WILDERNESS EDUCATION ASSOCIATION CERTIFICATION/AND
SAFETY, ECOLOGICAL IMPACT, AND CURRICULUM
STANDARDIZATION OF GRADUATES

by

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Graduates of the Wilderness Education Association (W.E.A.) were surveyed by mail to investigate the effects of their certification on safety, ecological impact, and curriculum standardization of their subsequent leadership activities. Self-reports showed a slight, but not statistically significant, decrease in the number of post-W.E.A. course evacuations and rescues. Graduates reported a moderate W.E.A. influence on their accident records, and knowledge of W.E.A. standard safety practices was low. W.E.A.'s reported influence on the ecological impact of current outdoor leadership activities was stronger than its influence on safety, but graduates revealed only a moderate level of knowledge about ethical use practices. Graduates reported implementing a mean of 4.54 out of 16 W.E.A. curriculum areas into current programs. Thirty-three and one-half percent of the graduates reported not implementing any curriculum areas into current programs. W.E.A. graduates indicated that the course had the greatest influence on the implementation of their outdoor education
curriculum areas which had previously not been highly standardized. Implications for certification of outdoor leaders are discussed.
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"The Lord's lovingkindnesses indeed never cease, for His compassions never fail. They are new every morning; great is Thy faithfulness."

Lamentations 3:22-23
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Chapter I
INTRODUCTION

The American public has caught the spirit of the wilderness explorer (Nash, 1979). More people are venturing to the woods, hills, and mountains than ever before. As a result, our nation has seen and will continue to see an increase in the use of its wilderness for outdoor adventure activities (Darst, 1980). The term outdoor adventure activity has been used synonymously with terms such as risk recreation, adventure recreation, or natural challenge activities. Generally speaking, the basic, essential components of outdoor adventure activity focus on the use of the natural environment with an element of adventure or risk (Allen, 1979). Iida (1976) defined an adventure-oriented program as "an educational program based on stressful experiences in the wilderness" (p. 22). An outdoor adventure activity is one which makes use of the natural environment, is physical in nature, and involves the elements of risk and adventure to a certain degree.

The increase in the number of participants has resulted in a concern over the growing number of outdoor adventure-related accidents and injuries (Meier, 1978). While outdoor educators are showing concern over accidents in adventure activities, wilderness managers are continuing to document
the negative environmental impacts of wilderness and backcountry users (Ittner et al., 1979). Because of this, leaders in the fields of outdoor education and wilderness management have recognized the need for a type of program or organization to properly train and educate outdoor leaders and users (Petzoldt, 1974; Nash, 1979). The certification of outdoor leaders is an idea which is currently being suggested by wilderness managers and outdoor educators as a means for decreasing the number of accidents and the negative environmental impacts involving wilderness and backcountry use.

As far back as 1940 wilderness managers suggested certification as a method to qualify outdoorsmen. J.V.K. Wager (1940) realized that the lack of outdoor knowledge and skill of many wilderness visitors resulted in negative environmental impacts. Today, wilderness managers are investigating certification or merit as a method for rationing wilderness use and reducing negative environmental impact (Stankey and Baden, 1977).

Certification has been the topic of a number of outdoor education research studies (e.g. Senosk, 1977; Cousineau, 1978; Schulte, 1975), and several organizations are now offering certification programs. Paul Petzoldt, a leading outdoor educator, has recognized the need for the proper
education of outdoor leaders and wilderness users. Some thirty years after Wagar (1940), Petzoldt (1974) described the need for a certifying organization:

Many people feel that the possibility of restricting use of the wild outdoors to those who know how to conserve it is beyond political or public acceptance. I disagree. If informed people will take action, such a plan could be implemented. The means: a national organization that would provide for the education and certification of outdoorsmen (p. 228).

