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ABSTRACT

Each fall, the Department of Natural Sciences at Calhoun Community College (CCC) integrates a field trip to the Great Smoky Mountains into two of its biology courses. Two preliminary class meetings culminate in a 4-day visit to the park. A fee is charged to cover accommodations, breakfast each day, two picnic lunches, and transportation. Course requirements include: (1) reading reports of research conducted in the Great Smoky Mountains; (2) writing a report summarizing the field activities conducted and the ecological aspects highlighted during the trip; and (3) collecting a sampling of plants and data from a hardwood forest. Field trip activities include nature hikes, wildlife observation, and leisure time. This student fieldtrip handbook contains a general itinerary of trip activities, lists staff responsibilities and group assignments, reviews specific course requirements (i.e., a two-page summary of activities, lists of facts learned, descriptions of weather conditions, tree sampling methods utilized, completed field data sheets, hike summaries, wildflowers observed, and a course evaluation), presents tips for effective photography, and includes a section on Rocky Mountain plant ecology which reviews six forest types and the plant species found in each forest. A plant ecology conversion table, plant study data sheets, plant sampling data guidelines, area maps, and a field study program brochure are included. (GFW)

BIO 286, 287

Field Studies in Plant Ecology I, II

A Short Course in Biology
Fall Quarter, 1989
And
Fall Quarter
1990

Instructor
George Williams, Chairman
Department of Natural Sciences
Calhoun Community College
Decatur, Alabama

Field Trip October 29-November 1 in the
GREAT SMOKY MOUNTAINS

ITINERARY FOR SMOKY MOUNTAINS TRIP, FALL '89

Sunday, Oct. 29

6:30 a.m. CST	Load vans
7:00	Depart Calhoun
7:45	Breakfast in Huntsville
	Lunch
4:00 p.m. EST	Arrive in Gatlinburg
7:30 p.m.	Class Meeting in Room 28 Plant Identification: Don Collier Cades Cove: Mrs. Elizabeth Brett (video)

Monday, Oct. 30

7:30 - 8:45	Breakfast
9:15	Load vans
10:00 - 12:00	Plant sampling in Sugarlands Forest
12:00 noon	Lunch in the Chimneys Picnic Area, compile field data
2:00 p.m.	Return to motel
3:30	Depart for Tremont Environmental Center
5:00	Slide Program on black bear research by Frank van Manen, Univ. of Tenn. Grad. Student
7:00	Cades Cove and spotlight deer count
12:00	Return to motel

Tuesday, Oct. 31

8:30 - 9:30	Breakfast
9:45	Load vans
10:00	Depart for Roaring Fork Motor Nature Trail
11:00 - 3:30	Roaring Fork Motor Nature Trail, Grotto Falls, hiking and wildflowering
4:00	Return to motel

ITINERARY (page 2)

8:30 - 9:30	Breakfast
11:00	Checkout, load vans, be ready to travel!
11:30	Depart Gatlinburg
8:00 p.m.	ETA Decatur and Calhoun

STAFF RESPONSIBILITIES AND GROUP ASSIGNMENTS FOR SMOKIES TRIP, FALL 1989

1. Drivers: George Williams, Melvie Taylor, Jimmy Duke
2. First Aid: Jan Collier
3. Plant Sampling and Compilation of Field Data: Don Collier, Williams, Duke
4. Wildflowering: Jimmy Duke

Sunday, October 29

1. Staff and students should unload personal gear, check into room and return immediately to vans and help unload food, equipment and camp gear.

2. Organize kitchen: George Williams and volunteers

Monday, October 30

1. Breakfast: Holly and Darla

2. Lunch: Load and unload food for field trip: Lynn, Michael and Jonathan

Prepare at Picnic Site: Jo, Rita, Dawn and Kim

3. Field Equipment: Carolyn and Jennipher

Tuesday, October 31

1. Breakfast: Leslie and Raye

2. Lunch: Load and unload vans: Vince and Keith

Prepare at Site: Nancy, Tammy, Janet and Marteen

Wednesday, Nov 1

1. Breakfast: Melvie and Melissa

2. Pack food for return trip: George and group

Please check this list and the itinerary for your assignments. If you will fulfill your responsibilities the trip will be easier for all concerned. Preparation and follow-up for each activity will require your participation. Thanks.

BIO 286 COURSE REQUIREMENTS

1. A two-page summary of the class activities - keep a notebook while you are on the trip.

2. Twenty (20) good, solid facts you learned from Mrs. Brett's talk on Cades Cove.

3. Notes on weather conditions and general description of the study area for tree sampling activity.

4. Brief description of the tree sampling methods.

5. Copies of your own field data sheets, and printed summary of frequency, density, dominance, and importance values of your group's work.

6. List 10 facts of biological interest to you which you learned about the Great Smoky Mountains National Park.

7. List 20 facts about the research with the black bears in the Smokies.

8. Write a summary of the tour of the Roaring Fork Motor Nature Trail and the hike to Grotto Falls.

9. Make a list of all the wildflowers observed by the class. See Mr. Jimmy Duke for this information.

10. Course Evaluation: What did you like most about the trip? Suggestions for next year? What should we change?

Sam's Tips for Better Smoky Mountain Photos

Make sure you don't lose your pictures before you get started:

1. Recheck the ISO/ASA setting - it should match the speed rating of your film.

2. Check the batteries - they always fail at the worst time. Low temperature and high humidity of Smokies weather can cause their early demise.

