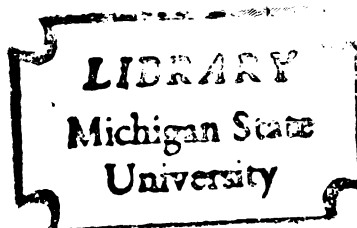


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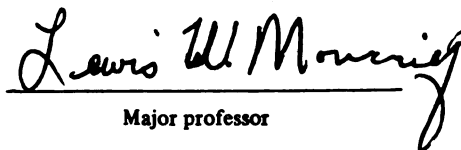


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Information Diffusion and Career Decision Making of
Natural Resource Graduates: Implications for Recruitment
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INFORMATION DIFFUSION AND CAREER DECISION
MAKING OF NATURAL RESOURCE GRADUATES :
IMPLICATIONS FOR RECRUITMENT OF
RACIAL MINORITIES

By
Clyde Eugene Chesney

A DISSERTATION
Submitted to
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ABSTRACT

INFORMATION DIFFUSION AND CAREER DECISION MAKING OF NATURAL RESOURCE GRADUATES: IMPLICATIONS FOR RECRUITMENT OF RACIAL MINORITIES

By

Clyde Eugene Chesney

Racial minorities--blacks, American Indians, Orientals and Spanish Americans--share few of the professional career positions in environmental education, forestry, resource development, park and recreation resources, fisheries and wildlife or other related areas. Barriers restricting the entry of minorities into professions in natural resources have been categorized as academic, financial, aspirational, geographic, physiological, psychological and sociological. Yet very little has been done to systematically examine these variables within a theoretical framework in order to objectively ascertain which policy or agency procedures need to be altered in order to effect some practical solutions to these barriers.

The information-diffusion model of Rogers and Shoemaker was selected to provide the overall research framework for this study. That is, accurate, timely and appropriate career information during the vocational choice process influences the range and scope of occupations considered--especially in such non-traditional occupations like natural resources--and ultimately, an individual's choice of employment.

The primary objective was to investigate the knowledge dimension of the vocational choice process of two cohorts of

natural resource graduates--1965 and 1975. Specific objectives were to: (1) assess career information diffusion and determine its impact on vocational choices . . . ; (2) compare the perceived dissimilarities between careers in natural resources and other vocations; and (3) develop a testable model for the recruitment of blacks and other racial minorities.

A mailed questionnaire to a disproportionate sample from 10 universities gathered data about the following information dissemination variables: career knowledge, sources, methods, timeliness, content and attitudes (expectations). Follow-up consisted of two letters and a long distance telephone call--the final return rate approached 50 percent (49.3). Data were analyzed using the Statistical Package for the Social Sciences. Frequency, crosstabs, breakdowns and discriminant analyses were performed to determine differences between respondents by year of graduation, race and employment status.

Major empirical findings were: (1) Prior to college, minorities rated senior high courses, high school teachers and junior high courses as moderate or higher in importance. On the other hand, recreation/leisure participation was the most important source factor in the choice of a career by majority respondents. (2) Prior to college, minorities rated books, lectures and demonstrations as important methods of receiving career information. (3) Age at first receipt of useful career information about six job factors did not differ significantly by race. Yet, those now employed in natural resources learned

about these factors an average of 2 years earlier than those not so employed, even though all had similar training. (4) None of the five content factors showed any differences by race prior to college. (5) Whites and non-whites had similar responses in career expectation for: feeling of self-fulfillment; opportunity to participate in determining methods and procedures; opportunity to develop close friendships; and feeling that administrators are willing to discuss subordinate's problems. The most dramatic difference, however, was registered in response to the factor--opportunity to help other people--minorities rated this one higher by 22.6 units.

Using the information diffusion model, six null hypotheses were formulated to guide the investigation and to help suggest a strategy for increasing the number of minorities in natural resources. Breakdown and discriminant analyses revealed statistically distinct patterns between non-white and whites for source, method, content, attitude and career knowledge variables. No such difference was observed for the timeliness variable.

One recommendation was the establishment of a comprehensive recruiting and retention program by universities that would focus on both pre-college and college experiences. Among other things, it should include specific roles and responsibilities for disseminating career information in natural resources. Finally, a combination social change-marketing model was suggested for resource agencies to provide the impetus for their dissemination efforts.

ACKNOWLEDGEMENTS

To complete a dissertation a student needs financial and moral support, advice and counseling, objective review and other assistance from a multitude of people and organizations. I will be forever grateful to the assistance and patience shown by my Graduate Advisory Committee--especially my Chairman, Dr. Lewis W. Moncrief for his interest in this project, his efforts to secure financial support and most of all, his long distance efforts following my return to North Carolina. Thanks must also be given to the other members--Dr. Eugene Dice, Professor, Department of Parks and Recreation Resources; Dr. Robert Marty, Professor, Department of Forestry; and Dr. John Wanous, Associate Professor, Department of Management for their many helpful contributions.

The financial support came from two sources: North Carolina Agricultural Extension Service and the North Central Forest Experiment Station. Special thanks to R. E. Jones and Dr. Daniel D. Godfrey, the former and current Administrator, respectively, of the Agricultural Extension Program, for their support of my study leave. Dr. George H. Moeller, Assistant Director, Research Planning and Application, N.C. Forest Experiment Station was instrumental in coordinating the funding for this research and also providing the opportunity for me to visit with USDA-Forest Service personnel in the Washington office to discuss application of findings.

For my wife, Anita and two sons--Clyde, Jr. and Charles--enough cannot be said of their moral support, sacrifice and love during these past three years.

In addition, I must acknowledge the assistance and cooperation of the many people at the ten universities included in the sample--faculty and staff who provided the names and addresses of their graduates and, of course, the graduates themselves who took the time to respond.

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Finally, my fellow students must be acknowledged for they are a vital ingredient in a graduate education. They help in ways that often go unnoticed--from providing advice on course selection to sharing the mutual trials and frustrations that characterize such an endeavor as this.

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TABLE OF CONTENTS

LIST OF TABLES	vi
LIST OF FIGURES	viii
CHAPTER	
I. INTRODUCTION TO THE PROBLEM	1
Need for the Study	4
Study Objectives	6
II. LITERATURE REVIEW	7
Natural Resources Literature	7
Vocational Choice Research	31
Information Dissemination Theories	41
III. MODELS AND HYPOTHESES	46
Information Diffusion-Dissemination Model	47
Specification of Variables	54
Study Hypotheses	58
IV. RESEARCH METHODS AND PROCEDURES	60
Selection of Sample	60
Design and Administration of Questionnaire	65
Analysis of Data	70
V. FINDINGS	81
The Repondents	81
Respondent Characteristics and Information Diffusion	86
Career Knowledge and Information Diffusion	105
Implications for Model Development	107
VI. MINORITY CAREERS IN NATURAL RESOURCES-- HOW DOES IT HAPPEN?	122

Recruitment and Retention Model	122
Removing the Barriers--The Social Change Process	133
The Social Marketing Process	133
VII. CONCLUSIONS AND RECOMMENDATIONS	155
Summary of Empirical Findings	156
Hypotheses Testing	158
Theoretical and Methodological Limitations	161
Assessment of Research for Future	162
APPENDICES	
A. Factors in Selection of Colleges and Universities	164
B. Initial Letter to University Contacts . . .	166
C. University Contacts Who Assisted with Development of Sample	168
D. Cover Letter	169
E. Survey Instrument	170
F. First Follow-up Letter	171
G. Second Follow-up Letter	172
H. Conversation Guide and Questionnaire Used in Telephone Follow-up	173
I. Conversation Guide and Questionnaire Used in Pre-Telephone Contact	178
J. Breakdown Tables for Knowledge Variable By Race	183
K. Resource Persons Consulted Concerning Development of Recruitment Component . .	194
LIST OF REFERENCES	195
General References	200

LIST OF TABLES

1. Corporate Landownership and Position Among Largest United States Industries	24
2. Geographic Location of Institutions	61
3. Overall Sample Size	64
4. Schedule of Survey Strategy and Response	68
5. Orientation Provided Telephone Interviewers	69
6. Results of Telephone Follow-up	71
7. Respondents Grouped for Analysis	74
8. Timeliness: Age at Receipt of Useful Career Information	75
9. Timeliness: Adjusted Frequency of Respondent's Receiving Yearly Reinforcing Information	76
10. Attitudes: Career Expectations	77
11. Total Mean Distance Matrix (Knowledge Variable)	79
12. Age Distribution of Respondents	82
13. Residential History of Respondents	83
14. Occupations of Parents	84
15. Size of High School Graduating Class	84
16. Length of Work Experience Prior to College Enrollment	85
17. Percentage of Respondents with Paid Work Experiences in Natural Resources After Enrolling in College	85

18.	Breakdown of Source Variable by Race (Prior to College)	92
19.	Breakdown of Source Variable by Race (After Enrolling in College)	94
20.	Breakdown of Method Variable by Race (Prior to College)	95
21.	Breakdown of Method Variable by Race (After Enrolling in College)	96
22.	Breakdown of Timeliness Variable by Race (Age)	98
23.	Crosstabs of Timeliness Variable by Race (Frequency)	99
24.	Crosstabs of Content Variable by Race	100
25.	Breakdown of Career Expectations by Race	101
26.	Summary of Breakdown Analysis	108
27.	Stepwise Discriminant Analysis of Source Variable	112
28.	Stepwise Discriminant Analysis of Method Variable	114
29.	Stepwise Discriminant Analysis of Content Variable	115
30.	Stepwise Discriminant Analysis of Career Attitudes-Expectation Variable	117
31.	Stepwise Discriminant Analysis of Knowledge Variable	119
32.	Summary of Discriminant Analysis (Independent Variables)	121

LIST OF FIGURES

1. The Innovation-Decision Process	48
2. Measurement of Individual Differences	50
3. Total Possible Cells of Matrix	52
4. Career Information Diffusion	54
5. A Model of the Recruitment Component	123
6. A Model for Minority Recruitment and Retention in Natural Resources	129
7. The Social Action Process	135
8. Social Marketing Planning System	137
9. Removing the Barriers--The Social Marketing/ Change Process	138

Chapter I

INTRODUCTION TO THE PROBLEM

The successful planning, management and development of America's natural resources depends on a corps of diverse professionals. Their roles span such tasks as policy making, program leadership, management, technical assistance, planning and communication activities.

But, because society is faced with a limit to its production possibilities (fixed amount of land, associated natural resources, labor, capital), it must choose among the various alternatives available. Inherently, such policy making is a pragmatic, socio-political process. Policy makers attempt to blend economic efficiency with political realities.¹

During the twenty year period from 1957 to 1977, federal and state legislative action provided an unprecedented impetus to the environmental-conservation-outdoor recreation movement. Likewise, these two decades saw the elimination of virtually all legal barriers restricting racial minorities from enrolling in colleges or universities and from entering careers of their choice.

Yet, despite the availability of colleges and universities, few racial minorities have enrolled in natural resource

¹Richard M. Alston and David M. Freeman, "The Natural Resources Decision-maker as Political and Economic Man: Toward a Synthesis," Journal of Environmental Management 3 (1967): pp. 167-183.

programs or entered this profession in percentages proportionate to their numbers in the population. In fact, racial minorities--blacks, American Indians, Orientals and Spanish Americans--share few of the professional positions in environmental education, forestry, resource development, park and recreation resources, fisheries and wildlife or other related occupations.¹

Since these professionals play a key role in the policy making process, the virtual absence of racial minorities has become a cause of professional and legal concern. This problem has been documented by concerned researchers, particularly in parks and recreation and forestry. In 1972, for example, Godbey directed a nationwide study of the "Participation of Minority Students in Recreation and Park Curricula." Minorities--blacks, Puerto Ricans, Mexican Americans and American Indians--represented only 408 out of 5,043 (8.09 percent) baccalaureate degree students and only 13 of 193 (6.73 percent) college faculty positions.²

Recent results from the National Recreation and Parks Association's (NRPA) Manpower Study also illustrate the

¹According to Bureau of Labor Statistics, in 1977 the percentage distribution of blacks and other minorities in white collar occupations exceeded 12.0% in the following: recreation workers (19.3%), social workers (19.1%) and vocational and educational counselors (14.3%). They approached parity as biological scientists (12.7%), health technologists and technicians (12.1%), personnel and labor relations workers (11.9%) and registered nurses (11.3%).

²Figures on Minority participation reported in article by James F. Murphy, "Recreation Education--A Social Concern," Parks and Recreation, Vol. 5, No. 9, (1970): pp. 57-58, 83, 89.

pervasiveness of the low number of minorities in decision making positions. Godbey and Henkel coordinated this study for NRPA and studied the present status of employees in park and recreation organizations across the country between June and November, 1975. With 50% of the sample responding, minority groups were severely underrepresented in the top five administrative positions--only 6% (242 of 4,021) of the combined total number of chief executives, assistant directors of park and recreation departments, superintendents of recreation, superintendents of parks, and division heads were minority group members.¹

Recent studies of students in park and recreation curricula have shown that this trend is unlikely to change. In 1974 Dunlavey, for example, completed a census of undergraduate students at Michigan State University and found that the typical student was white with a middle to upper-middle class suburban background.²

Similarly, Didriksen showed that this situation is also true for other careers in natural resources. In the fall of 1973, there were only 286 racial minorities (less than one percent) enrolled in professional forestry programs out of some 18,000 undergraduates at the 51 institutions accredited

¹Donald Henkel and Geoffrey Godbey, Parks, Recreation and Leisure Services Employment in the Public Sector: Status and Trends, (Arlington, VA.: National Recreation and Park Association, 1977), pp. 35-40.

²Robert J. Dunlavey, "A Description of Personal Backgrounds, Experiences and Attitudes of Park and Recreation Resources Undergraduates at Michigan State University, 1974," (M. S. Technical Paper, Michigan State University, 1974), pp. 89-90.

or affiliated with the Society of American Foresters. There were 53 American Indians, 52 black Americans, 95 Orientals and 86 Spanish Americans.¹

And currently (1978) within the United States Forest Service there are only 88 black professionals--(10 foresters) out of some 27,000 permanent employees (5,000 foresters).²

Need for the Study

One conclusion from this data is that future students entering careers in natural resources from Michigan State University and similar institutions will not be dissimilar from present career professionals. Unfortunately, this situation may create a credibility problem in terms of convincing racial minorities that they do or should have an important role in deciding the optimum utilization of the nation's natural resources. Obviously, this situation is contradictory to the spirit behind the "equal opportunity employer" slogan.

Consequently, in 1975, concerned individuals, representing educational institutions, industry, and federal and state governmental agencies, convened a national workshop at Tuskegee, Alabama to address the issue of insufficient numbers of minorities enrolled in educational programs or actively working in natural resources. The workshop on "Entry

¹Ralph G. Didriksen, "Minorities in Professional Forestry Schools, 1973," Journal of Forestry, Vol. 73, No. 5 (May, 1975), p. 283.

²Correspondence with former Equal Opportunity Specialist with North Eastern Forest Experiment Station, August 10, 1977.

of Minorities into Natural Resources Careers" focused on:
 (1) reasons minorities appear not to aspire to natural resource careers; (2) opportunities in academia, industry and government; and (3) some tools used by these institutions which have been in some measure successful in recruiting minorities into these careers.

The conference's work groups successfully identified barriers or road blocks facing minorities: negative agriculture and forestry experiences, financial need, racial discrimination, lack of awareness, and so forth.¹ Yet, very little has been done to systematically address these variables within a theoretical framework in order to objectively ascertain which policy or agency procedures may need to be altered in order to effect practical solutions. Since affirmative action--a movement to see that minorities are given equal access to professional positions--is supported by both professional ethics and legislative mandate, it seemed imperative that additional research be conducted.

Vocational choice, for example, is a process made up of events or "choice acts" which take place usually during the ten year period from early adolescence to occupational entry.² Moreover, there are several dimensions of this choice process (awareness, value clarification, knowledge,

¹Proceedings of a Workshop in Entry of Minorities into Natural Resource Careers, (Tuskegee, Alabama: Southern Forest Experiment Station, Forest Service, USDA, 1975), p. 78.

²John Crites, Vocational Psychology, (New York: McGraw-Hill Book Company, 1969), p. 155.

independence, fantasy, means-ends cognizance and consistency of choices). But the one considered most relevant to this problem is occupational information--knowledge of different (non-traditional) occupations. Information which is accurate and timely can do much to dispel the myths and half truths often associated with non-traditional careers.

If recruiting efforts are to achieve maximum effectiveness, then concerned professionals in academia, industry and governmental agencies should at least know more about this dimension: how career information is disseminated and its subsequent impact on vocational choice.

Study Objectives

In general, the quantity and quality of career information is influenced by the student's family background, education opportunities and labor force experiences.¹ The primary objective, therefore, of this research was to systematically investigate the knowledge dimension of the vocation choice process of natural resource graduates. The specific objectives were:

1. Assess career information diffusion and determine its impact on vocational choices of graduates in natural resources.
2. Compare the perceived dissimilarities between careers in natural resources and other vocations.
3. Develop testable model(s) for the recruitment of blacks and other racial minorities.

¹Joseph A. Mihalka, Youth and Work, (Columbus, Ohio: Charles Merrill Publishing Co., 1969).

Chapter II

LITERATURE REVIEW

Because of the complexity of this problem, it required an interdisciplinary approach involving the review of natural resources, vocational choice and diffusion literature. A review of the most pertinent literature is included in this chapter.

Natural Resources Literature

There is a paucity of literature in natural resources which addresses the problem of the lack of minority participation beyond just articulating and defining the situation. Most writers like Didriksen in 1975, Murphy in 1970, Dunlavey in 1974, and Godbey and Henkel in 1976, have mainly articulated and documented the problem.

Godbey and Henkel's study, is very illustrative of minority representation in parks and recreation. They found that 84,105 full time staff were employed at the municipal, county, special district and state level. Ethnic minorities (blacks, American Indians, Spanish and Oriental Employees) numbered about 22 percent.¹ Minorities and women, however, were notably absent from positions of power. Both were more heavily represented in leadership and supervisory roles.

¹Women represented about 15% of all employees but since they represented almost 50% of those enrolled in colleges and universities, the authors concluded that their percentages should increase.

Minority groups were more heavily represented in the skilled park personnel positions such as maintenance persons, tree surgeons, and so forth.¹

Additional information on the Negro's role in related resource industries has been provided by the Industrial Research Unit of the Wharton School of Finance and Commerce, University of Pennsylvania. Northrup and Howard, respectively, documented the role of the Negro in the paper and lumber industries.

In 1968, 700,000 persons were employed in making pulp and paper and converting the basic products to other common uses--about 7.3 percent or 49,000 were black. Northrup concluded, however, that the racial occupational employment pattern in southern mills kept them out of better paying jobs.²

Howard, likewise studied the role of the Negro in the lumber and wood products industry. He concluded that the industry has been the largest industrial employer of blacks in the South for many years. In 1967, blacks represented almost 136,000 or 41.6 percent of the industry's labor force. Historically, blacks worked predominantly in the low paying blue collar occupations which required low skills and little education for entry. And like the pulp and paper industry, civil rights and governmental pressures have been unable to achieve

¹Henkel and Godbey, Parks Recreation and Leisure Services Employment in the Public Sector: Status and Trends, pp. 35-40.

²Herbert R. Northrup, The Negro In The Paper Industry, (Philadelphia: University of Pennsylvania Press, 1970), pp. 1-3, 62.

any major changes in that few blacks are employed in white collar positions.¹

Environmental Attitudes

Other writers have discussed the attitudes held by blacks and other racial minorities as possible factors in their non-selection of careers in natural resources. In 1971, Payne and Theoe attributed the lack of blacks in forestry to their lack of knowledge of what the profession is all about and to an anti-agricultural bias. They argued that urban, low income, non-whites are more likely to pursue careers in areas which are perceived as being of higher status--i.e., law, medicine or engineering.²

Kreger reached similar conclusions about ecology and black student opinion in a study of an availability sample of 28 black Michigan State University students in 1972. Although the sample was not selected scientifically, the study provided useful insights. She summarized the expressed opinions of black students as: (1) Blacks were not as interested in ecology as whites. (2) Ecological concern is a stage in a society's life and in the United States, the dominant white group has reached this stage, but blacks haven't. (3) Ecology is a white middle class concern because the economic position of blacks has imposed limitations regarding interest in other

¹John C. Howard, The Negro In The Lumber Industry, (Philadelphia: University of Pennsylvania Press, 1970), pp. 70-76.

²Brian R. Payne and Donald R. Theoe, "Black Foresters Needed: A Professional Concern," Journal of Forestry, Vol. 69, No. 5 (May, 1971), pp. 295-298.

societal concerns. Finally, she concluded that blacks can only be expected to take an increased interest in the ecology movement when increased economic opportunities and other advancements are realized.¹

Similarly, Meeker and others contended that National Parks and Wilderness areas mean different things to white Americans than to black Americans:

. . . National Parks and Wilderness areas promote the myth of the National Garden of Eden--a place where the (white man) can feel close to the origins of human life and to the peace, innocence and moral purity that myth ascribes to the pre-fallen state of mankind. National Parks are places to seek refuge from cities and machines, offering (whites) the psychological relief (i.e., recreation) which makes it possible to continue their work in unpleasant urban surroundings . . .²

On the other hand, they suggested the feelings of non-whites for the land differed dramatically: "The heritage of slavery for the black man and the brutal conquest of Indian lands shaped their conceptions about land." Cleaver, for example, wrote in his essay on "The Land Question and Black Liberation" that during slavery black people learned to hate the land. He suggested the daily grind of working the land "for profit they themselves would never see or taste" has made blacks sensitive to being referred to as farm boy, "to infer he is from a rural area or in any way attached to an agrarian situation."³

¹Janet Kreger, "Ecology and Black Student Opinion," Journal of Environmental Education, 3 (Spring, 1972), pp. 32-35.

²Joseph W. Meeker, William K. Woods and Wilson Lucas, "Red, White and Black in the National Parks," The North American Review, (Fall, 1973), p. 4.

³Eldridge Cleaver, "The Land Question and Black Liberation," Post Prison Writings and Speeches, (New York: Random House, 1968), pp. 57-72.

But as long as the more basic social and economic needs of blacks and other minorities remain unmet, it is not surprising that this group remains skeptical of an "environmental movement," especially one which has focused exclusively on solving higher needs--recreational benefits, wilderness use, environmental quality, etc.

Hunt wrote in 1973 that this is one reason blacks have avoided or looked with skepticism on the environmental movement. Many have felt that national priorities would be diverted from achieving improved health care, housing and equality in employment and directed to improving the quality of the environment.¹

Disadvantaged groups, moreover, may not only feel that concentrating on improving the environment is a misplaced priority but a deliberate scheme by insensitive national leaders to sabotage their drive for equality. In March of 1976, the Potomac Institute, Inc., published "Environment and Equity" which documented in part the friction between the "haves" and the "have-nots". This paragraph from the introduction helps illustrate the issue:

Through most of the present century, those seeking to protect forests, wildlife, streams, and landscapes have been viewed by social equity interests as too often the conservers of a status quo America having little place to house, employ, and otherwise release millions locked in poverty.²

¹John D. Hunt, "Natural Resource Use and the Hierarchy of Needs," Journal of Environmental Education, 4 (Summer, 1973), pp. 20-21.

²Environment and Equity, (Washington, D.C.: The Potomac Institute, Inc., 1976), p. 1.

The criticism of several minority leaders and others take a similar form. Bayard Rustin, President of the A. Phillip Randolph Institute, remarked: "The good and sweeping intentions of many environmentalists are now an obstacle blocking those less fortunate Americans who desire economic justice."¹

Mayor Richard G. Hatcher of Gary, Indiana commented: "The nation's concern with the environment has done what George Wallace was unable to do: distract the nation from the human problems of the black and brown American, living in just as much misery as ever".²

And, ironically, where there has been an opportunity to meet the most pressing environmental and/or outdoor recreation needs of the disadvantage, it has not materialized. A pertinent example which Burdick documented in 1975 was the inequitable distribution of money from the Land and Water Conservation Fund. He concluded that the use of the fund "has been particularly prejudicial to the needs of impoverished residents of inner city neighborhoods, where high densities and a paucity of private open space create special public responsibilities."³ For example, Land and Water Conservation monies are often used to locate regional parks in metropolitan areas, which theoretically supply recreation benefit to all area residents. In the past, however, little attention has focused

¹Ibid., p. 5.

²Ibid.

³John M. Burdick, Recreation in the Cities: Who Gains From Federal Aid?, (Washington, D.C.: The Center for Growth Alternatives, 1975), p. 13.

on the social, psychological and physical accessibility problems of low income residents who must rely on inefficient or non existent public transportation to journey into suburbs where they often are not wanted.¹

But perhaps the most intensive examination of this conflict--between environmental quality and social justice--occurred during the 1974 conference convened by the Conservation Foundation. In Chapter I of the Conference's Proceedings, James Smith, a Senior Associate with the Conservation Foundation wrote that advocates of social justice are readily characterized in social, economic and ethnic terms: "it is a lower class, poor, and largely minority."² In contrast the environmentalists are largely middle to upper-middle class and almost exclusively white. And, perhaps more significantly states Smith, "they are part of a small, relatively affluent minority which wields social and political influence disproportionate to their absolute number."³

Population and Resource Distribution

According to Hazel Henderson in Chapter VIII of the Conference's Proceedings, the central issue in the environmental debate concerns redefining economic growth or reslicing the economic pie:

¹Ibid.

²James N. Smith, "The Coming of Age of Environmentalism in American Society," Environmental Quality and Social Justice in Urban America, (Washington D.C.: The Conservation Foundation, 1974), pp. 2-6.

³Ibid., p. 7.

The new questions concern, on the one hand, the the price in social and environmental exploitation which we pay for economic growth . . . and on the other hand, the companion questions of how we should distribute the costs and benefits of a new set of social arrangements geared toward a 'steady-state economy' in equilibrium with the eco-system.¹

In other words, the issue revolves around the basic economic questions: what is produced; how is it produced; when is it produced; who benefits and who pays the costs?

Ironically, the costs of environmental control appear to fall most heavily on poorer citizens. For example, when environmental standards are implemented, costs are most often passed on to the consumer.² But even more "ironic" as Henderson suggests the poor also suffer more disproportionately when environmental problems go unattended. But, since the environmentalists are part of the "small, relatively affluent who control the social, cultural and political rules of the game in America," Smith states that changes advantageous to the poor may be slow in materializing: "The central issue then is linking the traditional concern for the preservation of the natural landscape with the ecological health of the urban environment."³

More specifically, the agenda for the urban poor include the problems of hunger, malnutrition, poor health and premature

¹Hazel Henderson, "Redefining Economic Growth," Chapter VIII of Environmental Quality and Social Justice in America, p. 123.

²If this product of service has an inelastic demand or is considered a necessity such as an automobile, the low income consumer may end up paying a larger percentage of his income for the goods or services.

³Smith, Environmental Quality and Social Justice in America, p. 14.

death. Unfortunately, in 1974, this linkage had not materialized and in 1979, it is still lacking. More alarming, however, has been the slow erosion of much of the 1960's progress. Indicative of this trend has been the cutback in social programs, referenda on limiting governmental spending and charges of reverse discrimination aimed at ambitious attempts to compensate for past discriminating practices.¹ Obviously, during the latter half of this decade, wider cleavages have developed between the rich and poor, suburbia and central city, middle class and lower class, black and white, the haves and have nots. While environmental awareness by the public is perhaps at an all time high, concern for the poor living in poverty in the central cities is less apparent.

The Agrarian Heritage

While the heritage of slavery cannot be erased, it is perhaps useful to consider the agrarian situation of the black American following emancipation and the Civil War as a means of better understanding present attitudes about the land and the natural environment. Blacks are now overwhelmingly city dwellers: in 1977, New York City had 2.5 million blacks, Chicago 1.5 million, Los Angeles and Long Beach 1.0, Philadelphia 0.9 and Washington, D.C. almost 0.9 million.² But during

¹See for example, The State of Black America: 1979, (National Urban League, Inc., January 17, 1979), p. ii.

²Frank G. Pogue, "The Mobile Black Family: Sociological Implications," The Black Rural Landowners--Endangered Species, Leo McGee and Robert Boone, ed., (Westport, Conn.: Greenwood Press, 1979), p. 23. Data from official 1970 Census of Population, prepared by SROS Consumer Market Data Division (January 1, 1979).

the Reconstruction Era following the Civil War, the majority of blacks continued to labor in the same fields they had tilled as slaves.

According to Manning Marable writing in Chapter I of The Black Rural Landowner--Endangered Species, most blacks elected to live and work in the South after slavery--many believed that their masters' plantations would be divided and distributed to the former slaves.¹ However, as Manning documents, the basic pattern of southern land tenure changed very little after 1865. "In most counties, the wealthiest 5 percent of all landowners controlled 40 percent of the property or more, and the upper tenth of all farmers owned from one-half to two-thirds of all land in every county."²

Yet, the desire for owning their own farm land continued as a strong motivating force for the freed man. By the 1890's, for example, land acquisition and the development of a strong black land base became an ideological imperative articulated by such spokesmen as Booker T. Washington who preached the rationale of self sufficiency through land ownership.³ And despite the exploitative sharecropping system--a functional alternative to a shortage of cash following the Civil War with which to remunerate farm labor--blacks increased their ownership of farms to 213,000 representing 16 million acres by 1910.

¹Manning Marable, "The Land Question in Historical Perspective: The Economics of Poverty in the Blackbelt South, 1865-1920, "The Black Rural Landowner--Endangered Species, pp. 4-5.

²Ibid., pp. 5-6.

³Ibid., pp. 11-15.

After 1910, however, the number of black farmers and black landowners started to decline. Faced with exhausted land, a poor cotton market and increasing discrimination and harassment by the Klu Klux Klan, blacks started to leave the South in a migration stream that has only been slowed and now reversed in the 1970's--almost 60 years later.

The Urban Orientation of Minorities

Increasingly, after 1910 racial minorities--blacks in particular--sought to escape the racial discrimination, low wages and other disadvantages associated with a rural Southern life style by migrating to the urban Northeast and Midwest. During the first half of the 20th century almost two million migrated. This constituted, according to Lerone Bennett, Jr., "the greatest internal migration in modern history."¹ By 1930, for example, one out of every four blacks had left the state of his birth and nine out of every ten northern blacks lived in cities.² Herbert succinctly summarizes this exodus: "A people who in 1900 were 77 percent rural, in half a century became more than 65 percent urban."³

¹Lerone Bennett, Jr., Before the Mayflower: A History of the Negro in America 1619-1964 (Baltimore: Penguin Books, 1966), p. 935.

²Leslie H. Fishel and Benjamin Quarles, The Black American (Glenview, Illinois: Scott Foresman and Co., 1970), pp. 362-363.

³James H. Herbert, "Urbanization and the Negro," National Conferences of Social Work, Proceedings, 1933, (New York: Macmillan, 1934), p. 41. Quoted in Frank G. Pogue, "The Mobile Black Family: Sociological Implications."