Petzoldt has addressed this expressed need by founding the Wilderness Education Association (W.E.A.). One major activity of W.E.A. is to develop the curriculum and evaluation procedures for the National Standard Program for Outdoor Leadership Certification (N.S.P.O.L.C.). The N.S.P.O.L.C. is offered through the W.E.A. central office in Driggs, Idaho, and through twenty-three affiliating colleges and universities throughout the country. The program is a thirty-six day standard course which utilizes wilderness activities to accomplish educational objectives in areas such as judgment, leadership, expedition behavior, and environmental ethics. W.E.A. states that a certified graduate of the N.S.P.O.L.C. is able to do the following:

1. Teach others how to use and enjoy the wilderness with minimum ecological impact.
2. Safely lead others in the wild outdoors.
3. Exercise good judgment in a variety of outdoor environments and conditions.
4. Demonstrate a basic standard of outdoor knowledge and experience.

The program hopes to reduce injuries, searches, and deaths, and provide a basic national standard for outdoor leadership training. Through the N.S.P.O.L.C., W.E.A. hopes to reach its overall goals of maximizing the opportunity for people to safely enjoy wild outdoor areas and minimizing man's impact on those areas ("Wilderness Education Association," 1982).

Purpose of the Study

The purpose of this study is to determine the effects of the W.E.A. certification on safety, ecological impact, and curriculum standardization of graduates. This was addressed through a mail survey of W.E.A. graduates which was designed to investigate three of the four major goals of W.E.A.: increased safety, lessened ecological impact, and the involvement of graduates in demonstrating a basic standard of outdoor knowledge and experience. Consequently, this study has one research objective for each of these three major goals.

Safety

Research objective number one is to determine the safety records and the safety knowledge of W.E.A. graduates.
To do this, four aspects of safety were investigated: 1) knowledge of W.E.A. standard safety practices, 2) the number of evacuations conducted for trips led before and after W.E.A. certification, 3) the number of rescues conducted for trips led before and after W.E.A. certification, and 4) the graduates' perception of the effect of W.E.A. training and certification on the number of accidents for their current outdoor leadership activities. These four areas were thought to provide a valid measure of safety for exploratory, descriptive research.

Three research questions were asked concerning safety.

1. Do the graduates show a significant difference in the number of pre and post-W.E.A. course rescues and evacuations for trips they have led?

2. How much of an influence do W.E.A. graduates report that their course had on the number of accidents occurring in their current outdoor leadership activities?

3. How knowledgeable were the graduates concerning W.E.A. safety standards?

Ecological Impact

Research objective number two is to determine the degree of ecological impact on trips led by graduates. Ecological impact knowledge and self-reports of the effect of W.E.A. certification on ecological impacts of current outdoor leadership activities were used to measure W.E.A.
graduates' effectiveness. Two research questions were used to investigate this objective.

4. To what extent do W.E.A. graduates report an influence from W.E.A. training on low impact camping practices of their current outdoor leadership activities?

5. How knowledgeable were the graduates concerning W.E.A. ecological impact standards?

Curriculum Standardization

One of W.E.A.'s major goals is for graduates to demonstrate a basic standard of outdoor knowledge and experience. Demonstration of a basic standard might be accomplished by graduates working in the field of outdoor leadership and implementing W.E.A. curriculum areas into the programs in which they now operate. In shorter terms, we call this curriculum standardization. One research question addresses curriculum standardization.

6. To what extent do W.E.A. graduates implement W.E.A. curriculum areas into the programs in which they operate?

Justification and Problem Statement

If the field of outdoor education moves toward the process of certification of its leadership, it is essential to know if this process is proving effective. Much time, effort, and money are required to attain certification. Is certification producing results worth the personal costs?
Is it an effective method for combating outdoor education's problems with accidents, injuries, and negative environmental impacts? Concerning outdoor education leadership, Senosk (1977) asserted that, "The best growth pattern can be established by the utilization of the best leadership" (p. 3). Is certification the best way to develop quality leadership in outdoor education?

As in some other social service professions, research in the outdoor education field falls far behind the actual implementation of the practices. Research on the effectiveness of outdoor leadership certification should be conducted now before it becomes too firmly established. Finally, W.E.A. is a national outdoor leadership certifying organization which has taken a firm position on the issue of certification. An evaluation of its ability to fulfill its goals and objectives would give helpful insight into the effectiveness of the certification process.