3. Make sure film is properly loaded - the rewind crank should "unwind" as you advance the film.

The following techniques can help you develop your own personal "style":

1. Use small lens opening (high f number) if you wish to have foreground and background sharp at same time (good for scenics).

2. Use large lens opening (low f number) if you want to isolate a sharp foreground against an unfocused background (nice for portraits).

3. When shooting from a moving vehicle, use a high shutter speed to minimize motion.

4. Remember you must use a higher than normal shutter speed if you shoot with a telephoto or zoom lens - this prevents blurring due to camera motion.

5. Don't overlook "detail" photos - sometimes fall colors can be best captured by close-ups of individual leaves.

6. Spectacular sunsets are easy to photograph - just aim and meter as you would for a normal scene.

Make sure you don't lose your masterpieces after you have taken them:

1. The film must be rewound before you open the camera back (it's easy to forget).

2. Rewind film leader all the way into cassette - this makes it impossible to reload an exposed roll.

3. If you have questions about more advanced techniques, feel free to ask for more info.

SMOKY MOUNTAIN PLANT ECOLOGY

Explanation

No plant community is totally stable. Individual plants may vary in age and longevity; as individuals die they are replaced. The replacements that occur are orderly and predictable. One community of plants is replaced by another community which may itself be later replaced. This process continues until a community develops that can reproduce and maintain itself. The orderly change from one community to another is called succession, and the community which can reproduce and maintain itself is called the climax.

Succession is caused by environmental changes. For example, the amount of light available to plants, drying potential and temperature differences can all change over time. As these changes occur, they may gradually eliminate the original communities and favor development of new kinds of plants.

The specific kinds of plants in a climax community depends primarily on climate. Climate is the determining factor for moisture and temperature. Although no factors are more important to plants than moisture and temperature, there are many determinants: latitude, elevation, substrate, aspect and prevailing winds are all important in determining climate.

Plant Communities

There are six types of climax communities in the Great Smoky Mountains: Spruce-Fir, Northern Hardwood, Hemlock, Cove, Pine, and Oak-Hickory. Their locations are determined by differences in elevation, aspect, and substrate. In other words, different microclimates determine the differences in plant communities. A brief

description of the six forest types follows:

Spruce-Fir

This is the evergreen climax composed of red spruce and Fraser Fir. Spruce and fir grow only at the highest elevations where temperatures are coolest and moisture is highest. At sea level, this type climax is found in northern Maine or Canada.

Northern Hardwoods

This is a deciduous climax composed mostly of yellow birch and beech. Northern hardwoods are found just below the spruce-fir forest. They extend to lower elevations on the cooler northfacing slopes.

Cove Hardwoods

This is a middle-elevation climax composed of many species of deciduous trees. In fact, its basic characteristic is variety; however, Mountain Silverbell might be considered an indicator of this climax in the Smokies.

Hemlock

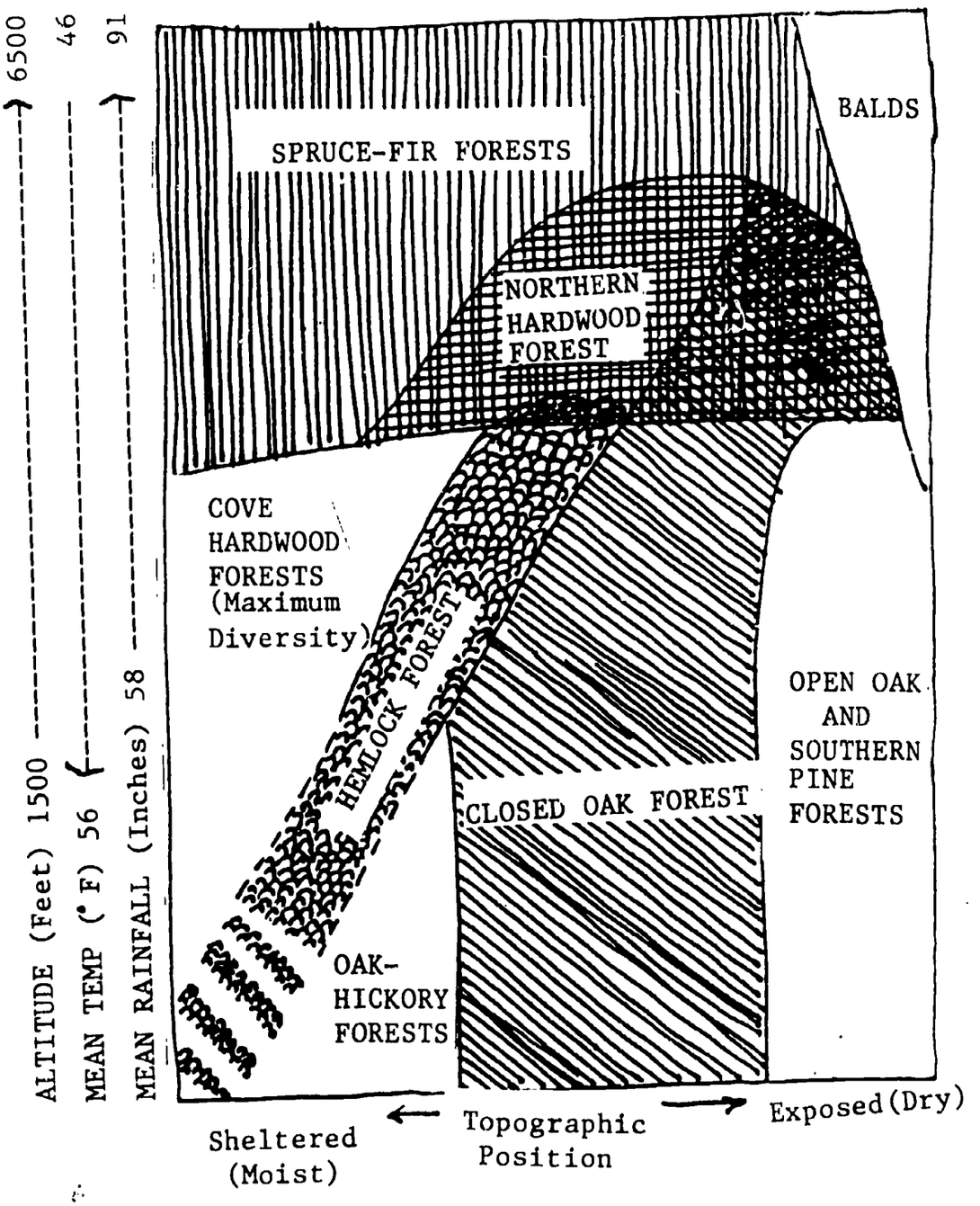
Hemlock can become dominant along streams in middle elevations. Sugar maple has similar habitat requirements and is often associated with a hemlock climax.

