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CHANGES IN THE STATUS OF CONSERVATION EDUCATION IN SELECTED INSTITUTIONS OF HIGHER LEARNING IN SOUTHEASTERN UNITED STATES SINCE 1954

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CHANGES IN THE STATUS OF CONSERVATION EDUCATION
IN SELECTED INSTITUTIONS OF HIGHER LEARNING
IN SOUTHEASTERN UNITED STATES SINCE 1954

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Charles Ross Stephen, B.S., M.A.

* * * * *

The Ohio State University

1984

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Professor Robert E. Jewett

M. Eugene Gilliom

Adviser
Department of
Educational Theory
and Practice
This work is dedicated to the memory of the late Dr. Charles A. Dambach, conservationist at The Ohio State University, who was largely responsible for my interest in conservation.
ACKNOWLEDGMENTS

Many individuals have encouraged and aided me in this endeavor. Grateful appreciation is extended to Dr. Robert E. Jewett for helping to initiate the project, and to Dr. Henry L. Hunker for helping to see it through. Special appreciation is due Dr. M. Eugene Gilliom for his friendship and for assistance in this work and my graduate program.

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VITA

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CHAPTER I

INTRODUCTION

This study is a replication of a study conducted by Dr. Sam E. Clagg in 1954, in which Clagg surveyed conservation educators in selected institutions of higher learning in the Southeastern United States in an attempt to determine the status of the field and to make recommendations concerning changes for its improvement.¹

The writer has been a student, friend, and colleague of Clagg during the three decades since his dissertation study was completed and is experienced with the subject of Clagg's research and the region covered, having taught conservation courses in colleges and universities in and near the southeastern region from 1957 to 1972.

The study also compares current findings with the findings of the Clagg study of 1954 and generates predictions for the future of conservation education by a Delphi procedure.

Need for the Study

In this time of worldwide environmental crisis and resource depletion, the conservation attitudes of citizens have become increasingly important. Finding ways to improve public awareness and attitudes regarding the environment is a goal of conservation education, and elementary and secondary school teachers necessarily play a major role in achieving this awareness and in shaping these attitudes. Teachers directly influence their students—the future adult population—and indirectly influence parents and other community members. Teachers with a highly developed conservation awareness also can influence curriculum decisions in schools and can provide leadership when conservation related issues are dealt with at the local, state and national levels. If teachers can play such crucial roles in developing conservation awareness, it seems clear that they need more than a cursory introduction to environmental issues during their years in college.

In assessing the present status of college level conservation education, it is necessary to discover where such programs are offered, what content is studied, what types of instructional materials and strategies are used, and to predict the direction in which conservation education is headed. In this study, college level conservation education in Southeastern United States has been analyzed in an attempt to discover the current status of the field, to compare the findings with Clagg's findings, and to generate guidelines for future developments.
A study of the current status of conservation education in Southeastern United States is needed for several reasons: (1) the population of the region has grown significantly in the last three decades, and enrollments have increased dramatically in colleges and universities in the region. This study will determine whether this growth is paralleled by growth in conservation programs in the institutions. (2) population increase in the region has changed the ways in which the environment and resources are used. This study will determine the extent of these changes and will draw implications for conservation education. (3) dramatic changes in technology in the last three decades have resulted in an increase in the use of resources and have diminished the quality of the environment. This study will determine how conservation educators perceive these changes and whether current educational policies are designed to keep conservation education in tune with technological advances. (4) content and methods in conservation education have changed since the Clagg study was made in 1954. Teachers of conservation need to become familiar with materials and methods being used by other instructors in the field and to understand how these can be beneficial in their own conservation courses. This study will identify these materials and methods and make the information available to conservation teachers.

A conservation education study similar to Clagg's has not been done in Southeastern United States since Clagg completed his study in 1954. Although there is no absolute way to judge the influence of Clagg's study, based upon the numerous inquiries he has received
regarding his research and the degree to which it is referred to in
the literature of the field, it seems clear that the study made a
significant contribution to conservation education and that Clagg's
method of research was considered sound.

Interest in the Clagg study has been demonstrated through the
years in a variety of ways. In 1957, for example, Lively and Preiss
reviewed the Clagg study and devoted several pages to its methodology,
scope, and findings. Another example of the use of the Clagg study
involved an agency of the federal government. In 1956, the Soil
Conservation Service of the U. S. Department of Agriculture
distributed an estimated 400-500 abstracts of the Clagg study
throughout Southeastern United States in an effort to apprise
interested conservationists of the status of conservation education in
the region and to present them with proposed recommendations for
improvement.

As pointed out, many changes have occurred in Southeastern
United States since Clagg's original study in 1954. In light of these
changes, a replication of the Clagg study should prove valuable as a
basis for identifying developments in conservation education during
the past three decades and as a basis for formulating policies related
to conservation education.

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2 Lively, Charles E., and Jack J. Preiss, *Conservation
Education in American Colleges*, New York: Ronald Press, 1957, pp. 48-
51.

3 Personal interview with Clagg in February, 1984.
Statement of the Problem

In this study the writer has addressed the following questions:

1. What is the status of conservation education in selected institutions of the region at the present time with respect to: (a) problems of the area, (b) topic emphasis, (c) level of emphasis, (d) class size, (e) textbooks and materials used, (f) methods of presentation, (g) use of audio-visuals, (h) teacher preparation, (i) use of agencies in classroom work, and (j) instructor cooperation with outside agencies?

2. What changes have occurred in conservation education in institutions of higher learning in Southeastern United States in the last three decades?

3. What is the predicted status of conservation education in institutions of higher learning in Southeastern United States in 20 to 25 years?

Methodology

The two research methods used in the present study were the replication and Delphi techniques. The replication was used to repeat the Clagg study of 1954, and the Delphi was used to obtain opinions from conservation educators concerning conservation education in the future.

Replication. As a research method replication involves deliberately repeating a study, using identical procedures with different subjects, at a different time and in a different setting. Best claims the term was derived from the fusion of duplication and repetition.\(^4\) There are different types of replications, but the

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literal replication was selected as the type to use in the present study. Literal replication involves exact duplication of the first investigator's sampling procedure, experimental conditions, measuring techniques, and methods of analysis. Replications follow the exact procedures of the original study in order that findings between the studies may be directly compared. It was determined that this procedure should be used in the present study to enable comparison between conservation education three decades ago and the present. The findings resulting from such a comparison should be valuable to educators and policy makers faced with making decisions pertaining to conservation education.

Delphi. The Delphi technique is a research method for obtaining opinions of an informed group about a future event. The participants are not brought together for discussions, and opinions of individuals are not reported. The technique was designed for long-term predictions. Delphi was developed in the early 1950s by Olaf Helmer and his colleagues at the Rand Corporation. Weatherman and Swenson described the Delphi technique in the following manner: "Delphi is a group of related procedures for eliciting and refining the opinions of a group of people." They also said, "Helmer has

---

described the procedure as a method of choosing among alternative policies that affect the future.\textsuperscript{6}

The Delphi involves several rounds of communication between the manager and participating experts in the area of inquiry. Three rounds of communication are considered adequate. The first round involves asking the group of respondents to make a value judgment or an estimate of a future event. In the second round the manager's edited responses from the first round are circulated to the entire group so participants can rank items as to their relative importance. In the third round the edited responses from round two are circulated and participants are asked to choose the most promising items. The opinions from the final round are considered the group opinions.

The Study Area

Following Clagg's lead, the Southeastern United States was selected as the area to be studied. Clagg drew on Howard W. Odum's definition of Southeastern United States as presented in his \textit{Southeastern Regions of the United States}. The southeastern region was defined as the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.\textsuperscript{7}


\textsuperscript{7} Clagg, \textit{op. cit.}, pp. 27-30.
Population of the Study

The replication portion of the present study involved three groups of instructors in colleges and universities of the southeast. They were: (1) conservation instructors who were personally interviewed, (2) conservation instructors who completed a long check-list questionnaire, and (3) instructors in courses not primarily concerned with conservation who completed a shorter questionnaire.

Interviewed instructors. The first part of the replication involved the selection of generalist conservation instructors from major state institutions in Southeastern United States for personal interviews. Duplicating the Clagg list of interview institutions, one major state institution was chosen from each of the eleven states and an additional one was chosen from Florida. The twelve interview institutions selected were: (1) University of Alabama; (2) University of Arkansas; (3) University of Florida; (4) Florida State University; (5) University of Georgia; (6) University of Kentucky; (7) Louisiana State University; (8) University of Mississippi; (9) University of North Carolina; (10) University of South Carolina; (11) University of Tennessee; and (12) University of Virginia.8

8 In Clagg's study he did not find conservation instructors at Louisiana State University and the University of Virginia, so he chose George Peabody, East Tennessee State, and Troy State Teachers College to make a total of thirteen institutions from which interview instructors were chosen.
Since Clagg found most of his generalist conservation instructors in geography departments, these were the first departments contacted. If the geography department had no conservation instructor, the chairman was asked to identify the department at his institution where such a person could be found. Upon the department chairmen's recommendations, one conservation educator was chosen from each institution. Of these twelve conservation instructors interviewed, nine were members of geography departments or departments where geography was combined with other disciplines, two were members of education departments, and one was in a department of environmental sciences. Interviews were arranged so as to allow visitation to several institutions on a single trip.

Questionnaire instructors. In the second part of the replication, conservation instructors were selected from twelve other institutions (in addition to the twelve interview institutions) of Southeastern United States to complete the check-list questionnaire. Clagg felt that having an additional group of conservation instructors complete the check-list questionnaire would better substantiate the findings and develop a wider interest in the study. Twenty-two institutions used by Clagg were invited to participate in the present study, and twelve instructors from these institutions completed questionnaires. Seven of the eleven southeastern states were represented among the participating questionnaire institutions. A questionnaire was completed by a conservation instructor in each of the following institutions: (1) Arkansas State University; (2)
Florida Southern College; (3) University of Miami; (4) West Georgia College; (5) Western Kentucky University; (6) Delta State University; (7) Appalachian State University; (8) East Carolina University; (9) George Peabody College; (10) Memphis State University; (11) Middle Tennessee State University; and (12) Tennessee Technological University.

**Short form questionnaire instructors.** A third part of the replication involved a questionnaire containing twelve questions completed for 27 separate courses in 15 departments. Some departments returned two or three questionnaires because different courses in the department had conservation content. The interviewed instructors furnished names of departments which they knew had courses with conservation content. In some cases they named instructors who used conservation materials in their courses. Three short form questionnaires were sent to each of the recommended instructors and department chairmen to be distributed among their colleagues who they perceived to have conservation content in their courses. A letter describing the study accompanied the questionnaires. The 27 completed questionnaires came from departments of biological science, botany, curriculum and instruction, elementary education, geology, recreation administration, sociology, and zoology and physiology.

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9 See Appendix for letter that accompanied the short questionnaires.
One or more questionnaires were returned from every interview institution except the University of Georgia and the University of Virginia. The following list shows the participating institutions and the number of questionnaires returned from each: University of Alabama - two; University of Arkansas - three; University of Florida - one; Florida State University - three; University of Kentucky - four; Louisiana State University - three; University of Mississippi - one; University of North Carolina - one; University of South Carolina - three; and University of Tennessee - six.

Use of the Instruments

Check-list questionnaire. For the first part of the replication a check-list questionnaire was prepared for use during the interviews with the selected instructors. The check-list questionnaire appears in the Appendix.

The check-list contained questions relating to the nature and content of conservation courses, textbooks used, enrollments, materials and methods used, and perceived problems and needs in conservation education. Eleven of the twelve interview instructors were visited (one was interviewed by telephone), with interviews lasting for approximately two hours, and the check-lists were completed. The formal questions and answers led to related discussions, and pertinent additional comments of the instructors were recorded. The check-list materials were tabulated.

10 The check-list questionnaire appears in the Appendix.
and analyzed, and the findings were compared with the findings of the Clagg study. The results of the 1954 interviews and those of the present study are presented in Chapter III.

**Mailed check-list questionnaire.** The instruments completed and returned by the questionnaire respondents were treated in the same fashion as the check-list questionnaires from interviews. The questionnaire materials were tabulated and analyzed, and the findings were compared with the findings from the interview institutions and the Clagg study. The results of the questionnaire replication are presented in Chapter IV.

**Short form questionnaire.** This questionnaire was used to determine the conservation content in courses not primarily concerned with conservation. Some of the more pertinent aims of the questionnaire were to determine how conservation is taught in the course, the per cent of the course devoted to conservation, the areas of conservation emphasized, the per cent of students intending to become teachers, the degree to which the course meets the conservation needs of the students, and the perceived conservation needs of their state.11 The questionnaire covering courses not primarily concerned with conservation is treated at the end of the questionnaire chapter (Chapter IV). The responses to the questions on this questionnaire

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11 The short form questionnaire appears in the Appendix.
are discussed in light of the types of courses taught by the respondents, and the nature of their respective approaches to conservation education in those courses.

Delphi instruments. Three instruments were used in correspondence with the Delphi participants. The first instrument used contained the statement, "Please list all of the things that you think are likely to be included as the major thrust of conservation education in 20 to 25 years." The instrument was sent to each participant, along with a letter of explanation, as the first round of Delphi. The responses from round one were integrated into a second instrument which contained a check-list of twenty selected and edited responses. The second instrument and a cover letter were sent to each participant as round two of the Delphi. The Delphi participants were asked to choose the ten areas of conservation education they felt would head the list in 20 to 25 years, and rank their choices from one to ten. The returned responses were plotted in tabular form and favored responses were ranked in a "scoring" process. The ten favored responses from round two were incorporated in the third instrument of the Delphi. The check-list of ten selected conservation areas was sent to each participant as round three. Assuming that each of the ten specialty areas would occupy a place of importance in Conservation Education in 20 to 25 years, the participants were asked to choose the five they thought would lead the list and rank their choices from one to five. The returned responses were plotted, scored and ranked. The ranking of responses from the final round was considered the group
opinion concerning the major thrust of conservation education in the future. The Delphi instruments appear in appropriate parts of Chapter V.

The check-list, questionnaire, and Delphi instruments described above were administered to the population of the study in an attempt to determine the status of conservation education in a variety of categories. The following list contains the various topics covered: (1) subject content of courses primarily concerned with conservation; (2) extent of conservation materials in courses not primarily concerned with conservation; (3) materials used in conservation education, including course outlines and textbooks; (4) opinions of instructors concerning courses most valuable in preparing students for teaching conservation in public schools; (5) opinions of instructors as to which subject courses in the public schools lend themselves most readily to integration of conservation materials and at what levels they should be offered; (6) extent and kind of cooperation carried on by the institutions with outside conservation agencies; and (7) opinions of a group of conservation "experts" concerning the future areas of emphasis in conservation education.

A comparison of the content of current general conservation courses with the content of courses offered in 1954 could reveal whether changes were appropriate in light of conservation problems of the region. Opinions of conservation educators concerning the status and perceived future status of conservation education could be valuable to political and educational figures in creating policy for
research and planning in the field. The formulation of recommendations for the region based on an interpretation of the data could help to motivate additional discussions concerning the future of conservation education.

The Definition of Terms

Throughout this report certain pertinent terms will recur. Working definitions of the more prominent terms are listed below for purposes of clarity and consistency. Any deviations from these definitions will be noted.

Conservation. The wise use of natural resources for the benefit of all mankind.12

Conservation education. The conscious and organized attempt on the part of an institution or agency to offer instruction or information that will enable students to better understand and meet the problems of conservation. Conservation education, as used in the present study and in Clagg's study is confined to the general course in conservation designed to acquaint prospective teachers, active teachers, and the public with the field of conservation. This study is not concerned with the training of the conservation specialist who will actually perform conservation work as a profession.

12 Since this study is a replication of the Clagg study of 1954, definitions appearing in this chapter are edited versions of those on pages 2-4 of that work.
Resource-use education. A more advanced phase of conservation education. The goal of resource-use education is the improvement of living as the result of an educational program and involves going beyond the activities of conservation education to approach the community or regional resource problem through research and planning by students and adult citizens of the community.

Course offerings. A systematized series of classes or lectures in a given subject or field and listed in the institutional catalog as a part of the curriculum.

Basic conservation course offerings. Courses specifically designed to offer material in the field of conservation on a non-professional basis.

Conservation units in other courses. Organized conservation material offered as a part of some course not specifically designed to offer conservation.

Conservation agencies. Organizations outside the jurisdiction of the colleges or universities that do work in the field of conservation.

Natural resources. Resources provided by nature which are used for the benefit of man, but do not include man himself.

Southeastern United States. That portion of the United States which includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.
Institutions of higher learning. Schools above the secondary school level.

Interview institutions. Schools actually visited and selected instructors questioned by the writer concerning their conservation offerings.

Questionnaire institutions. Schools furnishing information regarding conservation courses by mail.

Summary

The present study is a replication of a study conducted by Sam E. Clagg in 1954. The original study attempted to determine the status of conservation education in colleges and universities in Southeastern United States. The present study deals with the same region and topic and identifies changes in the status of conservation education since 1954.

The three main questions addressed in the study are: (1) What is the status of conservation education in selected institutions of higher learning in Southeastern United States at the present time? (2) What changes have occurred in conservation education in these institutions of higher learning in the region in the last three decades? (3) What is the predicted status of conservation education in institutions of higher learning in Southeastern United States in 20 to 25 years?

Information generated by answering these questions provided the basis for formulating policy recommendations in conservation education.
The methodology of the study involved the replication method and the Delphi method. The population of the study involved 24 conservation instructors, and 27 additional instructors who had conservation content in their courses, in 24 institutions of higher learning in Southeastern United States. The southeastern region (the study area) contains the eleven states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

Data collection techniques included personal interviews, mailed questionnaires, and three rounds of correspondence in a Delphi procedures. The interview and questionnaire instruments were administered to the population of the study in an attempt to determine the status of conservation education in Southeastern United States. The findings of the present study were compared with those of the Clagg study of 1954 in an attempt to identify changes in conservation education in the last three decades. The Delphi procedure was used to predict the status of conservation education in Southeastern United States in 20 to 25 years.

In the collection and treatment of data throughout the study the generalist approach was used concerning conservation education. Emphasis was placed on teacher preparation in conservation and introductory courses in conservation directed toward the undergraduate student.
CHAPTER II

CHANGES IN CONSERVATION EDUCATION
IN SOUTHEASTERN UNITED STATES

Conservation Education Prior to 1950

As in the present study, the Clagg study of 1954 was involved with three decades of the evolution of conservation education. The former study was concerned with the status of conservation education in the early 1950s and with historical events leading to the thinking in the field at the time.

Clagg's findings revealed that the conservation effort of Theodore Roosevelt's administration had been largely legislative in nature. World War I necessarily diverted attention from significant conservation effort, so little was done in conservation education until the 1920s. As early as 1921 states in the Southeastern region had school laws pertaining to conservation. For example, in 1921 Tennessee had laws designating that public school students have instruction concerning the state's forests and plant life, in 1926 Mississippi law provided for the study for forestry in schools, and in 1929 the Georgia legislators provided for the teaching of conservation and protection of birds, animals, fish and forests.¹

¹ Clagg, op. cit., p. 53.
A conservation surge developed out of the depression and drought of the 1920s and 1930s, and the Franklin D. Roosevelt administration. In 1936 and 1939 Florida and Georgia, respectively, provided legislation for comprehensive coverage of conservation in the public schools and for all teacher training institutions to require a conservation course before teacher certification.²

A book titled *The Conservation of Natural Resources in the United States*, by Charles R. Van Hise, was credited as being very influential in the early dissemination of conservation knowledge. This book, first published in 1910, became the basic textbook for college courses in conservation for the next twenty-five years. It also established the pattern for most conservation texts that followed, and was largely responsible for creation of the first conservation courses offered by colleges and universities in the United States. The first conservation course in Southeastern United States was in the geography department at George Peabody College for Teachers, Nashville, Tennessee, in 1922. Between 1925 and 1938, nineteen other institutions of the southeast started conservation courses. Eighteen were in geography departments and one was in a geography, geology and mineralogy department. Conservation education surveys in 1948-1950 revealed most conservation courses in geography

² Ibid., pp. 53-54.
departments offering four or more courses in geography. Seventy percent of the geography departments surveyed by Clagg had a conservation course.3

Conservation Education in the 1950s

In the 1950s the emphasis in conservation education tended to be on natural resources and wise use of the resources. On a national scale the resources emphasized were soil, water, forests, grasslands, minerals, wildlife and man. Clagg, in 1954, found the instructors of the southeastern region emphasizing soils and forests with much less time devoted to the other resources. The instructors perceived those as the outstanding problems of the region.

The texts and course titles of the 1950s reveal the natural resource emphasis in conservation education in the decade. Tables 1 and 2 show selected popular textbooks of the time, with their publication dates, and selected course titles from college catalogs. Each of the texts highlighted natural resources and contained material on the history and purpose of conservation. Some had begun to include sections on local, state, and national planning for resource use. Sections on atomic and solar energy were included in a few of the texts.

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3Ibid., pp. 50-51.
### TABLE 1

**CONSERVATION TEXTBOOKS OF THE 1950s**

<table>
<thead>
<tr>
<th>Selected Textbooks by Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, <em>Conservation of Natural Resources</em>, 1950.</td>
</tr>
<tr>
<td>Whitaker and Ackerman, <em>American Resources</em>, 1951.*</td>
</tr>
<tr>
<td>McNall, <em>Our Natural Resources</em>, 1954.</td>
</tr>
<tr>
<td>Callison, <em>America's Natural Resources</em>, 1957.</td>
</tr>
</tbody>
</table>

*This was the most used textbook by the Clagg instructors in 1954.*
TABLE 2

CONSERVATION COURSE TITLES OF THE 1950s

<table>
<thead>
<tr>
<th>Selected Course Titles in Southeastern U.S.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Conservation of Natural Resources&quot; (20 institutions)</td>
</tr>
<tr>
<td>&quot;Conservation of Resources&quot; (2)</td>
</tr>
<tr>
<td>&quot;Conservation of National Resources&quot; (2)</td>
</tr>
<tr>
<td>&quot;Resource Use Education&quot; (1)</td>
</tr>
<tr>
<td>&quot;Economics of Resource Utilization&quot; (1)</td>
</tr>
<tr>
<td>&quot;World Resources&quot; (1)</td>
</tr>
<tr>
<td>&quot;Principles of Resource Utilization&quot; (1)</td>
</tr>
<tr>
<td>&quot;World Resources and Their Utilization&quot; (1)</td>
</tr>
</tbody>
</table>

*In the Clagg interview and questionnaire institutions.
Many of the conservation texts had a very "cold" and structured approach, and many instructors followed them faithfully. We do not know, of course, what specific topics were actually covered in the conservation classrooms or where emphasis was placed. A complete analysis of what happened in some of these classrooms in 1954 appears in Chapters III and IV of this paper, where the writer compares his findings with the Clagg findings.

One conservation instructor, Dr. William R. Brueckheimer, was not pleased with conservation textbooks or instruction in the 1950s, and proposed a shift in emphasis. His proposal was as follows:

In a typical textbook, a resource such as soils is traditionally treated in the following fashion: the various major soil groups are described, the past mis-use of soils and the result of such mis-use are recounted in dramatic fashion; and recommendations for the wise use of soils in the future are listed and discussed. This and the similar treatments of other resources seem to be based on the somewhat unrealistic assumption that if knowledge of wise conservation practices is made known, this knowledge will automatically be put into practice. Little emphasis, none at all at times, is given to the discussion of conservation problems as social problems—that is problems of social policy, problems of action, problems of instrumentation which necessarily involve a discussion of social conditions and those values basic to a liberal democratic society. Very often we know the changes that must take place in the physical use of resources but very often these physical changes cannot be instituted unless changes are also made in the social order.4

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Whether or not one believes in Dr. Brueckheimer's* premise, his
description of the texts and methods of presentation were accurate,
and it demonstrated an attempt to change and expand conservation
instruction.

The Directory of College Geography of the United States, 1952–
53, reported course offerings for 1,469 geography departments and 124
had a course in conservation. This represented a national average of
about 9 per cent. In the eleven states of the southeast, 213 colleges
and universities were surveyed and 45 institutions had a conservation
course. This was about 21 per cent, or more than twice the per cent
of conservation courses offered in the country as a whole.5 This was
due largely to the reaction of educational and governmental
institutions to the soil and forest problems of the southeast and the
initiation of such projects as the Tennessee Valley Authority.

Clagg felt in 1954 that several factors operated against the
formation of a sound conservation attitude. Some of these factors
were:

1. Conservation "scare books" which led many to believe our
   resources were exhausted.
2. Conservation agencies publicized their activities in such a
   way that others thought our conservation problems had been
   solved.

* Note: Professor Brueckheimer was an interview instructor and
a Delphi participant in the present study.

5 Clagg, op. cit., pp. 63 and 66.
3. The idea that had persisted in America since pioneer days that our resources were inexhaustible.
4. The traditional thought that an individual had the right to do as he pleased with his property.
5. The lack of a basic definition of conservation.
6. The thought that science could find a substitute for a depleted resource.
7. The idea that America could import strategic types of materials as they were exhausted.

It was difficult for a sound, consistent, conservation attitude to evolve from such divergent thinking. It should be stated that this type of thinking with respect to conservation has not been confined to the 1950s.

In his 1933 and 1951 editions of *World Resources and Industries*, Erich W. Zimmermann defined resources in a different fashion and changed the thinking of many people in conservation education. The Zimmermann book was used by one of the conservation instructors in the Clagg study, but is not usually considered a conservation textbook. Most conservation instructors have had great respect for Zimmermann and have used his book as a reference and as a recommended reading for students. However, this attitude was not confined to the 1940s or 1950s. His book is still used in the same fashion.

Zimmermann said that "Resources are living phenomena, expanding and contracting in response to human effort and behavior. They thrive under rational harmonious treatment. They shrivel in war and strife.

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To a large extent, they are man's own creation. Man's own wisdom is his premier resource—the key resource that unlocks the universe.  

Zimmermann and his followers believe that man should use his ingenuity to "create" resources from natural materials, use these resources as needed and with reason, then move on to "create" more resources. If natural earth materials are passed over, they may not be needed in the future scheme, and so do not get used for man's benefit.

In a conservation education study published in 1957 (all data were collected during the calendar years 1954 and 1955), Lively and Preiss presented many of the same kinds of materials found in the Clagg study. They reviewed Clagg's work and devoted several pages to his findings. Their research was funded by The Conservation Foundation and involved sending questionnaires to approximately 60 percent of all colleges and universities in the United States. It was not possible to separate materials for the southeastern region from their national study, but their book was an asset to the conservation education field.

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In 1957 the Lively and Preiss definition of conservation education was as follows:

... conservation education consists of more than merely imparting a select body of information or a certain set of specific skills; it must be regarded not only as vocational education, in the sense that it prepares the learner for a specific job, but as preparation for a conservation-oriented way of living, resulting in the development of habits and attitudes and a point of view toward nature, life and society.

In summary of conservation education in the 1950s, the writer believes the concentration on natural resources was a logical transition from the obsession with war, drought, and depression to a later diversified area of interest. The people in conservation were acutely aware of what can happen to resources in times of war and natural disaster. At a time of increasing demands and diminishing resources, the conservation educators felt the best way to approach the situation was to inform their students about the status and possible solutions of resource problems.

Conservation Education in the 1960s

By the 1960s the major focus of conservation education had shifted from natural resources to a concern for improving the quality of the environment and the quality of the lives of the people.

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Conservation educators increasingly were dealing with environmental issues related to pollution, hazards, energy, and human needs.

Table 3 shows the proliferation of research and publications concerned with environmental quality in the 1960s. Mitchell compared the number of articles appearing in one five-year period (1964-68) with the next five-year period (1969-73). In a category titled "Environmental perception" the number of articles increased from four in the first period to 24 in the second period. Under "Environmental hazards" the number of articles increased from seven to 25.

There were also significant increases in numbers of articles under the headings "Agricultural systems," "Theoretical issues," "Water resources," "food, hunger, and diet," and "energy resources."

Table 4 shows the themes of environmental research published in geographical journals from 1964 through 1973. Mitchell claimed 311 environmentally related articles were published during the period. His list of themes supports the premise that conservation (environmental) researchers and educators were concerned with environmental quality.®

In his book The American Environment, first published in 1968, Roderick Nash has a section titled "Conservation as Quality of the Environment." Under this heading he said that since the Second World War the driving force in American conservation had been the quest for

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<table>
<thead>
<tr>
<th>Themes</th>
<th>1964–68</th>
<th>1969–73</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental perception</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>Agricultural systems</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>Theoretical issues</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>Water Resources</td>
<td>14</td>
<td>26</td>
</tr>
<tr>
<td>Food, hunger, diet</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Energy resources</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Human modification of environment</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Marine and maritime resources</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Medical geography</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Population pressure</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>


TABLE 4

THEMES OF ENVIRONMENTAL RESEARCH PUBLISHED
IN GEOGRAPHICAL JOURNALS FROM 1964 THROUGH 1973*

<table>
<thead>
<tr>
<th>Themes</th>
<th>Number of Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural systems and rural resource development</td>
<td>41</td>
</tr>
<tr>
<td>Theoretical issues</td>
<td>41</td>
</tr>
<tr>
<td>Water resources</td>
<td>40</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>32</td>
</tr>
<tr>
<td>Resource appraisal and environmental perception</td>
<td>28</td>
</tr>
<tr>
<td>Human modification of the environment</td>
<td>24</td>
</tr>
<tr>
<td>Food, hunger, diet</td>
<td>21</td>
</tr>
<tr>
<td>Energy resources</td>
<td>17</td>
</tr>
<tr>
<td>Medical geography</td>
<td>16</td>
</tr>
<tr>
<td>Marine and maritime resources</td>
<td>8</td>
</tr>
<tr>
<td>Population pressure, carrying capacity</td>
<td>8</td>
</tr>
<tr>
<td>Land use assessment</td>
<td>7</td>
</tr>
<tr>
<td>Livestock and wildlife management</td>
<td>4</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>24</td>
</tr>
</tbody>
</table>


quality in the environment. He believed we had been distracted for a time with resource emphasis and providing for man's material needs.