**Definition of Terms**

1. **Certification** - a process which guarantees that certain standards of proficiency have been met by examination and/or proof of prescribed educational and/or experiential requirements (Senosk, 1977, p. 4).
2. **W.E.A. graduate** - One who has completed one of the various W.E.A. courses and has received the certification offered in that course.

3. **Course** - the W.E.A. course from which the person graduated.

4. **Leader** - One who is responsible for the actions of a group. For the purpose of the study, one who is responsible for leading a group in an outdoor education activity.

5. **Program** - The program in which the graduate subsequently works.

6. **Evacuation** - Transporting to safety an injured group member by members of that same party.

7. **Rescue** - Transporting to safety an injured group member by members of an outside party.

8. **Safety** - Experiences free from accident or injury.

9. **Ecological impact** - The degree to which the physical-biological environment is impaired.

10. **Curriculum standardization** - The extent to which graduates implement W.E.A. curriculum areas into their current programs.
Delimitations

This study is delimited to 648 W.E.A. graduates from the years 1976 through 1983. Analysis of the data is based upon 155 of the 261 surveys which were returned. The 155 respondents were deemed usable for the study because they were employed in outdoor education-related positions after or before and after having received their W.E.A. certification.

Limitations

1. The study is limited in that no control group was used; therefore, it cannot be concluded that a certified outdoor leader is any more or less competent than one who is not certified.

2. The number of evacuations and rescues were used as a measure of safety. It is understood, though, that accidents causing an evacuation or rescue could have occurred which were not caused by irresponsible action on the part of the instructor. Also, there may be unsafe behavior that didn't require evacuation or rescue.

3. The study is limited by the accuracy of the self-report data on accidents, evacuations, rescues, and the number of curriculum areas which were implemented due to W.E.A. experience.
4. The study is limited in that there may be a significant difference between the risks involved in activities led by W.E.A. graduates before vs. after W.E.A. certification.
Chapter II
LITERATURE REVIEW

This literature review describes current research and related literature pertaining to outdoor education certification. It is divided into the following sections: (1) related research and literature pertaining to outdoor education certification, (2) related research and literature pertaining to investigation of certification in wilderness management research, and (3) the effectiveness of education for safety in outdoor recreation activities.

Related Research and Literature Pertaining To Outdoor Education Certification

A thorough literature search produced two studies directly referring to the certification of outdoor adventure leadership and one study dealing specifically with certification for a particular outdoor adventure activity.

Senosk's (1977) examination of outdoor pursuit leadership certification within the United States for the year 1976 revealed a growing number of outdoor adventure participants and the need for stronger leadership. She stressed that the area of outdoor pursuits (outdoor education) was confronted with the issue of certification. One hundred forty-eight outdoor pursuit organizations responded to her mail survey. A majority (70.1%) of
identifiable outdoor pursuit organizations and programs had no certification or licensing system in effect for its employed leaders during 1976, and of those organizations, 60.4% responded as having no future plans for developing a system. Forty-eight percent of the directors or duly appointed officials of the programs expressed no need for certification, but Senosk stressed that this is not a majority and that it deserves a closer examination. Fifty-two percent of the organizations claiming certification systems in effect for their employed leaders had a system "whereby only certain activities are certifiable" (p. 52). Thirteen percent of these organizations had only one certification system in effect which recognized one as a "certified outdoor pursuit leader" (p. 52). From these findings Senosk concluded:

Although outdoor pursuit leader certification and licensing was not as widespread as anticipated in 1976, there are reasons to believe that the situation could change in the future. One reason is the growth of outdoor pursuit activity participation and the increased numbers of novices going into the out-of-doors and participating in potentially dangerous activities. A second reason is the possibility of government intervention in the certification process. Finally, there is the increase in negative environmental impact as a result of excessive wilderness use (pp. 60-61).

The purpose of Cousineau's (1977) study was to identify a series of principles upon which certification for outdoor adventure leaders could be developed. The study dealt with
outdoor adventure leadership in the province of Ontario. A three round Delphi-type questionnaire methodology was conducted with the Council of Outdoor Educators of Ontario (C.O.E.O.) and with various other experts in the field of outdoor education. The C.O.E.O. is one of the leading outdoor education organizations in Canada. The study was justified because of the need for school administrators to have something by which to measure outdoor adventure leadership so that safe and educationally sound experiences could be secured for students.