Oak-Hickory

An oak-hickory association often predominates at lower elevations, especially in areas with southern and western exposures.

Pine

Only in the driest sites can pine become a climax. Pines are drought-tolerant and therefore occur on rocky outcroppings and areas where the soil is shallow. The ideal pine habitat is



This Diagram reflects the pattern of forest vegetation in the Great Smoky Mountain National Park as related to temperature and moisture gradients.

on south or west facing slopes provided the elevation is not too high and the soil is shallow or has outcrops of rock.

The Study Area

The study area is a quiet walkway located approximately 1 mile east of the Sugarlands Visitor's Center. Species data were collected using the Point Centered Quarter Method. Separate data were collected on overstory and understory species. Understory data provided information on plant reproduction. The following table is a summary of data collected in 1984:

	% Frequency and Density, combined	
Species	Overstory	Understory
Red Maple	130	25
Sugar Maple	25	51
Hemlock	0	117
Yellow Poplar	45	0

Based on these data, the study area is a cove hardwood community in which red maple and yellow poplar predominate. The life span of this community is limited by two factors:

1. The life span of individuals within the community. The following averages are from Silvics of Forest Trees of the United States, Agriculture Handbook No. 271.

Species	Average Life Span
Red Maple	80-150 yrs.
Yellow Poplar	100-200 yrs.?
Sugar Maple	300-400 yrs.
Hemlock	400-900 yrs.

Obviously, the individual red maples and yellow poplars will die out before the sugar maples and hemlocks.

2. Ability of these species to reproduce in the shade of the parent trees. This ability is determined by the shade tolerance of each species; i.e. the ability of seedlings to grow in shade. Species that are intolerant cannot grow in shade while tolerant species can. The following information is from the source used earlier.

Species	Shade Tolerance
Red Maple	Intermediate
Yellow Poplar	Intolerant
Sugar Maple	Very Tolerant
Hemlock	Very Tolerant

Future of the Study Area

A comparison of data from the understory and overstory allows us to predict the course of succession. This prediction is based on the following:

1. that no catastrophy or climatic change occurs within the study area.
2. relative reproduction of trees in the overstory
3. longevity of the predominant species.

Within 200 years, this plant community will change from a cove hardwood community to a hemlock community. Predominant species will be hemlock and sugar maple instead of red maple and yellow poplar.

Two hundred years from now, a few red maples will remain because of their intermediate shade tolerance. However, red maples will be completely eliminated within 300 years because their seedlings will not be able to survive underneath the dense shade of the hemlock climax.

A few ancient yellow populars will remain 200 years from now because of their longevity. However, they, like the red maples, will die out within an additional century.

Given no catastrophic events, in 300 years our descendants will view a solid stand of virgin forest: the hemlocks and sugar maples that we now see as small seedlings. This magnificent stand of hemlocks and sugar maples will be rarely interrupted where lightening or wind will have eliminated a forest monarch and allowed some shade intolerant species to capture a temporary place in the sun.

OVER-STORY DATA

QUARTER POINT CALCULATION SHEET

Samples taken in 1984, by group GEO.

Species	Pts.	Freqncy	Trees	Density	Bas Area	Domin.	Imp. Val.
Sugar Maple	6	60.0%	7	17.5%	1203	13.2%	90
Pine	3	30.0%	3	7.5%	854	9.3%	46
Red Maple	8	80.0%	15	37.5%	3067	33.5%	150
Hickory	4	40.0%	4	10.0%	1288	14.1%	64
Tulip Poplar	4	40.0%	6	15.0%	2173	23.8%	78
Black Locust	1	10.0%	1	2.5%	133	1.5%	13
Buckeye	1	10.0%	1	2.5%	113	1.2%	13
Hemlock	2	20.0%	2	5.0%	113	1.2%	26
Beech	1	10.0%	1	2.5%	201	2.2%	14

Number of Sample Points: 10
Date samples taken: 30 / 10 / 84.
Location of sampling: GSMNP
Study Area:Sugarlands Forest Hardwood Cove
Weather Conditions: Sunny warm — perfect
Class: Bio 243 Field Studies in Plant Ecology
Group Leader: George Williams

QUARTER POINT CALCULATION SHEET

Samples taken in 1984, by group DON.