In regard to our change of conservation attitude in the 1960s Nash said:

But the idea of protecting the environment for its nonmaterial values also had a long, if usually less potent, history in American thought. And by the 1960s this concept challenged utilitarianism as the central purpose of conservation. Continued improvements in technology, for one thing, eased fears of overpopulation and resource exhaustion. More importantly, many Americans were coming to realize that an environment conducive to survival—even to affluence—was not enough. They demanded that the land had to do more than just keep people alive. 10

Nash believed the "new conservation" brought with it a series of new problems. He said "the benefit-cost analyses were extremely difficult to make in regard to nonmaterial values," "the growing appreciation of nature created a crisis in outdoor recreation with a decrease in recreational satisfaction due to saturation and environmental abuse," and "the fact of too many people was responsible for pollution and general deterioration of the American environment." 11

Having taught conservation in West Virginia and Florida during the 1960s, the writer can confirm that the people of Southeastern United States were especially concerned with environmental quality, and conservation educators were more active in this part of the field.


11 Ibid., p. 156.
A book written by Rachel Carson in the early 1960s probably had more to do with creating a positive attitude toward environmental quality than any other factor in the decade. Her book, *Silent Spring*, published in 1962, was a history-making bestseller and won many awards. Her theme was that man-made pollutants in our environment threaten to destroy life on the earth. The book was well received because of Carson's science background (oceanography), its especially readable nature, and the extensive documentation. After the Houghton hardcover edition the book was published in a Fawcett paperback at $1.50, making it available to a mass audience.

In *Silent Spring* Carson recounts the "poisons" man has spread as pesticides and food additives and the effects these have had and will have on plants, animals and man. She felt very pessimistic about the chances for environmental quality, but proposed alternatives to the use of deadly chemicals. Her pessimism is expressed as follows:

> The most alarming of all man's assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible.12

In a bibliographical note in their 1972 conservation textbook, Ehrlich and Ehrlich called *Silent Spring* "probably the most important book by a scientist in the last 25 years." In the same bibliography they referred to another kind of activity concerning the attitude

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toward environmental quality. The Environmental Pollution Panel of the President's Science Advisory Committee reported its findings in 1965. The topic of the report was "Restoring the Quality of our Environment." The Ehrlichs said this was "an important source on environmental deterioration and what might be done about it." This is further evidence that environmental quality was being emphasized in the 1960s.

In his 1968 edition of Environmental Conservation, Dasmann expressed the view of environmental emphasis as follows:

Almost ten years have passed since the first edition (1959) of this book was written. During that decade much has happened in conservation. The words 'conservation' or 'environmental studies' are now in common usage. The need for an integrated approach to the problems of the human environment has become apparent.

It was possible ten years ago for a text on conservation to give minor space to the problem of pollution of water, none to pollution of air, and scant attention to the dangers from pesticides. Ten years ago it was an innovation to discuss urban problems in a conservation text. Today urban problems are the center of the struggle for conservation.

The approach to conservation that holds the most hope for the future is an ecological approach, that takes into account the ecology of man.

Dasmann's emphasis was that of a biologist and claimed the textbook was written from the viewpoint of an ecologist. At the end of the 1960s, Dasmann and other conservationists were beginning to use the word "ecology" and were "setting the stage" for the 1970s.

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Conservation Education in the 1970s

The emphasis of conservation education in the 1970s has tended to be on ecology and ecosystems. This observation is borne out both by the findings of the present study and the literature of the 1970s.

In his 1976 edition of The American Environment, Roderick Nash presented some of the best evidence for labeling the 1970s the decade of ecology. In this regard he said:

By the early 1970s hardly anyone in the United States was unaware of conservation even if they called it by a different name. "Environment" was in vogue. "Ecology" also became a household word, although those capable of defining it correctly were in a decided minority... Riding the crest of a wave of public interest and support, the conservation-turned-environment movement attained an unprecedented political and cultural power. During the years 1969 and 1970, which marked the zenith of environmental concern, it was a rare issue of a magazine or newspaper that did not feature some aspect of man's relationship to the earth.15

Nash felt the increasing American concern for conservation was rooted in shifting attitudes and values and, in view of what he called its evangelical character, he labeled it "The Gospel of Ecology." The diagram in Figure 1 shows his "Gospel of Ecology" and how conservation thinking came to a focus on ecology in the 1970s.

The lower levels of the Nash diagram separate and highlight "utilitarian," "ecological," and "aesthetic," the three major rationales for conservation that had been advanced in the United

15 Nash, op. cit., p. 225.
Figure 1. The Gospel of Ecology

States. Listed along the utilitarian branch of the diagram are names of people and events credited for the theories of wise and efficient use of resources prevalent in the 1950s. George Perkins Marsh (1801-1882) had been referred to as the "fountainhead of the conservation movement," and Gifford Pinchot (1865-1947), a great influence in organizing "conservation" to describe the movement in 1907. Pinchot was noted for his utilitarian approach to resources. Listed along the aesthetic branch of the diagram are names of people and events responsible for the attitude toward quality of environment/life prevalent in the 1960s. Henry David Thoreau (1817-1862) did much to focus attention on the man-nature relationship and influenced ethical and aesthetic conservation thought, and John Muir (1838-1914), a scientist and nature lover, was a pioneer in the promotion of aesthetic philosophy in the conservation movement. David Brower's affiliation was with "The Sierra Club" and "Friends of the Earth," organizations active in attempting to preserve environmental quality.

Listed along the middle, ecological branch of Nash's diagram are the names of key people and events leading to the fear for the environment experienced in the 1960s. The list includes American Indians, Aldo Leopold, Rachel Carson, Paul Ehrlich, and Barry Commoner. Leopold's *A Sand County Almanac*, Carson's *Silent Spring*, Ehrlich's *Population Bomb*, and Commoner's many conservation works have been particularly instrumental in contributing to the "fear" portion

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of the diagram. Nash believes fear was the catalytic agent that brought the three branches of conservation together in the 1960s. In regard to the fear he wrote:

... it was not the old fear of running out of useful resources which had impelled the utilitarians and produced its own minor explosion of public concern in 1907-1909. Nor was it the fear of making the world ugly and uninspiring, which figured as the mainstay of aesthetic conservation. The fear implicit in the ecological rationale stems from the recognition of threats to the health of the entire ecosystem.\(^\text{17}\)

The result of all of this activity in conservation was a focus on ecology in the 1970s. It is believed the intensity of environmental concern has cooled. This is shown by a constriction of the broad arrow in the diagram toward the end of the 1970s. In spite of the cooling, the legacy is a conservation/environment movement broader and deeper than before.\(^\text{18}\)

For a better understanding of what was being emphasized under the ecological theme in the 1970s the writer provides the following selected definitions of ecologically related terms from the glossary of Miller's *Living in the Environment*:

Ecology—the study of the relationship of living organisms with each other and with their environments; study of the structure and function of nature.

Ecosystem—self-sustaining and self-regulating community of organisms considered in relationship with each other and with their environment.

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\(^{17}\) Nash, *op. cit.*, p. 227.

Ecosphere (biosphere)—sum total of all the various ecosystems on the planet. The sphere of water, air, and land in which all life is found.

Ecosphere shares—concept that each human being is automatically entitled to a basic share of the world's resources that provide basic food, shelter and clothing.¹⁹

This approach to conservation education involves all of the resources that were studied in the past, such as water, soils, forests, wildlife, minerals, and man, but deals with them through food chains, food webs, and energy productivity.

Miller explains the process in the following manner:

An ecosystem functions through the two important processes of chemical cycling and energy flow. These two processes connect the various structural parts of an ecosystem together so that life is maintained.²⁰

Miller claims that these two processes are the major theme throughout his book. These processes have been used in parts of many of the recent conservation textbooks.

In the foreword to Miller's book, Garrett Hardin made the following remarks concerning the ecological approach to conservation:

Undoubtedly the single most important factor in ushering in the ecological age was the publication of Rachel Carson's Silent Spring in 1962. The immense activity in the field of human ecology since that time has produced a dazzling array of articles and books. . . .Sound guidance is needed, and we are given such guidance in this text by Professor Miller . . .

---


²⁰ Ibid., p. 57.
It is a marvelous frontier, this frontier that has been opened up by ecology. It abounds in first-rate intellectual puzzles and endless opportunities for improving the quality of human life.21

In the institutions of Southeastern United States the ecological approach to conservation education in the 1970s was reflected in the titles of conservation textbooks and courses. Selected textbooks and course titles of the decade are shown in Tables 5 and 6. The titles had not changed significantly from the 1950s to the 1960s, but a comparison of Tables 1 and 2 with Tables 5 and 6 reveals dramatic changes in this regard by the 1970s. Most of the course titles of the Clagg study were simply "Conservation of Natural Resources," but the conservation course titles of Southeastern United States were changed considerably at the time of the present study. The same trend is revealed in regard to conservation textbooks. Some of the textbook and course titles reflect the environmental quality emphasis of the 1960s and others reflect the ecological emphasis of the 1970s. The authors and instructors managed to incorporate the ecological theme in their titles in a variety of ingenious ways.

Terms commonly found in conservation course syllabi of the 1970s were: "Ecosystems in jeopardy," "Modifying ecosystems," "Ecological accounting," "People from ecosystem to biosphere," "Ecosystems and the balance of nature," "Systems and ecosystems applications to the biome concept," "Ecological determinism," and

21 Ibid., Foreword.
## TABLE 5

CONSERVATION TEXTBOOKS OF THE 1970s

<table>
<thead>
<tr>
<th>Selected Textbooks and Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whittaker, <em>Communities and Ecosystems</em>, 1970.*</td>
</tr>
</tbody>
</table>

* Textbooks used by instructors in the present study.
TABLE 6

CONSERVATION COURSE TITLES OF THE 1970s

<table>
<thead>
<tr>
<th>Selected Course Titles in Southeastern U.S.(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Conservation Ecology and Resource Management&quot;</td>
</tr>
<tr>
<td>&quot;Geography of Environmental Quality&quot;</td>
</tr>
<tr>
<td>&quot;Living Resources and the Future of Man&quot;</td>
</tr>
<tr>
<td>&quot;Natural Resources and Environmental Policy&quot;</td>
</tr>
<tr>
<td>&quot;Environmental Conservation&quot;</td>
</tr>
<tr>
<td>&quot;Man's Impact on Environment&quot;</td>
</tr>
<tr>
<td>&quot;Environmental Conservation&quot;</td>
</tr>
<tr>
<td>&quot;Geography of Environmental Resources&quot;</td>
</tr>
<tr>
<td>&quot;Environmental Problems&quot;</td>
</tr>
<tr>
<td>&quot;Man and Environment&quot;</td>
</tr>
</tbody>
</table>

\(^a\) In the interview and questionnaire institutions of the present study.
"Concepts of Ecology." If their syllabi were an indication of what the conservation instructors were actually doing in the courses of the 1970s, a considerable emphasis was being placed on the ecological theme.

Conservation Education from the 1950s to the 1980s

Conservation education in the three decades since 1954 has changed in a variety of other ways. One way to view changes in the field over the last three decades is to survey trends in enrollment in conservation courses. The only central source of geography enrollment data is The Directory of College Geography. There were interruptions in the publication of this directory before 1954, but publication has been continuous since that time. Fortunately, this time interval coincides with the period covered by the present study. Most of the conservation enrollment figures in the directory were reported by geography but some departments other than geography also reported enrollment figures.

Table 7 shows conservation enrollments in colleges and universities of Southeastern United States from 1954 to 1979. The table lists total conservation enrollments, per cent of total geography enrollments, average annual conservation enrollments, and institutions offering conservation for the eleven southeastern states during the 25 years. Florida outranked the other southeastern states with 29 institutions reporting a total of 31,684 conservation enrollments, which was an annual enrollment of 1,267. Considering the
<table>
<thead>
<tr>
<th>State</th>
<th>Total Conservation Enrollments</th>
<th>Per Cent of Total Geography Enrollments</th>
<th>Average Annual Conservation Enrollments</th>
<th>Institutions Offering Conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>4,104</td>
<td>1.91</td>
<td>164.2</td>
<td>10</td>
</tr>
<tr>
<td>Arkansas</td>
<td>8,469</td>
<td>6.77</td>
<td>338.8</td>
<td>11</td>
</tr>
<tr>
<td>Florida</td>
<td>31,684</td>
<td>12.51</td>
<td>1,267.4</td>
<td>29</td>
</tr>
<tr>
<td>Georgia</td>
<td>1,855</td>
<td>1.04</td>
<td>74.2</td>
<td>4</td>
</tr>
<tr>
<td>Kentucky</td>
<td>5,696</td>
<td>2.10</td>
<td>227.8</td>
<td>11</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1,304</td>
<td>0.40</td>
<td>52.2</td>
<td>9</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,273</td>
<td>2.07</td>
<td>90.9</td>
<td>8</td>
</tr>
<tr>
<td>North Carolina</td>
<td>3,517</td>
<td>0.92</td>
<td>140.7</td>
<td>18</td>
</tr>
<tr>
<td>South Carolina</td>
<td>666</td>
<td>0.89</td>
<td>26.6</td>
<td>3</td>
</tr>
<tr>
<td>Tennessee</td>
<td>11,402</td>
<td>3.17</td>
<td>456.1</td>
<td>17</td>
</tr>
<tr>
<td>Virginia</td>
<td>1,467</td>
<td>1.05</td>
<td>58.7</td>
<td>10</td>
</tr>
<tr>
<td><strong>Southeast Total (mean)</strong></td>
<td><strong>72,437</strong></td>
<td><strong>(2.98)</strong></td>
<td><strong>(263.4)</strong></td>
<td><strong>130</strong></td>
</tr>
<tr>
<td><strong>All States Total (mean)</strong></td>
<td><strong>361,852</strong></td>
<td><strong>(2.63)</strong></td>
<td><strong>(283.8)</strong></td>
<td><strong>540</strong></td>
</tr>
</tbody>
</table>

*The eleven Southeastern states had 20 per cent of the total conservation enrollment.

b The eleven Southeastern states had 24 per cent of the institutions offering conservation.

nation as a whole, the only states outranking Florida were Wisconsin and Illinois with 39,918 and 48,007 enrollments respectively. Conservation enrollments in the southeast were 2.98 per cent of total geography enrollments, which was slightly higher than the nation as a whole. Average annual enrollments were slightly lower than the nation as a whole. During these 25 years the southeast had 24 per cent of the institutions offering conservation and had 20 per cent of the total conservation enrollment. The most striking figure in the southeast and in the nation is listed under Florida, where 12.51 per cent of all geography enrollments were in conservation during the study period.22

Vining listed 33 institutions in the United States with average conservation enrollments exceeding 100 per year during the 25-year period. Only six of the institutions were in the southeast. Three were in Florida and there was one each in Arkansas, Kentucky and Tennessee. Vining gave a variety of reasons for the high enrollments at the leading institutions. Some of these reasons were: (1) At the University of Miami, ranked second with more than 400 students per year, conservation is only a social science elective but attracts students because they perceive it as being interesting and pertinent in today's world, (2) the conservation course at the third ranked institution had a popular instructor and the students receive senior-

level credit, (3) at the sixth-ranked institution the conservation course was required for teacher certification and was viewed by majors in other fields as interesting and valuable, and (4) hundreds of students who major in conservation at one institution were required to take the geography department's conservation course.\textsuperscript{23}

Vining concluded that conservation was an important geography course in the United States between 1954 and 1979. In explanation of his findings he said:

\begin{quote}
Despite an absolute increase in conservation enrollments during the middle and late 1960s, other geography courses apparently experienced greater increases to account for the decline in conservation's percentage of total enrollment at that time. The rapid growth of geography programs in the 1960s provided increased opportunity for students to enroll in new courses—courses perhaps promising more excitement than conservation just because they were new.

The rash of new geography courses spurred by growing interest in ecology, such as human ecology, environmental management, and the geography of pollution, as well as new environmental courses introduced by such departments as biology, agriculture, geology, and economics, would appear to represent stiff competition for conservation courses. Beginning in 1969-70, however, conservation's percentage of total enrollment grew rapidly and the course reached a new zenith in popularity during the 1970s. Despite a minor downturn in enrollment in the late 1970s, conservation shows no signs of significant weakening. Its importance in geography seems likely to continue.\textsuperscript{24}

Some conservation instructors are not as optimistic as Vining concerning the position of conservation. One of his critics said:
\end{quote}

\textsuperscript{23} Ibid., p. 29.
\textsuperscript{24} Ibid., pp. 31-32.
Vining appears to perceive that conservation is alive and well, largely, because he seems to believe that courses taught under other titles are carrying on the work. I disagree. I think there are substantive differences.

The public and many academicians flocked to ecology and environmental science when the terms became faddish, and generally misunderstood both their meaning and their content. Ecology does not span easily the gamut of resources since its focus is upon organisms. Although there is much research into environmental relationships, ecology cannot produce a conservation ethic. Conservation appears to remain as the only study of resources that synthesizes, or integrates, that emphasizes selecting wise use from many alternatives, and that has a broad philosophical base.25

At approximately the same time Vining was presenting his findings on conservation enrollments in colleges and universities for a 25 year period (1954 to 1979), Maxfield was presenting his findings which compared enrollment for two widely separate academic years (1951-52 and 1979-80). Tables 8 and 9 contain data gleaned from the Maxfield study. Table 8 shows conservation enrollment in geography departments in Southeastern United States in 1951-52, and Table 9 shows enrollment in 1979-80. The tables are designed to show total geography enrollment, total conservation enrollment, per cent of total geography enrollment, and number of institutions in the eleven southeastern states.

In 1951-52 Tennessee had nine institutions with 12,884 enrolled in geography and only 380 of those were in conservation. In dramatic contrast, Arkansas had eight institutions with only 3,897 enrolled in geography and 1,324 of those were in conservation. The Arkansas

TABLE 8

CONSERVATION ENROLLMENT IN GEOGRAPHY
DEPARTMENTS IN SOUTHEASTERN U.S. -
(ACADEMIC YEAR 1951-1952)*

<table>
<thead>
<tr>
<th>State</th>
<th>Total Geog.</th>
<th>No. Inst.</th>
<th>Conservation</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>7,152</td>
<td>7</td>
<td>413</td>
<td>5.77</td>
</tr>
<tr>
<td>Arkansas</td>
<td>3,897</td>
<td>8</td>
<td>1,324</td>
<td>33.97</td>
</tr>
<tr>
<td>Florida</td>
<td>6,237</td>
<td>7</td>
<td>593</td>
<td>9.45</td>
</tr>
<tr>
<td>Georgia</td>
<td>2,655</td>
<td>2</td>
<td>121</td>
<td>4.55</td>
</tr>
<tr>
<td>Kentucky</td>
<td>5,634</td>
<td>3</td>
<td>46</td>
<td>0.81</td>
</tr>
<tr>
<td>Louisiana</td>
<td>4,168</td>
<td>2</td>
<td>24</td>
<td>0.57</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,445</td>
<td>3</td>
<td>112</td>
<td>4.58</td>
</tr>
<tr>
<td>North Carolina</td>
<td>8,418</td>
<td>4</td>
<td>108</td>
<td>1.28</td>
</tr>
<tr>
<td>South Carolina</td>
<td>1,928</td>
<td>1</td>
<td>5</td>
<td>0.25</td>
</tr>
<tr>
<td>Tennessee</td>
<td>12,884</td>
<td>9</td>
<td>380</td>
<td>2.94</td>
</tr>
<tr>
<td>Virginia</td>
<td>1,816</td>
<td>1</td>
<td>10</td>
<td>0.55</td>
</tr>
<tr>
<td>Southeast Total</td>
<td>57,270</td>
<td>47</td>
<td>3,136(^a)</td>
<td>5.88</td>
</tr>
<tr>
<td>All States Total</td>
<td>240,161</td>
<td>159</td>
<td>8,244(^a)</td>
<td>3.43</td>
</tr>
</tbody>
</table>

\(^a\) The Southeastern states had 38\% of total conservation enrollment.

<table>
<thead>
<tr>
<th>State</th>
<th>Total Geog.</th>
<th>No. Inst.</th>
<th>Conservation</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>7,401</td>
<td>2</td>
<td>58</td>
<td>0.78</td>
</tr>
<tr>
<td>Arkansas</td>
<td>6,402</td>
<td>4</td>
<td>239</td>
<td>3.73</td>
</tr>
<tr>
<td>Florida</td>
<td>13,530</td>
<td>13</td>
<td>1,341</td>
<td>9.91</td>
</tr>
<tr>
<td>Georgia</td>
<td>9,243</td>
<td>5</td>
<td>279</td>
<td>3.01</td>
</tr>
<tr>
<td>Kentucky</td>
<td>13,224</td>
<td>4</td>
<td>225</td>
<td>1.70</td>
</tr>
<tr>
<td>Louisiana</td>
<td>14,999</td>
<td>6</td>
<td>248</td>
<td>1.65</td>
</tr>
<tr>
<td>Mississippi</td>
<td>3,509</td>
<td>3</td>
<td>70</td>
<td>1.99</td>
</tr>
<tr>
<td>North Carolina</td>
<td>19,448</td>
<td>9</td>
<td>245</td>
<td>1.26</td>
</tr>
<tr>
<td>South Carolina</td>
<td>5,026</td>
<td>3</td>
<td>192</td>
<td>3.82</td>
</tr>
<tr>
<td>Tennessee</td>
<td>14,301</td>
<td>11</td>
<td>320</td>
<td>2.24</td>
</tr>
<tr>
<td>Virginia</td>
<td>12,959</td>
<td>3</td>
<td>63</td>
<td>0.49</td>
</tr>
<tr>
<td>Southeast Total</td>
<td>120,042</td>
<td>63</td>
<td>3,280</td>
<td>2.78</td>
</tr>
<tr>
<td>All States Total</td>
<td>670,598</td>
<td>310</td>
<td>24,459</td>
<td>3.65</td>
</tr>
</tbody>
</table>

* The Southeastern states had 13% of total conservation enrollment.

figure amounted to almost 34 per cent of geography enrollment in conservation. The Arkansas figure accounted for more than a third of the total for the southeast and placed the southeast with 38 per cent of total conservation enrollment in the nation. No evidence has been found as to why the conservation enrollment figure was so high in Arkansas in 1951-52.

Two tables in the Appendix show total enrollments in 1952 and 1980 for the twelve interview institutions and twelve questionnaire institutions of the present study. The tables show dramatic increases in student populations at these 24 schools, and it is assumed similar increases occurred at many other institutions in the southeast. With a significant increase in total enrollment, a comparable increase in geography and conservation enrollment would be expected by 1979-80. The increases were not as great as expected. Forty-seven institutions had 57,270 geography enrollments in 1951-1952 and 63 institutions had 120,040 geography enrollments in 1979-80. The conservation enrollments remained essentially the same. The southeast had only 13 percent of total conservation enrollment in the nation in 1979-80. The total conservation figure would have been much lower without Florida's 1,341. Florida had 18 institutions involved, and the University of Miami alone was averaging about 422 conservation enrollment each year during this period. (See Vining discussion). Two other Florida institutions were averaging over 100 per year.26

26 Ibid., pp. 7-8.
Finally, in dramatic contrast to the optimism expressed by Mitchell, Nash, and Vining earlier in this chapter, the writer includes views of Towler and Brenchley. They feel that geographers have given very little attention to environmental education. Their pessimistic views were expressed as follows:

We have witnessed the decline of geographic content in the elementary schools, its disappearance into the morass of the social studies and earth sciences in the secondary schools, and a somewhat feeble battle for survival currently being waged in the United States at the university level. For a subject which has so much to offer to so many people in so many walks of life and which relates directly to almost every aspect of human endeavor, it is almost impossible to account for the lack of attention geographers have paid to the growing and important field of environmental education.  

The views of Towler and Brenchley were based on surveys conducted in the public sector pertaining to environmental concerns. They were amazed to find how unaware and unconcerned students and the general populace were about environmental concerns. They believed more hands-on conservation education was needed at all levels.

It seems clear that the variety of opinions demonstrated by these generalists in conservation education accomplish what the individuals set out to do, which is to motivate others in the field to agree or disagree—research, implement, test, and report.

Summary

Early in the century conservation work was largely legislative in nature, so little was done in conservation until the 1920s. A book by Van Hise in 1910 started the dissemination of conservation knowledge. Some believed it established the pattern for conservation textbooks, and was largely responsible for the first conservation courses in colleges and universities in the 1920s, 1930s, and 1940s. Most of these courses were in geography departments. These textbooks and courses established the emphasis in wise use of natural resources that prevailed through the 1950s.

The emphasis on natural resources in conservation education in the 1950s was revealed in the textbook and course titles of the decade. The conservation textbooks usually had "resources" in the title and most of the college conservation courses were titled "Conservation of Natural Resources." The emphasis was on wise use of soils, water, forests, minerals and wildlife. In the 1920s and 1930s in Southeastern United States the greatest emphasis in conservation education was on soils. The Clagg study revealed that soils and forests received greatest emphasis in conservation courses in 1954. The early 1950s was the time of the Korean War and people had vivid memories of the depression, drought, and World War II. Those in conservation education reacted by writing "scarce books" and other conservation materials and by emphasizing natural resources in their courses. Some, such as Zimmermann, said man should use his ingenuity to create resources.
Beginning earlier with input from such concerned persons as Thoreau, Muir, and Leopold, and culminating with Rachel Carson's book in 1962, the quality of environment/life emphasis was established for the 1960s. The textbook and course titles did not change significantly in the 1960s, but book and course formats were changed to adjust to the environment theme. There was a proliferation of articles on such topics as "environmental perception" and "environmental hazards" in the periodicals of the decade. Improved technology eased fears of overpopulation and resource exhaustion and people realized that an environment conducive to survival was not enough. They wanted improvements in the quality of the environment. Conservation educators reacted by including sections in their textbooks and courses concerning urban problems, pesticides, and many kinds of air and water pollution problems. Before the 1960s in the southeast the conservation educators were more interested in soils, forests, water, and minerals for their own sake, but in the 1960s they emphasized what mining and processing those minerals did to the soil, water and air, what urban pollutants such as oil and detergents did to soil and water, and what all of the changes were doing to the people and wildlife.

The emphasis in conservation education in the 1970s was ecology and ecosystems. Because of protests, demonstrations and the "true believer" attitudes of the people, some applied the label "Gospel of Ecology" to the conservation movement. The ecology movement was ushered in by the Santa Barbara oil spill (Jan. 28, 1969), the
National Environmental Policy Act (Jan. 1, 1970), and Earth Day (April 22, 1970). The utilitarian, ecological, and aesthetic branches of the conservation movement were now brought together under the "ecology" banner. There was the usual range of views but a common focus for research and teaching, and social and political action. In Southeastern United States the ecological approach to conservation education in the 1970s appeared in textbook and course titles. In the late 1970s a number of textbooks had "ecology" and "ecosystem" in the title, and course titles had some of the same features. The course syllabi contained even more ecology related terms.

Geography departments in the eleven states of Southeastern United States have been very active in conservation education since 1954. During the 25 years from 1954 to 1979 there were 72,437 conservation enrollments in Southeastern United States in 130 institutions offering conservation. The southeast had 24 per cent of the institutions offering conservation and 20 per cent of the total conservation enrollment in the nation. Total enrollments at colleges and universities in Southeastern United States have increased dramatically in the last three decades, but geography and conservation courses have not kept pace. One study revealed the total conservation enrollment in the southeast to be essentially the same in academic years 1951-52 and 1979-80, at just over 3,000. In the nation as a whole the total conservation enrollment was 8,244 in 1951-52 and 1979-80. The southeast had 38 per cent of the nation's conservation enrollment in 1951-52 but only 13 per cent in 1979-80.
In the nation as a whole there were absolute increases in conservation enrollments in the middle and late 1960s, but there was a decline in conservation's percentage of total geography enrollment, due to increases in other geography courses. New geography courses with ecology, pollution, and management themes, and environmental course in other disciplines gave conservation courses some competition. Beginning in 1969-70, however, conservation percentage of total geography enrollment grew rapidly and the course maintained great popularity during the 1970s.
CHAPTER III

THE FINDINGS FROM THE INTERVIEW INSTITUTIONS

Introduction to the Data

The procedures for identifying interview institutions and conservation instructors for this analysis were patterned after procedures used in the Clagg study of 1954. A generalist conservation instructor was identified at each of twelve major state institutions in Southeastern United States for a personal interview. The twelve interview institutions selected from eleven southeastern states were: (1) University of Alabama; (2) University of Arkansas; (3) University of Florida; (4) Florida State University; (5) University of Georgia; (6) University of Kentucky; (7) Louisiana State University; (8) University of Mississippi; (9) University of North Carolina; (10) University of South Carolina; (11) University of Tennessee; and (12) University of Virginia. Selection of the eleven southeastern states of the study area, and selection of the interview institutions from those states were discussed in Chapter I. Figure 2 shows the locations of the interview institutions.

