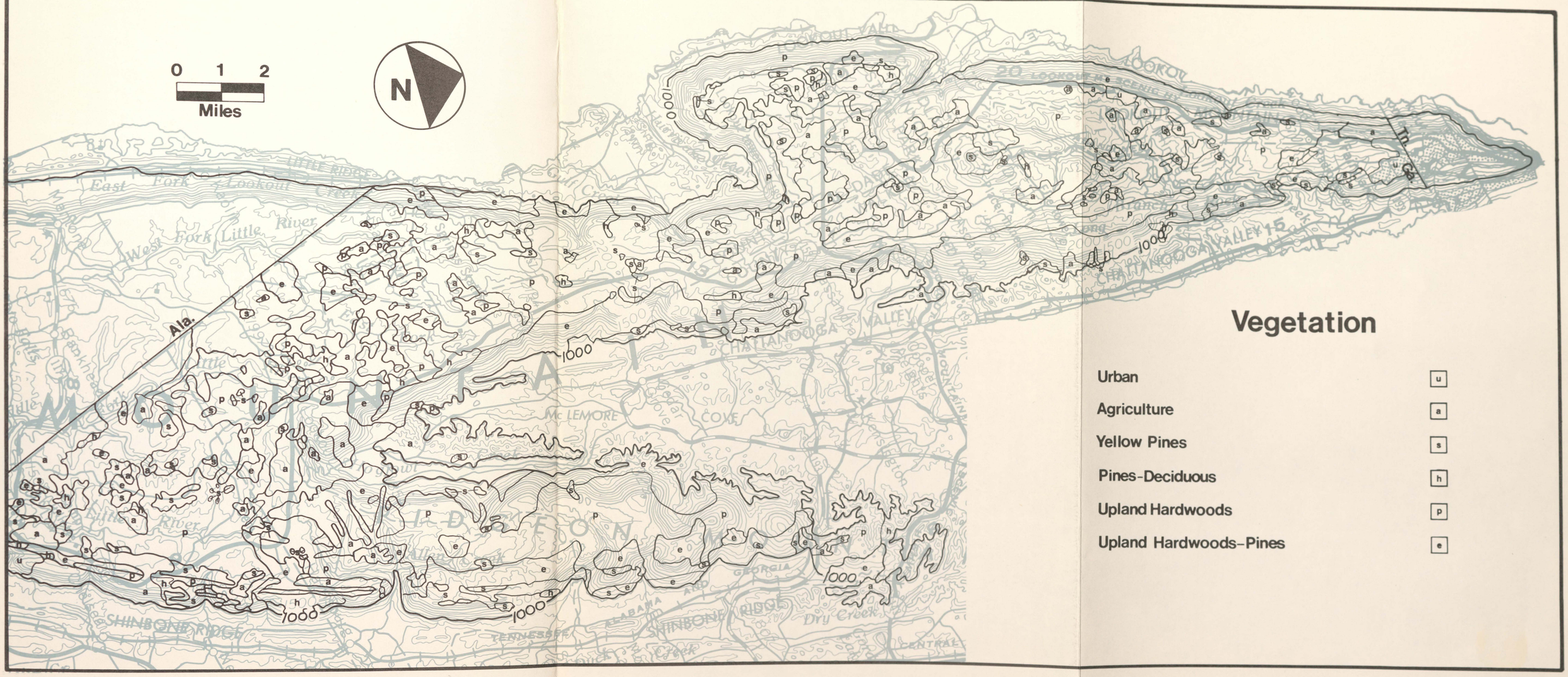


Smaller Red-root
ceanothus ovatus



Vegetation

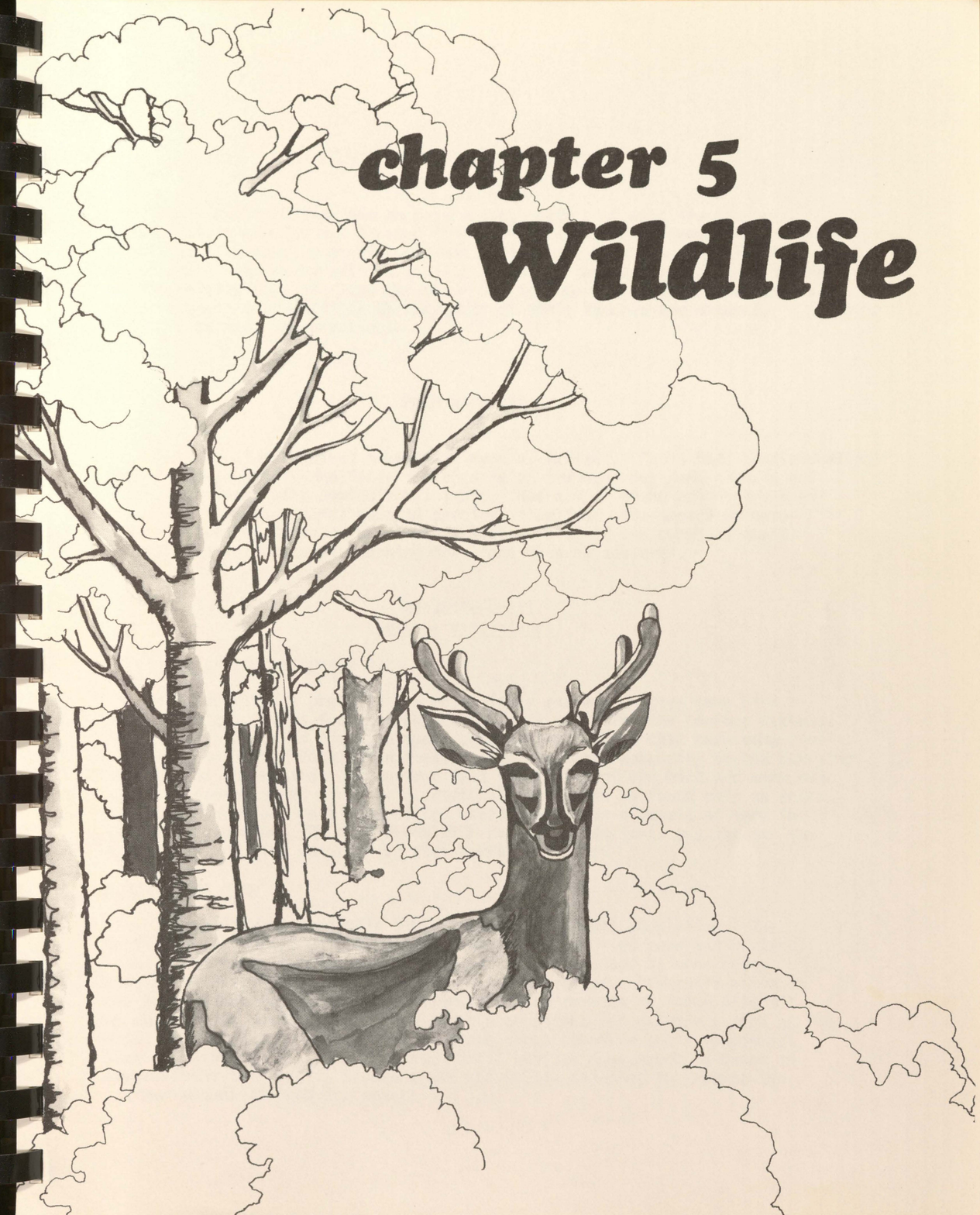
Urban	u
Agriculture	a
Yellow Pines	s
Pines-Deciduous	h
Upland Hardwoods	p
Upland Hardwoods–Pines	e



Vegetation

Urban	u
Agriculture	a
Yellow Pines	s
Pines-Deciduous	h
Upland Hardwoods	p
Upland Hardwoods-Pines	e

chapter 5
Wildlife



WILDLIFE OF THE LOOKOUT PLATEAU

The Lookout Plateau has an interesting variety of wildlife species. Many of these species are located there, as a result of different land use practices - farming, timber management, and cattle farming. Not all of these practices are beneficial to wildlife as we have painfully learned. We must carefully plan our land use practices in order to conserve and protect various species of wildlife because many of these species are directly affected by land use practices.

FARM WILDLIFE

Each species requires a specific type of habitat. Farms have traditionally been known as small game factories because of the numerous game animals and birds associated with agricultural lands. Not all of these can be given as the list contains several hundred species. The four most important game species found on farms on the Lookout Plateau are: 1) the bobwhite quail, 2) cottontail rabbit, 3) mourning dove, and 4) gray squirrel.

Bobwhite Quail
(Colinus virginianus)

Distribution and Abundance

The bobwhite is probably the most highly esteemed native game bird in North America. It is found throughout Georgia including the Lookout Plateau. The bobwhite quail is found on most farms on the Plateau that have some cropland type habitat. Population densities vary greatly depending on the carrying capacity of the habitat. A maximum fall population of one bird per acre over areas exceeding 1,000 acres is exceptionally high and is found only on areas with the finest and most diversified quail habitat as a result of very intensive management. On most farms with natural conditions, populations may reach only one bird per four or five acres.

Habitat and Home

The quality of available habitat controls a quail population. The habitat will support only a certain number of quail - no more and no less. Losses from other factors such as predators, disease and in some cases starvation must occur, if the excess is not harvested. Diversification is the key to good quail habitat. Diversification creates an "edge effect" which attracts quail and provides their necessities for existence such as food, water, and cover. Probably more is known about bobwhite quail management than any other upland game species. Quail habitat management is based on diversifying the forest, brush, grass and cultivated land to produce the maximum amount of food and cover.

Habits

May, June, July, and August are the most important months for quail. Most nesting sites include about fifty percent vegetative ground cover - providing screening for nests and passageways for movements. Studies in Georgia by the Game and Fish Division have shown that hens lay an average of sixteen eggs in nests built in April but averages only nine eggs in August nests. A pair of quail will raise only one brood of chicks per year. Re-nesting occurs only if earlier attempts fail. Other studies have found that chick mortality may be as high as fifty percent between hatching and fifteen weeks. Annual natural mortality approaches eighty percent, so hunters may harvest 30-50 percent of the birds without threatening next year's population.

Foods

Other studies in Georgia found that the annual diet of a bobwhite is comprised of 60-65 percent seeds, 15-20 percent fruits, 15 percent animal matter, and five percent green forage. Food availability, of course, varies with the seasons with the greatest fruit consumption occurring in late spring and summer, and the consumption of animal matter is greatest in summer and fall. Seeds are most important during winter months.

Cottontail Rabbit
(Sylvilagus floridanus)

Distribution and Abundance

The eastern cottontail is found throughout Georgia and is common on the Lookout Plateau. Populations on the Plateau differ greatly because of the varying habitats. The highest populations usually occur on soils of medium fertility with diversified habitat. The rabbit population in Georgia has declined significantly since the 1940's due to "clean farming" practices and the abandonment of small rural farms.

Habitat and Home

Cottontails are very adaptable and are found in practically all types of cover. However, they prefer "edge" type habitat. This is found along fields, fence rows or any brushy area. Diversity is again a keynote. Several small patches of food and brush will support more rabbits than one large area of each. Home to a cottontail is a "form" or resting place concealed in a dense clump of grass, under a brush pile or in a thicket. Cattle farming creates very poor rabbit habitat.

Habits

In good habitat, the home range may vary from one to five acres. In areas where food and water are of poor quality, home ranges may be fifteen acres or larger. Cottontails are most active at night and early morning. Most of the day is spent resting or in the shade. When pursued by predators, rabbits can leap 10-15 feet for short periods. Reproduction begins in early March and lasts through September. Pregnancy requires 26 to 28 days. Litter sizes

vary from one to nine with four or five being most common. Most females produce three to five litters a year. Heavy hunting does not seem to bother the rabbit population from year to year. As with most small game animals, rabbits can not be stockpiled from one year to the next.

Foods

Rabbits feed almost entirely on plants. Their diet is almost infinite. It includes stems, leaves, buds, twigs, grasses, sedges and sprouts. In summer, grasses may make up 65 percent of their diet. The winter diet is mainly leaves, buds, twigs, stems of woody plants, and bark.

Mourning Dove
(Zenidura macroura)

Distribution and Abundance

The mourning dove is the most widely distributed game bird in America. Hunter surveys in Georgia indicated that the dove is the most sought after game bird. Doves are common on the Lookout Plateau on farms producing and harvesting grain crops. Mourning doves are migratory and populations vary with the seasons.

Habitat and Home

Doves are most plentiful on farms where agricultural crops are harvested by mechanical harvesters leaving waste grain on the ground. Doves prefer bare areas which enables them to light on the ground and feed; thick pine stands are favorite roosting sites.

Habits

Mating begins in early spring and lasts until September. Normally two eggs are layed. Incubation takes only about 15 days, with both parents assisting with the incubation. After hatching the young are fed a very rich diet of "pigeon milk". The young doves mature rapidly and leave the nest after only 16 days. A pair of doves usually hatch two to three broods during the nesting season.

Foods

Both wild and cultivated seeds make up the dove's diet. In late summer and early fall doves readily feed on agricultural grains left by mechanical harvesters. These grains include cereal grains, lespedezas and hay. Preferred wild seeds are ragweed, begger-weed, smartweed and pokeberry.

Eastern Gray Squirrel
(Sciurus carolinensis)

Distribution and Abundance

Both gray and fox squirrels are found on the Lookout Plateau; however, the gray squirrel is much more abundant. Fox squirrels prefer pine forests and woods near farms while gray squirrels live in more dense hardwood areas. The gray squirrel population on the Lookout Plateau has declined somewhat because of the establishment of pine plantations and short timber rotations.

Habitat and Home

As stated earlier gray squirrels are found in hardwood forests. The greatest populations are usually found along river bottoms with a brushy understory. Home to a gray squirrel is a leafy nest located in a tree fork or cavity. Cavities suitable for squirrel nests occur most often in older trees, particularly white oaks, sycamores, elms, and maples. The older nesting trees should be protected to provide escape cover as well as good nesting areas. The cavities are filled with leaves to serve as insulation against the cold, and as a warm place for their young. Squirrel nests are constructed in the fall and again in the spring. These nests can be constructed in a days time and usually last six to ten months. Some nests are repaired and are used 2-3 years. Squirrels usually have several nest trees or cavities which they commonly use within their home range.

Habits

Squirrels generally do not move more than 200 yards from their main tree nest. However occasionally during times of high population and mast failures, squirrels do migrate as much as five miles. Gray squirrels do not hibernate, they are most active in the fall during the nut crop ripening season. Little movement occurs during bad or cold weather. During the day squirrels are most active around sunrise and shortly thereafter and again in late afternoon. Most of the day is spent sunning or sleeping on a limb. At dusk they retire to their nests.

Male squirrels are promiscuous and are capable of breeding throughout the year. Females generally mate only during two periods a year, each lasting 10 to 14 days. First mating usually occurs in early January and second mating usually from May to July. Gestation requires 44 to 45 days. Litter sizes vary from one to six while most average two to three.

Food

Squirrels are vegetarians. They have a varied diet, hickory, pecan, oak, walnut, elm, mulberry trees and field corn are their style food. Food preferences vary with seasons. Squirrels usually have favorite feeding sites. They also store or hide nuts and acorns - many of which are forgotten or eaten by other squirrels. An average gray squirrel eats about two pounds of food a week or about 100 pounds a year. Squirrels also water daily.

Approximately two-thirds of Georgia is considered forest land and is potentially productive wildlife habitats. Most of the Lookout Plateau is covered with forests and is considered productive wildlife habitat. The four major forest wildlife species considered below are the black bear, white-tailed deer, ruffed grouse, and wild turkey.

Black Bear
(Ursus americanus)

Distribution and Abundance

The black bear originally was common throughout Georgia but is now found only in extreme southern and northern Georgia. A few black bear are found on the Lookout Plateau. Several sightings were reported on Pigeon Mountain in 1975. The Georgia Game and Fish Division is currently involved in a black bear study to determine population estimates and movements.

Habitat and Home

Bears live in heavily wooded areas. In winter they den in hollow trees, caves or under the roots of trees. They make beds of grass, leaves, twigs and bark. They have no permanent summer home. They usually sleep in trees or on the ground. Most of the bears have been driven to the extreme mountainous areas or swampy areas because of human populations and urbanization.

Habits

Little is known about bears because very little research was conducted until recently. The Georgia Game and Fish Division is currently involved in a black bear study that will provide useful information when completed. Bears feed heavily in the fall in preparation for winter. During cold weather they go into a deep sleep, but do not hibernate because the body temperature remains normal. This period of winter inactivity usually lasts until April. Black bears usually range within a 10 mile radius, but others have been known to travel much further. Bears walk with a lumbering gait, but can attain speeds of 25 miles per hour. They are expert climbers and swimmers. Mating occurs in June or July. After fertilization a delayed implantation occurs. The young are born in late January . Females do not breed until they are three years old. Her first litter usually is only one young. After that two or three young are born on alternate years. Cubs are very small at birth weighing 6-8 ounces and are about nine inches long. Cubs usually stay with their mother until the second summer.

Food

Black bears have a varied diet. Berries, grasses, fruits, seeds, nuts, inner bark of trees and roots are their main plant food. Insects and small animals make up part of the bear's diet also. They are also very fond of garbage dumps.

White-tail Deer
(Odocoileus virginanus)

Distribution and Abundance

White-tail deer are Georgia's most popular big game animal. They are found in every county throughout Georgia. Hunters in Georgia annually harvest over 30,000 deer. Georgia's estimated deer population is over 300,000. Population estimates for the Lookout Plateau range from four per square mile to as much as twenty-five per square mile on some parts of Pigeon Mountain. In the United States and Georgia deer reached their lowest numbers in the early 1900's. Restocking and redistribution efforts by Game Departments were very successful in bringing populations to an all time high.

Habitat and Home

Deer show a preference for timbered areas, but they are very adaptable even to human presence. Deer utilize edge or border areas, also, because of the variety of foods found along edge areas. A recent deer study on the Berry College Wildlife Refuge showed that deer had seasonal ranges varying from 94 to 603 acres with an average of 313 acres.

Habits

On the Berry College Refuge, it was found that bucks had larger summer and fall ranges than does. Buck movements were greater in the fall with the onset of rut beginning early November. During the rutting period bucks commonly fight, but there are few serious injuries. When does enter into a "heat" period ready to be bred, bucks will stay with them for a couple of days and then move on to another. The fawning time usually begins in April and lasts through early September with May and June the peak months. Does usually breed when they are one and one-half years old, but usually don't produce twin fawns until they are two and one-half years old - depending on the quality browse they get. Antlers normally occur only on males and are formed and shed each year. Antler growth begins in April or May. During the growth period, the antlers are covered with short hair and have a plush-like or "velvet" appearance. Antlers are very tender and subject to injury during this period. The antlers reach full size in August. The male produces a male sex harmone, testosterone, in increasing amounts and initiates shedding of the velvet. The buck rubs his antlers against trees to help remove the old velvet. Antlers are carried through the breeding season and then shed in late January or early February. In their first fall, fawn bucks produce buttons, after that the number of points on the antlers varies according to the condition and quality of browse the deer receive. Injury to antlers in velvet accounts for the extremely large number of points.

Foods

Deer are browsers, feeding chiefly on leaves, twigs, fruits, shrubs and foliage of herbaceous plants. They also feed on fungi, grasses and farm crops.

Acorns and legumes are important winter foods. On the Lookout Plateau, some of the choice deer foods are honeysuckle, greenbrier, acorns, legume, strawberry bush, and maple sprouts.

Ruffed Grouse
(Bonasa umbellus)

Distribution and Abundance

Georgia is on the edge of known ruffed grouse range. In Georgia grouse are found in extreme North Georgia mostly in the Appalachian Mountains. A few grouse have been sighted on John's Mountain and occasionally reports of grouse further south particularly around Lake Allatoona have been verified. Grouse were once found on the Lookout Plateau in the early 1900's, but were extripated as a result of farming and timber practices. Ruffed grouse were transplanted to Pigeon Mountain Wildlife Management Area in the summer of 1975 in an effort to reestablish grouse on the Lookout Plateau. Censuses conducted on the Cohutta Wildlife Management Area estimated one grouse per nineteen acres in the fall of 1974. This would be considered a low population compared to other northern states.

Habitat and Home

Forests, in one form or another, are typical habitat of ruffed grouse. They are rarely found outside the forests. Recent research studies have found that ruffed grouse prefer second growth forests and abandoned farms. In northern states, it was found that clearcutting small blocks of timber (5 acres or less) and control burning (3-5 year intervals) produced highest grouse populations. Grouse need the "edge effect" created by clearcutting small blocks. Controlled burnings provides more food. In Georgia grouse require thick brushy cover such as laurel thickets and clearcut areas.

Habits

The ruffed grouse is probably our most interesting upland game bird. He is named for the ruff of dark feathers on its neck, which may be displayed by either sex, but more commonly by the male. The male grouse is also known as the "drummer". In the spring during mating season, male grouse begin the familiar thump, thump, thump, heard throughout the mating season. Males select traditional logs and make the drumming sound by powerful wing motions creating "air concussions". Grouse nest on the ground. A clutch of eggs usually contains 10-14 eggs. Incubation requires 23 to 24 days. The entire job is performed by the female. After hatching the young immediately leave the nest and follow the mother. Little research has been conducted on grouse in Georgia, but it is believed normal daily movements are confined to distances less than one-fourth mile.

Food

Foods are seasonal. Recent studies have indicated that grouse in Georgia prefer green vegetation. Their diet includes buds, twigs, fruits, and mast. Spring foods are tender green shoots and insects. In summer , grouse feed on fruits, green leaves, and insects.

Wild Turkey
(Meleagris gallopavo)

Distribution and Abundance

The wild turkey is Georgia's top upland game bird and it is also considered the most prized big-game trophy in Georgia. Georgia's turkey population has remained relatively stable during the last twenty years. Most of the turkeys in Georgia are located in South Georgia. Local populations do exist throughout North Georgia. Several flocks have been reported on the Lookout Plateau, but the overall population is low. The Game and Fish Division began a wild turkey restoration program in 1972 transplanting wild trapped turkeys to various areas of suitable habitat. Turkeys were stocked on Pigeon Mountain Wildlife Management Area in 1971 and 1973. The population there has increased significantly.

Habitat and Home

Most turkeys occupy mature or nearly mature forests. Turkeys depend on their keen hearing and eyesight. Because their eyesight is important for protection they prefer an open understory which is found in mature forests. Ideal cover is characterized by different aged forest types well interspersed with small openings and some cultivated land. Openings and cropland should make up ten to twenty percent of the total range. Winter range is usually restricted to the mature forests in search of mast or other food. Good nesting and brood rearing range is found around brushy openings and old overgrazed pastures.