Species	Pts.	Freqncy	Trees	Density	Bas Area	Domin.	Imp. Va
Sycamore	1	10.0%	2	5.0%	236	2.8%	17
Red Maple	8	80.0%	20	50.0%	4642	55.5%	185
SL Pine	1	10.0%	1	2.5%	143	1.7%	13
Black Birch	2	20.0%	2	5.0%	192	2.3%	27
MT Silverbell	1	10.0%	1	2.5%	95	1.1%	13
Sugar Maple	2	20.0%	2	5.0%	228	2.7%	27
Hickory	1	10.0%	2	5.0%	237	2.8%	17
Yellow Poplar	3	30.0%	6	15.0%	1435	17.2%	62
Black Locust	1	10.0%	3	7.5%	1080	12.9%	29
Unidentified	1	10.0%	1	2.5%	79	0.9%	12

Number of Sample Points: 10
Date samples taken: 30 / 10 / 84.
Location of sampling: GSMNP
Study Area:Sugarlands Forest Cove Hardwood
Weather Conditions: Perfect-Warm partly cloudy/ clear
Class: BIO 243 Field Studies in Plant Ecology
Group Leader: Dr. Don Collier

UNDER-STORY DATA

QUARTER POINT CALCULATION SHEET

Samples taken in 1984, by group AMY.

Species	Pts.	Freqncy	Trees	Density	Bas Area	Domin.	Imp. Val
Dogwood	20	100.0%	32	40.0%	1	14.3%	154
Red Maple	4	20.0%	4	5.0%	1	14.3%	39
Sourwood	1	5.0%	1	1.3%	1	14.3%	20
Hemlock	17	85.0%	26	32.5%	1	14.3%	131
Sugar Maple	8	40.0%	9	11.3%	1	14.3%	65
MT Silverbell	1	5.0%	1	1.3%	1	14.3%	20
Rhododendron	6	30.0%	7	8.8%	1	14.3%	52

Number of Sample Points: 20
Date samples taken: 30 / 10 / 84.
Location of sampling: GSMNP
Study Area:Sugarland Forest Cove Hardwood Understory
Weather Conditions: Perfect - Warm Partly Cloudy / Clear
Class: BIO 243 Field Studies in Plant Ecology
Group Leader: Dr. Don Collier

PLANT COMMUNITY STUDY* QUARTER METHOD

Sampling Method

A series of points is chosen in the field according to any objective procedure (usually by pacing a fixed distance along a predetermined compass line). The 360° space around each point is divided into four quarters. Within each quarter, the tree nearest to the point is chosen and its basal area and species determined. These values for the four trees (one in each quarter) are recorded on a prepared data blank. The nearest individual sapling and shrub in each quarter can also be recorded.

Definitions

1. # points at which a given species occurred.
2. % frequency $\frac{\text{\# points at which a species occurs}}{\text{\# points sampled}}$.
3. # of individual trees of a species.
4. % density $\frac{\text{\# individual trees of a species}}{\text{\# trees of all species}}$.
5. Basal area is the total trunk area (cross section) of a species at breast height.
6. % dominance $\frac{\text{total basal area of one species}}{\text{total basal area of all species}}$.
7. Importance value. Add all percentages---decimals are dropped. The maximum I.V. is 300.

   _____ % frequency

   \+ _____ % density

   \+ _____ % dominance

   = _____ Importance Value

8. Basal area, Bitterlick

   $\frac{\text{Total \# Trees per Species}}{\text{\# Points Sampled}}$ X 10

PLANT ECOLOGY CONVERSION
Diameter in Inches to Basal Area in Square Inches

Diam. Inches	B. A. Sq. In.	Diam. Inches	B. A. Sq. In.	Diam. Inches	B. A. Sq. In.
1.0	0.78	13.0	132.7	28.0	615.8
1.25	1.23	13.5	143.1	28.5	637.9
1.5	1.77	14.0	153.9	29.0	660.5
1.75	2.41	14.5	165.1	29.5	683.5
2.0	3.14	15.0	176.7	30.0	706.9
2.25	3.98	15.5	188.7	30.5	730.6
2.5	4.91	16.0	201.1	31.0	754.8
2.75	5.94	16.5	213.8	31.5	779.3
3.0	7.07	17.0	227.0	32.0	804.2
3.25	8.30	17.5	240.5	32.5	829.6
3.5	9.62	18.0	254.5	33.0	855.3
3.75	11.04	18.5	268.8	33.5	881.4
4.0	12.57	19.0	268.8	34.0	907.9
4.5	15.90	19.5	283.5	34.5	934.8
5.0	19.63	20.0	314.2	35.0	962.1
5.5	23.75	20.5	330.1	35.5	989.8
6.0	28.27	21.0	346.4	36.0	1017.9
6.5	33.18	21.5	363.1	36.5	1046.3
7.0	38.48	22.0	380.1	37.0	1075.2
7.5	44.18	22.5	397.6	37.5	1104.5
8.0	50.27	23.0	415.5	38.0	1134.1
8.5	56.75	23.6	433.7	38.5	1164.2
9.0	63.62	24.0	453.4	39.0	1194.6
9.5	70.88	24.5	471.4	39.7	1225.4
10.0	78.54	25.0	790.9	40.0	1256.6
10.5	86.59	25.5	510.7	41.0	1320.3
11.0	95.03	26.0	530.9	42.0	1385.4
11.5	103.87	26.5	551.5	43.0	1452.2
12.0	113.10	27.0	572.5	44.0	1520.5
12.5	122.72	27.5	594.0	45.0	1590.4

Type Sample _____ (understory, seedling, bitterlick or quarter pt.)