A review of institutional catalogs revealed a primary conservation course (nine in geography departments, two in education, and one in environmental science) at each of the interview
Figure 2. Location of the Interview Institutions
institutions. Through correspondence with department chairmen the conservation instructors were identified, and an instructor from each institution agreed to be interviewed.

A check-list questionnaire was prepared for use during the interviews with the instructors. The check-list contained questions relating to the nature and content of conservation courses, texts used, enrollments, materials and methods used, and perceived problems and needs in conservation education. Each of the twelve instructors of primary conservation courses was personally interviewed and the check-lists were completed.

The questions to be answered in this portion of the study are: (1) What was the status of primary conservation courses in these twelve institutions of Southeastern United States in regard to nature and content, textbooks, enrollments, materials and methods, and problems and needs? (2) How did the findings in the present study compare with the findings in the former study? (3) What are the perceived reasons for change or lack of change in status of conservation education during the intervening years, and what conclusions may be drawn from the findings?

The next section of this report follows the form of the interview check-list and questionnaire. Individual questions are discussed under main headings concerning course offerings, teaching

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1 The check-list questionnaire appears in the Appendix.
methods, textbooks, student enrollments, conservation materials in
departments, conservation problems in the region, and cooperation with
conservation agencies.

**Primary Conservation Courses**

In an attempt to recognize and highlight the primary
conservation courses in the participating departments, the following
questions were asked: What are the titles of the primary conservation
courses in your department, and at what levels are the courses
offered?

As shown in Table 10, eight of the twelve interview
institutions surveyed listed primary conservation courses in geography
departments. The survey revealed a variety of courses offered by the
departments. In addition to standard courses such as "Conservation of
Natural Resources" and "Conservation of Resources," a number of less
conventional courses were identified, including "Conservation Ecology
and Resource Management," "Natural Resources and Environmental
Policy," "Geography of Environmental Quality," and "Environmental
Conservation." Two of the interview institutions offered primary
conservation courses in the education department, one institution had
its course in a geography-geology department, and one had the course
in an environmental science department. One of the education
departments called its course "Conservation Education Workshop," and
conducted the course in the summer for teachers with at least one year
of teaching experience. The other education department called its
<table>
<thead>
<tr>
<th>Institution</th>
<th>Course Title</th>
<th>Department</th>
<th>Hours</th>
<th>Credit Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>Environ. Earth Science</td>
<td>Geog.-Geol.</td>
<td>4 sem.</td>
<td>So</td>
</tr>
<tr>
<td>Arkansas</td>
<td>Cons. of Natural Resources</td>
<td>Geography</td>
<td>3 sem.</td>
<td>J-S</td>
</tr>
<tr>
<td>Florida</td>
<td>Cons. of Resources</td>
<td>Geography</td>
<td>4 qt.</td>
<td>J-S</td>
</tr>
<tr>
<td>Florida St. U.</td>
<td>Man and Environ.</td>
<td>Geography</td>
<td>3 qt.</td>
<td>F</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Geog. of Environ. Quality</td>
<td>Geography</td>
<td>3 sem.</td>
<td>So</td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>Environmental Cons.</td>
<td>Geography</td>
<td>3 sem.</td>
<td>J-S-G</td>
</tr>
<tr>
<td>Mississippi</td>
<td>Cons. Educ. Workshop^</td>
<td>Education</td>
<td></td>
<td>G</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Natural Resources</td>
<td>Geography</td>
<td>3 qt.</td>
<td>J-S</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Man's Impact on Environ.</td>
<td>Geography</td>
<td>3 sem.</td>
<td>J-S</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Environmental Educ.*</td>
<td>Education</td>
<td></td>
<td>J-S-G</td>
</tr>
<tr>
<td>Virginia</td>
<td>Living Res. and the Future of Man</td>
<td>Envir. Sci.</td>
<td>3 sem.</td>
<td>F-So</td>
</tr>
</tbody>
</table>

* Reported by one instructor in each institution.

** F-Freshman, So-Sophomore, J-Junior, S-Senior, G-Graduate

^ Offered in the summer and requires a degree plus one year of teaching experience.

* One undergraduate and one graduate course listed under the same name with different numbers.
course "Environmental Education," and geared the course for seniors preparing to be teachers. The geography-geology department called its course "Environmental Earth Science," and the environmental science department called its course "Living Resources and the Future of Man."

As shown in Table 10, the title of the primary conservation course was different in each of the twelve interview institutions.

In his 1954 study, Clagg found that most of the primary conservation courses had the title "Conservation of Natural Resources." Only one course in the present study had that title. The institution using this title has done so since 1954, and the course description remains the same. Some of the courses have retained qualities of their former names, such as "Conservation of Resources" and "Geography of Natural Resources." One interview instructor stated that the word "conservation" had recently been dropped from the course title at his institution. He did not know the reason for this change.

The variety of titles that have been given the primary conservation courses in the years since the Clagg study, reflect changes in attitude toward the subject, but many are due to the proliferation of research and writing in the conservation realm. Changes in course titles also reflect changes in textbook titles. Several of the textbooks used in 1954 and in the previous five years

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2 Clagg, op. cit., p. 69.
had conservation, natural resources, or both in their titles. As shown in Table 10, many of the course titles in the present study reflect the use of textbooks with the word environment in their titles.

Table 10 shows that primary conservation courses were offered from freshman to graduate levels. Of the fourteen\(^3\) course titles listed, nine were open to juniors and seniors and four were open to graduate students. Four of the remaining courses were open to freshmen and/or sophomores and one course was limited to graduates. The course with the greatest number of students (approximately 500 each term) was offered to freshmen and sophomores in an environmental science department. When the instructor of this course was asked why so many students enrolled, he answered, "Because it is an easy course." He soon added, however, that the course had a reputation for being interesting and rewarding to the students.

Regarding the level of course offerings, the main difference between the present study and the Clagg study was that in 1954 all of the conservation courses were restricted to students at the junior level or above. Several instructors in the present study expressed the view that more students would be exposed to conservation if there were fewer prerequisites and restrictions applied to enrollment in the conservation courses. Several of the Clagg instructors felt that

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\(^3\) Two courses are listed for Florida State University and two for the University of Kentucky.
students needed a better general background for a better understanding of the conservation courses.

The greatest similarity among conservation courses in both studies was in regard to the hours of credit students could earn in the courses. All but three courses in each study were offered for three quarter or semester hours credit. The remaining three courses in each study were offered for four or five quarter or semester hours. In spite of complaints in both studies concerning their not having enough instructional time in the courses, the conservation instructors felt that three quarter or semester hours were appropriate for the course.

Methods in Primary Conservation Courses

The first question posed to the interview instructors concerning methods in their conservation course was: How do you present your course in conservation?

Table 11 shows the lecture method as the predominant technique of conservation instruction. All of the instructors used the lecture method at times, and seven of the twelve used lectures exclusively. Field work was used by only three of the instructors, and one of the courses involved in field work was strictly a field course offered in the summer. One of the instructors took his students on two or three short field trips each term, and another had his students "in the field" for a full day every other weekend. The two conservation courses using the workshop method were in education departments.
### TABLE 11

**METHODS OF PRESENTING CONSERVATION IN THE INTERVIEW INSTITUTIONS**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Lecture</th>
<th>Workshop</th>
<th>Field Work</th>
<th>Laboratory</th>
<th>Correspondence</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>x^ay^b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>x y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>East Tenn. St.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Florida</td>
<td>x y</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Florida St. U.</td>
<td>x y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>x y</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>x y</td>
<td>x</td>
<td></td>
<td>y</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Kentucky</td>
<td>x y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>y</td>
</tr>
<tr>
<td>Mississippi</td>
<td>x y</td>
<td></td>
<td></td>
<td>y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>x y</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>x y</td>
<td>x</td>
<td>x y</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (G)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (E)</td>
<td>x y</td>
<td>x y</td>
<td>x</td>
<td>x y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troy State</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*b The present study.*

*c In Clagg Study, not in present study.*

* Reported by one instructor for a course in each institution.*
These workshop courses relied heavily on outside specialists. In a workshop syllabus acquired from one instructor, twelve conservation specialists were listed for one two-week summer course.

In the Clagg study, as in the present study, lecture was the preferred method of instruction. All of the Clagg instructors used lectures at times, but only one-fourth of the Clagg group used the lecture method alone. Table 11 shows field work as the second most used method for Clagg instructors. The table also shows workshop, laboratory, extension, and correspondence as methods used by the Clagg instructors.

There appeared to be no clear cut distinction between field work and laboratory work in either of the studies. Table 11 shows five Clagg institutions with field work and four with laboratory work, which is more than in either category in the present study. Clagg briefly discussed conservation courses by extension and correspondence in his study, but there was no mention of either of these methods in the present study.

It appears that the Clagg instructors used a greater variety of methods than instructors in the present study. In both groups instructors deplored the use of so much lecture, but felt that time and limited facilities prohibited the use of other methods. The situation appeared to be more acute in the present study, since the instructors repeatedly referred to problems with large classes and the need for more time with their students. They also claimed the conservation field had become so complex, and there was so much to
cover in their courses, that they needed to devote more time to lecture and less time to what they felt were more time consuming and less productive pursuits.

In contrast to the "pressure" expressed by instructors in the present study, Clagg described a more leisurely approach in some conservation courses in 1954. Five of his interview instructors were explicit in their support of the lecture and class discussion or "informal chat" approach to their conservation courses. Clagg claimed the limited number of students in the classes contributed to the popularity of this approach. A comparison of class size between the two studies may explain, at least in part, this difference in attitude. The total primary conservation enrollment for a single term (14 courses) in the Clagg study was 386, with a range in class size from 10 to 43. The total enrollment for a single term (12 courses) in the present study was 1,008, with a range in class size from 12 to 50. One institution had a course with 108 students in three sections, a second had 100 students in two sections, and a third had 540 students in numerous sections. Comparing the individual class enrollments of the two studies (See Table 19 in section on enrollment) reveals larger classes in the present study, thus more "pressure" on the instructors.

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4 Clagg, op. cit., p. 80.
5 Ibid., p. 134.
The second question posed to the interview instructors concerning methods was: On what topics in conservation do you place the greatest emphasis? The topics listed were soils, water, minerals, forests, wildlife, and human.

All of the instructors interviewed had devoted time to each of the topics on the questionnaire, but each was quick to remark that he had placed special emphasis on some plus additional ones. Table 12 shows the topics emphasized by interview instructors in both studies in addition to soils, water, minerals, forests and wildlife. Many of the same topics appear in both studies, but the times mentioned in the various categories is significantly different. History and philosophy of conservation was mentioned five times in the present study as an important part of the course, but was mentioned only once in the Clagg study. The greater emphasis on history and philosophy is part of the diversification of conservation topics since 1954. Energy was mentioned five times as a major topic in the present study, but was not mentioned by the Clagg group. This was to be expected considering the problems with energy today as compared with 25 to 30 years ago.

None of the topics listed on the questionnaire was picked as receiving the greatest emphasis in the conservation courses of the instructors. In the present study six of the twelve instructors listed water as an important part of their course. All six believed water was important because of its relationship to all of the other topics, but two in particular preferred the water topic because of special training in graduate school. One had studied marine biology
<table>
<thead>
<tr>
<th>Conservation Topics</th>
<th>Number of times mentioned (Present study)</th>
<th>Number of times mentioned (Clagg study)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>History and Philosophy of Cons.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Energy</td>
<td>.5</td>
<td></td>
</tr>
<tr>
<td>Human (population, food)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Conservation Planning</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ecology, Ecosystems</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Recreation and Scenic Resources</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Coastal Erosion</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cons. Objectives and Theory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Grasslands</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fisheries (ocean resources)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Clagg, op. cit., p. 84.
at the University of Miami and the other had been a Lake Erie specialist. Five instructors listed forests, and four listed minerals as special topics in their courses because of their significance in the southeastern region.

In the Clagg study 50 per cent of the instructors placed primary emphasis on conservation of soils. Clagg felt the emphasis on soils demonstrated an instructional effort to combat a basic resource problem of the southeastern region—soil, erosion and depletion. Forests, water, and minerals were placed second, third, and fourth respectively as topics of emphasis in their courses.

None of the instructors in the present study isolated soils for exclusive study in their courses. They only mentioned soil as it related to other problems. When asked about the emphasis on soils in the conservation courses, three of the respondents answered, "not now," "not much," and "less than before." The instructors gave a variety of reasons for this: (1) the region is no longer so strictly agricultural, (2) the new industries had created air and water pollution problems, (3) ecological balances had been disturbed by the establishment of facilities for increased population, tourism, and industry, (4) energy had become a much greater problem, and (5) conservation concerns were now more national and international than local.

6 Ibid., p. 84.
It would appear that a better balance among topics in conservation courses exists today than in the 1954 study. The attitude toward philosophy of conservation appears to be more enlightened, and emphasis on a wider range of topics on a national scale appears to be a better approach to the education of a college student in conservation. Learning how to slow erosion, stop pollution, or make inventories of resources might better be left to conservation specialists.

The third question posed to the interview instructors concerning methods in their conservation courses was: What factors most limit your teaching of conservation?

Nine of the twelve instructors in the present study expressed the feeling that time was the factor that most limited their teaching of conservation (see Table 13). Their time problems were related to numbers of students and length of terms. Two instructors blamed large classes. One of these instructors was in a department where approximately 500 freshmen and sophomores were registered in the conservation course each term. Some of the other problems mentioned were: (1) teaching graduates and undergraduates in the same course, (2) students from many parts of the country and world, (3) not enough laboratory time, (4) need more money for the field course, and (5) transportation problems hindering field work. The two instructors offering workshops felt that the workshops were too short.
### TABLE 13

**FACTORS THAT LIMIT TEACHING OF CONSERVATION IN THE INTERVIEW INSTITUTIONS**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Student background</th>
<th>Time factor</th>
<th>Large classes</th>
<th>Semester system</th>
<th>Institutional finances</th>
<th>No demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>X&lt;sup&gt;a&lt;/sup&gt;</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>X</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Tenn. St.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida St.</td>
<td>X</td>
<td>X Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>Y</td>
</tr>
<tr>
<td>Kentucky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Louisiana St.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>X</td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Tennessee (G)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tennessee (E)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troy State&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Virginia</td>
<td></td>
<td></td>
<td>Y</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Clagg, *op. cit.*., p. 89.

<sup>b</sup> In Clagg study, not in present study.

* Reported by one instructor in each institution.
Approximately two-thirds of the Clagg interview instructors felt that both time and student background were factors limiting their teaching of conservation. They blamed the students' lack of background in conservation as the major factor causing the time problem. They thought the students should have acquired this background in other courses and especially in geography courses. They felt that after teaching the background material, little time was left to cover the field of conservation. They realized this could have been remedied, somewhat, by screening the students and having prerequisites, but this would have reduced the size of classes.

It appears that many of these instructors had an ideal in mind that could never be realized. The varied backgrounds of students will remain a challenge to instructors and the time factor will always be a problem for some. The solutions to these problems are as varied as the numbers and backgrounds of the people involved.

The next question posed was: In your teaching of conservation at what level do you place your greatest emphasis? The levels listed were national, regional, local, and other.

Table 14 compares the findings of both studies as to areas emphasized in conservation courses. The table shows that all of the interview instructors in both studies placed some emphasis on the subject at the national level. In the present study, eight of the twelve instructors devoted time to the southeastern region and only
### Table 14

**Areas Emphasized in Conservation Courses in the Interview Institutions**

<table>
<thead>
<tr>
<th>Institution</th>
<th>National</th>
<th>Regional</th>
<th>State</th>
<th>Local</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Arkansas</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Tenn. St. b</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>X</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida St. U. b</td>
<td>X</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody b</td>
<td>X</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>North Carolina</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (G) b</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (E)</td>
<td>X</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troy State b</td>
<td>X</td>
<td>Y</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Clagg, *op. cit.*, p. 93.

*b In Clagg study, not in present study.*

* Reported by one instructor in each institution.
three emphasized the state level. Six of the instructors stressed emphasis at the local level and six placed emphasis at the international level.

In the present study, one instructor said he put greatest emphasis on the national level because "so much of the policy is made nationally." One instructor simply said he used the global and national levels because "this is a geography course." And, finally, one instructor said he used "the world and national approach because of personal interest and interest of the students."

Table 14 shows that the instructors in the original study placed great emphasis on regional, state, and local levels in their conservation courses. Only three instructors spent significant amounts of time at the international level. This may have been due to the instructors' perceived need for the prospective teachers in their courses to be exposed to regional, state, and local examples in conservation. The smaller size of the Clagg institutions could have explained the "local" rather than international approach to conservation teaching.

In a comparison of the two studies, it was encouraging to find that there is a greater emphasis at the international level in conservation instruction today than in 1954. With world problems as they are, and with global situations becoming more complex and more important, conservation education should become more "globalized." The conservation instructors in our colleges and universities could be
very influential in the "globalization of conservation education" by simply increasing the emphasis at the international level in their courses.

The old study and the new each had two courses offered in education departments. Both instructors in each study placed a greater emphasis below the national level because of a desire to give teachers materials they could use in their own teaching.

The instructors interviewed for the present study appeared to have the needs of their students in mind and were willing to adjust to these needs. In the final analysis, they want to instill in their students a conservation awareness and an understanding of the basic concepts of the field.

In an attempt to determine if the conservation instructors were taking students outside the classroom for practical experiences, the following questions were posed to them concerning availability of land for their conservation courses: Do you have land available to you for work in the field? Who owns the land, how much is available, and what is the nature of the land? Do you take field trips?

Six of the twelve instructors interviewed in the present study took students into the field. Two of these were involved in workshops and four involved students in more conventional field trip experiences. As shown in Table 15, eight of the twelve interview instructors reported having university property available for field work. Of these eight, only four used the university property for such
<table>
<thead>
<tr>
<th>Institution</th>
<th>No Field work</th>
<th>University property</th>
<th>State property</th>
<th>Private property</th>
<th>Federal property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>$X^a$</td>
<td>Y</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Tenn. St. b</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>Y X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida St. U. b</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody b</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>Y X Y</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Kentucky</td>
<td>X Y</td>
<td></td>
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</tr>
<tr>
<td>Louisiana St. U.</td>
<td>X Y</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mississippi</td>
<td>X Y</td>
<td></td>
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</tr>
<tr>
<td>North Carolina</td>
<td>Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina b</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (G) b</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (E) b</td>
<td>Y X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troy State b</td>
<td>Y X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Clagg, op. cit., p. 97.

b In Clagg study, not in present study.

* Reported by one instructor in each institution.
activities. Some reported that the property was not suitable for their use. The university parcels ranged in size from a few acres of a university farm, to hundreds of acres of forest, and an extreme case of 44,000 acres. The latter parcel was mostly forested and had working coal mines. State, federal, and private property was reported as available by three instructors in each category. Instructors taking students into the field used government and private property more than university property, because more of what they wanted to show was in the mines and forests. Most of the reported trips were to National Parks, State Forests, and strip mines. The instructor of a summer workshop used National Parks and State Forests for the entire course.

Clagg found that 57 per cent of the conservation courses in his study offered field work. It was found that private property was most used for field trips. There were six parcels of private property used for field work among the respective institutions. Ownership of land available for field work was evenly distributed among university, state, and federal property, with three parcels each.

The interview instructors of both studies were in favor of the field work approach to conservation education, but were in agreement that time was the most prohibitive factor. Complaints were the same from instructors regardless of whether or not they did field work: (1) the course was too short to permit going into the field often, (2) the short class periods prohibited field work, and (3) travel to and from field sites interfered with other classes.
Most of the field trips reported in the two studies appeared to be rather conventional, but one different type was encountered in the present study. It was titled "Self Guided Geography Field Trip," and was designed to be taken by students whenever it was convenient for them. An instruction manual for the student contained the route to be taken, estimated travel time, and recommended stops. Some history and physical description of the area to be covered were included along with maps and natural history checklists. The manual included a running description of what was to be observed, and descriptions of what to look for at the stops. This field trip was designed for general use in the geography department, but it seems clear that the approach would be effective in conservation education. Some instructors complained that field work took too much of their class time and that it was difficult to work it into students' schedules. It would take some time and effort, but if planned and executed properly, the self guided field trip could be valuable to both the conservation instructor and student.

Several questions were posed to the interview instructors concerning the use of visual aids in conservation courses. Do you use visual aids in your conservation teaching? If you do, what types are used and what are your sources?

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7 Manual furnished by Dr. Clark I. Cross, Department of Geography, University of Florida.
In a comparison of the findings of the two studies, Table 16 shows that all of the instructors used some type of visual aid. As shown in Table 16, the most frequently used visual aid in the present study was 35 mm slides. All but one of the interview instructors used their slides in conservation classes. About 50 per cent of these used additional slides from other sources. Several of the instructors used slides to show charts and graphs. The instructors felt that slides were less complicated than films and gave them the advantage of producing their own. Use of their own slides also permitted the avoidance of unwanted materials as is often the case with film.

Films were used by seven of the twelve instructors in the present study. The instructors not using films doubted the value of this type of teaching aid and felt it took too much class time. It was also felt that only a small percentage of most films was of real value for the college student.

In each of the studies the least used visual aids were film strips. Film strips posed many of the logistical problems of films, and the strips were considered to be of poor quality. One-half of the Clagg group used film strips and none of the present group used them.

Instructors in the Clagg group commonly used charts, posters and bulletin boards to present conservation materials. In the present study five of the twelve people did not use this type of material in any form and seven had other methods of presenting the material.
<table>
<thead>
<tr>
<th>Institution</th>
<th>Slides</th>
<th>Films</th>
<th>Film Strips</th>
<th>Charts</th>
<th>Overhead Projectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>Y</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Tenn. St.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>X Y</td>
<td>X Y</td>
<td>X</td>
<td>X Y</td>
<td>Y</td>
</tr>
<tr>
<td>Florida St. U.</td>
<td>X</td>
<td>X Y</td>
<td>X</td>
<td>X Y</td>
<td>Y</td>
</tr>
<tr>
<td>George Peabody</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>X Y</td>
<td>X Y</td>
<td>X</td>
<td>X Y</td>
<td>Y</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>X Y</td>
<td>X Y</td>
<td>X</td>
<td>X Y</td>
<td>Y</td>
</tr>
<tr>
<td>North Carolina</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>X Y</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (G)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee (E)c</td>
<td>X Y</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troy State b</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Reported by one instructor in each institution.

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* Clagg, op. cit., p. 106.

b In Clagg study, not in present study

c Used video tapes
Several instructors used overhead projectors to present this type of material and one used mimeographed handouts. One person said he was a firm believer in the chalk board.

One type of visual aid that did not appear in the Clagg study of 1954 was the overhead projector. Six of the twelve participants in the present study used the overhead projector regularly, and it was used by guest speakers in the conservation classroom of another instructor. The overhead projector was used to show materials that would have been on charts, graphs, and posters in 1954. Another visual aid that was not generally available in the earlier study was video tapes.

With the changes in technology since 1954, many changes in audio visual use in conservation teaching were expected. The findings show that charts and posters had been replaced by overhead projectors, film strips had lost their appeal, films had lost some appeal, slides had gained in appeal, and video tapes had appeared as a possible aid in conservation instruction.

Television monitors in today's classrooms can be used to show films, tapes, and slides containing a variety of materials. It is surprising that more instructors in the present study did not mention this technique. It is certainly more useful for the mass audience in public schools, but should be tried in more college courses.
In an attempt to determine what was being taught that would be of value to teachers in making demonstrations in their own classrooms, the following question was posed to the interview instructors: Do you attempt to show students how to set up demonstrations in conservation? (Conservation demonstrations are laboratory or field experiments used to show the practical application of a conservation technique.) Clagg felt this would be a valuable pursuit since so many of the conservation students at the time were preparing to be teachers. It will be shown later in this portion of the study that fewer conservation students in the present study were preparing to teach.

None of the geographers in the present study worked with demonstrations. They were used exclusively by the two education instructors in workshops. In one workshop the instructor called the activities "geological demonstrations" and "how to make inventories of plant communities." In the other workshop, field demonstrations of the participation type mentioned were: (1) growing plants in different types of soil, (2) making tests on water, (3) purifying water by filtering, and (4) determining different arrangement of rows in planting trees. The demonstrations were conducted by conservation specialists participating in the workshops. Five of the fourteen instructors in the Clagg study demonstrated to students how to set up conservation demonstrations.

The generalist conservation instructors (geographers) in the present study were not interested in working with conservation demonstrations. They felt this type of activity should be left to
people in education departments and specialists in conservation. The writer feels that conservation demonstrations have no place in today's generalist conservation instruction because of the diversity and change in emphasis of conservation topics, and the changing needs of conservation students.

The last questions asked in the methods portion of the study pertained to reports required of the students. Do you require oral or written reports from the students? If yes, what is the nature of these reports?

As shown in Table 17, ten of the twelve instructors in the present study required some kind of report from the students. Seven of the twelve required no oral reports. They were quick to follow their negative answers with explanations. Some of these were: (1) the classes have been too large, (2) the technique has been reserved for graduate courses, and (3) they have been too difficult to evaluate. The five remaining instructors were enthusiastic about oral reports.

Ten of the twelve instructors in the present study had students do written reports. In some cases the choice of topic depended on the format of the course. For example, one instructor assigned students a piece of topographic map for field research, and a structured report was written. One instructor had his undergraduate students compile an
### Table 17

**Nature of Student Reports in the Interview Institutions**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Oral reports</th>
<th>Written reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>X^a</td>
<td>X Y</td>
</tr>
<tr>
<td>Arkansas</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>East Tenn. St. b</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Florida</td>
<td>X</td>
<td>X Y</td>
</tr>
<tr>
<td>Florida St. U. b</td>
<td>X</td>
<td>X Y</td>
</tr>
<tr>
<td>George Peabody b</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>Kentucky</td>
<td>X</td>
<td>X Y</td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Mississippi</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>North Carolina</td>
<td>X</td>
<td>X Y</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Y</td>
<td>X Y</td>
</tr>
<tr>
<td>Tennessee (G) b</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tennessee (E)</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>Troy State b</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^a Clagg, *op. cit.*, p. 115.

^b In Clagg study, not in present study.

* Reported by one instructor in each institution.
annotated bibliography. In some cases the written material was recorded laboratory work, recorded field work, or part of a workshop assignment.

Table 17 shows that all of the Clagg instructors required a report of some kind. The twelve instructors requiring oral reports usually assigned topics, depending on one or more of four things. They were: (1) to supplement text material not covered to the satisfaction of the instructor, (2) to bring up-to-date certain types of materials in the text, (3) to allow students to share with the class the main points of their written reports, and (4) to call attention to conservation items of local interest. There was a wide range of opinion as to whether students should be assigned oral reports. One instructor felt that oral reports should only be assigned to the upper one-third of the class because of the poor performance of the poorer students. Another instructor assigned oral reports to the poorer students because they needed the extra work to aid their grades. 8 Eleven of the fourteen Clagg instructors had their students do written reports. The guidelines for choice of topic were similar to those for oral reports, and written reports were a more elaborate documented presentation of materials from oral reports.

In comparing the two studies, Table 17 shows that written reports were required by most conservation instructors of both studies. Fewer instructors in the present study required oral reports

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8 Ibid., p. 116.
because of a perceived time problem in their courses due to the present diversity of the field. Among the instructors requiring reports, it was felt that preparation for these reports gave the students valuable exposure to conservation literature and field methods in addition to class discussions. Presentation of findings was considered a valuable experience for the student and allowed them to share conservation materials and experiences with the class.

At the end of the section on methods used in conservation courses, the instructors were asked to supply course outlines, bibliographies, or any other printed materials available from their conservation courses. Printed materials from the instructors could give further insight concerning content and methods of their courses. The writer received syllabi from six of the instructors, a bibliography from one, and a list of library periodicals from another. Selected copies of these materials are found in the Appendix. Six of the Clagg instructors furnished a course outline, six had no materials available, and two were using texts they had written as an "outline" for their courses. It was surprising that more printed materials were not readily available, and it was felt that this was a weakness in the conservation courses.

Textbooks Used in Primary Conservation Courses

The previous section placed emphasis on certain resources and methods of presentation in conservation courses. This section on textbooks and class size is also related to methods, but is placed
under a separate heading to facilitate organization and to maintain consistency with the subject headings discussed in the interviews. All questions were posed for the purpose of considering each conservation course as a unified subject-matter field.

Several questions were posed to the instructors concerning textbooks. What textbooks are you using in your conservation course? What other textbooks have you used in the past five years? Are you satisfied with the present textbook? If not, why not? If not, what do you do about it? Do you have an outside reading list? It was hoped that more could be learned about the nature of the courses by determining the textbooks and other books used, and by personal examination of the books.