This transformation of the black population from a predominantly rural to an overwhelmingly urban orientation has, of course, brought about massive social and economic changes. But according to Williamson, despite the urban reality of blacks and other racial minorities, "the process of urbanization did not necessarily strip the black Americans of an affinity for the trees, songbirds, fishing, swimming holes, or the clean fresh air of the less populated South."¹ He, furthermore, argued that while a number of migrants achieved their dreams of a better life, a vast number were disappointed with the ensuing quality of life in the city--few trees, few songbirds, noise, pollution and so forth.² And ironically, the black American's affinity for the natural environment--i.e., the trees, songbirds, fishing, swimming holes to which Williamson refers--was both nourished and stifled by his experiences in the rural south:

It is the land of bitter memories, it is the land once worked by slaves; the land on which tenant farmers and sharecroppers struggled to survive, a land so hard that those who worked it cursed it and those who owned it often considered it a millstone around their necks. It is the land from which millions of blacks fled during the great trek from the South. . .³

One indication, however, of increasing dissatisfaction of minorities with the quality of urban life in northern cities

¹Robert D. Williamson, "Urban Minorities: Don't We Count?," Journal of Forestry, 73 (May, 1975), p. 281.

²Ibid., p. 282.

³Earl Caldwell, "Gaining Ground on Black Property," Black Enterprise, (May, 1978), p. 21.

has been the slow reversal of blacks leaving the South. Between 1970 and 1974 the number of blacks four years old and over moving to the South closely approximated the number leaving--276,000 immigrants versus 241,000 outmigrants.¹

And so, where once the promised land of the North attracted yet another generation of young blacks during the 1950's and 1960's, this promise turned sour in the Seventies--spiraling living costs, high crime rates, polluted air and filthy streets first slowed, then reversed this migration.²

Land as an Equity Resource

This great trek from the rural south to the northern metropolitan cities in search of dignity and decent wages did not solve all the problems for the black man. In fact, it may have exacerbated life for many. He came seeking dignity and a decent wage, but found in many instances unemployment, underemployment, substandard housing, inadequate education for his children, and so forth.

The civil rights gains of the Sixties--voting, access to public accommodations, desegregation of public facilities--moreover, were spawned in part by civil rights demonstrations

¹Frank G. Pogue, "The Mobile Black Family: Sociological Implications." Chapter 2 of The Black Rural Landowner--Endangered Species, p. 29.

²Flontina Miller, "Coming Home: Many Find the North No 'Promised Land,'" The Greensboro Record, part of the Record Series "Years of Change . . . 1954-1978," an attempt to assess the changes in Greensboro's black community since the U.S. Supreme Court decision in May of 1954 outlawing segregated public schools.

which forced media attention on the incongruence of the plight of American Blacks and this country's principles.

But now in the Seventies with problems of environmental quality and inflation-recession, many of the hard fought gains in civil rights have been eroded by an increasingly conservative national mood. Although attitudes were altered enough for passage of much civil rights legislation, many now perceive that too much was done for this minority group. They readily accept the myths that the problems of discrimination no longer exist, that most blacks have achieved middle class status, that total equality of opportunity has been achieved and that there is no need for special efforts on behalf of blacks and other minorities.¹

Yet much of the progress of blacks and other minorities over the past twenty years, has depended largely on their ability to find and keep jobs (through civil rights initiatives), but any substantial progress toward economic security is dependent on more than just acquiring a good job. Minorities must begin to control a larger proportion of the economic wealth in the United States. For example, fluctuations of the economy during the Seventies, if nothing else, has taught blacks and other non-whites a cruel lesson. They own or control disproportionately less of the capital resources in America than any other group.²

¹Vernon E. Jordan, Jr., Introduction to The State of Black American: 1979 (New York: National Urban League, Inc., 1979), p. ii.

²Lester Thurow and Robert Lucas, of the Massachusetts Institute of Technology, claim that in twenty-five years of steady economic growth, the income shares are essentially the same in 1970 as they were in 1947.

In a study by Peter Henle of the United States Department of Labor, he noted a persistent trend in the economy toward actual inequality. For example, from 1958 to 1970 the share of aggregate wage and salary income earned by the lowest fifth of male workers declined from 4.60 percent to 4.10 percent, while the share of the highest fifth of the male wage and salary earners rose from 38.15 percent to 40.55 percent. Given this trend, he concluded that the structure of the economy was producing more high-paying, high-skill jobs while low-skill employment remained constant.¹

Although civil rights legislation has indeed "opened the door," perhaps true social progress depends upon acquiring a larger slice of the economic wealth of the United States. Unfortunately, the lack of capital resources and business management expertise has been a persistent barrier to minority economic development.²

And, perhaps even more ironic, the search to find minority equity ownership focused attention on the importance of non-white land ownership, especially in the rural South where land constitutes the largest equity resource under minority control, but from whence millions of blacks migrated thirty to forty years ago.

¹Smith, Environmental Quality and Social Justice, p. 130.

²James M. Hund, Black Entrepreneurship (Belmont, California: Wadsworth Publishing Co., Inc., 1970), pp. 32-33.

Significance of Natural Resources

More racial minorities should be involved in owning, planning, managing, using and developing natural or land resources for three basic reasons: (1) significance of natural resources as factors in production, (2) political influence, and (3) economic influence. Since land and associated resources are basic factors of production along with labor, capital and management, those who own or control them help dictate to a large extent what is produced, how it is produced and who benefits. Land, according to Raleigh Barlowe is a natural source of food, fiber, building materials, minerals, energy resources and other raw materials essential to modern society.¹

In 1970, 1.6 billion acres (69 percent) were classified as forest, range land and inland waters.² Most of this acreage--825 million acres (70 percent) are privately owned. Outdoor recreation, water, timber, wildlife and minerals reflect the diversity of the goods and services that flow from this land resource:

. . . Nearly all of 1.6 billion acres is used in some form of outdoor recreation by well over half the population.

. . . Forest and rangeland influence the quantity, quality and timing of water in the streams, lakes and reservoirs of the country.

¹Raleigh Barlowe, Land Resource Economics: The Economics of Real Property, (Englewood Cliffs, New Jersey: Prentice-Hall, 1972), p. 9.

²U.S. Department of Agriculture, Forest Service, The Nation's Renewable Resources--An Assessment, 1975, p. 1.

. . . Timber is the nation's second most important agricultural crop in terms of value--equal to about 17 percent.

. . . All 1.6 billion acres provide habitat for various forms of wildlife--big game as well as countless numbers of lesser mammals, song birds, upland game birds, water fowl, reptiles, amphibians and fish.

. . . Extensive mineral deposits underlie forest and rangeland. Between 1930-1971 some 3.7 million acres of land in the United States were mined.¹

The potential for political and economic influence can also justify increased minority involvement in natural resources. In 1978, national income from the agriculture, forestry and fisheries industry represented 44,594 (million dollars) or 2.36 percent of a total GNP--1.887 (billion dollars). Individually, farms represented 39,814 (million dollars) or 2.10 percent.² On the other hand, government outlays by function show natural resource and environmental programs receiving 12,125 (million dollars) in 1978--this amount was 2.62 percent of the 462.2 (million dollar) fiscal 78 budget.³

Yet to really see the significance of the relationship between land resource ownership and control and political and economic influence, one might examine corporate land ownership. According to Marbury, major corporations owned 122.2 million acres (See Table 1) of commercial non-federal forest land.⁴

¹Ibid., pp. 42-52

²The World Almanac and Book of Facts--1979, pp. 94-97.

³Ibid., p. 94.

⁴Carl Marbury, "Decline in Black-Owned Rural Land," in The Black Rural Landowner--Endangered Species, pp. 104-105.

Table 1
Corporate Landownership and Position
Among Largest United States Industries

	Acreage in Millions (including some offshore)	Fortune Directory of 500 Largest U.S. Industrial Corporations (ranked by sales)
<u>ENERGY COMPANIES</u>		
Standard Oil of Indiana	20.3	12
Texaco	9.9	5
Mobil	7.8	4
Gulf	7.5	9
Phillips Petroleum	5.3	26
Standard Oil of California	5.2	6
Continental Oil	4.5	18
Union Oil	4.1	35
<u>TIMBER COMPANIES</u>		
International Paper	7.0	62
Weyerhaeuser	5.6	69
Georgia Pacific	4.5	53
St. Regis	3.9	128
ITT	2.1	11
U.S. Plywood-Champion	2.0	74
Scott	1.8	168
Boise--Cascade	1.8	111
Union Camp	1.6	225
Crown--Zellerbach	1.6	115
Kimberly--Clark	1.5	148
Continental Can	1.4	67
<u>RAILROAD COMPANIES</u>		
Burlington Northern	8.4	
Union Pacific	7.9	
Southern Pacific	5.1	
St. Louis--San Francisco	<u>1.4</u>	
Total	122.2 million acres	

¹Fortune, May 7, 1979, pp. 268-293.

Although this is only 18 percent of the total, all energy and timber companies with sizable acreage are ranked in Fortune's Magazine's Directory of the 500 largest U.S. Industrial Corporations (ranked by sales). The only exceptions were railroad companies. Energy companies were ranked no less than 35th, while Timber companies ranged from 11th to 225th.¹

Marbury only used corporate landownership to preface his thesis that fewer and fewer owners control the land, especially with the number of absentee landowners increasing.² Yet, prime farm land--land having the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops--has increasingly been selected as a hedge against inflation by all sorts of investors. In fact, because of the demand from weekend farmers, ranchers, investors, developers and full-time farmers themselves, farm land prices recorded a 14 percent nationwide increase in 1979. This compares to a 9 percent increase the previous year.³

Moreover, Barlowe, suggests that of the many institutional factors that affect ownership and use of land resources, none are more important or fundamental than the concept of

¹Computing a direct correlation between land ownership and a corporation's sales is beyond the scope of this study.

²Marbury, "Decline in Black-Owned Rural Land," The Black Rural Landowner--Endangered Species, p. 105.

³Jack Bickers, "Why the Southern Land Boom May Be Just Beginning," Progressive Farmer, July, 1978, p. 15.

property rights. Consequently, sentiment favoring farm and especially home ownership has had a marked effect upon the nation's land policies and an integral part of our accepted political philosophy.¹

Nelson, for example, states that "in a society based on capitalism, land ownership becomes an essential and unalterable prerequisite for economic development and the exercise of substantial political influence."²

Unfortunately, since 1910 there has been a steady decline in the amount of black-owned farm land. From a high of eleven million acres, less than five and one-half million acres remain, which is itself being lost at the rate of 6,000 acres a week.³

Lester Solomon in a study of black-owned land carried out for the Office of Minority Business Enterprise, had earlier documented this disappearing equity base--a loss of five million acres of land or over 330 thousand acres per year between 1954 and 1969.⁴ He later refers to this phenomenon as a crisis and an opportunity because land represents a sizeable equity resource to support non-agricultural minority economic

¹Barlowe, Land Resource Economics, p. 358.

²William E. Nelson, Black Rural Land Decline and Political Power, Chapter 6 in The Black Rural Landowner--Endangered Species, pp. 83-85.

³Earl Caldwell, "Gaining Ground in Black Property," Black Enterprise, May, 1978, p. 22.

⁴Lester M. Solomon, Black-Owned Land: Profile of a Disappearing Equity Base (Working Paper Institute of Policy Review and Public Affairs, Duke University, 1974), p. 11.

development, but at the same time is rapidly being depleted through a variety of legal and paralegal procedures, i.e., partition sales, tax sales, foreclosures, and adverse possession.¹

Finally, Caldwell notes that "for Blacks," memories of the land have not changed. But the South has changed. The importance and value of the land has changed, too, and that is reflected in the intensity of the effort mounted to halt the loss of black-owned farmland in the South:

It is still the land of bitter memories. These memories cannot be erased. But the people who live in the South on the land that the slaves once worked, the land tenant farmers and sharecroppers struggled to survive on, they believe that it is important that they share in the ownership of the national territory. They believe that the ability to deny people land is the way of keeping themselves--economic slaves.²

Therefore, because of this potential equity base and because of the quality of life in the South, as opposed to northern ghettos, and because of new job opportunities, minorities are slowly returning to the "new South" and rediscovering that they can indeed take pride in rural ownership because ownership of such land can help achieve the goal of social justice and equality in America.³ Given this trend, old assumptions about this group's perceptions of the land and their attitudes about the South should perhaps be reexamined.

¹Ibid.

²Earl Caldwell, p. 48.

³Jack Nelson, "A New Landscape In the South," Greensboro Daily News, June 17, 1979, LA Times--Washington Post News Service.

Identified Barriers

Perhaps, the first national effort to focus on the problem of the lack of minorities pursuing careers in natural resources was the 1975 Tuskegee Workshop on "Barriers Facing the Entry of Minorities Into Natural Resource Careers."

Berry, a keynote speaker, categorized these barriers as academic, financial, aspirational, geographic, physiological, psychological and sociological. He further suggested that few blacks or other minorities have been involved in educational preparation because leaders in this field have not in the past, sought, encouraged, nor welcomed black high school graduates.¹

Following other presentations on specific aspects of these barriers, the workshop participants reached a final consensus on thirteen roadblocks restricting the entry of blacks and other minority groups into these professions:

1. Resistance to change by the natural resource professions.
2. Negative agricultural and forestry experiences.
3. Urban orientation of minority groups.
4. Financial need.
5. Racial discrimination.
6. Lack of awareness and exposure to natural resource careers.

¹Gordon L. Berry, "Career Development and Afro-Americans: Defoliation of the Barriers," in Proceedings of Workshop on Entry of Minorities Into Natural Resource Careers, (Tuskegee, Alabama: Southern Forest Experiment Station, Forest Service, USDA, 1975, pp. 9-17.

7. Past job availability.
8. Education system--teachers, counselors, administrators and professors.
9. Home culture and environment.
10. Too many foresters for available jobs today.
11. Poor academic preparation.
12. Lack of role models.
13. Lack of positive interest by personnel representing academic institutions, industry, state and federal governments.

Secondly, the workshop participants recognized a number of factors which have enabled a limited number of minorities to successfully pursue careers in natural resources: scholarships, summer employment, Youth Conservation Corps, cooperative education, environmental education and cooperative relationships between industry and academic institutions.¹

Summary and Implications from Natural Resources Literature

The results of this review may be summarized under three headings: limited minority professional employment, negative land and environmental heritage, more barriers than opportunities.

1. Ethnic minorities hold few positions of power in parks and recreation organizations but even fewer are professional foresters.

¹Proceeding of a Workshop on Entry of Minorities Into Natural Resource Careers, P. 78.

2. Blacks played an important role in the development of the southern forestry industry--pulp and paper and lumber and wood products--but primarily as low paid, unskilled labor.
3. The heritage of slavery and rural experiences in the south have given many blacks negative conceptions about the land. There is a feeling that the environmental movement has distracted from the priorities so important to racial minorities such as adequate health care, housing, education and employment.
4. The existence of financial, aspirations, geographic, physiological, psychological and sociological barriers does not preclude the influence of positive factors if nurtured.

In essence the struggle and continuing vigilance of black and other minority Americans to achieve and retain basic human rights has, perhaps, precluded their extensive involvement in the environmental movement. Thus the major articulation of the inequalities of the American System by black and other racial minorities has focused on civil rights, housing, employment and educational opportunities. For these reasons, many may be oriented to careers which are perceived as instrumental to this struggle (i.e., law, medicine and education).

Yet, no systematic study of graduates of programs in natural resources has been attempted to establish the existence of a correlation between career decision making and the many variables influencing their selection. No systematic study has attempted to ascertain commonalities, if any, among minority graduates who do pursue careers in natural resources.

Since blacks and other minorities, moreover, are a diversified group with different backgrounds and experiences, future efforts to recruit both minority students and professionals may be less than optimum without a more complete understanding of this problem.

Vocational Choice Research

Although no systematic study of graduates of programs in Natural Resources has been initiated to establish a correlation between career decision making and the many variables influencing their career selection, or to ascertain commonalities among minority graduates who do pursue careers in natural resources, this does not mean that the career decision making process has not been researched. On the contrary, the process has been widely studied; but despite numerous studies, career decision making still remains only a partially understood process. Vocational psychologists like Crites have agreed, however, that it is a process made up of a series of events or "choice acts" which usually take place during the ten year period from early adolescence to occupational entry.¹

According to Crites, there are seven dimensions of vocational choice appearing in the literature: (1) orientation to choice--awareness that one must choose an occupation as his life's work; (2) clarification of vocational self-concept--crystallization of traits and aptitudes; (3) occupational

¹Crites, Vocational Psychology, p. 164.

information--knowledge of occupations and how to enter them; (4) independence--more self sufficiency in decision making; (5) day dreaming and fantasy--picturing oneself in different kinds of work; (6) means-end cognizance--relating goals with the necessary steps to achieve them; and (7) consistency of choices--agreement among choices increases with maturity.¹

Of these seven dimensions, however, occupational information appeared to have the most relevancy to this problem. Super, for example, states that as the individual ages, he also gathers more information about occupations and how to enter them. And as the individual matures, this career information should increase in relevance, reliability and specificity; he or she should use it more often as a basis for their decisions.²

Treatment of Race

Within this specific dimension of occupational knowledge, racial background is a critical factor. The history of racial minorities in America indicate that lack of occupational knowledge due to past discrimination and its legacy influences their failure to consider many non-traditional career options. For the purpose of this review, treatment of race in vocational literature may be classified as pre-1970 and post-1970.

¹Ibid., pp. 165-167.

²Ibid., p. 167.

Pre-1970 Studies

Prior to 1970 three major studies focused on race as a major factor in vocational choice: Hyte¹ in 1936, Gray² in 1944 and Lawrence³ in 1950. These studies and other results lead Crites to conclude that almost without exception, black youth selected three occupations most frequently: (1) physician, (2) teacher, and (3) musician. They selected the occupations of lawyer, engineer and farmer less frequently.

Yet among the available Pre-1970 studies that compared the differences in vocational choice by race, results were inconclusive when all other factors except race were controlled--race is not a major predictor of career choice. But Crites did cite one study by Witty and others that concluded: Whites prefer occupations which are largely "thing-oriented," while Negroes select occupations which are mostly "people-oriented." The occupations which ranked the highest for Negroes were postal work, musician, physician and lawyer; for whites, they were engineer, aviator, mechanic-machinists and forester.⁴

¹C. Hyte, "Occupational Interests of Negro High School Boys," School Review, 44 (1936) pp. 34-40, cited by Crites, Vocational Psychology, p. 224.

²S. Gray, "The Vocational Preference of Negro School Children," Journal of Genetic Psychology, 64 (1944) pp. 239-247, cited by Crites, Vocational Psychology, p. 224.

³P. Lawrence, "Vocational Aspirations of Negro Youth in California," Journal of Negro Education, 19 (1950: pp. 47-56.

⁴P. Witty, S. Garfield and W. Bunk, "A Comparison of the Vocational Interests of Negro and White High School Students," Journal of Educational Psychology, 32 (1941) pp. 124-132, cited by Crites, Vocational Psychology, p. 226.

Some insight into why blacks have traditionally selected teaching as a career was provided by Brazziel's 1961 study of 170 sophomores and seniors at a southern university. He found that more than half entered teaching as a second choice, while slightly less than half intended to use it as a stepping stone to another occupation.¹ In other words, many black college students, recognizing the restrictions against their race, chose teaching as a "second best" but realizable goal.

Brazziel also attempted to determine the key influentials in the vocational choice process. He found that parents and public school teachers were the most influential.

In 1961 Uzzell studied the influencers of occupational choice of 301 senior male Negro high school youths in eastern North Carolina. He found a definite relationship between respondent's occupational aspirations and their knowledge of occupational models: of the 211 respondents who knew models, 162 or 77 percent indicated their choices were influenced by models; only 49 or 23 percent who knew models indicated they were not influenced by them.

Finally, Uzzell suggested that the number of visible models for superior or high aspiring students may be very limited in small towns that have a low socio-economic level. The general occupational structure is unlikely to include a representative cross section but rather a concentration of low status ones.²

¹W. F. Brazziel, Jr., "Occupational Choice in the Negro College," Personnel and Guidance Journal, 39 (1961) pp. 739-742.

²Odell Uzzell, "Influencers of Occupational Choice," Personnel and Guidance Journal, 39 (1961) pp. 666-669.

Post-1970 Studies

In 1970, Pallone, Rickard and Hurley studied the "Key Influencers of Occupational Preferences among Black Youth." They compared the reported key influencers of occupational preferences of black and white youth from working class families in four northern cities.¹

They concluded that the most potent influencers of occupational preference was the same-sex parents in tandem with appropriate occupational role models, whatever the subjects race or sex. Only among black males did the influence of the opposite-sex parent, rival that of the same-sex parent.

In 1974, LaFette analyzed the work values of university students by ethnic group and sex. She started with the premise that values are "inner determiners" that tend to dictate a person's choices in life. Work values can serve as a tool for differentiating priorities of interests, alternatives and the values that influence these alternatives.

She found that there were indeed differences and similarities in work values (as measured here by the Work Value Inventory) between ethnic groups. Her data demonstrated by order of emphasis that:

1. American born groups placed way of life as the highest value; foreign students gave creativity the highest mean score.
2. Anglo-Americans emphasized way of life, achievement, altruism and independence.

¹N. Pallone, F. Rickard and R. Hurley, "Key Influencers of Occupational Preference Among Black Youth," Journal of Counseling Psychology, 17 (1970) pp. 498-501.

3. Black-Americans emphasized way of life, economic returns, supervisory and achievement values.
4. Mexican-Americans emphasized way of life, security, achievement and independence.
5. Oriental Americans emphasized way of life, creativity, achievement and surrounding.
6. All groups emphasized achievement.¹

Responding to this gap in the vocational development knowledge of black individuals, Elsie J. Smith compiled a "Profile of the Black Individual in Vocational Literature." In 1975, she examined past research in terms of impact of family role models, family stability-instability, work concept and job values, Maslow's need hierarchy, the motivator-hygiene theory, self concept and identity foreclosure. Although her profile was useful, Smith readily admitted its accuracy was open to debate and research verification: "the profile of the Black individual as portrayed in the research cited is a portrait of a vocationally handicapped person. . ."²

The pre-1970 research of blacks in the vocational literature also sparked June and Pringle in 1977 to suggest that career development theories in the past have had limited applicability to the black or minority experience. Black and

¹Pat Chew LaFette, "Work Values of University Students: An Analysis by Ethnic Groups and Sex. (Master's Thesis, University of Texas, 1974), pp. 66-67.

²Elsie J. Smith, "Profile of the Black Individual in Vocational Literature," Journal of Vocational Behavior, 6 (1975), pp. 41-59.

other racial minorities face problems unique to their particular groups which need to be considered.¹

In 1975, Career Behavior of Special Groups further documented the psychological, sociological, economic and educational viewpoints of vocational choice behavior. In Chapter two, Carter and Picou discussed "Status Attainment Theory and Black Youth." They suggested that status attainment research has been very productive in testing basic socio-psychological theory and advancing the understanding of the actual processes by which status is allocated within and across generations. Since Blau and Duncan developed the basic model of this process in 1967, it has become useful in summarizing the situation of blacks and whites in America:

. . . They are apparently operating under two distinct systems of stratification. The primary stratification system can be defined as "institutional racism," in which the society at each stage of the life cycle, gives blacks a smaller reward than it gives whites for equivalent investments or attainments. . . it does not appear to make much difference how much status a black attains at any one stage of the life cycle: the system will not allow him to carry that attainment on to the next stage as easily as it will a white person.²

Using this basic status attainment research, Woefel advanced "A Theory of Occupational Choice" to explain or predict actual job choices. Basically, socio-economic status, sex and

¹Lee N. June and G. Pringle, "The Concept of Race in the Career Development Theories of Roe, Super and Holland," Journal of Non-White Concerns, 6 (1977), pp. 17-24.

²Michael T. Carter and J. Steven Picou, "Status Attainment Theory and Black Male Youth," Career Behavior of Special Groups, ed. J. S. Picou and R. E. Campbell (Columbus, Ohio: Charles E. Merrill, 1975), pp. 28-40.

other factors exercise casual influence over socio-psychological factors, which in turn exert direct influence over individual attitudes. Ultimately, the individual selects a career where these different forces of influence are in balance--occupational expectations from significant others, personal expectations, socio-economic variables and so forth. Or, in other words, a career choice logically attempts to balance these dissimilarities in occupational expectations.¹

A year later in 1976, Smith completed additional research: "Reference Group Perspective and the Vocational Maturity of Lower Socioeconomic Black Youth." She interpreted the significance of her finding as lower socioeconomic black youths vocational maturity varies as their reference group perspectives, post high school plans (work or college bound), and their views of the opportunity structure (open or closed) varies. Because of so much potential diversity, black youth should not be treated as one homogenous group.²

Dillard assumed in his 1976 study that levels of career maturity are related to socio-economic status independent of race. He subsequently found in his study of 252 sixth grade black males that self-concept may have less influence on their career maturity than was initially expected among the independent variables; socio-economic background seems to be the

¹Joseph Woefel, "A Theory of Occupational Choice," Michigan State University, 1975 (mimeographed).

²Elsie J. Smith, "Reference Group Perspective and the Vocational Maturity of Lower Socio-economic Black Youth," Journal of Vocational Behavior, 8 (1976) pp. 321-336.

most useful in predicting career maturity.¹

Under-representation of minority groups in science careers was studied by Maureen Sie and others.² For the most part, the results did not clearly illustrate any differences between the groups' family background, motivation or attitudes and experiences within the University. The small sample size, however, of black science majors precluded widespread generalization. But personal preferences, enjoyment of the subject, and getting a good job were of paramount importance for all respondents.

Osipow concluded his discussion of career development theories by suggesting the process involves at least six steps regardless of the specific theory: self-assessment, obtaining information, processing information, planning, decision-making, and coping with crisis and change.³

Conceptually, these six steps are interdependent; although, the obtaining and processing of career information controls the success of the entire process. Accurate, timely, and pertinent information are prerequisites for effective career decision-making.

¹John M. Dillard, "Relationship Between Career Maturity and Self-Concepts of Suburban and Urban Middle and Urban Lower Class Preadolescent Black Males," Journal of Vocational Behavior, 9 (1976) pp. 311-320.

²Maureen Sie, Barry Mackman and Stephen B. Hillman, "Minority Groups and Science Careers: An Ecological Analysis," paper presented at the American Educational Research Association Annual Conference, April, 1977.

³Osipow, Theories of Career Development, p. 16.

Summary and Implications of Vocational Choice Literature

Throughout this literature, there were frequent references to career information of knowledge of careers and its importance to effective decision making. For these reasons, the importance of career information cannot be minimized. Other major highlights may all be summarized under the heading of race and career choice:

- (1) Although blacks may have different occupational selection patterns, race is not a major predictor of career choice when all other factors are controlled.
- (2) Black and other racial minorities may select careers in terms of realizable goals given the limitation of their race. Economic returns and achievement are important in their career choice.
- (3) There is a relationship between occupational aspirations and knowledge of occupational models. Same-sex parents and occupational role models are key influencers.
- (4) Past vocational theories may have limited utility for the problems of such special groups as minorities, women and the handicapped.
- (5) Because of within group diversity, black and other racial minorities should not be treated as one homogeneous group.

Although often stated humorously, there is a measure of truth to the statement that once blacks and other racial minorities could only aspire to be teachers, preachers or social workers with any chance of success. Today, however, with the

advent of the civil rights legislation of the sixties, non-whites have increasingly selected careers heretofore illegally closed to them. But while many of their choices are certainly different from teaching or preaching, they continue to reflect a pattern of the "helping-social" careers, perhaps because they are still perceived as having been most helpful in the continuing drive to achieve social and economic justice. Few have opted for careers in natural resources.

Information Dissemination Theories

Because the current pattern of minority career selection does not necessarily reflect the impact of the equal employment opportunity legislation in many non-traditional careers, another element needs to be considered--the process of information dissemination.

Since information and its dissemination play such a vital role in a complex society, there is a rich research tradition in a variety of disciplines which address the diffusion or dissemination of innovations (information) into a society, group or culture.

In 1972 Zaltman characterized the process of diffusion as the (1) acceptance, (2) over time, (3) of some specific item--and idea or practice, (4) by individuals, groups, or other adopting units, linked (5) to specific channels of communications, (6) to a social structure, and (7) to a given system of values or culture.¹

¹Gerald Zaltman, Philip Kotler and Ira Kaufman, Creating Social Change (New York: Holt, Rinehart and Winston, Inc., 1972),

The assumption is that increased selection of non-traditional careers in natural resources by racial minorities is such an innovation. It is then hypothesized that given accurate, timely and pertinent career information, blacks and other racial minorities may aspire for, and pursue such careers. According to Berry, Picou, Campbell and others, the normal career development model may be inappropriate at best in predicting or explaining career choices of minority groups. New and more relevant models are needed.

The Bicultural American

In their review of related literature, Greenberg and Devin referred to past research which emphasized that the poor lived in a subculture.¹ The behaviors, attitudes and feelings of the poor differ from those of the rest of society.² And since race is an important factor of subculture, several models have been advanced for describing and analyzing their culture.

Yet Valentine states that such "deficit, difference and culture of poverty models" are inaccurate. As a result of ongoing field investigations he proposed a bicultural educational model which recognized that many blacks and other racial minorities are simultaneously committed to both a minority culture and a mainstream culture. The two are not mutually exclusive as generally assumed:

¹Bradley Greenberg and Brenda Devin, "Mass Communication Among the Urban Poor," Public Opinion Quarterly, 34 (Summer, 1970), pp. 224-235.

²See for example Kerner Commission Report or Oscar Lewis, "The Culture of Poverty," Scientific American, 215 (October, 1960), pp. 19-25.

. . . the collective behavior and social life of the Black Community is bicultural in the sense that each Afro-American ethnic segment draws upon both a distinctive repertoire of standardized Afro-American group behavior and, simultaneously, patterns derived from the mainstream cultured system of Euro-American derivation. Socialization into both systems begins at an early age, continues throughout life and is generally of equal importance in most individual lives. . .¹

Even the ghetto homes are not excluded from the enculturation experience according to Valentine. From earliest childhood, their members are exposed to many mainstream themes, values and role models.

McCullogh, author of a special chapter in Minorities in the Youth Conservation Corps, also thinks that biculturalism is one way of understanding the behavior of blacks. He believes blacks share much more of the mainstream culture than whites do of black culture. Yet blacks maintain much closer ties with their minority culture. This culture is an important factor in forming a black's perspective of the white majority and the many mainstream activities.²

"The black adolescent," for example, "has to incorporate some concept of his black culture into his search for identity and his vocational choice process. And even though he has pride in his blackness (partially the result of the black awareness

¹Charles A. Valentine, "Deficit, Difference and Bicultural Models of Afro-American Behavior," Harvard Educational Review, 41 (1971), p. 143.

²William Moris, Jerome Johnston, Albert Jaramillo and Wayne McCullogh, Minorities in the Youth Conservation Corps: A Study of Cultural Groups in the 1974 YCC Program (Ann Arbor: Institute for Social Research, 1974), pp. 39-51.

movement of the sixties) at some point in time, the black adolescent comes to realize that the larger society may still restrict the places he can go comfortably, the activities and organizations he may participate in or belong too, and, unfortunately, even the occupation he might wish to select for his life's work."