Group Members:

_____

_____

_____

_____

_____

LOCATION _____

DATE _____

QUARTER POINT DATA SHEET

NOTE: Basal area is recorded only for the Quarter Point method.

SPECIES	BASAL AREA AT EACH POINT									
	1	2	3	4	5	6	7	8	9	10

TYPE COMPUTATION: (Understory, seedling, or Quarter Point). Circle one.

Group Members:

LOCATION _____

DATE _____

CALCULATION SHEET

SPECIES	1 # POINTS	2 % FREQ.	3 # TREES	4 % DENSITY	5 BASAL AREA	6 % DOMIN.	7 IMPORTANCE VALUE

BASIC DATA: # points sampled _____.

Total # trees of all species _____.

Total basal area of all species _____.

NOTE: For understory and seedling data:

1. Columns 5 & 6 are not calculated.
2. Column 7 will be called Importance; its maximum is 200. To calculate, add the percentages in columns 2 and 4.

BITTERLICK CALCULATION SHEET

Group Leader: _____

Location: _____

Date: _____

Group Members:

_____

_____

_____

_____

No. of Points Sampled:

_____

Species	1. # Trees	2. X Trees/Point	3. Frequency	4. Basal Area/Acre

1. Total number of trees of a species.
2. Mean number of trees/species. (Column 1 ÷ Number of points sampled).
3. Number of points at which a species occurred ÷ Number of points sampled
4. Total square feet/acre (trunk area) covered by a species. Column 2 X 10.

SAMPLING

In order to fully investigate and compare the communities in our study areas, the tree and shrub species must not only be observed, but must also be identified and quantified. One accurate means of quantifying such data is by the Bitterlick Sampling Method.

After choosing a representative point in each community, identification data is collected using a bitterlick stick. From a given spot in each community, a 360^{o} survey of qualifying tree and shrub identities is recorded on the Sampling Data sheet. A tree or shrub qualifies by being larger than a metal plate on the end of the bitterlick stick held at eye level. In addition to tree identity at a certain geographic locations, this bitterlick record will also show basal area per acre in square feet. Also, from this data a percent occurance per species per community can also be determined. The results of recording such data will at a glance define each community by tree and shrub species.

The living species at each sampling point will vary in age and size. Accurately categorizing this information will profile each community. The following definitions will prove helpful:

1. Overstory - trees in the upper canopy
   A. More than 6" in diameter
   B. Less than 6" in diameter
2. Understory - trees below the canopy
   A. Sapling (Immature) - (potential overstory)
   B. Shrub type - (not potential overstory)
3. Successional Seedling - woody plant less than breast height that can become part of the overstory

Succession studies must include future community species. To quantify this information, seedling identification is required. Also, from the same spot in each community, a 10 meter cord measures a 360^{o} survey of the seedling species. This seedling identification is also recorded on the Sampling Data sheet.

NOTE:

1. Overstory and Understory are sampled using the Bitterlick Method.
2. Seedlings are sampled using the 10 meter cord.

SAMPLING DATA

PLANT SPECIES

COMMUNITIES

Oak-Hickory-Pine	Cove Hardwood	Northern Hardwood	Spruce-Fir

KEY

T = Tree greater than 6" in diameter
t = Tree less than 6" in diameter
S = Shrub type
· = Seedling

SAMPLING DATA

PLANT SPECIES	COMMUNITIES			
	Oak-Hickory-Pine	Cove Hardwood	Northern Hardwood	Spruce-Fir

KEY

T = Tree greater than 6" in diameter
t = Tree less than 6" in diameter
S = Shrub type
• = Seedling

SUCCESSION

No plant community is totally stable. Individual plants may vary in age and longevity; as individuals die they are replaced. The replacements that occur are orderly and predictable. One community of plants is replaced by another community which may itself be later replaced. This process continues until a community develops that can reproduce and maintain itself. The orderly change from one community to another is called succession, and the community which can reproduce and maintain itself is called the climax.

Succession is caused by environmental changes. For example, the amount of light available to plants, drying potential and temperature differences can all change over time. As these changes occur, they may gradually eliminate the original communities and favor development of new kinds of plants.

The specific kinds of plants in a climax community depends primarily on climate. Climate is the determining factor for moisture and temperature. Although no factors are more important to plants than moisture and temperature, there are many determinants: latitude, elevation, substrate, aspect and prevailing winds are all important in determining climate.

Waysides, Roadside Parks

Campsites

S.P. State Parks
S.F. State Forests
S.R. State Reserves

Other Roads
Unpaved Roads
Scenic Routes

For explanation of all map symbols, see pg. 1. Index of counties and towns, page 120.

Mileage in red between red arrowheads, in black between intersections. Some interchange numbers indicate mileage.