Habits

The range of a wild turkey would vary from different areas because of differences in habitat, but studies in the Appalachian Mountain areas have shown that the feeding range of a flock appears to be two and three miles. This means that an average flock would travel over an area of 8,000 to 18,000 acres. The male turkey or gobbler is polygamous and will mate with a number of hens. In the spring gobblers establishes harems until the hens are bred and egg-laying begins. Egg laying usually begins in mid-April. Clutch sizes usually range from eleven to fourteen eggs. Incubation requires twenty-eight days; all the work is done by the hen. After hatching, the brood stays with the mother hen until fall. Then usually in the fall flocks become segregated into groups of hens, groups of young gobblers and groups of old gobblers; they remain segregated until nesting time.

Foods

The turkey's diet is characterized by a preference for vegetable materials in general, and fleshy fruits, mast and green leaves in particular. Mast and green leaves are the important winter foods. Insects are very important in the spring and summer particularly for young poults. Acorns, grasses, and sedges, wild grapes, dogwood, greenbrier, and wild cherry are natural foods eaten at all seasons of the year.

FUR BEARERS

Both the pelts and carcasses of at least some of these animals are an economic resource for trappers. Landowners and trappers both profit by the production and harvest of furs. This differs from wild game. Game laws prohibit the direct sale of wild game even though the game bird or animal was obtained during the legal hunting season. These game laws are designed to prevent market hunting and create sport hunting.

Intelligent management of fur bearers is the responsibility of public conservation agencies regardless of the economic and beneficial aspects of fur production. Research has shown that carnivarous fur bearers rarely are directly responsible for any general reduction of game population.

Beaver
(Castor canadensis)

Distribution and Abundance

Originally beavers were found practically throughout North America, but by 1900, extensive trapping exterminated populations in the eastern and southern portions of its range. Protection and subsequent introductions have re-established many colonies. Beavers have made a significant come-back in Georgia during the past twenty years. Beavers are now common throughout middle and north Georgia, including the Lookout Pleateau. Only recently were beavers sighted on Pigeon Mountain.

Habitat and Home

Beavers are found along streams, rivers, marshes and small lakes. They often construct dams across streams creating "beaver ponds". Their home consists of lodges which may be forty feet wide and seven feet high made of sticks, limbs, and mud. This lodge may be built against a bank or in shallow water. If fluctuating water levels make lodges impractical, beavers construct their homes in stream banks.

Habits

Beavers are excellent dam builders. Dams are built across streams to stabilize water levels. Beavers are usually nocturnal, but may come out during the day in protected or remote areas. They feed primarily on bark, eating the cambium layer. They usually select trees two-to-eight inches in diameter for felling.

A beaver colony is a family unit and consists of the adult male and female and their yearlings and kits. Breeding is usually done in January or February. The male and female usually pair for life. The gestation period is three to four months. Litters are usually born in April, May, or June and consists of one to eight, but mostly three to four young. The young remain with their parents until they are about two years old.

Foods

Beavers are primarily bark eaters, eating the new growth (cambium layer) between the outer bark and the wood of branches and trunks. They feed on a wide variety of trees. Sweetgum is probably their preferred choice. In the summer, various water plants such as pond lily, water cress, and arrowheads supplement their diet. A beaver consumes one and one-half to two pounds of food daily.

Bobcat
(Lynx rufus)

Distribution and Abundance

Bobcats are found throughout Georgia and are common on the Lookout Plateau. Little research in Georgia has been conducted on the bobcat. Actual populations are not known at this time. Marked fluctuations related to the food supply occur in the population. The price for bobcat pelts has greatly increased during the past few years; this may affect the overall population.

Habitat and Home

Bobcats are found in heavy forest cover. They prefer second growth timber stands with much underbrush. Home to a bobcat is a rest shelter such as a fallen log, rock cliff or thicket. During the breeding season a more inaccessable place is usually chosen. The nest is made of dried leaves or moss.

Habits

The bobcat is a night prowler. His home range is about five square miles depending on his food supply. Their range is considerably large during the mating season. They rely more on their keen eyesight and hearing more than their sense of smell. Bobcats can kill prey as large as a deer, but predation on deer is not common. Bobcats are good climbers and often take refuge in trees especially when pursued by dogs. Reproduction begins in January and extends through June. The gestation period is 50-70 days. Most litters are born in April or May and average two to three per litter.

Foods

Food habit studies have found that rodents make up the bulk of their diet. Occasionally, however, they will prey upon game animals or game birds. They usually gorge themselves when food is plentiful and may not feed for several days afterwards. They seldom return to an old kill to feed unless food is scarce.

Gray Fox
(Urocyon cinereoargenteus)

Distribution and Abundance

Both the red fox and gray fox are found on the Lookout Plateau, but the gray fox is much more common and widely distributed. Populations vary depending on weather conditions during breeding seasons. Research has shown that populations increase when the breeding season is wetter and warmer than usual and decrease when it is colder and drier.

Habitat and Home

The gray fox is found in wooded areas and open brushland areas. Foxes seem to survive well even in areas near dense human populations, but they are also found in remote areas. Dens are located in hollow logs, hollow trees, under rock piles and sometimes in the ground. They are usually filled with bark, leaves or grass.

Habits

The gray fox is usually nocturnal, but is often seen during the day. The gray fox is a good tree climber in contrast to the red fox. Red foxes are more cunning than gray foxes making the gray foxes easier to trap. Top speed is about twenty-six miles per hour for a very short distance. The breeding season is from January through May. The gestation period averages fifty-three days. Average litter size is three to five young. The young usually stay in the den until they are three months old. Families break up in late summer.

Foods

The gray fox is omnivorous. Their diet might include wild berries, small rodents, particularly field mice, rabbits, birds, frogs, crayfish, grapes, acorns, and grasshoppers.

Other important fur bearers found on the Lookout Plateau include the Muskrat (Ondatra zicbethicus), Raccoon (Procyon lotor), and spotted skunk (spiloyale putorius), and striped skunk (Mephitis mephitis).

A very few number of coyote sightings have been reported on the Lookout Plateau. A male coyote was killed on Pigeon Mountain in 1972 by a deer hunter. Where these coyotes originated is not known.

WATERFOWL

Waterfowl are migratory and they follow four major waterfowl flyways in North America. These four flyways are: 1) the Atlantic Flyway - extending from the Atlantic coast west to the Allegheny Mountains and curving north westward across northern West Virginia and northeastern Ohio to the western end of Lake Erie. 2) The Mississippi Flyway - its eastern boundary runs through southern Ontario to western Lake Erie, thence across Ohio and Indiana to the Mississippi Valley, following the river to its mouth. Its western boundary extends from southern Saskatchewan, across northeastern Montana, along the Missouri River to western Missouri and across western Arkansas and northwestern Louisiana to southeastern Texas. 3) The Central Flyway - it is bounded by the Missouri River and western parts of Arkansas and Missouri. The western boundary appears to start on the north at Great Salt Lake, Utah, and runs southeastward across Utah and western New Mexico. 4) The Pacific Flyway - extending from the Pacific Coast to the Rocky Mountains.

Northwest Georgia is on the extreme western edge of the Atlantic flyway. Very few large concentrations of waterfowl are found on the Lookout Plateau because of the lack of good waterfowl habitat. The wood duck is native to Georgia and is common on the Lookout Plateau. The wood duck will be the only major species discussed below.

WOOD DUCK
(Aix sponsa)

Distribution and Abundance

The male wood duck's plumage in breeding is considered the most beautiful of the American waterfowl. As mentioned earlier, the wood duck is native to Georgia and common for the Lookout Plateau along streams, and swampy areas, particularly in the beaver ponds. Wood ducks nest in hollow trees in swampy areas. By the beginning of the twentieth century, man had drained much of the swamp areas and converted the swamps to farm land. This loss of habitat has drastically reduced the wood duck population. They were given complete protection in 1918 in both Canada and the United States until 1945. The wood duck has made a remarkable comeback because of a concerned effort by sportsmen and bird lovers. Artificial nesting boxes were erected again creating the necessary nesting habitat for survival.

Habitat and Home

Wood ducks prefer hardwood swampy areas. With the return of the beavers in increased numbers and the construction of beaver dams creating beaver ponds, wood duck habitat has increased. Beaver ponds are ideal habitat for wood ducks as well as other species of waterfowl. Beaver ponds provide feeding habitat as well as nesting habitat.

Habits

Northern wood ducks migrate; however, because of the warm climate many local wood ducks in Georgia do not migrate.

In the early spring, the ducks pair off and begin searching for a suitable nesting cavity. Once a cavity is selected, an average of eleven eggs are laid. Incubation requires 28 to 31 days and is performed by the female alone. After hatching, the young are coaxed from the nest by the mother and led to the nearest water.

Foods

Its usual feeding grounds are along the banks of woodland streams, ponds, and beaver ponds. It feeds upon the seeds of various trees and shrubs. Acorns are very important to the diet of the wood duck.

SELECTED REFERENCES

1. Kortright, F. H. 1967. Ducks, Geese and Swans of North America. 476 pp.

2. Latham, R. M. 1956. Complete Book of the Wild Turkey. 265 pp.

3. Madson, J. 1959. The Cottontail Rabbit. (Conservation Dept. Olin Mathieson Chemical Corp.) 56 pp.

4. Madson, J. 1969. Ruffed Grouse. (Conservation Dept. Olin Mathieson Chemical Corp.) 103 pp.

5. Madson, J. 1971. The White-tailed Deer. (Conservation Dept. Olin Mathieson Chemical Corp.) 108 pp.

6. Rosene, W. 1969. The Bobwhite Quail: Its Life and Management. 418 pp.

7. Schwartz, C. W. and Elizabeth R. Schwartz. 1971. The Wild Mammals of Missouri. 341 pp.

8. Trippensee, R. E. 1948. Wildlife Management: Upland Game and General Principles. Vol. 1. 479 pp.

9. Trippensee, R. E. 1953. Wildlife Management: Fur Bearers, Waterfowl and Fish. Vol. II. 572 pp.

chapter 6
Slope



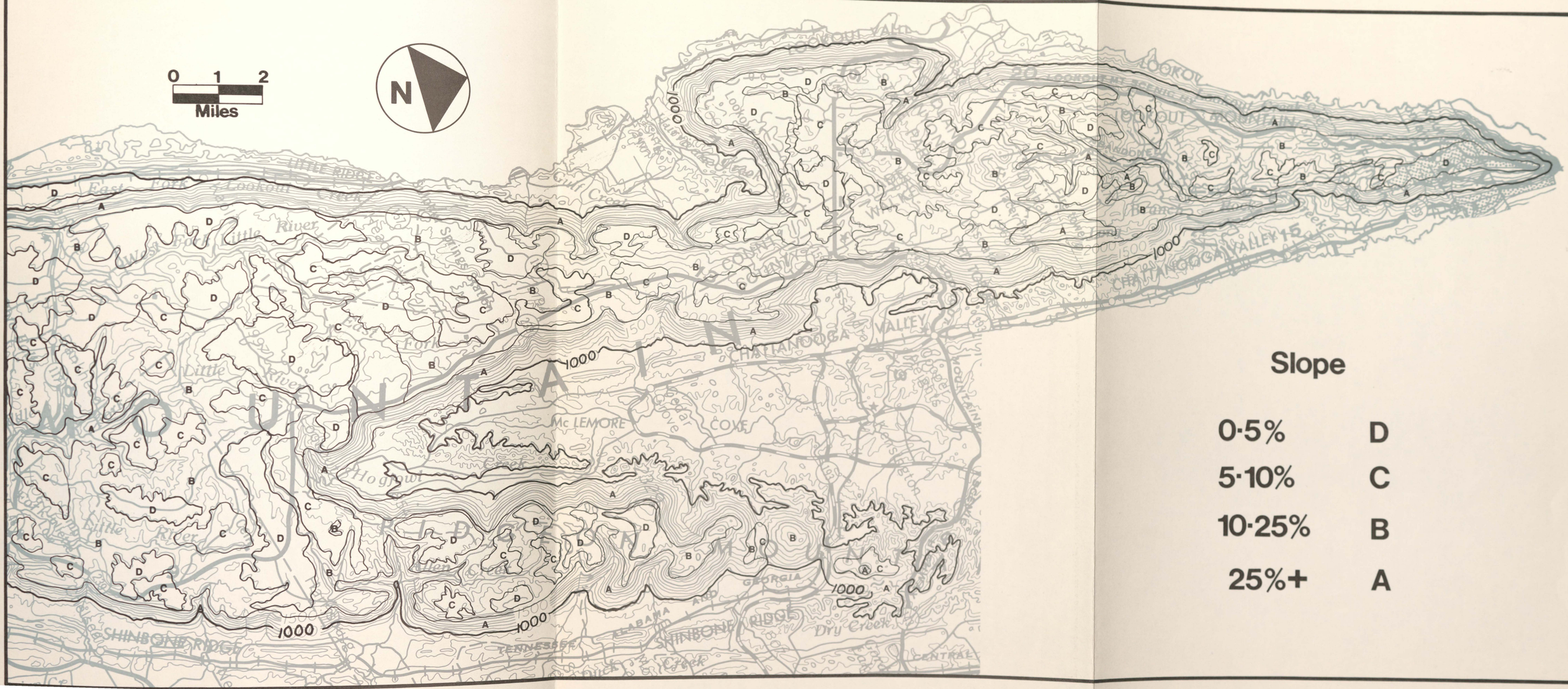
SLOPE

A slope analysis aids the planner in determining the feasibility of various land uses in particular areas. For example, arable farmland is not suitable on slopes greater than 25 percent due to the virtual impossibility to plow and fertilize such steep terrains. The environmental analysis of a particular region should include a slope study that identifies at least four slope catagories.

Slope analysis can be a general guideline in determining soil type, drainage patterns, surface run-off, and visual landscape vulnerability. One can assume that development along steep slopes is more costly and has a greater visual impact. Such land uses as timber harvesting and highway development are largely affected by slope constraints. Erosion can prove to be a severe problem if road cuts, strip mines, and forest clear cutting operations take place on steep slopes.

Percent slope can help naturally define land use areas. A good example is Chickamauga National Military Park along the sides of Lookout Mountain. Due to steep terrain, this land was ideally suited for recreation and open space amenities. The alluvial fan of the Plateau reaches far beyond just the National Park. It defines an environmentally sensitive area on both east and west escarpments.

Slope in land forms that occur on specific sites will determine how suitable a location is for various facilities. The regional slope analysis is general in nature and should not be relied upon for site specific planning. Slope considerations become more detailed as proposed projects near the implementation phase.


0 1 2
Miles
N
LOOKOUT VALLEY
LOOKOUT MOUNTAIN
LITTLE RIDGE
East Fork Lookout Creek
West Fork Little River
Little River
Gulf Creek
Mc LEMORE
COVE
CHATTANOOGA VALLEY
CHATTANOOGA VALLEY 15
Hogfowl Creek
Allen Creek
SHINBONE RIDGE
TENNESSEE
ALABAMA AND GEORGIA
Dry Creek
CENTRAL
1000
1500
Slope
0·5% D
5·10% C
10·25% B
25%+ A

chapter 7
Visual



A VISUAL ANALYSIS

The Lookout Plateau is a prominent visual feature in the landscape of Northwest Georgia, Southeast Tennessee and Alabama. Its rolling peneplain extends 80 miles south from Chattanooga, Tennessee to Gadsden, Alabama. The plateau tapers off slowly at Ft. Payne, Alabama which is about 55 miles south of Chattanooga. During this 80 mile span of rolling mountainous topography, the eye beholds many types of landscapes. These range from broad sweeping valley panoramas to isolated features and details.

Seasonal variation plays an important role in the visual characteristics of the region throughout the year. Autumn finds the plateau vegetation in full color with the coming of cooler weather bringing out the warm hues of the leaves on the deciduous trees to contrast with stands of evergreens. The winter months fashion the landscape into barren hardwoods reaching upwards like inverted root systems searching the blue skys and cloudy days for the spring when the environment comes alive with young green shoots and colorful flowering dogwoods. In spring, the plateau turns into a veritable showcase of natural beauty with over 10,000 species of wildflowers putting on their fancy clothes for man and creature to enjoy. High temperatures and humidity accompanying the summer months lull the days with thick atmospheric haze until a welcomed thunderstorm rains to bring color back to flora and cool the hot outcroppings of sandstone prevailing along the brows of the mountain. This is but a touch of the visual poetry offered by the Plateau's landscape experience.

A few years ago, methods in which landscapes could be classified and inventoried were being explored in several universities in the United States. A system of landscape nomenclature has been developed and applied to the Plateau's Highway 157 South Corridor. This scenic corridor commences in Lookout Mountain, Tennessee going south into Georgia through the Hinkle and Thompsonville communities, crossing Highway 143 (Trenton/LaFayette Highway), then taking a sharp right on an unimproved portion approximately seven miles south of Highway 143 that leads the observer through a delightful sequence of rural, and natural landscapes into Mentone, Alabama.

When viewing the Highway 157 scenic corridor, special attention should be given to variables that serve to define a particular scene. Forms are defined by scale and size, degree of isolation, contour distinction, and surface variations. Direction of lighting, distance, hue and value are variables that give landscapes an ephemeral quality depending on the time of day, weather conditions, and the time of year a particular setting is being observed. Spatial definition created by valley-ridge relationships plays an important role in the feeling for scale.

A series of landscape compositional types have been formulated for classification purposes. These classification categories are as follows:

Feature Landscape
Enclosed Landscape
Focal Landscape
Panoramic Landscape
Detailed Landscape
Canopied Landscape
Ephemeral Landscape

Feature Landscape - Landscapes that are dominated by powerful features such as the ridge at Highpoint or a scenic farm pond fall under this category. Also, man made elements such as buildings, firetowers, and water tanks qualify. The old Mentone Hotel is a distinctive feature landscape that is an historic landmark.

Enclosed Landscape - An area that is surrounded by elements that give it a feeling of enclosure. This could be a field surrounded by mountains or woods, a hollow, meadow or enclosed lake.

Focal Landscape - A series of seemingly parallel lines such as a virtually straight road or opening in the trees that guides the eye to one vanishing or focal point.

Panoramic Landscape - A landscape that allows a view of a broad area encompassing 180 degrees or more. Panoramas of Chattanooga and Lookout Valley are available from the Lookout Plateau.

Detailed Landscape - Isolated elements of a landscape that have exceptional lines, textures, and or hue and value qualities. The complex dteail in the graveyard at Hinkle is an example.

Canopied Landscape - An area that is fully enclosed by the crown cover of trees or other forms of vegetation. Canopys can also be created by rock overhangs.

Ephemeral Landscape - Landscapes that change significantly with the seasons, weather conditions or lighting characteristics throughout the day.

Although these landscape compositional types frequently stand alone, combinations do exist. Enclosed fields with panoramas as backdrops are commonly found on the Plateau. This is due to the peneplain type geologic formation that characterized the Plateau as a series of undulating hills and ridges. Ephemeral landscapes are also combined with many of the other types.

The relationship of the observer to the landscape is a noteworthy aspect in that observer position can be a critical factor in determining landscape composition. Three types of positions can be classified.

Observer Inferior
Observer Normal
Observer Superior

Observer Inferior - A location low in the landscape such as a view of Cloudland Canyon from Sitton's Gulch.

Observer Normal - Observer is located on middleground in relation to the landscape. An example would be the view of Highpoint from the Thompsonville community.

Observer Superior -A location in the landscape where views from a peak or highest point are available. The panorama of Big Wills Valley from mile 34.1 on the West escarpment in the following landscape inventory would be a good example.

Distance zones are another way to aid the observer in landscape inventory and analysis. Foreground, middleground, and background boundries are methods of classification that can help define views. Normally these zones are determined by imaginary lines drawn at certain distances from the viewer. A good estimate for these zones is outlined in the following table.

Zones	Near Boundry (Miles)	Far Boundry (Miles)
Foreground	0	¼-½
Middleground	¼-½	3-5
Background	3-5	∞

The application of the visual analysis and landscape inventory as a viable tool for land use planning is a relatively new development in the state of the art as far as the sequential approach is concerned. It is difficult to quantify the vulnerability of landscapes in purely the visual sense. It is also difficult to assign a ranking as to the value a particular landscape has over another. One can assume though that certain landscapes have a higher amenity than others. For example, Eagle Cliff, Lula Lake, and Lula Falls have a far greater visual value than the road cut at Hwy. 157 and Rock Creek or even the Durham mines for that matter.

Landscape vulnerability is an issue to be considered when planning for land use decisions. What impacts are man's endeavors going to make on our visual enjoyment of particular landscapes? The visual vulnerability of landscapes can be seen as a function of % slope, i.e., the steeper the slope the greater man's impact will be

on the visual environment. For example, if a logging operation clear cuts 1,500 acres of trees in the interior valley between Highpoint and Thompsonville, the visual impact would be far less than if they had performed their operation on the sides and top of Highpoint Ridge itself. The same can be said for strip mining operations or urban development - adverse environmental impact increases as % slope increases.

