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## INTRODUCING MINORITIES TO NATURAL RESOURCE CAREER OPPORTUNITIES<sup>1</sup>

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**ABSTRACT.** In an effort to increase the participation of minorities within natural resource professions, the U.S. Forest Service's Northeastern Forest Experiment Station and The Ohio State University's School of Natural Resources developed and implemented a resident outdoor experience to introduce selected minority youth to natural resource career opportunities. Two groups of high school students, one minority and one non-minority, participated in three-day resident programs. The research design consisted of a pretest-posttest comparison of results from a resource inventory, stress test and an information questionnaire administered to each group prior to and after the experience. Results indicate that a positive learning experience for both groups took place; however, when compared to the non-minority students the knowledge and attitudes of the minority students changed significantly. There was no difference in stress level factors between the two groups. At the end of the experience, the minority students indicated an increased interest in forestry and other natural resource management areas, especially wildlife.

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### INTRODUCTION

The daily lives of all Americans are affected by the management, use and conservation of natural resources. However, due to the paucity of minorities in natural

resource-related professions, minorities are not effectively sharing in decisions about natural resources management.

In the six professional areas of the United States Department of the Interior, where national policies regarding natural resources are formulated, Blacks, Hispanics, and Asian Americans only hold 2.8% of the jobs. Native Americans fill

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only 1.2% of the jobs in those professional areas. These professions include parks and recreation management, forestry, wildlife biology, hydrology and general biological sciences (Washington 1984).

Of the 22,000 members of the Society of American Foresters, approximately 100 are Black. As of June 1978, the Forest Service, U.S. Department of Agriculture, employed 16 Blacks, 32 Hispanics, 17 Native Americans, and 5 Asian Americans as professional foresters. During the summer of 1980, the minority employment level increased to a total of 96 foresters but still represented only 1.7% of the total (USDC 1983).

Upon examination of statistics on the educational preparation of minority students, the low representation of minorities in natural resource-related professions is not surprising. In 1976, only 4.1% of the agriculture and natural resource majors graduated from American colleges were minorities. In these 1862 Land Grant Institutions, only one percent of the agriculture students are Black. Even in the historically Black 1890 Land Grant Institutions, only 50% of the agriculture students are Black (Washington 1984).

Minority enrollment in The Ohio State University in the School of Natural Resources proves to be no exception to the aforementioned pattern. Enrollment in the school for the 1982-1983 academic school year (Henne 1982) indicates a total of 536 undergraduate students pursuing degrees in natural resource areas. Only two of these individuals were classified as minority, one being foreign born. Of the 62 graduate students enrolled during the same academic year, two were Black and two Oriental.

Attempts by organizations and agencies to recruit high school minority students into natural resource management programs have met with failure (ODNR 1982). Approaches traditionally used have included presentations at career day seminars, letter campaigns, high school presentations, and radio and public address announcements. It should be noted that

none of these activities were planned by personnel or organizations involved specifically with minority students.

In response to the identified need to increase the participation of minority individuals in natural resource professions, the United States Forest Service and The Ohio State University's School of Natural Resources initiated a cooperative venture. The project goal was to develop and implement a resident outdoor experience to introduce a selected group of minority youth to career opportunities in natural resources and to investigate the effects of the resident experience on the knowledge and attitudes of the participants toward natural resources management.

More specifically, this study sought to:

1. Identify minority students with potential for developing interest in the field of natural resources management.
2. Introduce the students to career possibilities in forestry and other natural resource management areas, and stimulate these students' interest in natural resource management as a career choice.
3. Investigate whether or not the participants' knowledge and attitudes about natural resources management changed significantly ( $p < .05$ ) after attending a resident natural resource education program.
4. Compare and contrast the minority students' knowledge and attitudes about natural resources management with a group of non-minority students from the central Ohio area who participated in a similar program.
5. Examine and assess stress level factors present in the study groups prior to and after participation in a natural resources resident program.