In the present study no more than three instructors were using the same textbook. This variety of textbook preference is shown in Table 18. The favored textbook of the interview instructors was Miller's *Living in the Environment: Concepts, Problems, and Alternatives*. This title contains many of the interests expressed by the conservation instructors in the present study. An examination of the Miller book revealed the following subject areas: (1) Man and Nature, (2) Some Concepts of Ecology, (3) Population, Resources and Pollution, and (4) Earthmanship: Environment and Society. The topics of soil, forests, water, minerals and wildlife were found in the Miller book, but they were given less emphasis in favor of other problems.
TABLE 18
PRESENT AND PAST TEXTBOOKS OF THE PRIMARY CONSERVATION COURSE IN THE INTERVIEW INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Present text</th>
<th>Text used over past 5 years</th>
<th>Present text satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>None*</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td>Arkansas</td>
<td>S</td>
<td>S</td>
<td>Yes</td>
</tr>
<tr>
<td>Florida</td>
<td>Pa</td>
<td>S</td>
<td>Yes, But—</td>
</tr>
<tr>
<td>Florida St. U.</td>
<td>M</td>
<td>C</td>
<td>Yes</td>
</tr>
<tr>
<td>Georgia</td>
<td>O</td>
<td>O</td>
<td>Yes, But—</td>
</tr>
<tr>
<td>Kentucky</td>
<td>M</td>
<td>M</td>
<td>Yes</td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>W</td>
<td>B</td>
<td>Yes</td>
</tr>
<tr>
<td>Mississippi</td>
<td>P</td>
<td>None</td>
<td>Yes, But—</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Da</td>
<td>A-L</td>
<td>Yes, But—</td>
</tr>
<tr>
<td>South Carolina</td>
<td>M</td>
<td>De</td>
<td>Yes</td>
</tr>
<tr>
<td>Tennessee</td>
<td>T</td>
<td>M</td>
<td>No</td>
</tr>
<tr>
<td>Virginia</td>
<td>Da</td>
<td>E</td>
<td>Yes, But—</td>
</tr>
</tbody>
</table>

Key to Table:
A-K—Allman, Kopp and Zufiied, Environmental Education
A-L—Allen and Leonard, Conserving Natural Resources
B—Billings, Plants, Man and Ecosystems
C—Commoner, The Closing Circle
Da—Dasman, Environmental Conservation
De—Detwyler, Man's Impact on Environment
E—Ehrenfeld, Biological Conservation
M—Miller, Living in the Environment
O—O'Riordan, Perspectives on Resource Management
P—Pavani, Hugien and Heer, Preserving Man's Environment
S—Smith, Conservation of Natural Resources
T—Turk, Environmental Science
W—Whittaker, Communities and Ecosystems
Pa—Parson, Conserving American Resources

* Used collection of readings
* Reported by one instructor of a course in each institution.
Some of the other topics covered in the Miller book were ecosystems, energy problems, human population problems, urban problems, pollution problems, economics and environment, politics and environment, and environmental ethics. The Miller book was one of the more elaborate and attractive textbooks being used. Especially interesting was a large section of "Enrichment Studies."

The second favorite textbook of the instructors interviewed in the present study was Dasmann's *Environmental Conservation*. This book had a more "conventional" format, with greater emphasis on resources. New editions (1976 and 1984) of the Dasmann book had increasing emphasis on such topics as population, ecology and energy. As shown in Table 18 the key words common to textbook titles in the present study were environment, ecosystem, and management. As was noted earlier, these were also key words in titles of primary conservation courses.

All of the textbooks being used by the Clagg instructors appear in the following list:

1. Carter, *Man on the Landscape*
2. Gustafson, *Conservation in the United States*
3. Parkins and Whitaker, *Our Natural Resources and Their Conservation*
4. Renner, *Conservation and National Resources*
5. Renner and Hartley, *Conservation and Citizenship*
6. Smith, *Conservation of Natural Resources*
7. Whitaker and Ackerman, *American Resources*
8. White and Foscue, *Regional Geography of Anglo America*
9. Zimmermann, *World Resources and Industries*

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The three most used books from this list were by Whitaker and Ackerman, Smith, and Parkins and Whitaker. One textbook American Resources by Whitaker and Ackerman, was being used by seven of the fourteen instructors. The words conservation and resources were common to most of the textbooks used in 1954. As was noted earlier, these were the key words in titles of primary conservation courses at the time. A comparison of the above list of textbooks with Table 18 reveals the contrast of textbook titles between the two studies.

A variety of reasons for the choice of a textbook were revealed during the interviews with the instructors of the two studies. The subject areas of the selected textbooks of the present study were more inclined toward people, environmental quality, energy, and ecological considerations. These were perceived to be the topics more pertinent in generalist conservation at the time. The dominant subject areas of the selected textbooks of 1954 were soils, forests, water, minerals, and wildlife. One factor mentioned as to choice of textbook in both studies was the age of the book. The instructors tried to select the best of the newer editions for their courses. The Miller textbook (1975 edition) favored in the present study was newer than all of the other books being used at the time. At the time of the 1954 survey, the Whitaker and Ackerman textbook (1951 edition) was the most recent in the conservation field.

As shown in Table 18, three of the instructors in the present study had not changed textbooks during the previous five years, and two had not used a textbook previously. The remaining seven had used
a variety of textbooks. A total of six different textbooks had been used by the Clagg instructors, indicating change in the preceding five years. The Gustafson and Parkins and Whitaker books had been the earlier favorites.

Table 18 shows that eight instructors in the present study reported satisfaction with their conservation textbooks. Several complained that the textbooks were poorly edited and were too superficial on some topics. Ten Clagg instructors claimed they were satisfied with their textbooks, but some were critical. Considering the various comments of the instructors in both studies, most appeared to be as satisfied as professors ever are with a textbook.

In regard to methods of overcoming textbook inadequacy, all but one instructor in the present study had students do outside readings. The syllabi acquired from instructors included lists of paperbacks for sale in the bookstores or books and articles on reserve in the library. Another technique was to recommend one or more publications, usually paperback, which contained a collection of readings on conservation. Detwyler's *Man's Impact on Environment* was an excellent example of the latter technique. In general, the Clagg instructors had students do outside readings to supplement the textbook, but four of his instructors required two books. Considering the price of textbooks today, it is likely the requirement of two books would have been a problem in the courses of the present study.
It appeared that the conservation instructors in both studies were appropriately concerned with exposing their students to the latest and best textbooks and supplementary readings available in the field.

**Student Enrollment in Primary Conservation Courses**

Several questions were posed to the interview instructors concerning enrollments. How many students were enrolled in your most recent conservation classes? Is it a required course for any group of students? On an elective basis, what subject major group seems most common in the conservation class? What prerequisites do you have for your conservation classes?

Table 19 shows the enrollment in primary conservation courses at the time the instructors were interviewed for the present study, and the latest course enrollment figures available for the 1954 study. The figures from the present study show a total enrollment in the primary conservation courses at 1,008 students in the eleven institutions reporting. It was difficult to determine the average number of students per class because one institution had a peculiar arrangement of classes and laboratories. This institution had 540 students in the course at the time of the interview. Excluding this institution, the average class size was determined to be 36 for the ten remaining institutions. The range in class size was from twelve to fifty.
TABLE 19
ENROLLMENT IN PRIMARY CONSERVATION COURSES
IN THE INTERVIEW INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Enrollment (Present study)</th>
<th>Enrollment (Clagg study)a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>Arkansas</td>
<td>108 (3 sections)</td>
<td>38</td>
</tr>
<tr>
<td>East Tenn. St. b</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Florida</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>Florida St. U.</td>
<td>41</td>
<td>27</td>
</tr>
<tr>
<td>George Peabody b</td>
<td>39</td>
<td>41</td>
</tr>
<tr>
<td>Georgia</td>
<td>40</td>
<td>14</td>
</tr>
<tr>
<td>Kentucky</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>100 (2 sections)</td>
<td>23</td>
</tr>
<tr>
<td>Mississippi</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>North Carolina</td>
<td>44</td>
<td>10</td>
</tr>
<tr>
<td>South Carolina</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Tennessee (G) b</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Tennessee (E)</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Troy State b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>540 (numerous sections)</td>
<td></td>
</tr>
</tbody>
</table>

a Clagg, op. cit., p. 134

b In Clagg study, not in present study.

* Latest class enrollment at time of interview, reported by the instructor of a course in each institution.
There was a considerable difference in total enrollment from the 1954 study to the present study. The total in the Clagg study was 386 in fourteen institutions. The classes averaged 27.5 and the range in class size was from ten to forty-three. These figures show average class size and total enrollments to be larger in the present study. The larger enrollment figures in the present study were due, at least in part, to significant increases in student population in the institutions. (See Table in appendix showing enrollment totals of interview institutions in 1952 and 1980.)

Based on the interviews in the present study, it was determined that the conservation classes were probably too large for efficient teaching. Large classes could cause problems in class discussion, laboratory work, field work, and in testing and evaluation. The instructors in the present study were concerned that the large classes were placing extra pressure on their time and resources.

At this point in the interview the instructors were asked if the conservation course was required of any group of students. This was asked in an attempt to determine if the students were in the course because of a requirement, an interest in conservation, or simply a chance to get some additional hours credit. In the present study the course was elective in all but one institution. In this institution the course was unique because it was a workshop for teachers. At one institution the course satisfied a state certification requirement for teachers. The students could meet the
requirement by taking this course or one in geology or biology. The conservation course in geography had been very popular in recent years. In the Clegg study about two-thirds of the instructors stated that their course was elective. Since the generalist conservation course was not required of most students, it is likely that the majority of those enrolled in the course perceived it to be interesting and valuable in their education.

The interview instructors were asked to name the subject majors most often electing their conservation courses. The findings from both studies are shown in Table 20. In the present study, the major students registering most frequently in conservation courses were education, geography, business administration, economics, and engineering. Another group taking the course less frequently were geology, biology, agriculture, social science, sociology, and journalism majors. The instructors indicated these major students elected the course because they felt it would be valuable to them in the future. They claimed the majors in the respective fields, especially geography majors, took the course to give them more hours in their major and to broaden their background in the field. One instructor had engineering and agriculture majors on a regular basis because they did not have conservation courses in their departments.

As shown in Table 20, all of the instructors in the 1954 study listed education students among the subject major most often taking conservation as an elective. Some education students were required to
<table>
<thead>
<tr>
<th>Institutions</th>
<th>Majors electing Conservation (Present study)</th>
<th>Majors electing Conservation (Clagg study)*</th>
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<tr>
<td>East Tenn. St. b</td>
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<td>Educ., Bus. Ad.</td>
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<td>Educ., Biol.</td>
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<tr>
<td>Troy State b</td>
<td></td>
<td>Educ., Geog.</td>
</tr>
</tbody>
</table>

* Reported by one instructor in each institution.

a Clagg, op. cit., p. 142

b In Clagg study, not in present study.
take the course and others perceived it as being of value in their respective teaching specialties. Many students in education were mentioned as taking the course because they planned to teach in another state where it was required for certification. Fewer instructors had education students electing their conservation courses in the present study because the institutions were not as heavily oriented to teacher preparation as in 1954.

The instructors were asked what prerequisites they had for their courses. In the present study, ten of the twelve conservation courses had no prerequisites. The conservation course in the geography-geology department listed an introductory geography course as a prerequisite. The instructor admitted to "not holding to" this prerequisite when registering students. In reality, this meant that only one course in the present study had a firm prerequisite, and it was a workshop. The workshop was for experienced teachers and they were expected to have a degree.

All of the institutions in the Clagg study placed the course at the junior level or above. Three of the conservation courses had a geography course as a prerequisite. The instructors claimed the conservation student needed a broad background in geographic principles, and an understanding of the relationship between man and

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10 Ibid., p. 141.
the natural environment. One Clagg instructor had an added requirement of an A grade in the prerequisite course.

It is clear that the instructors in the present study had the better attitude toward prerequisites. The absence of prerequisites for the primary conservation courses left a "healthy climate" for students inclined to take the course. The primary conservation course was not designed to "train professional conservationists," but to broaden the conservation horizons of a variety of interested students.

**Conservation Materials in Departments Offering Primary Conservation Courses**

The interview instructors were asked a series of questions concerning conservation materials in their departments. How many books and pamphlets on conservation do you have in your department for student use? Does the department lend these for the student to take out? Do you receive any journals in the department that are largely of a conservation nature?

In the present study ten of the twelve departments had no departmental holdings of conservation books or pamphlets. All of these materials had been placed in a library. Four of the conservation instructors made personal materials available to students, in and out of the library, on reserve. One department was unique in this regard. It was a Department of Environmental Sciences, with thirty instructors and an elaborate, well organized library. This was the department with 540 freshmen and sophomores in the primary conservation courses.
Clagg found that all of the departments except three maintained conservation materials in the department, and all departments loaned these to students. The number of texts available ranged from eight to thirty, with approximately half of the departments claiming fifteen. The instructors claimed to have unlimited numbers of pamphlets in their departments.

In regard to departmental subscription to journals, eleven of the twelve departments in the present study did not subscribe to periodicals. The instructors explained that university libraries discouraged departments from having a library. One department in the Clagg study subscribed to ten journals of a conservation nature. Five other departments maintained three or four and three departments subscribed to one journal each. Some did not subscribe because the titles were in the main library.

In regard to the maintenance of printed conservation materials in departments, it was found that the practice was more prevalent in the former study than in the present study. It is felt that the use of a common library depository for such materials is a more efficient way to use institutional funds. This also gives the departments more time and resources for other pursuits.

Conservation Problems and Needs of the Southeastern Region

The purpose of this portion of the study was to: (1) determine the instructors' opinions as to the resource problems in the area their institution served, (2) get the instructors' ideas as to how to
develop the conservation attitude, (3) get ideas on teacher preparation needed in conservation, and (4) get opinions on the possible role of the public schools in presenting conservation.\footnote{11 Ibid., p. 151.}

The instructors were asked what they considered to be the primary and secondary conservation problems in the areas served by their institutions. They were given a choice of soils, water, minerals, forests, wildlife, human, equal, and others. Table 21 shows that water, minerals, and human problems were thought to be the major conservation problems in the present study. One instructor considered soil to be the number one problem, and two chose forests as a second problem. Table 21 shows that soils, forests, and water were considered to be the major conservation problems in the Clagg study. Minerals were mentioned as a conservation problem only once in the Clagg study. In the present study minerals ranked high among the problems in the region. This was largely due to a significant change in mining, mineral use, and increased industrial activity in the last three decades. A total of three instructors in the two studies had difficulty highlighting a single problem because of perceived interrelatedness of problems. Interrelatedness of several problems would have been an appropriate response from other instructors.
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<tr>
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</table>


b In Clagg study, not in present study.

* Reported by one instructor in each institution.
The instructors were asked if they believed the people of their state were conservation aware. In the present study seven of the twelve instructors expressed concern for the lack of conservation awareness. Some of the pessimistic instructors were amazed at how "ignorant" people were about conservation, how they were mostly issue oriented, and were mostly thinking in terms of preservation instead of conservation. Some instructors based their optimism on their children's school assignments and on informed and informative articles in newspapers. Only one Clagg instructor was satisfied with the amount of conservation awareness in his state. His attitude was largely due to the conservation education work of his institution. It is unlikely that any conservation instructor would ever be satisfied with the level of conservation awareness of the people.

The instructors were then asked if they felt the people of the area really knew the meaning of conservation. Nine of the twelve instructors in the present study felt that people did not. Twelve of the fourteen Clagg instructors were of the same opinion, and believed the majority of people thought conservation to be a process of saving resources. In spite of a few favorable remarks, this part of both studies revealed that the majority of instructors believed the people in their respective states lacked sound conservation concepts.

In the next part of the study the instructors were asked a series of questions concerning teacher preparation in conservation. The first of these questions involved conservation training in the
respective departments. Seven of the eleven instructors in the present study reported that their major students did not receive adequate training in conservation. They reported that all of their majors did not take the conservation course, and due to the specialized nature of some geography courses, there was not as much conservation content as had been the case in the past. In the Clagg study, seven of the eleven instructors reported that their major students received adequate training in conservation. All seven stated that conservation preparedness was not due to the single primary conservation course, but that most of the geography courses contained conservation information. A consideration of the reports of the two groups of instructors revealed that more majors especially in geography, received conservation training in the former study than in the present study.

The second question under teacher preparation involved the percentage of students taking the conservation courses who are preparing to teach. Among the six instructors in the present study who had these figures available, the average was about 30 per cent. The average in the Clagg study was about 74 per cent. The lower figures in the present study are due, in part, to less relative emphasis on teacher preparation and larger enrollments in primary conservation courses.
The instructors were asked if they believed all students preparing to teach in the state should be required to take at least one course in conservation. Six of the twelve instructors in the present study believed prospective teachers should have conservation courses. Ten of the fourteen instructors in the Clagg study believed a primary conservation course should be required of all students preparing to teach. The consensus was that there are very few places in education where conservation cannot be taught.

The instructors were asked what courses other than conservation did they feel would be especially helpful to a person planning to teach conservation in high school. The instructors in the present study did not mention geography as being helpful to teachers of conservation. Courses mentioned were biology, geology, and general science. Geography courses were mentioned by all of the Clagg instructors as being valuable in preparing teachers of conservation.

The instructors were asked where courses, in their opinion, lend themselves to the teaching of conservation as an integrated subject. In the present study the courses mentioned as being helpful in this regard were geography, biology, social science, economics, sociology, education, regional planning, agriculture and ecology. In the Clagg study the courses mentioned where conservation might be taught were geography, geology, biology, history, economics, physical science, political science, social science, and sociology. The
instructors in the two groups agreed that the subjects which gave a background in conservation were essentially the same ones where conservation might be taught as an integrated subject.

At this point in the interviews the instructors were asked to give their opinions concerning the level at which conservation can best be taught. The seven instructors in the present study who reacted to this question agreed on two points. They believed that an attempt should be made to develop the conservation ethic and attitude as early as possible, and that conservation should be taught at all levels. All of the instructors of the two studied agreed that conservation could and should be taught at every level. It was felt that care should be taken to direct the appropriate conservation concepts to each age group, and to give "breaks" at different stages to keep the subject from being repetitious and boring.

The instructors were asked to give their opinions concerning the adequacy of conservation education in the public schools of their areas. Of the twelve instructors in the present study five claimed the public schools were not doing an adequate job with conservation teaching, and three believed they were. None of the instructors in the Clagg study believed the public schools were doing an adequate job in conservation education. The instructors were alarmed at the number of students arriving at their institutions with
no conservation background. They concluded that the public schools were not teaching conservation or were not teaching it effectively.\footnote{12}

The instructors in the present study were less involved with education majors than those in the Clagg study, so they found it more difficult to react to the question in this section on teacher preparation and conservation in the public schools. Some instructors did not react to the questions because of insufficient information or interest.

The Work of Outside Agents and Agencies in the Primary Conservation Courses of the Southeast

It was the purpose of this portion of the study to determine the extent and kind of cooperation between the interview institutions and outside conservation agencies.

The instructors were asked if they used outside specialists to assist in their conservation courses. Six of the twelve instructors in the present study used representatives from outside agencies in their classes. More were used in workshops than in other courses. Instructors used specialists from outside agencies because they (1) apprised students of the nature of their work, (2) described its application to local problems, and (3) conducted tours to demonstrate practical aspects of their endeavors. Approximately 85 per cent of the Clagg instructors used outside agents, but except for workshops,

\footnote{12 \textit{Ibid.}, pp. 181-182.}
they were not used on a regular basis. The common complaint in both studies was that specialists used too much of the limited class time. Generalist conservation instructors should use information from the specialists, but the specialists should be used in workshops and public schools where more time is available and more people could benefit from the experience.

Does your department cooperate with outside agencies in preparation of conservation education materials? In answer to this question six of the twelve instructors in the present study reported that their departments cooperated with agencies in this regard. Clagg found that 42 per cent of the departments in his study were participating with agencies in preparation of materials. In both studies the most active departments in this regard were education departments. The instructors in these departments had cooperated in writing texts and other conservation materials, and in directing films to be used in the public schools. In both studies it was found that the geographers at interview institutions had been producing more works on conservation subject matter than on conservation education.

The final question on agencies was: Does anyone in your department work with a resource-use planning committee? In the present study, instructors in four of the twelve departments worked with planning groups, but none were working with resource-use planning committees. Two instructors in the Clagg study were working in resource-use planning. Their institutions were in the same state and
they were both members of the same committee. Resource-use planning is perhaps more in the realm of the conservation specialist than the generalist. This may have been a reason why so few of the interview instructors were involved.

**Conservation Materials in the Main Libraries of the Interview Institutions**

It was the purpose of this portion of the study to determine the availability of conservation materials in the main libraries of the interview institutions. Ten of the twelve libraries were visited, the materials were surveyed, and the appropriate library persons were interviewed. The review of holdings was limited to the following: (1) a count of the books listed in the card file under "conservation," (2) a count of the pamphlets related to conservation, and (3) an assessment of the availability of selected journals related to conservation education. No attempt was made to survey all of the conservation related materials in these libraries.

Many of the institutions visited in the present study had developed unusual library facilities, making it difficult to match the 1954 research. New buildings had been built and library facilities had been dispersed. One institution had two separate main libraries, a second had a main library and an undergraduate library, and a third had a large science library in addition to the main library. As was noted earlier in the chapter, one institution had most conservation
holdings in an elaborate environmental sciences library. Several main
libraries appeared to be the same ones used in the Clagg study and a
few of the main libraries had obviously been moved to new facilities.

In the ten libraries reviewed in the present study, the
listings in card files under "conservation" ranged from 75 to 333. In
the ten libraries the total was 2,057. This was an average of
approximately 200 books per library. In the Clagg study, the listings
in the card file under "conservation" ranged from eleven to fifty, for
a total of only 403 books in fifteen libraries. This was an average
of 27 books per library. 13 The comparison clearly indicates that the
conservation holdings in the libraries of the interview institutions
have increased significantly since 1954.

There was no way of determining what Clagg included in his
count or the number of duplications encountered; however, it appeared
that the conservation holdings were much more extensive in the present
study.

Libraries of both studies had insignificant or no pamphlet
files. The librarians said the classifying and filing of pamphlets
made the process prohibitive, and that pamphlet collections were
relegated to the respective departments.

Clagg made a list of ten conservation related journals to look
for in the libraries. With the exception of the Journal of Geography,

13 Ibid., p. 193.
all of these journals were listed by Ward P. Beard as periodicals containing significant conservation information. The Journal of Geography was included because of perceived conservation content and because so many geography departments were in the study. The other nine journals were American Forests, Audubon Magazine, Journal of Forestry, National Parks Magazine, Nature Magazine, Parks and Recreation, Reclamation Era, Soil Conservation and The Land.  

Three libraries in the present study subscribed to all ten of the periodicals and three subscribed to nine. The remaining four libraries took seven or eight each. Considering these and other conservation related periodicals observed, the libraries were making significant numbers of conservation related publications available to students and faculty.

Two of the libraries in the Clagg study subscribed to all ten of the periodicals, and two others subscribed to nine. Most of the remaining libraries took six or seven, and three libraries took four or less. Some of the main libraries duplicated many of the periodicals received by the departments.

The duplication of periodicals had been virtually eliminated at the time of the present study. As was stated earlier in this

14 Ibid., p. 147.

15 The interview institutions had eliminated departmental libraries in an effort to avoid duplication of materials and to make more efficient use of library budgets.
chapter, eleven of the twelve departments did not subscribe to any of the conservation related periodicals. Giving the libraries sole responsibility for these periodicals may have been one reason for more appearing in libraries in the present study. Of course, there have been dramatic increases in student enrollments and library budgets since 1954.

In the present study there was a temptation to make a longer list of conservation related periodicals since so many good ones were encountered in the libraries. There has been a significant increase in this type of publication since 1954.

**Summary**

The procedures used in this chapter were patterned after the procedures used in the Clagg study of 1954. The former study was concerned with determining the status of conservation education in selected colleges and universities of Southeastern United States. The present study is concerned with the present status and with changes since the earlier study. This chapter is an important part of the study since it involves personal interviews with selected generalist conservation instructors in the region and their views on certain aspects of their conservation courses.

The questions asked in this portion of the study were: (1) What was the status in primary conservation courses in these twelve interview institutions in regard to nature and content, textbooks, enrollments, materials and methods, and problems and needs? (2) How
did the findings in the present study compare with the findings of the former study? (3) What are the perceived reasons for change or lack of change in the status of conservation education during the intervening years?

Eight of the twelve interview institutions had their primary conservation courses in geography departments. Two of the institutions offered primary conservation courses in the education department, one institution had its course in a geography-geology department, and one had the course in an environmental science department. The title of the primary conservation course was different in each of the twelve interview institutions. In the 1954 study, most of the conservation courses had the title "Conservation of Natural Resources," but in the present study the courses had a variety of titles such as "Conservation Ecology and Resource Management," "Natural Resources and Environmental Policy," "Geography of Environmental Quality," and "Environmental Conservation." Changes in conservation course titles since the Clagg study reflect changes in attitude toward the subject, the proliferation of research and writing in the field, and changes in textbook titles.

In the present study the conservation courses were open to students from the freshman to the graduate level, but in the Clagg study the courses were restricted to the junior level or above. Instructors in the present study expressed the view that more students would be exposed to conservation if there were fewer restrictions to enrollment in the courses.
In regard to the method used in the presentation of conservation courses, all of the instructors of both studies reported using the lecture method in their courses. Seven of the twelve instructors in the present study used lectures exclusively. Only one-fourth of the Clagg instructors used the lecture method alone. It was surprising that the Clagg instructors used a greater variety of methods than instructors in the present study. Both groups of instructors claimed that limited time prohibited the use of other methods, but the situation appeared to be more acute in the present study. They claimed that the conservation field had become so complex, and there was so much to cover in their courses, that they needed to devote more time to lecture and less time to field and laboratory work. A comparison of the individual class enrollments of the two studies revealed larger classes in the present study, thus more "pressure" on the instructors.

All of the instructors in the present study had devoted time to soils, water, minerals, forests, wildlife, and the conservation of man in their courses, but none of the topics was picked as receiving the greatest emphasis. Each of the instructors placed emphasis on additional conservation topics. History and philosophy of conservation was mentioned by five instructors as an important part of their course, but was mentioned by only one Clagg instructor. Energy was mentioned by five instructors as a major topic in the present study, but was not mentioned by the Clagg instructors. In the Clagg study 50 per cent of the instructors placed primary emphasis on soils.
Forests, water, and minerals were placed second, third, and fourth respectively as topics of emphasis in their courses. It seems clear that a better balance among topics in conservation courses exists today than in 1954. The attitude toward philosophy of conservation appears to be more enlightened, and emphasis on a wider range of topics appears to be a better approach to conservation education.

In regard to level emphasized in conservation courses, the majority of instructors in both studies reported teaching at the national level. However, more instructors in the present study reported teaching at the international level and more Clagg instructors reported teaching at the regional and state level. The smaller size of Clagg institutions could have explained the "small area" rather than international approach to conservation teaching. It was encouraging to find that there is a greater emphasis at the international level in conservation instruction today than in 1954. With conservation problems becoming increasingly complex and international in scope, conservation education should become more "globalized."

In the present study no more than three of the twelve instructors were using the same textbook. In the Clagg study one textbook was being used by seven of the fourteen instructors. The greater diversity of textbooks being used in the present study is due, at least in part, to the proliferation of conservation topics and materials in the years since 1954. The subject areas of the selected textbooks of the present study were more inclined toward people,
environmental quality, energy, and ecological considerations. The dominant subject areas of the selected textbooks of 1954 were soils, forests, water, minerals, and wildlife. These were perceived to be the topics more pertinent in generalist conservation at the respective times.

A comparison of conservation course enrollments in the present study with those in 1954 reveals the average class size to be larger in the present study. The average class size in the present study was 36 students and in the former study was 27.5 students. The larger enrollment figures in the present study were due, in part, to significant increases in student population in the institutions. Based on the interviews in the present study, it was determined that the conservation classes were probably too large for efficient teaching. The instructors were concerned that the large classes were placing extra pressure on their time and resources.

In regard to the maintenance of printed conservation materials in departments, it was found that the practice was much more prevalent in the former study than in the present study. Perhaps the use of a common library depository for such materials is a more efficient way to use institutional funds. This gives the departments more time and resources for other pursuits.

The interview instructors of the present study considered water and mineral problems to be of primary and secondary concern in the areas of their institutions. Soils and forests were considered to be the major conservation problems in the Clagg study. The shift in
concern to water and minerals is largely due to significant increases in population and industrial activity in the southeast in the last three decades. The result is that land has been taken out of agricultural use and water quality has deteriorated.

The instructors in the present study were less involved with education majors than those in the Clagg study, so they found it more difficult to react to questions on teacher preparation and conservation in the public schools. A consideration of the reports of the two groups of instructors revealed that more majors, especially in geography, received conservation training in the former study than in the present study. The two groups of instructors agreed that a primary conservation course should be required of all students preparing to teach, because there are very few places in education where conservation cannot be taught. All of the instructors of the two studies agreed that conservation could and should be taught at every school level.

In the ten interview libraries reviewed in the present study, there was an average of approximately 200 conservation related books per library. In the Clagg study there was an average of 27 books per library. In addition to an obvious increase in holdings in these libraries, the majority of acquisitions had been made in the previous decade. Libraries of both studies had insignificant or no pamphlet files. The classifying and filing of pamphlets made the process prohibitive. The libraries at the interview institutions had impressive collections of conservation related periodicals. Eleven of
the twelve departments involved in the present study did not subscribe to any of the conservation periodicals; therefore, the main libraries had sole responsibility for these publications.
CHAPTER IV

THE FINDINGS FROM THE QUESTIONNAIRE INSTITUTIONS

Introduction to the Data

The procedures for identifying questionnaire institutions and conservation instructors for this analysis were patterned after procedures used in the Clagg study of 1954. A generalist conservation instructor was identified at twelve additional institutions (that is, other than interview institutions) of Southeastern United States to complete a mailed check-list questionnaire. This was the same questionnaire used during the personal interviews with interview instructors. Twenty-one questionnaire institutions and one interview institution used by Clagg were invited to participate in the present study, and twelve instructors from these institutions completed questionnaires. A questionnaire was completed by a conservation instructor in each of the following institutions: (1) Arkansas State University; (2) Florida Southern College; (3) University of Miami; (4) West Georgia College; (5) Western Kentucky University; (6) Delta State University; (7) Appalachian State University; (8) East Carolina

1 George Peabody College was perceived as an appropriate questionnaire institution for the present study.
University; (9) George Peabody College; (10) Memphis State University; (11) Middle Tennessee State University; and (12) Tennessee Technological University. Figure 3 shows the locations of the questionnaire institutions in the present study.