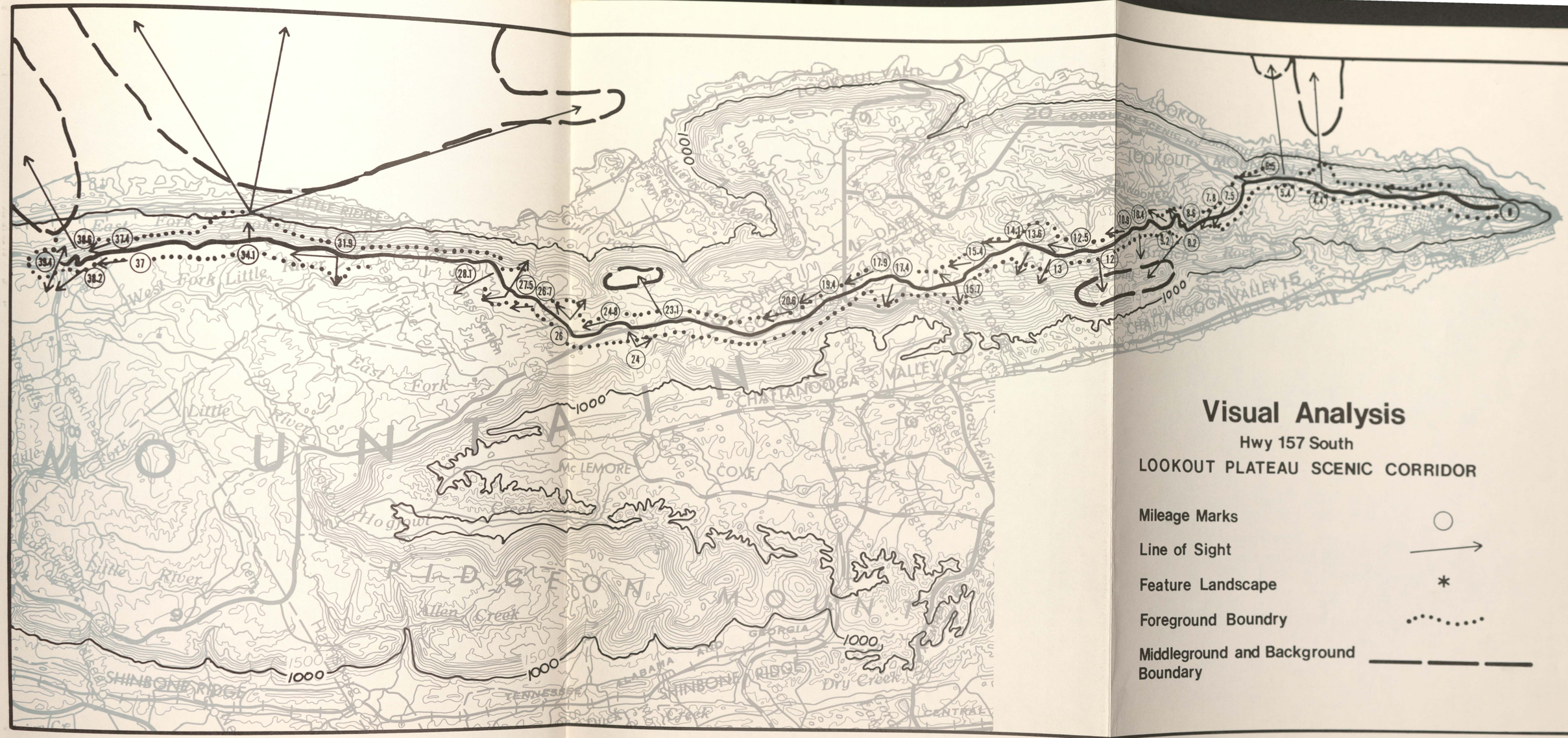
From a holistic point of view, the landscape inventory can aid the regional planner in not only the purely visual sense but also in the cultural, economic, and aesthetic considerations that need to be made in laying the ground work for regional policy.

Sources

The View From the Road. Appleyard, Lynch, Myer. 1964. MIT and Harvard University Press.

Forest Landscape Description and Inventories - A Basis For Land Planning and Design. R. Burton Litton, Jr., Assistant Professor Landscape Architecture, University of California, Berkeley U.S.D.A. Forest Service Research Paper PSW-49. 1968.

The Aesthetic Quality of Scenic Rivers in Idaho. Luna Leopold, Professor of Hydrology and Landscape Architecture, Berkeley U.S.G.S. Report.



Visual Analysis

Hwy 157 South

LOOKOUT PLATEAU SCENIC CORRIDOR

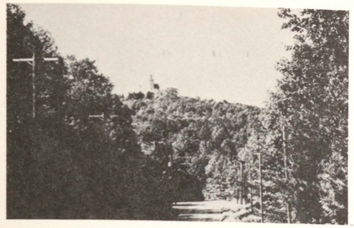
Mileage Marks ○

Line of Sight →

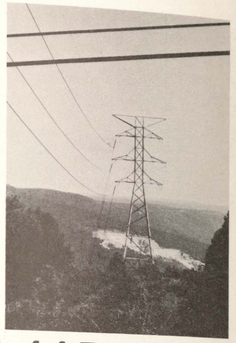
Feature Landscape *

Foreground Boundry ·····

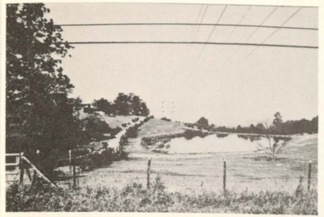
Middleground and Background Boundary ——— ——— ———



Mile 0 Focal Landscape



Mile 4.4 Focal Landscape



Mile 5.4 Feature Landscape



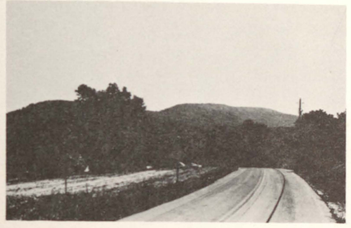
Mile 6.5 Ordinary Landscape



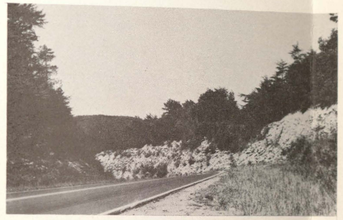
Mile 7.5 Feature Landscape



Mile 7.8 Detailed Landscape



Mile 8.2 Feature Landscape



Mile 8.6 Enclosed Landscape



Mile 9.2 Feature Landscape



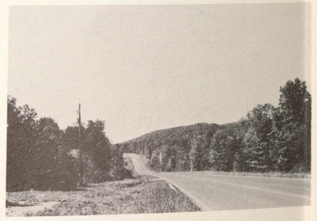
Mile 10.4
Ephemeral Landscape



Mile 10.9 Feature Landscape



Mile 12 Ridge Panorama



Mile 12.5 Focal Landscape



Mile 13 Feature Landscape



Mile 13.6 Feature Landscape

Landscape Inventory

Sequential photographs were taken along the Hwy 157 corridor at locations that express key landscape composition types.

MILAGE MARKS COORDINATED WITH BASE MAP

FIGURE 1



Mile 14.1 Feature Landscape



Mile 15.4 Feature Landscape



Mile 15.7 East View Enclosed Field Panorama



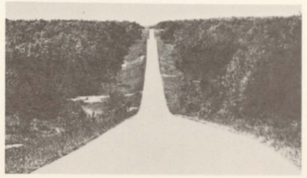
Mile 15.7 Feature Landscape SW View



Mile 17.4 Feature Landscape



Mile 17.9 Focal Landscape Self-Enclosed Terminus



Mile 19.4 Focal Landscape Point Convergence



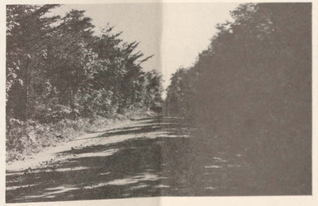
Mile 20.6 Enclosed Landscape



Mile 23.1 Ordinary Landscape



Mile 24 Portal Landscape



Mile 24.8 Canopied Roadscape



Mile 26 Road-Field Edge SW



Mile 26 Field Feature NW

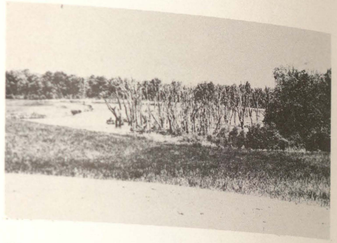
Landscape Inventory

These views from the road help the observer recognize the impact of the landscape as a critical ingredient in re-creation use and travel.

FIGURE 2



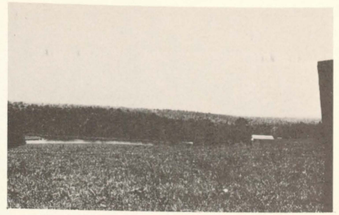
Mile 26.7 Feature Landscape



Mile 27.5 Feature Landscape



Mile 27.5 Feature Landscape



Mile 28.1 Field-Forest Panorama



Mile 31.9 Feature Landscape
View East



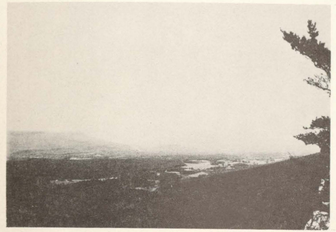
Mile 31.9 Canopied Landscape
View South



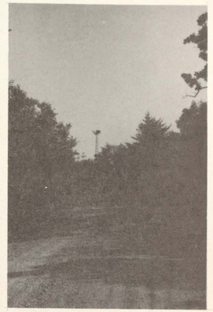
Mile 34.1 Canopied Landscape



Mile 34.1 Screened Panorama



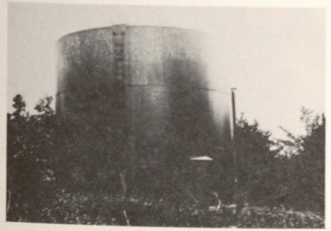
Mile 34.1 Valley Panorama



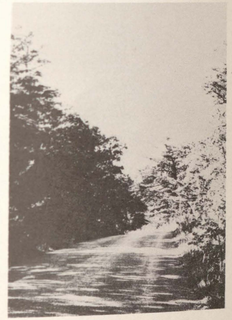
Mile 37 Focal Landscape



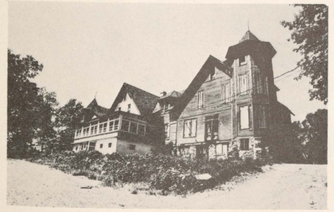
Mile 37.4 Detailed Landscape



Mile 38.2 Feature Landscape



Mile 38.6 Canopied Landscape



Mile 39.4 Feature Landscape
View SE



Mile 39.4 Feature Landscape
View NW

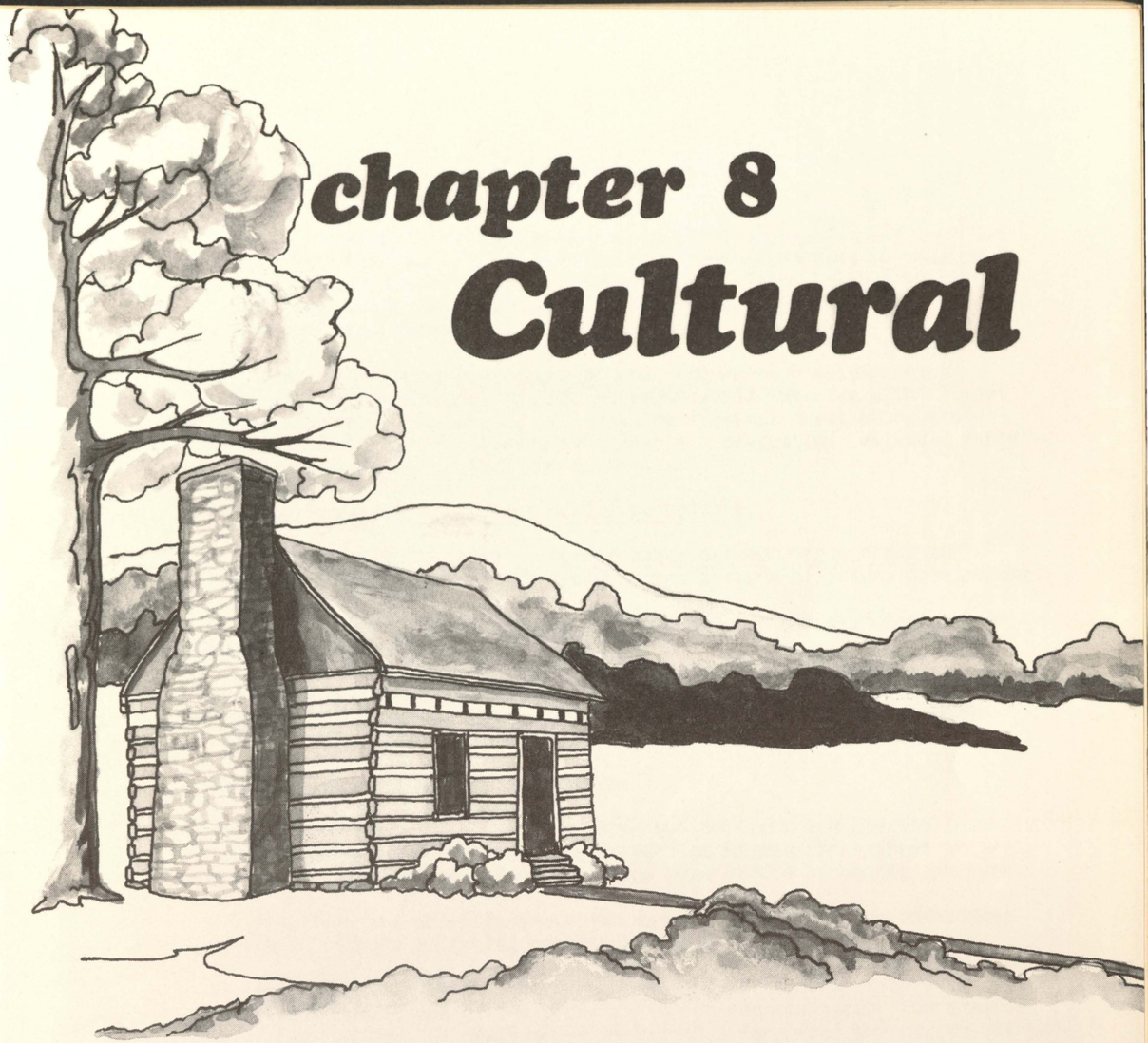
Landscape Inventory

Special attention should be paid to landscape compositional elements. These include:

- Shapes
- Size and Scale
- Textures
- Lighting
- Hue
- Value
- Distance

FIGURE 3

chapter 8
Cultural



CULTURAL AND AESTHETIC RESOURSE PROTECTION AND ACQUISITION

Workshop respondents ranked "better recreation and open space opportunities" with a specific response of "determining needs and attempting to acquire additional open space" as one of their top three goals. There follows as list of four types of land which are recommended to keep in a natural state or at least protected from development.

1) Areas of critical environmental concern, areas with important cultural or natural characteristics that development would interfer with. Types of land include wetlands; flood plains of lakes and streams; areas of unstable soils; steep slopes and ridge tops; rare or valuable ecosystems, valuable forests, and related lands; and historic sites and districts.

2) Areas required for future public recreation.

3) Areas that would serve as buffer zones between urban areas and would have strategic significance in controlling the pattern of future development.

4) Unique and highly productive farmland which might also promote the buffer zone function.

The open space plan recommends such areas to be left free of development. It is recognized that the region lacks the appropriate ordinances to implement a plan.

Some methods of acquiring open space:

1) Purchase by condemnation: Because public funds are usually in short supply for buying open space land, only the properties having the highest priority in accordance with an open space and conservation plan should be bought outright.

2) Donations are often feasible for owners looking for tax advantages or ways in which to signify a lasting contribution to the community.

3) Purchase of easements and less than full development rights is often advisable when heavy public use of the property is not contemplated. For example, the purchase of the residential development rights of a farm that the county wishes to keep in agriculture as part of a green belt should cost considerably less than buying full title to the property. Purchase of easements allowing public fishing, hiking, or horseback riding rights on a piece of privately owned land is another form of this kind of acquisition of open space.

4) Sale-lease backs allow a public agency to acquire title to lands and then rent them out to private tenants for open space uses. Thus the owner of the hypothetical farm might realize some cash from the sale but be able to keep the land in food production without property tax burdens.

5) Contracts: Some areas, such as California, preserve agricultural space by offering farmers and ranchers agricultural preserve contracts, whereby in return for keeping the land in agriculture rather than converting to other uses, the owner receives a tax break in the form of a tax assessment based on the agricultural value of the land rather than full market value.

6) Regulation: More and more jurisdictions are acquiring open space by use of special provisions of their zoning and subdivision ordinances. In zoning, open space is preserved by low density controls (e.g., one unit per sixty acres) are acquired by allowing higher density residential developments or smaller lot sizes in return for open space. In subdivisions, open space is gained through clustering of lots, or by simply requiring either an outright dedication of a certain fixed percent of the land to be subdivided or a cash payment in lieu of dedication.

Sources:

Reilly, William K., The Use of Land: A Citizens' Policy Guide to Urban Growth. New York: Thomas Y. Crowell Co., 1973.

Shomon, Joesph James, Open Land for Urban America, Acquisition, Safekeeping, and Use. Baltimore: The Johns Hopkins Press, 1971.

Solnit, Albert, The Job of the Planning Commissioner, A Guide to Citizen Participation in Local Planning. Berkeley: University Extension, University of California, 1974.

HISTORIC PLACES

1. Lookout Mountain Incline - First built in 1895 and was powered by steam. An electrically powered model was installed at a later date. The incline is the steepest passenger railway in the world.

2. Cravens House - Built in 1856. General Walthalls, a confederate general, had his headquarters stationed here. After the war, the Union General Hooker was stationed at the Cravens House.

3. Chickamauga Military Park - Currently a national park along the sides of Lookout Mountain marks the battleground for the Battle of Lookout Mountain during the Civil War.

4. Little Brown Church - Victorian wood built in early 1900's and still has some original benches and Bible in it.

5. Bartle T. McFarland Memorial Chapel, Mt. Olive - Located in the Hinkle community. Dates back to the 1930's named after B. T. McFarland whose family first explored and developed Lookout Mountain.

6. This Old House, New Salem - Saddlebag cabin wood at least 100 years old, in excellent condition.

7. Plum Nelly - Mixture of cabins and 1950's structures. Logs and wood dates from about 1860.

8. Commissary Building Pay Office - Two-room brick. Only remaining outbuilding which was once part of commissary complex.

9. Rising Fawn Furnace Company Commissary Building - Two-story brick, built about 1882 and is one of the most important monuments in Georgia.

10. Hurt House (President's Home for the Commissary Building) - Two-story brick built about 1882.

11. Cave Springs Methodist Church and Club House - Rectangular, clapboard, pitched roof and the structure itself remains the same.

12. Will Bradford House - Two-story, clapboard Victorian wood built in the late 1800's.

13. Cloverdale House - Two-story, three bayed rock mansion with wooden shingles. Dates from about 1840.

14. Levins House - Victorian gingerbread wood. Built in 1886.

15. Hawkins Cabin - Saddlebag wood built about 1800 by Cherokee Indians.

16. Hester House - Two-story Victorian wood built by Cherokee Indians or early pioneers. Dates from 1832.

17. Mt. Cove House - Two-story rock. Mountain Cove Farm is a show place and one of the most fabulous cattle ranches in the south. It should most definitely, without hesitation, be put on the Register.

18. Byrd House - Victorian, two-story wood. Dates from the 1890's. It is typical Victorian gingerbread.

19. School House - Log cabin. Dates from the 1830's. It now is falling down and sits precariously on the top of a hill right next to the road.

20. Clarkston House - Victorian, two-story wood. About 90 years old. 1885. Note the fancy saw work done of the porch posts.

21. Mt. Cove - Two-story, wood. Part of the property recently purchased by the State. It dates from the 1850's.

22. Hickson House or Mashburn House - Two-story log cabin, wood and log. Has been recently purchased by the State as a part of the Pigeon Mountain Wildlife Reserve.

23. Cedar Grove Methodist Church - Victorian, wood. Dates from the late 1800's. The entrance is particularly beautiful with its depressed arch doorway and sidelights.

24. Underwood House - Two-story, wood and log. The Underwood house is really two separate houses. One a log cabin and the other dating from the 1880's.

25. Hise House - Two-story, wood. Built about 1856. It would be a possible National Register Nomination. Note the huge rock chimneys.

26. Andrews House - Two-story, wood. Built around 1900.

27. Cedar Grove House - Cabin, wood and log. I could not get near the house because the gate is locked. It appears, however, to be a log cabin with several outbuildings.

28. Morgan House - Two-story, brick. Dates from 1860's. Recently a young couple, the Paradises, decided to move into and restore the old house. It is definitely one of a kind. Must be seen to be believed!

29. Bailey-Coulter House - Two-story frame, wood. House was originally one-story and ½.

30. McLemore's Cove Methodist Church Parsonage - Two-story Victorian, wood, board and batten. Built in 1883. The back half of it was a one-room log cabin.

31. Kirkes House - Pre-Civil War, wood. 1850. Has two original beds from the 1850's.

32. Ryan House or Phillips House - Two-story, wood. Supposed to be one of the first frame houses in the cove. 1850's. It was probably built around a log cabin. Note the large size of the chimneys.

33. Shaw House - Two up, two down, rental hall, wood. Dates form the late 1840's or 1850's.

34. McAdoo House - Victorian, two-story, wood. Built in the 1880's by President Harding's nephew, Mr. McAdoo. It remains in its original state including the stained glass windows and is quite beautiful.

35. Miller Brothers Hotel - Hotel, Victorian, wood and brick. Built in the 1880's during the Kensington boom years when the railroad ran from Gadsden, Alabama to Chattanooga, Tennessee.

36. Widow Davis House - Pre-Civil War, two-story, wood and rock. Front part built before the Civil War. Back rock - 1884. General Megley of the Union Army used the house for a headquarters during the Civil War.

37. Maple Grove - Pre-Civil War, wood. Maple Grove is part of a large tract of land purchased recently by the State of Georgia for a part of the Pigeon Mountain Wildlife Management area. Dates from the 1850's.

38. Chief Blue Bird Cabin - Two part log cabin, log and board and batten. The Chief Blue Bird Cabin is quite unusual and rather fantastic in its construction. It is constructed of two separate log cabins and an addition from the 1880's or so.

39. Atwood House - Two-story, wood. One room is log and has hand made brick chimney. The house is very interesting and is a good example of several building periods.

40. Thurman House - Two-story, wood. It is quite beautiful with its trabeated entrance and large hand-made brick chimneys, and it is very unusual to be such a fine house.

41. Thurman House - Origianlly four-room log cabin, log and wood. The original house is log and is four rooms long.

42. Day House - Part log cabin, wood. One-room log here. The building onto the cabin was done in the late 1800's.

43. Wright House - Victorian, wood. Built in 1916. The rooms are 16 ft. square. Ceilings are 9 ft. tall.

44. Mitchell House - Victorian, wood. Built in the late 1800's. The Mitchells have lived there since 1911.

45. Lane Strickland House - Two-story wood. House is very interesting. It has two trabealed entrances built in the 1870's.

46. Iron Foundry Remains - Left from the days when Hemitite was mined in Johnson's Crook and along the slopes of Lookout Mountain.

47. Mentone Hotel - Built in late 1880's. Owned as a retreat and was the lodge for many fox hunters in the region. It was managed as a hotel from 1945 and now houses a collection of pipe organs.

48. Hitching Post - Built in late 1880's. Was the community general store and square dance hall for many years. Now is the site of a delightful ice cream parlor.