In an opinion poll conducted among the total C.O.E.O. constituency, 76.2% were shown to be in favor of certification. Cousineau reported:

What the total population of the respondents seemed to want was a certification system to improve the quality and the safety of outdoor educational experiences (p. VI).

One important aspect of Cousineau's study is that a major outdoor education organization and a number of highly respected and reputable outdoor adventure leaders could, for the most part, agree on the issue of certification. Also, "They would like a provincial certification scheme to be implemented . . . and to be reviewed every three years" (p. VI). The C.O.E.O. formed a task force in 1976 in response to the membership's concern over certification. This
concern led to the development of Leading to Share, Sharing to Lead, a thirty-nine page publication "presented to meet the perceived need for a rationale of leadership development in Outdoor Adventure Experiences" (Rogers, 1976, p. II) and to speak to the organization's interest in certification.

Other outdoor educators are also seeing certification as a need for the field. Paul Petzoldt, former Chief Instructor of the Colorado Outward Bound School, founder of the National Outdoor Leadership School (N.O.L.S.), and former Executive Director of W.E.A., has been a leader in the movement for the certification of outdoor leaders. N.O.L.S. began certifying outdoor leaders and continues to do so today. That organization currently offers a two-level certification program, and it stresses outdoor leadership skills and minimum impact camping. Level one certification is given to students who complete a N.O.L.S. course. Level two certification is given to those students who have passed the N.O.L.S. Instructors Course (N.O.L.S., 1985). N.O.L.S. is a highly respected and widely recognized outdoor leadership school, and their offering of outdoor leadership certification is a possible indicator of acceptance of the certification issue.

W.E.A.'s description of what prompted the development of the National Standard Program for Outdoor Leadership
Certification also suggests acceptance of the certification issue ("W.E.A.", 1982, p. 3):

For many years many outdoor professionals, educators, and administrators were in favor of a national standard outdoor leadership certification program, but they could not agree on how it could be accomplished. Over the years numerous meetings were held and numerous committees were appointed without resulting action.

Easther (1979) felt that the certification of outdoor leaders was inevitable because of its potential use by government agencies, insurance companies, administrators, and the public for easy appraisal of outdoor leaders and the regulation of environmental and public safety.

A 1975 study by Schulte examined certification of whitewater paddlers as a possible means for developing safer whitewater paddling. The acceptability of certification was determined by interviewing officials of the Interagency Whitewater Committee and surveying representatives of American Whitewater Affiliates. Schulte concluded the following:

... despite the reservations expressed by many, a whitewater certification program, properly run, would be acceptable to most of the whitewater paddlers and the agency officials of the Interagency Whitewater Committee (pp. 54-55).

Also in reference to whitewater activities, Sheltmire (1979) asked:

Could it be that in the not too distant future man will be required to have some formal educational training before he is allowed to use certain waterways?
I feel this is a direction we must certainly take, for the use of these areas will not be declining in the future. (p. 5)

This literature and research concerning outdoor education certification shows that major outdoor education organizations and outdoor educators are interested in the study and implementation of certification, though actual certification programs are not prevalent at this time.

Wilderness Management and Certification

Wilderness managers are also considering the certification of outdoorsmen. J.V.K. Wagar first proposed this idea in a 1940 article in American Forests entitled, "Certified Outdoorsmen." He realized that "the woods are filled with folk with no idea of woods sanitation, care with fire, or outdoor good manners" (p. 492). Furthermore, Wagar stated:

We need something which will definitely mark and reward those with experience and wisdom in outdoor living, resourcefulness in outdoor emergencies, and with acceptable standards for outdoor conduct . . . We need, in short, a certification of outdoorsmen (p. 492).

Wagar's ideas, however had no effect on backcountry land management as people still entered wilderness freely (Nash, 1980).
With this wilderness use came wilderness abuse. In 1964 the Wilderness Act was passed indicating that society was becoming increasingly aware of its potential for backcountry travel and appreciation. Nash (1973) put this newfound enthusiasm into perspective.