#### METHODS AND MATERIALS

The study group consisted of 24 minority students from the Upward Bound Programs at The Ohio State University, Columbus, Ohio, and Ohio Wesleyan University, Delaware, Ohio. The Upward Bound Program works with urban minority youth ages 15-18 from low socio-economic backgrounds who have been identified by public school teachers as having academic potential. Forty non-minority students enrolled in an elective ecology class in a

Columbus suburban high school constituted the control group. Students in both groups were juniors and seniors, and the ratio of males to females was similar.

Both groups participated in similar three-day resident programs. Behavioral objectives, content information, and program components were closely monitored for each group. The program was designed to provide natural resource-related field experience and to explore career opportunities in natural resource areas. Program activities for both resident groups were conducted by university students, faculty from The Ohio State University School of Natural Resources and personnel from the United States Forest Service. The university students were junior and senior natural resource majors participating in a quarter-long resident outdoor education course at the camp facility. The university students were under the direction of the principle investigator. They were responsible for conducting programs for many groups during the 10-wk experience. In conjunction with a Forest Service representative, the university students were responsible for developing program objectives, scheduling activities, conducting sessions and assigning personnel. The Forest Service personnel were technicians from the Forest Experiment Station, Delaware, Ohio. They were responsible for the intensive investigation of a forest demonstration plot conducted during the resident sessions. Program sessions were coordinated. The same staff and support personnel were involved in the same program components in each resident session. The principle investigators monitored the resident sessions to assure that every attempt for program consistency was taken.

Specific program components included:

1. General introductory hikes.
2. Demonstration plots where detailed explanation of the management practices and professional responsibilities were given for each area visited.
3. Intensive investigation of a forest demonstration plot in which participants were responsible for collecting and recording specific ecological and resource information. This information was then entered into a computer program, and participants were assisted in manipulating the data.
4. Career opportunity discussions, including slide presentations illustrating natural resource-related careers and explorations of higher education curriculum programs in natural resource management.

The study utilized a pretest-posttest comparison. Results from a series of test instruments given to both groups by the principle investigators were analyzed. Three separate pencil-and-paper surveys were administered: a resource inventory, a stress test, and an informational questionnaire.

The 25-item resource inventory instrument was administered to determine whether or not change in attitudes and knowledge occurred after participation in the resident experience. Items were selected from validated attitudinal and cognitive instruments

(Burriss-Bammel 1978, Bowman 1974). This Likert-type instrument seeks to determine both knowledge and attitudes about natural resources, land management, social action, and ecosystems. Attitudinal item responses were considered desirable or correct on the instrument if the response reflected "a total environment" or "multiple-use" philosophy. A less desirable or incorrect answer indicated a single-use view of the ecosystem. Responses were analyzed by a Chi-square test of independence and a *t*-test to determine whether or not change occurred.

The Today Form of the Multiple Affect Adjective Checklist (MAACL) was administered as a way to assess stress levels as a result of participating in a new program and/or being in an unfamiliar setting. This checklist measures three factors indicative of stress, specifically: anxiety, depression, and hostility. The MAACL is self-administered. The respondent simply makes a checkmark or leaves blank the box next to each of the 130 adjectives describing affective states. A plus-minus scoring system is used as a partial control of the influence of the checking response set.

To gather more background information about the participants a 12-item open-ended informational questionnaire was developed. Although this instrument was designed primarily to register attitudes and opinions, the data do provide some basic information and perception changes of participants. Responses were used to indicate the general tenor of the experience and allow for unrestricted participant response regarding the experience.

On the questionnaire participants were asked to respond to items such as: 1. Do you feel comfortable in the woods? 2. Could you work in this type of environment? 3. Do you have an understanding of what natural resources are? 4. Are you interested in a career in natural resources? 5. What areas of natural resources do you find most interesting?

The three aforementioned instruments were administered to each group at the beginning and again at the end of the resident experience. The resident experience represents the treatment. The instruments were used to establish whether significant differences were apparent between the groups prior to and after the experience and whether or not change occurred in each group.