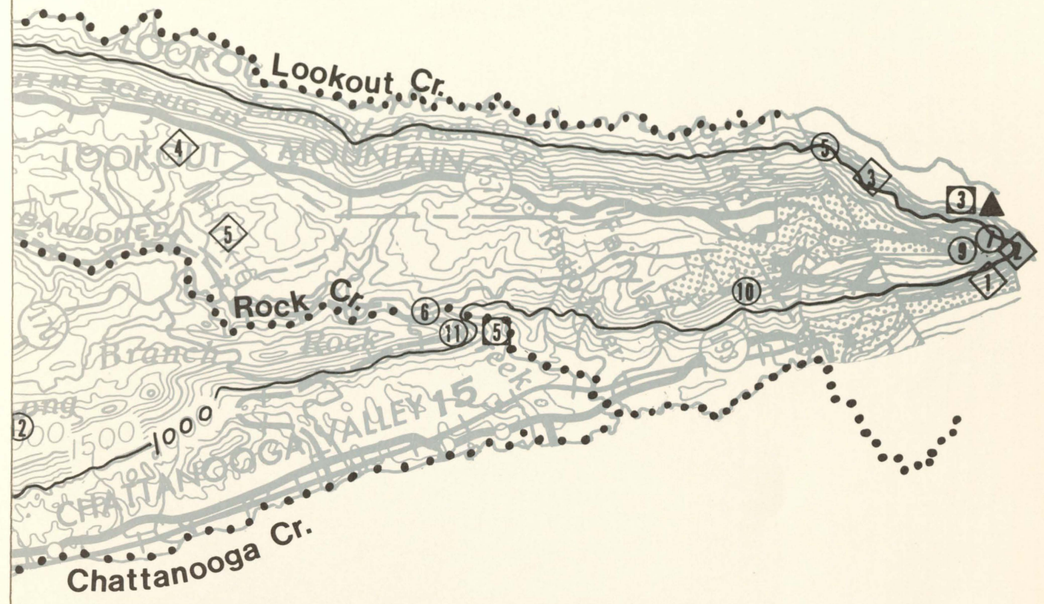
49. St. Joseph's on the Mountain - Epsicopal. Over 100 years old. Was a private residence for many years. Recently converted into a church.

SCENIC AREAS

1. Cloudland Canyon State Park
2. Case Caverns
3. Pigeon Mountain Wildlife Management Area (Rocktown)
4. Walker County Scenic Area (Cloudland Canyon State Park)
5. Sunset Rock
6. Lula Lake and Falls
7. Ruby Falls
8. Sitton Gulch
9. Point Park
10. Rock City
11. Eagle Cliff
12. High Point
13. McWhorter Gulf
14. Dickson Gulf
15. Harrisburg Gulf
16. The Pocket
17. McLemore Cove
18. Anderson Cave Spring
19. Foster Gap
20. Tatum Gap
21. Sulphur Springs Gap
22. Crow Gap
23. Daughtery Gap
24. Moore Gap
25. Round Mountain, Durham

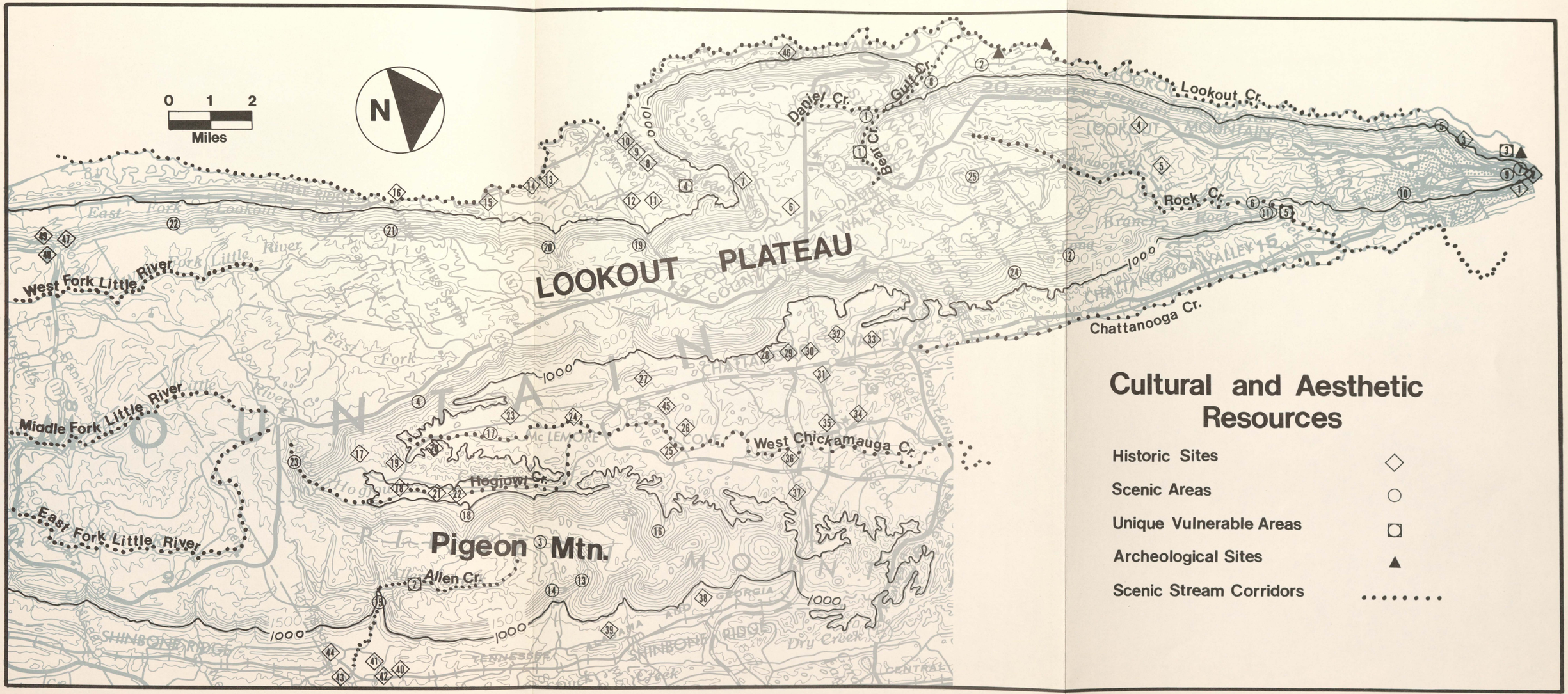
UNIQUE VULNERABLE AREAS

1. Lookout Mountain - Upperside of Cloudland Canyon
2. Allen Creek Watershed
3. Beaver Habitat
4. Johnson's Crook
5. Tannery Gulf



Cultural and Aesthetic Resources

Historic Sites	◇
Scenic Areas	○
Unique Vulnerable Areas	▢
Archeological Sites	▲
Scenic Stream Corridors	.....


0 1 2
Miles
N
LOOKOUT PLATEAU
Pigeon Mtn.
Lookout Cr.
Daniel Cr.
Gulf Cr.
Bear Cr.
Rock Cr.
Chattanooga Cr.
West Fork Little River
Middle Fork Little River
East Fork Little River
West Chickamauga Cr.
Hogjowl Cr.
Allen Cr.
1000
1500
Cultural and Aesthetic Resources
Historic Sites
Scenic Areas
Unique Vulnerable Areas
Archeological Sites
Scenic Stream Corridors

chapter 9
Social

DEMOGRAPHIC AND SERVICE SURVEY

The Community Service sub-committee has obtained a partial demographic survey of the Mountain area and information on different services available to the Mountain's citizens.

The estimated population is 5,361. This includes Dade County, 946; Hamilton County 1,741; and Walker County 2,674. This breaks down into estimated present population in Lookout Mountain, Tennessee at 1,900, and Lookout Mountain, Georgia at 1,450. Between 1970 and 1973, the Tennessee portion gained population while the Georgia portion lost population.

On the Tennessee side of the Mountain there is an abnormal growth in the percentage of elderly and retired persons, and a decrease of those within the middle range. Figures from the 1970 census show this area of the Mountain has 8% fewer young people and 8% more elderly persons than the average for Hamilton County.

Available sources of employment located within the planning area are mostly in non-manufacturing areas of retail trade and service-oriented functions, suggesting that many workers engaged in industry tend to travel off the Mountain each day. Some businesses are oriented toward servicing tourists. The Mountain is not considered a major employment center in any category. In 1973, there were seventeen retail businesses with sales of $1,330,000 in Tennessee. No information is available concerning the number in Dade and Walker counties.

The residents of the Lookout Mountain, Tennessee area comprise an unusually high percentage of professional, business, and civic leaders. Thirty-six percent of the total number of families have an income in excess of $25,000 per annum. It is estimated that the family median income for the rest of the study area is in the range of $5,194 to $8,603.

An unusual contrast between the geographic area of the study also occurs in terms of the educational level of adults over twenty-five. In the Tennessee area the median school years completed are 15.2. The estimated median range for Dade and Walker counties is between 8.8 and 11.2 years.

As noted in the preceding sections, there is a strong correlation between education level and earning capacity.

In order to interpret organizational trends of family units, census information utilizes the number of households headed by a man and wife or a primary index of family stability. This particular family arrangement is considered as providing the best environment for optimum child development, and the proportion of such families is usually an indication of neighborhood-community standards and structure. The 1970 census data shows a decrease in the proportion of families headed by a married man for the part of the study area in Tennessee. This indicates shifts in family structure, usually caused by death or divorce, and does not represent vitality and positive growth factors occurring in family environment. It is estimated that the dynamic quality of population characteristics is relatively stable for the rest of the study area.

All the residents of the Tennessee side of the Mountain are eligible for the Chattanooga-Hamilton County Health Department's services and various clinics. If certain income qualifications are met, programs are available at the Alton Park Community Center.

Home nursing care is available with one nurse serving approximately fifty people, but there are no nursing homes established on the Mountain. Mobile x-ray units and an immunization bus serve the area periodically at various locations. Health education programs are conducted through schools, clubs, churches, organizations, and other agencies with the emphasis placed on education and prevention.

All areas have electrical service on the Mountain. The northern portion has telephone service while the southern portion may not have service in some areas. Tennessee has municipal fire service while Georgia has a volunteer company. CARTA transportation serves both Tennessee and Georgia while the rest of the Mountain does not have public transportation. This is a problem in the rural areas, especially for the elderly and indigent.

A visual review of activities on the Mountain identifies some residential construction activity taking place in the Hinkle and West Brow areas. There is also some residential construction in the vicinity of the two cities. Most of the rest of the Mountain is open space, with some farming in the less hilly regions. The southern portion of the Mountain will probably have few changes due to its remoteness and inaccessibility, while the northern portion will continue to be urbanized with the residents commuting into the Chattanooga urban area for work, shopping, and many services. The best opportunity for further development on the southern part of the Mountain is probably in recreation and tourism related development.

SPECIALIZED SERVICES

The Cherokee Regional Library has bookmobile service to Lookout Mountain in Dade and Walker counties. In addition to home and community stops, the library services the following schools: Fairyland, Gillen, The Mountain School, Seventh-Day Adventist School, and Covenant College upon request. The librarian who has Stay Home for pre-school age children also goes to the Headstart class at Gillen for a story hour each month. If the library does not have specifically needed materials, they try to get them through interlibrary loans.

The Chattanooga Area Literacy Movement has helped a number of illiterate adults in Walker, Dade and Hamilton counties to learn to read and write, spell, and do simple arithmetic. Classes are held twice a week for two hours, and they are taught by specially trained volunteers in small groups. The class sessions can be set up where it is convenient for both teachers and students to meets.

The Tennessee Department of Human Services has twenty-four hour protective service available to abused and neglected children, regardless of family income. They provide homemaker services to indigent, aged, or families receiving aid for dependent children. They handle applications for Food Stamps, Medicaid, foster home services, and adoptions. They also provide for Tennessee residents general casework services.

The Dade County Department of Family and Children Services provides: food stamps, protective services to children and adults, foster home services, adoptions, aid to dependent children, services to unwed mothers, Georgia medicaid certification, nursing home applications, and referral service. The referral service is to vocational rehabilitation, health department for physical, mental and family planning; social security, Team Evaluation, OEO, and the retired senior volunteer program.

The Northwest Georgia E.O.A., Inc. provides assistance to disadvantaged individuals in every community who have difficulty understanding the mechanisms of the State supported dependency agencies. In addition, through the Neighborhood Service Systems, it provides information, referral and services for: education (general, adult, vocational, and special), manpower, health, transportation (limited), social services, housing, emergency clothing, emergency energy referral or counseling, disaster relief, C.F.N.P. Gardens, and Headstart.

The Cooperative Extension Service for Walker County will assist residents with any phase of crop production, gardening, landscaping or homemaking. This is an educational service only, with no funds to purchase materials. The Dade County Extension Office provides the same services in Dade County.

The Walker County Health Department provides: immunizations, family planning services, maternal heath services, hypertension and stroke prevention, early periodic screening diagnosis and treatment for children, vision and hearing screening, mental health, dental health and diabetic screening services; tuberculosis screening and treatment, venereal disease screening and treatment, pap smear for cancer control, nutritional counseling, and an environmental health program.

SOURCES

A Demographic and Service Survey questionnaire was mailed to various regional agencies. The information contained in this Demographic and Service report was compiled from the forms returned by the following agencies.

Greater Chattanooga Area Chamber of Commerce

Chattanooga Area Regional Council of Governments

Chattanooga Hamilton County Regional Planning Commission

Chattanooga Area Literacy Movement, Inc.

Cherokee Regional Library

Cooperative Extension Services - Walker County

Northwest Georgia E.O.A., Inc.

Dade County Department of Family and Children Services

Department of Human Resources - Public Health - Walker County

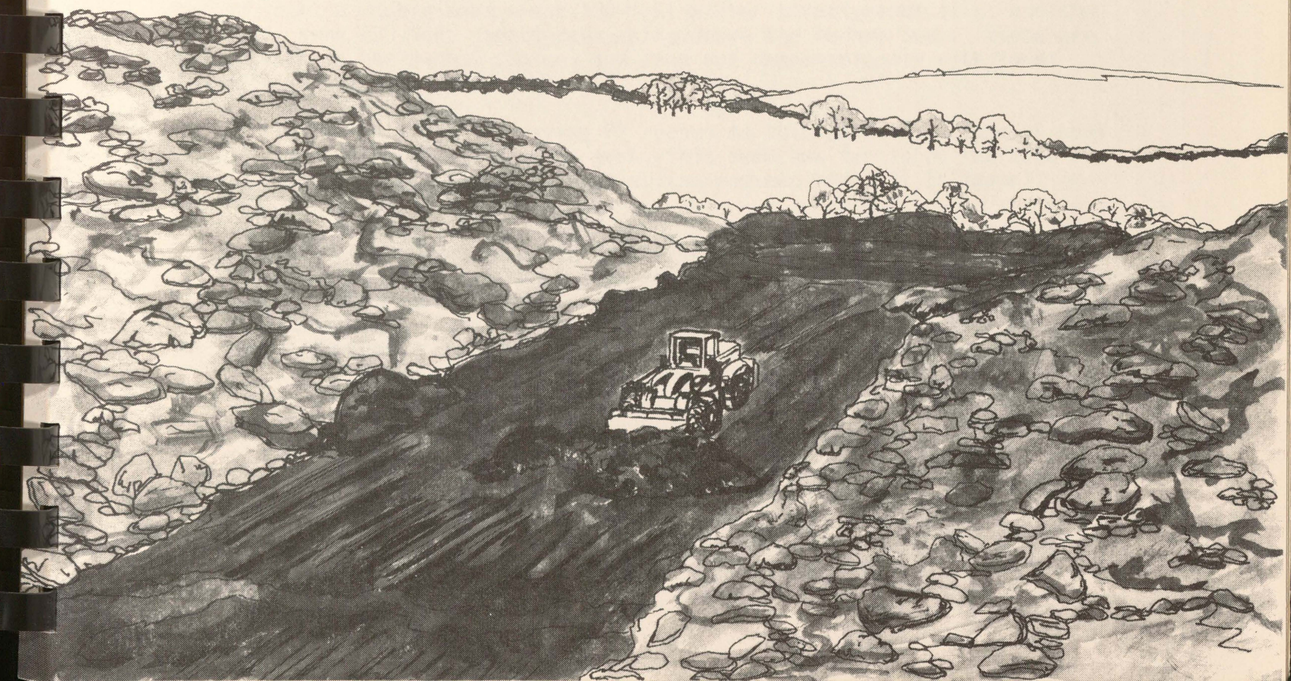
Tennessee Department of Human Services

Community Services of Greater Chattanooga

Electric Power Board of Chattanooga

Tennessee-American Water Company

chapter 10
Economic



MINERAL RESOURCES

COAL

Coal in this area has been mined continuously at one locality or another since a number of years before the Civil War.

In the vicinity of Round Mountain, outcrops of coal were worked to a very limited extent prior to the Civil War, and utilized locally. It was not until 1891, however, that intensive mining operations began to be carried out. The building of the railroad spur in to Durham aided these activities, and from 1892 until the end of the second World War, the mines were in continuous operation. At the turn of the century the mines were producing about 1000 tons per day. Originally, a large part of the coal was converted to coke in ovens at nearby Chickamauga, but the coke ovens fell into disuse, and the coal was shipped as mined. At the present time, these mines at Durham are under consideration for modern strip mining.

Within the Pottsville formation in this area are nine to ten coal seams varying from 4 to 30 inches in thickness. In addition to these, there are innumerable smaller lenses and seamlets of coal which are more local in character and distinctly less persistent than the larger ones. Workable seams tend to be concentrated near the top of the Pottsville formation (See Stratigraphy), and hence are to be found cropping out chiefly in the vicinity of Round Mountain and Durham, which is the central portion of the basin containing the higher strata of the Pottsville.

At Durham, the seams are three in number: Number Four Seam; the Durham seam, a double seam about 180 feet higher stratigraphically; and the "A" Seam, some 120 feet stratigraphically above the Durham Seam. These are all exposed in the Durham region, and crop out concentrically with Round Mountain as a center.

The Durham Seam, averaging 24 inches in thickness, is a type of coal similar to Pocahontas, and in the past, this seam has furnished the bulk of the production, with the result that at the present time, it is largely exhausted.

Number Four Seam, about 180 feet below the Durham seam, averaging 17 to 18 inches in thickness, has a high value for coking and industrial purposes. This seam is reported to underlie some 6000 acres, giving a possible reserve of 9,600,000 tons.* This, together with the smaller "A" Seam, 120 feet above the Durham Seam would seem to assure reserves well into the future.

*From Durham Land Company prospectus.

CLAYS ASSOCIATED WITH COAL

In connection with the coal seams within the Pottsville formation and coextensive with these seams are layers of clay, usually occurring below the coal, but in some instances overlying the coal seam. They may be seen in all localities where the coal is exposed. This clay reanges in thickness from 2 to 4 feet, and in general is rather plastic, light gray to tan, fine-grained clay, which usually contains varying amounts of carbonized plant fossils.

Up until now, no use has been made of these clays. It appears, however, that such clays will burn to buff color, such as would be suitable to the manufacture of face brick or glazed tile of that color, and would warrant careful consideration of this clay for that purpose. In addition to the use for brick manufacturing, this clay could probably be utilized for a variety of other purposes, either with or without the addition of other ingredients.

The development of a use for the clays associated with the coal seams of Dade and Walker counties would serve the additional purpose of furthering the coal industry, inasmuch as large quantities of clay are now handled to no avail in opening drifts into the coal seams. All of this clay is now discarded, but with the development of a use for it, the miner could take out both the coal and the clay, which will not only give him greater working space within the mine, but would mutually lower the cost of removing these two products, and would assure the miner larger profits.

As in the use of coal, the clay could very easily be transported from the mines by truck. Since there are no brick manufacturing plants in the area, this clay would have to be taken to Chattanooga or to other parts of north Georgia for processing, unless a brick plant could be established in the area.

Thus, these clays represent a hitherto undeveloped mineral resource which offers excellent opportunities for further advancement in the mineral industries of Georgia.

These clays seem to possess suitable properties for structural products and possibly for pottery wares such as buff brick, glazed brick, hollow tile, glazed structural tile, floor and wall tile (glazed and unglazed), art pottery (vases, pots, specialties, itc.), jugs, churns and stoneware.

The rich buff colors of these clays, when fired to normal ceramic heats plus their hard, smooth and pleasing textures, would add to the market value of the manufactured products. These clays have good plasticity and, since they pulverize rather easily, they are not difficult to prepare for use.

QUARRY STONE

Flagstone

Flagstone of good quality occurs within the Pottsville formation on both Sand and Lookout Mountains. It consists generally of white to yellow, cross-bedded sandstone, or thin-bedded sandstone, which may be separated from one another into flags ranging from 1 inch to 6 inches in thickness. These flags weather into a deeper yellow or into a reddish color on the surface. Only several localities were noted where any use had been made of this material, but more detailed work with flagstone specifically as the objective would no doubt reveal other sites suitable for the removal of this material.

On Lookout Mountain, the following exposures were seen:

Lot 100, District 11, Northeast corner. A partially quarried, fine-grained, unfossiliferous, white sandstone, with variegated iron hydroxide markings along the bedding planes and through the flags. Evenly bedded, striking N 60° E, and dipping 8° NW. The strata are in beds varying from one-half inch up to about 4 inches, with an average of between one and one-half inches. Portions of this exposure are quite soft, but there is a large percentage hard enough for flagstone purposes.

Lot 66, District 11, East Central part. Cross-bedded sandstones, striking N 30° E and dipping 18° NW, with an exposure of 15 feet above Bear Creek. Medium-grained, well-cemented, solid tan sandstone, which is quite hard and durable. Beds are even and regular with individual thicknesses of from one-half to two inches.

Lot 66, District 11, Center, along Bear Creek. Beds exposed along the stream for a distance of about 20 feet, dipping 10 to 15 degrees obliquely to the stream. Two feet of hard, fine-grained, steel blue to tan flagstone in layers one-quarter to one-half inch in thickness. Beds are very regular

Lot 66, District 11, West Central part along Bear Creek. Exposure on side of hill with a total thickness of 10 to 15 feet exposed. Beds consist of cross-bedded sandstone varying in dip from 8 to 20 degrees, which are hard and quartzitic, medium-grained, tan to brown in color, through stained black on the bedding surfaces. The thickness of the individual beds varies from one-half to two inches, and they occur in very smooth and regular layers.

Limestone

Limestone is present and available in large quantities for quarry purposes. Much of this limestone is cherty and magnesian, and would probably be suitable only as crushed stone or ballast material. Some beds are rather pure limestone and may find use as flux or cement material.

The limestone in this area consists of two formations, the lowermost is the Trenton limestone of Ordovician age, which is found all through the

central part of the Lookout Creek anticline, and recurs on the east side of Lookout Mountain, in the flanks of the anticline of Chattanooga Creek; the uppermost is the Bangor limestone of Mississippian age, which occurs on the flanks of Lookout Mountain, exposed in its entire thickness of 300 to 500 feet.