The questions were: (1) What was the status in primary conservation courses in these twelve questionnaire institutions of Southeastern United States in regard to nature and content, textbooks, enrollments, materials and methods, and problems and needs? (2) How did the findings in the present study compare with the findings in the former study? (3) What were the perceived reasons for change or lack of change in status of conservation education during the intervening years, and what conclusions may be drawn from the findings?

The outline of this portion of the study follows the form of the check-list questionnaire. Individual questions from the questionnaire are posed and answered under main headings concerning offerings, methods, text and class size, needs, and agencies.

**Primary Conservation Courses**

In an attempt to recognize and highlight the primary conservation courses in the participating departments, the following questions were posed to the instructors: what are the titles of the primary conservation courses in your department, and at what levels are the courses offered?

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2 The check-list questionnaire appears in the Appendix.
Figure 3. Location of the Questionnaire Institutions
As shown in Table 22, four of the courses in the present study had the title "Conservation of Natural Resources" and three others had "Conservation" in the title. Some other course titles were, "Environmental Problems," "Environmental Studies," and "Geography of Environmental Resources." None of the course names contained key words such as "ecology" or "management," which appeared in course titles in the interview institutions. Perhaps this was due to the smaller sizes of the questionnaire institutions, and they were still oriented toward local problems with resources and the environment.

Each of the twenty-one institutions in the Clogg study offered a primary conservation course. Only two of the twenty-one courses did not have the word "conservation" in their title. As was shown in the interview portion of the study, the conservation texts in 1954 had "conservation" in their titles and this was reflected in course titles.

In the present study, there were only two geography departments among the twelve participating questionnaire institutions. As shown in Table 22, ten of the institutions had placed the conservation course in a department where geography was combined with another discipline or in departments of biology, history, social science, and earth science. All but four of the departments in the interview institutions had geography as their singular title. Enrollment problems in the geography departments of the smaller questionnaire institutions resulted in geography being phased out or combined with another department. In the Clogg study, all but one of the
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<td>Arkansas St.</td>
<td>Cons. of Nat. Res.</td>
<td>Soc., Soc.Wk.&amp; Geog.</td>
<td>3</td>
<td>S</td>
</tr>
<tr>
<td>Florida Sou’n.</td>
<td></td>
<td>Biology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U. of Miami</td>
<td>Cons. of Res.</td>
<td>Geography</td>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td>West Ga. C.</td>
<td>Environ. Studies</td>
<td>History</td>
<td></td>
<td>J-S</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>Cons. of Nat. Res.</td>
<td>Geog.-Geol.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta State</td>
<td></td>
<td>So. Sci.</td>
<td></td>
<td>J</td>
</tr>
<tr>
<td>Appal’n. St.</td>
<td>Environ. Prob.</td>
<td>Comm. Plan.&amp; Geog.</td>
<td>3</td>
<td>So</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>Geog. of Envir. Res.</td>
<td>Geog.&amp; Plan.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>Envir. Cons.</td>
<td>Soc.Stud.(Geog.)</td>
<td></td>
<td>J-S</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>Prin. of Cons.</td>
<td>Geography</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Middle Tenn. St.</td>
<td>Cons. of Nat. Res.</td>
<td>Geog.&amp; Geol.</td>
<td>3</td>
<td>S-G</td>
</tr>
<tr>
<td>Tenn. Tech. U.</td>
<td>Cons. of Nat. Res.</td>
<td>Earth Science</td>
<td>3</td>
<td>F-So</td>
</tr>
</tbody>
</table>

* Reported by one instructor for a course in each institution.

* F - Freshman, So - Sophomore, J - Junior, S - Senior, G - Graduate.
conservation courses were being offered in departments of geography. In 1954, most institutions had geography departments and that was perceived as the place for the conservation course.

Table 22 shows the conservation courses in the present study being offered from the freshman to graduate levels, which was also the situation in the interview institutions. In the Clagg study, only six of twenty-one questionnaire institutions and none of the interview institutions offered their conservation below the junior level. The Clagg instructors felt that students needed background courses, especially in geography, before they entered the conservation course. Instructors in the present study felt that conservation courses should be made available at all levels, in an attempt to attract larger numbers of interested students.

**Methods in Primary Conservation Courses**

The first question posed to the questionnaire instructors concerning methods in conservation was: How do you present your course in conservation?

As shown in Table 23, all but one conservation instructor in the present study used the lecture method. The one person reporting workshop as his presentation method did not elaborate on the procedure. All of the instructors in the Clagg study employed the lecture method in primary conservation courses. Table 23 shows that the Clagg instructors were using more of the methods in addition to
TABLE 23

METHODS OF PRESENTING CONSERVATION IN THE
QUESTIONNAIRE INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Lecture</th>
<th>Workshop</th>
<th>Field Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>X</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U. of Miami</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>X Y</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>X Y</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Delta State</td>
<td>X</td>
<td>X Y</td>
<td></td>
</tr>
<tr>
<td>Appal'n. St.</td>
<td>X Y</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>X Y</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>George Peabody</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memphis St.</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Tenn. St.</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenn. Tech. U.</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


*b The present study.

* Reported by one instructor of a course in each institution.
lecture than instructors in the present study. In both studies, time was mentioned as the factor "forcing" the instructors to use more lecture and less supplementary work.

The questionnaire instructors were then asked: On what topics in conservation do you place the greatest emphasis? The topics listed for consideration were soils, water, minerals, forests, wildlife, and human.  

As shown in Table 24, five of the questionnaire instructors in the present study declared that they gave equal time to the listed topics of soils, water, minerals, forests, wildlife, and human. Four of the instructors claimed the human factor received the greatest emphasis in their conservation course. Two instructors named minerals as receiving the greatest emphasis and one persons ranked soils first.

Soils and forests were ranked at the top of the list by both groups of Clagg instructors, but were of little interest to the instructors in the present study. Except for those instructors giving equal emphasis to all topics, soil was chosen by only three instructors as a first or second choice. This reveals a significant shift of focus in conservation topics and a diversification of interest among conservation instructors. The instructors in the Clagg study appeared to be more interested in the needs of their region in

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3 Population problems and "the conservation of man" have been integral parts of conservation courses and textbooks.
TABLE 24
PRIMAR Y AND SECONDARY
EMPHASIS ON CONSER VATION TOPICS IN THE
QUESTIONNAIRE INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Equal emphasis on all topics</th>
<th>Human (Cons. of Man)</th>
<th>Minerals</th>
<th>Soils</th>
<th>Water</th>
<th>Forests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>1a</td>
<td>(2)</td>
<td>(1)</td>
<td>(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Sou’n.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U. of Mimi</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Ky.</td>
<td></td>
<td>1 (2)</td>
<td>2 (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta State</td>
<td></td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appal’n. St.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>East Car. U.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memphis St.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2)</td>
</tr>
<tr>
<td>Middle Tenn. St.</td>
<td></td>
<td>2</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenn. Tech. U.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a The present study.

b Parentheses used to indicate the Clagg study. Clagg, op. cit., pp. 213-214.

* Reported by one instructor for a course in each institution.
regard to specific resources, such as soils, forests and water. The instructors in the present study appeared to be catering, at least in part, to the perceived needs of the students. The instructors in both studies admitted to placing emphasis on topics of personal interest, and the interests of the instructors in the present study appeared to be more diversified.

As shown in Table 12 (Chapter III), several interview instructors in the present study emphasized topics other than soils, water, minerals, forests, and wildlife. For example, five interview instructors mentioned energy and five mentioned history and philosophy of conservation as topics emphasized in their teaching. This was due, in part, to the larger size of the interview institutions, and the greater diversity of interests of the instructors and the students. It may also have been due to the difference in quality and quantity of information obtained in personal interviews versus that obtained by a mailed questionnaire.

The next question posed to the questionnaire instructors concerning methods in their conservation courses was: What factors most limit your teaching of conservation?

Each of the questionnaire instructors in the present study gave a different limiting factor to his or her teaching of conservation. Time was a problem mentioned by the majority of interview instructors, but was mentioned by only one questionnaire instructor as a singular limiting factor in the course.
Some of the other factors limiting the teaching of conservation were: (1) enrollment problems due to the general lack of interest and awareness of the crucial need for conservation, (2) limited reading and preparation time to keep pace with developments in the field, (3) availability of good visual aids, and (4) inability to offer fieldwork of any significance.

The Clegg instructors at the interview and the questionnaire institutions agreed that time was the most serious limiting factor in their conservation courses. They also agreed that student background was the second most serious problem.

The questionnaire instructors in the present study appeared to be more realistic and thoughtful concerning limiting factors in their conservation teaching than their interview counterparts, or either group of instructors in the former study.

The next question on the questionnaire concerning methods in conservation courses was: In your teaching of conservation at what level do you place your greatest emphasis? The levels suggested were national, regional, local, and other.

As shown in Table 25, eight of the twelve instructors in the present study reported an emphasis at the national level. Three instructors reported emphasis at the local level, two at the regional level, and only one at the international ("world") level. A comparison of Table 14 with Table 25 shows that the interview instructors placed greater emphasis at the regional and international
### TABLE 25

**AREAS EMPHASIZED IN CONSERVATION COURSES IN THE QUESTIONNAIRE INSTITUTIONS**

<table>
<thead>
<tr>
<th>Institution</th>
<th>National</th>
<th>Regional</th>
<th>State</th>
<th>Local</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U. of Miami</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Ga. C.</td>
<td></td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Ky.</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta State</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appal'n. St.</td>
<td>X</td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Car. U.</td>
<td>X Y</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memphis St.</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Tenn. St.</td>
<td>X Y</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenn. Tech. U.</td>
<td>Y</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Clagg, *op. cit.*, p. 221.

* Reported by one instructor for a course in each institution.
levels than the questionnaire instructors. This was perhaps due to the larger size of interview institutions and the wider range of interests of students and instructors.

The instructors in the present study who reported placing greatest emphasis at the national level in their conservation courses generally agreed on the reasons for this emphasis. Some of their remarks were:

The national is the largest unit for dealing with most of the problems. The national policy results from individual attitudes and action.

Since minerals are emphasized, and they are primarily a national problem.

The national level is the most workable and generally the most meaningful to students.

Because conservation problems overlap state boundaries; yet there is hope that effective measures may be instituted at national—if not international—levels.

The greatest contrast between the two studies was at the local level, with twice as many Clagg instructors reporting local emphasis. The smaller size of Clagg institutions could have explained the "local" approach to conservation teaching. All of the Clagg institutions reporting a local emphasis were small at the time of his study. The local emphasis in conservation teaching could also have been due to the background and/or training of faculty members at local levels.
In an attempt to determine if the questionnaire instructors were taking students outside the classroom for practical experiences, they were asked the following question: Do you have land available to you for work in the field? Who owns the land, how much is available, and what is the nature of the land? Do you take field trips?

In the present study fifty per cent of the courses had no field work (See Table 26). Only one of the instructors reporting field work in conservation had university property available for this purpose. The majority of the larger interview institutions had university farms and forested areas available for field work, but the smaller questionnaire institutions had small campuses and fewer land holdings. The remaining five instructors doing field work used state and private land. The kinds of places visited for conservation field work and trips were campus environmental studies centers, natural areas, phosphate mines, state and federal experiment stations, an energy efficient house, and private property.

In the Clagg study sixty-one percent of the courses offered no field work. Clagg's questionnaire instructors had less property available for field work than the interviewed instructors. This was due, in part, to the smaller size of the questionnaire institutions.

The next questions posed to the questionnaire instructors concerned the use of visual aids in their conservation courses. Do you use visual aids in your conservation teaching? If you do, what types are used and what are your sources?
TABLE 26

OWNERSHIP OF LAND FOR FIELDWORK AND TRIPS
IN THE QUESTIONNAIRE INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>No field work</th>
<th>University property</th>
<th>State property</th>
<th>Private property</th>
<th>Federal property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>X</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>X Y</td>
<td>Y</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U. of Miami</td>
<td>X Y</td>
<td>X</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Georgia C.</td>
<td></td>
<td>X</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Ky.</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta State</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appal'n. St.</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Car. U.</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>X</td>
<td></td>
<td>Y</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Reported by one instructor for a course in each institution.

* Clagg, op. cit., p. 223.
As shown in Table 27, all but one of the questionnaire instructors in the present study used visual aids in his or her conservation teaching. Ten of the twelve instructors used slides and in most cases these were their personal slides. As was the case among the interview instructors, the questionnaire instructors did not use charts. They used slides and overhead projectors to present the types of materials that were formerly presented on charts.

Films were used by fifty per cent of the questionnaire instructors in the present study. As shown in Table 27, Clagg reported a more extensive use of films in 1954. More films with conservation themes were probably available to the instructors in the present study, but there was a greater variety of visual aids than in 1954. Overhead projectors were mentioned by the questionnaire instructors in the present study, but video materials were not. Several interview instructors discussed video tapes at length. This, of course, is essentially a new method of presenting what had been previously presented on film.

All of the Clagg instructors reported the use of some type of visual aid. The use of slides and charts was reported by more questionnaire instructors than interview instructors. The opposite situation was reported concerning films and film strips. Clagg felt that the smaller questionnaire institutions probably had limited film libraries with less funds to devote to films and equipment. Since the
### TABLE 27

**VISUAL AIDS USED IN CONSERVATION TEACHING IN THE QUESTIONNAIRE INSTITUTIONS**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Slides</th>
<th>Films</th>
<th>Film Strips</th>
<th>Charts</th>
<th>Overhead Projectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>X Y</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Sou'n</td>
<td>X Y</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U. of Miami</td>
<td>X Y</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>X Y</td>
<td>X Y</td>
<td>X Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Ky.</td>
<td>X Y</td>
<td>X</td>
<td></td>
<td>X Y</td>
<td></td>
</tr>
<tr>
<td>Delta State</td>
<td>X Y</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appal'n St.</td>
<td>X</td>
<td>X Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Car. U.</td>
<td>X Y</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memphis St.</td>
<td>X Y</td>
<td>X Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>X Y</td>
<td>X Y</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>X Y</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Clagg, op. cit., p. 226.

* Reported by one instructor for a course in each institution.
interview institutions were usually state universities, they were probably the source for lending films to the smaller institutions of their respective states.

The questionnaire instructors were asked if they attempted to show students how to set up demonstrations in conservation. Three of the twelve instructors in the present study reported involvement with conservation demonstrations. They expressed this involvement in the following manner: (1) "Part of the student reports involves the preparation of demonstrations such as stream table/erosion, air pollution, microscope slide preparation, filtration, and water pollution chemistry experiments," (2) "We use 'Rutile on the Beach' from the High School Geography Project," and (3) "We make personal consumption diaries and inventories of ownership of certain commodities." Several of the instructors in the present study were in such departments as history and social science, and therefore were not as interested in demonstrations and laboratory procedures.

Six Clagg instructors reported instruction in preparation of conservation demonstrations. These were usually prepared for the benefit of prospective teachers.

The final questions asked of the questionnaire instructors in the methods portion of the study were: Do you require oral or written reports from your conservation students? If yes, what is the nature of these reports?
As shown in Table 28, nine of the twelve questionnaire instructors required oral reports of their conservation students, and ten of the twelve required written reports. The oral report usually involved reporting the findings from the written report or term paper. Some other approaches to the oral report were: (1) individual reports and panel discussions based on library work, in order to expand topics beyond the text presentation, (2) student presentations of environmental impact summaries to class, and (3) term reports with sub-reports on more specific topics, with discussion between topics and with the whole class. Some specific aspects of the written reports were: (1) weekly quiz on readings in text and weekly inventories, (2) term papers based on current events, and (3) annotated bibliographies on topics of the student's choice.

All of the Clagg questionnaire and interview instructors required a report of some kind. The questionnaire instructors were especially interested in oral reports from their students. This was surprising in light of the time problems reported earlier. They perceived the benefits of oral reports in conservation classes to outweigh time problems and other considerations.

At the end of the section on methods used in conservation courses, the questionnaire instructors were asked to send copies of course outlines, bibliographies, or any other printed materials
TABLE 28

NATURE OF STUDENT REPORTS IN THE QUESTIONNAIRE INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Oral Reports</th>
<th>Written Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>X^Y</td>
<td>X Y</td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>X Y</td>
<td>Y</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>X</td>
<td>Y</td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>Delta State</td>
<td>X Y</td>
<td>X</td>
</tr>
<tr>
<td>Appal'n. St.</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>X Y</td>
<td>X Y</td>
</tr>
<tr>
<td>George Peabody</td>
<td>X Y</td>
<td>Y</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>X</td>
<td>X Y</td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>X Y</td>
<td>X Y</td>
</tr>
</tbody>
</table>

* Reported by one instructor for a course in each institution

*a Clagg, op. cit., p. 229.
available from their conservation courses. A review of printed organizational materials could possibly have given further insight concerning course content and method.

Four instructors in the present study sent printed materials with the questionnaire. Two of these sent simple course syllabi and two sent elaborate bibliographies, glossaries, and formats for environmental analysis and environmental impact statements. Six Clagg instructors enclosed course outlines and bibliographies with their questionnaires. It was a surprise that more printed course materials were not furnished by conservation instructors in the two studies. If this was an indication of the amount of printed material available to conservation students, it was perhaps a significant weakness in the conservation courses.

Textbooks Used in Primary Conservation Courses

In this part of the questionnaire, several questions were asked concerning textbooks. What textbooks are you using in your conservation courses? What other textbooks have you used in the past five years? Are you satisfied with the present textbook? If not, why not? If not, what do you do about it? Do you have an outside reading list? It was hoped that more could be learned about the nature of the course by determining the textbooks and other books used.

The conservation textbooks which were being used at the questionnaire institutions in both studies are shown in Table 29. All of the instructors in both studies were using textbooks in their
### TABLE 29

**PRESENT AND PAST TEXTBOOKS USED IN THE PRIMARY CONSERVATION COURSES IN THE QUESTIONNAIRE INSTITUTIONS**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Present textbook</th>
<th>Textbooks used over last 5 years</th>
<th>Present textbook satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>Da (G)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Paperbacks (P-W)</td>
<td>Yes (Yes)</td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>S (R)</td>
<td>None (G)</td>
<td>Yes (Yes)</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>M (S)</td>
<td>(G)</td>
<td>Yes (No)</td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>P (W-A)</td>
<td></td>
<td>Yes (No)</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>O (W-A)</td>
<td>H</td>
<td>No (No)</td>
</tr>
<tr>
<td>Delta State</td>
<td>M (G)</td>
<td></td>
<td>Yes (Yes)</td>
</tr>
<tr>
<td>Appal'n. St.</td>
<td>M (S)</td>
<td>W (P-W)</td>
<td>Yes (Yes)</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>D, C (S)</td>
<td>(V, V-H, P-W)</td>
<td>Yes (No)</td>
</tr>
<tr>
<td>George Peabody</td>
<td>D-M, D, F, N (W-A)</td>
<td>Same (G)</td>
<td>Yes (Yes)</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>O (W-A)</td>
<td>D (G, Gr)</td>
<td>Yes, No (Yes)</td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>H (S)</td>
<td></td>
<td>No (No)</td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>D (G)</td>
<td>None</td>
<td>Yes (Yes)</td>
</tr>
</tbody>
</table>

**Textbooks from present study:**

C—Cook, Man, Energy, Society
D-M—Darling and Milton, Future Environments of N. A.
D—Dasmann, Environmental Conservation
Da—Dasmann, The Conservation Alternative
F—Farvar and Milton, The Careless Technology
H—Highsmith, Jensen and Rudd, Conservation in the United States
TABLE 29 (continued)

M—Miller, Living in the Environment
N—Nash, The American Environment
O—Owen, Natural Resource Conservation
P—Petulla, American Environmental History
S—Smith, Conservation of Natural Resources
W—Wagner, Environment and Man

Textbooks from Clagg Study:

Gr.—Graham, Natural Principles of Land Use
G—Gustafson, Conservation in the United States
P-W—Parkins and Whitaker, Our Natural Resources and Their Conservation
R—Renner, Conservation of National Resources
S—Smith, Conservation of Natural Resources
S-P—Smith and Phillips, Economic Geography
V—Van Hise, Conservation of Natural Resources in the United States
V-H—Van Hise and Havemeyer, Conservation of Our Natural Resources
W-A—Whitaker and Ackerman, American Resources
Z—Zimmermann, World Resources and Industries


* Reported by one instructor for a course in each institution.
conservation courses. Eleven different textbooks were used in the present study. The most popular were Miller's *Living in the Environment* and Dasmann's *Environmental Conservation*. Each of these was being used by three questionnaire instructors. In the interview institutions the Miller book was being used by three instructors and the Dasmann book by two.

Clagg reported that five different textbooks were being used by his questionnaire instructors. Three of these were the same as those being used by the interview instructors. A comparison of textbook selection of the Clagg study with that of the present study shows a greater diversity of textbooks being used in the present study. This was due, at least in part, to the proliferation of conservation topics and materials in the years between the two studies. Many of the course titles and textbooks of 1954 contained the word "resources," and reflected an emphasis on soils, forests, water, minerals, and wildlife. In contrast, Tables 22 and 29 show that many course titles and textbooks in the present study contain the word "environment," and reflect an emphasis in conservation course more toward people, environmental quality, and ecological matters.

In regard to textbooks used in the previous five years, about one-half of the instructors in each of the studies failed to complete the questionnaire. Only four of the twelve instructors in the present study reported specific textbooks they has used in the previous five years. Table 29 shows these to be textbooks by Highsmith and others, Wagner, and Dasmann. The person who used four textbooks reported
using the same four books for several years. One instructor had previously used "several paperbacks," one had not used a textbook, and another reported that the course had not been offered before.

In the Clagg study seven different textbooks had been used over the previous five years by the instructors who indicated change. The same four textbooks were predominantly used by the interview instructors and the questionnaire instructors. These four textbooks were written or edited by Gustafson, Parkins and Whitaker, Smith, and Whitaker and Ackerman.

A comparison of the two studies revealed that the Clagg instructors had used more textbooks in the previous five years, and expressed greater freedom in changing books than the instructors in the present study. It was felt that this was due to the more elaborate nature and greater expense of the textbooks at the time of the present study. Fortunately, a variety of soft-cover books on conservation were available to instructors in the present study. Dasmann's *Environmental Conservation* was an example of a soft-cover textbook being used by several questionnaire instructors. The instructor who used four textbooks had used the same four books for several years, which would have made used copies of the books available to the students. One questionnaire instructor described a unique arrangement for coping with the high cost of textbooks. The textbook was carefully selected, the instructor agreed to use the book
for at least three years, and a leasing agreement was made between the publisher and the institution.4

In the present study nine instructors reported satisfaction with their present textbook, two were not satisfied, and one simply said "yes and no." As was reported by the interview instructors, some of the questionnaire instructors had problems with their textbook even if they liked it generally. A common complaint was that too many important details had been left out of the conservation texts. Two critical comments of interest to geographers were: (1) "the textbook has many good features, but I would like one written by geographers," and (2) "I would like a more recent one written by a geographer."

One of the questionnaire instructors in the present study was particularly pleased with his textbook, which was Miller's Living in the Environment. His comment about the book was that, "It is the best textbook ever published!" It is ironic that he can no longer use the book. In a recent telephone interview this instructor informed the writer that his department and the earth studies department were both using the book. It was recommended that one department stop using it, so his department yielded to earth studies. He replaced the textbook with Botkin and Keller's Environmental Studies and has found the new book to be very satisfactory.

4 Phone conservation with Dr. Robert E. Reiman in February, 1984.
Approximately one-third of the Clagg instructors were not satisfied with their present textbook. Some of the others were satisfied but with certain reservations. Many complaints concerning textbook inadequacy were similar to those of the interview instructors. Three instructors complained to Clagg about Smith's Conservation of Natural Resources. Some of their comments were: (1) "The students do not see, through the textbook, enough of the connection to actual problems and plans," (2) "Students have commented that the textbook lacks a coherent theme and approach," and (3) "The chapter outlines are stock things, commonplace, and deadening." 5

It was found in both studies that the questionnaire instructors were meeting textbook inadequacies in the same way as interview instructors. Briefly, some of the methods mentioned were: additional lecture, assigned readings, assigned reports, and field trips. The key term in most of the instructors' comments was "supplemental material" which would be the situation in regard to textbooks in any discipline.

Student Enrollment in Primary Conservation Courses

The question posed to the questionnaire instructors concerning enrollments were: How many students were enrolled in your most recent conservation classes? Is it a required course for any group of students? On an elective basis, what subject major group seems most

5 Clagg, op., cit., p. 235.
common in the conservation class? What prerequisites do you have for your conservation classes?

Table 30 shows enrollments for a single term in the twelve questionnaire institutions in the present study and enrollments for a single term in those twelve institutions in the Clagg study. The enrollments ranged from eight to fifty-five in the questionnaire institutions of the present study and from five to sixty-six in the Clagg institutions. The twelve institutions in the present study had a total enrollment in the latest conservation classes of 280 students. This was an average of 23.3 students per class. The conservation courses in the interview institutions had an average of 36 students.

The same twelve institutions in the Clagg study had a total enrollment in the latest conservation classes of 398 students. This was an average of 33.2 students per class. The conservation courses in the Clagg interview institutions had an average of 27.5 students. These figures show a slightly higher average class size in the interview institutions in the present study and a higher average class size in the questionnaire institutions in the Clagg study. Considering the small number of courses sampled in the two studies these are not significant differences in average class size.

It was difficult to compare total conservation enrollments in the questionnaire institutions of the two studies. This was possible in the interview institutions because most of the conservation courses in both studies were in geography departments, and figures could be acquired from the Directory of College Geography. Most of Clagg's
TABLE 30

ENROLLMENT IN PRIMARY CONSERVATION COURSES IN THE QUESTIONNAIRE INSTITUTIONS*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Enrollment (Present study)</th>
<th>Enrollment (Clagg study)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>20</td>
<td>66</td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>35</td>
<td>28</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>17</td>
<td>36</td>
</tr>
<tr>
<td>Delta St.</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>Appal'n St.</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>20</td>
<td>55</td>
</tr>
<tr>
<td>George Peabody</td>
<td>19</td>
<td>41</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>30</td>
<td>26</td>
</tr>
</tbody>
</table>

a Latest class enrollment at time of completion of questionnaire.

b Clagg, op. cit., p. 236.

* Reported by one instructor for a course in each institution.
questionnaire institutions had the primary conservation courses in geography departments, but in the present study many were in such departments as history, biology, and social studies. (See Table 22) The larger schools still have geography departments but many of the smaller schools do not. They have either phased out geography departments or combined them with other disciplines. Due to these changes the geography or conservation enrollments may or may not be listed in the Directory of College Geography.

All but one of the twelve questionnaire instructors in the present study reported that conservation was not required of any students. One instructor said it was required of park, recreation and conservation majors. Three questionnaire institutions in the Clagg study required conservation of all students preparing to become teachers. Seven of twenty-one institutions required the course for elementary teachers and two required it for secondary teachers. Clagg attributed this to the fact that the questionnaire institutions were primarily engaged in teacher education.6 The questionnaire institutions had grown dramatically between the Clagg study and the present study. As a result they had become more diversified and not primarily engaged in teacher preparation. Some of these institutions had their names changed from teachers college to university. This did not necessarily mean a complete change of function.

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6 Ibid., p. 242.
The questionnaire instructors were asked to name the subject majors most often electing their conservation courses. The findings from both studies are shown in Table 31. In the present study the major students electing conservation, and the number of times mentioned by the instructors, were: geography (3), wildlife management (2), biology (2), social science (1), business administration (1), agriculture (1), recreation (1), planning (1), and engineering (1). Only one instructor in the present study mentioned having education majors in his conservation courses. This does not mean that education majors do not take conservation courses, but that they are not numerous enough to warrant mention by the instructors.

As shown in Table 31, eight of the twelve Clagg institutions listed, commonly had education majors electing conservation courses. In the broader Clagg study education majors were mentioned 48 per cent of the time among major students electing conservation. Other majors reported as electing conservation were social studies, geography, business administration, home economics, and science.

Clagg found in the previous section of the study that conservation was required of some groups of students preparing to teach. In this part of the study he found that additional education majors were electing conservation courses. This is further support for the theory that teacher preparation was a major function of the questionnaire institutions at the time of the former study, but was not a major function at the time of the present study.
# TABLE 31

**MAJOR STUDENTS TAKING PRIMARY CONSERVATION COURSES FOR ELECTIVE CREDIT IN THE QUESTIONNAIRE INSTITUTIONS***

<table>
<thead>
<tr>
<th>Institution</th>
<th>Majors electing Conservation - Present study</th>
<th>Majors electing Conservation - Clagg study*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida Sou'n.</td>
<td>Biol.</td>
<td>—</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>Biol.</td>
<td>—</td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>Bus. Ad.</td>
<td>Ed.</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>—</td>
<td>Ed.</td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>—</td>
<td>Ed.</td>
</tr>
</tbody>
</table>

*a Clagg, *op. cit.*., p. 243.