Ironically, the very increase in appreciation of wilderness threatened to prove its undoing. Having made extraordinary gains in the public's estimation in the last century, wilderness could well be loved out of existence in the next.

The problem is that dams, mines, and roads are not the basic threat to the wilderness quality of the environment. People are . . . (p. 264).

Because of this, wilderness managers are examining different methods to alleviate the problem. Techniques for allocation (distributing the available recreational opportunities among the potential users) include permit systems (Nash, 1979), and allocation and rationing methods such as pricing, reservations, lotteries, queuing, and merit (Stankey and Baden, 1977; Shelby, et al., 1982).

In a 1977 U.S.D.A. Forest Service Research Paper (Stankey and Baden, 1977), merit is discussed as an alternative system of rationing wilderness use. Merit seems similar to certification in that permits are distributed on the basis of some demonstrable skill, knowledge, or past behavior (Shelby et al., 1982). Stankey and Baden (1977) saw the concept behind the merit system as improved behavior
resulting in reduced impact per person, thereby allowing higher levels of use without increasing total impact. They also noted that merit assumes that most of the negative impacts result from "innocently uninformed behavior" (p. 11). The advantages of the merit system are identified as reduced per capita impact, restricted total wilderness use levels, the personal demand of a merit system acting as a rationing device and thereby causing a positive relationship between the opportunity and the behavior required to achieve that opportunity, and increased appreciation of nature. Some disadvantages identified were difficulty in determining the desired behavior, testing knowledge, establishing standards, determining levels of knowledge and behavior, and developing the procedures, personnel, and facilities to assess merit. Possible discrimination against the handicapped and less skilled was also acknowledged. Stankey and Baden ended by suggesting that merit could be favored by wilderness users.

If such a system could in fact lower per capita impact, the time at which more authoritarian rationing might become necessary could be postponed, a situation most users would probably favor (p. 12).

A 1982 study by Shelby et al. examined backpacker and river runner preferences for five allocation techniques -- pricing, reservations, lotteries, queuing, and merit. The
data were collected from questionnaire responses by backpackers and river runners in three Oregon recreation areas. A description of each allocation technique was given to respondents, and they were asked (1) how they thought that particular system would affect their chances of getting a permit, (2) whether they thought it was a fair method for distributing permits, (3) whether the system was acceptable to them, and (4) whether they would try to obtain a permit by that method. Concerning merit, sixty-six percent of the backpackers felt that it would have little effect on them. Thirty-seven percent of the river runners agreed with this. Merit was seen as fair by fewer than 40 percent of the users in each recreation area, and none of the user groups gave merit majority support for acceptability. However, a majority of backpackers were willing to try merit. Support for merit was obviously not found to be strong in this study. The authors suggest that characteristics of different recreation areas or activities affect user assessments of allocation systems. They presume that allocation systems should be tailored to the expected clientele.

The previous studies examined the preferences of all wilderness and backcountry users toward merit. LaPage (1984) suggested that a special license is needed to test
competency for group leaders only. He felt that certifying all hikers and backcountry users would be impractical and probably unnecessary.

In general, the study and the support of merit or certification is not prevalent among wilderness management researchers or wilderness and backcountry users. However, the concept is regularly mentioned in discussions of techniques for resource allocation.

**The Effectiveness of Education for Safety of Recreational Activities**

No studies were found which dealt specifically with the certification of other recreational activity participants. A number of studies investigating the effectiveness of education programs were found, though, and they will be reported here. These studies are relevant because the research reported here is also investigating the effectiveness of an education program — W.E.A.'s N.S.P.O.L.C. Comparisons between education for outdoor leadership and for participation in other recreation activities may be possible.

A 1978 U.S. Coast Guard final report (Sautkulis et al., 1978) investigated cause identification analysis of fatal accident data for canoes, kayaks, and inflatable craft. Fatal accident data were used to identify the major cause of
fatalities, though not enough data were available to draw conclusions for kayaks. The researchers stressed that canoe fatalities generally involved inexperienced and uninstructed persons. They concluded that people involved in fatal canoe accidents generally have not had a formal boating course and that occupant education appears to be closely related to the outcome of an accident.