Trenton Limestone. Since the base of this limestone is not exposed, it is impossible to tell the exact thickness, but it probably is on the order of 300 feet or more thick. The limestone is, in general, a light gray to dark gray, argillaceous and highly calcareous limestone, with occasional layers of cherty and magnesian limestone. The percentage of magnesia is generally low, so that it would be suitable for the manufacture of Portland cement. It may also be used for road material and concrete.

The limestone is exposed in a long, narrow, elliptically shaped outcrop in the center of the Lookout Creek anticline, extending from a point near Wildwood to Cedar Hill, a distance of about 12 miles along U.S. Highway 11. The beds are dipping away from the axis of the Lookout Creek anticline, with average dips of about 12°, although higher local dips are noted. A short distance on either side of the main highway, the Ordovician limestone usually crops out at the base of a series of low hills, and these areas would probably be more suitable for quarry sites. The limestone could be easily obtained, and accessible to highway or railroad anywhere in the area, thus, quarries could be located to suit the operator's convenience.

On the east side of Lookout Mountain, the Ordovician limestone occupies the same relative position with respect to the Chattanooga Creek anticline, and crops out all along the east foot of the mountain. One large quarry is located just north of Cooper Heights, where the limestone was removed for building the highway across Lookout Mountain.

Bangor Limestone. The Bangor limestone here ranges from 300 to 500 feet in thickness, the thicker portions lying near the Tennessee line. The limestone consists of thick-bedded and massive, pure, magnesian, or cherty limestones, exposed along the flank of the mountain. This limestone is useful as road material and ballast, and has been used as a flux in the smelting of the red hematite of that area. The high cherty and magnesian content probably precludes the utilization as cement material or the manufacture of lime products, although some beds are entirely free of these impurities.

Shale

The shales of Dade and Walker counties consist of the Red Mountain formation of Silurian age, which occurs between the Trenton limestone and the Fort Payne chert; the Pennington shales of Mississippian age, which lie directly above the Bangor limestone; and shales which occur in the Pottsville formation, the thickest and most persistent being at the base of that formation. The Chattanooga shales at the base of the Mississippian are of slight thickness, but may have some possible use.

Source:
Sullivan, John K., The Geology of The Sand - Lookout Mountain Area, Northwest Georgia. Atlanta, Georgia Department of Natural Resources, Division of Mines and Geology, 1942.

chapter 11

Suitability

THE REGIONAL ECONOMIC BASE

Range Management

A substantial portion of the Lookout Plateau is cleared to pasture for the raising of beef cattle. Mountain Cove Farm located at the head of McLemore Cove is one of the largest cattle ranches in the Southeast. Many plateau dwellers utilize their acreage in this fashion on a much smaller scale to supplement their annual incomes. Statistics on the role of the range on the Lookout Plateau as it relates to GNP (gross national product) are not available at this time.

Timber Products

The harvesting of merchantable timber on the Lookout Plateau was once an important industry before most of the good stands were cleared and fire destroyed many of the others. Tree farms still play an important role in the regional economic base, but the wood products industry does not have the vibrant air once enjoyed during the 1930's. Scrub and yellow pine are basically used for pulp wood. Hickory, oak, and other hardwoods still supply the saw log market with high quality lumber. Forest areas can be considered as the primary land use within the Lookout Plateau region. The percentage of the land mass that could be considered as income producing property due to the forest products industry is undetermined at this time.

Wildlife Management

The Pigeon Mountain Wildlife Management area, Cloudland Canyon State Park, Chickamauga and Chattanooga National Military Park and DeSoto State Park all have rules and regulations on the treatment of the wildlife within their designated boundaries. In terms of the regional economic base, the Pigeon Mountain Wildlife Management area contributes more to supply and demand relationships than the aforementioned parks.

The Georgia Department of Fish and Game introduces a steady supply of deer, wild turkey, ruffed grouse, and brook trout into this area annually. Managed deer hunts take place yearly on Pigeon Mountain and hunters from all over the country come to take part in the sport. Income is generated from hunting licenses and charges for the number of animals taken. An indirect result is the stimulation of the tourist industry.

The Recreation Resource Base

Recreation is the largest income producing industry on the Lookout Plateau. Both the public and private sectors are well represented. In the private sector such attractions as Rock City, Ruby Falls, Reflection Riding, Fairyland Club, Lookout Mountain Golf Club, The Hitching Post in Mentone, an assortment of summer camps and fishing ponds and lakes supply the people of the region with jobs and revenue. The public sector has a number of interest points; Cloudland Canyon State Park, the Lookout Mountain Incline, Craven's House and DeSoto Falls State Park.

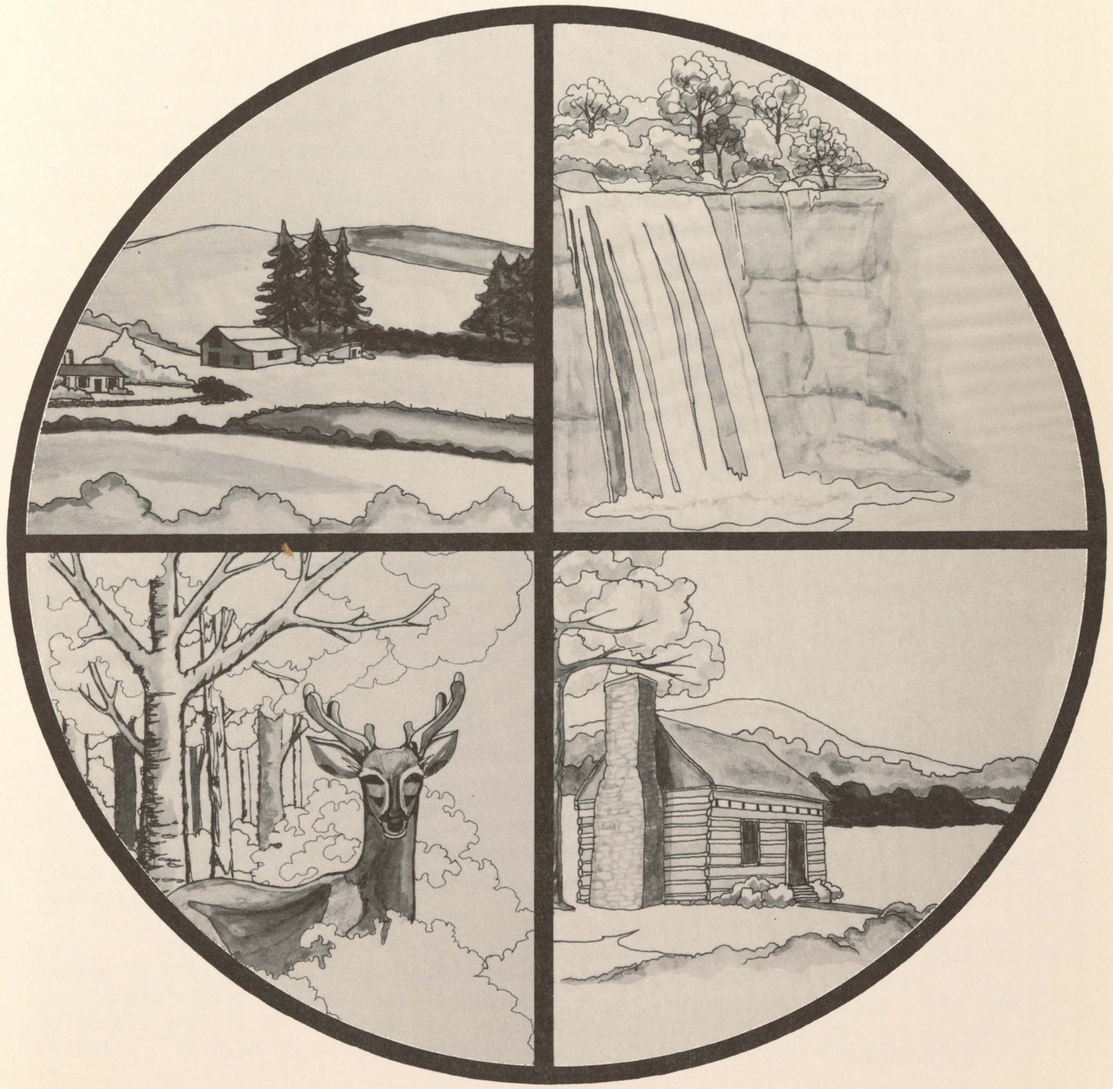
Convenience Commercial Facilities

The "mom and pop" type general store is still very much alive on Lookout Mountain. While driving south one passes numerous small stores that supply the sightseer or mountain dweller with gas and groceries. Such places as "Shorty Moore's", Wilson's Grocery", "Stop and Shop", "The Hitching Post", and "Mountain Top Grocery" are but a few of the convenience commercial facilities on the plateau. Many of these businesses operate independently while others are supplemented by farming endeavors and auto repair garages.

Public and Private Institutions

Primary, elementary, and secondary schools play a key role in the employment of teachers and staff personnel of the mountain. Covenant College is the only institution of higher learning. A variety of churches is available along with community centers. All of these institutions supply jobs and services to the communities.

chapter 11
Suitability



GENERALIZED LAND USE

While natural environmental systems should be a major determinant of desirability of land use, existing patterns of development are an essential element in any planning process. Those elements of community services, such as roads, utilities and existing commercial areas, help determine future land use patterns.

It is not the lack of developable land that presents the present crisis of values, but rather the shortage of certain types of open space around population centers, pollution-free, biologically sensitive areas which play a key role in the environmental health of whole regions, and prime agricultural land. The pressures for growth between now and the year 2000 will place a serious threat on these critical areas as we must build again all that has been built before, duplicating in the next twenty-five years all the homes, schools, hospitals, and office buildings since our country was founded. In addition to the shortage of open space, pollution-free environments, and prime agricultural land, a depressing pattern of land abuse exists. Soil erosion results in billions of tons of soil washed away annually, while a million and a half acres of forest lands and wildlife habitat have been destroyed by strip mining in the United States. Millions of tons of logging debris are left unused to rot in the forests every year. Surely such wasteful patterns of resource use must be reconsidered. One of the more pressing problems in this pattern of improper and uncontrolled use is the narrowness of political boundaries in which development occurs. The Lookout Plateau, encompassing elements of three states and six counties, presents such a problem in which natural areas of statewide or national importance may be lost due to local apathy or inability to act.

One need only look at the unplanned and unrestrained growth in the northeast Georgia mountains to realize the threat to environmentally sensitive areas which are fragile in terms of their capacity for supporting construction and large developments. Steep slopes and easily eroded soils need adequate water drainage and forest cover, however, because of the scarcity of flat sites, developments have all too often been built on deep cuts in too steep slopes, resulting in land slides and destructive sedimentation of the natural stream corridors. Such development has also resulted in increased costs to the original residents in terms of governmental services, sanitation, police and solid waste management.

The loss of prime agriculture land is virtually irreversible as soils uniquely suited for intense cultivation have been judged to represent the highest level of natural productivity. Urbanization often takes the best farmland because it is flat and easy to build on, thus the increase in value associated with development often results in the sale of prime farmland due to increased taxes. Thus, often changes in land use are the result of neither the desire by the land owner nor the best interest of the public, but the difficulty of meeting unrealistically high taxes.

Zoning has proven to be a tool incapable of dealing with land use issues of greater than local impact, as scenic or important natural areas are rarely viewed by localities in terms of their regional importance. The limits of local jurisdiction are simply not adequate to encompass regional ecological systems. The myth of an inexhaustible supply of land has been disspelled and

replaced with a growing public concern that particularly ecologically significant and scenic land is being seriously threatened.

Recognizing land as a finite resource subject to irreversible damage, we must strive to integrate those positive elements of open space, recreation, and scenic amenities into an improved system of decision making and seek to minimize the negative effects of air and water pollution, loss of prime agricultural land, and the excessive costs of sprawl. Decision makers at all levels are challenged by the need to coordinate future growth, as in large part, determined by local land use decisions, with the protection of existing environmental resources on a regional scale.

Social government must develop the necessary institutional capabilities with the aid of informal planning as a tool in their decision making. If they are unable to meet this challange, such issues will be addressed and dealt with at the state and federal levels with an unavoidable loss of autonomy to local decision makers.

RECOMMENDED POLICIES

1) Growth and development should be reasonably correlated with existing land use patterns and existing natural resource opportunities and amenities provided that such uses and patterns are not causing or contributing to existing environmental problems. In assessing whether or not a proposed development is consistent with this recommendation, consideration should be given to: a) capability of the given area to accommodate the proposed development and those related activities, such as roads, transportation, governmental services, water supply, adequate energy and sewage disposal; b) the effect that any proposed development may have on the protection and enhancement of the existing environmental quality of the area. In many areas of the region, growth and development would be of considerable benefit to the existing population and should be encouraged. Attention should be given to creative new developmental concepts which encourage the preservation of environmental quality.

2) Significant natural areas should be protected from development that might cause irreparable damage. Places of outstanding esthetic, historical, or educational value should be protected from development that unreasonably impairs their character and quality. A list of recommended preservation zones accompanies the map.

3) Disposal of sewage is a subject of critical concern. Recognition should be given to newer, innovative methods of waste disposal that may be available or developed to satisfactorily overcome the natural limitations of subsurface disposal. Except when other methods are available and prove satisfactory, developments should avoid steep lands, areas subject to flooding, or where bedrock is close to the surface. Substantial evidence should be provided that onsight sewage disposal, if it is to be used, is feasible by reason of ability of soils to assimilate liquid wastes, and contamination of water sheds or areas that are sources of public or private water supplies will not occur.

4) Development should avoid areas of agricultural, forestry, recreational or mineral extraction potential, if possible, when their preservation for such uses is of significant benefit to the public and its health, safety and welfare.

5) The impact of development of scenic quality, natural beauty, and esthetic values should be considered in evaluating a proposed development. As growth and development continues, we should endeavor to ensure the integrity of the natural landscape by reducing the contrasts of color and materials in relation to their surroundings as well as encouraging more effort and improvement in designs and design detail. The compatibility of natural and man-made features is an important concept in preserving environmental quality.

6) Future development should consider the local community's economic well being, interest, activities and desires. Activities which present short term benefits and long term costs should be discouraged.

7) The community should enocurage the purchase or acquiring of rights in unique natural areas and historic sites so as to provide permanent protection for these most important areas.

8) Significant effort should be made to redress present environmental degredation due to illegal dumping and encourage new methods of recycling and re-use of all types of waste products.

9) The community should be encouraged to limit access points and strip development which impair the usefulness and safety of highways as transportation routes and potentially degrade the visual environment.

10) Industrial development which might degrade air and water quality beyond its present state and does not satisfactorily account to the community for indirect costs should be discouraged.

11) The community should seek to require public projects and any private project requiring a governmental permit to file an environmental impact report as outlined in the following description. (See Environmental Impact Evaluation).

12) The community is encouraged to pursue enabling legislation at the county and state levels to effect any of the above recommendations.

Sources:

Vermont Adopted Interim Land Capability Plan.

ENVIRONMENTAL IMPACT EVALUATION

Due to the sensitive nature of many of the plateau's ecosystems, the report staff recommends the adoption of a plan which would call for the preparation of ENVIRONMENTAL IMPACT REPORTS (EIR) on all state and local projects, except for those involving only planning, which could have a significant effect on the environment. Private activities for which a governmental permit or other entitlements for use is necessary should also be encouraged to comply.

Contents of an adequate Environmental Impact Report (EIR):

1) The project description, using maps, must give a clear idea of where the project is in relation to its surroundings, and what is intended to be done during all phases of the project. The project's objectives should be compared with any plans which various jurisdictions might have for the area, or for meeting the same goals as the project. Comparasions should be made with general planning and goals of regional planning agencies. Mention should be made of relevant plans by more limited purpose agencies such as the pollution control districts, and any local districts (water, sewage, etc.) which may have jurisdiction. For example, a major road upgrading should refer not only to local and county general plans, but to plans that are regional transportation agency.

A public project's objectives should be given in relation to assessment of the need for the project, and how that need was determined. Private project description should mention if it satisfies a public need.

2) The description of the existing environment should be given in sufficient detail that the reader can make an independent evaluation of the environmental factors which could be affected by the project. Emphasis should be given to discussion of regional as well as local setting, and of rare or unique resources of the setting, such as an endangered species habitat, an archeological site, or a unique stand of trees. Related projects should also be covered in order that the cumulative impact of adding this project can be assessed.

3) All of the environmental impacts of all phases of the project described in detail. The method used should be comprehensive and illustrated or described in the EIR so that the readers may judge for themselves whether the correct items were chosen, or relationships drawn. Such a method as described in the U.S. Department of the Interior, Geological Survey Circular 645, "A Procedure for Evaluating Environmental Impact" is recommended.

The description should include secondary as well as primary impacts, long- as well as short- term effects. A road extension might cause immediate impact on a fragile environmental area through sediment run-off from soil disturbance, but residential growth adjacent to the area, made possible by the new road, might in the long run destroy the fragile area as a wildlife refuge or degrade its scenic value.

Information on impacts should be given in qualitative as well as quantitative terms, since some of the impacts EIRs are designed to report on can't be measured, such as scenic value.

4) Any adverse environmental effects which cannot be avoided if the

proposal is implemented. This section is intended to highlight the adverse impacts of the project, and should include discussion in relation to the section on alternatives (see below). If alternatives exist which could minimize or eliminate adverse impacts, reasons should be given why this project was chosen instead of alternatives.

A good EIR would give details in this analysis on physical and biological impacts, impacts on esthetically or culturally valuable surrounding, human health, and standards of living. A good EIR would also describe who would be affected by the impacts mentioned and should discuss objections raised by those parties.

5) Mitigation measures proposed to minimize the impact. This section is designed to point out where design or construction features have been included in the plans to reduce adverse impacts. The report should state why such levels of reduction are considered acceptable. Where alternative mitigation measures are available, reasons for the choices should be given.

Measures described should give some indication of how they realistically can be expected to be carried out. If the statement is made "all effort will be made to preserve the large stand of original hardwoods on the property," a description should be given of how the trees are to be selected and marked so that they will be avoided by construction crews, how roads are to be set up so that compaction over the root structure is avoided, etc.

Potential adverse impacts that may be generated by the mitigation measures recommended should be discussed, and methods described that will minimize any damage.

6) Alternatives to the proposed action is a key part of the EIR, and should include an evaluation of "no project," modifications of the project or portions of it, other types of projects to meet the same objectives, or other alternatives which would reduce adverse impacts, even if they impeed the obtainment of the objectives or cost more. Modifications include changes in location as well as in the structure or function of the project.

Alternatives should not be narrowly defined. The goals of a proposed roadway might be met by an alternative route, by an alternative structural design, or by alternate methods of transportation, such as rapid transit, a bus system over the existing road, etc.

7) The relationship between local, short term uses of man's environment and the maintenance and enhancement of long term productivity, cumulative and long term effects, the closing off of options for the future, and possible risks to health and safety that may show up in the future should be covered. The beneficial aspects of the project are to be weighed to rationalize why it should be done now, rather than saving the option for future alternatives.

8) Any irreversible environmental changes which would be involved in the proposed action should it be implemented. This includes the use of resources required by the project, commitments which would make removal or non-use of the

project unlikely, secondary impacts such as access to previously inaccessible areas, and irreversible damage which might result from an environmental accident associated with the project. If commitments of resources which cannot be reversed are to made, discussion has to be included on why these resources should be used now and in this project.

9) The growth-inducing impact of the proposed action. Growth includes facilitation of population growth either directly or indirectly, and encouragement or facilitation of other projects which would cumulatively or individually affect the environment. This discussion should amount to a singling out of the secondary and future impacts of the project for more specific consideration.

10) Organizations and persons consulted. An EIR should say who actually prepared it and mention everyone, including agencies, organizations, and private individuals consulted during the preparation of the report.

11) References and appendixes. Statements should be documented, sources given as references and detailed information needed to substantiate conclusions should be given as appendixes.

A final EIR should contain:

12) Comments and Responses. This section should contain comments either verbatim or in summary from those agencies responding to the report and citizens' comments should be included as a summary of points made and important questions raised.

What else should be given consideration in evaluating an EIR? In addition to the contents as spelled out above, there are a number of "background" considerations which will help an individual in evaluating or writing an EIR.

1) Objectivity of the report. Proponent agency bias is a major problem with EIR's written "in house." An agency would be unlikely to propose a project unless it felt it was beneficial at least for some of the public. Therefore, the tendency is for the EIR to be a justification and promotion of the project, and for adverse environmental impacts to be minimized.

The more impartial the report prepared by a consulting firm or a private developer, the more acceptable it will be as a neutral review.

2) Thoroughness. The thoroughness of the report has to be assessed in relationship to the impacts covered in the alternatives assessed. One starting point is the information sources in the study. The matrix method as recommended above should help outline the disclosure of a full range of impacts.

3) Personnel. The EIR should indicate not only who took responsibility for the report, but the people who actually did the work, their positions, and backgrounds. As the environment is a complex system, it must be studied in an interdisciplinary fashion, and the only way we have now is either to use individuals who are trained to find, understand and integrate knowledge from a variety of fields, or to assemble a team of experts who can interact on a problem. This goal was spelled out specifically in section 102(2) (A) of the National Environmental

Protection Act:

> All agencies...shall utilize a systematic interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on man's environment.

4) The review process. This process should take place at the local level providing the broadest opportunity for citizen comment and input.

Sources:

Solnit, Albert, The Job of the Planning Commissioner; A Guide to Citizen Participation in Local Planning. University Extension, University of California. Berkeley, c. 1974.

FUTURE LAND USE

Planning for future growth and conservation is a highly complex and, at times, controversial process, and should take into account the perceptions of ethical, legal, economic, ecologic and other value concepts of the community as they affect land use. Concepts of land use and its proper management have changed over time to meet the needs of the existing community. As we constantly amend our legal and economic structures to insure their usefulness, we must insure that our use of the land and natural resources continues to meet our economic, political, and social needs.

Given the availability of the necessary description of natural systems, an inventory of types and intensities of appropriate development should be related directly to the land. Such a system allows for the determination of future human impact. The following inventory recommends the consideration of four land use categories which encompass character descriptions; purposes, policies, and objectives; overall intensity guidelines; and a classification of compatible uses.

The primary uses in the classification of compatible uses list for each designation are those generally considered compatible with the character, purpose, policies, and objectives of each area, so long as they are in keeping with the overall intensity guidelines for such areas. The secondary uses are those which are generally compatible with such an area, depending on their particular location and impact upon nearby uses.

A) Urban areas:

1) Character Description: Urban areas may be defined as varied communities that contain a sizable, permanent population with a diversity of residential and commercial development and a high level of public services and facilities.