MS p.52 | AL p.8 | GA p.23

Dimensions: N-S 120 miles, E-W 430 miles
Highest Point: Clingmans Dome 6,643 ft., F-26
Capital: Nashville, C-14
Largest City: Memphis, H-2

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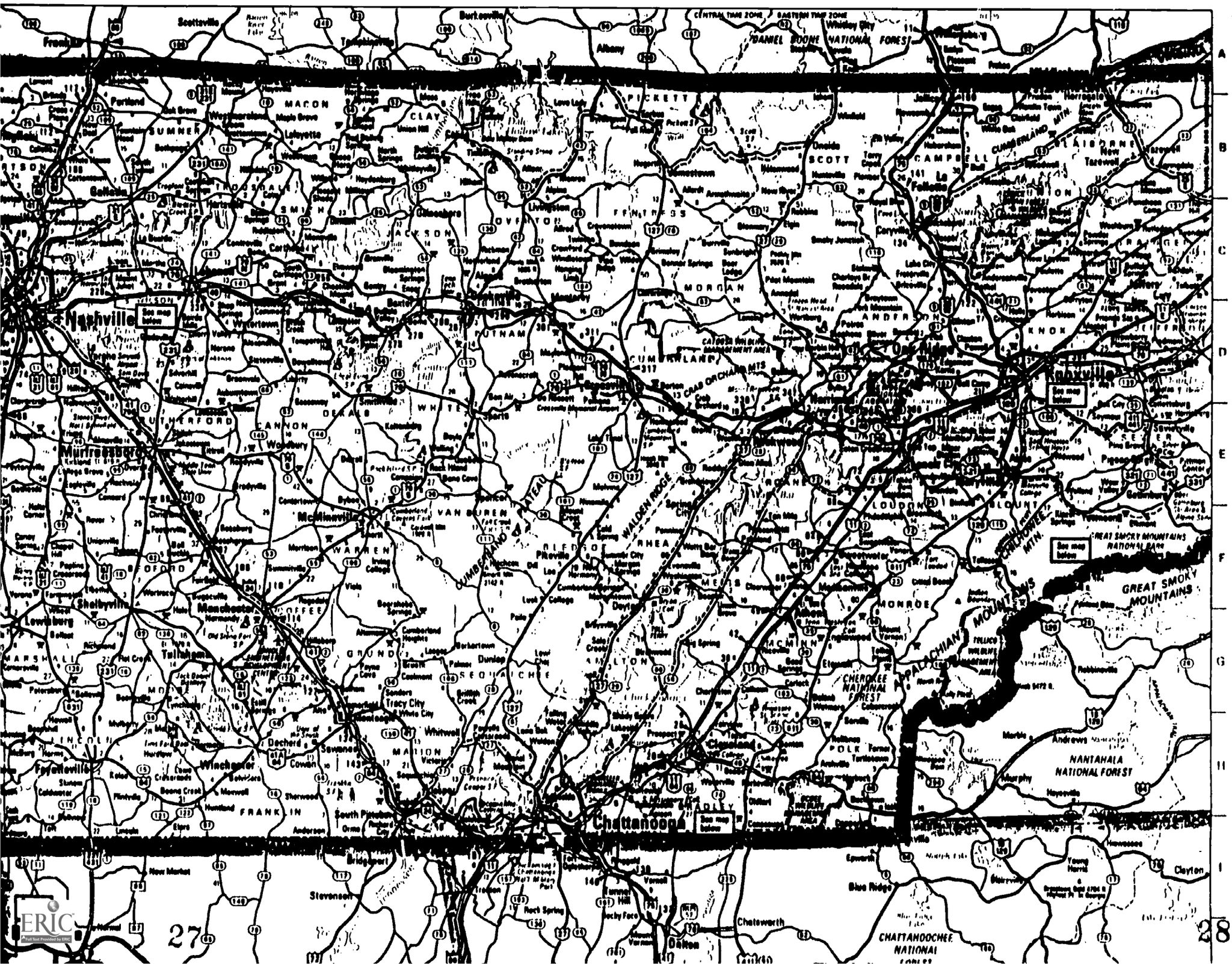
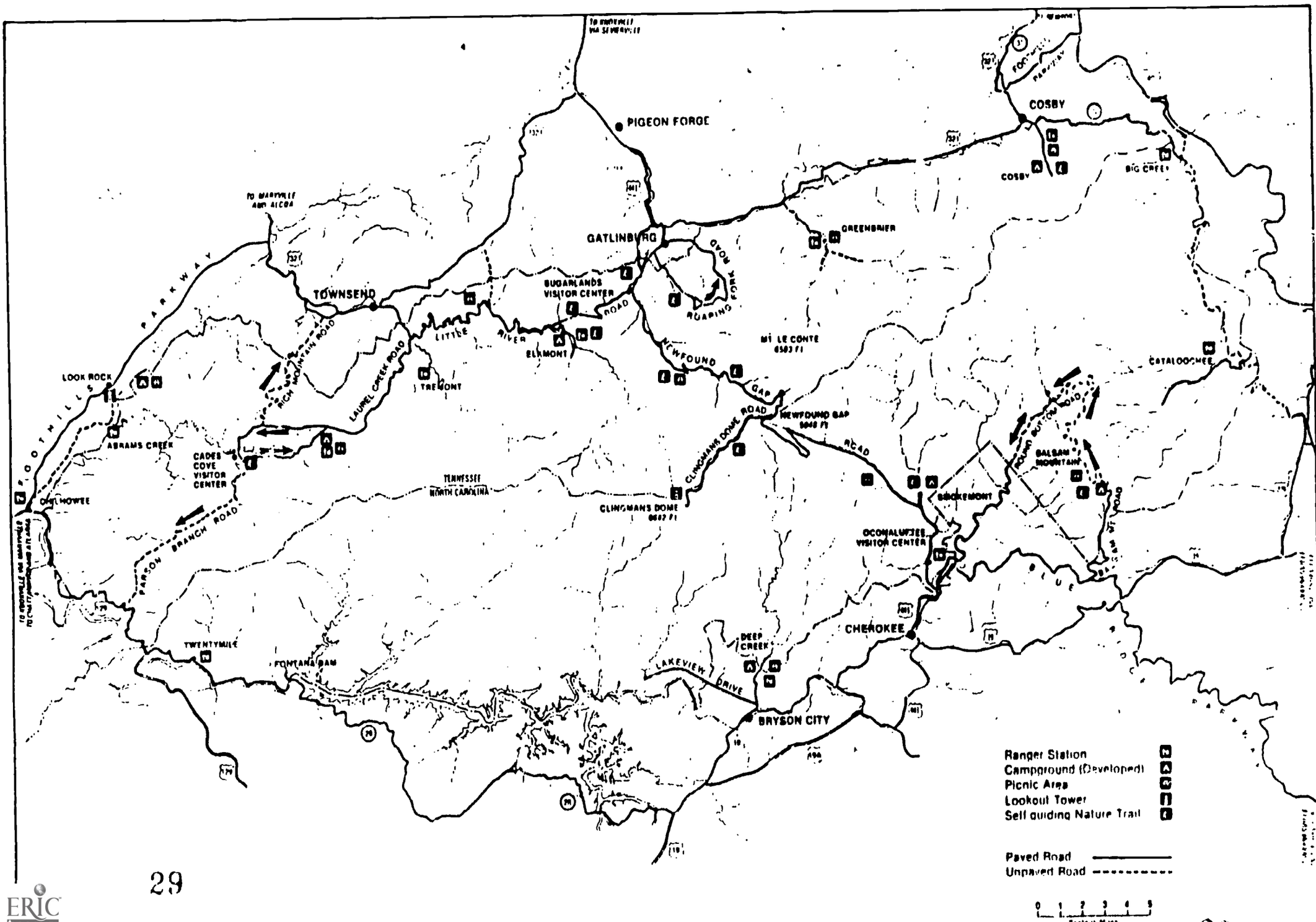
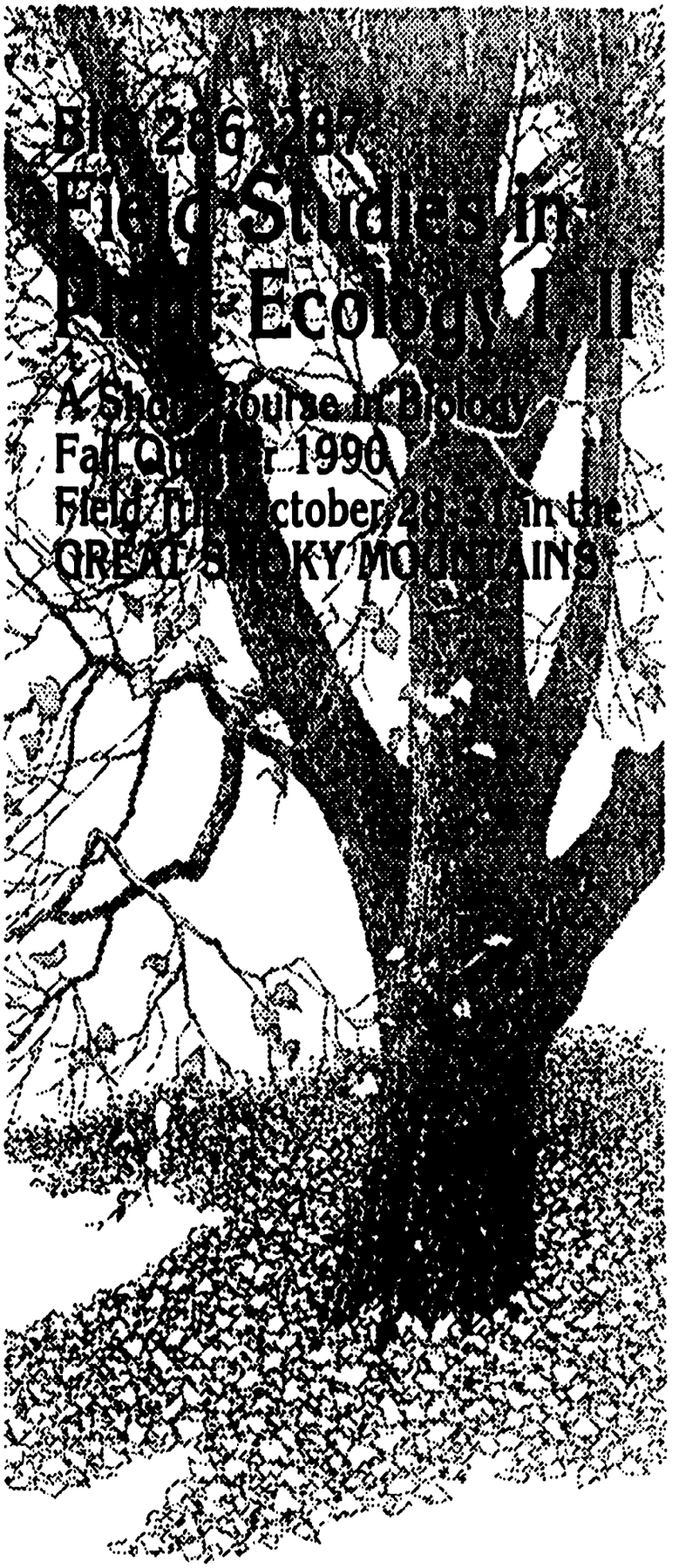