* Reported by one instructor in each institution.
Six of the twelve questionnaire institutions in the present study had no prerequisites for primary conservation courses. The biology department participating in the study required one course in botany, zoology or general biology as a prerequisite to the conservation course. This prerequisite was directed toward non-majors. Three of the twelve departments required one previous course in geography, and one department required junior standing. In the Clagg study there were four primary conservation courses in which the instructors reported a principles of geography course as prerequisite. A certain class standing was mentioned as a prerequisite by some but was loosely interpreted. The interview institutions in the Clagg study had more prerequisites to the conservation courses than the questionnaire institutions. This gave greater access to the course, especially for prospective teachers, in the education oriented questionnaire institutions. The questionnaire institutions in the present study had more prerequisites to the conservation courses than the interview institutions. This was not particularly restrictive in light of the fact that the prerequisites could have been general biology and introductory geography, which many students take early in their college career.

Conservation Materials in Departments Offering Primary Conservation Courses

The questionnaire instructors were asked a series of questions concerning conservation materials in their departments. How many books and pamphlets on conservation do you have in your department for
student use? Does the department lend these for students to take out? Do you receive any journals in the department that are largely of a conservation nature? There was difficulty in the Clagg study and in the present study in this part of the questionnaire. The question regarding periodicals in the department was misinterpreted or avoided by some instructors. A few of the Clagg instructors reported subscriptions to conservation related periodicals in their departments.

In the present study seven of the twelve questionnaire instructors reported having conservation related books in their department libraries. The number of books ranged from 20-30 in some departments to as many as 150 in one department. Some claimed to have collections of relevant pamphlets in the departments. One such collection contained 100 items and another was estimated at 400. The instructors reported large collections of conservation related periodicals in the main libraries, but listed many titles in their departmental collections. The department periodicals were: Audubon Magazine, American Forester, Journal of Geography, National Parks Magazine, Soil Conservation, Natural History, Florida Conservation, Florida Wildlife, and National and International Wildlife.

The interview instructors in the larger universities reported insignificant departmental libraries since the responsibility for such materials had been placed in the main libraries. The larger departmental collections reported by the questionnaire instructors reflected the smaller and possibly more personal nature of these
Several instructors commented that their personal and departmental conservation materials were readily available to the students.

**Conservation Problems and Needs of the Southeastern Region**

The questionnaire instructors were asked what they considered to be the primary and secondary conservation problems in the areas served by their institutions. They were given a choice of soils, water, minerals, forests, wildlife, human, equal, and other.

Table 32 shows that the questionnaire instructors were especially concerned about water and human problems. A comparison of Table 32 with Table 21 shows that the questionnaire and interview instructors were in general agreement concerning conservation problems in their areas. The main points of disagreement were that four questionnaire instructors placed equal emphasis on several problems of their areas, and more interview instructors placed emphasis on problems with minerals. Soils were listed by only one questionnaire instructors as the single greatest problem. Except when placed on an equal basis with several other problems, forests were not listed as a first or second ranked problem by any instructor.

Tables 32 and 21 show that the Clagg instructors in both groups listed soils and forests as the primary and secondary conservation problems in their service areas.
### TABLE 32

**PRIMARY AND SECONDARY CONSERVATION PROBLEMS IN THE SERVICE AREAS OF THE QUESTIONNAIRE INSTITUTIONS**

<table>
<thead>
<tr>
<th>Institution</th>
<th>All problems equally important</th>
<th>Water</th>
<th>Human</th>
<th>Soil</th>
<th>Forests</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>X</td>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td></td>
<td>1 (2)</td>
<td>2</td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>U. of Miami</td>
<td></td>
<td>1 (1)</td>
<td></td>
<td></td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>West Georgia C.</td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Western Ky.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td>Minerals-1</td>
</tr>
<tr>
<td>Delta St.</td>
<td></td>
<td>1</td>
<td>2 (2)</td>
<td>(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appal'n St.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2)</td>
<td>Land Use-1 (Wildlife-1)</td>
</tr>
<tr>
<td>East. Car. U.</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>2 (1)</td>
<td></td>
</tr>
<tr>
<td>George Peabody</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Memphis St.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>X</td>
<td>2</td>
<td>(2)</td>
<td></td>
<td>(1)</td>
<td></td>
</tr>
</tbody>
</table>

*a* In the present study.

*b* Parentheses used to indicate the Clagg study. Clagg, *op. cit.*, p. 249.

* As identified by one instructor in each institution.
One interview instructor would not highlight a single conservation problem in the service area of his institution, but insisted that there was an interrelatedness of problems. Table 32 shows that four questionnaire instructors had the same attitude when they claimed that several of the problems listed were of equal importance in the service areas of their institutions. One instructor listed "human" as a problem in his area, but said "the human problem encompasses and affects all of the others." The same could be said about water, since it is so completely "interwoven" with all of the other problems.

The questionnaire instructors were asked if they believed the people of their state had enough conservation awareness. In the present study ten of the twelve questionnaire instructors reported that there was a lack of conservation awareness in their state. Approximately 71 per cent of the questionnaire instructors in the Clegg study reported a lack of conservation awareness and ten per cent reported enough awareness. The remaining instructors had doubts concerning awareness but felt it was increasing. The majority of conservation instructors of both studies were predictably pessimistic about the conservation awareness of the people. Most conservation instructors are in the field because of a perceived lack of conservation awareness among the people. Many point to the widespread abuse and neglect of the environment as "evidence" of the lack of conservation awareness.
The questionnaire instructors were then asked if they thought the people of the area really knew the meaning of conservation. In the present study ten of the twelve questionnaire instructors responded to this question. All of these instructors agreed that the people of their area did not know the meaning of conservation. Approximately one-fourth of the Clagg instructors felt that some people knew something about the meaning of conservation but believed the concept to be too narrow.

If their answer was negative concerning people's understanding of conservation, the instructors were asked to complete a second part of the question which said, "What do they think conservation is?"

Some of the instructors gave the following replies to the question:

Conservation is confused with total protection and lack of use instead of management. People tend to think in absolutes and are either at one extreme of (sentimental) agreement with an organization goal or scathing denunciation.

Many think of it as personal sacrifice—job loss, staying cold in winter, low standard of living—rather than efficiency, new kinds of jobs, personal effort and not government regulation. People, I think, fear it.

Many have sharply polarized views that do not evaluate trade-offs and choices.

Most seem to think of it as a 'good thing' that some people are involved in—foresters, soil experts, some farmers—not as wise use of resources on a societal basis.

The questionnaire and interview instructors of both studies agreed that the majority of people in their area did not know the meaning of conservation. The above remarks are typical of how conservation educators perceive the attitude of the general public.
toward conservation. Similar remarks were encountered during the course of interviews and discussion with conservation instructors throughout the present study.

In the next part of the questionnaire the instructors were asked a series of questions concerning teacher preparation in conservation. The first of these questions was: Do you feel the major students in your department who intend to teach receive adequate training in conservation? In the present study, six of twelve questionnaire instructors and seven of eleven interview instructors who responded to this reported that their major students did not receive adequate training in conservation. Seventy-five per cent of the Clagg questionnaire instructors and about 33 per cent of the interview instructors reported major students in their departments did not receive adequate preparation in conservation. The two sets of data did not agree on this point. Clagg felt that since most of these smaller questionnaire institutions did not offer a major in geography, the instructors had read the question to mean all those intending to teach rather than limiting it to majors in their own departments. The instructors in both studies thought that a significant number of prospective teachers in their departments were not receiving adequate training in conservation. This would appear to be a serious problem for the development of conservation awareness among our youth. Fortunately, teachers learn about conservation through their teaching and by using conservation specialists and materials.
The second question under teacher preparation involved the percent of students taking the conservation courses who were preparing to teach. Questionnaire instructors' estimates concerning students enrolled in primary conservation courses, and preparing to teach are shown in Table 33. In the present study the range of estimates among the questionnaire instructors was from five to 100 per cent and among the interview instructors was from ten to 90 per cent. In both groups of Clagg instructors the estimates ranged from one to 95 per cent. The range of estimates was due, in part, to the lack of accurate information. Some instructors reported that they did not have enough information to make an estimate.

The next question posed to the questionnaire instructors was: What per cent of the students going out of this institution each year to teach have had a course in conservation? Questionnaire instructors' estimates concerning graduating teachers who have had a conservation course are shown in Table 34. In the present study the estimates of instructors ranged from zero to 25 percent. The estimates from the Clagg questionnaire instructors ranged from one to 100 per cent. It seems clear that the lower figures in the present study were due to increased enrollments and diversification of programs in the institutions since the Clagg study.

The questionnaire instructors were asked if they believed all students preparing to teach in the state should be required to take at least one course in conservation. In the present study, nine of the
### TABLE 33

**QUESTIONNAIRE INSTRUCTORS' ESTIMATION REGARDING THE PER CENT OF STUDENTS TAKING THE CONSERVATION COURSE WHO WERE PREPARING TO TEACH**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Present Study</th>
<th>Clagg Study&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>75</td>
<td>95</td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>20</td>
<td>70</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>Do not know</td>
<td>50</td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>No response</td>
<td>90</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Delta St.</td>
<td>100</td>
<td>85</td>
</tr>
<tr>
<td>Appal'n St.</td>
<td>30</td>
<td>No response</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>George Peabody</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>Do not know</td>
<td>65</td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>No response</td>
<td>25</td>
</tr>
</tbody>
</table>

<sup>a</sup> Clagg, *op. cit.*, p. 257.

* Estimated by one instructor in each institution.
TABLE 34

QUESTIONNAIRE INSTRUCTORS' ESTIMATION REGARDING THE PER C ENT OF GRADUATING TEACHERS WHO HAD TAKEN THE CONSERVATION COURSE*

<table>
<thead>
<tr>
<th>Institution</th>
<th>Present Study</th>
<th>Clagg Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas St.</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Florida Sou'n.</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>Do not know</td>
<td>No response</td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>0</td>
<td>90</td>
</tr>
<tr>
<td>Western Ky.</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Delta St.</td>
<td>25</td>
<td>85</td>
</tr>
<tr>
<td>Appal'n St.</td>
<td>Very few</td>
<td>No response</td>
</tr>
<tr>
<td>East Car. U.</td>
<td>Very few</td>
<td>1</td>
</tr>
<tr>
<td>George Peabody</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Memphis St.</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>Middle Tenn.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Tenn. Tech.</td>
<td>No response</td>
<td>No response</td>
</tr>
</tbody>
</table>

*a Clagg, op. cit., p. 259.

* Estimated by one instructor in each institution.
twelve questionnaire instructors thought prospective teachers should be required to take at least one conservation course. Only fifty percent of the interview instructors believed teachers should be required to take conservation. This was due, at least in part, to the diversified nature of the larger interview institutions and the history of teacher preparation at the questionnaire institutions. In the Clagg study, all but one questionnaire instructor and one interview instructor believed a conservation course should be required of all preparing to become teachers.

The questionnaire instructors were asked what courses other than conservation they felt would be especially helpful to a person planning to teach conservation in high school. In the present study ten of the twelve instructors named geography as the course most valuable to a person planning to teach conservation in high school. In most cases the instructor specified physical, economic, or introductory geography courses. In contrast to the questionnaire findings, the interview instructors did not mention geography as being helpful to teachers of conservation. Several interview instructors indicated that geography departments were too specific and professional in other areas to be of much help in conservation.

Several other courses were mentioned one, two or three times as being helpful to conservation teachers. They were: soil science, ecology, wildlife management, biology, geology, economics, sociology, and weather and climate. The questionnaire instructors of the Clagg
study reported geography, biology, and geology as the courses most helpful to teachers of conservation. The two groups of Clagg instructors were in agreement regarding these subjects.

In an attempt to determine where conservation can best be taught, the instructors were asked: Which courses, in your opinion, lend themselves to the teaching of conservation as an integrated subject? In the present study four of the questionnaire instructors failed to answer this question and one person inserted a (?). Of the remaining seven instructors, only three chose geography as the best field to offer conservation as an integrated subject. Seven other fields were mentioned in this regard. They were, in descending order of times mentioned, biology (4), history and sociology (2), political science, agriculture, social studies and earth science (1). One instructor felt that conservation could best be taught on an interdisciplinary basis.

Clagg's questionnaire instructors believed geography to be the best field in which to offer conservation as an integrated subject. Twelve other courses were mentioned one, two or three times each in this regard. Probably the Clagg questionnaire instructors selected geography as the place to teach conservation because most of them were in geography departments. Most of the conservation instructors in the present study were in departments where geography was combined with
other disciplines, and they did not select geography as the place to teach conservation as an integrated subject. Their choices were from a wide variety of fields.

At this point in the questionnaire the instructors were asked to give their opinions concerning the level at which conservation can best be taught. In the present study, all but three questionnaire instructors thought conservation could be taught at every level in the schools. The three exceptions confined their answers to colleges and preferred upper levels. Approximately 53 per cent of Clagg's questionnaire instructors believed conservation could be taught at all levels.

The instructors were then asked if they felt conservation should be taught at every level. About 83 per cent of the instructors in the present study believed conservation should be taught in some way at every level. About 90 per cent of the Clagg instructors were of the same opinion. The instructors were asked to comment on the possible difficulties of teaching the subject at every level. Several questionnaire instructors commented that getting properly trained teachers at every level would be a problem, and it would be difficult to get the right kinds of material to the students at appropriate times to avoid repetition and boredom.

As a final question in this part of the questionnaire, the instructors were asked to give their opinions concerning the adequacy
of conservation education in the public schools of their areas. Nine of the twelve instructors in the present study felt that the public schools were not doing an adequate job in conservation. Two instructors were optimistic, and furnished examples of good work being done by specific schools. Only one Clagg instructor believed the public schools were doing an adequate job in conservation education.

The questionnaire instructors, like the interview instructors, were alarmed at the lack of conservation awareness and background of the students arriving at their institutions. They thought the public schools were not doing an adequate job in conservation education.

**The Work of Outside Agents and Agencies in the Primary Conservation Courses of the Southeast**

The questionnaire instructors were asked a series of questions about conservation agencies in an attempt to determine the extent and kind of cooperation between the agencies and the educational institutions.

The instructors were asked if they used outside specialists to assist in their conservation courses. Four of the twelve instructors in the present study used outside conservation specialists in their courses. The agents and agencies listed by the instructors included federal, state, and business representatives and organizations. Approximately 80 per cent of the instructors in the Clagg study used outside conservation specialists in their courses. These specialists were not used often because of limited class time.
Another question posed to the questionnaire instructors on agencies was: Does your department cooperate with outside agencies in preparation of conservation education materials? One instructor in the present study developed nature trails for parks, and another developed education materials through a graduate course called, "Environmental Education for Teachers." Less than 15 per cent of the Clagg questionnaire instructors assisted outside agencies in preparation of conservation education materials. As in the interview institutions, the members of these departments were not active in these pursuits.

The final question on agencies was: Does anyone in your department work with a resource-use planning committee? Seven of the twelve, or about 58 per cent, of the departments in the present study had people working with resource planning committees. In the Clagg study, 38 per cent of the department had personnel working on resource-use committees.

The types of committee work mentioned in the present study were: (1) Peach River Basin Planning Board; (2) The Regional Development Institute; (3) University's Environmental Studies Council; (4) City Ecological Committee; and (5) Resources Planning Committee for BRADD.

Some of the types of committees mentioned in the Clagg study were: (1) Florida Resource-Use committee; (2) Delta Council; (3) Wolf River Watershed Association; (4) Division of Planning and Economic Welfare; and (5) Lakeland Planning Commission.
More questionnaire departments of both studies were working with planning groups than interview departments. Many of these smaller questionnaire institutions are in small communities and more remote areas, and they may be the only organizations in their service areas with conservationists available for committees.

**Questionnaire Instructors' Opinions Regarding Status of Conservation Education in the Colleges and Universities of Southeastern United States**

The writer posed two additional questions to the questionnaire instructors concerning their opinions on the status of conservation education in the institutions of the Southeast. The questions were: (1) In your opinion, and from your experience, what is the status of conservation education in the colleges and universities of the Southeastern United States, and (2) What direction should conservation education be taking, in these institutions of higher learning, in the next twenty years?

**Status of conservation education in Southeastern United States.**

The instructors gave a variety of thoughtful opinions:

I know of no unusual status for the Southeast. For many years, geographers and biologists have been those interested in conservation. Recently there has been some broadening of interest; however, geographers seem to be neglecting the area—especially with respect to publication.

A few are doing a good job. Many other departments are now trying to get into the act, since this has become very popular.

Not bad, but as everywhere, not treated with the degree of importance it deserves—not recognized as necessary for SURVIVAL by most people.
Very weak—students are either alienated (crisis—but I can't do anything) or antagonistic (you can't make lots of money in the conservation business, so why learn about it?).

I think it has slipped considerably in the past 15 years.

Weak and generally inadequately recognized by other faculty members as important.

Spotty, with very intensive interest and good educational experiences in some areas, but very little in others.

**Proposed direction of conservation education in the next twenty years.** Some of the opinions of the questionnaire instructors concerning the proposed direction of conservation education were:

They should foster a pattern of thinking which leads to evaluating alternatives and, in many cases, advocating a middle ground for action. The critical decisions change, but the rational approach is always needed.

More emphasis on public education. Problems of fragmentation of administration, breadth of field, and diversity of interests. This is healthy in a way, but also defeating. Need a diplomat rather than a zealot.

It would be delightful to see it available to every student as a general education elective on a freshman or sophomore level.

More problem oriented.

Should be recognized and accepted as necessary for survival, let alone for the 'good life'.

Providing basic education of conservational needs to traditional students and to the adult public through the development of new courses in conservation.

For openers—requiring conservation education to be taught as say U. S. History is taught, as a required subject (i.e. 5th, 8th, 11th and college grade levels).
We should avoid extremes of environmentalist philosophy. Emphasis should be placed on fertilizers, fuels, metals, soils, forests, water and population. No areas should be neglected. Population control should get special attention since it is the number one problem of the world.

Geography departments should take a much more active role in resource-use planning.

Some course on conservation in particular and environmental education generally ought to be required of all graduates of schools receiving state or federal funds.

Conservation Education Offerings in Courses Not Primarily Concerned with Conservation

This part of the replication of the Clagg study involved a short form questionnaire containing approximately ten items which was completed for 27 separate courses in 19 departments. The instructors completing these questionnaires were in the interview institutions. The interview instructors furnished names of departments which they knew had courses with conservation content. In some cases they named instructors who used conservation materials in their courses. Three questionnaires were sent to each of the recommended instructors and department chairpersons to be distributed among their colleagues who they perceived to have conservation content in their courses.

Several blank questionnaires were returned, accompanied by comments as to why they were not completed. Several others were completed for special conservation courses with 100 per cent conservation content, and were not included in the survey. One or more questionnaires were used from ten of the twelve interview institutions. The following list shows the participating institutions
and the number of questionnaires from each: University of Alabama - two; University of Arkansas - three; University of Florida - one; Florida State University - three; University of Kentucky - four; Louisiana State University - three; University of Mississippi - one; University of North Carolina - one; University of South Carolina - three; and University of Tennessee - six.

The following list shows the kinds of departments (disciplines) participating and the number of questionnaires completed in each of the fields: geology-eight; biological science-seven; curriculum and instruction-four; zoology and physiology-three; botany-two; elementary education-one; recreation administration-one; and sociology-one. It was expected that the largest number of participating departments would be from the sciences. The majority of participating departments in the Clagg study were from biological science, botany, and zoology.

The titles of courses involved in the present study were:

- Environmental Education
- Introductory Geology
- Environmental Geology
- Field Botany
- Man and Environment (Biology)
- Environmental Earth Science
- Outdoor Recreation: Policy and Development
- Economic Education Workshop
- Animal Ecology
- General Ecology
- Limnology
- Ichthyology
- Teaching Science and Social Studies in Elementary Schools
- Aquatic Pollution Biology
- Ecology and Behavior
Some of the more pertinent aims of the questionnaire were to determine how conservation is taught in the course, the per cent of the course devoted to conservation, the areas of conservation emphasized, the per cent of students intending to become teachers, the degree to which the course meets the conservation needs of the students, and the perceived conservation needs of the respective states.

In an attempt to determine the way in which conservation was being taught in the courses, the questionnaire contained a check-list of the following methods: (1) as a separate unit, (2) as an organized part of an integrated program, (3) incidentally where it seems appropriate, and (4) some other way. In the present study, 56 per cent of the instructors reported that they were teaching conservation incidentally where it seemed appropriate. Thirty-seven per cent were teaching it as an organized part of an integrated program, and seven per cent as a separate unit. In the Clagg study the situation was essentially the same, where 67 per cent of the instructors taught some conservation in an incidental manner, and 29 per cent taught it as an organized part of an integrated program. More conservation should
probably have been taught in a separate unit or as an organized part of an integrated program, but at least some conservation was being taught incidentally by about two-thirds of the instructors.

In an attempt to determine which phases of conservation were being stressed in the courses, the questionnaire contained a check-list of the following suggested phases: Soils, Water, Minerals, Forests, Wildlife, All equally, and Other. The instructors in the present study reported giving equal treatment to each of the phases of conservation, with a slightly greater emphasis on water and minerals. Some other phases of conservation mentioned by the instructors were water pollution, energy, population, outdoor recreation, open space, and fresh air. The instructors in the Clagg study reported giving equal treatment to each phase of conservation listed, with slightly greater emphasis on soils, water, and forests. Some other phases of conservation mentioned by the Clagg instructors were ecology, human, and energy. As was the case in other parts of the two surveys, the instructors in the present study placed more emphasis on water and minerals and the Clagg instructors placed more emphasis on soils and forests. These were perceived to be the major problems of the southeastern region at the times of the respective surveys. It appeared that the instructors in 1954 were beginning to consider ecology, human, and energy problems, which became major focal points in conservation by the time of the present study.
The instructors were asked if they used visual aids in the conservation portion of their courses. Twenty-one of the 26 instructors responding in the present study used some sort of visual aid in conservation teaching. Slides and films were the most popular visual aid, and several reported using his or her own slides. Only 56 per cent of the Clagg instructors reported the use of visual aids in their courses. Slides and films were the most used visual aids in 1954, but the instructors complained that the teaching of conservation in an incidental way did not allow much time for visual aids devoted entirely to conservation.

Do you conduct field work as part of your conservation teaching? In each of the studies approximately two-thirds of the instructors reported that they had no field work in conservation. Since the majority of the courses involved were science courses (especially biological and geological in nature), and had regular field experiences, the conservation experience was secondary to the primary purpose of the field work.

Approximately what per cent of this course is devoted to conservation education? In the present study the instructors' estimated time devoted to conservation ranged from two per cent to 50 per cent, with the average being about 16 per cent. In the Clagg study the instructors estimated that they devoted ten per cent of their course time to conservation, but thought that such a small amount of time did not allow for a substantial creation of the
conservation attitude. In the present study, it was felt that an instructor devoting 16 per cent or more of class time to conservation could not be expected to do more and still fulfill his or her obligation to the content of the basic course.

Give your estimate of the per cent of students in this course who intend to become teachers. In this regard the estimates in both studies ranged from zero to 100 per cent. The average of all estimates was 36 per cent in the present study and 44 per cent in the Clagg study. This was not a great difference, but was probably due to the greater emphasis on teacher preparation in the interview institutions in 1954. It is felt that this was a significant number of prospective teachers being exposed to conservation in a practical way in a variety of disciplines. If a prospective teacher had this kind of exposure to conservation in several courses, it would be an excellent means for passing the conservation method and attitude on to public school students.

Is this a required course for teachers in any field? In the present study, only 25 per cent of the instructors reported that their course was a requirement for teachers in some fields. Fifty-two per cent of the Clagg instructors reported that their course was required for teachers. Much of this difference between the two studies was due to less teacher preparation in the institutions in the present study, but was also due to the specialized nature of more courses in the present study. The courses in the Clagg study were usually general
and introductory courses in such areas as biology, geology or education, but several additional types of courses in the present study were ichthyology, limnology, and ecology.

Do you feel that your course meets the conservation education needs of the student, or should they have a course devoted entirely to conservation? In answer to this question, about 71 percent of the instructors in the present study felt that their course met the conservation needs of the students, and the remainder felt that the students should have a conservation course. Approximately one-half of the Clagg instructors believed that their course was meeting the conservation needs of the students. It is felt that the instructors' opinions in this regard were related more to the courses being surveyed, and that they did not necessarily mean they were meeting the total conservation education needs of their students. In fact, the instructors in primary conservation courses were not satisfied that their courses were meeting the needs of the students.

Is the conservation portion of your course taught primarily on the national, regional, local, or other level? In answer to this question, the majority of instructors in the present study checked the national level. Obviously, the local level was emphasized in field work in highly specialized courses. A few instructors did report emphasis at all levels including international. In the Clagg study the majority of instructors also reported emphasizing the national level in the conservation portion of their courses. These findings
were in accord with all portions of both studies, in that the national level was perceived by conservation instructors as the best place for emphasis in conservation education.

A final question on the questionnaire involved the instructors' opinions concerning the conservation needs of their respective states. The instructors in the two studies agreed that the greatest needs were to educate the general public concerning the meaning of and basic problems in conservation. Instructors in the present study expressed their concerns as follows: "There is a definite need for more environmental education in our schools," "More people need to understand conservation," and "There is a need for people to develop a personal sense of responsibility to conservation."

In regard to conservation being taught in courses not primarily concerned with conservation, it was determined that a relatively small amount of time was devoted to the subject in a variety of disciplines. It was taught where it seemed appropriate to the instructors, in all of the phases of the field, and mostly on the national level. In spite of any disadvantages in teaching the subject in this manner, it is felt that the conservation which was being taught made a significant contribution toward the conservation education of the students in these courses.
Summary

The procedures used in this chapter were patterned after the procedures used in the Clagg study of 1954. Conservation instructors were selected from twelve institutions (other than the twelve interview institutions) of Southeastern United States to complete the check-list questionnaire as a mailed questionnaire. A questionnaire was completed by a conservation instructor in each of the twelve selected questionnaire institutions.

An additional part of the replication of the Clagg study involved a short form questionnaire containing approximately ten items which was completed for 27 separate courses in 19 departments in the interview institutions. The purpose of this questionnaire was to determine the conservation education offerings in courses not primarily concerned with conservation.

The questions asked in this portion of the study were: (1) What was the status in primary conservation courses in these twelve questionnaire institutions in regard to nature and content, textbooks, enrollments, materials and methods, and problems and needs? (2) How did the findings in the present study compare with the findings of the former study? (3) What are the perceived reasons for change or lack of change in status of conservation education during the intervening years? and (4) What is the status of conservation education in courses not primarily concerned with conservation?
The majority of participating departments in the questionnaire institutions were not geography departments. Unlike the course titles in the interview departments, the course titles in the questionnaire departments were more "conventional" and had "conservation" or "resources" in their titles rather than "ecology" or "management".

The majority of instructors in both studies used the lecture method in presenting conservation. Time was not considered a serious limiting factor by questionnaire instructors, but interview instructors and Clagg instructors felt that time problems "forced" them to use more lecture and less field work, fewer films, and fewer outside agents.

The majority of questionnaire instructors in the present study claimed they gave equal emphasis to each of the listed conservation topics or to a consideration of human problems. Soils and forests were given the greatest attention by the Clagg instructors. The majority of instructors in both studies reported placing the greatest emphasis at the national level in their conservation courses. Only about 50 per cent of the instructors had field experiences in their courses. This was due, in part, to the small size of the questionnaire institutions and university property was not available. The most used visual aids were slides, and most instructors had their own. Charts were used by the Clagg instructors but not in the present study. The materials once shown on charts are now shown on slides or overhead projectors.
A comparison of textbook selection of the two studies shows a greater diversity of textbooks being used in the present study. This was due, in part, to the proliferation of conservation topics and materials in the years between studies. The size of conservation classes was found to be very similar between the two studies and between questionnaire and interview institutions. Conservation was not a required course in most of the institutions in the present study, but was required of prospective elementary and secondary teachers in several Clagg institutions. The Clagg questionnaire institutions were primarily engaged in teacher education.

The department holdings of books and pamphlets in the questionnaire institutions were greater than those in interview institutions. These materials had been placed in the libraries of the larger interview institutions, but were still in the department libraries of the smaller questionnaire institutions.

The questionnaire instructors of the present study considered human and water problems to be of primary and secondary concern in the areas of their institutions. Soils and forests were considered to be the greatest problems in the same areas in 1954. The majority of conservation instructors of both studies were pessimistic about the conservation awareness of the people in their areas. The questionnaire and interview instructors of both studies agreed that the majority of people in their areas did not know the meaning of conservation.
The instructors in both studies felt that prospective teachers in their departments were not receiving adequate training in conservation. The instructors in both studies also agreed that all prospective teachers should be required to take at least one conservation course. Clagg's questionnaire instructors believed geography the best field in which to offer conservation as an integrated subject. This was not the case in the present study, and was mostly due to the fact that more Clagg instructors were in geography departments. The instructors in both studies did agree that conservation should be taught in some way at every school level.

The questionnaire instructors gave a variety of thoughtful opinions concerning the status of conservation education in Southeastern United States, and the proposed direction of conservation in the next twenty years. Their remarks are recorded at the end of the report on questionnaire institutions.

The instructors of conservation courses not primarily concerned with conservation were in a variety of science and education departments. The courses ranged from general and introductory to very specialized courses such as limnology and ichthyology. The majority of instructors in both studies taught conservation in their courses incidentally where it seemed appropriate. The instructors in the present study reported giving equal treatment to each of the phases of conservation, with a slightly greater emphasis on water and minerals. The Clagg instructors did the same with a slightly greater emphasis on soils, water, and forests.
The instructors in the present study devoted an average of 16 per cent of the class time to conservation and the Clagg instructors an average of ten per cent. Twenty-five per cent of the instructors in the present study and 52 per cent of the Clagg instructors reported that their course was a requirement for teachers in some field.