Because of this situation, Valentine speculates that a good deal of the mainstream cultural content learned by bicultural racial minorities remain only latent. "The structural conditions of poverty, discrimination and the legacy of segregation, prevent the minority group member from truly achieving the many mainstream middle-class values, aspirations and role models." Ironically, enculturation provide great familiarity with mainstream patterns but limited opportunity to actively practice these patterns.¹

Summary and Implications of Information Dissemination Theories

Because there was a need for new models to understand and predict vocational choice of racial minorities; and because the selection of non-traditional careers by racial minorities may be considered an innovation, the researcher selected the information diffusion/dissemination model as an experimental vehicle.

Accordingly, the most pertinent results of this review may be summarized as:

¹Valentine, "Deficit, Difference and Bicultural Models of Afro-American Behavior," Harvard Educational Review, p. 144.

- (1) If given accurate, timely and appropriate career information, then black and other racial minorities may aspire to and pursue careers in natural resources.
- (2) The process of biculturation hinders the development of an isolated racial subculture. Most racial minorities are simultaneously acculturated to both ethnic and mainstream culture.
- (3) Although mainstream and ethnic cultures are juxtaposed, the institutional conditions (i.e., poverty and discrimination) of society may prevent minorities from truly achieving the many mainstream middle class values, aspirations and role models.

Through this review of pertinent literature from natural resources, career decision-making and information dissemination, the researcher has attempted to synthesize key elements from the many divergent theories in order to understand and measure the crucial factors that need to be considered when developing successful minority recruitment and retention models.

Chapter III

MODELS AND HYPOTHESES

Career development is a lifetime process which begins early in an individual's life. Family background and life experiences, particularly those during the pre-teen and early teen years, have much to do with attitude formation and subsequent decisions about career choices. Secondly, educational experiences--primary, secondary, and college--also exert a measureable influence on this process. Finally, the labor force experiences, both before and after the occupation entry, affect future vocational choice.¹

Given these antecedents, expectations of significant others and related factors, the individual is still required to process the information and reach a decision. In conjunction or in order to explain these two processes--antecedent factors and related experiences--career decision making models have been conceptualized around early childhood experiences, developmental stages, extension of personality, self-concept and status attainment. Yet, according to Osipow, the career decision making process itself, despite which model is utilized involves six basic elements: (1) self-assessment;

¹Joseph A. Mihalka, Youth and Work, p. 5.

(2) obtaining information; (3) processing information; (4) planning; (5) decision making; and (6) coping with crisis and change.¹

Crites assigned the differences apparent in the several theories to the individual's frame of reference and his assumptions about human behavior. He also acknowledged that the vocational choice process may not be continuous--mid-adolescence is particularly traumatic of early career goals and there may be other periods. And because maturity and a variety of experiences--both positive and negative--determine how realistic the final choice is, the irreversibility of any career choice is also suspect.²

Moreover, the six elements of career decision making discussed by Osipow are not unlike the seven vocational choice dimensions highlighted by Crites. Both typologies, however, include the important concept of career information which is the major focus of this study.

Information Diffusion-- Dissemination Model

A theoretical framework that can systematically describe these diverse components is the general communications model. Communication is the process by which messages are transferred from a source to a receiver by certain channels: a Source (S)

¹Osipow, Theories of Career Development, p. 160.

²Crites, Vocational Psychology, p. 155.

sends a Message (M) via certain Channels (C) to the Receiving Individual (R).

Source → Message → Channels → Receiver

A more specific communication model for our purpose, however, is the revised diffusion model developed by Rogers and Shoemaker in Communication of Innovations (when minority students, for example, select careers in certain non-traditional areas like natural resources, this study assumes that it is an innovation).

Their diffusion model consists of the antecedents--receiver and social system variables, the innovation-decision process--knowledge, persuasion and decision; and the ultimate consequences of the process--confirmation of either the adoption or rejection of the decision.

The basic elements of this model are:

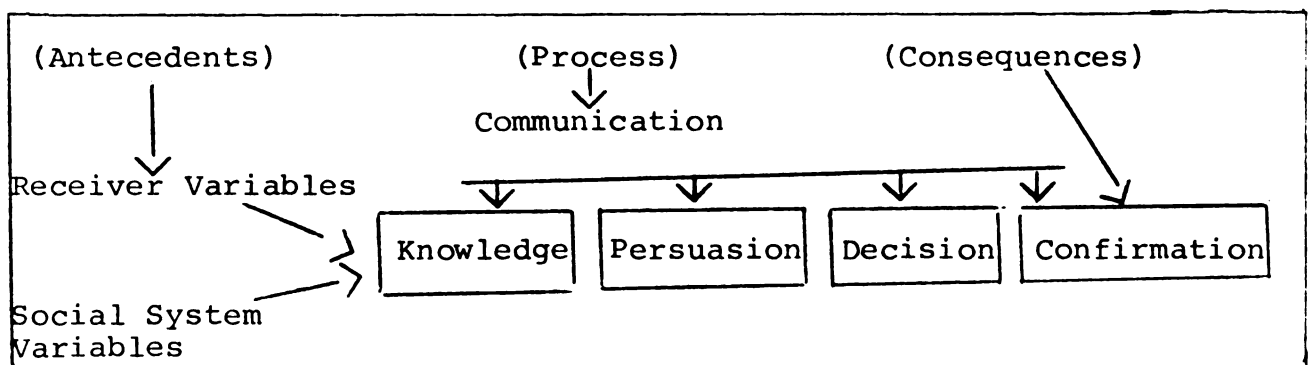


Figure 1. The Innovation-Decision Process¹

¹E. M. Rogers and F. F. Shoemaker, Communication of Innovations: A Cross-Cultural Approach (New York: Free Press, 1971), p. 102

The above model formed the systematic framework for this study. Yet, the major focus was on the process elements of knowledge, persuasion and decision, although, appropriate data were collected for antecedent and consequence variables. In essence, the basic task was to understand how graduates of programs in natural resources obtained and processed information prior to deciding on a career in natural resources.

According to the basic communication model, the knowledge element may be considered in terms of source of career information, timeliness of information, channels of information, content of message and attitudes of receiver. Consideration of the persuasion and decision element, however, requires a more complex model.

In 1975, Woelfel suggested "A Theory of Occupational Choice" which may be appropriate.¹ He used status attainment research in conjunction with paired-pair comparison of various careers on the basis of key variables (expectations of significant others, education expectations, socio-economic status, etc.) to develop his strategy. He viewed career choice as a product of the perceived dissimilarity among careers on the basis of these variables. Occupational choice or at least direction of job choice, consequently, may be viewed as an attempt to balance the various competing factors influencing the final selection.

Briefly, Woelfel's theory relies on the fundamental process of human perception: when an individual identifies an

¹Joseph Woelfel, "A Theory of Occupational Choice," mimeographed paper. Michigan State University.

object, he differentiates it from other objects by a single or in most cases, several attributes such as color, mass, shape and so forth.¹ Objects which are most similar, consequently, differ very little between any set of attributes.

He also uses the example of two persons who may differ in sex, age or height, and so on. When this difference or dissimilarity is measured and the measurements aggregated, the overall difference between two individuals is apparent.

	<u>Sex</u>	<u>Age</u>	<u>Height</u>	<u>Grade in School</u>
John	1	18	72"	12th
Mary	0	15	65"	9th

Figure 2. Measurement of Individual Differences

For example, if the above measurements are aggregated, John and Mary are of different sex (nominal scale), 3 years apart in age, 7 inches different in height (interval) and 3 classes apart in school (ordinal). Likewise, occupations are distinguishable from one another: potential to earn money, status-prestige, opportunity to work with people, chance to correct current (social) problems, chance to help solve environmental problems or educational requirements.

Specifically, Woelfel's research has concentrated on measuring such distances in other than the usual categorized or nominal level; a higher scale--ratio or interval--will, of course, allow more complex statistical analysis. But just

¹Ibid., p. 8.

how does a researcher measure respondent's opinions of the distance (difference) between paired comparisons, when the distance is not an abstract measure but a perceived distance? Woelfel reasoned that the best approach was to measure or express their judgments or perceptions as a ratio of some standard unit provided by the researcher:

If x and y are z units apart, how far apart are a and b?¹

Or using an example from this study:

If Postman and Bank Teller are 100 units apart, then how far apart in the chance to earn good money are high school teachers and city park and recreation superintendents?

In this study respondents were asked to indicate perceived differences between 12 pairs of careers on the basis of six job factors, resulting in a matrix of 72 cells. (See Section III of the Survey Instrument in Appendix E and Figure 3).²

Because this direct paired distance estimate requires a highly complex set of judgments, Woelfel cautioned that it is unreliable as a measure of individual perceptions; however, when a large number of individuals respond to a paired-comparison question, the central-limit theorem assures a normal distribution around a sample mean (typical test-retest reliability correlations range in the 70's).³

¹Ibid., p. 12.

²Since the researcher was primarily concerned with perceived difference between non-natural resource and natural resource careers, and limiting overall questionnaire length, the entire matrix--294 possible cells was not completed.

³Ibid., p. 14.

OCCUPATIONS	PAIRED COMPARISON						
	HST	LWY	ENG	PRS	FOR	FWB	EXT
High School Teacher		6	6	6	6	6	6
Lawyer	6		6	6	6	6	6
Civil Engineer	6	6		6	6	6	6
City Park-Recreation Superintendent	6	6	6		6	6	6
Forester	6	6	6	6		6	6
Fish-Wildlife Biologist	6	6	6	6	6		6
County Extension Agent	6	6	6	6	6	6	

Figure 3. Total Possible Cells of Matrix

Although Woelfel's theory is more complex than this brief summary, one may at least appreciate the contribution of this theory to the measurement of perceived dissimilarities of careers.

Moreover, this technique has several key advantages: (1) no restrictions are placed upon the respondent, who may report any positive real value whatever for any pair (the scale is unbounded at the high end and continuous across its entire range); (2) the unit of measure is always the same (i.e., the unit is provided by the investigator in the conditional, "If $\underline{x}$ and $\underline{y}$ are $\underline{u}$ units apart," and thus every scale unit is $\frac{1}{u}$ units); (3) the condition of zero distance represents identity between concepts and is hence a true zero (this is a ratio scale, which allows the full range of standard arithmetic operations); and (4) since the unit of

measure is provided by the experimenter, it is possible to maintain the same unit of measure from one measurement to another, both across samples and across time periods. These four characteristics taken together provide the capacity for comparative and time-series analyses at very high levels of precision.¹

Thus, when compared to the nominal or ordinal scale, the ratio scale, is much stronger and can show the more subtle differences among careers on a variety of dimensions. The end product of this technique, according to Woelfel, is a "matrix of perceived dissimilarities" of careers which represent the structure of the occupational system as it is perceived in the aggregate by the members of the culture from which the sample was drawn.²

The research model, consequently, combines major elements from Woelfel's Theory of Occupational Choice and Rogers' and Shoemaker's Innovation Decision model. The variables of the model are: knowledge of career (occupational) information, source(s) of career information, timeliness of career information, channel(s) of career information, content of career information and attitudes of the receivers.

¹Ibid., p. 13.

²Woelfel, "A Theory of Occupational Choice," p. 14.

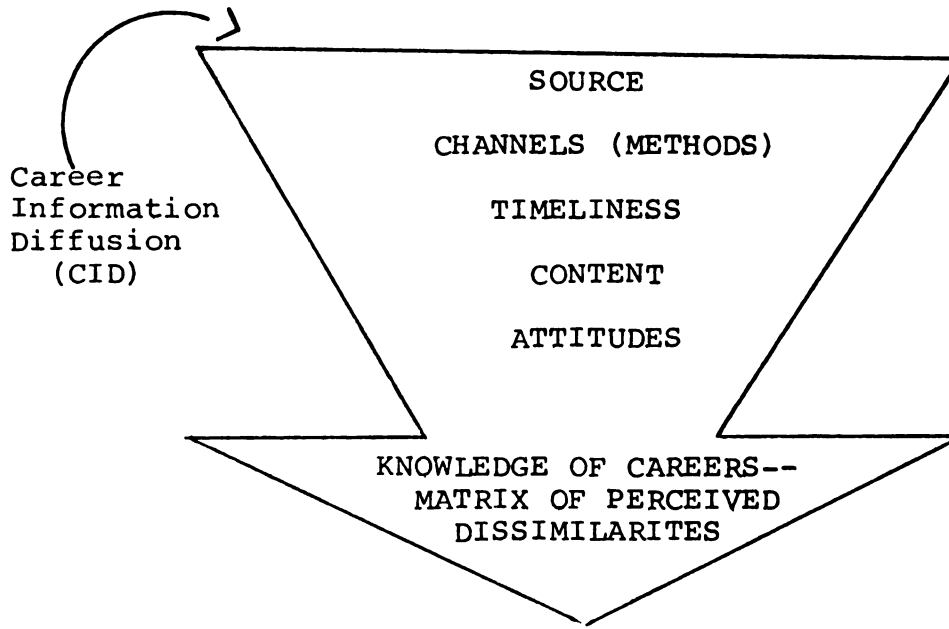


Figure 4. Career Information Diffusion

Specification of Variables

Since the occupational matrix not only represents perceived dissimilarities of careers but is also one measure of the knowledge of careers by the members of the culture from which the sample was drawn, the occupational matrix will be used as a measure of the knowledge variable.

In 1971 Rogers and Shoemaker classified knowledge in three types: awareness that an innovation exists, how-to-knowledge and principles knowledge. In terms of career development, especially where selection of a non-traditional career is treated as an innovation, the primary concern will be "awareness knowledge," which at least allows the individual to differentiate between the major attributes of various careers.¹ Knowledge of careers, therefore, will operationally

¹Rogers and Shoemaker, Communication of Innovations: A Cross-Cultural Approach, p. 106.

be defined as the matrix of perceived dissimilarities among the selected careers--the perceived difference between traditional careers and careers in natural resources.

In the past, source of innovations have been evaluated by degree to which pairs of individuals who interact are similar in certain attributes such as beliefs, values, education or social stature.¹ Moreover, innovations can only occur where there is some level of source-receiver difference. Source of career information, therefore, is operationally defined as individuals or institutions that originate a message--interact with the receiver in terms of presenting career information. Accordingly, the respondent must rate the perceived influence of different sources of career information on their selected area of college study and subsequent career--the Who of the CID process.

Channels of information dissemination are usually classified as interpersonal and mediated. But according to Rogers and Shoemaker, mass media channels such as television and radio usually create initial knowledge of the innovation, while interpersonal channels influence the final adoption of the innovation.

Operationally, channels are defined as the means by which a message gets from a source to a receiver, but in this study, channels were renamed methods for receiving or supplying career information. The respondent, therefore, was asked to

¹Ibid., pp. 210-211.

rate the perceived importance of different methods in supplying career information prior to their initial enrollment in college and following enrollment in college--the How of the CID process.

Since the acceptance of innovations is often predicated on the readiness of the target group, readiness for the acceptance of an innovation may be viewed as a temporal quality.¹ Moreover, timing of the initial dissemination of career information and frequency of exposure (reinforcement) to additional information influences the acceptance of the innovation.

Timeliness is thus defined or measured as the respondent's age when initially exposed to information about the area in which they are currently employed. Timeliness of career information, will be evaluated in terms of age at first knowledge of: (1) educational and other requirements; (2) entry job and upgrading opportunities; (3) pay and fringe benefits; (4) possible location of work; and (5) working conditions--the When of the CID process.

The purpose of communicating, of course, is the message. Content of career messages is defined as useful information about such occupational factors as: (1) working conditions; (2) possible location of work; (3) pay and fringe benefits; (4) entry job and upgrading opportunities; and (5) educational and other requirements.

Respondents were asked to indicate the amount of information received about each of the above career factors prior to their initial enrollment in college and again, following

¹Ibid., pp. 24-25.

their initial enrollment--the What of the CID process.

The final variable is the attitudes of the receiver about the innovation. Often, attitudes are the residual factors influencing acceptance or rejection. For this reason, attitudes were considered as the psychological and social factors influencing an individual's choice of occupation of career--the Why of the CID process.

To increase the reliability of the elicited responses for each respondent a rating scale rather than a simple rank-ordering technique was used. Haynes used a similar technique: he employed a one to 99 point response scale, to elicit the perceived importance of fifteen psychological or social factors in influencing the respondents choice of occupation.¹

The fifteen factors are similar to those developed by Porter in 1961 and used most recently by Haynes in 1977. The factors were designed to measure a given psychological need. They are listed in randomized order on the instrument.²

Respondents were asked to rate each psychological or social factor as follows: (1) a scale value of one indicated that the factor was of little importance in the selection of their present occupation or career; (2) a value of 50 indicated that the factor was not considered or made no difference in the selection of their present career; and (3) a

¹Worth E. Haynes, "Leadership Development and Goals Achievement through Occupations of Alcorn State University Agricultural Education Graduates," (Ph. d. Dissertation, Iowa State University, 1977).

²This researcher used the same randomized order as Haynes.

value of 99 indicated that the factor was very important in the selection of their present career.

Study Hypotheses

In order to frame the study to achieve the research objectives, two major questions were posed:

- (1) Does career information diffusion differ by year of college graduation, racial background and present job category?
- (2) Does the perceived dissimilarities between traditional careers (law, teaching, engineering) and non-traditional careers (park and recreation superintendent, forester, fish-wildlife biologist, extension agent) held by natural resource graduates differ by year of college graduation, racial background and present job category?

Using the information diffusion model and these two major questions, six specific null hypotheses were formulated to guide the investigation and to help suggest a strategy for increasing the number of minorities in natural resources. The specific hypotheses are:

- (1) There is no difference in source of career information among graduates of natural resource programs when analyzed by racial background;
- (2) There is no difference in methods of career information dissemination among graduates when analyzed by racial background.

- (3) There is no difference in timeliness when receiving career information among graduates when analyzed by racial background;
- (4) There is no difference in content of career information among graduates when analyzed by racial background;
- (5) There is no difference in attitudes (career expectations) among graduates when analyzed by racial background; and
- (6) There is no difference in perceived knowledge of careers among graduates of natural resource programs when analyzed by racial background.

Chapter IV

RESEARCH METHODS AND PROCEDURES

Selection of Sample

In 1975, over 40 colleges and universities sent representatives to the Tuskegee, Alabama "Workshop on Entry of Minorities into Natural Resource Careers". From these 40 plus institutions, ten were selected to develop the sample population.

A disproportional stratified sample was employed; the strata, of course, were the ten schools. Since the mere fact of having a representative at the workshop indicated a basic concern, other criteria for selecting sample institutions were: possibility of finding minority students and geographic location (See Appendix A for a more detailed description).

Most of these institutions have had a long and varied history in the preparation of students for entry into natural resources and/or agricultural fields. Nine of the institutions are either 1862 or 1890 land-grant colleges or universities, and represent nine states and most geographic divisions of the country:

Table 2. Geographic Location of Institutions

<u>Institution</u>	<u>Location</u>
Alcorn State University	Lorman, Mississippi
Florida A & M University	Tallahassee, Florida
Lincoln University	Jefferson City, Missouri
Michigan State University	East Lansing, Michigan
N.C. A&T State University	Greensboro, North Carolina
N.C. State University	Raleigh, North Carolina
Purdue University	W. Lafayette, Indiana
Suny-College of Environmental Science and Forestry	Syracuse, New York
Tuskegee Institute	Tuskegee, Alabama
University of California-Berkeley	Berkeley, California

And because elements of career information dissemination may change rapidly over time, two experimental cohorts were selected for comparison--1965 and 1975 graduates. Some of the significant factors influencing each group's career choices probably varied after a few years. The attitudes of the class of 1965, for example, were largely formulated during their pre-teen developmental years in the fifties prior to the activism and massive changes of the sixties. And assuming a normal progression from high school to college, the fundamental attitudes of the class of 1965 were largely in place ten to twelve years prior to their college graduation. On the other hand, the basic attitudes of the class of 1975 were probably shaped during the period between 1965-67. It is anticipated that each cohort will be able to recall those factors which may have left an indelible imprint on their attitudes about the land, natural resources and occupational preference.

For these reasons the universe of the study is the 1965 and 1975 graduates of programs in natural resources or closely related disciplines. Yet, at the same time, it must be remembered that Crites suggested that early vocational choice is not irreversible nor is it a continuous process.

Once the institutions to be sampled were selected, the next step was to contact the representatives listed in the published proceeding of the workshop. The initial letter (See Appendix B) to these individuals discussed the scope and objectives of the study, requested their cooperation and listed the requirements of such cooperative efforts. In most cases they readily agreed and returned the enclosed postcard. However, in two instances where these individuals had scheduling or time conflicts, one of their co-workers was recommended.

Through this contact person, the respective universities were asked to supply the names and addresses of their 1965 and 1975 graduates with appropriate majors. In some cases this information was available as computer print-outs. In other instances it was obtained from the alumni affairs office. At a couple of schools, it had to be compiled from departmental records and/or other sources.

During the months of April, May and June, the research coordinator traveled to eight of the ten universities. The principal investigator visited the remaining university (the data from Michigan State University were collected initially). The purpose of these visits was designed not only to collect

the names and addresses of the graduates, but also to further discuss the specifics of the study, respond to any questions by the university cooperators, and otherwise allay any concerns about the research and its possible use.

Of the ten institutions included in the sample, five are predominantly white, four are predominantly black and one is mixed. They represent a diversity of educational environments, geographic regions and program offerings. Finally, it was assumed that a large percentage of the cohorts would be pursuing careers in natural resources or closely related careers.¹

The career category of "closely related" was selected to encompass those programs, perhaps not as traditional as some but, nevertheless, one which the student through careful course selection, work experiences or transfer opportunities might be exposed to such careers. The number of graduates, moreover, varied from school to school depending on size and program emphasis.² Following a review of the available lists of graduates, a strategy was developed: to have a disproportionate sample reflective of both strata (schools) and cohort (year of graduation). A sample size of 20 for 1965 and 30 for 1975 was selected--a potential sample of 500.

¹Correctly assumed because 70.9 percent were so employed.

²In a few cases, for example, to provide an adequate pool of minority graduates the 1965 cohort might consist of 1965-70 graduates while the 1975 cohort might consist of 1971-75 graduates. This practice was true at no more than 4 or 5 schools.

This sample was an ideal equal or exceeded in several strata and cohort but not in all. In fact, some schools did not come close to having this number; some almost had this number exactly, while some had a considerably larger number.

Because of these numbers, a two step strategy evolved to improve sampling efficiency.¹ Where the total number of graduates exceeded the selected sample size, a random sample was obtained using a table of random numbers; but where the total number did not exceed this selected number, a 100% sample or survey ensued. In other words, one objective was to have a similar number of minority and non-minority graduates for comparison purposes.

For the 1965 cohorts, the sample ranged from a 100% survey to a 25% sample; for the 1975 cohorts, the sample ranged from a 100% survey to a 9.9% sample. Since school size often determined whether a survey or sample was utilized, the final sample size was:

Table 3. Overall Sample Size

YEAR	Total Number Graduates	Total Questionnaires Mailed	Adjusted Total Questionnaire*	Return Rate
1965	376 (20.9%)	170 (30.5%)	141	63 (44.6%)
1975	1,420 (79.1%)	387 (69.5%)	311	160 (51.4%)
TOTAL	1,796 (100%)	557 (100%)	452	223 (49.3%)

*Total number of mailed questionnaires adjusted because (1) non-deliverable--questionnaire returned, and (2) non-confirmation--accuracy of address not determined by telephone follow-up.

¹Also at the predominantly white institutions, the cooperators were asked to identify all minority graduates.

Design and Administration of Questionnaire

Content and Pretesting of Instrument

A twelve page survey instrument was developed to collect information about each of the variables or factors identified in the research model. To ensure clarity of understanding and appropriateness of the questions the instrument was pretested with two graduate classes at Michigan State University. Approximately 30 questionnaires were disseminated to students enrolled in "Community Resource Development" and "Recreation Resources Law" during the 1978 Spring quarter. In addition, copies of the pretest questionnaire were submitted to each of the cooperating universities for their review and comments.

And to ensure the protection of the rights of the sample, copies of the study proposal, cover letter and the questionnaire were submitted along with an attachment describing any possible impacts of the research on human subjects to the "University Committee on Research Involving Human Subjects" for their review. No unusual impacts were anticipated.¹

After the comments and suggestions from the pretest were reviewed and analyzed, the appropriate revisions were made in the instrument (See Appendix E). Organized in four sections, the final questionnaire was eleven pages long. Section I of this instrument obtained general information about career decision making of the respondent. Section IV collected family,

¹The one to 99 response scale used to measure psychological and social attitudes about careers was added following this pretesting of the instrument.

educational and employment background data. Section II measured the five independent variables of the model, while Section III elicited data about the perceived dissimilarity of occupations.

Survey Administration

Prior to the initial mailing, an effort was made to confirm the accuracy of the addresses by telephoning the long distance directory assistance operator. If such a listing was established, then at least a preliminary confirmation might be assumed. For the small schools this process was completed for all graduates; but for the larger schools, only the final sample was included.

Initially, following the acquisition of a telephone number, a pre-survey telephone call was contemplated to positively confirm if the address was accurate, and also to determine if the listee was indeed the graduate of the respective institution. Such a plan for a positive confirmation, however, was revised because of the time constraint, lack of a work study student during the summer and the decision to complete the first questionnaire mailing during the last week of August, 1978.

It was further assumed that since there might be legitimate reasons for no telephone listing: the given address might be the student's parents (phone listed in parents name); addressee had moved, or no phone--the survey should precede.

All questionnaires were mailed first class so that if non-deliverable because of expired forwarding address, the questionnaire would be returned. But even if the given address was the parents, it was anticipated that some forwarding of mail would occur. The first mailing started on August 25th and was concluded by the 31st.

During the first week of September, graduates completed and returned 29 surveys; 19 were returned as non-deliverable. During the next week, they completed and returned 51 instruments; 28 were returned as non-deliverable. The first scheduled follow-up letter was mailed during the third week; by then, the weekly return had declined to 11 (See Appendix F). By September 25, the fourth week, a total of 104 questionnaires had been returned; a total of 49 were returned as non-deliverable.

The second scheduled follow-up letter (letter with another questionnaire) was mailed during week seven. And because of the unusually large number of non-respondents, another follow-up strategy was implemented during week eight (See Table 4 for return rates).

The Telephone Follow-up

During weeks eight, nine and ten, two students were employed to telephone the non-respondents. After the eighth week, however, all the telephoning was completed by one student, a senior in the Resource Development curriculum. Both students were given orientation materials to read, provided

Table 4. Schedule of Survey Strategy and Response

Strategy	Date	Completed Instruments	Non Deliverable
1st mailing - - -	Aug. 25-30		
	Week 1	29	19
	Week 2	51	28
1st follow-up - -	Week 3	11	1
(letter)	Week 4	13	1
	Week 5	18	1
	Week 6	8	0
2nd follow-up - -	Week 7	5	1
(letter and questionnaire)			
Telephone - - -	{ Week 8	9	2
follow-up	{ Week 9	22	4
	{ Week 10	17	0
	Week 11	15	0
	Week 12	13	0
	Week 13	10	0
	Week 14	<u>2</u>	<u>0</u>
TOTALS	December 1	223	57

Source: Personal records of research assistant of return rates.

a question-answer session and required to complete several practice calls.

Table 5. Orientation Provided Telephone Interviewers

Study Material:

Study Prospectus
Survey Instrument

Conversation Guide to Questionnaire Telephone Follow-up

Question and Answer Session

Practice Telephoning: Associates unknown to the interviewers were asked to role play a variety of respondents.

Both students were judged very capable and related well to the respondents over the telephone. Only two truly negative telephone conversations ensued but were tactfully handled. All telephoning was completed Monday thru Friday between 6 and 10 p.m. in the respective time zones for a total of eleven days.

The "Conversation Guide to Questionnaire Telephone Follow-up" was adapted for this study to elicit compliance if a questionnaire had been received or to determine correct mailing address if a questionnaire had not been received.¹

Of the 345 non-respondents, 190 (55.1%) had telephone numbers obtainable from directory assistance: of this 190,

¹The Conversation Guide was adapted for this study from a similar guide appearing in the Appendix of a study by Kevin Szcodronski, Trends and Characteristics of Michigan Snowmobile Owners (M.S. Thesis, Michigan State University, 1978).

eighty-two or (23.8%) were at the home of the graduate; thirty-five (10.1%) were at the homes of the respondent's parents; while seventy-two (20.9%) were either the wrong number--wrong residence, unanswered after several call-backs, or disconnected--not in service (See Table 6).

When the telephone number was not in service, moreover, and no new listing was obtainable, the assumption was made that the prospective respondent had either moved, changed their name or did not presently have a phone. Accordingly, the total sample size was adjusted downward (Refer back to Table 3 on page 65).

There was the one exception to this procedure--the Lincoln University sample. Except for this sample, all graduates were mailed at least two questionnaires and a follow-up letter before the first telephone contact. But because the names and addresses from Lincoln University were received later than those from the other universities and because there was a smaller number of graduates, the Lincoln sample was initially contacted by telephone (See Appendix I for Conversation Guide used for Lincoln University Sample). Essentially, they were asked to participate in the study--all Lincoln graduates agreed to participate.

Analysis of Data

Coding and Keypunching

Although the survey instrument was precoded, the review of initial responses revealed seven questions that needed to

Table 6. Results of Telephone Follow-up

INSTITUTIONS	NON RESPONDENTS			HOME OF GRADUATE			
	with- out tele- phone	with tele- phone	unpub- lished number	has sent	will send	will not send	mail another question- naire
ALCORN	20	22	-	-	-	-	5
BERKELEY	9	14	-	-	2	1	1
FAMU	15	14	-	-	-	-	5
LINCOLN ¹	2	13	-	-	-	-	10
MSU	12	24	2	1	8	1	2
NC A&T ²	36	15	-	2	4	-	6
NCSU	21	24	-	-	4	2	6
PURDUE	5	19	-	1	-	-	4
SUNY	9	26	3	1	4	1	4
TUSKEGEE INSTITUTE	20	19	1	-	1	-	6
TOTAL	149	190	6	5	23	5	49

¹The Lincoln University sample was telephoned prior to the first questionnaire mailing.

²One of the respondents from NC A&T elected to respond to additional question by telephone.

Table 6 (cont'd.).

HOME OF PARENTS OF NON-RESPONDENTS				CANNOT CONTACT		
Will for- ward	have for- warded	can- not con- tact	obtained new address & mailed another questionnaire	wrong num- ber	rings, but no answer	not in ser- vice
-	-	-	4	7	3	3
-	1	2	2	2	-	3
-	-	1	4	1	3	-
-	-	1	-	1	1	-
1	1	2	2	1	4	1
-	-	-	-	2	-	-
-	-	-	-	4	5	3
1	-	3	-	1	4	2
-	1	2	2	2	6	2
-	-	1	1	3	4	4
2	3	12	18	24	30	18

be re-coded: in section I the responses to "present job" and "career area"; in section III any perceived difference units above 3 digits; in section IV "home state," "parents occupations," "total length of work experience prior to college" and "specific type of work experience after enrolling in college." Therefore each questionnaire, was not only checked for accuracy and completeness, but also had the above questions re-coded, prior to keypunching. All keypunching was done in-house by two undergraduate students who had considerable experience with other past and ongoing departmental studies. Generally all returned questionnaires were checked, recoded and key punched on data cards within two or three days

Preliminary data analysis was completed at the Michigan State University computational center. The file was then transferred to tape and additional analysis completed at N.C. Agricultural and Technical State University computational facilities.