For inflatables, the researchers found that of 86 fatalities, one had had formal instruction in general boating or in inflatable craft boating. They noted that as general boating experience and inflatable boating experience increase, the number of fatalities decreases.

Two points need to be stressed concerning the data: (1) the data only considers about 25% of the total fatalities, and (2) rate data were unavailable. The researchers concluded:

Without the rate data it could not be determined whether educated boaters actually have lower fatality rates than uneducated boaters. However, it can be seen that most victims had not been reached by formal education programs (p. 74).

LaPage (1984) showed similar results concerning education and search and rescue attempts. In the state of New Hampshire, one of every two search and rescue attempts involved hikers, skiers, and snowmobilers. One of four search and rescue attempts involved hunters or fishermen.
He felt that these statistics showed that hunters and fisherman were better prepared and that this may be because of a hunter education course which is required in the state.

Filkosky (1981) investigated the number of hunting accidents and rates per 100,000 hunters in Pennsylvania from 1915 through 1979. For the fifty-four year period from 1915 through 1968, the number of hunting accidents per 100,000 averaged 50.5. This included an average fatal accident rate of 5.62 per 100,000 and an average non-fatal rate of 44.43 per 100,000. In 1969 hunter education became mandatory for the first time for hunters under 16 years of age. Averages from 1969 through 1979 show the average fatal accident rate per 100,000 dropping to 1.50, the average non-fatal rate dropping to 25.41, and the average total accident rate dropping to 26.91 per 100,000 hunters. No further statistics were performed. The author concluded that hunting has become a safer sport in Pennsylvania since mandatory hunter education began.

The previous studies suggest a relationship between education and increased safety. Potential external variables which could affect the data have not been considered and controlled, thus allowing only a suggestion of a relationship between safety and education.
Summary

This literature review examined related research and literature pertaining to outdoor education certification, wilderness management researchers' investigation of certification, and the effectiveness of education for safety of recreational activities.

An increase in outdoor adventure activity participation in backcountry and wilderness has prompted the consideration of outdoor leader certification for combating accidents and ecological impacts in the backcountry. Major outdoor education organizations and outdoor educators have shown interest in the study of certification and are suggesting its implementation, though it is not widespread at this time. Wilderness management research has revealed little support for allocation of all backcountry use by merit, though a suggestion of certification for group leaders only has been made. Finally, a limited number of studies on the effectiveness of formal education programs for recreational activities suggest that education may improve safety records.
Chapter III
METHODOLOGY

This study is designed to examine the effects of W.E.A. certification on graduate safety, ecological impact, and curriculum standardization for the years 1976 through 1983. This chapter includes the following: (1) description of research methodology, (2) selection of subjects, (3) instrumentation, (4) data collection procedures, (5) data analysis, and (6) possible self-report bias.

Description of Research Methodology

The research methodology for this study is a combination of both descriptive and causal-comparative research. Descriptive research is used because of the need to systematically and accurately describe the facts and characteristics of the population being censused. Causal-comparative research investigates possible cause-and-effect relationships by observing an existing consequence and searching back through the data for plausible causal factors (Isaac and Michael, 1971). It is appropriate for this study because it was not possible to control and manipulate all the factors influencing W.E.A. graduates (e.g., date of course, instructor, job responsibilities pre and post-W.E.A. course, and other outdoor education-related
training experiences). Weaknesses do exist with causal-comparative research. The main weakness is lack of control over the independent variables (W.E.A. course, job responsibilities pre and post-W.E.A., and number and type of previous outdoor education-related training experiences). Also, the relevant causative factor may not be included among the various factors studied, and there is the possibility that a combination of factors yielded the outcomes. Finally, the fact that two or more factors are related does not necessarily imply a cause-and-effect relationship (Isaac and Michael, 1971). Despite potential weaknesses, the ex post facto nature of the study deems causal-comparative research appropriate.

Selection of Subjects

The target population for this study consisted of all 648 graduates of W.E.A. courses from the first course in 1976 to those up to and including 1983. W.E.A. graduates were selected because W.E.A. is a fairly prominent certifying organization for outdoor leaders at this time, and the results of the study might yield implications for certification as a more general concept in the field.