The questionnaire institutions, which make up the majority of this chapter, had grown dramatically between the Clagg study and the present study. As a result they had become more diversified and not primarily engaged in teacher preparation. Some of these institutions had their names changed from teachers college to university. This did not necessarily mean a complete change in function, but accounted for many of the differences encountered between the two studies.
CHAPTER V

CONSERVATION EDUCATION IN 20 TO 25 YEARS

The Delphi Project

At various stages in reading the Clagg report of 1954, and in other forms of preliminary research leading to the proposal for the present research, it became increasingly apparent that opinions of the conservation professors from the interview institutions should be sought concerning their predictions as to the status of conservation education in 20 to 25 years. Following the recommendation of Dr. Henry L. Hunker, one of the dissertation advisers, it was determined that this process of prediction be accomplished by the Delphi Method.

The Delphi technique.¹ The Delphi technique is a tool for collecting opinions, often about what will happen or about what should happen in the future. It attempts to overcome objections to the traditional method for achieving consensus through an open discussion. Delphi does not bring all of the participants together in one place, and hence it does not report opinions from specific individuals.

Delphi, thereby, attempts to overcome undue influence by the more vocal persons or the persons with the most authority in a group. It also attempts to overcome the unwillingness to abandon publicly expressed opinions and/or the bandwagon effect of the majority opinion.

The Delphi was originally developed by the Rand Corporation to establish a chronology of events and to judge when the events might occur through the speculations of several respondents to a questionnaire or survey instrument. This nonquantitative technique was designed for long-term prediction—ten, twenty, and fifty years ahead. It is an effort to obtain intuitive judgments as systematically as possible from persons who are regarded as experts in the area to be predicted.\(^2\)

Several rounds of communication occur between the conductor of the Delphi and the participating experts in the area of inquiry. In a first round, the group of respondents is asked to make a value judgment about or estimate of a future event. In the second round, the written contributions from the first round are circulated to the entire group, and the participants are asked to rank items as to their relative importance and to make further comments. The responses from the second round are edited by the manager, (in this case, the dissertation researcher), and refined in preparation for the third

round. In the third round, the participants state and rank those ideas which seem most promising. Collection is made again, and the opinions from the final round are held as the group opinions.

The Delphi participants. The experts used in this Delphi project are the twelve conservation professors who were personally interviewed concerning their respective conservation courses in major universities in Southeastern United States. During the course of these personal interviews, each of the twelve professors agreed to participate in the Delphi project. Some general characteristics of the Delphi were discussed with each of the prospective participants during the interview session. Some of the members were familiar with the technique, and a few had either conducted or participated in projects in other study areas.

Delphi—Round One. A letter was sent with Round One (Figure 4), which briefly described the intended procedure of the project, and contained the single statement to which the members were expected to respond. The following request was placed at the top of a separate sheet: Please list all of the things that you think are likely to be included as a major thrust of conservation education in 20 to 25 years. (Figure 5) A few guide numbers were placed on this first sheet and a second, blank sheet was attached for additional comments.

On the returned Round One instruments some of the respondents typed rather lengthy remarks, others used a few words in their responses, while the majority of the members furnished several
Attention: Delphi participant on conservation education.

Dear Sir:

On (date) I was in your office and interviewed you as part of the research for my dissertation. When I talked with you, in (month), you agreed to participate in a Delphi project on Conservation Education. Each of the conservation professors I interviewed, one in each of the major universities of Southeastern United States, is taking part in the project. The participants do not know who the other members are in the project.

I am enclosing the first round for you at this time. Please tell me what you think the major thrust is likely to be in Conservation Education in 20 to 25 years. I do not believe that the project will take much of your time, and I believe that the results could be interesting and valuable to you as well as to me.

Thank you for any cooperation you can give me on this project. I will send the second round of the Delphi to you as soon as I get replies from the other members and compile their responses.

Sincerely,

Charles R. Stephen

Enc.
Form Used in Round One of the Delphi Project

Please list all of the things that you think are likely to be included as the major thrust of Conservation Education in 20 to 25 years.

1.

2.

3.

4.

5.

6.

Figure 5
sentences with each of their predictions. The list of responses ranged from six to nine for the various participants.

Several of the respondents were especially interested in the Delphi predictions because they had been conducting their conservation courses with the future of conservation education in mind. Some of the responses contained references to this attitude in the organization of their courses. In a note enclosed with responses to the first round of the Delphi, one respondent said: "I developed a hand-out for my conservation course which lists some concepts I would like to get across to the students. I think many of these concepts are at the core of what our thrust in conservation education will need to be."^3

**Editing Round One Responses.** In preparation for Round Two of the Delphi, each response of the twelve participants was placed on a separate card for greater accuracy in compiling and editing. The cards were organized in an attempt to find topics of agreement among the respondents. For example, energy was mentioned by five of the respondents as a part of the field that should receive special attention in conservation education in the future. Some specific remarks were: "Energy Conservation: Ways to reduce waste in conventional use of presently known energy resources and efforts made to discover alternative sources," "A greater awareness of the role of

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^3 see Appendix for "Concepts at the Core of What the Thrust in Conservation Education Will Need to be" by Dr. W. R. Brueckheimer.
nuclear energy in the total environment," and simply "energy conservation." Planning was also mentioned five times on the Round One instrument. Some comments were: "Land Use Planning – Interaction of physical limitations, politics, and cultural needs," "Conservation students may someday be using computer data bases to execute schemes for land use planning." Land Use Planning and Energy Conservation were favorite subjects of the Delphi participants throughout the project, and emerged as the first and second choices, respectively, in the final round. Through this editing process, a compiled list of twenty separate conservation specialty areas was prepared for Round Two. The titles of these specialty areas appear in the following list:

1. Ecosystem Management
2. Energy Conservation
3. Conservation law
4. Interdisciplinary Programs
5. Geopolitics
6. Environmental Monitoring
7. Environmental Ethic
8. Recycling
9. Conservation at all Educational levels
10. Practical Conservation Education
11. Population Study
12. Environmental Pricing
13. Agriculture/Aquaculture
14. Greater Federal Government Involvement
15. Computers and Model Ecosystems
16. Land Use Planning on Various Levels
17. Management of Preserved Areas
18. Decision-making and Coercion
19. Endangered Species
20. Man's Influence on the Environment
Delphi—Round Two. A letter describing how the responses were compiled and edited was sent with Round Two. (Figure 6) The list of twenty edited responses was sent to each participating conservationist. (Figure 7) The members were apprised of the fact that the edited responses were arranged in no particular order as to assumed importance, length, or relation to another response. Assuming that each of the twenty specialty areas will occupy a place of importance in conservation education in 20 to 25 years, they were asked to choose the ten that they think will lead the list at that time, and to rank their choices from one to ten. It should be noted that all of the original members of the Delphi project responded to Round Two.

Comments made by the Delphi respondents, on the Round Two instrument or on letters enclosed with them, were both critical of and supportive of the list of twenty edited responses from Round One. When asked to select and rank items from the list, the comments from the respondents ranged from statements like, "This is kind of like sorting potatoes," to complimentary statements to the manager, such as, "Very good work."

One type of comment from some respondents involved the frustration they felt at not being able to debate issues with the other participants in the project. One member stated that, "A serious debate of the issues would seem to be in order." The participants were reminded that the avoidance of this type of debate is one of the important aspects of a Delphi project.
Attention: Delphi participant on conservation education.

Dear Sir:

Thank you for your response to the first round of our Delphi project on Conservation Education. As you would expect, the responses are greatly varied in number, length, and in the types of responses. This has involved considerable editing and arranging of responses in preparation for the second round. I am enclosing the second round at this time for your evaluation.

You will note that some of your responses on conservation education appear in relatively unaltered form, that other responses have been incorporated in responses from the other conservation specialists, and that most of your ideas appear somewhere in the enclosed list.

The edited responses are arranged in no particular order as to assumed importance, length, or relation to another response. Assuming that each of these twenty specialty areas will occupy a place of importance in conservation education in 20 to 25 years, I am asking that you choose the ten that you think will lead the list at that time, and rank your choices from one to ten. Please put your ranking numbers in the appropriate blanks. You are invited to make comments, add to the list, or to combine or alter responses on the attached sheet.

Your prompt reply to Round II will be appreciated. I will send the third and final round of the project in the near future. Thank you for your consideration.

Sincerely,

Charles R. Stephen

Enc.
The Twenty Selected and Edited Responses From Round One of the Delphi Project—As Prepared for Use in Round Two

Please list all of the things that you think are likely to be included as the major thrust of Conservation Education in 20 to 25 years. This request was made to twelve conservation specialists in twelve of the major universities in eleven of the southeastern states. The following list contains selected and edited responses from these conservation specialists: (Note: Please choose ten from the list and rank from one to ten.)

- **Ecosystem Management.** Concepts involving diversity, resilience, change during succession, niche and habitat, and biogeochemical cycles, to name a few, will be generally known to college students of conservation in the next two decades. The conservation educator will "fine-tune" these applied ecosystem principles.

- **Energy Conservation.** Conservation education will be increasingly concerned with ways to reduce waste in conventional use of presently known energy resources, and efforts will be made to discover alternative sources. Students of conservation in the next two decades will be involved in helping to develop an energy policy for the nation and the world.

- **Conservation Law.** Since conservation does not function without coercion there will be an increasing concern with "conservation law." Formulation, execution and revision of conservation law will become part of every conservation curriculum.

- **Interdisciplinary Programs.** In 20 to 25 years conservation education will involve a significant increase in the use of interdisciplinary approaches, team teaching, and the increased use of faculty and research specialists from different departments.

- **Geopolitics.** Since our nation will be even more involved with the rest of the world in 20 to 25 years than it is today, and since there will be more complicated international interrelationships on all levels including resource use, environmental protection and improvement, our conservation education people will be more involved in geopolitics. Students of conservation will be dealing more with such problems as the "have vs. have not" nations, world trade, balance of payments, etc.

Figure 7
Environmental Monitoring. Environmental monitoring systems will be in widespread use by the year 2000. Pollutants including noise and carcinogenic substances will be measured as routinely as temperature is measured now. Conservation specialists will also be checking for natural hazards, such as geologic hazards, climatological hazards, extraterrestrial interaction, and earth evolutionary effects. Future conservation educators will be helping their students understand these systems and to become better equipped to deal with the information learned from them.

Environmental Ethic. Future students of the environment are going to re-evaluate our economic institutions, recommend changes in our attitudes toward nature, help us to see the need for changes in our lifestyle, lead the way in the re-thinking of our priorities concerning resources, and lead the way in our development of an environmental ethic.

Recycling. Conservation education in 20 to 25 years will be much more involved with the problems and processes of recycling of materials. The conservation student will be much more concerned with social and cultural as well as with economic restraints in the recycling process.

Conservation at all Educational Levels. In 20 years there will be a greater emphasis in the pre-college curriculum on conservation, a growth in B.A./B.S. degree programs that turn out environmentally trained graduates, and an increase in graduate programs dealing with resources.

Practical Conservation Education. Conservation education in the next two decades will experience an increased use of off-campus internship experience, and will include various other types of practical experience.

Population Study. Students of conservation will be much more involved in the realm of human conservation and demographic study in 20 to 25 years. They will become more aware that the increase in world population is at the root of most environmental problems.

Environmental Pricing. In the future conservation education will be based more in fact and good scientific analysis than in emotion. This will include the use of economics to "price" environment. There should be third generation "how to price environment" books in 25 years.

Figure 7 (Continued)
Agriculture/Aquaculture. In 20 to 25 years there will be a dramatic increase in the time and energy devoted, in conservation education, to improved food production in our land and water areas.

Greater Federal Government Involvement. Conservation education of the future will be involved not only with the education of people toward the greater responsibility on the part of each individual citizen, but toward a greater involvement of the federal government. This would involve a balanced posture on the part of the federal government in overseeing the welfare of the nation but not assuming the responsibility of the citizens.

Computers and Model Ecosystems. The trend in mathematical modeling and computer simulation of model ecosystems will continue. Models of agro-ecosystems, land use systems, resource use systems, wilderness recreation, etc. will be devised which can be manipulated by the student. The new conservation educator will become more mathematical and computer oriented.

Land Use Planning on Various Levels. Much greater emphasis will be placed on land use planning in the conservation education field in 20 to 25 years. Students of conservation education, working with specialists in other disciplines, will be dealing with advanced methods and with ramifications of the field that are not considered today in planning.

Management of Preserved Areas. As people become more concerned about the preservation of "natural" areas, students of conservation will get more involved in the processes of getting and keeping land in preserved areas, and in the proper management of these areas.

Decision-making and Coercion. The nature and theory of decision-making and the control of the decision-making process will become parts of conservation education. Much of this will also include behavior modification and methods of coercion. If there is to be effective conservation there must be mutually agreed upon methods of coercion.

Endangered Species. In twenty years the researchers, teachers, and students of conservation will be much more deeply immersed in the endangered species dilemma.

Figure 7 (continued)
Man's Influence on the Environment. In addition to their increased interest and involvement in the protection of soils, water, forests, wildlife, wilderness areas, conventional energy sources, etc.; students of conservation at the turn of the century will be more deeply involved in the manipulation of the environment. Conservationists will be working with specialists in other disciplines to accomplish such things as influencing climate. They will also be more involved in the "creation of resources," to replace ones already in jeopardy, in a fashion reminiscent of some theories of Erich Zimmermann.
Some of the respondents were very critical of the views of other participants in the projects. Since the participants do not know who the other members are in a Delphi project, they are possibly critical in ways that they would not be in a face-to-face confrontation. One of these critical members said: "After looking over your Round Two list, I was somewhat surprised at the shortsighted and somewhat narrow views these educators have given to you. This is probably something you will want to report in your study." One participant had a longer and more technical criticism of the list:

In my opinion the list grossly underestimates future possibilities including the input of massive amounts of technical and scientific data along with economics into systems analysis, computer model solution technique. This would form the basis for political and resource decisions—to the virtual exclusion of the idealistic or philosophical approach to environment. However, this would be overshadowed by the philosophy resulting from resource need, consumptive demand and decreasing affluence.

**Scoring Delphi Responses.** The results of the selection and ranking by respondents in Round Two are shown in Table 35. The responses were "scored" in Table 35 by the number of times chosen by respondents. For example, "Land Use Planning on Various Levels" was placed number one and "Man's Influence on the Environment" number two because the former was chosen by more respondents. The choice was further supported by the smaller, and thus, higher ranking numbers in the first instance. In the case of "Interdisciplinary Programs" and "Environmental Ethics," which were chosen by the same number of
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**INSTRUCTORS' CHOICES IN ROUND TWO OF THE DELPHI**

* The conservation instructors are listed in chronological order of personal interviews and not in alphabetical order of persons or in alphabetical order of institutions as listed in the Appendix.

Note: Numbers represent ranking of conservation topics by conservation instructors. The "scoring" process is described in the text of the chapter.
respondents, the former was placed higher because of a smaller total of ranking numbers.

The twenty conservation areas as they were ranked by the Delphi participants are shown in Figure 8. At this point in the project the conservation educators rejected the topics in numbers eleven through twenty as not being so important in the future of conservation education. The respondents perceived some terms to be out of vogue (Geopolitics), some topics to be too specialized (Agriculture/Aquaculture and Endangered Species), and perhaps others to be too technical (Computers and Model Ecosystems). A checklist of the first ten specialty areas, and their descriptions, was prepared for Round Three.

**Delphi—Round Three.** As in Rounds One and Two, a letter describing how the data had been treated was sent with Round Three. (Figure 9) The list of ten responses, as selected by the conservationists in Round Two, was sent to each participant. (Figure 10) The members were informed that, as in Round Two, the items were arranged in no particular order as to assumed importance, length, or relation to another response. Assuming that each of the ten specialty areas will occupy a place of importance in conservation education in 20 to 25 years, they were asked to choose the five that they think will lead the list at that time, and to rank their choices from one to five. They were asked to do this in regard to the present list and with respect to their current ideas about the subject. They were again
The Twenty Conservation Education Areas as They Were Ranked by the Twelve Participants of Delphi—Round Two

1. Land Use Planning on Various Levels
2. Man's Influence on the Environment
3. Ecosystem Management
4. Energy Conservation
5. Conservation Law
6. Interdisciplinary Programs
7. Environmental Ethic
8. Practical Conservation Education
9. Management of Preserved Areas
10. Environmental Monitoring
11. Decision-making and Coercion
12. Conservation at all Educational Levels
13. Geopolitics
14. Agriculture/Aquaculture
15. Computers and Model Ecosystems
16. Environmental Pricing
17. Population Study
18. Recycling
19. Endangered Species
20. Greater Federal Government Involvement

* This ranking was made from the data in Table 35.

Figure 8
Attention: Delphi participant on conservation education.

Dear Sir:

Thank you for your response to the second round of our Delphi project on Conservation Education. As a result of the selections you made from round two, the number of items has now been narrowed to ten. I am enclosing the third and final round at this time for your evaluation.

As was the case in round two, the items are arranged in no particular order as to assumed importance, length, or relation to another response. And again, assuming that each of these ten specialty areas will occupy a place of importance in conservation education in 20 to 25 years, I am asking that you choose the five that you think will lead the list at that time, and rank your choices from one to five. Do this in regard to the present list and with respect to your current ideas about the subject. You are again invited to make comments, and especially as to why you ranked your choices as you did. Your comments will be given consideration, and many of them will be used in the paper.

Your prompt reply to Round III will be appreciated. You will be informed of the results of your efforts in this project. Thank you very much for your fine cooperation.

Sincerely,

Charles R. Stephen

Enc.
The Ten Selected Conservation Education Areas
From Round Two of the Delphi Project—
As Prepared for Use in Round Three

Delphi Project Participants: As a result of the selections you made from round two, the number of items has now been narrowed to ten. Assuming that each of these ten specialty areas will occupy a place of importance in conservation education in 20 to 25 years, I am asking that you choose the five that you think will lead the list at that time, and rank your choices from one to five.

Practical Conservation Education. Conservation education in the next two decades will experience an increased use of off-campus internship experience in the learning experience, and will include various other types of practical experience.

Man's Influence on the Environment. In addition to their increased interest and involvement in the protection of soils, water, forests, wildlife, wilderness areas, conventional energy sources, etc., students of conservation at the turn of the century will be more deeply involved in the manipulation of the environment. Conservationists will be working with specialists in other disciplines to accomplish such things as influencing climate. They will also be more involved in the "creation of resources," to replace ones already in jeopardy, in a fashion reminiscent of some theories of Erich Zimmermann.

Energy Conservation. Conservation education will be increasingly concerned with ways to reduce waste in conventional use of presently known energy resources, and efforts will be made to develop alternative sources. Students of conservation in the next two decades will be involved in helping to develop an energy policy for the nation and the world.

Environmental Ethic. Future students of the environment are going to re-evaluate our economic institutions, recommend changes in our attitudes toward nature, help us to see the need for changes in our lifestyle, lead the way in the re-thinking of our priorities concerning resources, and lead the way in our development of an environmental ethic.
Ecosystem Management. Concepts involving diversity, resilience, change during succession, niche and habitat, and biogeochemical cycles, to name a few, will be generally known to college students of conservation in the next two decades. The conservation educator will "fine-tune" these applied ecosystem principles.

Land Use Planning on Various Levels. Much greater emphasis will be placed on land use planning in the conservation education field in 20 to 25 years. Students of conservation education, working with specialists in other disciplines, will be dealing with advanced methods and with ramifications of the field that are not considered today in planning.

Environmental Monitoring. Environmental monitoring systems will be in widespread use by the year 2000. Pollutants including noise and carcinogenic substances will be measured as routinely as temperature is measured now. Conservation specialists will also be checking for natural hazards, such as geologic hazards, climatological hazards, extraterrestrial interaction, and earth evolutionary effects. Future conservation educators will be helping their students understand these systems and to become better equipped to deal with the information learned from them.

Interdisciplinary Programs. In 20 to 25 years conservation education will involve a significant increase in the use of interdisciplinary approaches, team teaching, and the increased use of faculty and research specialists from different departments.

Management of Preserved Areas. As people become more concerned about the preservation of "natural" areas, students of conservation will get more involved in the processes of getting and keeping land in preserved areas, and in the proper management of these areas.
invited to make comments, and especially as to why they ranked their choices as they did.

Some of the Delphi participants included remarks with the check-list in Round Three. One instructor sent this final comment:

Again, my choices probably reflect more of what I hope to see, rather than what will be emphasized. I think the conservation movement is fragmented at this time, with specialists in each area (energy, wildlife, ecosystems, etc.) functioning largely in their own areas, and not concerned with the overall conservation effort. The term conservation seems to be losing its appeal, supplanted by ecology and environmental science. Everyone is an environmentalist today, few are conservationists.

In regard to Environmental Monitoring, one instructor noted: "A brief conversation with people in The Occupational Health and Safety Administration would prove that I am right on this choice."

One instructor remarked that two of his choices, Environmental Ethic and Ecosystem Management, are closely related. He said: "The ethics will be ecosystems based." This proponent of Ecosystem Management supported his choice with the following remark: "At sometime in our correspondence I called ecology, especially ecological principles, The New Religion. Recently at a meeting of the Georgia Academy of Science a lecture was delivered on just this topic."

The results of the selection and ranking from Round Three are shown in Table 36. The responses were "scored" in Table 36 by the number of times selected by respondents. The "scoring" process was similar to that described in the previous round. Due to the distribution of the five choices of the twelve instructors among the
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Note: The scoring process is the same as in Table 35.
ten selected responses from Round Two, it was possible to rank their choices from one to five and from six to ten. (See Figure II)

After three rounds of corresponding, editing, and selecting, the Delphi participants determined that the following five conservation areas are likely to be included as the major thrust of conservation education in 20 to 25 years: Land Use Planning on Various Levels, Energy Conservation, Man's Influence on the Environment, Environmental Ethic, and Environmental Monitoring. As shown in Table 36, ten of the twelve instructors selected "Land Use Planning," nine selected "Energy Conservation," and seven gave a high ranking to "Man's Influence on the Environment." By weighted response it was found that "Man's Influence on the Environment" was given priority ranking, and "Energy Conservation," "Environmental Ethic," and "Land Use Planning," were given lower rankings. It is clear to the instructors that "Land Use Planning" (the wise use of land)\(^4\) and "Man's influence on the Environment" will continue to be key concepts in conservation education, and that energy considerations will continue as a major thrust in the field. It is also clear to the Delphi participants that there is an interrelatedness among all of the topics in the project, and the fact was expressed on several occasions in correspondence between the manager and the instructors.

\(^4\) The concept of "land" is used in the broad sense to include water and other characteristics of the environment.
The Ten Conservation Education Areas as They Were Ranked by the Twelve Participants of Delphi—Round Three*

As ranked by number of respondents

Land Use Planning On Various Levels - ten
Energy Conservation - nine
Man's Influence on the Environment - seven
Environmental Ethic - seven
Environmental Monitoring - seven
Conservation Law - six
Interdisciplinary Programs - five
Management of Preserved Areas - four
Ecosystem Management - three
Practical Conservation Education - two

* This ranking was made from the data in Table 36.

Figure 11
CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

At a time of environmental crisis, resource depletion, and additional threats to the quality of life of the people of our nation and the world, we should be especially concerned with the attitudes of our citizens toward conservation and in finding ways to improve public awareness of conservation issues. In turn, it is important to understand how awareness and attitudes affect and are affected by conservation education. The review of such issues should be an ongoing and formalized procedure, but this has not been the case. Rather there has been little research of this type upon which to base policy decisions. This study of the status and changing trends of conservation education in selected institutions of higher learning in Southeastern United States is an attempt to generate information that would be of use to conservation educators as they formulate policies to guide future developments in the field.

The procedures for the present analysis were patterned after those used in a study by Dr. Sam E. Clagg in 1954. In a replication of the Clagg study, generalist conservation instructors were selected from colleges and universities of Southeastern United States for personal interviews and to complete questionnaires concerning the
materials and methods used in their conservation courses. The opinions of these conservation educators were also sought concerning the conservation education of prospective teachers at their institutions, and the effectiveness of conservation teaching in the public schools in their service areas.

In an attempt to determine changes in conservation since 1954, the findings of the present study were compared with the findings of the Clagg study, and a survey of conservation related literature was conducted. In an attempt to determine the perceived major thrust of conservation education in the next 20 to 25 years, the opinions of the interviewed generalist conservation educators were acquired utilizing the Delphi methodology and procedure.

Summary and Conclusions

The following conclusions are based on the personal interviews with generalist conservation instructors, questionnaires completed by additional conservation instructors, and materials gleaned from conservation related literature.

Changing concepts in conservation education. The emphasis on conservation topics has shifted. A review of the literature of the past three decades and the results of interviews and questionnaires reveal a different emphasis in conservation education in each of the decades. For example, in the 1950s the emphasis was on inventory and assessment of resources, and in the 1960s on environmental quality and the quality of life. Today, in contrast, the emphasis is on air and
water pollution and ecological relationships. Clearly, the emphasis is no longer on conservation, per se, but on the ecological impact of man upon the natural environment.

The title and content of conservation courses and the meaning of conservation have, therefore, changed over the thirty-year period of time. The courses and textbooks reflect in their titles and content wider and more varied approaches to the study of man's relationship with the natural environment. The old concepts and terms have been replaced by a greater consideration for interrelationships among the various aspects of the environment, with particular emphasis on the term "ecology." Less attention is being paid to the classic issues of conservation that characterized the field 20-25 years ago.

In both studies the emphasis has been on national issues. Currently, less emphasis is given to state and local issues in the study area, and more is placed on international environmental issues. There are several reasons for this shift: (1) In the 1954 study, the conservation courses were a key factor in teacher education, and the prospective teachers were being prepared to introduce their students to relevant conservation information at the local level. (2) Due to the increased concern with environmental and ecological issues that were often of national scope, the instructors have necessarily shifted to fewer topics and those are increasingly issues of national concern. Rachel Carson's *Silent Spring* sparked interest and attention on environmental pollution on a national scale and the OPEC crisis of 1973-1974 focused our attention on international issues. (3) The
changes have resulted in less opportunity for field work, as the instructors have moved to the larger national and international framework in their teaching. Furthermore, the shift from conservation, per se, to the study of environmental and ecological issues, has resulted in a shift out of geography programs, as such, into other departments.

A comparison of the findings of the two studies reveal that there are fewer geography departments with the singular title "geography" among the institutions surveyed. Twenty-five years ago practically all generalist conservation was in geography departments. This is no longer true, due to the elimination of geography departments in some universities or the absorption or combining of geography with other disciplines. In addition, the increased focus on environmental science and ecology has served to reduce the traditional role of geography in the study of conservation.

Educational methods and techniques. The majority of students taking conservation or environmental courses do this on an elective basis. Since the generalist conservation course is not required of most students, it is likely that the majority of those enrolled in the course perceive it to be interesting and valuable in their education. What is unclear is whether or not more specific requirements in conservation and conservation related areas is desirable. Should we have a more structured program in conservation that would prepare students more effectively, perhaps, for life as well as for careers?
More students are taking conservation today but under the title or heading of environmental science and/or ecology. This is due, in part, to the generally larger population and the larger enrollments in the colleges and universities. Perhaps it also shows an increased concern for man's impact on the environment and hopefully a continuing conservation consciousness.

In both studies instructors deplored the use of so much lecture in conservation courses, but felt that time and limited facilities prohibited the use of other methods. The situation was more acute in the present study, due mainly to larger classes and the greater complexity of the field. The conclusion was that instructors needed to devote more time to lecture and less time to what they felt were more time consuming and less productive pursuits.

All of the instructors in both studies required either oral or written reports of their conservation students. It was concluded that preparation of these reports gave the students valuable exposure to conservation literature and field methods. Presentation of findings was considered a valuable experience for students and allowed them to share materials and experiences with the class.

The personal survey of the libraries of interview institutions revealed significant changes in their sizes and holdings since the 1954 study. The listings in card files under "conservation" had increased greatly. The participating departments in the Clagg study had their own libraries and subscribed to the conservation related periodicals, but at the time of the present study the library function
had been moved from the departments to the main libraries, and these libraries had elaborate holdings of conservation related periodicals.

The short questionnaire survey of conservation education offerings in courses not primarily concerned with conservation, revealed that conservation was being dealt with in a similar manner in the present study and in the 1954 study. The favored method of treating conservation in these courses was in an incidental manner where it seemed appropriate. The instructors in both studies also reported giving equal treatment to what they perceived to be the major issues in conservation, with a slightly greater emphasis on water and minerals in the present study, and a slightly greater emphasis on soils, water, and forests in the 1954 study. Since the majority of these courses were specialized courses in such fields as biology and geology, and had regular laboratory and field experiences, the conservation experience was secondary to the primary purpose of the course. In regard to conservation being taught in courses not primarily concerned with conservation, it was determined that a relatively small amount of time (an average of 10-15 per cent of the course) was devoted to the subject in a variety of disciplines. In spite of any disadvantages in teaching the subject in this manner, the fact that conservation issues were taught in these classes served to alert the students to basic conservation philosophy.
Recommendations

As part of this research the interview conservation instructors participated in a Delphi procedure. The Delphi participants were asked to: List all of the things that you think are likely to be included as the major thrust of conservation education in the next 20 to 25 years. After three rounds of correspondence, editing, and selecting, the following five carefully selected areas of conservation education emerged: (1) Land Use Planning on Various Levels, (2) Energy Conservation, (3) Man's Influence on the Environment, (4) Environmental Ethics, and (5) Environmental Monitoring. The following recommendations are based on the opinions of the Delphi participants.