2) Purposes, Policies and Objectives: Urban areas will serve as service and growth centers for the region. They will most probably accommodate a large portion of the necessary and natural expansion of the region's housing, commercial, and recreational uses. Building intensities occurring within such areas should allow a high and desirable level of public and institutional services to be economically feasible. Because an urban area is concentrated in character and located where existing development patterns indicate the demand for enviability of service and growth centers, they should be able to accommodate the large portion of growth expected in the region. These areas will continue to provide services and a diversity of land uses that will satisfy the needs of a wide variety of people.

3) Guideline for Overall Intensity of Development: The overall intensity of development for land located in any urban area should not exceed approximately ten dwelling units per acre.

4) Classification of Compatible Uses:

1) single family dwellings
2) open space recreational spaces

3) public and semi-public buildings
4) municipal roads
5) commercial uses
6) tourist accommodations
7) tourist attractions
8) campgrounds
9) golf courses
10) sewage treatment plants
11) major public utility uses

B) Semi-urban areas:

1) Character Description: Moderate intensity use areas where the compability of the natural resources and the anticipated need for future development indicate that relatively intense development, primarily residential in nature, is possible, desirable and suitable. These areas should be primarily located adjacent to existing settlements to provide for residential expansion. They should be located along highways or where existing development has established the character of the area. Those areas identified as moderate intensity use where relatively intense development does not already exist are generally characterized by moderate slopes and should not be in conflict with existing arable farmland.

2) Purposes, Policies and Objectives: Moderate intensity use areas will provide for development opportunities in areas where development will not significantly harm the relatively tolerant physical and biological resources. These areas should be designed to provide for residential expansion and growth to accommodate uses related to residential uses in the vicinity of existing development where community services can most readily and economically be provided. Such growth and services related to it will generally be at less intense levels than in urban areas.

3) Guideline for Overall Intensity of Development: The overall intensity of development for land located in any semi-urban use area should not exceed approximately five dwelling units per acre.

4) Classification of Compatible Uses:

1) single family dwellings
2) individual mobile homes
3) open space recreational uses
4) agricultural uses
5) agricultural use structures
6) forestry uses
7) forestry use structures
8) hunting and fishing cabins and other private club structures
9) game preserves and private parks
10) cemetaries
11) private roads
12) public utility uses
13) accessory uses and structures to any use classified as a compatible use

Secondary uses in semi-urban areas:

1) multiple family dwellings
2) mobile home courts
3) public and semi-public buildings
4) municipal roads
5) agricultural service uses
6) commercial uses
7) tourist accommodations
8) tourist attractions
9) campgrounds
10) group camps
11) golf courses
12) commercial or private airports
13) sawmills, chipping mills, pallet mills, and similar wood use facilities
14) mineral extractions
15) mineral extractions structures
16) water shed management and flood control projects
17) sewage treatment plants
18) major utility uses
19) light industrial uses

C) Rural use areas:

1) Character Description: Rural use areas are those where natural resource limitations and public considerations necessitate fairly stringent development constraints. These areas are characterized by substantial acreages of one or more of the following: fairly shallow soils, relatively severe slopes, significant ecosystems, critical wildlife habitats, fertile farmlands, proximity to scenic vistas or key public lands. In addition, these areas are frequently remote from existing development or are not readily accessible.

Consequently, these areas should be characterized by a low level of development and variety of rural uses that are generally compatible with the protection of the relatively vulnerable natural resources and the preservation of open space. These areas and the resource management areas should preserve the essential open space atmosphere that characterizes the plateau.

2) Purposes, Policies and Objectives: The basic purpose and objective of rural use areas is to provide for and encourage those rural land uses that are consistent and compatible with the relative sensitivity of the area's natural resources and the preservation of open spaces that are essential and basic to the unique character of the plateau. Another objective of rural use areas is to discourage strip development along major corridors in order to enhance the esthetic and economic benefit derived from the existing rural atmosphere along corridors.

Residential development and related development issues should occur on large lots or in relatively small clusters on carefully selected and well designed sites. This will provide for further diversity in residential and related development opportunities.

3) Guideline for Overall Intensity of Development: The overall intensity of development for land located in any rural use area should not exceed approximately one principal building per two acres.

4) Classification of Compatible Uses:

Primary uses in rural areas:

1) single family dwellings
2) individual mobile homes
3) open space recreation uses
4) agricultural uses
5) agricultural use structures
6) forestry uses
7) forestry use structures
8) hunting and fishing cabins and other private club structures
9) game preserves and private parks
10) cemetaries
11) private roads
12) public utility uses
13) accessory uses and structures to any use classified as a compatible use.

Secondary uses in rural areas:

1) multiple family dwellings
2) mobile home courts
3) public and semi-public buildings
4) municipal roads
5) agriculture service uses
6) commercial uses
7) tourist accommodations
8) golf courses
9) campgrounds
10) group camps
11) commercial or private airports
12) sawmill, chipping mills, pallet mills, and similar wook using facilities
13) mineral extractions
14) mineral extraction structures
15) water shed management and flood control projects
16) sewage treatment plants
17) waste disposal areas
18) major public utility uses
19) ligh industrial uses

D) Areas of critical environmental concern:

1) Character Description: Areas of critical environmental concern are those lands where the need to protect, manage and enhance forest, agricultural, recreational and open space resources is of paramount importance because of overriding natural resource and public considerations. Open space uses including forest management, agricultural and recreational activities should be located throughout these areas.

These resource management areas are often characterized by substantial

acreages of one or more of the following: shallow soils, severe slopes, elevations of over 2,000 feet, flood plains, proximity to designated or proposed wildlife or scenic stream corridors, wetlands, critical wildlife habitats or habitats of rare and endangered plant and animal species.

Other resource management areas should include extensive tracts under active forest management that are vital to the wood using industry and necessary to insure its raw material needs.

2) Purposes, Policies and Objectives: The basic purposes and objectives of areas of critical environmental concern are to protect the delicate physical and biological resources, encourage proper and economic management of forest, agriculture, and recreational resources, and preserve the open spaces that are essential and basic to the unique character of the plateau. Another objective of these areas is to prevent strip development along major travel corridors in order to enhance the esthetic and economic benefits derived from the park-like atmosphere along these corridors.

Finally, areas of critical environmental concern will allow for residential development on substantial acreages or in small clusters on carefully selected and well designed sites.

3) Guidelines for Overall Intensity of Development: The overall intensity of development for land located in any resource management area should not exceed approximately one principal building per ten acres.

4) Classification of Compatible Uses:

Primary uses in areas of critical environmental concern:

1) agricultural uses
2) agricultural use structures
3) open space recreation uses
4) forestry uses
5) forestry use structures
6) game preserves and private parks
7) private roads
8) public utility uses
9) hunting and fishing cabins and other private club structures involving less than 500 square feet of floor space
10) accessory uses and structures to any use classified as a compatible use

Secondary uses in resource management areas:

1) single family dwellings
2) hunting and fishing cabins and other private club structures involving 500 square feet or more of floor space
3) campgrounds
4) group camps
5) agricultural service uses
6) sewage treatment plants
7) municipal roads
8) golf courses

Sources:

Adirondack Park Agency, Adirondack Park, Land Use and Development Plan, Ray Brook New York.

APPENDIX

Pigeon Mountain ---------- A
Wild Flowers and Shrubs of the Johnson's Crook Area---------- B
Birds of the Johnson's Crook Area
The Problem of Solid Waste Pollution and
Recommendations for Improvement ---------- C
Workshop Grant Proposal ---------- D

PIGEON MOUNTAIN

17,000 acres of land located on the Lookout Plateau Physiographic Region of Georgia. Pigeon Mountain is the forgotten "arm" of Lookout Mountain. Rising in elevation from 800 feet on the valley floor to 2,200 feet on the top of the plateau, Pigeon Mountain offers a multitude of natural wonders.

Pigeon Mountain received its name from the now extinct Passenger Pigeon which used the mountain as a roosting area. Pigeon Mountain has a "quality of wildness" which is today highly endangered by land speculation and other development.

The major points of interest on Pigeon Mountain include: fossils, caves, waterfalls, cliffs, rock formations, rare plants and a gorge.

Caves. Pigeon Mountain has eight caves, two of which are classified as major caverns in the Eastern United States. Petty John's Cave is first described in 1837 and has 4.5 miles of passageway presently mapped with new passages still being discovered. Petty John's Cave, however, is small beside Ellison's Cave, the third deepest in the United States. Two of its pits rank first and second in depth found anywhere in the world. One called the "Fantastic" is a perpendicular drop of 510 ft. The other, the "Incredible" has a free fall of 440 ft. At present, eight miles of caverns have been explored within Ellison's Cave. This is said to be only a small fraction of the Ellison system which enters near the summit of the mountain and emerges at the foot.

Rock Formations. Of all the geologic fascination of Pigeon Mountain the most notable would have to be Rock Town consisting of approxomately 150 acres. This huge rock outcropping appears like a grotesque version of Disneyland in rock. Rocktown is located in a remote section of Pigeon Mountain and can be reached only by trail. Fossils are found readily on Pigeon Mountain. Blastoid and Bryozoa fossils which are from 280-450 million years old can be found in the Bangor Limestone and Floyd Shale which make up most of Pigeon Mountain.

Waterfalls. Several scenic and picturesque waterfalls are to be found on Pigeon Mountain. The most unusual site to be found is on Allen Creek where the stream cascades down through Harrisburg Gulf, a major gorge on Pigeon Mountain, and then disappears underground in a large crystal clear pool.

Historic Points. The historic points other than those associated with the mountain roll in early settlement and mining include Bluebird Gap named for a Cherokee Chieftan. The gap played an important role in the Civil War. Dougherty Gap, also of Civil War significance, are other points of interest.

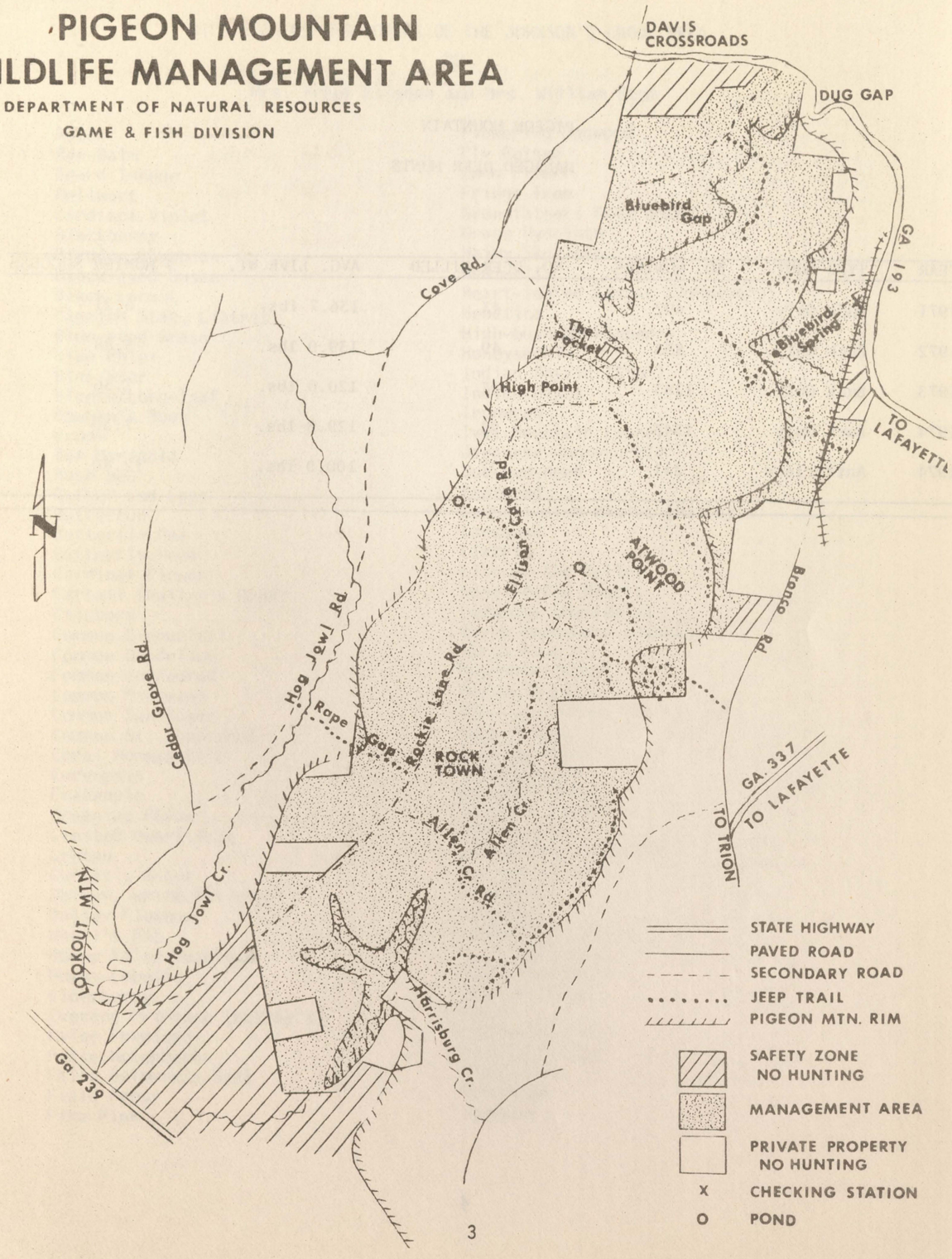
Wild Flowers. The flora of Pigeon Mountain is so varied and profuse that it can truly be referred to as a botanical garden.

The Pocket. The Pocket area on Pigeon Mountain can be described only as a natural amphitheater. Entering the pocket through a narrow gorge one emerges into this natural bowl which the acoustics are incredible.

Scenic Vistas. Pigeon Mountain cannot be described without refferring to the sights the viewer sees from the rim of Pigeon Mountain across McLemore's Cove toward Lookout Mountain or toward Missionary Ridge and Chickamauga Battlefield. A sight few people have ever seen but one which none could forget.

PIGEON MOUNTAIN WILDLIFE MANAGEMENT AREA

DEPARTMENT OF NATURAL RESOURCES
GAME & FISH DIVISION



PIGEON MOUNTAIN

MANAGED DEER HUNTS

YEAR	TYPE HUNT	NO. HUNTERS	NO. DEER KILLED	AVG. LIVE WT.	% HUNTER SUCCESS
1971	Buck Only	692	43	136.7 lbs.	6.21
1972	Buck Only	833	49	139.0 lbs.	5.88
1973	Buck Only	1283	97	120.0 lbs.	7.56
1974	Buck Only	1343	98	129.0 lbs.	7.30
1974	Antlerless	211	27	100.0 lbs.	12.80

WILD FLOWERS AND SCRUBS OF THE JOHNSON'S CROOK AREA

by

Mrs. Frank Baisden and Mrs. William Stem

Aster
Bee-Balm
Beard Tongue
Bellwort
Birdfoot Violet
Blackberry
Bladder Champion
Black-eyed Susan
Black Locust
Blazing Star, Liatris
Blue-eyed Grass
Blue Phlox
Blue Star
Bluets/Long-leaf
Bowman's Root
Broom
Bur Marigold
Bush pea
Butter and Eggs
Buttercup
Butterfly Pea
Butterfly Weed
Cardinal Flower
Cattail (Hailey's Pond)
Chickory
Common Cinquefoil
Common Dandelion
Common Goldenrod
Common Milkweed
Common Sunflower
Common St. Johnswort
Coral Honeysuckle
Coreopsis
Crabapple
Creeping Phlox
Crested Dwarf Iris
Croton
Curtis's Aster
Daisey, white (Ox-eye)
Daisey Fleahaw
Devil's Bit
Downy False Foxglove
Downy Lobelia
Elderberry
Evening Primrose (Hailey's)
False Foxglove
False Helenbare
False Solomon's Seal
Field Pansy
Fire Pink
Flowering Dogwood
Fly Poisen
Foam Flower
Fringe Tree
Grandfathers Grey Beard
Grape Hyacinth
Hairy Skullcap
Heal-all
Heart-leafed Ginger (Johnson's)
Hepatica
High-bush Huckleberry
Honeysuckle
Indian Physic (Stem)
Indian Pipes
Ironweed
Ivy; Mountain Laurel
Japanese Honeysuckle
Joe-pye-Weed
Knotweed
Lance-leafed Violet (Hailey's)
Larkspur
Liatris
Lily of the Valley
Long-leafed Bluets
Ludwigia (Hailey's)
Marsh Pennywort (Johnson's)
Marsh Pink
Mayapple (Stem)
Meadow Parsnip
Moccasin Flower (Hailey's)
Mock Orange
Morning Glory
Mountain Ash
Mountain Holly
Mountain Laurel
Musk Mallow
Narrow-leaf Sunflower
New Jersey Tea
Ninebark
Knotweed
Knodding Trillium
Pall Jewelweed
Partridge Berry
Passion Flower
Phlox
Pinkshell Azalea
Pink Wild bean
Pipsissewa
Poinsetta
Pokeweed

Polygala
Poisen Hemlock
Poisen Ivy
Prostrate Bluets
Purple Cone Flower
Purple Rhododendron
Rabbit Toabacco
Robins-Plantian
Ragweed
Redbud
Red Clover
Red Elderberry
Red-stemmed Aster
Rhododendron
Rose Pink
Sassafras
Sedum
Shadbush
Silky Camellia; Stewardia, rare
Smooth Sumac
Smooth Yellow Violet
Smortweed
Sneezeweed
Solomon's Seal
Sorrel
Sourwood
Sow Thistle
Spanish Bayonet, Yucca
Spiderwort
Spring Beauty
Spiraea
Sunflower
Swamp Rose
Swamp Thistle
Sweet Shrub
Sweetwater Violet
Tall Goldenrod
Thimbleweed
Trailing Arbutus
Trillium (Rafinsque)
Trumpet Creeper
Turk's-Cap Lily
Turtle Head
Umbrella Leaf
Variegated Milkweed
Vasey's Trillium
Venus Looking-Glass
Virginia Creeper
White Clover
White Delphinium (Johnson's)
White Lady Slipper, small, rare (Hailey's)
White Snake Root
Whorled Loosestrife
Whorled Pagonia
Wild Burganot
Wild Cherry
Wild Columbine
Wild Geranium
Wild Golden Glow
Wild Ginger (Johnson's)
Wild Hydrangea
Wild Strawberry
Wind Flower
Witch Hazel
Witherod Haw
Wood Botony
Wood Sorrel
Yellow Fringed Orchid (Cloudland Highway, South of 143)
Yellow Goats Beard
Yellow Lady Slipper (Johnson's)
Yellow Star-Glass

BIRD LIST, JOHNSON CROOK AREA AND ENVIRONS, 1976

by Mrs. Frank Baisden

	N: Nesting		M: Migrating
Pied-billed Grebe	M	Hailey's Pond	once
American Egret	M		once
Canada Geese	M	Johnson's Pond	once
Wood Duck		Stem's Pond	
American Coot		Stem's Pond	
Mallard		Stem's Pond	
Turkey Vulture	N		
Black Vulture	N		
Ruffed Grouse		Stem's Pond	once
Killdeer			
Common Snipe		Johnson's Pond	
Greater Yellowlegs		Johnson's Pond	
Belted Kingfisher		Johnson's Pond	
Mourning Dove			
Yellow-billed Cuckoo	N		
Woodcock		Johnson & Hailey Ponds	
Sharp -sh. Hawk			
Coopers Hawk			
Red-tailed Hawk	N		
Red shoulder Hawk			
Broad-winged Hawk	N		
Rough legged Hawk			
Screech Owl	N		
Gt. Horned Owl	N		
Barred Owl	N.		
Whip-poor-will			
Chuck-wills-Widow			once
Com. Nighthawk			
Com. Flicker			
Pileated Woodpecker	N		
Red-bellied Woodpecker	N		
Red-headed Woodpecker	N		
Hairy Woodpecker	N		
Downy Woodpecker	N		
Yellow-bellied Sapsucker	N		
Eastern Kingbird			
Gt. Crested Flycatcher			
Ea. Phoebe			
Ea. Wood Pewee			
Barn Swallow			
Cliff Swallow			
Tree Swallow			
Purple Martin			
Acadian Flycatcher			once
Traill's Flycatcher			once
Blue Jay			
Common Crow			
Blackcaped Chichadee	N		
Tufted Titmouse			

White Bellied Nutchhatch	N		
Red-breasted Nutchhatch			
House Wren			
Carolina Wren	N		
Winter Wren			
Bobwhite (Quail)	N		
Mockingbird	N		
Brown Thrasher	N		
Towhee	N		
American Robin	N		
Wood Thrush	N		
Hermit Thrush			
Eastern Bluebird	N		
Blue Gray Gnatcatcher	N		
Ruby-throated Kinglet			
Ceder Waxwing			
Loghd. Shrike			
White-eyed Vireo	N		
Yellow-throated Vireo			
Red-eyed Vireo			
Solitary Vireo			
Black & White Warbler			
Prothonotary Warbler			
Worm-eating Warbler	N		
Magnolia Warbler	M		
Blk-throated Green	N		
Cerulean Green		Bear Creek	
Blackburnian Green	M		
Yellow-throated Green	M		
Chestnut-sided Green	N		
Bay-breasted Green	M		
Black-polled Green	M		
Pine Green			
Prairie Green			
Palm Green			
Ovenbird Green	N		
Northern Waterthrush	N		
Yellowbreasted Chat	N		
Com. Yellowthroat	N		
Mourning Warbler			
Hooded Warbler			
Redstart Warbler	M		
Wilson's Warbler	M		
Canada Warbler	M		
Myrtle Warbler	M		
Suttons Warbler	?	Very rare	once
Boblink			
Eastern Meadowlark	N		
Orchard Oriole	N		
Baltimore Oriole			
Com. Grackle	N		
Brown headed Cowbird	N		
Summer Tanager	N		
Scarlet Tanager			
Cardinal	N		

Grosbeak, Rose Brs.		
Blue		
Evening		
Purple Finch		
American Goldfinch	N	
Pine Siskin		
Ruby-throated hummingbird	N	
Indigo Bunting		
Yellow & Dark-eyed Junco (Slate colored)		
Chipping Sparrow		
White Crowned Sparrow		
Yellow Crowned Sparrow		once
Fox Sparrow		
Song Sparrow		
Field Sparrow		
Chimney Swift	N	
American Golden Plover		
etc., etc., etc.		

A rare bat has been located in some of the caves within Johnson's Crook.

THE PROBLEM OF SOLID WASTE POLLUTION AND RECOMMENDATIONS FOR IMPROVEMENT

by

Michael J. McAinsh

Lookout Mountain has many natural attractions which make it one of the South's major scenic vacation meccas. Public and private development affords the casual visitor breathtaking beauty as well as an educational experience, and is tastefully designed for his saftey and convenience.