A decision was made to survey the entire population because the potentially large number of inaccurate addresses
of early graduates could result in a lowered return rate. In addition, it was uncertain as to how many of the respondents would be involved in outdoor education-related positions following their W.E.A. course, and thus be eligible for inclusion in the data set.

The subjects used for the data analysis of the study were those who had received their W.E.A. certification while completing a course during the years 1976 through 1983, had returned the questionnaire, and were employed in outdoor education-related positions post-W.E.A.

There are different types of W.E.A. courses. In addition to the National Standard Program for Outdoor Leadership Certification, W.E.A. offers a special program for professionals, an Alaska program, and a semester program. There is a slight variation in the number of days for these programs, but the W.E.A. curriculum is generally the same and certification can be gained through all of them. Respondents who received their certification through these additional programs were included in the data analysis, as were those who had completed more than one W.E.A. course.
Instrumentation

The instrument used to collect data was a thirty-two question, four part mail questionnaire. Only certain parts of this questionnaire were used to secure data for this study. A draft of the questionnaire was completed and reviewed by one W.E.A. instructor, the associate director of W.E.A., and two members of the W.E.A. board of trustees.

A revised draft was then pilot tested with twenty-nine graduates of the Virginia Tech affiliate W.E.A. course. It was mailed first class on 8 1/2 by 11 inch paper, and contained a cover letter (Appendix A) explaining the purpose and the need for the pilot study. The subjects were asked to complete and return the questionnaire, and they were encouraged to add input concerning the design of the questionnaire or the clarity of the questions. Fifty-five percent (16) of the pilot surveys were returned. These were reviewed and further revisions were made on the instrument. One of the ten knowledge questions was replaced due to uncertainty regarding the accepted W.E.A. standard practice. Three of the knowledge questions were reworded due to reviewers expressing need for increased clarity. The pilot study scored 100% correct on two of the knowledge questions. These two questions were reworded to increase their difficulty. Overall, six of the ten knowledge questions
were changed or deleted due to reviewers' comments and the pilot study results. The completed version was a twelve page photo-reduced booklet which addressed a more comprehensive evaluation of W.E.A. graduates in addition to the research objectives listed in chapter one (see Appendix B). Safety in outdoor leadership was addressed by question fourteen. Respondents were asked for the number of trips they led, the average trip length and average participants per trip, and the number of evacuations and rescues conducted each year for the years 1975 through 1983. Question fifteen asked the respondents to rate the degree of influence W.E.A. had on the number of accidents and the ecological impact of trips for their current outdoor leadership activities. To determine the extent of W.E.A. curriculum standardization, question seventeen listed all sixteen W.E.A. curriculum areas and asked the respondents to check those which they had implemented into their current outdoor education programs due to their W.E.A. experience. Questions eighteen through twenty-seven were knowledge questions concerning W.E.A. standard practices for safety and ecological impacts. They were designed to test for knowledge of the W.E.A. standard practice.
Procedures

The first mailing was a total of 648 questionnaires sent out on July 9, 1984. This covered all graduates of W.E.A. courses for the years 1976 through 1983. The survey packet was sent by third class mail, including a cover letter (Appendix A), the questionnaire (Appendix B), and a self-addressed stamped envelope. Ten days after this initial mailing a follow-up postcard (Appendix C) was sent as a reminder. A low return rate (26.85%) prompted another mailing of 182 surveys thirty-two days after the follow-up postcard. Though there were 474 nonrespondents at this time, only 182 surveys were sent out because of financial restrictions. This third mailing was identical to the first except that the cover letter was more strongly worded. These were sent by first class mail to 1982 and 1983 graduates since the highest percentage of return rates so far was from these years. In addition, this third mailing was sent to those not certified (for potential comparison with certified graduates), and to those students who had completed more than one course (for potential comparison with those graduates who had completed only one course). The return rate for the third mailing was 28.02%.

Thirteen (2% of the total sample) of the survey packets were returned because of inaccurate or untraceable
addresses. Subtracting these thirteen individuals from the population of W.E.A. graduates makes the final population censused at 635. Of these, 261 returned usable questionnaires for a response rate of 41.1%. One hundred fifty-five (23.91% of the total population) of these respondents were involved in outdoor education-related leadership experiences after or before and after their W.E.A. course, and were thus usable for this study.