Land use planning on various levels. The Delphi participants believed very strongly that much greater emphasis will be placed on land use planning in conservation education in the next 20 to 25 years. Students of conservation education, working with specialists in other disciplines, will be dealing with advanced methods and with ramifications of the field that are not considered today in planning. Based on the beliefs of these educators, it is recommended that lines of communication and cooperation between planners in conservation education and planners in other appropriate disciplines be kept open and active in an attempt to permit conservation education to keep pace with or ahead of conservation problems and needs.

Energy conservation. Conservation educators will be increasingly concerned with ways to reduce waste in conventional use of presently known resources, and these educators will be instrumental
in the efforts to develop alternative sources. Students of conservation in the next two decades will be involved in helping to develop an energy policy for the nation and the world. It is recommended that students and educators in conservation become more involved in policy making activities in the energy field in an attempt to maintain a proper balance among conservationists, resource specialists, and organizations that would jeopardize our energy resources.

*Man's influence on the environment.* In addition to their increased interest and involvement in the protection of our conventional resources, conservation educators at the turn of the century will be more deeply involved in the manipulation or resources and the environment. Conservationists will be working with specialists in other disciplines to accomplish such things as influencing climate. They will also be more involved in the "creation of resources" to replace ones already in jeopardy, in a fashion reminiscent of some theories of Erich Zimmermann. It is recommended that more students with science skills be recruited into conservation education, and that more students in conservation education be encouraged to get involved in scientific fields, so that there will be a better understanding of what needs to be done to influence man's impact on the environment.

*Environmental ethic.* Future students of the environment are going to re-evaluate our economic institutions, recommend changes in our attitudes toward nature, help us to see the need for change in our
life style, lead the way in the re-thinking of our priorities concerning resources, and lead the way in our development of a better environmental ethic. Recommendation was previously made that more conservation students should become involved in allied technological pursuits. It is now recommended that greater numbers of conservation students become involved in such areas as conservation philosophy, conservation law, and resource economics in an attempt to formulate more ethical attitudes and policies for the benefit of our citizens and their environment.

Environmental monitoring. Systems for monitoring the environment will be in widespread use by the year 2000. Pollutants, including noise and carcinogenic substances, will be measured as routinely as temperature is measured now. Conservation specialists will also be checking for natural hazards, such as geologic and climatological hazards, extraterrestrial interaction, and earth evolutionary effects. Future conservation educators will be helping their students understand these systems and to become better equipped to deal with the information learned from them. In light of this prediction by the Delphi participants, it is recommended that more time in conservation courses be devoted to the development of student awareness of the technological advances of the specialists in conservation and how the information acquired from these specialists can be used by generalists in conservation education.
Related recommendations. The following recommendations are not derived directly from the Delphi procedure, but are indirect results of those findings.

For example, in the present study, only one generalist conservation instructor was using the computer in his course. He was showing students how to make inventories of resources, how to use conservation simulation games, and how computers are valuable in conducting conservation research on various levels. Conservation specialists commonly use computers in their research, but it is also possible for generalist conservationists to use the computer effectively. With these possibilities in mind, it is recommended that the computer be made available to more conservation instructors and students, and that the conservation curriculum be designed to take greater advantage of this increasingly valuable educational tool.

In addition, conservation educators at several universities indicated that the teaching of conservation at the international level is an essential requirement in future conservation courses. Students in conservation courses come from many parts of the world, and they and others in those courses are going to many parts of the world to live and work. Air and water pollution, resource availability, and population problems have become international in scope. Therefore, it is recommended that conservation researchers, writers, and instructors devote more time and attention to the international level in conservation education.
Afterword

The present study reveals that there is great diversity in conservation instruction among the institutions of higher learning in Southeastern United States. With this in mind, it is recommended that measures be taken to achieve a greater standardization of philosophy, materials, and methods in generalist conservation instruction, and that where appropriate, the methodology in conservation teaching be updated and upgraded. Accurate and current information on the status of conservation education is essential if this goal is to be achieved. Therefore, it is further recommended that research be initiated and continued to keep the policy makers informed of the status and needs in conservation education.

The need to improve conservation education is eloquently expressed in the following "timeless" statement by Aldo Leopold:

Conservation is a state of harmony between men and land. Despite a century of propaganda, conservation still proceeds at a snail's pace...The usual answer to this dilemma is "more conservation education." No one will debate this, but is it certain that the volume of education needs stepping up?...The "Key-log" which must be moved to release the evolutionary process for a land ethic is simply this: quit thinking about decent land-use as an economic problem. Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.

Aldo Leopold
THE INSTRUCTORS PARTICIPATING IN THE STUDY

The Interview Instructors

University of Alabama
   Travis H. Hughes

University of Arkansas
   O. Orland Maxfield

University of Florida
   Clark I. Cross

Florida State University
   W. R. Brueckheimer

University of Georgia
   Vernon Meentemeyer

University of Kentucky
   Alan Fitzsimmons

Louisiana State University
   Fred Wiseman

University of Mississippi
   Harold C. Hein

University of North Carolina
   David G. Basile

University of South Carolina
   David Jones

University of Tennessee
   A. Paul Wishart

University of Virginia
   William E. Odum
The Questionnaire Instructors

Arkansas
Arkansas State University
Hubert B. Stroud

Florida
Florida Southern College
Margaret L. Gilbert
University of Miami
Anna J. Lang

Georgia
West Georgia College
Robert H. Claxton

Kentucky
Western Kentucky University
Willard Cockrell

Mississippi
Delta State University
Lenice V. Stephan

North Carolina
Appalachian State University
Robert E. Reiman
East Carolina University
Philip Shea

Tennessee
George Peabody College
Conrad T. Moore
Memphis State University
L. Arnold Siniard
Middle Tennessee State University
R. Paul Terrell
Tennessee Technological University
Harry F. Lane
Descriptions of the Primary Conservation Courses from Institutional Catalogs

The Interview Institutions

University of Alabama
General Studies 130. Basic Environment. (3 hours)
A basic examination of environmental problems and solutions, including such topics as air, water, and land pollution; energy; population; food; and recycling.

General Studies 230. Environmental Education. (3 hours)
This course focuses on environmental consciousness and methods of bringing this consciousness to others.

University of Arkansas
Geography 3003. Conservation of Natural Resources.
Theory and growth of conservation and the wise use of the major natural resources of the United States. This course meets the requirement in conservation for teachers. Prerequisite: junior standing.

University of Florida
Geography 331. Conservation of Resources. (4 hours)
A survey of natural and human resources followed by study of wise and wasteful practices of utilization of these resources. Course satisfies resource certification for social studies teachers.

Florida State University
Geography 4370. Natural Resources and Environmental Policy. (3 hours) Historical development of policies concerning natural resources from colonial period to present; current issues in conservation and environment.

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1 All course descriptions are taken from the most recent institutional catalogs available. All catalogs are dated for 1980 or later.
University of Georgia

Geography 410. Conservation Ecology and Resource Management. (5 hours) An ecological and economic analysis of the interaction of man and environmental resources within different cultural and geographical contexts with emphasis on environmental quality, planning and decision-making. The ecosystem concept is the basic framework for the course, and the major ecosystems of the earth are viewed as discrete resources.

University of Kentucky

Geography 550. Geography of Natural Resources. (3 hours) A study of the characteristics of resources, their management and mismanagement. Implications of resource utilization for the quality of the environment. The influence of institutional constraints upon resource development, and the role of perceptions and attitudes in decision making related to man's use of natural resources.

Geography 210. Geography of Environmental Quality. (3) Interactions of man and the ecosystems; deterioration of environmental quality in the context of physical processes and spatial distribution; case studies of the effects of pollution and outlook for future control.

University of North Carolina

Geography 156. Natural Resources. (3 hours) An analysis of selected biological and mineral resources of the world with particular emphasis on their distribution, utilization, management policies and on their social and economic implications.

University of South Carolina


University of Tennessee

The Questionnaire Institutions

Arkansas State University
Geography 261. Conservation of Natural Resources. (3 hours) Current problems associated with the conservation of natural resources.

Geography 262. Environmental Management. (3 hours) The dynamic nature of the earth's surface, using the hydrologic cycle as a broad framework for analyzing the physical environment and for assessing sound environmental management practices.

University of Miami
Geography 171. Conservation of Resources. (3 hours) Survey of some contemporary environmental problems, and a consideration of the role of various public and private agencies in the management of resources. Problems of resource availability in an urban-industrial society.

Appalachian State University
Geography 2400. Environmental Problems. (3 hours) Analysis of man's perception, use, and attempted regulation of his habitat; spatial and policy problems and implications.

East Carolina University
Geography 3005. Geography of Environmental Resources. (3 hours) A study of the location and development of the environmental resources at both the world and national levels.

Memphis State University

Middle Tennessee State University
Geography 531. Conservation of Natural Resources. (3 hours) Current problems related to an intelligent use of our environmental resources. Topics include, but are not limited to, air, water, and other resources.

Tennessee Technological University
Geography 213. Conservation of Natural Resources. (3 hours) Natural resources of the United States; their distribution and utilization. Soils, minerals, forests, water, wildlife and human resources.
Western Kentucky University

Geography 471. Conservation of Natural Resources. (3 hours) A biogeographical and ecological approach to resource management and environmental problems. Themes include management practices related to forests, fisheries and wildlife; environmental pollution; and energy resources.

George Peabody College*

Geography 215. Conservation of Natural Resources. (3 hours) A biogeographical and ecological approach to resource management and environmental problems. Themes include management practices related to forests, fisheries and wildlife; environmental pollution; and energy resources.

* George Peabody College is now part of Vanderbilt University.
<table>
<thead>
<tr>
<th>Institution</th>
<th>1952 fall enrollment</th>
<th>1980 fall enrollment</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>5,634</td>
<td>17,821</td>
<td>Tuscaloosa</td>
</tr>
<tr>
<td>Arkansas</td>
<td>4,600</td>
<td>16,925</td>
<td>Fayetteville</td>
</tr>
<tr>
<td>Florida</td>
<td>9,206</td>
<td>33,242</td>
<td>Gainesville</td>
</tr>
<tr>
<td>Florida St. U.</td>
<td>5,826</td>
<td>22,424</td>
<td>Tallahassee</td>
</tr>
<tr>
<td>Georgia</td>
<td>8,521</td>
<td>23,462</td>
<td>Athens</td>
</tr>
<tr>
<td>Kentucky</td>
<td>5,580</td>
<td>23,013</td>
<td>Lexington</td>
</tr>
<tr>
<td>Louisiana St. U.</td>
<td>7,053</td>
<td>28,505</td>
<td>Baton Rouge</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,061</td>
<td>9,607</td>
<td>Oxford</td>
</tr>
<tr>
<td>North Carolina</td>
<td>5,474</td>
<td>21,465</td>
<td>Chapel Hill</td>
</tr>
<tr>
<td>South Carolina</td>
<td>3,100</td>
<td>26,135</td>
<td>Columbia</td>
</tr>
<tr>
<td>Tennessee</td>
<td>7,859</td>
<td>30,282</td>
<td>Knoxville</td>
</tr>
<tr>
<td>Virginia</td>
<td>3,311</td>
<td>16,452</td>
<td>Charlottesville</td>
</tr>
</tbody>
</table>


\(^b\) Figures from Education Directory, 1981–82.
## Table 38

### Enrollment and Location of the Questionnaire Institutions in 1952 and 1980

<table>
<thead>
<tr>
<th>Institution</th>
<th>1952 Fall Enrollment</th>
<th>1980 Fall Enrollment</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas St. U.</td>
<td>1,192</td>
<td>7,615</td>
<td>State University</td>
</tr>
<tr>
<td>Florida</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Southern C.</td>
<td>1,555</td>
<td>2,821</td>
<td>Lakeland</td>
</tr>
<tr>
<td>U. of Miami</td>
<td>10,243</td>
<td>15,970</td>
<td>Coral Gables</td>
</tr>
<tr>
<td>Georgia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Georgia C.</td>
<td>243</td>
<td>5,223</td>
<td>Carrollton</td>
</tr>
<tr>
<td>Kentucky</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Ky. U.</td>
<td>1,732</td>
<td>13,358</td>
<td>Bowling Green</td>
</tr>
<tr>
<td>Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta State U.</td>
<td>410</td>
<td>3,355</td>
<td>Cleveland</td>
</tr>
<tr>
<td>North Carolina</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appalachian St. U.</td>
<td>1,182</td>
<td>10,485</td>
<td>Boone</td>
</tr>
<tr>
<td>East Carolina U.</td>
<td>2,076</td>
<td>13,928</td>
<td>Greenville</td>
</tr>
<tr>
<td>Tennessee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Peabody C.</td>
<td>1,408</td>
<td>2,040</td>
<td>Nashville</td>
</tr>
<tr>
<td>Memphis St. U.</td>
<td>2,581</td>
<td>20,653</td>
<td>Memphis</td>
</tr>
<tr>
<td>Middle Tenn. St. U.</td>
<td>1,276</td>
<td>11,300</td>
<td>Murfreesboro</td>
</tr>
<tr>
<td>Tenn. Tech. U.</td>
<td>1,754</td>
<td>8,098</td>
<td>Cookeville</td>
</tr>
</tbody>
</table>

*aClagg, op. cit., p. 319.

*bFigures from Education Directory, 1981-82.

*cThis school was an interview institution in the Clagg study.
Letter Used To Establish Contact For Interview

Dear Dr._______________________:

I am a member of the geography faculty at Marshall University and I am doing some research in conservation education. I am making plans to visit your campus during April or May for the purpose of obtaining information regarding conservation education. This study is being conducted in connection with the education and geography departments of the Ohio State University.

I would appreciate it greatly if you would give me, on the enclosed card, the name of some person on your faculty I might contact regarding conservation. I would prefer this person to be actively engaged in conservation teaching. If such a person will not be on the campus at the time, I shall be happy to talk with anyone interested in conservation education as it relates to the problems of your area. If you do not have a conservation specialist in your department, would you give me the name of a faculty person with such a specialty in education, biology, or in some other department.

I assure you my interview will take very little time, require no special tasks, and, I feel, be informative for the person involved.

Thank you for your consideration in this matter.

Sincerely,

Charles R. Stephen

Enc.
Letter That Accompanied Questionnaire for Primary Conservation Courses

Department Chairperson

Dear Dr.________________________:

I am at present conducting a study in conservation education in connection with the education and geography departments at the Ohio State University. A major part of the study consists of a personal interview with one or more conservation specialists in eleven southeastern states. I have had personal interviews at the Universities of Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and at Florida State and Louisiana State.

Many of these conservation specialists, and others concerned with the study, have expressed a desire to see this survey extended to a greater number of schools. Of course, time and limited funding prohibit my making a personal visit to every college and university in the Southeast. The interview check-list I am using, however, is one that does lend itself to being answered by mail. I notice a course with the title "Conservation of Resources" listed under your department in the university bulletin. I would appreciate it if you would ask an instructor of this course if he or she would be willing to complete the attached form and return it to me.

Note to the conservation specialist: Please do not be dismayed by the size of the questionnaire. Many of the questions may be answered by a word or two. In some cases, the questions would not apply to you and you may wish to add remarks of your own. In the section pertaining to visual aids, do not bother about the name of the producer if it is not readily available. On the question regarding "per cent of students", an estimate will suffice. If you do have any printed material I might use, please enclose, in the envelope provided, when you return the form.

Thank you very much for your cooperation.

Sincerely,

Charles R. Stephen

Enc.
The Interview Check-List and Questionnaire

METHOD

1. How many courses does your department offer in conservation?
   (Course Numbers) (Level) (Frequency)

2. How do you present your courses in conservation?
   Lecture_________, Workshop_________, Field course_______,
   Extension_________, etc.

3. On what topics in conservation do you place the greatest
   emphasis? Soils_________, Water_________, Minerals_______,
   Forests_________, Wildlife_________, Human_________.
   3a. Why this first?

4. On what conservation topic do you place second greatest
   emphasis?
   4a. Why this second?

5. What factors most limit your teaching of conservation?

6. In your teaching of conservation at what level do you place your
   greatest emphasis? National_________, Regional_________,
   Local_________, Other_________.
   6a. Do you have any particular reason for teaching at this level?

7. Do you have any land made available to you for actual work in
   the field?
   Where?
   How much?
How made available? University property_________.
Lease_______, Interested landowner_________, Other_______.

What is the nature of this land (Negative or positive approach, or both)?

8. Does any of the class do work in the community in a conservation way? Yes_______, No_____.

How?

9. Do you ever make field trips? Yes_______, No_____.
What is the purpose of these trips? (Negative, positive, both)

10. Do you make use of visual aids in your conservation teaching? Yes_______, No_____. What is the nature of these?
    Slides_______, Own, purchased, both.

    Film strip__________, Producer__________________
    Titles:

    Film__________, Producer__________________

    Charts or others______________________________

11. Do you attempt to show students how to set up demonstrations in conservation? Yes_____. No______.

12. Do you require oral reports from the students? Yes______, No______. Nature of these:

13. Do you require written reports from the students? Yes______, No______. Nature of these:

14. Do you have available a course outline, a bibliography, workshop reports, units, or any other printed material I might make use of?
TEXT AND CLASS SIZE

1. What texts are you using in your present conservation classes?

2. What other texts have you used over the past five years?

3. Are you satisfied with your present text?
   3a. If not, why not?
   3b. If not, what do you do about it?

4. Do you make use of an outside reading list? (get copy)
   4a. If no copy, get outstanding titles.

5. How many students were enrolled in your most recent conservation classes?

6. Is it a required course for any group of students?
   Yes_______. No_______. Explain:

7. On an elective basis, what subject major group seems most common in the conservation class?
   7a. Do you know of any reason for this?

8. What prerequisites do you have for your conservation classes?

9. How many books and pamphlets on conservation do you estimate you have in your department for student use?
   Books_______, Pamphlets_______, Other_______.
   9a. Does the department lend these for the student to take out?
      Yes_______. No_______. Conditions:
10. Do you receive any journals in the department that are largely of a conservation nature?

- American Forests
- Jor. of Forestry
- Nature Magazine
- Reclamation Era
- Jor. of Geog.
- Audubon Magazine
- National Parks Magazine
- Parks & Recreation
- Soil conservation
- The Land

Other:

NEEDS

1. Within the area your institution serves, what do you consider to be the greatest conservation problem?

Soils____, Water____, Minerals____, Forests____, Wildlife____, Human____, Equal____, Other____.

1a. Explain why this is considered first.

2. What do you consider to be the second greatest conservation problem of this area?

2a. Explain why this is considered second.

3. Do you believe the people of this state have developed enough conservation awareness? (Evidence)

4. Do you feel the people of this area really know what conservation is?

4a. If not, what do they think it is?

5. Do you feel the major students in your department that intend to teach, receive adequate training in conservation?

6. What per cent of the students taking your conservation courses are preparing to be teachers?

7. What per cent of the students going out of this institution each year to teach have had a course in conservation?
8. Do you believe all students preparing to teach in this state should be required to take at least one course in conservation? (Reason for answer)

9. For a person that is going to teach conservation at the high school level, what courses besides those in conservation do you feel would be especially helpful to him or her?

10. If conservation is going to be taught as an integrated subject, what courses do you feel lend themselves to this sort of arrangement?

11. At what level do you feel conservation can best be taught?

12. Do you feel conservation of some sort could and should be taught at every level?

12a. If yes, what would be the difficulties in this?

13. Do you feel the public schools of this area are doing an adequate job in conservation education?

14. Can you name any that are doing an outstanding job in conservation?

OUTSIDE AGENTS AND AGENCIES

1. Do you bring in any outside specialists to assist in the teaching of your conservation classes?

1a. Get names and examples.

2. Do you find any agencies in this area to be especially helpful in conservation education in any way?

2a. Get agencies names and how they help.

3. Does your department cooperate with any outside agencies in the preparation of conservation education materials?
3a. Explain.

4. Is anyone in your department working with any sort of resource-use planning committee?
4a. Get names of persons, nature of committee, and its work.

5. Are there any agencies in your area that could be helpful in conservation education? Mills and factories_____; Public services_____; State agencies_____; Others______.
5a. Get names of these, their nature, and how they might help.

In your opinion, and from your experience, what is the status of conservation education in the colleges and universities of the southeastern United States?

What direction should conservation education be taking, in these institutions of higher learning, in the next twenty years?
Guide for Library Research in Interview Institutions

LIBRARY MATERIALS

1. Number of listings under conservation title __________.
   Comments:

1a. Number of listings for the last twenty years __________.
   Comments:

   Organization of file:
   Cataloged:
   Source of materials:

3. What journals (periodicals) are taken that relate primarily to conservation?
   ______ American Forests ______ Audubon Magazine
   ______ Journal of Forestry ______ National Parks Magazine
   ______ Nature Magazine ______ Parks and recreation
   ______ Reclamation Era ______ Soil Conservation
   ______ Journal of Geography ______ The Land
Attention: Department Head

Dear Sir:

The enclosed questionnaire is a part of a study I am making in connection with the education and geography departments of the Ohio State University. This phase of the study is to determine what conservation education is being taught in courses not primarily concerned with conservation.

Since your teaching field is one that lends itself to conservation education, I would appreciate your giving me the small amount of time it will take to answer these questions.

Perhaps your department offers more than one course containing conservation elements. For that reason, I have included extra questionnaires to be filled out by the various instructors in your department that may be involved. Please do me the kindness of having them fill out the form and return it with your answers in the envelope I have provided.

I shall appreciate your cooperation in this matter.

Sincerely,

Charles R. Stephen

Enc.
Questionnaire for Conservation Education in Courses

Not Primarily Concerned with Conservation

Name of Institution_________________________________________________________

Questionnaire answered by____________________________________________________

Department_________________________________________________________________

1. Title and course number____________________________________________________

2. Author and title of course text____________________________________________

3. Check the way in which Conservation is taught in this course.
   ______ as a separate unit
   ______ as an organized part of an integrated program
   ______ incidentally where it seems appropriate
   ______ some other way (if so, indicate on back of sheet)

4. Which of the following phases of Conservation do you stress in this course?
   ______ Soils       ______ Forestry       Others:
   ______ Water       ______ Wildlife
   ______ Minerals    ______ All equally

5. Do you make use of any visual aids in your Conservation teaching?
   ______ Yes       ______ No

6. If so, please indicate the nature of these on the back of this sheet.
   (Title, Producer, Type of aid)

7. Do you do any field work in conservation teaching?
   ______ Yes       ______ No

8. If so, please indicate the nature of this on the back of this sheet.

9. Approximately what per cent of this course is given over to Conservation Education? _______

10. Approximately what per cent of this class intend to become teachers? _______
11. Is this a required course for teachers in any fields?

_____Yes   _____No

12. If so, what fields?

13. In a Conservation Education way for the majority of your students, do you feel this course:

_____meets their needs?

_____does not meet their needs, and they should have a course devoted to Conservation alone?

14. The level of Conservation taught in this course is primarily:

_____national  _____local

_____regional  _____other (Please explain on the back of this sheet.)

15. Please comment on what you feel to be the greatest Conservation needs of this state.
Note: Any thoughts you have or comments regarding this subject will be most welcome.
CONCEPTS AT THE CORE OF WHAT THE THRUST IN CONSERVATION EDUCATION WILL NEED TO BE*

I. Introduction

Geography as the science of spatial distribution and interaction is concerned with the distribution and interaction of those physical and cultural environmental factors which produce environmental problems.

Geography bridges the physical and social sciences and is, therefore, naturally concerned with the environmental problems which are at the same time social problems.

Environmental problems are growing in number and complexity, spreading geographically, and their impacts are intensifying to the point where many authorities believe man himself is an endangered species.

No solution to our ecologic crises can be expected from science and technology alone. Solutions will also require changes in attitudes, values, and institutions.

The tragedy of the commons. Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in the commons (freedom of the seas, air, water, etc.) brings ruin to all.

The individual benefits as an individual from his ability to deny the truth even though society as a whole, of which he is a part, suffers.

Principle of morality—the morality of an act is a function of the state of the system at the time it is performed.

The poor are the least responsible for pollution in the sense that materially they consume the least. Conversely, the poor are the chief sufferers from pollution in the sense that they have the least means of insulating themselves from pollution effects.

Principle of environmental unity—everything in the environment is related to everything else. Man is not something separate from and above nature, he is part and parcel of it. Man is the decision maker for all the ecosystems in which he is involved.

*Submitted by Dr. W. R. Brueckheimer, one of the interview instructors and a participant in the Delphi project.
II. Basic Causes of Environmental Problems

Man's attitude toward nature changes through time and space. This attitude has a direct effect upon how man creates, recognizes and solves environmental problems.

The significance of the physical environment is a function of the attitudes, objectives, and technical skills of man.

Most economic systems in the world today encourage environmental degradation by pursuing a goal of minimization of costs.

Decisions regarding a quality environment are necessarily based on a person's value system. Therefore, in order to solve the problems of environmental degradation one must change the society's value system.

The affluent society has become an effluent society. The six percent of the world's population in the U. S. produces over half of the world's solid wastes.

Most of the sharp increase in pollution levels is due not so much to population or affluence as to changes in productive technology.

To discover the true cost of the many benefits of modern technology, we need to look for, and evaluate, all the hidden social costs represented by environmental pollution.

III. The Population Explosion and Its Ramifications

The present trends in the exponential growth of population, pollution, and the plunder of resources cannot be sustained indefinitely into the future without placing the future of all mankind in serious jeopardy.

If present growth trends continue, total ecological demand will increase by a factor of six in the time taken for world population to double and by a factor of 32 in the time taken for world population to quadruple (66 years).

With respect to per capita consumption of resources and per capita pollution, the developed states of the world have populations far greater in impact than the developing states. In this sense, the population impact of Americans is equivalent to perhaps five to ten billion Indians, and the dangers are more grave and more immediate in the highly industrialized than in the less industrialized countries.
Present reserves of many resources will be exhausted within 50 years if consumption rates continue to grow as they are.

"If replacement (zero growth) is achieved in the developed world by 2000 and in the developing world by 2040, then the world's population will stabilize at nearly 15.5 billion about a century hence, or well over four times the present size." The optimum population is less than the maximum.

Social regimentation and standardization is compatible with the survival and multiplication of biological men, but not with the quality of human life. The mind is affected by environmental factors just as much as the body.

IV. Land: Its Uses and Its Limits

While the physical location of land is fixed, its economic and social location changes over time.

Throughout history, the advances man has made in his social organization and his technology have increased the intensity of his land use.

The impact of population and technology dictate an increased familiarity and use of the public's police powers and other land management tools.

In many regards Florida's landscape is a raw material to which the market comes. This unique economic situation will not continue if the people of Florida do not maintain the quality of the environment.

V. Man's Impact on Water Resources

Present day water problems are not so much problems of water shortage as problems of shortage in human foresight.

Future demands for fresh water will exceed existing supplies and, therefore, will require the recycling and cleanup of existing supplies as well as increased production of fresh water from sea water.

Having turned many rivers and lakes into dead bodies of water, mankind is now in the process of turning our estuaries and seas into the same.

Our present rate structures encourage the excess use and waste of water and energy.
VI. Soil: A Most Important Resource

An understanding of the physical character of soil is a prerequisite to decision-making in the area of soil conservation.

Soil conservation is a complex system of use and management based upon the capabilities of the land itself.

Spatial interaction of phenomena is just as applicable to the study of soil, its use and misuse, as it is to the smaller scale studies of specific landscapes, economic activities, or even countries.

Florida's soils are unique. They are basically sandy, infertile, low in humus and overly drained when above the water table. Technology and economic pressures have encouraged specialized agricultural uses in the sandy flatlands soil and in the areas of hydromorphic soils.

VII. Man's Impact on Flora and Fauna

Man is simplifying and homogenizing the biological landscape.

The world's stock of genetic resources (plant-gene pool) is diminishing.

Genetic diversity is essential for the security of our food supply since it is indispensable to future plant breeding and introduction.

The number of endangered species is growing alarmingly.

The combined effects of pollution and habitat destruction endanger the survival of no less than 280 mammal, 350 bird, and 20,000 plant species.

Man must develop biological controls where possible to replace the chemical control of weeds and pests.

VIII. Conclusions and Recommendations

The principle defect of the industrial way of life with its ethos of expansion is that it is not sustainable.

"Economic value" as at present calculated does not correspond to real value any more than "economic cost" corresponds to real cost.
The principle conditions of the society of the future—one that can be sustained indefinitely while giving optimum satisfaction are: (1) minimum disruption of ecological processes; (2) maximum conservation of materials and energy; (3) a population in which recruitment approximates loss; (4) a social system in which the individual can enjoy, rather than feel restricted by, the first three conditions.

Posterity, thinned by their father's crimes, shall read, with grief, the story of their times. (Horace)

A nation deprived of liberty may win it, a nation divided may reunite, but a nation whose natural resources are destroyed must inevitably pay the penalty of poverty, degradation, and decay. (Gifford Pinchot)

What is the use of a house if you haven't got a tolerable planet to put it on? (Thoreau)

The often-stated goal of the "greatest good for the greatest number" cannot be realized.

We can change the laws, institutions, etc. of man; we cannot change the laws of nature.
BIBLIOGRAPHY

Books


Schwendeman's Directory of College Geography of the United States. Richmond, Kentucky: Eastern Kentucky University, published annually.


Periodicals


Unpublished Material


Public Document