## RESULTS

Analysis of the resource inventory survey included tabulating the number of desired responses for each question on both pretest and posttest instruments for both groups. Comparisons were made on individual items. The responses were next converted to percentages and averaged. Group means were subjected to the Chi-square test. Table 1 presents the results of the pretest-posttest comparison within groups.

TABLE 1  
*Pretest-posttest comparison within groups.*

	No. in Group	Pretest Mean	Posttest Mean	X <sup>2</sup>
Minority	24	50.33	68.17	*5.8773
Non-Minority	40	53.80	60.60	.6870

\* $\alpha = .05 = 3.84$

Analysis of group mean scores was also conducted on pretest scores and posttest scores between groups. Again, the number of desired responses for each question was tabulated, converted to percentages, and tested. Table 2 presents the results of the pretest and posttest comparisons between groups.

On the MAACL test the raw score for each participant was converted to a T score by using the equivalent conversion scores established as norms for college students (Zuckerman and Lubin 1965). These scores then were tabulated as group mean scores for the minority and non-minority populations for both the pretest-posttest sessions.

Data percentages on the informational questionnaire were tabulated. Changes in the pretest-posttest results for each group were examined for trends in the degree and direction of change.

Results of the resource inventory survey seem to indicate a difference in effect of the resident experience on the participating groups. There is no significant difference between the pretest and posttest scores for the non-minority participants. The change between the pretest and posttest scores for minority students, however, does show a significant difference. This may be interpreted to mean that overall there was significant cognitive gain among the minority students. The higher posttest scores seem to be directly related to the resident experience rather than being based on previous knowledge.

Results of the comparison between minority and non-minority scores on pretests indicate that there was no significant dif-

TABLE 2  
*Pretest-posttest comparison between groups.*

	Minority	Non-Minority	T
Pretest	50.33	53.80	.9780
Posttest	68.17	60.60	*2.4188

\* $\alpha = .05 = 1.674$

ference between these particular groups. This suggests that both groups were equal in resource knowledge and attitude coming into the program.

Comparisons between groups on the posttest scores, however, indicate that there was for minority participants a statistically significant gain at the end of the resident experience. The non-minority participants showed no statistically significant difference on posttest scores. This may indicate that for these members of an ecology class there was a proportionally smaller amount of new information presented during the resident experience than for the minority participants. This can be interpreted to mean that overall there was significant gain among the minority students as a result of participating in this program and/or as a result of the academic potential of these minority students.

Analysis of the data from the MAACL instrument indicated that the program experience did not prove to be significant as a stress factor. No additional analyses were performed with the MAACL data.

Tabulated responses to the informational questionnaire indicated a positive experience for all participants, minority and non-minority. The experience and involvement seemed to foster an appreciation for the natural environment and an increased interest in natural resource management career-related opportunities.

## DISCUSSION

This study indicates that a positive learning experience for participants regarding natural resources management and related career opportunities took place.

Minority students who were given the opportunity to participate in activities and programs dealing with the field of natural resources management were found to possess the potential for developing an interest in this career area.

Although responses to the informational questionnaire could not be analyzed statistically, specific trends emerged. On the post-questionnaire, minority students indicated increased understanding of the breadth included in natural resource management careers. Several registered surprise that computers were utilized in natural resource professions and that many natural resource professionals did not work in the natural environment. This seemed to increase their interest in natural resources career opportunities.

A majority of minority students indicated that they had not been in the forest environment prior to the resident experience and as a result of the resident opportunity they enjoyed and felt comfortable in this type environment. Non-minority students tended to complain about housing facilities, whereas minority students indicated satisfaction with the living arrangements, and 100% indicated they would like to return to the center. Several wanted to include their families and school friends.

This study indicates that minority students have the potential for selecting the

fields of natural resources management as career opportunities. To be successful in the future in recruiting minorities into the profession, it will be necessary to develop an awareness and appreciation for the professional area. This study also shows that one effective way to increase interest is through participation in hands-on experiences provided through a resident program.

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