Visitors come from every part of the country to participate in more specialized pursuits: spelunking, hang-gliding and rock climbing being but a few of these. Many people make the mountain their home.

The caves, roadways, bluffs, streams and forests show the consequences of man's use of the area in large numbers; beauty is cloaked in the scourge of solid waste pollution. Citizens organize community clean-up campaigns throughout the year with varying degrees of success. Many Covenant College students spent a day of community service removing the litter from sections of scenic highway. Troop 29, B.S.A. of the New Salem community, organized a clean-up campaign which, with the help of many volunteers and assistance from Cloudland Canyon State Park, was successful. It was estimated that 95% of the wastes filling the seven pick-ups and one dump truck were beer cans. Much litter has already accumulated in this community in the three months following this latest effort, making another clean-up necessary next year.

A small group of people who enjoy the beauty of Lula Lake assembled there Sunday morning, May 23, to begin the task of cleaning up. The project interested many young people who, not knowledgeable of the project beforehand, nevertheless, asked for trash bags and helped out. This group concentrated mainly on the areas used for recreation and paths leading to these areas from the parking lot. This campaign did not accomplish its primary goal of cleaning up all the litter; the task being too immense for the small group that tackled it. It did serve as a way of demonstrating the need for an effective anti-litter program. One pick-up truck load of litter was collected. There are plans to re-organize the clean-up for the fall with the help of the Sierra Club. Walker County Commissioner Roy Parrish saw to the task of removing the wastes to the county landfill.

What can be done about the waste problem? One solution could be legislation outlawing all but deposit bottles and aluminum cans. The author was able to make $18 for about five hours total effort collecting aluminum cans and soft drink bottles. The monetary reward for this effort would have been greater had every bottle and can been recyclible. Groups could help clean their communities and raise funds for their organizations too. Perhaps recycling centers could be placed in the various communities with the funds generated from the centers to be used in the communities in which they are located.

On the other hand, individuals may be encouraged to pick up litter from the roadways by giving the monetary reward directly to them. Either way, the community should not have to rely on volunteer help in staffing centers. It is feasible that a staff could be hired if all but aluminum cans and deposit bottles were banned.

Reynolds Aluminum has shown its interest in the recycling of aluminum and will help in establishing collection centers in interested communities. Aluminum waste currently brings $ .15 a pound in Chattanooga area recycling centers. Members of the West Brow Community Center are currently formulating plans for the recycling of glass, paper and aluminum in their community.

Finally, all interested parties can appeal to the pride of their fellow individuals to clean up their garbage without pointing an accusing finger at anyone in particular. As always, example is a good teacher.

COMMUNITY WORKSHOPS

ON THE

ENVIRONMENTAL IMPLICATIONS

OF ALTERNATIVE

LAND USE DECISIONS

Mountain School Foundation
1308 Lula Lake Road
Lookout Mountain, Ga. 37350
Phone: 404-831-7255
January 17, 1975

ABSTRACT

The Lookout Plateau needs a program to educate its inhabitants on issues concerning environmental quality and land use alternatives. A series of workshops will be created to involve the community in issues affecting the area. These workshops will be aimed at three primary target groups, student, adult, and professional decisions makers. An emphasis will be placed on defining the existing resources and what the environmental impacts will be, both positive and negative, from proposed projects.

Workshops will include sessions on environmental education dealing with the physical, social, and economic aspects of enrionmental quality. An analysis and community awareness workshop will be held to survey the effects of a strip mining operation scheduled to begin on the Lookout Plateau spring 1975.

The Mountain School students will assist in teaching the workshops and help collect data and material that will be used in reports.

Why is it necessary for these workshops to be formed? The Lookout Plateau is a unique geological peneplain with abundant natural and scenic resources. Uncontrolled growth catalysized by industries such as coal mining and second home recreational development could result in urban sprawl and poorly planned commercial centers which would destroy the unique character of the region. The public need to be aware of how upcoming development is going to affect their land and surrounding environment. Community workshops would provide the opportunity to let the public have a voice as to what uses

various areas should be put for future development of their community.

After student and adult workshops have been completed, a workshop for decision makers on the federal, state, regional and local levels will be held. The content of the workshop will be to evaluate what the students and adults have concluded in the former workshops. With this information available, the decision makers will have a better idea of how the public would like their region planned, therefore providing guidelines for establishing policy coherent with community goals and objectives.

A detailed report describing the results of the workshops will be sent to all agencies having jurisdiction on the Lookout Plateau. In case of key agencies who did not attend the professional workshop, the report will be personally presented by the director and assistants of the program.

In the short run, the workshops will help familiarize the community as to the environmental implications of alternative land uses and create a better understanding of the complex interrelationship between human activity and natural ecosystems. In the long run, such a program will serve as the foundation for a comprehensive participatory environmental planning association with the role of abating environmental degradation and emphasizing environmental enhancement through the planning and design process.

The objective of the Mountain School workshops in environmental education is to give the citizens in the area who are being affected by land use decisions a voice in how their region will be altered. An approach using field trips and classroom audio-visual facilities will aide in conducting

workshops. The program will be operated by qualified volunteers in the community and staff members from the Mountain School. The facilities of the Mountain School will be available to help with the workshops, but all funding will come from the minigrant applied for at this time.

RATIONALE

Unique features of the Lookout Mountain plateau

Lookout Mountain is a finger-like plateau in the southern-most reaches of Appalachia, extending from southeastern Tennessee through northwestern Georgia, and into northeastern Alabama. Its slopes rise steadily to a sandstone cap which is exposed sharply as a palisade up to three hundred feet in height. Sandstone parent material gives it light, thin, acidic soil which is characteristically different from that of the surrounding valleys. Its winter temperatures average six degrees fahrenheit lower than in the valleys. Thus, physical differences from its surroundings make Lookout Mountain a distinct region.

The Lookout plateau has been sparsely inhabited. The land has been only slightly disturbed, thus the scenic value on the mountain is high and the panoramic views from its escarpments are exceptionally impressive. The mountain is rich in wildlife and water is abundant.

The plateau enjoys a rich historic heritage. Chief John Ross of the Cherokee nation lived in the area which witnessed the removal of the Cherokees to the west. Lookout Mountain and environs were the scene of major Civil War battles for the control of the key rail center of Chattanooga. The last battle of the American Revolution was also fought upon its slopes. The Lookout Mountain region is physically separated from the rapidly growing urbanized area which surrounds it. It is also a plateau whose geographic integrity is split by numerous political boundaries.

The Mountain population

Among its inhabitants is the characteristic southern mountain native, generally of fifth-generation Scotch-Irish descent. This group is composed primarily of farmers and skilled laborers, many of whom have learned their skills as a part of mountain family traditions, and others whose occupations are results of on-the-job training. Another segment of the mountain population is a professional group primarily located on the northern most tip of the mountain. They compose approximately 50% of the population while occupying a disproportionately small percent of the land mass. Many professions are represented in this group including business executives, doctors, lawyers, educators, salesman, etc. Professional artists, writers, and craftsmen, located primarily in the rural areas, have also been drawn to this unique environmental setting of the high plateau with its preserved natural scenery still relatively free of environmental pollution.

The problems of plateau region

Most of Lookout Mountain is an economically depressed area. Farming is minimal and most workers go off the mountain to their jobs. There is a gradual diminishing of the mountain populus as people leave permanently for jobs in metropolitan areas, thus weakening further the dwindling sense of community.

The Mountain and its inhabitants are faced with imminent change. During the spring of 1975 a strip coal mining operation, which threatens adverse effects both physically and economically to the mountain and its

inhabitants, is scheduled to commence.

Growth occurring now is random and gives rise to misuse of sensitive areas and arable farm land. Second home development which has become a detrimental reality in other parts of the south also threatens misuse of the land on the Mountain and would place on the county governments a burden not wholly covered by revenues received from such developments. Outlays to finance facilities for such developments would add insult to injury on the mountain which presently fails to receive a fair share of services from its various governmental bodies.

The Mountain School Workshop Program

Lookout Mountain's problems are effectively contained by its physical boundaries. This isolation allows for focus on local problems apart from those of surrounding areas; thus, Lookout Mountain is an excellent control location for pilot projects.

The Pilot Program as proposed through the Mountain School Workshop Program is designed to promote the individual's awareness of the physical social and economic implications of his or her environment.

Target Groups

Students, as the rising decision makers and future family providers, need the opportunity now to learn to make decisions for tomorrow in a rapidly changing environment.

Adults as providers today, as current decision makers for family and property, and as members of the electorate need education programs to help

them deal in an enlightened manner with today's environmental problems. Elected officials as current decision makers in government frequently need a greater awareness of local problems and a broader base of knowledge with which to deal with new environmental impacts. The goal of this workshop is to educate the professional to deal more effectively with community problems.

GOALS AND OBJECTIVES

Short range goals include:

Educate the community about the environment in which they live.

Create a public awareness of the implications of growth and development in the Lookout Mountain region.

Identify community goals and priorities and communicate them to the appropriate decision makers.

Long range goals include:

Protection and enhancement of environmental quality.

Evolution of a participatory regional planning association.

Specific objectives which this program is directed toward accomplishing include:

The documentation of existing environmental conditions through the inventorying of physical, social, and economic factors.

Creation of participatory planning tools to aid in the effectuation of community goals and priorities.

APPROACH

Through the use of a Community Action Planning Workbook developed for this program, a series of workshops has been outlined to accomplish the above objectives.

The curriculum developed for the student workshops examines existing natural, social, and economic factors of the Lookout Plateau. The information collected will serve as a resource base for the community planning process.

The adult segments of the workshop program will seek to identify community goals and translate them into a specific Community Action Program aimed at informing decision makers of community priorities.

The professional workshop is the means of bringing these goals and priorities to the attention of elected and appointed officials and thus help them see the mountain as a community artificially separated by three states and six counties.

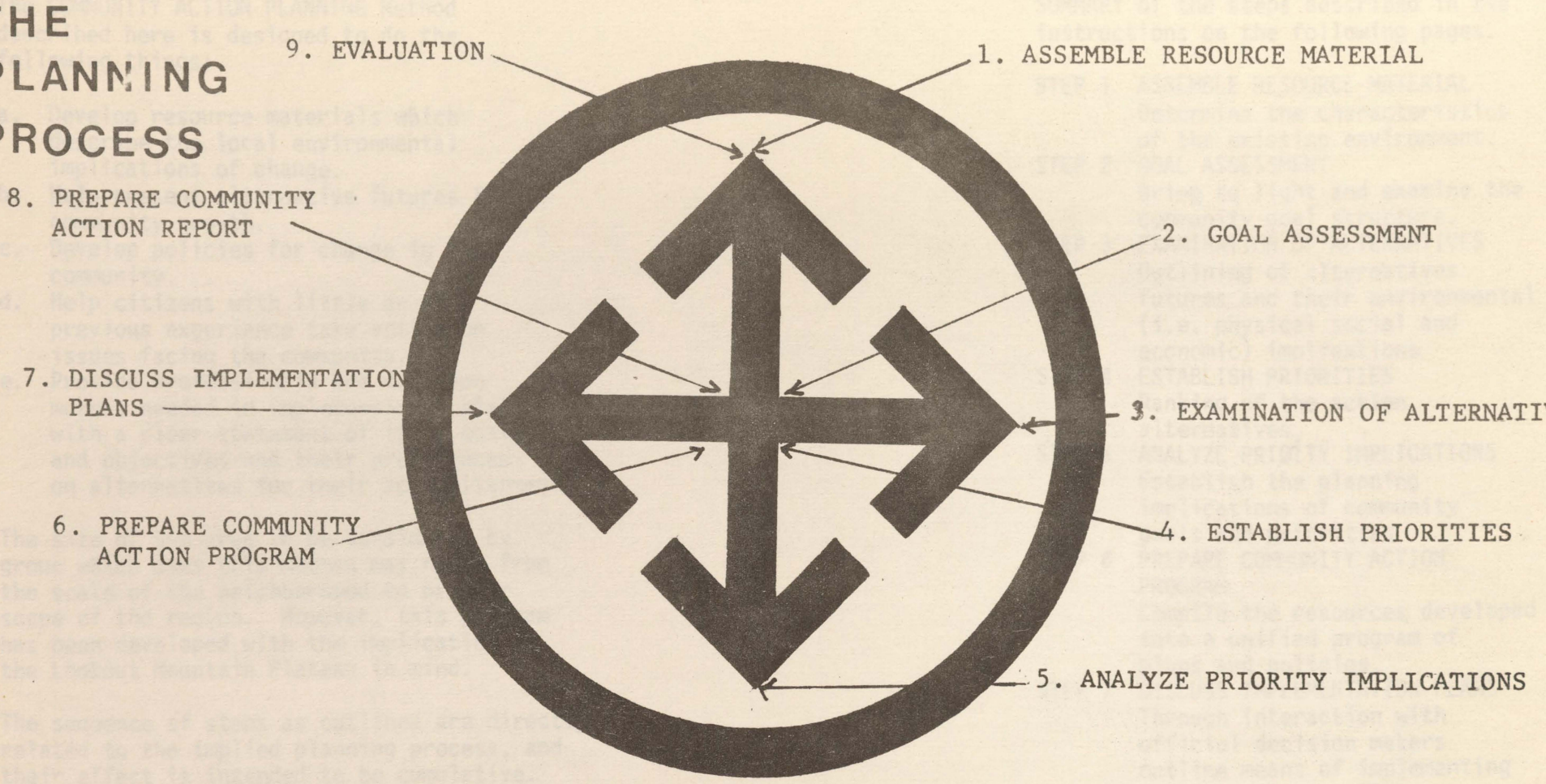
It is intended that the Community Action Planning Workbook and the workshop structure will serve as a model for community participation in land use decisions and the planning process. Its form is applicable not only to regions dissected by diverse jurisdictional boundaries but also to communities of neighborhood scale.

The evaluation, an important part of the program, will employ the use of questionnaires in addition to staff critiques. An Environmental Awareness Survey will be filled out by the participants, including students, adults and professionals, at the beginning of their respective workshop or workshops and again at their conclusion as a control method. In addition

the professional decision makers will be requested to evaluate the program and make suggestions as to how it might be improved. Finally the director and staff will assemble a written critique of both the form and content of the workshop format and an evaluation of the effectiveness of the program in accomplishing its objectives.

The workshops will be conducted primarily by volunteers and staff from the Mountain School Project. Contributions will be made by numerous local, state, regional and federal professionals in relevant fields (see appendix for flow chart). Local farms and woodlands have been made available for the study of the physical environment and considerable volunteer time has been employed in the compilation of the program and this grant proposal.

THE PLANNING PROCESS



COMMUNITY WORKBOOK

The COMMUNITY ACTION PLANNING Method described here is designed to do the following things:

a. Develop resource materials which describe the local environmental implications of change.
b. Help present alternative futures for community growth.
c. Develop policies for change in the community.
d. Help citizens with little or no previous experience take action on issues facing the community.
e. Provide professionals and decision makers needed in implementing a plan with a clear statement of local goals and objectives and their preferences on alternatives for their accomplishment.

The size of the area to be considered by group which uses this method may range from the scale of the neighborhood to broader scope of the region. However, this program has been developed with the implication of the Lookout Mountain Plateau in mind.

The sequence of steps as outlined are directly related to the implied planning process, and their effect is intended to be cumulative.

Each page of the instructions has three columns. The left hand column describes the process to be followed by the group. The right hand column describes the materials the group will need to carry out each action. The middle column shows what the materials look like.

SUMMARY of the steps described in the instructions on the following pages.

STEP 1 ASSEMBLE RESOURCE MATERIAL
Determine the characteristics of the existing environment.

STEP 2 GOAL ASSESSMENT
Bring to light and examine the community goal structure.

STEP 3 EXAMINATION OF ALTERNATIVES
Outlining of alternatives futures and their environmental (i.e. physical social and economic) implications

STEP 4 ESTABLISH PRIORITIES
Ranking of the action alternatives

STEP 5 ANALYZE PRIORITY IMPLICATIONS
Establish the planning implications of community goals and priorities

STEP 6 PREPARE COMMUNITY ACTION PROGRAM
Compile the resources developed into a unified program of plans and policies.

STEP 7 DISCUSS IMPLEMENTATION PLANS
Through interaction with official decision makers outline means of implementing Community Action Plan.

STEP 8 PREPARE COMMUNITY ACTION REPORT
Preparation of an information package to be disseminated to local officials and serve as the base for a regional planning association.

STEP 9 EVALUATION

STEP 1. ASSEMBLE RESOURCE MATERIAL

Determine characteristics of existing environment.

Why environmental analysis?

In order to formulate comprehensive land use plan for the region, a detailed inventory of the existing resource base from a physical, social, and economic point of view is imperative. It would be impossible to plan for an area before knowing what is really there.

WORKSHOP #1 - Vegetation and Water

Vegetation units play an important role in relating activities on the land. Certain species of flora are rare and endangered and such a workshop will help to define where these species are, then planning can be made for their protection. Certain stands of trees are valuable as merchantable timber while others help to define zones of preservation.

Hydrology, or water, also has a bearing on relating activities on the land. Knowing where unpolluted streams and springs are located can serve as a potable water resource. Water also plays an important role in developing a system for site drainage when considering development of the land. From a holistic viewpoint, water and vegetation play an important role in the maintenance of ecosystems.



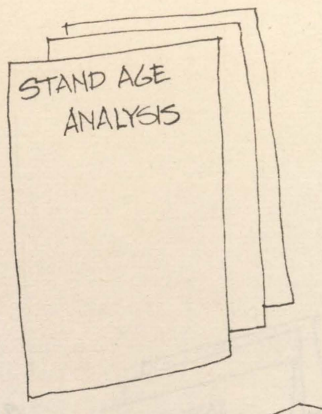
Workshop #1 - continued

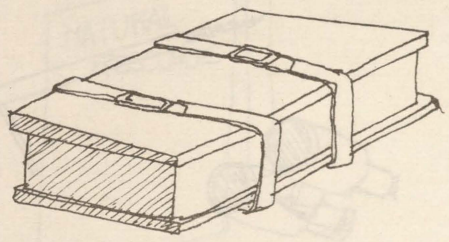
1. Discussion of flora on Lookout Plateau
2. Field observation and collection of plant materials.
3. Lunch
4. Stand age analysis - trees.
5. Creek hike - Aquatic Ecosystems study

WORKSHOP #2 - Geology, Soils, Wildlife

The geologic processes that have affected the type of rock below the surface of the soil will determine the adequacy of a site for development. In turn, the type of soil that exists in an area will be a direct product of the rock type existing around it. Also, soil characteristics are influenced by the type of vegetation that grows on it. Climatic conditions also have an effect on soils.

Wildlife are extremely important in the maintenance of ecosystems. If one predator-prey relationship is disturbed population dynamics can be drastically effected. An example of this is the case of the eradication of the Mountain Lion. As a result, deer populations have increased to the point so as to be a nuisance to people in certain areas. When planning an area an inventory of wildlife is important so as to protect rare, and endangered, species. Knowing what kinds of animals are present will allow for sound wildlife management practices.





RESOURCE REQUIREMENTS

1. Print out of regional flora.
2. Plant press, flora notebooks.
3. Food for lunch and snacks.
4. Copies of stand age analysis worksheet. Increment borers.
5. Thermometers, Sieves, Drift Nets

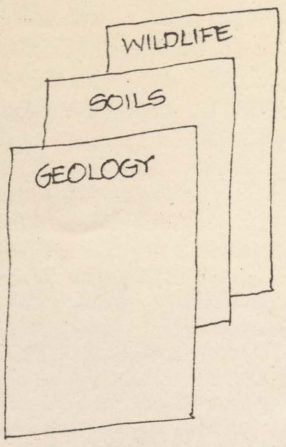
Workshop #2 - continued

1. Discussion of Geology, soils, and wildlife on Lookout Plateau.

2. Field discussion, testing and collection of soil samples.

3. Field discussion and collection of rock types.

4. Nature walk, wildlife discussion and wildlife inventory.



RESOURCE REQUIREMENTS

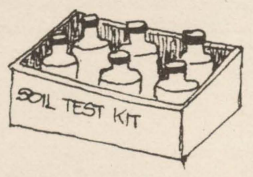
1. Print out of local geology, soils and wildlife maps.

2. Food for lunch and snacks.

3. Soil test kits, soil core borer, soil collection tube.

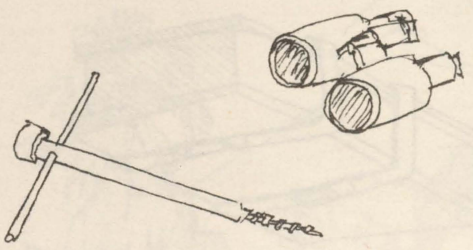
4. Brunton compass, hydrochloric acid and scratch kit.

5. Binoculars, butterfly net, camera.



WORKSHOP #3 - Social Relevance of Lookout Plateau.

Getting a handle on the economic and social institutions of the plateau will be necessary to plan for future activities in the region. An inventory of existing goods produced and services offered will show what additional goods and services could be made available.



1. Discussion of the meaning of social institutions in the community. Explanation of taxes and importance of community goods and services.

2. Formation of groups to inventory existing institutions.

3. Lunch

RESOURCE REQUIREMENTS

1. Print out of local institutions and their role in community life.

2. Checklists.

3. Food for lunch and snacks.

4. Camera, maps

5. Workbook

Workshop #3 - continued

4. Groups break up for field trip to inventory social and economic resource base. Photography, mapping, explaination.

5. Compilation of data collected in the field.

WORKSHOP #4 - Division of region into spatial units. Evaluation of environmental corridors and open space systems.

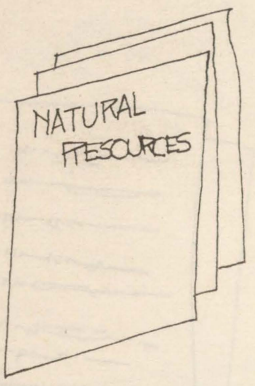
In looking at the Mountain Plateau, zones of vulnerability, preservation, and conservation need to be identified. Areas of virgin timber, unique rock outcroppings, waterfalls, and lakes are among many of the amenities that need to be inventoried. This information is necessary in formulating a comprehensive land use plan.

1. Discussion of the conservation movement in the U.S.

2. Division of region into spatial units-mapping. Specific areas on the Lookout Plateau that can be defined as high environmental amenities will be defined at this time.