Computation Strategy

The Statistical Package for the Social Services (SPSS) was selected to manage and process the data collected with the mailed questionnaire. Subsequent Data analysis consisted of three steps: (1) a descriptive analysis of respondent characteristics; (2) an analysis of difference in MEAN scores of the independent and dependent variables by the respondent characteristics of age (graduating class), race and status (job category); and, (3) stepwise discriminant analysis by race of prior to college variables.

Step I of the analysis concentrated on the responses to questions from sections I and IV of the instrument. With the primary measurement level in these two sections nominal and ordinal, SPSS subprograms used were frequency, condescriptive and crosstabs. This analysis revealed general family, educational and employment background information about the respondents.

For Step II of the analysis respondents were grouped in six categories: 1965 graduates, 1975 graduates, minority respondents (non-white), majority respondents (white), current professionals in natural resource and related careers, and graduates of programs in natural resources who are no longer employed in this profession. The resulting groups appeared as follows:

Table 7. Respondents Grouped for Analysis

GROUPS		TEST FACTORS
1965 Graduates	1975 Graduates	
64 (28.7%)	159 (71.3%)	AGE
Member of Minority Race	Member of Majority Race	RACE ¹
59 (26.5%)	160 (71.7%)	
Not Employed in a Natural Resource Profession	Employed in a Natural Resource Profession	JOB STATUS
65 (29.1%)	158 (70.9%)	

¹Four respondents did not answer the question.

Once the respondents were grouped for analysis, the next procedure was to obtain a mean value for each independent variable. Since each independent variable was composed of several factors, a mean rating (value) was obtained for each factor. Moreover, mean rating measures were obtained for both "prior to college" and "after college" experiences for source, method and content variables where "1" is the highest rating and "5" is the lowest rating (See pages 8, 9, 10, 11, 12 and 13 of Survey Instrument).

The timeliness variable consisted of six factors; each assessed as age at receipt of useful career information about six specific job characteristics. The resulting mean, of course, was mean age at receipt of such career information as: educational and other requirements, entry job and upgrading opportunities, possible location of work, working conditions and expected tasks (See Table 8).

Table 8. Timeliness: Age at
Receipt of Useful Career Information

JOB FACTORS	MEAN AGE	MEDIAN AGE	VALID CASES
Educational and Other Requirements	18.5	18.2	213
Entry Job and Up- grading Opportunitites	18.8	20.3	208
Pay and Fringe Benefits	20.2	21.2	207
Possible Work Location	19.9	20.9	206
Working Conditions	20.1	20.9	206
Expected Tasks	20.9	21.4	205

The second part of this variable measured the frequency of receiving additional information (reinforcing) after first receipt. No mean frequencies were obtained (See Table 9).

Table 9. Timeliness: Adjusted¹ Frequency for Percentage of Respondents Receiving Yearly Reinforcing Information

JOB FACTORS	MORE THAN 4 TIMES	2 to 4	ONCE	LESS THAN ONCE	NEV- ER	VALID CASES
Educational & Other Requirements	30.2%	33.7%	15.8%	11.9%	8.4%	202
Entry Job & Upgrading Opportunities	16.9%	27.7%	22.6%	11.8%	21.0%	195
Pay & Fringe Benefits	12.8%	22.6%	20.0%	23.1%	21.5%	195
Possible Work Location	19.6%	29.6%	17.9%	12.8%	19.9%	196
Working Conditions	20.1%	22.7%	22.7%	16.5%	18.0%	194
Expected Tasks	26.5%	24.5%	15.8%	18.4%	14.8%	195
Other	11.8%	17.6%	8.8%	11.8%	50.0%	34

The remaining independent variable, attitudes, was handled differently. Respondents were asked to indicate the importance to thirteen job characteristics on a scale of 1 to 99 (See Table 10). Each of the thirteen items, according to Porter and Haynes was designed to measure a given psychological need.²

¹Adjusted to reflect only valid cases.

²In Porter's and Hayne's studies, they used fifteen items for the purpose of this study, however, it was decided that thirteen items would be adequate.

Table 10. Attitudes: Importance of Job Factors¹

JOB FACTORS	NON-WHITE MEAN	WHITE MEAN
Self-Fulfillment	77.92	85.35
Security	78.80	66.66
Prestige	52.34	45.33
Opportunity to Help Others	79.42	62.41
Opportunity to Set Goals	74.41	65.38
Opportunity Personal Growth-- Development	85.88	79.54
Opportunity to Determine Methods-- Procedures	71.95	66.39
Opportunity to Develop Close Friendships	57.37	51.52
Promotions Based on Capabilities	73.03	66.63
Administrators Discuss Subordinates Problems	54.32	49.54
Cooperation Between Departments	61.00	51.97
Adequate Appreciation and Recognition	72.92	68.36
Administrators Appreciate Subordinate Work	66.10	62.02

¹203 Valid Cases With No Missing Variables

Section III of the questionnaire elicited data about the perceived dissimilarity of occupations by graduates. The objective of this strategy was to measure the perceived dissimilarity of occupations through paired-pair comparisons using the ratio scale.

This perceived dissimilarity, according to the research of Woelfel, was assumed to be reflective of the individual's group knowledge of the specific career. Consequently, a group's perceived knowledge of careers could be represented as a mean distance matrix (See Table 11).

In order to evaluate the mean difference in scores (step II) by the six groups for the dependent and independent variables, the SPSS BREAKDOWN and CROSSTABS procedures were utilized. The variables of SOURCE, METHODS, ATTITUDES, CONTENT and KNOWLEDGE were broken down by year of graduation, race and job category (non-natural resource versus natural resource).

Breakdowns were also obtained for the first part of the timeliness variable, however, where the data were grouped in categories, the second part of the timeliness variable, cross-tabs by year of graduation, race, and job category were obtained. Finally, a stepwise discriminant analysis (Step III) of prior to college variables by race was performed.

Table 11. Total Mean Distance Matrix (Knowledge Variable)

"Perceived Differences Between Criterion Occupations
and Natural Resource Occupations"

Perceived Differences	Criterion Occupations	Natural Resource Occupations			
		City Park & Recreation Superintendent		Forester	
		Non-white	White	Non-white	White
Opportunity to Earn Good Money	High School Teacher ¹	90.83	72.33	82.54	65.28
	Lawyer ²	224.06	281.39	225.59	319.41
	Engineer ³	183.95	161.92	187.27	179.84
Status Prestige	High School Teacher	98.61	84.70	97.22	77.82
	Lawyer	195.53	198.43	201.02	228.37
	Engineer	118.52	100.54	99.87	86.86
Opportunity to Work With People	High School Teacher	46.33	52.19	106.61	103.80
	Lawyer	74.18	70.32	122.76	123.26
	Engineer	97.04	124.99	67.23	82.54
Opportunity to Correct Current Problems	High School Teacher	86.98	98.19	77.06	103.89
	Lawyer	115.69	119.11	158.65	127.43
	Engineer	114.09	83.25	93.84	78.89
Opportunity to Help En- vironment	High School Teacher	98.39	112.42	161.96	166.96
	Lawyer	126.32	148.50	154.14	161.41
	Engineer	86.98	79.14	92.86	92.32
Educational Require- ments	High School Teacher	59.35	69.46	63.74	64.40
	Lawyer	216.14	197.43	171.63	175.96
	Engineer	119.16	94.25	109.34	76.36

¹187 Valid Cases with No Missing Variables

²194 Valid Cases with No Missing Variables

³196 Valid Cases with no Missing Variables

Table 11 (cont'd.).

Perceived Differences	Criterion Occupations	Natural Resource Occupations			
		Fish-Wildlife Biologist		Extension Agent	
		Non-White	White	Non-White	White
Opportunity to Earn Good Money	High School Teacher	103.05	73.75	80.09	66.46
	Lawyer	202.43	284.15	227.73	306.01
	Engineer	158.82	160.85	186.91	170.10
Status Prestige	High School Teacher	103.11	87.92	91.81	75.34
	Lawyer	164.90	201.05	187.12	227.24
	Engineer	91.66	80.25	119.32	96.86
Opportunity to Work With People	High School Teacher	107.26	121.04	48.93	46.23
	Lawyer	136.43	128.22	69.90	64.13
	Engineer	74.20	81.14	99.73	132.46
Opportunity to Correct Current Problems	High School Teacher	85.76	103.99	72.43	97.01
	Lawyer	162.35	130.54	115.73	118.22
	Engineer	79.39	82.54	91.70	98.04
Opportunity to Help Environment	High School Teacher	166.11	169.95	134.93	146.31
	Lawyer	159.27	164.59	138.78	152.70
	Engineer	90.20	100.04	98.48	97.75
Educational Requirements	High School Teacher	87.13	86.90	56.59	62.92
	Lawyer	128.94	147.70	182.80	179.40
	Engineer	94.36	78.25	113.00	91.53

Chapter V

FINDINGS

The Respondents

Part I of the survey instrument ascertained general descriptive information about the respondents' career decision making. For example, although respondents were performing a variety of roles--from administrative and policy making to purchasing and sales--the top three roles were providing production-technical services (sixty-nine, 30.9 percent), management services (thirty-seven, 16.7 percent) and high school or college teaching (twenty-two, 9.9 percent).

Non-natural resource jobs were held by sixty-five respondents (29.1 percent) while sixty (26.9) percent were employed in forestry, eighteen (8.1 percent) in fisheries-wildlife, and nineteen (16.6 percent) in park and recreation resources; twenty-four held other natural resource jobs.

When asked to indicate the important factor in learning about their first job, respondents indicated direct contact with employer (46.2 percent); friends and relatives (26.9 percent) and university assistance other than placement office (17.5 percent). But when present jobs differed from their first jobs, only twenty-nine percent had contacted employers directly; friends and relatives remained important (15.2 percent)

but many were contacted by employer (12.1 percent) or learned by other means (15.7 percent).

In many instances, especially in a tight employment market, graduates often accept positions bearing little relation to their major field of study. However in this sample only fifty (22.4 percent) followed this course; 106 (47.5 percent) were employed in same field, sixty-two (27.8 percent) in related fields.

Respondents ranged in age from 22 to 52 years with a mean age of 29.0 and a medium of 26.4 (See Table 12).

Table 12. Age Distribution of Respondents

Range	Frequency	Percent ¹
22 - 26	114	51.6%
27 - 31	40	18.1
32 - 36	47	21.3
37 - 52	20	9.0

¹Percentage adjusted to 221 Valid Cases

Males outnumbered females 9 to 1: 198 (90.0 percent to 22 (10.0 percent). Moreover, over 60.0 percent (134) of all respondents were married.

To gain a further understanding of the background of the sample, respondents were asked to indicate place of residence for four periods of their lives: 1-6 years, 7-12 years, 13-18 years and present home (See Table 13). Fewer now live in a large metro city than at age 1-6 years--16.2 to 12.2

Table 13. Residential History of Respondents

PLACED LIVED	AGE			
	1-6 years	7-12 years	13-18 years	Present
Large Metro City	16.2%	16.7%	16.7%	12.2%
Medium Size City	18.9%	20.3%	22.5%	23.4%
Smaller City	23.0%	22.5%	23.0%	23.4%
Township or Village	18.9%	18.9%	18.5%	19.4%
In the Country	10.8%	10.4%	9.0%	16.7%
Farm or Ranch	12.2%	11.3%	10.4%	5.0%

Percentage adjusted to 222 Valid Cases

percent. More now live in the country--10.8 to 16.7 percent, while less now live on a farm or ranch--12.2 to 5.0 percent.

The majority of the respondents' fathers were employed in professional-technical positions (33.9 percent), craftsmen-foremen (17.4 percent) or manager-official (12.9 percent). For mothers, however, 44.7 percent were homemakers, 19.4 percent were employed in professional-technical positions, and 16.6 percent in clerical positions (See Table 14).

The overwhelming majority of respondents graduated from public high schools (84.7 percent), with the largest number (27.9 percent) graduating from classes of over 400 (See Table 15).

Since the investigators were interested in learning about work experiences and possible influence on career decision making, two specific questions were asked to ascertain prior college experiences and paid work experiences after enrolling

Table 14. Occupations of Parents

Categories	Fathers	Mothers
Prof. - Tech.	74 (33.9%)	42 (19.4%)
Mgt. - Off. - Pro.	28 (12.8%)	10 (4.6%)
Clerical	5 (2.3%)	36 (16.6%)
Sales	14 (6.4%)	7 (3.2%)
Craftsman - Foreman	38 (17.4%)	2 (.9%)
Operatives	14 (6.4%)	8 (3.7%)
Service Work	12 (5.5%)	11 (5.1%)
Laborers	8 (3.7%)	1 (.5%)
Farmer	17 (7.8%)	97 (44.7%) (Homemaker)
Military	4 (1.8%)	
All other occupations	4 (1.8%)	

Table 15. Size of High School Graduating Class

Category	Frequency	Adjusted ¹ Percent
Less than 49	20	9.1%
50 - 99	28	12.8%
100 - 199	43	19.6%
200 - 299	35	16.0%
300 - 399	32	14.6%
Over 400	61	27.9%

¹Percentage Adjusted to 219 Valid Cases

in college. For the different categories, the overwhelming majority of respondents indicated no work experiences in natural resources (See Table 16). A sizeable number, however, (74.0 percent) still indicated lack of work experiences after enrolling in college--at least lack of paid work experience (See Table 17).

Table 16. Length of Work Experience
Prior to College Enrollment

Kinds of Work Experience	Length of Experience						
	None	Less than 1 yr.	1-3 years	4-6 years	7-9 years	10+ years	Other
Home Farm	82.1%	.9%	1.8%	3.2%	-	11.5%	.5%
Hired Farm	82.3%	6.4%	5.0%	3.6%	1.4%	.5%	.9%
YCC	98.2%	.9%	.9%	-	-	-	-
Park and Recreation Work	83.3%	10.0%	5.4%	.5%	-	.5%	.5%
Construction Work	80.2%	8.8%	10.1%	.5%	-	-	.5%
Grocery Store	82.4%	5.9%	9.0%	2.3%	-	.5%	-
Other	53.7%	12.7%	23.9%	6.6%	1.9%	1.4%	.9%

Table 17. Percentage of Respondents with Paid Work Experience In Natural Resources After Enrolling in College

CATEGORY	NUMBER	PERCENT
None	103	47.0%
Forestry	45	20.5%
Fisheries-Wildlife	6	2.7%
Parks-Recreation	15	6.8%
Agriculture	14	6.4%
Other	35	16.4%

Results of Crosstab Analysis

One objective of the sampling strategy was to produce a sample with both minority (non-white) and majority (white) graduates. The cross tabulation analysis of respondent categories demonstrates the success of this strategy.

When crosstabs were produced by Job Category by Race, Home State (grouped in regions) by Race and Job Category by Home State, the larger values of chi square 42.76 (5 d.f.), 79.98 (3 d.f.), and 43.40 (15 d.f.) respectively, illustrated the strong regional concentration of minorities (blacks) in the Southeast and close orientation with agricultural programs. This result was not unexpected, however. On the other hand, when crosstabs for graduating class by race and job category by graduating class were run, the much lower chi squares, 6.7 (1 d.f.) and 3.6 (5 d.f.) indicates a certain level of independence.

What the results demonstrate is that the final sample has an acceptable distribution by overall job category, by graduating class and graduating class by race. Furthermore, it also tend to reconfirm the existence of the original problem--the lack of racial minorities in natural resource careers.

Respondent Characteristics and Information Diffusion

One research design strategy was to permit analysis of the differences in "career information diffusion" between respondents when grouped on the basis of year of graduation.

(1965 graduate vs. 1975 graduate) race (minority or majority), and job category (non-natural resource employment vs. natural resource employment).

Because of the number of individual factors that were grouped to form the independent variables (five to thirteen factors each), breakdown analysis was selected to investigate the central tendencies of each variable. Breakdown treats the individual factors as independent variables and the test group (year of graduation, race or job category) as the dependent variables.

The following assumptions are necessary for breakdown analysis:

1. Despite the level of measurement of the factors (independent variables), they must be classified in a limited number of discrete groups; and
2. Whether the dependent variables are continuous or discrete, they must be a variable for which a mean represents a meaningful measure of central tendency.¹

A one way analysis of variance was performed on the data (Statistics 1) to test if the means of the subsamples were statistically significant (F. ratio @ .05 level of significance). This test also produced eta and eta-squared statistics which show how dissimilar the means on the dependent variable are within the categories of the independent variable. The higher the value of eta, the greater this dissimilarity.

¹Norman H. Nie et al., Statistical Package for the Social Science, 2nd. ed. (New York: McGraw-Hill Book Company, 1975), pp. 249-250.

Eta-squared is interpreted as the proportion of variance in the dependent variable explained or accounted by the independent variables (correlation ratio). Given the level of measurement of these factors, this test and the associated statistics were deemed appropriate.

Breakdown by Year of Graduation

Sixty-four (28.7%) of the respondents were classified as 1965 graduates, while 159 (71.3%) were classified as 1975 graduates.

Sources of Career Information

Respondents were asked to rate the importance of information source factors both prior to college and after enrolling in college. Since the rating scale ranged from a high of 1 and a low of 5, all rating scores of 3.9 or less (moderate influence to most influential) were considered important.

Of prior to college factors, only two were indicated as important by a large number of valid cases: participation in recreation and leisure activities--mean rating of 2.89 (214 valid cases) and respondents' family--mean rating of 3.30 (215 valid cases). The category "other" was also rated important--mean rating of 3.03 but with only 74 cases. Yet, when respondents were grouped to determine if significant differences (at .05 level) existed between rating of 1965 and 1975 graduates, (source factors prior to college), no difference was found between these three factors. Differences, however, did exist between their rating of importance for junior high

courses, although the mean rate for 1965 grads (4.74) and 1975 grads (4.35) was not considered important.

After enrolling in college, respondents rated seven of fourteen source factors of moderate importance or higher.

When grouped by year of graduation, however, only three factors--work experience, employer and recreation leisure participation--had significant differences in rating.

As a source of career information, work experience in addition to the employer were more valuable for 1965 graduates (mean rating of 2.67 and 3.00 respectively). Recreation/leisure participation (mean of 3.66) provided more information for 1975 graduates.

Methods of Obtaining Career Information

Prior to college, graduates rated four of thirteen methods of moderate importance or higher: conversations with relatives and friends (mean of 3.39), books (3.64), employment in area (3.88), and magazines (3.98). The "other" category also received a mean rating of (3.09).

Major differences existed between rating by 1965 and 1975 graduates: books and magazines were rated higher in importance (3.46 and 3.85 respectively) by the 1975 graduates. At the .07 level of significance, the 1965 graduates rated the "other" category higher (2.50).

After enrolling in college, methods of obtaining career information increased from four to eight, however, only two ratings were significantly different between groups. Again,

1975 graduates rated magazines higher than 1965 graduates-- 3.78 to 4.18; audio-visual media--films, slides and tapes-- also rated high with this group, i.e., a mean of 3.95.

Timeliness of Career Information

Timeliness or age at receipt of useful career information (about various job factors) by respondents ranged from a mean age of 18.5 years for information and other requirements to a mean of 20.9 for expected tasks. Tests of difference in mean ages revealed that 1975 graduates learned about education and other requirements of the job at a significantly earlier age: 17.9 compared to 19.8 years, a difference of over 2 years.¹ Similarly, 1975 graduates had a 2 year head start in learning about the possible location of work--19.2 compared to 21.5 years.

The majority of respondents received additional information about these job factors, 2 to 4 times per year (33.7% of respondents); moreover, 30.2% received additional information more than four times. In terms of frequency differences between 1965 and 1975 graduates, the education and other requirements category ($\chi^2 = 12.16$) was solely significant.

Content of Career Information

Prior to college, respondents rated content of career information for 3 of 5 job factors as adequate. Respondents, however, received very little information about entry job-upgrading opportunities and pay and fringe benefits. For

¹This difference should be interpreted cautiously because it could partly be attributed to better recall by 1975 graduates; however, it is also a factor of improved career counseling, media coverage, etc.

these variables no significant difference existed between 1965 and 1975 respondents.

College enrollment provided respondents adequate to more than adequate information for all five job factors. Again, there were no significant differences among groups for these five factors; however, the category other ($\chi^2 = 9.7$) was different between 1965 and 1975 graduates.

Career Expectations

Respondents also were asked to rate the importance of thirteen career factors on a scale of 1 to 99. When the means of such ratings were broken down by year of college graduation no significant difference (.05 level) was found among means.

Breakdown by Race

Fifty-nine respondents (26.5 percent) were members of minority groups: 1 American Indian, 52 blacks, 2 Mexican-Americans and 4 Oriental-Asian Americans. All were classified as a single minority group to facilitate analysis, the majority group (whites) numbered 160 or 71.7 percent.

Differences in Source of Career Information by Race

Although "families" and "recreation-leisure participation" are still important career source factors, "Breakdowns by Race" indicated significant differences between minority and majority mean ratings (See Table 18). Prior to college, there were seven factors with differences between means by race. Of these seven factors, minorities tended to rate them higher. Leisure

Table 18. Breakdown of Source Variable by Race (Prior to College)

SOURCES	PERCENT									
	TOTAL MEAN	MISSING CASES	MINORITY MEANS	N	MAJORITY MEANS	N	F	SIG	ETA	ETA SQUARED
Family	3.3119	9.4	3.3061	49	3.3137	153	.001	.9741	0.0023	0.0000
Friends	4.0600	10.3	4.1667	48	4.0263	152	0.526	.4692	0.0515	0.0026
Rec-Leisure										
Participation	2.9055	9.9	3.8298	47	2.6234	154	25.144	.0000	0.3349	0.1122
Professional	4.0153	12.1	3.7872	47	4.0872	149	1.725	.1906	0.0939	0.0088
Clergyman	4.9235	13.5	4.7609	46	4.9733	150	12.706	.0005	0.2479	0.0615
Work Experience	3.9697	11.2	3.7083	48	4.0533	150	2.102	.1487	0.1030	0.0106
Employer	4.5596	13.5	4.3111	45	4.6351	148	4.120	.0437	0.1453	0.0211
High School Teacher	4.0100	10.3	3.3061	49	4.2384	151	19.783	0.0000	0.3014	0.0908
Jr. High Course	4.4541	12.1	3.6087	46	4.7133	150	41.745	0.0000	0.4208	0.1771
Sr. High Course	4.0653	10.8	3.0816	49	4.3867	150	38.336	0.0000	0.4036	0.1629
Sr. High Coach	4.9385	12.6	4.8889	45	4.9533	150	1.200	0.2746	0.0786	0.0062
Sr.High Principal	4.8821	12.6	4.5778	45	4.9733	150	19.771	0.3048	0.0000	0.0929
Other Source	3.0725	69.1	2.5625	16	3.2264	53	1.505	0.2243	0.1482	0.0220

participation as source of career information was the only factor rated higher by majority respondents (2.62 to 3.83). But of the remaining six factors, only three--senior high course (3.08), high school teacher (3.31) and junior high course (3.61)--were considered at least of moderate importance.

After college enrollment, sources of career information shifted. Minorities rated enrollment in graduate school (3.75) significantly higher (See Table 19). Other minority ratings with significant group differences were: college administrator (4.22) and clergyman (4.29), although in terms of overall importance rating seemed of little influence.

Differences in Methods of Receiving Information by Race

Prior to college, nine methods of career information dissemination were rated differently by race; minorities tended to rate all nine higher (See Table 20). Only one, however, was rated of moderate importance: books (3.15). But lectures (3.87) and demonstrations (3.89) were of some importance. After enrolling in college, seven of the nine factors still received different ratings. Again, minorities tended to rate them of higher importance (See Table 21). Although books (2.96) and demonstrations (3.31) were moderate or higher, other factors of lesser importance were films, slides, tapes (3.64) and newspapers (3.98).

Table 19. Breakdown of Source Variable by Race (After Enrolling in College)

SOURCES	PERCENT									
	TOTAL MEAN	MISSING CASES	MINORITY MEANS	N	MAJORITY MEANS	N	F	SIG	ETA	ETA SQUARED
Family	3.3769	10.8	3.0833	48	3.4702	151	2.802	.0057	0.1184	0.0140
Friends	3.6769	12.6	3.6304	46	3.6913	149	0.081	.7757	0.0205	0.0004
Rec-Leisure	3.3782	13.5	3.5455	44	3.3289	149	0.819	.3667	0.0653	0.0043
Participation	3.2850	13.5	3.4773	44	3.2282	149	0.925	.3374	0.0694	0.0048
Professional										
Clergyman	4.6738	16.1	4.2857	42	4.7862	145	9.377	.0025	0.2196	0.0482
Work Experience	2.9740	13.9	3.1628	43	2.9195	149	0.797	.3731	0.0646	0.0042
Employer	3.3542	13.9	3.2791	43	3.3758	149	0.130	.7191	0.0261	0.0007
College										
Teacher	3.0573	13.9	2.6889	45	3.1701	147	3.442	.0651	0.1334	0.0178
College Course	2.9430	13.5	2.6136	44	3.0403	149	2.419	.1215	0.1118	0.0125
Former Student	4.4115	13.9	4.2093	43	4.4698	149	1.936	.1657	0.1004	0.0101
College Coach	4.9034	14.3	4.9286	42	4.9732	149	0.971	.3257	0.0715	0.0051
College Adminis- trator	4.6736	13.5	4.2222	46	4.8108	148	15.804	.0001	0.2764	0.0764
Graduate School	4.1719	13.9	3.7500	44	4.2973	148	4.760	.0271	0.1595	0.0254
Other Source	3.6154	76.7	3.5000	8	3.6364	44	0.037	.8492	0.0270	0.0007

Table 20. Breakdown of Method Variable by Race (Prior to College)

METHODS	PERCENT									
	TOTAL MEAN	MISSING CASES	MINORITY MEANS	N	MAJORITY MEANS	N	F	SIG	ETA	ETA SQUARED
Conversations with Relatives Lectures Group Discus- sions Demonstrations Work Study (Internships)	3.4404	13.5	3.4043	47	3.4521	146	0.044	.8347	0.0151	0.0002
	4.1571	14.3	3.8667	45	4.2466	146	4.221	.0413	0.1478	0.0218
	4.3915	15.2	4.1136	44	4.4759	145	4.536	.0345	0.1539	0.0237
	4.3511	15.7	3.8864	44	4.4931	144	10.563	.0014	0.2318	0.0537
	4.5189	17.0	4.2045	44	4.6170	141	5.106	.0250	0.1648	0.0271
Employment in Area Radio Programs Television Programs Films, Slides, Tapes	3.8989	15.7	3.8605	43	3.9103	145	0.034	.8532	0.0136	0.0002
	4.7606	15.7	4.5333	45	4.8322	143	7.988	.0052	0.2029	0.0412
	4.3862	15.2	4.0000	46	4.5105	143	9.543	.0023	2.2203	0.0486
	4.3245	15.7	4.0000	4	4.4266	143	5.764	.0173	0.1734	0.0301
Newspapers Magazines Books Other Methods	4.4180	15.2	4.1304	46	4.5105	143	5.138	.0245	0.1635	0.0267
	4.0212	15.2	3.9333	45	4.0486	144	0.270	.6039	0.0380	0.0014
	3.6859	14.3	3.1489	47	3.8611	144	10.319	.0016	0.2275	0.0518
	3.1132	76.2	3.3333	9	3.0682	44	0.150	.7003	0.0541	0.0029

Table 21. Breakdown of Method Variable by Race (After Enrolling In College)

SOURCES	PERCENT							ETA SQUARED
	TOTAL MEAN	MISSING CASES	MINORITY MEANS	N	MAJORITY MEANS	N	F	SIG
Conversations with Relatives/ Friends	3.4526	14.8	3.3261	46	3.4931	144	0.531	.4671
Lectures Group	3.1667	13.9	2.9130	46	3.2466	146	2.096	.1494
Discussions	3.5469	13.9	3.2667	45	3.6327	147	2.572	.1105
Demonstrations	3.8564	15.7	3.3111	45	4.0280	143	9.636	.0022
Work Study (Internships)	3.7622	17.0	3.4318	44	3.8652	141	2.467	.1180
Employment in Area	3.0374	16.1	3.1860	43	2.9931	144	0.443	.5067
Radio Programs	4.5531	16.1	4.2727	44	4.7832	143	14.105	.0002
Television Programs	4.5215	16.6	4.0909	44	4.6549	142	13.680	.0003
Films, Slides, Tapes	4.0851	15.7	3.6444	45	4.2238	143	7.880	.0055
Newspapers	4.3617	15.7	3.9778	45	4.4825	143	7.555	.0066
Magazines	3.9365	15.2	3.4220	45	4.0972	144	8.704	.0036
Books	3.5344	15.2	2.9556	45	3.7153	144	9.316	.0026
Other Methods	4.0208	78.5	4.1000	10	4.0000	38	0.029	.8652

Differences in Timeliness by Race

The age of first receipt of useful career information about the six job factors did not differ significantly between races (See Table 22). Similarly, crosstabulation of career factors by race revealed no significant difference between these groups (See Table 23).

Differences in Content by Race

Prior to college none of the five listed factors showed any significant difference (.05 level) between groups. Only the other category ($\chi^2 = 9.32$) showed any difference. But after college enrollment, specific career information about educational requirements and entry job--upgrading opportunities increased (χ^2 of 11.18 and 14.24 respectively). As shown in Table 24, this trend represented a marked departure from prior college experiences.

Career Expectation

The analysis by race of responses to the career expectation section indicated nine of thirteen factors were rated differently. Although mean scores of minorities were the highest for all these factors (See Table 25), the most dramatic difference was registered in response to the factor: opportunity to help other people--a difference of 22.6 units. On the other hand, whites and non-whites had similar responses for (1) feeling of self-fulfillment, (2) opportunity to participate in determining methods and procedures, (3) opportunity to develop close friendships, and (4) feeling that administrators are willing to discuss subordinate's problems.

Table 22. Breakdown of Timeliness Variable by Race (Age)

CAREER FACTORS	Age at First Receipt of Useful Information									
	TOTAL MEAN	PERCENT MISSING CASES	MINORITY MEANS	N	MAJORITY MEANS	N	F	SIG	ETA	SQUARED
Education and Other Require- ments	18.5	10.3	18.6	50	18.5	150	0.039	.8442	0.0140	0.0002
Entry Job and Upgrading Re- quirements	18.8	12.6	18.3	46	18.9	149	0.316	.5744	0.0405	0.0016
Pay and Fringe Benefits	20.2	13.0	19.9	46	20.3	148	0.134	.7145	0.0264	0.0007
Possible Loca- tion of Work	19.9	13.5	19.3	46	20.1	147	0.537	.4647	0.0529	0.0028
Working Conditions	20.0	13.5	19.9	46	20.2	147	0.089	.7662	0.0215	0.0005
Expected Tasks	20.8	13.9	21.5	46	20.6	146	0.835	.3620	0.0661	0.0044

Table 23. Crosstabs of Timeliness Variable By Race (Frequency)

CAREER FACTORS	FREQUENCY OF RECEIPT OF ADDITIONAL INFORMATION				
	Raw Chi Square	Degree of Freedom	Significance	Cramer's ¹ V	# of Missing Observations
Educational & Other Requirements	5.69	4	0.2235	0.1735	34
Entry Job & Up-Grading Opportunities	0.87	4	0.9282	0.0691	40
Pay & Fringe Benefits	2.87	4	0.5794	0.1253	40
Possible Location of Work	0.63	4	0.9598	0.0585	39
Working Conditions	1.75	4	0.7807	0.0982	41
Expected Tasks	5.91	4	0.2061	0.1797	40
Other Factors	3.53	4	0.4726	0.3324	191

¹Cramer's V measures strength of relationship when crosstabs table is not 2x2. A large value of V signifies that a high degree of association exists.