Great Smoky Mountains National Park





Bio 286, 287
Field Studies in Biology I, II

A Short Course in Biology
Fall Quarter 1990
Field Trip: October 28 - Nov 4 in the
GREAT SMOKY MOUNTAINS

Instructor
George Williams, Chairman
Department of Natural Sciences
Calhoun Community College
Decatur, Alabama

The following information about the park was taken from the "Guide to the Great Smoky Mountains National Park" summer 1981 by the Great Smoky Mountains Natural History Association.

These mist-draped mountains are rich in history; for years they have watched the procession of life pass under their shadow.

Now their majesty is safeguarded by a National Park - a park which covers over 516,000 acres, spans two states, and holds within it the highest mountain range east of the Mississippi River. The range contains many peaks as high a 5-6,000 feet, which are surrounded on all sides by foothills, valleys and coves, all drained by hundreds of streams. Although old and worn down compared to some other mountains on this planet, the terrain is none-the-less steep and rocky in most places.

Looking out across the Great Smoky Mountains on a misty summer day the great expanses of forest seem to be a uniform dark green. Although pines or spruces may crown a ridge here and there, the landscape seems almost unchanging from shoulder to valley, one unbroken blanket of vegetation, one great tangle of trees.

As the early explorers discovered, however, the Great Smokies contain an incredible variety of trees and shrubs. The forest is not one forest, but many forests, each with its residents and each with its place in the landscape.

The deep valleys, for instance, are called coves and contain some of the finest big tree stands in the eastern United States. Before the days of logging, the farmers cut trees on the more accessible slopes; so in many of the steeper and more rugged places the original forest was left intact.

The diversity of tree species in the cove is among the highest in the temperate parts of the world. Sugar maples, buckeyes, hemlocks, tulip trees, yellow birches, cherries, hickories, oaks, white ashes, beeches, and basswoods grow side by side in the same sites. There are 10 oak species altogether. This type of forest is exceedingly important to wildlife species, such as black bear, which depend on the fall crop when they are storing up fat for the winter.

The animals that roam the mountains today are, for the most part, the same species that were here before man, and a few that were not, such as the rainbow trout and the European boar. The climate is temperate, the rainfall generous: a benevolent environment for nearly any plant or animal in search of a home.

Department of Natural Sciences Field Trip for College Credit

Information

What:	*A* field biology course — BIO 286, 287 Field Studies in Plant Ecology I,II
Where:	Great Smoky Mountains National Park and Gatlinburg, Tennessee
When:	Course taught during fall quarter ; Field trip conducted October 28-31, 1990
Instructors:	Mr. George Williams and Dr. Don Collier, phone 353-3102, office R-215
Credit:	2 hours credit may be awarded either fall or winter quarter.
Fees:	$120.00 for Calhoun students, faculty and staff ($150 for teachers/adults making the trip for professional development)

Fees Include:

- accommodations at the River Park Motel in Gatlinburg, October 28-30, double occupancy, two beds per room
- continental breakfast October 29-31
- picnic lunches October 29 and 30
- transportation — college vans will depart Calhoun Community College, Decatur, Sunday, October 28 at 6:00 a.m., return Wednesday, October 31 at 8:00 p.m.

Fees will NOT include the following:

- meals on Sunday, October 28 — travel day
- supper October 28-30
- lunch Wednesday, October 31 — travel day

Students must take money for these meals and spending money for any gifts, attractions, etc.

Payment of fees:

- a refundable room deposit of $60.00 payable on or before October 10
- balance of $60.00 payable on or before October 24

**deposit may be refunded if you must cancel within 10 days of the field trip*

Reservations will be made on a first-come, first-served basis. Enrollment will be strictly limited to 15 students. For reservations and payment of fees, make check payable to "Extended Field Trips" and return to Mr. George Williams along with your application form.

Planned Activities:

- visit Sugarlands visitor center for audio-visual program on the Great Smoky Mountains
- nature hike through Sugarlands forest for plant and wildlife observation
- naturalist's hike to Grotto Falls
- field trip to Cades Cove for observation of plant communities, wildlife, and some historical aspects of pioneer settlement within the cove
- picnic and free time at the Chimneys picnic area on the Little Pigeon River
- observation of the deciduous trees in fall colors within the National Park, via bus trip
- leisure time in Gatlinburg

Course Requirements:

- class will meet two times prior to the trip – Monday, October 15 and Monday, October 22
- some reading assignments on scientific research conducted in Great Smoky Mountains
- written report on the ecological aspects of the Smoky Mountains to be submitted by each student after the field trip in October . The report will also include a summary of the activities conducted in the field
- sampling of a hardwood forest near Sugarlands and compilation of data collected