3. Lunch

4. Field trip to potential areas of preservation-Lula Lake Falls, Round Mtn. Eagle Cliff, Cloudland Canyon, etc.



RESOURCE REQUIREMENTS

1. Printout on conservation of natural resources.

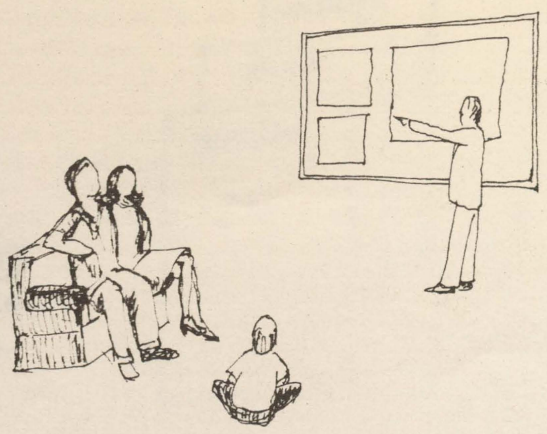
2. Maps.

3. Food for lunch and snacks.

4. Camera, Binoculars.

STEP 2. GOAL ASSESSMENT

Bring to light and examine the community goal structure.



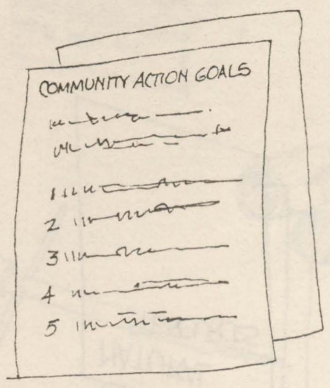
WHAT IS A GOAL STRUCTURE?

Every community however diverse possesses a set of goals and objectives, be they better education for the children, more open space for recreation, or better jobs. For the most part these goals are implicit and unexpressed. This is an extremely important step in the planning process and the structure from which alternatives are generated.

WORKSHOP #5

In order to establish an informed goal structure an understanding of the communities physical, social, and economic environment is a prerequisite.

1. ENVIRONMENTAL AWARENESS QUESTIONNAIRE. The first adult workshop will begin with the filling out of a questionnaire rating environmental awareness to be used in the evaluation process.
2. ENVIRONMENTAL ASSESSMENT PRESENTATION. Upon completion of the questionnaire an exposition of the environmental assessment carried out in the student workshops. The student will take the lead in explaining the various environmental factors which they have investigated and their interrelationships.
3. REVIEW OF SAMPLE GOALS. In the appendix is a survey of Community Action Goals which various planning groups have considered to be important.



RESOURCE REQUIREMENTS

1. The materials collected and assembled by the students will form the basis for the environmental assessment presentation.
2. Questionnaire on environmental awareness.
3. Survey of Community Action Goals.

3. FINAL RANKING. This segment allows for the reassessment of priorities in light of unexpected conflicts.

THE RESULTS OF THIS INCLUDE

1. A better understanding of the problem of conflicting goals and priorities and alternative resolutions.
2. A statement of community priorities which will form the preparation of the community action program.



STEP 3. EXAMINATION OF ALTERNATIVES.

Outline of alternative futures and their environmental (i.e. physical, social, and economic) implications.

WHAT ARE THE IMPACTS OF ALTERNATIVES?

Each alternative discussed will create unique impacts on the life of the community and its individuals. By examining these various impacts, community members will be better able to choose those alternatives which most closely suit their goals and capabilities.

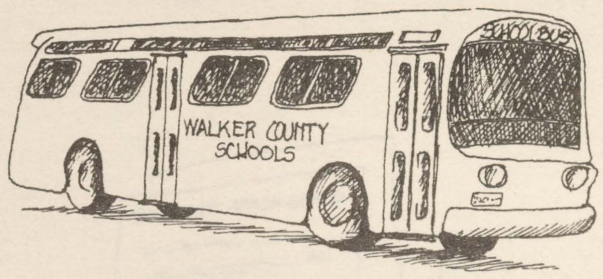
WORKSHOP #6

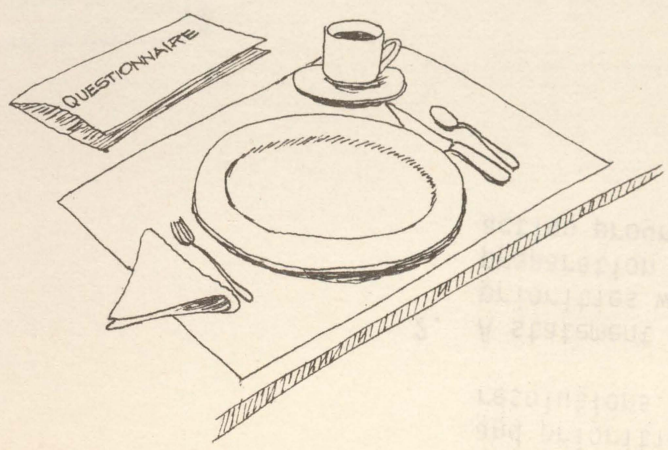
So that the workshop participants might better understand the far ranging impacts of decisions on alternatives, the issue of strip coal mining planned to commence shortly in the community will be examined in depth and its impact on the life of the community discussed. This will serve as as introduction to the appraisal of other specific alternatives.

1. EXAMINATION OF LOCAL MINED AREAS. This segment of the workshop will focus on field trip to the site of the Durham mines and will involve the examination of old spoil piles and the attempts of nature to reclaim them. Soil profiles revealing the mountain's sandstone cap overlying shale grading into coal will be studied.

RESOURCE REQUIREMENTS

1. Transportation to the mine areas (to be provided by Walker County School Board).
2. Food for lunch.
3. 20'x30' tent for outdoor workshop (use of which has has been promised by local corporation)





2. LUNCH
3. DISCUSSION OF MINING IMPACTS. Impacts of surface mining will be discussed and the advantages of proper reclamation will be detailed.
4. EXAMINATION OF OUTLINED ALTERNATIVES. The list compiled in Workshop #5 will be discussed as to their impact on the life of the community in terms of the broader implications of environmental quality. These impacts will be broken down into their physical, social, and economic componants and ranked. A general assessment will then be made as a basis for the establishment of priorities.

THE RESULTS OF THIS STEP INCLUDE:

1. A better understanding of the many impacts of a single action in the environment.
2. An assessment of the impact of the outlined alternatives.

STEP 4. ESTABLISHMENT OF PRIORITIES

Ranking of the alternative futures.

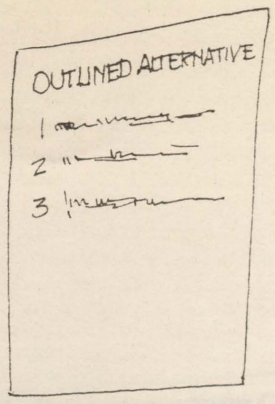
WHAT ARE ALTERNATIVE FUTURES:

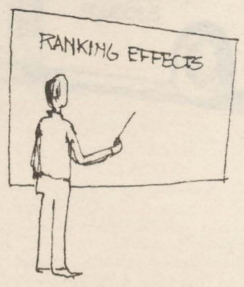
Alternative futures are specific responses to the goal structures established by the community. They propose constructive alternatives to meet the needs and objectives of the citizenry such as a new secondary school to meet the expanding educational requirements of the community.

WORKSHOP #7

This workshop is organized to establish a priority structure for the outlined alternatives and examine their interrelationships and effects on decision making.

1. INITIAL RANKING. In order to better understand the way in which a priority structure affects the future development of the community and the individual alternatives within the structure, a preliminary ranking is carried out by the workshop participants.
2. DISCUSSION OF EFFECTS OF RANKING. It is necessary to examine the implications of establishing priorities on the decision making process. For example, the potential conflicts between the goals of maintaining arable farm land and/or open-space and the alternatives of development.





RESOURCE REQUIREMENTS

The list of outlined alternatives and their possible impacts.

A space conducive to discussion and a large blackboard.

STEP 5. ANALYZE PRIORITY IMPLICATIONS

Establish the planning implications of community goals and priorities.

HOW ARE PLANNING IMPLICATIONS EXPRESSED?

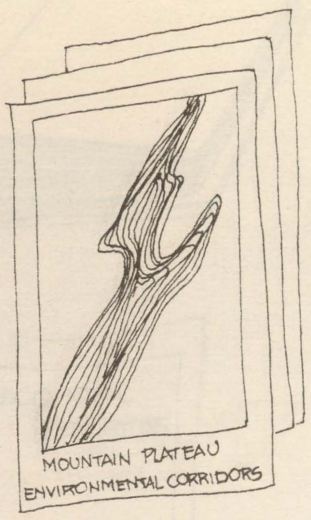
Through the use of graphic and verbally descriptive material, the priorities established by the community participants will be analyzed.

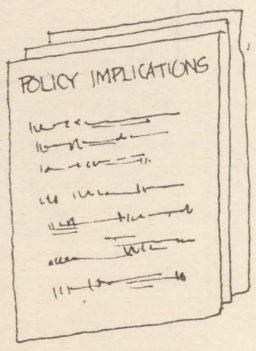
WORKSHOP #8

With the aid of planning professionsls, the workshop participants will prepare land use maps and outline the policy implications of the individual priorities.

1. Through the use of comparable examples the information assembled in the preceeding workshops will be translated into descriptive graphic form.

2. The second segment will concentrate on the expression of community priorities in terms of action oriented policies.





RESOURCE REQUIREMENTS

Maps and materials for recording land use implications

RESULTS OF THIS INCLUDE

1. A set of maps expressing the physical planning implications of a set of goals and priorities.

2. A set of action oriented policies indicating means to accomplish community ends.

The group will select and rank a set of goals using the survey as a guide and starting point.

4. DISCUSSION OF GOAL STRUCTURE. Important issues are often the basis for discussion between community members. Through such discussion new goals or rankings may result.
5. ESTABLISHMENT OF GOAL STRUCTURE. By consensus establish a set of community goals and discuss possible alternatives for their accomplishment.

THE RESULTS OF THIS INCLUDE:

1. A Community Goal Structure which will form the basis for alternative futures.

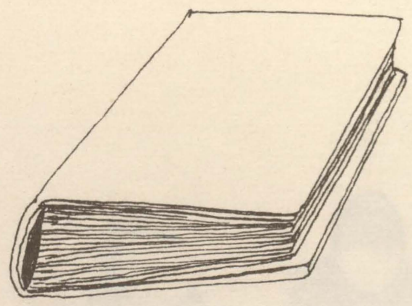
2. An outline of planning alternatives to be examined in the next step.

STEP 6. PREPARE COMMUNITY ACTION PROGRAM

Compile the resources developed into a unified program of plans and policies.

What is a community action program?

A community action program is the synthesis of community goals and priorities into communicable form. Emphasis is placed on planning as a process rather than a product and plans and policies are developed which establish guidelinesbut allow room for the enevitability of change.



WORKSHOP #9

1. Materials previously developed will be assembled in a logical format and their interrelationships described.

2. A general review of the project will be made, survey forms filled out and individuals selected to present materials at the professional workshop.



RESOURCE REQUIREMENTS

Graphs must be reduced to format size

Binder for assembled material

Survey of community action goals

Survey of economic priorities

RESULTS OF THIS INCLUDE

1. Evaluation of change in community attitudes.

2. Package to be presented at the professional workshop.

3. Discussion of participants change in attitude as reflected by evaluation forms.

STEP 7. DISCUSS IMPLEMENTATION PLANS

Through interaction with official decision makers, outline means of implementing Community Action Plan

WHO ARE THE DECISION MAKERS?

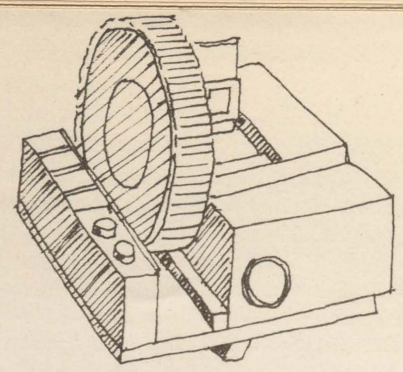
The decision makers are the public administrators of state, regional, and local levels, whose jurisdictions overlap. The Community Action Plan brings these administrators together with the people in order to achieve a greater communication with them as well as among themselves and to examine the implications of growth and establish an effective means of future controlling land use practices.

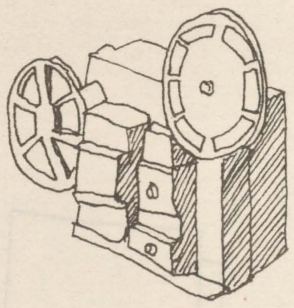
WORKSHOP #10

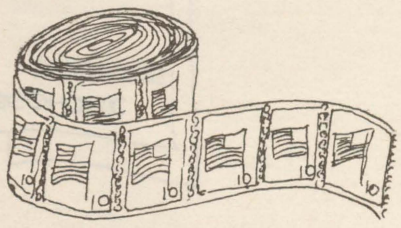
The workshop for decision makers is designed to bring administrators and citizens together for interaction in formulating land use decisions for Lookout Mountain.

1. Student presentation "Look Around You"
   A short program presented by members of the student workshop. This program will include a brief view of Lookout Mountain's wildlife and other natural resources, a review of what they have learned about the mountain's problems, the jobs of their administrators, and their responsibilities and rights as future land use decision makers.

2. Adult Presentation - Slide Series
   A short slide series reviewing the adult workshop including the coal mine field trip and the study addressed to the issue of present and future land use, and of ways







RESOURCE REQUIREMENTS

1. Food for banquet - to be planned later.
2. Slide projector (to be provided by school)
3. Film for slide series
4. 16MM sound projector (to be provided by school)
5. Film "Region for Change" to be procured from Ga. Dept. of Natural Resources
6. Paper and printing for questionnaires
7. Return postage for questionnaires

Workshop #10 - continued

in which the local governments can better serve the community in land use decisions.

3. Film "The Region In Change".
   A documentary of the problems in the Southern Highlands brought about by rapid and uncontrolled growth.

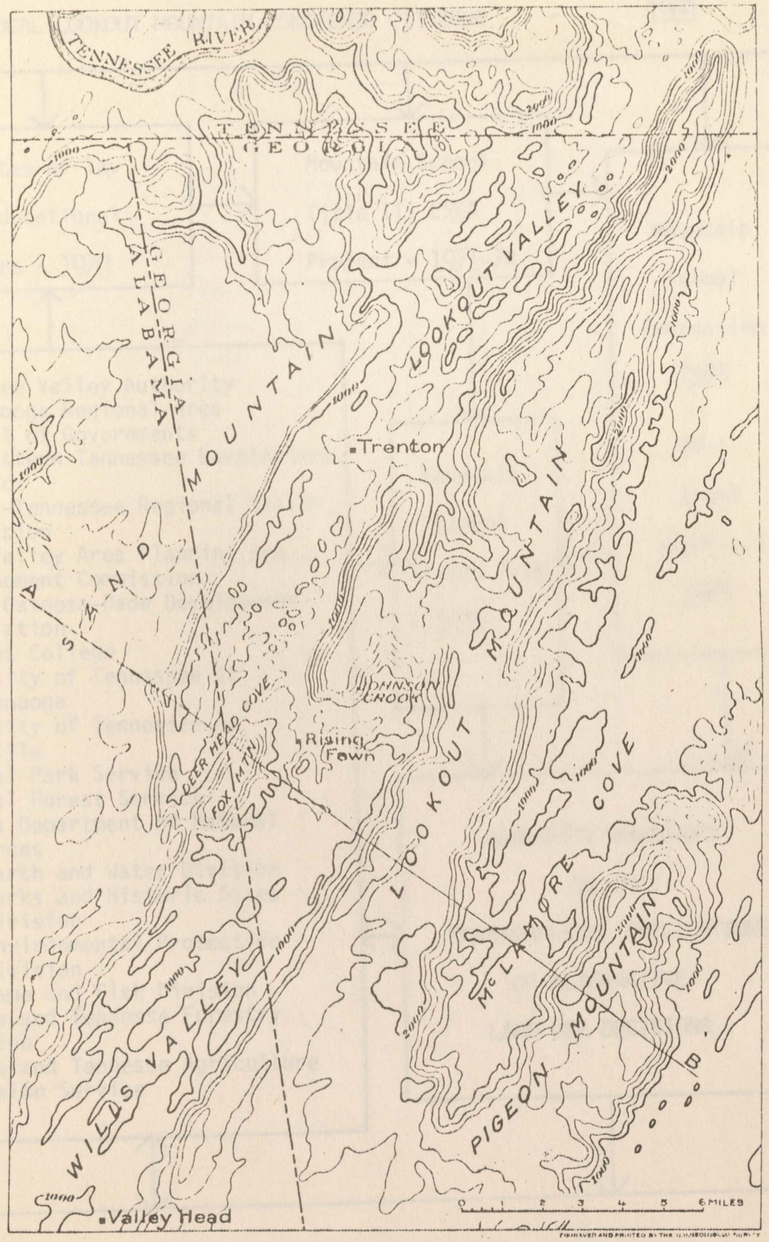
4. Lecture "Ways in which We can Prevent Detrimental Growth".
   A description of various ways in which a town or regional government can prevent problems shown in the film.

5. Open Discussion.
   Everyone present is encouraged to take part in the open discussion, the goal being to create a program of interaction between administrators and the community with regard to local land use decisions.

6. Dispersal of Questionnaires.
   Questionnaires concerning the value of this workshop are given to all participants of this workshop, the results of which will be evaluated by the director and co-directors of the program in order to improve its format and to assemble a similar packaged program to be made available to other administrators and communities.

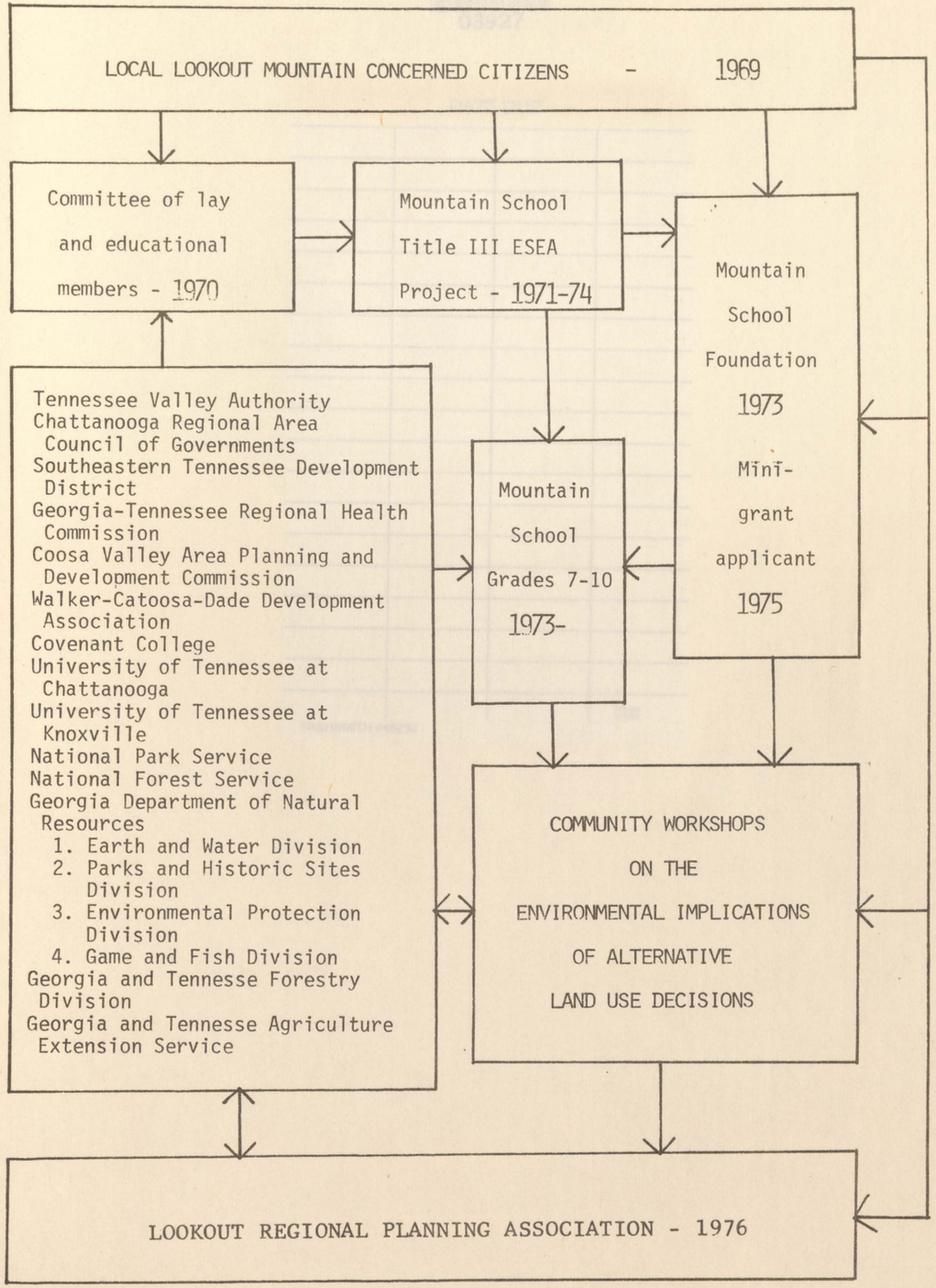
7. Dismissal of group.





THE PRINCIPAL TOPOGRAPHIC FEATURES OF THE LOOKOUT PLATEAU

Contour interval 200 feet


LOCAL LOOKOUT MOUNTAIN CONCERNED CITIZENS - 1969
Committee of lay and educational members - 1970
Mountain School Title III ESEA Project - 1971-74
Mountain School Foundation 1973 Mini-grant applicant 1975
Tennessee Valley Authority
Chattanooga Regional Area Council of Governments
Southeastern Tennessee Development District
Georgia-Tennessee Regional Health Commission
Coosa Valley Area Planning and Development Commission
Walker-Catoosa-Dade Development Association
Covenant College
University of Tennessee at Chattanooga
University of Tennessee at Knoxville
National Park Service
National Forest Service
Georgia Department of Natural Resources
1. Earth and Water Division
2. Parks and Historic Sites Division
3. Environmental Protection Division
4. Game and Fish Division
Georgia and Tennesse Forestry Division
Georgia and Tennesse Agriculture Extension Service
Mountain School Grades 7-10 1973-
COMMUNITY WORKSHOPS ON THE ENVIRONMENTAL IMPLICATIONS OF ALTERNATIVE LAND USE DECISIONS
LOOKOUT REGIONAL PLANNING ASSOCIATION - 1976

H.B. Owens Resource Center
03927

DATE DUE

HIGHSMITH #45230
Printed in USA