Table 24. Crosstabs of Content Variable By Race

CONTENT	Prior to College			
	Raw Chi Square	Degree of Freedom	Signifi- cance	Cramer's V # of Missing Observations
Education & Other Requirements	8.20	4	0.0846	0.2020 23
Entry Job & Upgrading Opportunities	6.59	4	0.1592	0.1815 24
Pay & Fringe Benefits	1.46	4	0.8333	0.0857 24
Possible Location of Work	5.87	4	0.2092	0.1721 25
Working Conditions	0.44	4	0.9795	0.0469 25
Other Content	9.32	4	0.0535	0.6366 200
CONTENT	After Enrolling in College			
	Raw Chi Square	Degree of Freedom	Signifi- cance	Cramer's V # of Missing Observations
Education & Other Requirements	11.18	4	0.0246	0.2364 23
Entry Job & Upgrading Opportunities	14.24	4	0.0066	0.2675 24
Pay & Fringe Benefits	5.76	4	0.2175	0.1706 25
Possible Location Work	4.95	4	0.2928	0.1581 25
Working Conditions	3.94	4	0.4143	0.1410 25
Other Content	0.36	3	0.4292	0.3626 202

Table 25. Breakdown Of Career Expectation By Race

CAREER EXPECTATIONS	PERCENT							ETA		
	TOTAL MEANS	MISSING CASES	MINORITY MEANS	N	MAJORITY MEANS	N	F	SIG	ETA	SQUARED
Feeling of Self- Fulfillment	84.1176	8.5	79.6667	51	85.6013	153	2.951	.0874	0.1200	0.0144
Feeling of Security	69.6337	9.4	80.5294	51	65.9536	151	14.335	.0002	0.2586	0.0669
Prestige with- in Community	47.1300	10.3	54.0392	51	44.7651	149	4.393	.0373	0.1473	0.0217
Opportunity to Help Other People	67.1386	9.4	83.1731	52	61.5800	150	32.158	.0000	0.3722	0.1385
Opportunity to Participate in Setting Goals	68.2836	9.9	76.6863	51	65.4267	150	7.468	.0069	0.1902	0.0362
Opportunity for Personal Growth and Development	81.7843	8.5	87.5577	52	79.8092	152	6.266	.0131	0.1735	0.0301
Opportunity to Participate in Determining Me- thods and Procedures	68.2921	9.4	73.0588	51	66.6821	151	2.533	.1130	0.1118	0.0125
Feeling That Administrators are Willing to Discuss subor- dinate's prob- lems	50.9900	10.3	56.9216	51	48.9597	149	2.591	.1091	0.1137	0.0129

Table 25 (cont'd.).

CAREER EXPECTATIONS	TOTAL MEAN	PERCENT MISSING		MINORITY		MAJORITY		F	SIG	ETA	ETA SQUARED
		CASES	MEANS	N	MEANS	N	MEANS				
Opportunity to Develop Close Friendships	52.5248	9.4	56.8824	51	51.0530	151	1.864	.1737	0.0961	0.0092	
Feeling that Promotions Based on Capabilities	68.9606	9.0	75.6538	52	66.6558	151	4.293	.0396	0.1446	0.0209	
Feeling that Administrators encouraged Inter- Departmental Cooperation	54.3650	10.3	62.7255	51	51.5034	149	5.356	.0217	0.1623	0.0263	
Feeling that Adequate Appreciation and Recogni- tion given	70.2475	9.4	76.2692	52	68.1600	150	4.408	.0370	0.1468	0.0216	
Feeling that Administrators Appreciate Subordinates and their work	63.7400	10.3	71.0980	51	61.2215	149	4.675	.0318	0.1519	0.0231	

Breakdown by Job Category

Another comparison was to determine if graduates not employed in a natural resource or related profession and graduates who were so employed had similar ratings. Sixty-five (29.1%) were grouped in the former category while 158 or 70.9 percent were in the latter.

Sources of Career Information

Interestingly, the two differences of any significance prior to college were not ones identified by year of graduation or racial breakdown: family--3.16 and senior high course--3.77. Those employed in natural resources rated family as the greater source of career information, yet those not employed in natural resources rated senior high courses as a more important source.

After initial college enrollment, all source factors rated high were again different from the prior group comparisons. But this time, the natural resource employees rated all significant source factors higher: college teacher (2.67), recreation-leisure participation (3.07), family (3.22) and friends (3.48).

Methods of Obtaining Career Information

Each of the analyses of difference breakdowns revealed books as a moderately important source for all the groups: 1975 graduates, minority graduates and now, present natural resource professionals (3.53).

After enrolling in college, five of the thirteen methods of receiving career information were rated higher (.05 level) by present natural resource professionals than graduates not so employed: employment (2.88), conversations with friends (3.27), books (3.33), magazines (3.77) and films, slides, and tapes (3.92).

Timeliness of Career Information

Recalling that only two timeliness factors had different mean rates by year of graduation, this prior to college timeliness breakdown by job category showed five factors with that distinction. There is a significant difference in ages at receipt of career information: graduates presently employed in natural resources and selected professions learn about educational requirements of the job at a mean age of 17.9 years compared to 20.0 years for those not employed in natural resources; useful information about pay and fringe benefits at age 19.6 vs. 21.6; possible location of work--19.0 vs. 21.9 years; working conditions--19.4 vs. 21.9 years; and finally, the expected tasks--20.1 vs. 23.0 years. Overwhelmingly, present employees in natural resources seemed to have had a much earlier exposure to the various job factors.

After enrolling in college however, the number of factors with significant differences between mean rates declined to one: expected tasks ($\chi^2 = 7.09$).

Content of Career Information

Specific career information about education and other requirements of the job were rated differently by the grouping. It received an χ^2 measure of 12.80 (.01 sig level); no factor was significant after college enrollment.

Differences in Career Expectations by Job Category

Current natural resource professionals felt self-fulfillment in the job was more important (mean of 85.60) than non-natural resource professionals (79.39). Moreover, this factor appeared to be rated of higher importance by all respondents when broken down by job category.

Career Knowledge and Information Diffusion

Career knowledge, measured as perceived difference between a criterion career and selected natural resource careers was also examined in terms of the major respondent categories. Each criterion career (high school teacher, lawyer, civil engineer) was compared to four natural resource careers (city park and recreation superintendent, forester, fish-wildlife biologist and extension agent) on the basis of several factors: differences in chance to earn good money, status--prestige, change to work with people, chance to correct current problems, chance to help environment, and in educational requirements.

Differences in Career Knowledge

Year of Graduation and Race

Breakdown of the variable by year of graduation, for example, yielded no significance difference in means between

1965 and 1975 graduates in their perceptions of the difference between high school teachers, lawyers and civil engineers and the selected natural resource professions.

In general, moreover, the breakdown of knowledge variable by race as measured by perceived differences between careers did not differ too drastically from the year of graduation breakdown. But there were eight differences. While minority groups assigned a greater perceived distance between the money a high school teacher and fish wildlife biologist earns; the white majority assigned a higher perceived distance between the income of a lawyer and an extension agent. Finally, minority groups felt that more education was required for a civil engineer than either for a park recreation superintendent or a forester. The non-whites' perceived differences were significantly greater than the whites (See Table 1, 2 and 3, Appendix J).

Job Category

Perhaps the greatest perceived differences between criterion and natural resources careers were between respondents not employed in this field or a related career and those who were; the only criterion career where no difference by category was noted was high school teachers. Non-natural resource workers consistently rated civil engineers and lawyers as more different: (1) on the basis of status--prestige, civil engineers were rated different from both park and recreation superintendents and extension agents, (2) in terms of educational requirements, the perceived differences were between

civil engineer and all but one of the comparison careers--the fish-wildlife biologist.

Lawyers rated highest in terms of perceived differences. They received thirteen significant difference ratings: (1) in terms of earning potential lawyers differed from foresters and fish and wildlife biologists; (2) but for status-prestige and opportunity to help the environment, they differed from all compared careers, and (3) the perceived education requirement for lawyer exceeded those for park and recreation superintendent and extension agent.

Implications for Model Development

Breakdowns of the five independent variables and single dependent variable indicate significant differences within the test categories--i.e., year of college graduation, race and job category (See Table 26). But since the third research objective was to develop testable model(s) for increasing the number of non-white students that do select careers in natural resources, another data analysis procedure was warranted to indicate more precise differences between non-whites and whites.

Stepwise discriminant analysis, consequently, was performed on prior to college measures of source, method, content, attitude and knowledge variables.¹ The mathematical objective of discriminant analysis is to weigh and linearly combine the discriminating variables in some fashion so that the groups are

¹The breakdown analysis of the timeliness variable was accepted as adequate because there were only six factors.

Table 26. Summary of Breakdown Analysis¹

TEST CATEGORY	VARIABLES					
	KNOWLEDGE	SOURCE	METHODS	TIMELINESS	CONTENT	ATTITUDES
Year of Graduation	--	--	--	--	--	--
	--	--	Books & Magazines	Education & other re-quirements	--	--
Race	Difference in money Lawyer & Extension Agent	Recreation and lei-sure par-ticipation	--	--	--	--
	Difference in money High School teacher & biologist Difference in education Civil Engineer & Forester	Senior high course High School teacher Junior high course	Books & Magazines Lectures Demonstra-tions	--	--	Opportu-nity to help other people

Table 26 (cont'd.).

TEST CATEGORY	VARIABLES				
	KNOWLEDGE	SOURCE	METHODS	TIMELINESS	CONTENT ATTITUDES
Job Category					
Natural Resource Employment	--	Family	Books & Magazines	Education & Other requirements Pay & Fringe benefits Possible location of work Working conditions Expected tasks	--
Non-Natural Resource Employment	Difference in status prestige Civil Engineer & PRS, Extension Agent Difference in Education Civil Engineer & PRS, Extension Agent	Senior High Course			

¹Significant difference (.05) between groups)

forced to be as statistically distinct as possible.¹ Specifically, the stepwise procedure begins by selecting the single best discriminating factor (Minimum D squared), then selects each subsequent variable based on its ability to improve the discrimination criterion in combination with the first variable. When factors no longer contribute to further discrimination, the stepwise procedure stops and further analysis using only the selected variables begins.²

While no single factor will perfectly differentiate between non-white and white on the four career information diffusion variables, several can be mathematically combined to produce discriminant functions of the form ($D_i = d_{i1}Z_1 + d_{i2}Z_2 + \dots + d_{ip}Z_p$) where D_i is the score on discriminant function i , the d 's are weighing coefficients, and the Z 's are the standardized values of p discriminating factors used in the analysis. When these functions are analyzed, the coefficient represents the relative contribution of associated factors, while the sign denotes the direction of this contribution--positive or negative. Finally, the percentage of cases correctly classified when only the discriminant factors are known shows the accuracy of this linear equation and enables the researchers to suggest specific strategies for model development.

¹William R. Klecka, Chapter 23 in Statistical Package for the Social Sciences (New York: McGraw-Hill Book Company, 1975).

²Ibid.

Discriminant Analysis of Source Variable

Five of twelve source factors statistically discriminate between non-white and white respondents: senior high class, recreation-leisure participation, senior high principal, clergyman and friends (See Table 27). The resulting discriminant function is positive (0.849) for the non-white group and negative (-0.290) for the white.

The classification results (success of discriminant function $D_i = d_{i1}Z_1 + d_{i2}Z_2 \cdots + d_{ip}Z_p$ predicting group membership when only the factor scores are known) are 58.5 percent for non-whites and 77.3 percent for whites. Overall, 72.4 percent of grouped cases can be correctly classified.

Once the discriminant equation is obtained, it can be used to predict an "expected rating score" on each identified discriminant factor for non-whites and whites.¹ These expected rating scores can then be used to suggest specific career information diffusion-dissemination strategies.

From analyzing Table 27, the following career information strategy is suggested:

- (1) Increase the non-traditional career knowledge base of the formal institutional sources which non-whites have relied in the past; and
- (2) Increase the utilization of such informal sources as leisure time participation and knowledgeable friends or associates.

¹In some instances this expected rating score differs from the previous group means, partly because the grouped classification rate is not 100 percent successful and also because the discriminant analysis involves a weighting and linear combination of individual factors.

Table 27. Stepwise Discriminant Analysis of Source Variable

STEP	Factors	Significance ¹	Standardized Coefficients	Expected Rating ² Non-White White
1	Senior-High Class	.000	-.547	1 5
2	Recreation-Leisure Participation	.000	.547	5 1
3	Senior-High Principal	.000	-.409	1 5
4	Clergyman	.000	-.280	1 5
5	Friends	.000	.229	5 1
Canonical Discriminant Function evaluated at group means $\left\{ \begin{array}{l} \text{non-white} \\ \text{white} \end{array} \right.$				
Percentage of Cases Correctly Classified				
With Discriminant Functions		58.5%	77.3% (72.4% for all cases)	

¹The selection rule for each factor is to maximize minimum mahalanobis distance (D squared) between groups.

²A rating of "1" is most influential, while a rating of "5" indicates source of little influence. Because the discriminant functions for non-whites is positive, all negative weighting coefficients are minimized and all positive coefficients maximized.

Discriminant Analysis of Method Variable

Five of twelve methods of obtaining career information prior to initial enrollment in college were identified as statistically distinct between non-whites and whites: demonstrations, television programs, magazines, books, and newspapers (See Table 28). The two discriminant functions are negative (-0.604) for non-whites and positive (0.207) for whites.

The two functions, moreover, are 61.2 percent successful in predicting group membership of non-whites and 65.2 percent for whites. Overall, only 64.2% of cases are correctly classified.

The analysis of the expected rating scores show that while non-whites do list many methods of receiving career information, evidently they are not as effective in transmitting information about non-traditional careers.

A suggested strategy is to increase the effectiveness of career information diffusion channels (methods) for this group.

Discriminant Analysis of Content Variable

Two of five content factors are statistically distinct between non-whites and whites: amount of career information received prior to college about entry job and amount of information about work location (See Table 29). The discriminant functions are (0.430) for non-whites and (-0.161) for whites.

Table 28. Stepwise Discriminant Analysis of Method Variable

STEP	Factors	Significance ¹	Standardized Coefficients	Expected Rating ² Non-white White
1	Demonstrations	.003	.561	1 5
2	Television Program	.003	.379	1 5
3	Magazines	.001	.408	1 5
4	Books	.000	-.978	5 1
5	Newspapers	.000	.584	1 5
Canonical Discriminant Function Evaluated at Group Means				
			non-white white - .604 .207	
Percentage of Cases Correctly Classified with Discriminant Functions				
			61.2% 65.2% (64.2% for all cases)	

¹The selection for each factor is to maximized minimum mahalanobis distance (D squared) between groups.

²A rating of "1" is most important, while a rating of "5" indicates method of least importance. Because the discriminant function for non-whites is negative, all positive weighting coefficients must be minimized and all negative coefficients maximized.

Table 29. Stepwise Discriminant Analysis of Content Variable

Step	Factors	Significance ¹	Standardized Coefficients	Expected Rating ² Non-White	White
1	Information about Entry Job	.056	-1.151	1	5
2	Information about Work Location	.001	1.076	5	1
Canonical Discriminant Functions Evaluated at Group Means					
Percentage of Cases Correctly Classified with Discriminant Function					
non-white white .430 -.161 30.4% .78.7% (65.6% for all cases)					

¹The selection rule for each factor is to maximized minimum mahalanobis distance (D squared) between groups.

²A rating of "1" indicates an exceptionally large amount of career information was received prior to college while "5" indicates little or none was received.

The discriminant functions successfully predict actual group membership for non-whites in only 30.4 percent of the cases, while it is more successful for whites (78.7 percent). Overall only 65.5 percent of the cases are correctly classified. Two suggestions which may help explain the low classification rate for non-whites is the apparent similarity in the scores of the two groups and the diversity of non-white responses (perhaps, indicating a sizeable range in the amount of career information about entry job and work location received prior to college). Almost 70 percent of the non-whites responded like the white majority responded to this question.

Discriminant Analysis of Career Attitudes (Expectations)

Five of thirteen career expectation factors show a statistically significant difference between non-whites and whites: opportunity to help others, self-fulfillment, security, opportunity for personal growth-development and feeling that administrators appreciate subordinates' work (See Table 30). The resultant discriminant function for non-whites is (-0.872) and for whites (0.357).

This discriminant function successfully classifies 69.5 percent of the non-white cases and 75.7 percent of the white cases--an overall rate of 73.9 percent.

Analysis of the expected rating scores for attitude factors reveal a specific strategy for increasing the quality and quantity of career information about non-traditional

Table 30. Stepwise Discriminant Analysis of Career Attitudes-Expectation Variable

Step	Factors	Significance ¹	Standardized Coefficients	Expected Rating ² Non-white White
1	Opportunity to help others	.000	-.698	99 1
2	Self-fulfillment	.000	.924	1 99
3	Security	.000	-.653	99 1
4	Opportunity for Personal Growth Development	.000	-.418	99 1
5	Appreciation of Subordinates and Their Work	.000	.266	1 99
Canonical Discriminant Functions Evaluated at Group Means				
			non-white white - .872 .357	
Percentage of Cases Correctly Classified with Discriminant Function		69.5%	75.7% (73.9% of all cases)	

¹The selection rule for each factor is to maximized minimum mahalanobis distance (D squared) between groups.

²A rating of "99" indicates the factor was very important in selection of career, while a rating of "1" would indicate a very important factor.

occupations. Because non-whites are distinguished from white respondents in their desire for a career which provides opportunities to help others, security and personal growth development, future information should emphasize these aspects of relevant natural resource careers.

Discriminant Analysis of Knowledge Variable

The final discriminant analysis addressed the differences in knowledge (perceived dissimilarities) between non-whites and whites. While Breakdown analysis had revealed some difference at .05 level of significance (See Table 31), this analysis revealed those differences where the two groups were most distinguishable. Eight of a possible 72 comparisons can be used to separate the two groups.

From Table 31, two differences are associated with money, three with chance to correct current problems, two with opportunity to work with people and two with educational requirements. The non-traditional career registering the most differences was forester with four difference measures. (Fish-wildlife Biologist and Extension Agent had similar number of differences--two and three respectively.

The results of the discriminant analyses of the independent variables are summarized on Table 32. These career information dissemination factors provide the greatest discrimination between non-white and white respondents in this sample and logically should be emphasized in the development of recruitment retention models.

Table 31. Stepwise Discriminant Analysis of Knowledge Variable

Step	Factors	Significance ¹	Standardized Coefficients	Expected Perceived Differences Non-white White
1	Differences in Money/ High School Teacher-- Fish Wildlife Biologist	.016	.974	High Low
2	Differences in Chance to Correct Current Problems/High School Teacher--Extension Agent	.005	-.415	Low High
3	Differences in Chance to work with People/ High School Teacher-- Fish Wildlife Biologist	.007	-.569	Low High
Canonical Discriminant Function Evaluated at Group Means				
			non-white white .415 -.156	
Percentage of Cases Correctly Classified with Discriminant Function			55.4% 66.7% (63.5% of all cases)	

1	Differences in Money/ Lawyer--Forester	.009	.958	Low High
2	Differences in Chance to Correct Current Problems/Lawyer-- Forester	.001	-1.317	High Low

Table 31 (cont'd.).

Step	Factors	Significance	Standardized Coefficients	Expected Perceived Differences	
				Non-white	White
3	Differences in Chance to Correct Current Problems/ Lawyer--Extension Agent	.001	.685	Low	High
Canonical Discriminant Function Evaluated at Group Means					
			non-white white -.531 .189		
Percentage of Cases Correctly Classified with Discriminant Function					
			80.4%	59.7%	(65.3% of all Cases)

1	Differences in Education Requirements/Civil Engineer--Forester	.080	-2.091	High	Low
2	Differences in Chance to Work with People/Civil Engineer--Extension Agent	.011	.748	Low	High
3	Differences in Educational Requirements/Civil Engineer--Forester	.011	1.326	Low	High
Canonical Discriminant Function Evaluated at Group Means					
			non-white white -.383 .153		
Percentage of Cases Correctly Classified with Discriminant Function					
			66.1%	64.8%	(65.2% of all cases)

1 The selection rule for each factor is to maximize minimum mahalanobis distance (D squared) between groups.

Table 32. Summary of Discriminant Analysis
(Independent Variables)

Variables	Standardized Coefficients (Contribution & Direction)	Factors	Most Distinct Group Discrimination (non-white) (white)	
SOURCE	-.547	Senior high class	X	
	.547	Recreation-leisure Participation		X
	-.409	Senior high Principal	X	
	-.280	Clergyman	X	
	.229	Friends		X
METHOD	.561	Demonstrations	X	
	.379	Television Programs	X	
	.408	Magazines	X	
	-.978	Books		X
	.584	Newspapers	X	
CONTENT	-1.151	Information about entry job	X	
	1.076	Information about work location		X
ATTITUDE	-.698	Opportunity to help others	X	
	.924	Self-fulfillment		X
	-.653	Security	X	
	-.418	Opportunity for Personal Growth and Development	X	
	.266	Appreciation of subor- dinates & their work		X

Chapter VI

MINORITY CAREERS IN NATURAL RESOURCES--

HOW DOES IT HAPPEN?

The Recruitment-Retention Model

There are many different actors and levels of responsibility in recruiting students to colleges and universities. A model which addresses the recruitment of non-white students has been suggested by Chuck Dooley of the U.S. Forest Service (see Figure 5). This model has four sections: Actors, Identification of Students, Attraction of Ethnic Minorities and Encouragement of their Enrollment in Natural Resources:

1. Junior and senior high counselors and teachers have the primary responsibility for identifying minority students.
2. Minority organizations can also help identify students and provide moral and financial support.
3. Community leaders can both help identify students and encourage students to enroll.
4. Alumni of respective colleges can give overviews of the total college environment while graduates of natural resource departments can personally speak as to what departments and professors are like.
5. Professionals employed in the field have very important responsibilities to be sensitive to minority students and help them see how they might play a role in natural resources management.

ACTORS	Responsibilities		
	Identify (Adequate Pool of Students)	Attract (Sell Idea of Natural Resource Career)	Recruit (Encourage Enrollment in Natural Resource of Related Career)
Junior and Senior High Counselors	_____		
Minority Organizations	_____		
Community Leaders	_____	-----	
Alumni of College Graduates of Department	-----	_____	
Professional	-----	-----	
Faculty, Staff and Students	-----	-----	_____
Mass Media	-----	_____	
Natural Resource Agencies ¹	-----	-----	-----

Figure 5. A model of the Recruitment Component

¹Taken from a speech by Chuck Dooley, "Public Agencies' Role in Recruiting Minorities for Careers in Forest Resources," Personnel Staff Unit, Recruitment, Placement and Appraisals Groups, Southern Region, USDA-Forest Service (n.d.)

Major Responsibility

-----Minor Responsibility

6. Faculty, staff and students have the ultimate responsibility to contact prospective students--by mail, telephone or personally--and to encourage enrollment in natural resources or related programs.
7. Mass media is most helpful in initially attracting students and providing sources of supplementary information.
8. Finally, according to Dooley, the public agencies' role in recruiting minority students is one of enrichment and support. Moreover, they can (a) provide opportunities for ethnic minorities to see a larger spectrum of the diversity of skills required in resource management and development; (b) show how management decisions benefit or negatively affect the lives of people; (c) show how natural resource professions are relevant to every day problems ("the Big Picture"), (d) and finally, they should see that mass media materials and other publications are accurate and do not perpetuate myths or half truths about careers.

But once the students have been identified, recruited and enrolled in the respective university what happens then? Coleman suggests that successful recruiting of minority students for non-traditional programs at large, predominately white colleges and universities goes beyond just identifying and recruiting the student--the successful program should recruit as well as retain (educate and graduate) ethnic minority students.¹ He has successfully coordinated the development of such a model for minority students in the College of Osteopathic Medicine--a non-traditional career for minority students--at Michigan State University.

¹Don E. Coleman, A Study Related to the Development and Implementation of a Program to Recruit, Counsel, and Retain Ethnic Minority Students in the Osteopathic Profession. Final Progress Report 1974-1977 (East Lansing, Michigan: Michigan State University, 1977), pp. 24-26.

Entitled a Minority Comprehensive Support Program or "A Program to Recruit, Counsel and Retain Ethnic Minority Students in the Osteopathic Profession," it has enabled the College to double its percentage of ethnic minorities from about 10 percent between 1969-1973 to about 20 percent between 1975-1978.¹

Although Osteopathic Medicine and Natural Resource Careers are vastly dissimilar, they do share the common distinction of not being traditional choices of ethnic minority students. Consequently special efforts are required to increase their representation in both careers.² And by broadening the model from just the recruitment aspect, it allows the investigators to consider the problems of attracting minorities to professions in natural resources--the few that do graduate from these programs and those that possess job skills which are transferable from one industry to another. One objective of this chapter, therefore, is to adapt the Coleman model to the need of forestry and other natural resource departments to increase their recruitment and retention of non-white students.

Perhaps of primary consideration, which Coleman articulates in this report on the development and implementation of the program at Michigan State is the initial and continuing commitment of administration, faculty, staff and students (for industry this commitment would include top and middle management as well as other staff) to the rationale behind.

¹Ibid., pp. 23, 30, & 35.

²Ethnic minorities, however, probably have a more accurate perception of the role and responsibilities of a physician than they do of a forester or other natural resource professional.

this approach.¹ Why devote resources to such an endeavor? Should it be just to demonstrate the presence of a highly visible minority or two? No! The obvious reason, perhaps, is that ultimately such efforts will produce a more equitable and efficient use of human and other resources. Coleman has implied that without this commitment, any approach may be doomed for failure.

Essentially, what is necessary is a firm commitment and belief in the principle of "affirmative action: to rectify past wrongs, to increase the presence and enhance the roles that ethnic minorities play in nontraditional careers. Yet, for many of the white majority this policy is viewed as "reverse discrimination."

The latest challenge to affirmative action despite the momentous overtones of the Bakke decision came in the recent Brian Weber appeal before the United States Supreme Court: Weber, a white worker at Kaiser Aluminum in Gramency, Louisiana contended that their voluntary affirmative action plan to upgrade the roles of black workers discriminated against him because he was white, a violation of the Civil Rights Act of 1964.

Tom Wicker, a columnist for the New Yorker Times in a July 1 article writes that the court's ruling represented "A Victory for Affirmative Action": "in eradicating racial discrimination in employment, some consideration of color may be permitted because it is necessary to achieve the desirable

¹Don E. Coleman, pp. 101-106.

results."¹

Weber argued successfully in the lower courts that the remedy Congress intended for racial discrimination and employment was color-blind employment practices. Wicker, however, noted that the majority of the justices saw this not as a remedy for the victims of an existing evil, but a prescription for the elimination of future evil.² The following example was offered to illustrate the difference between a "remedy and a prescription."

. . . Two workers, one white, one black, of equal physical and mental ability enter the employment of a company. After 10 years, because of racial discrimination, the white worker has a high supervisory position and twice the salary of the black who remains at a low level job. At this point, Congress orders color-blind employment practices. The kind of discrimination of which the black was a victim must therefore cease; but he remains at his low level job and his low salary while the white retains all his ill-gained advantages.³

Wicker thus concludes that this would be no remedy for the victim. Nor would it be much of a remedy if the only option open to the black was to hire an attorney and file a law suit. Accordingly, the Supreme Court ruled: "that had Congress intended that nothing could or should be done to provide a practical remedy for victims conceded to exist, it would have said so."⁴

¹Tom Wicker, "A Victory for Affirmative Action" Greensboro Daily News, July 1, 1979, A New York Times News Service.

²Ibid.

³Ibid.

⁴Ibid.

Although this court ruling does represent a victory for affirmative action and gives legitimacy to efforts to increase the number of minority students and professionals in non-traditional educational programs and professions such as natural resources, a word of caution is in order because the court also said such an affirmative action plan should remain in force only until the number of blacks in the skilled jobs reaches the proportion of blacks in the labor force from which Kaiser's plants recruit.

Basic Elements of Model

The elements of a recruitment-retention model include: Recruitment, Early Entrance Program, Academic Support Program, Counseling Program, Instructional Program, Special Service Program and Program Evaluation (See Figure 6). Although most colleges and universities do provide a variety of these services, few have developed a systematic program (with all seven components, funding, and staff) to specifically increase the number of ethnic minorities in natural resources.¹

Although the comprehensive minority recruitment and retention model should include the above seven components, the results of this research are most applicable in refining the recruitment component or insuring that accurate, timely, and appropriate career information about natural resource professions is disseminated to a large pool of ethnic minority

¹The Tuskegee Pre-Forestry Program has had some success with recruiting minority students, providing two years of basic education, then transferring them for the last two years to a four-year Forestry and/or Natural Resource Program.

- I. Recruitment (Sensing Matrix)--to identify, attract and recruit more ethnic minority students
 - A. Identification of Ethnic Minority Students
 - B. Community Organizations and Leaders
 - C. University Graduates and Natural Resource Professionals
 - D. University Faculty, Staff, Students
- II. Early Entrance Program--to provide overview of classroom and college expectations
 - A. College Curriculum
 - B. College Testing
 - C. College Evaluation
 - D. College/University Support Service
 - E. College/University Environment
 - F. Academic Governance
- III. Academic Support Program--to monitor performance and provide assistance to students having difficulties
 - A. Academic Advisement
 - B. Tutoring
 - C. General Advisement
 - D. Financial Aids
- IV. Counseling Program--to assess student problems and intervene, if necessary
 - A. General Counseling
 - B. Psychological Counseling
 - C. Academic Counseling
 - D. Vocational/Career Counseling
 - E. General Advisement
- V. Instructional Program--to see that learning skills are appropriate and instructional programs relevant
 - A. Curriculum Modification
 - 1. Re-tracking
 - 2. Extended Program
 - 3. Special Electives
 - B. Learning Skills
 - 1. Reading Comprehension
 - 2. Test-taking Skills
 - 3. Test-taking Techniques
 - 4. Learning Strategies
- VI. Special Services Program--to acclimate new minority students to the college and community
 - A. Academic Summer Program
 - B. Summer Internships
 - C. High School Career Day
 - D. Cultural Environment Program

Figure 6. A Model for Minority Recruitment and Retention in Natural Resources.

- VII. Program Evaluation--to regularly monitor performance
(fine tune model)
 - A. Program Components
 - B. Student Achievement
 - C. Student/Program Evaluation

Figure 6 (cont'd.).

Source: Except for a few changes, this proposed model is essentially the same one that was developed for the Minority Comprehensive Support Program in College and Osteopathic Medicine at Michigan State University.

students and graduates. The primary goal of this first component should be to develop a program to identify, attract, and recruit more ethnic minority students to the natural resource professions. Accordingly, the researcher interviewed several individuals to gain insights about a workable recruitment component (See Appendix P).

As a result of these interviews, several criteria of a recruitment component were gleaned:

1. Special financial support of the project (three to five years).
2. Cooperation with other programs to identify a sizeable pool of students, i.e., multi-discipline approach.
3. Employment of a director or coordinator of the project.

And from analyzing the results from this study other considerations are suggested:

4. The pool of potential minority students should include more than students with farm or vocational agriculture backgrounds.

Also, the specific results of the Breakdown and Discriminant Analyses may be applied in the following manner (See Table 32):

- | | |
|-------------|---|
| (Knowledge) | 1. Since career information is readily available for such traditional careers as high school teacher, civil engineer, lawyer and others, efforts should be made to present information on such non-traditional natural resource careers as park-recreation superintendent or fish and wildlife biologist or forester in terms of vocational job factors. Such comparative information should be developed and disseminated through the recruitment component. |
|-------------|---|

- | | |
|----------|--|
| (Source) | 2. Whites indicated that recreation-leisure participation was important in supplying |
|----------|--|

career information while blacks placed more importance on formal school settings. Efforts should be made to increase the amount and quality of non-formal career information available to minority groups.

3. But since minorities relied more heavily on the formal school system, efforts should also be made to strengthen this source. Accurate, timely and appropriate career information about natural resources should be available to guidance counselors and teachers serving this group.
 4. Since families played an important role as a source of career information for present holders of natural resource jobs, efforts should be made to involve more minority parents in learning about resource management, i.e., increase participation of minority groups in resource planning, management and development activities.
 5. In terms of high school courses, efforts should be made to broaden the diversity of information presented about careers, especially to urban students.
- (Methods)
6. For 1975 graduates, books and magazines played a larger role in providing career information than for 1965 graduates. Consequently, efforts should be made to ensure that these books and magazines accurately portray the natural resource professions, and that they are available to minority groups.
 7. Although books and magazines along with lectures and demonstrations are recognized for supplying valuable career information, more effort should be devoted to involving the minority student in career exploration activities that are less passive, i.e., employment and leisure time activities where he can gain a first-hand glimpse of the field.
- Time-
liness)
8. Although 1975 graduates learned about career factors significantly earlier than 1965 graduates, those not currently employed in natural resources also lagged behind by two to three years in

acquiring career information early in their adolescence about various natural resource job factors--educational requirements, pay and fringe benefits, entry job and upgrading opportunities, possible location of work, working conditions, and expected tasks. Such information should be available no later than junior high school and should be reinforced throughout high school.

- (Career Expectations) 9. Minorities stressed that the opportunity to help other people was significantly important in career selection. Efforts consequently should be made to disseminate information on just how positions in natural resources will benefit people, especially categories of people they can relate to.

Removing the Barriers--The Social Change Process

This study has focused on one specific aspect of the problem, namely, that accurate, timely and pertinent career information about natural resources is not available to racial minorities. Although such a narrow approach was necessary for research purposes, it did not necessarily specify or suggest an effective action stage for resource agencies. For example, Coleman's recruitment and retention model focused primarily on the role of colleges and universities. Therefore, how might a resource agency tackle the overall problem? Will concentration on the information dissemination process along remove the barriers to entry?

At the 1975 Tuskegee Conference the barriers to entry of minorities into natural resources were conceptualized as: academic, financial, aspirational, geographic, physiological, psychological and sociological. Moreover, it is apparent at

this point that this and prior studies were prerequisites to an action stage, and while the recruitment-retention model suggested for institutions warrant experimental use, it may not be adequate for the needs of concerned resource agencies. A broader perspective must be applied. The Social Action Process is one such approach (See Figure 7).

Social Action is defined as "planned collaborative change that is consciously evoked through the alteration of the systemic attributes of society and subsystems through the development of new systems and the alteration of old ones."¹ Information and information diffusion are, of course, basic to the social action (change) process. Yet, the process can be approached from several perspectives, emphasizing different aspects. However, it has most often been approached or studied from the perspective of the educator, particularly the adult educator working with voluntary community based programs.

On the other hand, Kotler advocates consideration of situations requiring action or social change as a marketing problem.² This means that the problem can be analyzed and action steps initiated using basic marketing concepts. Since both perspectives have merit, the final approach was to employ models developed from each perspective to suggest an action stage suitable for resource agencies--both models can

¹Edgar J. Boone, "A Conceptual Analysis of Social Action." Prepared for the Community Resource Development Workshop held July 15-19, 1968, Division of Continuing Education and Departments of Adult Education, Sociology, and Economics, North Carolina State University, p. 1.

²Philip J. Kotler, Marketing for Nonprofit Organizations (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1975) o. 281.

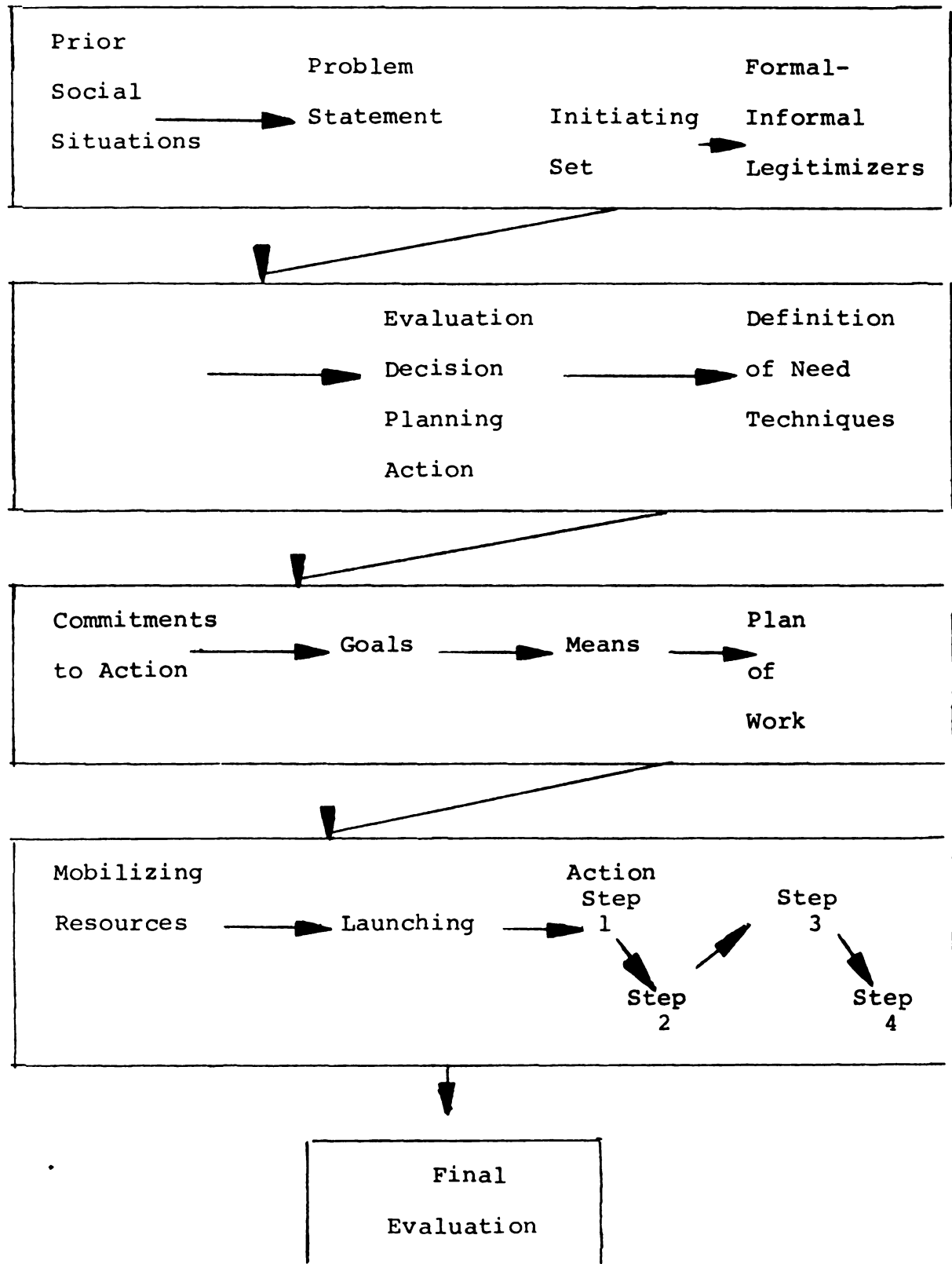


Figure 7. The Social Action Process

Source: Adapted from a model conceptualized by Edgar J. Boone in 1968

contribute essential elements to developing an applied action stage. While Boone's conceptual approach provides a more basic orientation to the social change process employed in adult education, Kotler's model is the more dynamic one employing the pragmatism of a business perspective (See Figure 8).

The final approach, consequently, was to combine the two models, using the social change model as the overall framework, but analyzing the research problem in terms of key concepts taken from the social marketing model (See Figure 9).

The discussion which follows provides a perspective of the social change parameters which should be considered in developing a comprehensive program to address the research problem. While the discussion incorporates the study findings, it also attempts to move beyond the recommendation-conclusion stage of most dissertations. It suggests general and specific steps that natural resource agencies may employ to increase or alter the knowledge, attitudes, skills and aspirations of racial minorities.

The Social System

In general the problems facing many minorities are associated with the lower end of Maslow's Need Hierarchy--employment, adequate housing, education, health care, etc. Within this context, acquiring necessary training or education and a subsequent job is a prerequisite for moving beyond this stage. Yet, a number of minorities realize that gaining control of productive resources and acquiring economic and political clout requires more than simply receiving a regular

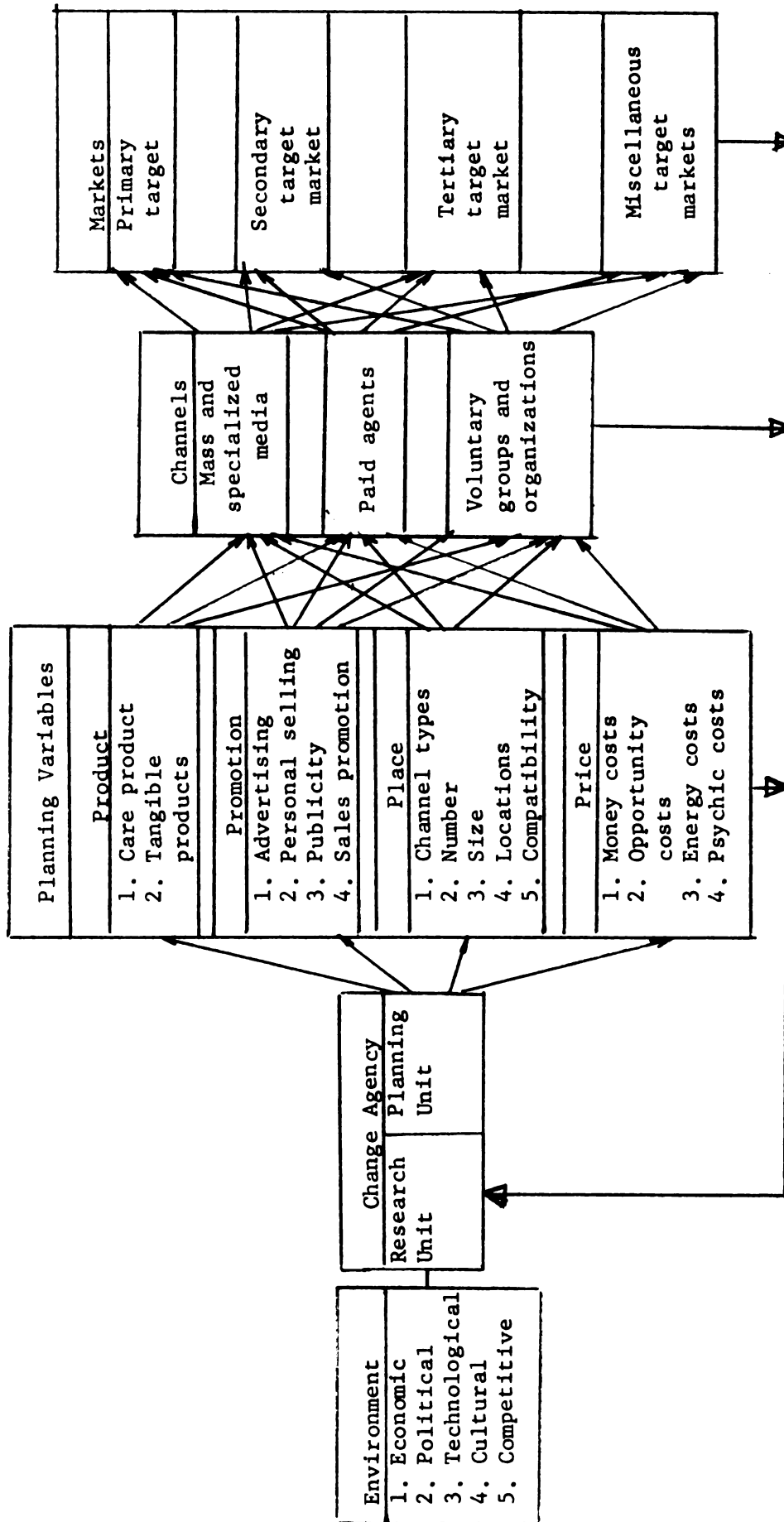


Figure 8. Social Marketing Planning System

Source: Philip Kotler, Marketing for Nonprofit Organizations, p. 297.

- I. Social Systems (Groups and Interest of Persons Involved)
 - Market Identification
 - A. Primary Target Market
 - B. Secondary Target Market
 - C. Tertiary Target Market
 - D. Miscellaneous Target Market
- II. Problem Situation (Racial Minorities are Significantly below parity in the ownership, utilization, planning, management and development of natural resources.
- III. Problem Goal (Develop parity for racial minorities in Natural Resources)
- IV. Prior Social Situation (Atmosphere or environment)
 - A. The Environment of primary target market

BARRIERS

Environment	Financial	Aspirational	Geographic	Physio-logical	Socio-logical
Economic					
Political					
Technological					
Cultural					
Competition					

- V. Initiating Sets (Anyone who recognizes "problem")
 - A. Resource Agencies
 - 1. Federal
 - 2. State
 - 3. Local
 - B. Universities with natural resource program
 - 1. 1862
 - 2. 1890
 - C. Minority and other professionals

Figure 9. Removing the barriers--the social marketing/change process.

- VI. Legitimizers of Idea (Individuals within social system)
 - A. Formal
 - 1. Junior High and Senior High teachers
 - 2. Junior High and Senior High counselors
 - 3. Minority teachers
 - B. Informal
 - 1. Parents
 - 2. Relatives and friends
 - 3. Community leaders
 - 4. Peer group

- VII. Diffusing Sets (Action groups spread idea that something can be done)
 - A. Community organizations
 - B. Minority mass media
 - C. Minority professionals in agriculture and natural resources
 - D. Interpretation of minority heritage in natural resources at park and outdoor recreation facilities

- VIII. Definition of Need (Awareness that something can be done)

Why should racial minorities be involved in planning, owning, using, managing and developing natural resources?

- IX. Techniques Used (To create awareness)

Market Planning Variables

 - A. Product
 - 1. Core product
 - 2. Tangible product
 - B. Promotion
 - 1. Advertising
 - 2. Personal selling
 - 3. Publicity
 - 4. Sales promotion
 - C. Place
 - 1. Channel types
 - 2. Number
 - 3. Size
 - 4. Locations
 - 5. Compatibility
 - D. Price
 - 1. Money costs
 - 2. Opportunity costs
 - 3. Energy costs
 - 4. Psychic costs

Figure 9 (cont'd.).

- X. Goals for Individuals and Groups (Short and long term goals)
 - A. Short term goal--Help develop (identify) pool of qualified applicants. ("Piggy back" with other programs)
 - 1. Primary market
 - 2. Secondary market
 - 3. Tertiary market
 - 4. Miscellaneous market
 - B. Long term goals--provide accurate, timely, pertinent information on natural resource careers
- XI. Means for individuals and groups
 - Marketing chanels
 - A. Mass and specialized media
 - B. Paid Agents--Select appropriate ones
 - C. Voluntary groups and organizations
 - 1. Community leaders
 - 2. Community action organizations
 - 3. Churches
 - 4. Youth groups
- XII. Mobilizing Resources
 - Interagency task force to help allocate necessary:
 - A. Staff time
 - B. Physical facilities
 - C. Budgets
 - D. Skills
- XIII. Launching (Appropriate promotional activities)
 - A. Clearing house for information--How can minority person gain necessary information?
- XIV. Action steps
 - A. Develop program materials
 - B. Identify--Contact markets
 - C. Recruit volunteer or paid field staff
 - D. Initiate pilot programs
 - E. Increase use and consumption of products
 - (Provide opportunities to observe benefits of natural resources)

XV. Progress toward problem goal (Evaluation)

- A. Inputs
- B. Activities
- C. People Involvement
- D. Reactions
- E. KASA
 - 1. Knowledge
 - 2. Attitudes
 - 3. Skills
 - 4. Aspirations
- F. Practice change
- G. End results--Minorities approaching parity in natural resource use, employment and development activities

Figure 9 (cont'd.).

salary. Because of the largely negative land resource legacy of minorities, positive attempts must focus on marketing the concept (to a larger target audience) that natural resources involvement (ownership, employment, policy making) is a critical link in economic production and development (GNP) and ultimate social and political influence.

The target audience consists of four markets: the primary market composed of minority youth aged 13-18 years; the secondary market of minority youth already in college (18-24 years); a tertiary market of minority professionals in related careers and a miscellaneous market of technical school graduates and minorities currently employed with the agency but in the lower job classifications.

It is important that the primary target audience be pre-college youth because they are probably the most receptive to exploring new career avenues. Moreover, both urban and rural youth should be identified and provided the appropriate information for informed decision making about a prospective career in natural resources. For urban residents, the approach should emphasize environmental awareness and the interdependencies of the land and environment, especially ways in which different policy decisions, seemingly affecting the natural resources located in remote regions, influence the quality of the urban environment.

But for rural youth, the approach might differ. For example, their concepts about the land and associated careers might be negative, especially if they have been shaped by first hand experiences with wood crews in the pulp and paper industry

or tenant farming operations. This marketing strategy should, consequently, attempt to remove negative or stereotypical images of forestry or other related professions.

Finally, all minority youth in this age group should be considered a primary target because with the complexity of future resource problems, it is desirable that all youth achieve a minimum understanding of the environment regardless of place of residence.

In the past only students with farm and or vocational agriculture backgrounds were considered as a prime target market. Although every student cannot be expected to like or enjoy all aspects of a particular natural resource career, there are certainly many facets of such careers where unique skills or interests can be focused.

The secondary market should consist of minority youth already enrolled in college. Such majors as agriculture, biology, horticulture, health, physical education and recreation (HPER), etc. should be included in this secondary market. Accordingly, efforts are necessary to review or update civil service entry level positions such that these non-traditional applicants can be employed and anticipate moving into mid-level technical positions. After entry level work, for instance, many may be receptive to pursuing graduate programs designed to prepare them for a higher grade in a more specialized area. Also, if opportunities exist in natural resource professions for science majors, political science graduates, economists, writers, etc., then these opportunities must be identified and marketed to this target audience.

Tertiary markets may exist for minority professionals with such specialities as research, geography, land use planning, law, public health or any career where the core training and skills are transferable to natural resource positions. A miscellaneous target market consists of minority students pursuing technical degrees, retired military personnel with extensive management or technical background and current employers working in low job classifications. If given the opportunity and necessary in service training, they may help strengthen the program.

Problem Situation Analysis

Because racial minorities are below parity in the ownership, utilization, planning, management and development of natural resources, efforts should be made to ensure that more involvement occurs at each stage. A social marketing perspective, moreover, might identify the problem as lack of minority demand for careers in natural resource. This demand may range from "negative," "non-existent" to "latent." At the same time, demand by majorities for such careers is "overfull."

Problem Goal

In order to increase representation of racial minorities, negative demand must be disabused by a conversional marketing strategy, non-existent demand must be created by simulational marketing and latent demand must be developed by developmental marketing.

In contrast, the demand by the majority group should be reduced by a de-marketing strategy. For example, in the 1974 Michigan State study by Dunleavy, of students in the Parks and Recreation curriculum, many indicated a reason for selecting such a major was for an opportunity to "get away from people," or in other words work with the environment rather than with people.¹ In reality, perhaps, only a small percentage do work extensively in remote regions away from all public contact. However, accurate and timely information may dispell such preconceptions by majority students which may allow them to select another alternative. Perhaps in marketing a school's program, working and helping people can be emphasized while less emphasis is placed on remote duty stations.² This strategy may achieve two results: reduce attractiveness for majority students and increase attractiveness for minority youth. Since students do select careers based on an initial perception of job tasks, location, advancement opportunities, etc., accurate and timely career information may help create a more realistic view of the field.

Prior Social Situation

By analyzing the environment of the primary target market each state or region could localize its outreach strategy. For example, within a particular state, economic, political,

¹Dunleavy, A Description of Personal Backgrounds, Experiences and Attitudes of Park and Recreation Resource Undergrads at Michigan State University, 1974.

²This is not to lessen the importance of management of remote natural resources, but to outline an approach that could be considered as a factor in altering attitudes.

technological, cultural and competitiveness (demand for jobs) factors influence what can be reasonably accomplished.

In addition, if barriers such as lack of financial resources, aspirational, geographic, physiological, psychological and sociological are accepted as valid, then the appropriate system should be tackled to help remove these barriers.

Initiating Sets

A chief initiating set for the social action process should logically include the agency or organization concerned about the problem. In this case it is suggested that resource agencies at all levels of government be involved or at least share responsibility. Obviously, since some agencies have expressed more interest or concern, a logical first step, for example, may be an interagency agreement to assist efforts in increasing the pool of qualified minority students and professionals who become knowledgeable of natural resource careers.

Secondly, since many universities with natural resources programs are concerned about the lack of minority enrollment, special pilot efforts should be initiated in those states where both 1862 and 1890 land grant institutions share joint responsibilities for teaching, research and extension activities. Efforts should be made to link their approaches. But this linkage should not be one sided. It should represent a mutual sharing of resources and information--i.e., the interchange of faculty, joint seminars, and student interchanges for exposure to unique course offering, etc.

Legitimizers of Idea

Historically, minority educators have played an enormous role in instilling in youth the necessity for an education. What they lacked in material resources, they compensated by moral support and encouragement to black youth. Now, with the advent of integration, blacks may have equal access to the latest equipment and newest books but sorely miss the moral support and encouragement given their older brothers and sisters. Black teachers knew firsthand the challenges that were facing even those students who were fortunate enough to graduate. Yet, because black educators are more dispersed in the integrated schools, formal channels of moral support, at least from this sector, may not be forthcoming.

Increased reliance must be placed on the parents, relatives and friends, community leaders and even peer group members who help shape the perceptions and aspirations of the student.

Diffusion Sets

The groups that can effectively disseminate the idea that minority involvement in this arena is critical are the traditional civil rights organizations such as National Association for Advancement of Colored People (NAACP), Congress for Racial Equality (CORE), National Urban League and Operation Push and newer, rural oriented organizations such as Emergency Land Fund and Rural America. National social and fraternal organizations such as ELKS, sororities, fraternities, and local and community organizations such as community action

agencies and black churches can also play an effective role. And because of the time devoted to the consumption of mass media by minorities, it certainly may have some impact in creating job awareness.

Third, minority professionals in agriculture and the few in natural resources can play an instrumental role in counseling black youth, but more specifically serving as a role model.

Finally, all public organizations such as parks, national forests and historical facilities, must ensure that the interpretation of the minority heritage at park and outdoor recreation facilities receive the highest priority.

Definition of Need

What should be the strategy for convincing minority groups that something can be done? Primarily it reverts back to the often repeated statement that natural resources are a basic factor of production along with labor, capital, and managerial skills. Secondly, political and economic influence are certainly associated with their ownership and control. Efforts such as those by the Emergency Land Fund to stem the tide of the increasing loss of land by blacks must be increased and supported by public policy. For example, Professor Earl O. Heady¹ notes that during the evolution of agricultural policy in the United States, there has never

¹Earl O. Heady, "Systems Concept in Agriculture--The Small Farm System," Comments made at Lucas Memorial Symposium, September 24, 25, 1979. N.C. State and N.C. A&T State Universities.

really been a policy of protecting or ensuring economic viability of the small family farm. Since most minority farmers or land owners are in this category, public policy has effectively led to the dilution of this equity base.

Most recently, Solomon in a report to Office of Minority Business Enterprise has proposed that federal lands in the south be increasingly used to stimulate the growth of minority farming or other resource based operations. For example, increasing number of cattle grazing permits issued to adjacent minority land owners may help expand their operations from more than a marginal level.

Techniques: The Planning Variables

According to Kotler, a successful marketing strategy usually has four planning variables: product, promotion, place and price.¹ If natural resource careers are considered the product, then achieving the objective requires skillful manipulation of the other variables. But what is the essential or core feature of a natural resource career? Since they span a diversity of tasks and require a host of skills, just what is the core product? Professor Colin R. W. Spedding² has suggested that in order to understand a career one must know:

- (1) what it is
- (2) what it does

¹Kotler, Marketing for Nonprofit Organizations, p. 163.

²Colin R. W. Spedding, "Systems Concept in Agriculture--The Small Farm System," Comments made at Lucas Memorial Symposium; September 24-25, 1979. N.C. State and N.C. A&T State Universities.

(3) who does what within it

(4) where and for what purposes

If these questions are answered satisfactorily, then, the core product may be discernable; this is what should be marketed initially. But in addition to the core product, there are also intangible products or other related factors associated with a career. For example, Richard Boles has suggested that the process of job factoring often discloses the many subsystems or components associated with the main job.¹ In other words, although individual skills and competencies when taken as a whole constitute a specific career--they also help determine the intangible product. The core and intangible product, consequently, should be promoted and actively marketed. Again, Kotler recommends a full and comprehensive approach relying on advertising to create awareness (of different types of careers in natural resources), personal selling to clarify (specific career questions) and publicity to reinforce (initial choices). Publicity may help reduce the dissonance between career choice and perceived aspirations of significant others.

Publicity, can also highlight the potential of these jobs to assist the community and the attractiveness of such a career to meet community needs in the future. Moreover, direct comparisons should be made with the more traditional and well known careers such as law, engineering and medicine. The interrelationship of each discipline and policy making, implementation and impact should be stressed. But more specifically

¹Richard Boles, What Color Is Your Parachute, (Berkeley, California, Ten Speed Press, 1978), p. 102.

information should be provided on specific differences: (1) educational and other requirements, (2) entry job and upgrading opportunities, (3) pay and fringe benefits, (4) possible location of work, (5) working conditions, and (6) expected tasks.

What location or channel is optimum for the marketing of variables? Because of the heterogeneity of racial minorities, all channels (public, private, mass media, individual contacts, etc.) should be employed to disseminate information on the need for minorities in natural resources.

Market analysis would help determine the optimum level of resources committed to individual channels, but each state which has a sizeable minority population should establish a pilot project to reach the target audience. For example, if informal channels (participation in recreation and leisure activities) as indicated by white respondents are indeed sources of key career information, then efforts should be initiated to ensure similar minority exposure. For example, participation in outdoor recreation activities and subsequent exposure and exploration of different careers in natural resources may be facilitated by intensive summer programs. Specific objectives of such a summer program might be three fold:

1. Provide informal channel for exposure to natural environment,
2. Provide opportunity to explore different natural resource career options,
3. Learn which colleges or technical institutes offer such programs.

Price is the third marketing factor. In this case it might represent the salary and benefits associated with a particular career. When comparing competing careers such as forestry vs. law or park and recreation resources vs. engineering, the opportunity costs may represent the salary and benefit differential (What salary and fringe benefits are foregone because of selection of a different career?). An effective marketing strategy, however, should not exclude those students who have expressed an initial interest in law, engineering or even medicine. Because of the complexity of environmental problems, many specialized disciplines help shape policies and program. For these students, emphasis should be placed on marketing methods in which the application of such specialized careers can help achieve more effective management of the basic resources. Obviously, what must be stressed is the interdisciplinary character of all systems and the resultant conflicts in simultaneously achieving economic growth, resource protection and enhancement of the public's health and well being.

Each state or region (natural resource agencies and universities) should develop short and long range goals for each of the target markets: primary, secondary, tertiary and miscellaneous. For example, a key goal that needs to be accomplished initially is to identify minorities within each of the suggested market categories.

If identification of a pool of interested and qualified minorities is an appropriate short range goal, then a long range goal to provide accurate, timely and pertinent career

information to this pool is also warranted.

The specific means for individuals and groups to receive this information spans mass and specialized media, paid agents (full time director of state projects), and voluntary groups and organizations. For example, college alumni employed in particular target counties may serve to funnel much of this information. They are a logical conduit for two-way, personalized communication flows.

The mobilization of resources might start with an inter-agency task force and memorandum of understanding on the priority of increasing the number of racial minorities involved in the natural resource development process. Appropriate time, physical facilities, budget and staff skills are required.

Projects should be launched with effective promotional activities, closely coordinated with other ongoing systems. The implementation teams should monitor the process and rate of information diffusion. Within this context the state action plan should be developed and tailored to the specific needs and characteristics of each state. Some suggested action steps are:

1. Employ project director
2. Develop program materials
3. Identify and contact minority individuals
4. Recruit or enlist volunteers
5. Design and initiate pilot programs within states

6. Increase use and consumption of renewable resource product (provide opportunities for ethnic minorities to observe specific benefits occurring to the minority community)

Finally, evaluating the progress of goal achievement is extremely important. Since each identified market should have specific objectives: such factors as, inputs, activities, people involvement, reactions, change in knowledge, attitudes, skills and aspirations, practice change and end results should be measured. Specifically, the end results are to increase minority representation to parity in natural resources use, employment and developmental activities.

The above perspective of the social change process as an action stage to address the problem of too few minorities in natural resources warrant consideration. Because without a major investment of time, human and financial resources to stimulate such approaches in different states, minorities may never achieve parity and thus have greater impact on planning, owning, managing and developing the nation's natural resources.

Chapter VII

CONCLUSIONS AND RECOMMENDATIONS

Because ethnic minorities are employed in professional positions in natural resources substantially below their percentages in the general population, this dissertation represents a systematic effort to address the problem. Using the information diffusion model of Rogers as the theoretical framework, an interdisciplinary approach evolved which required a review of pertinent literature from natural resources, vocational choice and information diffusion.

The virtual lack of minorities in decision-making positions goes beyond the notion of "equal opportunity" and "affirmative action." It involves the socio-political policy making process: deciding what is produced, how it is produced, and who benefits from the development of natural resources of which a substantial mount is owned or controlled by the public sector.

The review of literature has shown that:

1. There is limited minority professional employment in natural resources;
2. Although there is some evidence that they have had a negative land and environmental heritage, there is also a positive aspect, particularly with the potential of land ownership as an equity resource;

3. There may exist more barriers--social, psychological, economic, geographic--than opportunities for entrance;
4. Although blacks may have different occupational selection patterns, race is not a major predictor of career choice when all other factors are controlled;
5. There is a relationship between career aspirations and knowledge of occupations;
6. Past vocational theories may have limited utility for problems of special groups: minorities, women and the handicapped;
7. Racial minorities possess great intergroup diversity and generalizations about career aspirations may be misleading;
8. Accurate, timely and appropriate career information, is a necessity before minorities start considering careers in non-traditional fields;
9. The process of biculturation ensures that most minorities are simultaneously enculturated to both ethnic and mainstream culture;
10. And finally, although mainstream and ethnic cultures are juxtaposed, institutional conditions prevent minorities from achieving mainstream middle-class values, aspirations and role models.

Summary of Empirical Findings

This study was intended to assess career information diffusion and determine its impact on vocational choices of graduates. The diffusion model consists of the three stages: (1) the receiver and social system variables, (2) the innovation--decision process and (3) the consequence of the process. Basic to the innovation--decision stage is the knowledge variable, which, according to the basic communication model, may be

considered in terms of source of career information, timeliness of information, methods of receiving, content of message and attitudes of receiver.

Knowledge of careers was operationally defined as the matrix of perceived dissimilarities among the selected careers--the perceived difference between traditional careers and careers in natural resources. Source was defined as those individuals or institutions that originate a message--interact with the receiver in terms of presenting career information. Method was defined as the means by which a message gets from a source to a receiver. Timeliness was measured as the respondent's age when initially exposed to career information about five occupational factors. Content was useful information about these same five occupational factors. Finally, attitude was considered the psychological and social factors influencing an individual's choice of occupation. Specific information was sought to determine significant differences in test groupings, particularly by race in terms of career knowledge, source, methods, timeliness, content and attitudes:

1. The finding by race (significantly different at .05 level) show that minorities ranked senior high courses, high school teachers and junior high courses as moderate or higher in importance as a source of career information. Only the majority means for recreation-leisure participation was ranked significantly higher.
2. Prior to college, minorities ranked books, lectures and demonstrations as important methods of receiving career information.
3. Age of first receipt of useful career information about six job factors did not differ significantly between races.

4. Prior to college none of the five content factors showed any difference by race.
5. Whites and non-whites had similar responses for: (a) feeling of self-fulfillment, (b) opportunity to participate in determining methods and procedures, (c) opportunity to develop close friendships, and (d) feeling that administrators are willing to discuss subordinate's problems. The most dramatic difference, however, was registered in response to the factor: opportunity to help other people--minorities ranked this factor higher by 22.6 units.

Hypotheses Testing

From the information diffusion research model, six null hypotheses were formulated to guide the investigation. Hypothesis I states: There is no difference in sources of career information among graduates of natural resources programs when analyzed by racial background. Results of the stepwise discriminant analysis does not support this hypothesis. When the discriminant functions and weighting coefficients are evaluated, two statistically distinct patterns are revealed. Although non-whites have relied on such formal sources as senior high classes, senior high principal and clergymen as sources of career information, these sources have largely exerted a negative influence. Whites, however, have relied mainly on non-formal channels such as recreation-leisure participation and friends. These two factors have had a positive effect on their source of career information about natural resources (See Table 27).

Hypothesis II states: there is no difference in methods of career information dissemination among graduates when

analyzed by racial background. Again the discriminant function and weighting coefficients reveal two statistically distinct patterns. While whites only seem to place more importance on books, non-whites indicate demonstrations, television programs, magazines and newspapers are positive factors (See Table 28).

Hypothesis III states: there is no difference in timeliness of receiving career information among graduates when analyzed by racial background. Breakdown analysis of this variable and subsequent difference of means tests reveal no significant differences between races on age of first receipt of useful career information about six job factors. Hypothesis III, therefore seems to be supported by this analysis.

Hypothesis IV: there is no difference in content of career information among graduates when analyzed by racial background. Only two of five factors reveal any difference between groups in the discriminant analysis. These two factors--amount of information about entry job and amount of information about work location--statistically separate non-whites from whites. Work location information is important and would seem to have a positive impact on whites, while information about entry job is important to non-whites but appears to have a negative effect in the discriminant function (See Table 29).

Hypothesis V's focus is on career attitudes or expectations: there is no difference in attitudes among graduates when analyzed by racial background. Again the discriminant

analysis tend not to support hypothesis V. While non-whites rate opportunity to help others, security and opportunity for personal growth-development high, these factors have a negative weighting coefficient. Whites, however, tend to rate self-fulfillment and the administration's appreciation of work as high. Both these two factors have positive coefficients (See Table 30).

The final hypothesis states: There is no difference in perceived knowledge of careers (traditional versus non-traditional) among graduates of natural resources programs when analyzed by racial background. Here the discriminant analysis shows a statistically distinct pattern between non-whites and whites (See Table 31). While this measure is only a perceived difference and not an actual difference it does measure certain vectors where minorities and whites differ. For example, two measures of difference exist for the money vector, three for chance to correct current problems, two for chance to work with people and two for educational requirements. Surprisingly, the greatest differences appear to be between perceived differences of traditional careers and the forester.

Summarizing, five of six hypotheses were not supported by the research results. The data reveals statistically distinct patterns between non-whites and whites for sources, methods, content, career attitudes and career knowledge variables. No such difference is observed for the timeliness variable.

Theoretical and Methodological
Limitations

This study has several limitations which should be readily acknowledged including sample size, return rate, questionnaire length and measurement of knowledge variable. Many of the addresses of graduates obtained from the cooperating universities were inaccurate or incomplete. Subtracting the names of graduates that could not be contacted (non-telephone confirmation and/or undeliverable questionnaires) reduced the overall sample size. Although the rate of return approached 50 percent, the rate for questionnaires that actually reached the intended respondent may be somewhat higher--the researcher suspects that many survey instruments never reached the intended respondent nor were accounted for as undeliverable (via returned mail). Moreover, it was initially recognized that these findings, could not be generalized to all graduates of natural resources or related programs, but could point to areas where future research might be fruitful.

Although several comments were received on the returned questionnaire about length (11 pages), the majority of the questions were answered. Several of the respondents, however, experienced difficulty answering questions because they had never really considered such questions with respect to their career choice before. The assumption was made that those graduates who objected to the length--justified on basis of subject and study sample--did not bother to return the instrument.

Several respondents also questioned the validity of the technique for measuring the knowledge variable. Again this was probably a comparison that they had never been asked to make. Because this measuring technique is much more sophisticated than the treatment it received in this study, future research is certainly warranted, particularly for natural resource graduates.¹

Finally, a purist of any one discipline tapped to develop this research model may object to this applied approach, but the researcher felt it crucial that all pertinent information from related subjects be considered because of the complexity of the problem and the paucity of natural resources literature.

Assessment of Research for the Future

Although this research has its limitations, it is nevertheless, useful. It represents, perhaps, the first attempt to systematically examine the problem of recruiting racial minorities to natural resource careers. Consequently, future research is certainly warranted to extend this dimension and to more fully understand information diffusion/dissemination and the career choice process.

Specific suggestions for future research are:

- (1) Duplication of study with larger and more diversified sample--include graduates of other programs;

¹Woelfel has shown that when perceived difference in careers is measured in the ratio scale instead of nominal or ordinal, it can expand the analysis strategy to include such sophisticated techniques as factor analysis and regression.

- (2) Testing and refining of suggested models through applied research projects;
- (3) Development of a coordinated national or regional effort in natural resources similar to the nationwide Minority Engineering Project; and
- (4) General research of attitudes, motivations and change strategies for involving more minorities in using, owning, developing, and managing natural resources.

APPENDICES

APPENDIX A

FACTORS IN SELECTION OF COLLEGES
AND UNIVERSITIES

APPENDIX A

FACTORS IN SELECTION OF COLLEGES AND UNIVERSITIES

<u>Institution</u>	<u>City</u>	<u>State</u>	<u>Region</u>	<u>Enrollment¹</u>	<u>Percent Minority²</u>	<u>Residence of Students²</u>
1. Suny-College of Environmental Science & Forestry	Syracuse	NY	N.E.			Majority Mid-Atlantic N. England
2. Michigan State University	E. Lansing	MI	N.C.	48,488	3.5% black, 1.5% Oriental, 4% other	Mid-West
3. Purdue University	W. Lafayette	IN	N.C.	28,923		
4. Alcorn State University	Lorman	MS	S.E.	3,091	predominantly black	Majority students from South
5. Florida Agricultural & Mechanical University	Tallahassee	FL	S.E.	5,314	predominantly black	95% from South
6. Lincoln University	Jefferson City	MO	S.E.	2,607	mixed	Majority students N.C. region

APPENDIX A (CONT'D.)

<u>Institution</u>	<u>City</u>	<u>State</u>	<u>Region</u>	<u>Enrollment¹</u>	<u>Percent Minority²</u>	<u>Residence of Students²</u>
7. North Carolina A&T	Greensboro	NC	S.E.	5,345	predominantly black	
8. North Carolina State	Raleigh	NC	S.E.	17,471	2.5% black, 5% Oriental	85% South, 10% Mid-Atlantic
9. Tuskegee Institute	Tuskegee	AL	S.E.	3,590	predominantly black	
10. University of California	Berkeley	CA	P.S.W.	34,809	5% black, 15% other non-white	96% West & Northwest

¹ Taken from Education Directory: Colleges and Universities 1976-1977 published by U.S. Department HEW, Education Division, National Center for Education Statistics.

² Taken from Comparative Guide to American Colleges 1975 edited by James Cass and Max Birnbaum.

APPENDIX B

INITIAL LETTER TO UNIVERSITY CONTACTS

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PARK AND RECREATION RESOURCES
NATURAL RESOURCES BUILDING

EAST LANSING • MICHIGAN • 48824

March 31, 1978

Dear

We recently had the opportunity to study the Proceedings of "A Workshop on Entry of Minorities into Natural Resource Careers" held at Tuskegee, Alabama, in February 1975. Since that time we have developed and received funding for a research project which addresses that issue.

The objectives of this research project, "Information Diffusion and Career Decision Making of Graduates of Natural Resource Programs with Implications for Recruitment of Minorities" are:

1. To assess information diffusion and career decision making of graduates of Natural Resource and related programs;
2. To compare the influence of perceived dissimilarities of Natural Resource careers and other occupations of minority and non-minority graduates of Natural Resource programs on career decision making; and,
3. To develop a testable model for the recruitment of black and other racial minorities for educational programs and professional positions in the Natural Resource Field.

We are in the process of developing contacts with several of the individuals and their institutions who attended that workshop. The nature of that contact would be to facilitate the development of a list of graduates of Natural Resource and related programs to establish the sample. Data will be collected by mailed questionnaire. We are simultaneously contacting representatives from the following institutions:

SUNY - College of Environmental
Science & Forestry
Michigan State University
Purdue University
Alcorn State University
Florida A & M University
Lincoln University
North Carolina A & T State University
North Carolina State University
Tuskegee Institute
University of California - Berkeley

Syracuse, New York
East Lansing, Michigan
West Lafayette, Indiana
Lorman, Mississippi
Tallahassee, Florida
Jefferson City, Missouri
Greensboro, North Carolina
Raleigh, North Carolina
Tuskegee, Alabama
Berkeley, California

Page "2"

We are interested in obtaining the names and current mailing addresses of 1965 and 1975 graduates of Natural Resource and other related programs from your university. All costs that you might incur such as payment of computer costs will be fully reimbursed. We sincerely invite your cooperation in this study since we are looking for a sample representing diverse backgrounds, i.e., geographical, size of institution, program emphasis. The specific effort requested of each contact or cooperator is as follows:

1. During the month of April obtain a complete listing of 1965 and 1975 graduates (names and current mailing addresses) of Natural Resource and related programs from your institution.
2. During the latter part of April and the months of May and June meet with Mr. Clyde Chesney, the Research Coordinator of this project who will make a personal visit to each campus. The purpose of these trips will be to obtain this information and to finalize the sample.

Please complete and return the enclosed self-addressed post card as soon as possible. Thank you for your time and prompt consideration of this matter.

Sincerely,

Lewis W. Moncrief, Ph.D.
Associate Professor
Principal Investigator

Clyde E. Chesney
Doctoral Student-Dept. of Resource Devel.
Research Coordinator

LWM:rd

Enclosures

APPENDIX C

UNIVERSITY CONTACTS WHO ASSISTED WITH THE DEVELOPMENT OF THE SAMPLE

UNIVERSITY CONTACTS WHO ASSISTED WITH
THE DEVELOPMENT OF THE SAMPLE

Dr. Charles A. Fountain
N.C. A&T State University
Dept. of Landscape Architecture
312 N. Dudley Street
Greensboro, NC 27411
FTS #699-5111
(919) 379-7520

Dr. LeRoy c. Saylor
Dept. of Forestry-Genetics
N.C. State University
P. O. Box 5126
Raleigh, NC 27607
FTS #672-4020
(919) 727-2883

Dr. John Helms
Asst. Dept. Chairman
145 Mulford Hall
Univ. Calif.-Berkeley
Dept. of Forestry
Berkeley, Calif. 94720
FTS #458-6000
(405) 642-5037

Mr. Nathaniel Sayler
Associate Professor Science
& Technology
Campus Box 67
Florida A & M University
Tallahassee, Fla. 32307
FTS #946-2011
(904) 599-3429

Dr. Willie F. Jackson
Chairman, Dept. of Agriculture
Alcorn State University
Lorman, Ms. 29096
FTS #490-4211
(601) 877-3711

Mr. Earl Stephens
Coordinator, Forest Resources
Tuskegee Institute
Tuskegee Institute, Al. 36088
FTS #229-1000
(205) 727-8452

Dr. Fred H. Montague
Asst. Prof. & Dir. Office of
Student Services
Dept. of Forestry & Nat.
Resources
Purdue University
W. LaFayette, IN 47907
FTS #331-7000
(317) 749-2433

Dr. Edward D. Taylor
Lincoln University
900 Moreau Drive
Jefferson City, Mo. 65101
FTS #758-7212
(314) 751-3797

Dr. Alton W. Zanders
Affirmative Action Officer
SUNY-College of Environmental
Sciences & Forestry
Syracuse, NY 13210
FTS #950-5111
(315) 473-8679

APPENDIX D

COVER LETTER

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PARK AND RECREATION RESOURCES
NATURAL RESOURCES BUILDING

EAST LANSING • MICHIGAN • 48824

Dear Graduate:

Michigan State University is doing research related to graduates of Natural Resource programs in various schools. The primary objective of this research is to assess information diffusion and career decision making of graduates of Natural Resource programs of ten selected colleges and universities.

You have been contacted because you graduated from a Natural Resource or related program. Please consider this invitation to participate in the study. We want you to participate whether you are working in a Natural Resource field or not.

Participation involves completing a questionnaire. Section I of the questionnaire requests general information about your career decision making. Section II of the questionnaire requests that you indicate the importance or influence of various aspects of career information dissemination on your present occupation: source(s), method(s), timeliness, content and career expectations. Section III of the questionnaire requests that you compare pairs of careers (occupations) for a number of characteristics. Section IV of the questionnaire requests general information about family background, educational and labor force experiences. You may plan to spend about thirty minutes for completion of the questionnaire.

In order to maintain confidentiality and anonymity, participants are assigned a study number for the purpose of grouping subjects. Additionally, no names of participants or agencies are elicited on any of the data collection tools. The study findings will be reported as grouped data. Please complete the questionnaire and return the booklet in the enclosed stamped envelope addressed to me in seven days or at your earliest convenience.

Your participation is of great importance in facilitating understanding of career decision making of graduates of Natural Resource programs. Should you have further questions concerning the study, please do not hesitate to contact me at Michigan State University or the following telephone number:

(517) 353-0823

Sincerely yours,



Clyde Chesney
Research Project Coordinator

CC:fp

Enclosures: Questionnaire booklet
Addressed, stamped envelope

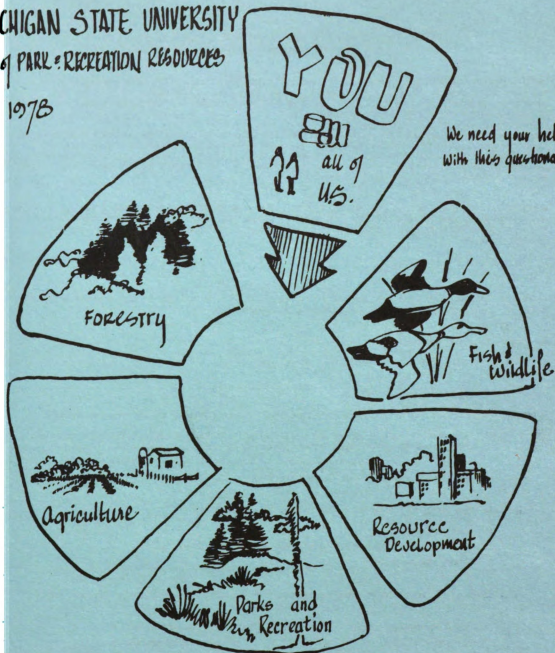
APPENDIX E

SURVEY INSTRUMENT

MICHIGAN STATE UNIVERSITY

Dept. of PARK & RECREATION RESOURCES

1978



Information Diffusion and Career Decision Making
of Graduates of NATURAL RESOURCE PROGRAMS

STUDY OF INFORMATION DIFFUSION AND CAREER DECISION
MAKING OF GRADUATES OF NATURAL RESOURCE PROGRAMS

You have been selected to participate in a study of graduates of natural resource programs from ten universities chosen on the basis of indicated interest in the study, diversity of programs and geographic location. This study is concerned with Information Diffusion and Career Decision Making of Graduates of Natural Resource Programs.

The success of this project is dependent upon your voluntary cooperation. The research team believes the information collected in this study will facilitate understanding how career information is disseminated to graduates of a variety of natural resource programs. The information supplied by you and your fellow graduates will be kept strictly confidential. No information will be released in any way that individual graduates could be identified.

PLEASE READ CAREFULLY AND COMPLETE ALL QUESTIONS ON THE FORM TO THE BEST OF YOUR ABILITY. IF YOU HAVE ANY COMMENTS WHICH MIGHT HELP CLARIFY YOUR ANSWERS, PLEASE FEEL FREE TO WRITE THEM IN THE LEFT-HAND MARGIN OF THE QUESTIONNAIRE. PLEASE TAKE A FEW MINUTES NOW, BEFORE YOU FORGET, TO COMPLETE YOUR QUESTIONNAIRE.

I.D. Code _____
Card 1

(1- 3)
(4)

Section I: Please give your answers to the following questions by writing in the appropriate spaces or by making a ✓ in the blanks as indicated.

A. Career Decision Making

What is your present job, or last job if unemployed?

(5- 6)

Which category below best describes this position? (Check category and circle best answer)

(7- 8)

_____ 1. An aspect of natural resources: 1) forestry, 2) fisheries and wildlife, 3) parks and recreation, 4) agriculture, other (please specify) _____

_____ 2. Non-natural resource area (please specify) _____

What was your first full time job after leaving the university?

(9-10)

_____ 1. Same as above.

_____ 2. Does not apply, went right from undergraduate to graduate school.

_____ 3. Other, please specify _____

What factors led you to learn about the job so that you could be considered? (You may check more than one.)

(11-19)

_____ Contacted employer directly

_____ University placement office

_____ Friends and relatives

_____ Other university assistance

_____ Approached by employer

_____ Employment office

_____ An advertisement

_____ Other, please specify

_____ Financial investment

What factors led you to learn about your present job, if different from your first full time job? (You may check more than one.)

(20-28)

☐ Contacted employer directly ☐ University placement office
☐ Friends and relatives ☐ Other university assistance
☐ Approached by employer ☐ Employment office
☐ An advertisement ☐ Other, please specify _____
☐ Financial investment _____

How closely related is your present job to your major at the university?

(29)

☐ 1. Same field ☐ 2. Related field ☐ 3. Different field

Do you consider your present job (last job if unemployed) or area of work as your career?

(30)

☐ 1. Yes ☐ 2. No

If no, would you define your career area? _____

(31-32)

Section II: Please give your answers to the following questions by marking ✓ in the appropriate columns.

A. Source of Career Information

Prior to your initial enrollment in college, please indicate the influence of each source on your selection of a major. (If you changed your major, use first major.)

(33-45)

	(1) Most Influential	(2) Very Influential	(3) Moderate Influence	(4) Some Influence	(5) Little Influence
My family	☐	☐	☐	☐	☐
My friends (classmates and family friends)	☐	☐	☐	☐	☐
Participation in recreation and leisure activities	☐	☐	☐	☐	☐
Professional working in the area	☐	☐	☐	☐	☐
Clergyman	☐	☐	☐	☐	☐
Successful work experiences	☐	☐	☐	☐	☐
Employer	☐	☐	☐	☐	☐
High school teacher or counselor	☐	☐	☐	☐	☐
Had a course related to this area in junior high	☐	☐	☐	☐	☐
Had a course related to this area in senior high	☐	☐	☐	☐	☐
High school coach	☐	☐	☐	☐	☐
High school principal	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐

After the time of your first enrollment in college up until your present job, please indicate the influence of each source below on your career or present occupation.

46-59)

	(1) Most Influential	(2) Very Influential	(3) Moderate Influence	(4) Some Influence	(5) Little Influence
My family	—	—	—	—	—
My friends (classmates and family friends)	—	—	—	—	—
Participation in recreation and leisure activities	—	—	—	—	—
Professional working in the area	—	—	—	—	—
Clergymen	—	—	—	—	—
Successful work experiences	—	—	—	—	—
Employer	—	—	—	—	—
College teacher or advisor	—	—	—	—	—
Had a course related to this area in college	—	—	—	—	—
Former student	—	—	—	—	—
College coach	—	—	—	—	—
College administrator	—	—	—	—	—
Enrollment in graduate school	—	—	—	—	—
Other (specify) _____	—	—	—	—	—

I.D. Code
Card 2

(1-3)
(4)

B. Methods of Obtaining Career Information

Prior to your initial enrollment in college, please indicate the importance of each method in obtaining information about your present career.

(5-17)

	(1) Most Important	(2) Very Important	(3) Moderate Importance	(4) Some Importance	(5) Least Important
Conversations with relatives and friends	—	—	—	—	—
Lecture presentations	—	—	—	—	—
Group discussions	—	—	—	—	—
Demonstrations	—	—	—	—	—
Work-study (internships)	—	—	—	—	—
Employment in this area	—	—	—	—	—
Radio programs	—	—	—	—	—
Television programs	—	—	—	—	—
Films, slides, tapes	—	—	—	—	—
Newspapers	—	—	—	—	—
Magazines	—	—	—	—	—
Books	—	—	—	—	—
Other (specify) _____	—	—	—	—	—

After the time of your first enrollment in college, please indicate the importance of each method in obtaining information about your present career.

(18-30)

	(1) Most Important	(2) Very Important	(3) Moderate Importance	(4) Some Importance	(5) Least Important
Conversations with relatives and friends	—	—	—	—	—
Lecture presentations	—	—	—	—	—
Group discussions	—	—	—	—	—
Demonstrations	—	—	—	—	—
Work-study (internships)	—	—	—	—	—
Employment in this area	—	—	—	—	—
Radio programs	—	—	—	—	—
Television programs	—	—	—	—	—
Films, slides, tapes	—	—	—	—	—
Newspapers	—	—	—	—	—
Magazines	—	—	—	—	—
Books	—	—	—	—	—
Other (specify) _____	—	—	—	—	—

C. Timeliness of Career Information

When considering your present occupation (career), please indicate your age the first time you received useful information about the following aspects of your career.

(31-42)

	<u>Age</u>	<u>Don't Know</u>
Educational and other requirements	_____	_____
Entry job and upgrading opportunities	_____	_____
Pay and fringe benefits	_____	_____
Possible location of work	_____	_____
Working conditions	_____	_____
Expected tasks	_____	_____

How frequently after first receiving useful career information did you receive or obtain additional information about the following aspects of your future career?

(43-49)

	(1) More than 4 times a Year	(2) 2 to 4 Times a Year	(3) Once a Year	(4) Less than Once a Year	(5) Never
Educational and other requirements	_____	_____	_____	_____	_____
Entry job and upgrading opportunities	_____	_____	_____	_____	_____
Pay and fringe benefits	_____	_____	_____	_____	_____
Possible location of work	_____	_____	_____	_____	_____
Working conditions	_____	_____	_____	_____	_____
Expected tasks	_____	_____	_____	_____	_____
Other (specify) _____	_____	_____	_____	_____	_____

D. Content of Career Information

Prior to your initial enrollment in college, please indicate the amount of information you received about the following career factors.

(50-55)

	(1) Exceptionally Large Amount	(2) More Than Adequate	(3) Adequate Amount	(4) Very Little	(5) None
Education and other requirements	_____	_____	_____	_____	_____
Entry job and upgrading opportunities	_____	_____	_____	_____	_____
Pay and fringe benefits	_____	_____	_____	_____	_____
Possible location of work	_____	_____	_____	_____	_____
Working conditions	_____	_____	_____	_____	_____
Other (please specify) _____	_____	_____	_____	_____	_____

After the time of your first enrollment in college, please indicate the amount of information you received about the following career factors.

(56-61)

	(1) Exceptionally Large Amount	(2) More Than Adequate	(3) Adequate Amount	(4) Very Little	(5) None
Education and other requirements	_____	_____	_____	_____	_____
Entry job and upgrading opportunities	_____	_____	_____	_____	_____
Pay and fringe benefits	_____	_____	_____	_____	_____
Possible location of work	_____	_____	_____	_____	_____
Working conditions	_____	_____	_____	_____	_____
Other (please specify) _____	_____	_____	_____	_____	_____

Section III:

Just as we can measure the distance between two physical objects (in terms of inches, yards, miles, etc.), social researchers can also measure the distance (difference) between occupations in the same manner. This section asks you to make judgments about how different (or in other words, "far apart") certain occupations are from each other on several attributes. Differences between occupations are measured in units, such that the more different two occupations are for a particular attribute, the more units apart they are from each other. Two occupations that are the same on a particular attribute, then, would be zero (0) units apart.

To help you know how large a unit is, assume Postman and Bankteller are 100 units apart; that is, imagine that the difference (distance) between the two occupations is 100 units. (Note that Postman and Bankteller are CONTROLS and may or may not be this far apart in reality.) However, we would like you to use this idea of distance in the comparison of the occupations.

Please tell us how many units apart the occupations on the next three pages are from each other for six occupational attributes or dimensions. If you think that any of the pairs of occupations are more different than Postman and Bankteller, write a number larger than 100. For example, two occupations that you consider to be twice as far apart should be 200 units apart. Likewise, occupations that are judged to be three times as far should be 300 units apart. On the other hand, if you think that the occupations are half as different as Postman and Bankteller, you would write 50 units. Remember, the more different the occupations are from each other for a particular attribute, the higher the number you should write. For some attributes occupations may be close together and for others, occupations may be far apart.

There are no correct or incorrect answers, only your judgments of the differences between occupations on the eight attributes. We realize that these judgments may be difficult to make. Please make the **BEST** estimate that you can. Consider each pair and specific attribute carefully and indicate the number of units that you feel separate the occupations.

I.D. Code _____
Card 4

(1-3)
(4)

REMEMBER: POSTMAN AND BANKTELLER ARE CONTROLS!!! ASSUME THEY ARE 100 UNITS APART FOR EACH ATTRIBUTE; HOWEVER, THIS DOES NOT NECESSARILY MEAN THAT OTHER PAIRS OF OCCUPATIONS ARE THE SAME DISTANCE APART ON ALL ATTRIBUTES. THE MORE DIFFERENT THE OCCUPATIONS ARE FROM EACH OTHER ON ANY ATTRIBUTE, THE HIGHER THE NUMBER YOU SHOULD WRITE. WRITE ANY NUMBER THAT YOU FEEL ACCURATELY CORRESPONDS TO THE DISTANCE BETWEEN OCCUPATIONS FOR THE SPECIFIC ATTRIBUTE. THERE IS NO MAXIMUM NUMBER.

How far apart in the chance to earn good money are	Units	
High School Teacher and City Park and Recreation Superintendent	_____	(5-7)
High School Teacher and Forester	_____	(8-10)
High School Teacher and Fisheries and/or Wildlife Biologist	_____	(11-13)
High School Teacher and County Agricultural Extension Agent	_____	(14-16)
How far apart in status-prestige are	Units	
High School Teacher and City Park and Recreation Superintendent	_____	(17-19)
High School Teacher and Forester	_____	(20-22)
High School Teacher and Fisheries and/or Wildlife Biologist	_____	(23-25)
High School Teacher and County Agricultural Extension Agent	_____	(26-28)
How far apart in chance to work with people are	Units	
High School Teacher and City Park and Recreation Superintendent	_____	(29-31)
High School Teacher and Forester	_____	(32-34)
High School Teacher and Fisheries and/or Wildlife Biologist	_____	(35-37)
High School Teacher and County Agricultural Extension Agent	_____	(38-40)
How far apart in chance to correct current problems are	Units	
High School Teacher and City Park and Recreation Superintendent	_____	(41-43)
High School Teacher and Forester	_____	(44-46)
High School Teacher and Fisheries and/or Wildlife Biologist	_____	(47-49)
High School Teacher and County Agricultural Extension Agent	_____	(50-52)
How Far apart in chance to help the environment are	Units	
High School Teacher and City Park and Recreation Superintendent	_____	(53-55)
High School Teacher and Forester	_____	(56-58)
High School Teacher and Fisheries and/or Wildlife Biologist	_____	(59-61)
High School Teacher and County Agricultural Extension Agent	_____	(62-64)
How far apart in educational requirements are	Units	
High School Teacher and City Park and Recreation Superintendent	_____	(65-67)
High School Teacher and Forester	_____	(68-70)
High School Teacher and Fisheries and/or Wildlife Biologist	_____	(71-73)
High School Teacher and County Agricultural Extension Agent	_____	(74-76)

I.D. Code _____
Card 5

(1-3)
(4)

REMEMBER: POSTMAN AND BANKTELLER ARE CONTROLS!!! ASSUME THEY ARE 100 UNITS APART FOR EACH ATTRIBUTE; HOWEVER, THIS DOES NOT NECESSARILY MEAN THAT OTHER PAIRS OF OCCUPATIONS ARE THE SAME DISTANCE APART ON ALL ATTRIBUTES. THE MORE DIFFERENT THE OCCUPATIONS ARE FROM EACH OTHER ON ANY ATTRIBUTE, THE HIGHER THE NUMBER YOU SHOULD WRITE. WRITE ANY NUMBER THAT YOU FEEL ACCURATELY CORRESPONDS TO THE DISTANCE BETWEEN OCCUPATIONS FOR THE SPECIFIC ATTRIBUTE. THERE IS NO MAXIMUM NUMBER.

How far apart in the chance to earn good money are	Units	
_____ Lawyer and City Park and Recreation Superintendent	____	(5-7)
_____ Lawyer and Forester	____	(8-10)
_____ Lawyer and Fisheries and/or Wildlife Biologist	____	(11-13)
_____ Lawyer and County Agricultural Extension Agent	____	(14-16)
How far apart in status-prestige are	Units	
_____ Lawyer and City Park and Recreation Superintendent	____	(17-19)
_____ Lawyer and Forester	____	(20-22)
_____ Lawyer and Fisheries and/or Wildlife Biologist	____	(23-25)
_____ Lawyer and County Agricultural Extension Agent	____	(26-28)
How far apart in chance to work with people are	Units	
_____ Lawyer and City Park and Recreation Superintendent	____	(29-31)
_____ Lawyer and Forester	____	(32-34)
_____ Lawyer and Fisheries and/or Wildlife Biologist	____	(35-37)
_____ Lawyer and County Agricultural Extension Agent	____	(38-40)
How far apart in chance to correct current problems are	Units	
_____ Lawyer and City Park and Recreation Superintendent	____	(41-43)
_____ Lawyer and Forester	____	(44-46)
_____ Lawyer and Fisheries and/or Wildlife Biologist	____	(47-49)
_____ Lawyer and County Agricultural Extension Agent	____	(50-52)
How far apart in chance to help the environment are	Units	
_____ Lawyer and City Park and Recreation Superintendent	____	(53-55)
_____ Lawyer and Forester	____	(56-58)
_____ Lawyer and Fisheries and/or Wildlife Biologist	____	(59-61)
_____ Lawyer and County Agricultural Extension Agent	____	(62-64)
How far apart in educational requirements are	Units	
_____ Lawyer and City Park and Recreation Superintendent	____	(65-67)
_____ Lawyer and Forester	____	(68-70)
_____ Lawyer and Fisheries and/or Wildlife Biologist	____	(71-73)
_____ Lawyer and County Agricultural Extension Agent	____	(74-76)

I.D. Code _____
Card 6

(1-3)
(4)

REMEMBER: POSTMAN AND BANKTELLER ARE CONTROLS!!! ASSUME THEY ARE 100 UNITS APART FOR EACH ATTRIBUTE; HOWEVER, THIS DOES NOT NECESSARILY MEAN THAT OTHER PAIRS OF OCCUPATIONS ARE THE SAME DISTANCE APART ON ALL ATTRIBUTES. THE MORE DIFFERENT THE OCCUPATIONS ARE FROM EACH OTHER ON ANY ATTRIBUTE, THE HIGHER THE NUMBER YOU SHOULD WRITE. WRITE ANY NUMBER THAT YOU FEEL ACCURATELY CORRESPONDS TO THE DISTANCE BETWEEN OCCUPATIONS FOR THE SPECIFIC ATTRIBUTE. THERE IS NO MAXIMUM NUMBER.

How far apart in the chance to earn good money are	Units	
Civil Engineer and City Park and Recreation Superintendent	___	(5-7)
Civil Engineer and Forester	___	(8-10)
Civil Engineer and Fisheries and/or Wildlife Biologist	___	(11-13)
Civil Engineer and County Agricultural Extension Agent	___	(14-16)
How far apart in status-prestige are	Units	
Civil Engineer and City Park and Recreation Superintendent	___	(17-19)
Civil Engineer and Forester	___	(20-22)
Civil Engineer and Fisheries and/or Wildlife Biologist	___	(23-25)
Civil Engineer and County Agricultural Extension Agent	___	(26-28)
How far apart in chance to work with people are	Units	
Civil Engineer and City Park and Recreation Superintendent	___	(29-31)
Civil Engineer and Forester	___	(32-34)
Civil Engineer and Fisheries and/or Wildlife Biologist	___	(35-37)
Civil Engineer and County Agricultural Extension Agent	___	(38-40)
How far apart in chance to correct current problems are	Units	
Civil Engineer and City Park and Recreation Superintendent	___	(41-43)
Civil Engineer and Forester	___	(44-46)
Civil Engineer and Fisheries and/or Wildlife Biologist	___	(47-49)
Civil Engineer and County Agricultural Extension Agent	___	(50-52)
How far apart in chance to help the environment are	Units	
Civil Engineer and City Park and Recreation Superintendent	___	(53-55)
Civil Engineer and Forester	___	(56-58)
Civil Engineer and Fisheries and/or Wildlife Biologist	___	(59-61)
Civil Engineer and County Agricultural Extension Agent	___	(62-64)
How far apart in educational requirements are	Units	
Civil Engineer and City Park and Recreation Superintendent	___	(65-67)
Civil Engineer and Forester	___	(68-70)
Civil Engineer and Fisheries and/or Wildlife Biologist	___	(71-73)
Civil Engineer and County Agricultural Extension Agent	___	(74-76)

I.D. Code _____ (1-3)
Card 7 (4)

THIS INFORMATION IS CONFIDENTIAL

Section IV: Background Data

Please fill out the blanks below to complete the survey.

Age _____ (5-6) Sex: _____ 1. Male _____ 2. Female (7)

How do you describe yourself: (8)

- _____ 1. American Indian _____ 4. Oriental or Asian-American
_____ 2. Black or Afro-American or Negro _____ 5. White or Anglo-American
_____ 3. Mexican-American or Chicano _____ 6. Other (specify) _____

Home state if citizen of U.S.? _____ (9-10)
(State where you were born and/or lived most of your life up to age 18.)

Marital status: _____ 1. Married _____ 2. Single _____ 3. Divorced _____ 4. Separated (11)

Please indicate the kind of place you lived for each period of your life:

	A large metropolitan city (over 500,000 in population)	A medium-sized city (50,000 to 500,000 in population)	A smaller city (10,000 to 50,000 in population)	A town or village (under 10,000 in population)	In the country, outside of a city or village	In the country and on a farm or ranch, outside of a city or village	
	(1)	(2)	(3)	(4)	(5)	(6)	
1 - 6 years old	_____	_____	_____	_____	_____	_____	(12)
7 -12 years old	_____	_____	_____	_____	_____	_____	(13)
13 -18 years old	_____	_____	_____	_____	_____	_____	(14)
Present home	_____	_____	_____	_____	_____	_____	(15)

Father's occupation (what he does, NOT where he works) _____ (16-17)
(If retired or deceased, use last occupation)

Mother's occupation (what she does, NOT where she works) _____ (18-19)
(If retired or deceased, use last occupation)

How many brothers and sisters do you have? _____ (20-21)

From what type of high school did you graduate? (22)

_____ 1. Public _____ 2. Private (Parochial) _____ 3. Private (other) _____ 4. Other
(e.g. G.E.D.)

How many students were in your graduating class in high school? (23)

- _____ 1. Less than 49 _____ 4. 200 to 299
_____ 2. 50 to 99 _____ 5. 300 to 399
_____ 3. 100 to 199 _____ 6. over 400

Please indicate the kinds of work experience you had prior to your initial enrollment in college.

	<u>Yes</u>	<u>Total Length</u>	
Farm or ranch work on home farm	_____	_____	(24-26)
Farm or ranch work elsewhere as hired employee	_____	_____	(27-29)
Youth Conservation Corps	_____	_____	(30-32)
Park and recreation work	_____	_____	(33-35)
Construction work	_____	_____	(36-38)
Grocery store work	_____	_____	(39-41)
Other (specify) _____	_____	_____	(42-44)

After enrolling in college did you receive any paid work experience in natural resources before your first full time job? (45)

_____ 1. Yes _____ 2. No

If yes, please specify. _____ (46-47)

Thank you for your time and effort in filling out this questionnaire. Your assistance will be very helpful in understanding more about information diffusion and career decision making of graduates of natural resource programs. If you think there are other important things we should consider but failed to inquire about, please write us about them in the space below. Also please place this completed questionnaire in the enclosed envelope and mail it today.

THANK YOU AGAIN AND BEST WISHES

APPENDIX F

FIRST FOLLOW-UP LETTER

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PARK AND RECREATION RESOURCES
NATURAL RESOURCES BUILDING

EAST LANSING • MICHIGAN • 48824

Dear Graduate:

Did you forget us? If you have, please take about 30 minutes and complete the questionnaire on "Information Diffusion and Career Decision Making of Graduates of Natural Resource Programs...". The questionnaire and a stamped envelope addressed to me was mailed about two weeks ago. Your response is essential for the completion of the study!

Please accept my thanks for your consideration in this research endeavor.

Sincerely,


Clyde Chesney
Research Project Coordinator

CC:fp

APPENDIX G

SECOND FOLLOW-UP LETTER

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PARK AND RECREATION RESOURCES
NATURAL RESOURCES BUILDING

EAST LANSING • MICHIGAN • 48824

Dear Graduate;

Again we invite your participation in the study of "Career Decision Making" being conducted by Michigan State University; the overall objective is to assess information diffusion and career decision making of graduates of Natural Resource programs.

We have contacted about 600 graduates of 10 universities in 9 states: Alabama, California, Florida, Indiana, Michigan, Mississippi, Missouri, New York, and North Carolina. To adequately document and understand the information dissemination variables influencing career selection, however, it is imperative that we obtain your completed questionnaire. Along with your fellow graduates in agriculture, forestry, parks & recreation, fish & wildlife, and other related areas, won't you invest about 30 minutes in this endeavor?

Section I of the questionnaire requests general career decision making information; section II requests you rank the importance or influence of information dissemination variables; section III requests that you compare pairs of careers on the basis of 6 criteria; while section IV requests general background information.

Let me reiterate that your confidentiality and anonymity will be maintained at all times. Moreover, if you are at all concerned about the results of this survey, we will be happy to provide you with a summary of the findings.

Thank you for your time and we will be looking for your questionnaire in the mail.

Sincerely,


Clyde Chesney
Research Project Coordinator

Enclosures: Questionnaire booklet
Addressed, stamped envelope

CC:rd

APPENDIX H

CONVERSATION GUIDE AND QUESTIONNAIRE USED IN THE TELEPHONE FOLLOW-UP

CONVERSATION GUIDE and QUESTIONNAIRE Used in the Telephone Follow-Up of the
1978 Information Diffusion and Career Decision Making Survey.

Name of Natural Resource Graduate _____
 Street Address _____
 City & State _____
 Telephone # _____
 Identification # _____

Hello, is this the _____ residence?

() Yes () No —————> (If no, but home of parents or other
relative:

PROCEED TO PAGE 2A

If no, confirm the number dialed &
terminate the call)

() Wrong Number
 () Wrong Residence

May I speak with _____?
 (Nat. Res. Grad.)

() Yes () No —————> (If no), Is there a convenient time
at which I can call back & speak
with him/her?

PROCEED TO PAGE 2

() Yes

Time _____ (If a time cannot be
(between 7-10 set up, then ask to
p.m.) speak to someone who
may recall if _____
Day _____ received a questionnaire
from Michigan State
University.

**Terminate
the call**

PROCEED TO PAGE 2

If Home of Graduate:

My name is _____ and I'm calling from Michigan State University in regards to a Career Decision Making questionnaire we sent you a while back. I'm calling to find out if you have received it in the mail yet.

() Yes

() No

Have you had a chance to complete and return it to us yet?

() Yes

() No

Terminate the call

Your response is important to us for the successful completion of the study. Will you be willing to complete and return the questionnaire within the next few days?

() Yes

() No

Do you still have the questionnaire?

Proceed to
Page 3

() Yes

() No

Thank you for your time and we will be looking for your questionnaire in the mail.

Will you please give me your present address so that we can put a questionnaire in the mail for you tomorrow?

Terminate the call

We are doing a study of graduates of Natural Resource and/or related Agricultural programs in order to understand how you obtained career information and how you decided on a career. We sent questionnaires to graduates of several schools and our records show that you should have received one in the mail. If we send you another one will you be willing to complete and return it to us?

() Yes

() No

Will you please give me your present address so that we can put a questionnaire in the mail for you tomorrow?

Terminate the call

Proceed to
Page 3

If Home of Parents or Other Relatives:
 (Respondent has other address)

My name is _____ and I'm calling from Michigan State University in regards to a Career Decision Making Questionnaire we sent to this address a while back. I'm calling to find out if you have received it in the mail yet.

() Yes

() No

↓
 Have you had a chance to forward it to your son/daughter (or other relative) yet?

() Yes

() No

↓
 We are doing a study of graduates of Natural Resource and/or related Agricultural programs in order to understand how they obtained career information and how they decided on a career.

↓
 We sent questionnaires to graduates of several schools and our records show that your son/daughter (or other relative) should have received one.

↓
 If you can give us his/her current address, we can put another questionnaire in the mail for them tomorrow.

Do you have their phone #?

↓
Terminate the call

() If parents or other relative refuse to give address of respondent, also

↓
Terminate the call

While I have you on the phone, it will be useful to our study to get a limited amount of information concerning your career decision making. Will you answer a few short questions for me now?

() Yes

() No

Terminate the Call

1. Are you now employed in a natural resource or related field? () Yes () No
2. What is your present job/or last job if unemployed?

Code appropriate aspect: (1) Forestry, (2) Fish & Wildlife, (3) Parks & Recreation, (4) Agriculture, (5) Other.

3. What sources of career information were most influential prior to your enrollment in college?

After College: _____

4. What methods of obtaining career information were most important prior to your enrollment in college?

After College: _____

5. What age did you first learn about the educational & other requirements of this career?

6. What job factors were most important in selecting your career?

In order to better understand career decision making of natural resource graduates, we need to relate the information to background data. Will you please answer the following questions?

() Yes

() No

Terminate the Call

7. What is your age? _____

8. What state were you born and/or lived most of your life up to age 18?

9. What is your fathers occupation? _____

What is your mothers occupation? _____

10. How many brothers & sisters do you have? _____

11. What kinds of work experience did you have prior to your initial enrollment in college?

Length (how long)? _____

12. After enrolling in college did you receive any paid work experience in natural resources before your first full time job? () Yes () No

Code type (1) Forestry, (2) Fisheries & Wildlife, (3) Parks & Recreation, (4) Agriculture, (5) Other.

Terminate the Call

Check the sex and race of the person talked to:

_____ Male _____ Female

_____ American Indian

_____ Oriental or Asian American

_____ Black

_____ White or Anglo-American

_____ Mexican-American

_____ Other

_____ Not sure

APPENDIX I

CONVERSATION GUIDE AND QUESTIONNAIRE USED IN THE PRE-TELEPHONE CONTACT

CONVERSATION GUIDE and QUESTIONNAIRE Used in the Pre-telephone Contact of Potential Respondents in the 1978 Information Diffusion and Career Decision Making Survey.

Name of Natural Resource Graduate _____

Street Address _____

City & State _____

Telephone # _____

Identification # _____

Hello, is this the _____ residence?

() Yes

() No

—————> (If no, but home of parents or other relative:

PROCEED TO PAGE 2A

If no, confirm the number dialed & terminate the call)

() Wrong Number

() Wrong Residence

May I speak with _____ ?
(Nat. Res. Grad.)

() Yes

() No

—————> (If no), Is there a convenient time at which I can call back & speak with him/her?

PROCEED TO PAGE 2

() Yes

Time _____
(between 7-10 p.m.)

Day _____

Terminate the Call

(If a time cannot be set up, then ask to speak to someone who may recall if _____ received a questionnaire from Michigan State University.

PROCEED TO PAGE 2

If Home of Graduate:

My name is _____ and I'm calling
from Michigan State University in regards
to a Career Decision Making questionnaire.



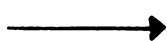
We are doing a study of graduates of Natural Resources
and/or related Agricultural programs in order to under-
stand how you obtained career information and how you
decided on a career.



Your response is important to us for the successful
completion of the study. Will you be willing to
complete and return the questionnaire within the
next few days?

() Yes

() No



PROCEED TO PAGE 3



Will you please give me your present address so that we
can put a questionnaire in the mail for you tomorrow?



Terminate the Call

If Home of Parents or Other Relatives:
(Respondent has other address)

My name is _____ and I'm calling from Michigan State University.

↓
We are doing a study of graduates of Natural Resources and/or related Agricultural programs in order to understand how they obtained career information and how they decided on a career.

↓
We plan to send questionnaires to graduates of several schools and our records show that your son/daughter (or other relative) should receive one.

↓
If you can give us his/her current address, we can put a questionnaire in the mail for them tomorrow.

Do you have their phone #?

↓

Terminate the Call

() If parents or other relative refuse to give address of respondent, also

↓

Terminate the Call

While I have you on the phone, it will be useful to our study to get a limited amount of information concerning your career decision making. Will you answer a few short questions for me now?

() Yes

() No → Terminate the Call

1. Are you now employed in a natural resource or related field? () Yes () No
2. What is your present job/or last job if unemployed?

Code appropriate aspect: (1) Forestry, (2) Fish & Wildlife, (3) Parks & Recreation, (4) Agriculture, (5) Other.

3. What sources of career information were most influential prior to your enrollment in college?

After College: _____

4. What methods of obtaining career information were most important prior to your enrollment in college?

After College: _____

5. What age did you first learn about the educational & other requirements of this career?

6. What job factors were most important in selecting your career?

In order to better understand career decision making of natural resource graduates, we need to relate the information to background data. Will you please answer the following questions?

() Yes

() No

Terminate the Call

7. What is your age? _____

8. What state were you born and/or lived most of your life up to age 18?

9. What is your fathers occupation? _____

What is your mothers occupation? _____

10. How many brouthers & sisters do you have? _____

11. What kinds of work experience did you have prior to your initial enrollment in college?

Length (how Long)? _____

12. After enrolling in college did you receive any paid work experience in natural resources before your first full time job? () Yes () No

Code type (1) Forestry, (2) Fisheries & Wildlife, (3) Parks & Recreation, (4) Agriculture, (5) Other.

Terminate the Call

Check the sex and race of the person talked to:

_____ Male _____ Female

_____ American Indian

_____ Oriental or Asian American

_____ Black

_____ White or Anglo-American

_____ Mexican-American

_____ Other

_____ Not sure

APPENDIX J

BREAKDOWN TABLES FOR KNOWLEDGE
VARIABLE BY RACE

APPENDIX J

Table 1-Breakdown of Knowledge Variable by Race (High School Teacher)

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA	ETA SQUARED
Differences in Chance to Earn Good Money										
High School Teacher and City Park Rec. Supt.	83.3990	11.2	97.0000	50	77.4662	148	1.433	.2327	0.0852	0.0073
High School Teacher and Forester	75.5250	10.3	94.0000	50	69.3667	150	2.670	.1039	0.1153	0.0133
High School Teacher and Fish-Wildlife Biologist	84.7739	10.8	106.4000	50	77.5168	149	4.060	.0453	0.1421	0.0202
High School Teacher and Extension Agent	75.0505	11.2	89.8000	50	70.0676	148	1.924	.1670	0.0986	0.0097
Differences in Status Prestige										
High School Teacher and City Park Rec. Supt.	84.833	11.2	82.000	50	85.7906	148	0.066	.7980	0.0183	0.0003

Table 1 (cont'd.).

PERCEIVED DIFFER- ENCES IN CAREERS	TOTAL MEANS	% CASES MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA	SQUARED
High School Teacher and Forester	82.8191	10.8	91.5000	50	79.9060	149	0.667	.4151	0.0581	0.0034
High School Teacher and Fish-Wildlife Biologist	89.5657	11.2	92.4600	50	88.5878	148	0.064	.8006	0.0181	0.0003
High School Teacher and Extension Agent	79.433	11.2	83.5600	50	78.0405	148	0.093	.7610	0.0218	0.0005
Differences in Chance to Work With People										
High School Teacher and City Park Rec. Supt	57.9141	11.2	63.8980	49	55.9463	149	0.245	.6215	0.0353	0.0012
High School Teacher and Forester	108.1263	11.2	110.3534	48	107.4133	150	0.029	.8644	0.0122	0.0001
High School Teacher and Fish-Wildlife Biologist	120.1117	11.7	109.2083	48	123.6242	149	0.590	.4433	0.0549	0.0030
High School Teacher & Ext. Agent	47.3553	11.7	41.7083	48	49.1745	149	0.385	.5355	0.0444	0.0020

Table 1 (cont'd.).

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% CASES MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA SQUARED
Differences in Chance to Correct Current Problems									
High School Teacher and City Park Rec. Supt.	95.9639	13.0	89.5400	50	78.1941	144	0.243	.6228	0.0355 0.0013
High School Teacher and Forester	98.8827	12.1	82.4200	50	104.5205	146	1.633	.2029	0.0914 0.0083
High School Teacher and Fish-Wildlife Biologist	100.1231	12.6	88.9800	50	103.9655	145	0.791	.3750	0.0639 0.0041
High School Teacher and Ext. Agent	94.2268	13.0	86.2000	50	97.0139	144	0.310	.5786	0.0401 0.0016
Differences in Chance to Help Environment									
High School Teacher and City Park Rec. Supt.	110.1117	11.7	103.8600	50	112.2381	147	0.0461	.6886	0.0287 0.0068

Table 1 (cont'd.).

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA SQUARED
High School Teacher and Forester	164.7919	11.7	159.7143	49	166.4730	148	0.055	.8144	0.0168 0.0003
High School Teacher and Fish-Wildlife Biologist	168.6051	12.6	166.6667	48	169.2381	147	0.008	.9310	0.0062 0.0000
High School Teacher and Ext. Agent	141.8061	12.1	131.9592	49	145.0884	147	0.223	.6371	0.0339 0.0011
Differences in Educational Requirements									
High School Teacher and City Park Rec. Supt.	66.3485	11.2	56.1000	50	69.8108	148	0.621	.4316	0.0562 0.0032
High School Teacher and Forester	68.4200	10.3	80.8200	50	64.2807	150	0.789	.3753	0.0630 0.0040
High School Teacher and Fish-Wildlife Biologist	87.3769	10.8	104.2800	50	81.7047	149	1.228	.2691	0.0787 0.0062
High School Teacher and Ext. Agent	65.9365	11.7	71.5306	49	63.4189	148	0.187	.6656	0.0310 0.0010

Table 2

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% CASES MISSING	MINORITY MEANS	N	MAJORITY MEAN	N	F	SIG	ETA SQUARED
Differences in Chance to Earn Good Money									
Lawyer and City Park and Rec. Supt.	277.0263	14.8	254.7174	46	284.1528	144	0.543	.4622	0.0537 0.0029
Lawyer and Forester	304.9479	13.9	253.3261	46	321.2123	146	3.068	.0815	0.1261 0.0159
Lawyer and Fish- Wildlife Biologist	274.4450	14.3	234.0652	46	287.2552	145	1.784	.1832	0.0967 0.0094
Lawyer and Ext. Agent	290.1968	15.7	226.1136	44	309.7778	144	4.794	.0298	0.1585 0.0251
Differences in Status Prestige									
Lawyer and City Park and Rec. Supt.	207.8912	13.5	224.2553	47	202.6233	146	0.420	.5176	0.0469 0.0022
Lawyer and Forester	231.2539	13.5	236.7660	47	229.4795	146	0.046	.8309	0.0155 0.0002
Lawyer and Fish- Wildlife Biologist	195.5183	14.3	176.3043	46	201.6138	145	0.689	.4074	0.0603 0.0036

Table 2 (cont'd.).

PERCEIVED DIFFER- ENCES IN CAREERS	TOTAL MEANS	% CASES MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA SQUARED
Lawyer and Ext. Agent	218.6211	14.6	189.9783	46	227.7708	144	1.357	.2455	0.0847 0.0072
Differences in Chance to Work with People									
Lawyer and City Park Rec. Supt.	79.2165	13.0	100.0626	48	72.3630	146	1.755	.1869	0.0952 0.0091
Lawyer and Forester	124.9687	13.9	111.4130	46	129.2397	146	0.628	.4290	0.0574 0.0033
Lawyer and Fish- Wildlife Biologist	132.2461	14.3	120.7609	46	135.8897	145	0.441	.5075	0.0482 0.0023
Lawyer and Ext. Agent	69.4767	13.5	80.9362	47	65.7877	146	0.855	.3562	0.0668 0.0045
Differences in Chance to Correct Current Problems									
Lawyer and City Park Rec. Supt.	116.6984	15.2	96.3043	46	123.2587	143	1.354	.2460	0.0848 0.0072
Lawyer and Forester	134.5436	14.8	136.6304	46	134.0556	144	0.011	.9160	0.0077 0.0001
Lawyer and Fish- Wildlife Biologist	136.7234	15.7	134.1304	46	137.5634	142	0.020	.8863	0.0105 0.0001
Lawyer and Ext. Agent	121.7819	15.7	95.2609	46	130.3732	142	2.185	.1410	0.1078 0.0116

Table 2 (cont'd.).

PERCEIVED DIFFER- ENCES IN CAREERS	TOTAL MEANS	% CASES MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA	SQUARED
Differences in Chance to Help Environment										
Lawyer and City Park Rec. Supt.	157.1510	13.9	157.6596	47	156.9862	145	0.000	.9837	0.0015	0.0000
Lawyer and Forester	169.4869	14.3	182.4043	47	165.2708	144	0.278	.5986	0.0383	0.0015
Lawyer and Fish- Wildlife Biologist	168.9048	15.2	161.4348	46	171.3077	143	0.091	.7633	0.0220	0.0005
Lawyer and Ext. Agent	164.2434	15.2	172.7660	47	161.4225	142	0.118	.7320	0.0251	0.0006
Differences in Educational Requirements										
Lawyer and City Park Rec. Supt.	216.3368	14.8	235.3404	47	210.0909	143	0.418	.5186	0.0471	0.0022
Lawyer and Forester	179.1474	14.8	177.8261	46	179.5694	144	0.004	.9507	0.0045	0.0000
Lawyer and Fish- Wildlife Biologist	153.1368	74.8	133.4348	46	159.4306	144	0.930	.3361	0.0702	0.0094
Lawyer and Ext. Agent	184.2032	16.1	195.8261	46	180.4113	141	0.250	.6179	0.0367	0.0013

Table 3 Breakdown of Knowledge Variable by Race (Civil Engineer)

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA SQUARED
Differences in Chance to Earn Good Money									
Civil Engineer and City Park Rec. Supt.	169.8969	13.0	197.4200	50	160.3403	144	1.338	.2403	0.0847 0.0072
Civil Engineer and Forester	183.6224	12.1	202.9400	50	177.0068	146	0.679	.4109	0.0591 0.0035
Civil Engineer and Fish Wildlife Biologist	161.1692	12.6	168.8800	50	158.5103	145	0.139	.7098	0.0268 0.0007
Civil Engineer & Ext. Agent	176.9638	13.0	198.5400	50	169.4722	144	0.968	.3262	0.0708 0.0050
Differences in Status Prestige									
Civil Engineer and City Park Rec. Supt.	108.2154	12.6	127.1400	50	101.6897	145	1.342	.2480	0.0831 0.0069
Civil Engineer and Forester	90.9847	12.1	105.6600	50	85.9589	146	1.456	.2290	0.0863 0.0074
Civil Engineer and Fish-Wildlife Biologist	83.5282	12.6	96.8600	50	78.9310	145	1.387	.2403	0.0845 0.0071

Table 3 (cont'd.).

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% MISSING	MINORITY		MAJORITY		SIG	ETA SQUARED	
			MEAN	N	MEAN	N		ETA	SQUARED
Civil Engineer and Ext. Agent	104.8564	12.6	129.8400	50	96.2414	145	2.812	.0952	0.1198 0.0144
Differences in Chance to Work With People									
Civil Engineer and City Park Rec. Supt.	119.4691	13.0	91.7143	49	128.8483	145	1.942	.1650	0.1001 0.0100
Civil Engineer and Forester	82.0256	12.6	64.3878	49	87.9452	145	1.716	.1918	0.9393 0.0088
Civil Engineer and Fish Sild-life Biologist	80.9231	12.3	80.5000	50	81.0690	145	0.001	.9718	0.0026 0.0000
Civil Engineer and Ext. Agent	120.9016	13.5	94.1837	49	129.9931	144	2.394	.1234	0.1113 0.0124
Differences in Chance to Correct Current Problems									
Civil Engineer and City Park Rec. Supt.	95.2539	13.5	111.6122	49	89.6875	144	0.929	.3363	0.0696 0.0048
Civil Engineer and Forester	88.0513	12.6	93.3000	50	86.2414	145	0.118	.7316	0.0247 0.0006

Table 3 (cont'd.).

PERCEIVED DIFFERENCES IN CAREERS	TOTAL MEANS	% MISSING	MINORITY MEAN	N	MAJORITY MEAN	N	F	SIG	ETA	SQUARED
Civil Engineer and Fish Wildlife Biologist	85.6753	13.0	78.1200	50	88.2988	144	0.400	.5278	0.0456	0.0021
Civil Engineer and Ext. Agent	99.4845	13.0	86.3000	50	104.0625	144	0.682	.4098	0.0595	0.0035
Differences in Chance to Help Environment										
Civil Engineer and City Park Rec. Supt.	82.7461	13.5	72.8776	49	86.1042	144	0.530	.4676	0.0526	0.0028
Civil Engineer and Forester	92.0361	13.0	88.4000	50	93.2986	144	0.057	.8117	0.0172	0.0003
Civil Engineer and Fish-Wildlife Biologist	95.9378	13.5	82.0200	50	100.8042	143	1.074	.3014	0.0748	0.0056
Civil Engineer and Ext. Agent	97.0312	13.9	86.900	50	100.5986	142	0.456	.5003	0.0489	0.0024
Differences in Educational Requirements										
Civil Engineer and City Parks Rec. Supt.	106.1554	13.5	139.8600	50	94.3706	143	3.922	.0491	0.1418	0.0201

Table 3 (cont'd.).

PERCEIVED DIFFER- ENCES IN CAREERS	TOTAL MEANS	% CASES MISSING	MINORITY		MAJORITY		F	SIG	ETA SQUARED	
			MEAN	N	MEAN	N			ETA	SQUARED
Civil Engineer and Forester	86.1692	12.6	119.2600	50	74.7586	145	5.232	.0233	0.1625	0.0264
Civil Engineer and Fish Wild- life Biologist	82.7784	13.0	99.2800	50	77.0486	144	1.585	.2096	0.0905	0.0082
Civil Engineer and Ext. Agent	100.8964	13.5	122.5600	50	93.3217	143	1.796	.1817	0.0965	0.0093

APPENDIX K

RESOURCE PERSONS CONSULTED CONCERNING
DEVELOPMENT OF RECRUITMENT COMPONENT

APPENDIX K

RESOURCE PERSONS CONSULTED CONCERNING
DEVELOPMENT OF RECRUITMENT COMPONENT

The researcher interviewed the following individuals
to gain insights about a workable recruitment model:

Bernie Akin
Director of Personnel Management
USDA--Forest Service

Dr. Don Coleman
Former Project Director for
Minority Comprehensive Support Program
Assistant Dean, Graduate School
Michigan State University

Dr. William Gamble
Director of Minority Affairs
College of Engineering and
Professor, Education and Counseling Service
Michigan State University

Beverly C. Homes
Staff Assistant to the
Deputy Chief for Research
USDA--Forest Service

Jetie Wilds, Jr.
Director of Civil Rights
USDA--Forest Service

Keith Williams
Director of Upward Bound Program
Michigan State University

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