Data Analysis

Safety

A paired t-test was used to determine if the graduates showed a difference in the number of pre- and post-W.E.A. course reported rescues and evacuations for trips led. This was calculated as follows. First, the total number of evacuations or rescues conducted between 1975 and the graduate's W.E.A. course was calculated. Pre-W.E.A. evacuations or rescues were then summed for all graduates. Next, the number of trips led for a given year was multiplied by the average trip length. This number was then multiplied by the average number of participants per trip to yield the average number of participant days for each year. These were then summed to yield the total number of average participant days pre-W.E.A. for that graduate. Total
average participant days pre-W.E.A. was calculated for each graduate, and this number was finally summed over all graduates and divided into the total number of evacuations or rescues. The final figure yielded evacuations or rescues per participant day. The same procedure was used to calculate evacuations or rescues per participant day post-W.E.A. course completion. This was done for all respondents who led trips before and after their W.E.A. course. Paired t-tests were then performed to determine the significance level for evacuations and rescues separately.

The mean score for all cases on the four point scale (1-had a negative effect, 2-had no effect, 3-helped somewhat, 4-helped greatly) was used to determine W.E.A.'s reported influence on accident rates of graduates' current outdoor leadership activities. The mean score for number correct out of five was used for the safety knowledge questions.

**Ecological Impacts**

The mean score for all cases on a four point Likert-type scale was used to determine W.E.A. influence on the ecological impact of graduates' current outdoor leadership activities. The mean score for number correct out of five was used to analyze the ecological impact questions.
Curriculum Standardization

To determine the degree of curriculum standardization, frequencies were totaled for each of the W.E.A. curriculum areas which were reported to have been implemented into the graduates' current programs.

Self-Report Data

This study uses a self-report measure for data collection. The validity of self-report measures has been questioned in the past (Wellman, 1978; Eisler, 1976). Self-reports, though, are advantageous to the researcher in that they allow a convenient and economical means for collecting data (Eisler, 1976). This is particularly true in a study such as this where the sample is scattered throughout the United States and data collection using observation would be virtually impossible. Cautela and Upper (1976) support the use of self-report data for behavioral research and state that self-reports have not been shown to be more unreliable or invalid than other types of measurement. Walsh (1967) reviewed seven studies investigating the validity of questionnaire data and found that three indicated high validity while four indicated low validity. A further study (Walsh, 1968) provided support for the validity of self-report findings for biographical information from subjects.
even though they were given the incentive to distort information to improve their chances of reward. This is relevant to this study in that respondents may be hesitant to accurately report potentially negative data such as rescues and evacuations conducted on trips they have led. Potential problems with self-report measures exist, but given the study constraints, they were deemed the most feasible method.
Chapter IV

RESULTS

The purpose of this study was to determine the effects of the W.E.A. certification process on safety, ecological impact, and curriculum standardization of graduates. Research objectives were aimed at each of these areas.

Safety

Three research questions were asked concerning safety. The first question examined if the graduates showed a significant difference in the number of pre- and post-W.E.A. course rescues and evacuations for trips they had led. Of the 155 usable responses, forty-one (25.45%) had led trips both before and after successful completion of their W.E.A. course. All forty-one of these were used in analyzing pre- and post-course evacuations. Because of missing values, only thirty-eight (24.51%) were used to analyze pre- and post-course rescues. It should be noted that these numbers represent only 6.5% and 5.9% of the total 635 graduates surveyed, respectively. For pre- and post-course evacuations, there were twenty-five total evacuations before the course and twenty-three after the course. The scores reported in Table 1 are the average number of evacuations or rescues per participant day. A paired t-test was performed.
# Table 1

A Comparison of Pre- and Post-W.E.A. Course Evacuations and Rescues

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>Total Number of Evacuations and Rescues</th>
<th>Evacuations or Rescues Per Participant Day*</th>
<th>Standard Deviation</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-W.E.A. Evacuations</td>
<td>41</td>
<td>25</td>
<td>.0013</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>Post-W.E.A. Evacuations</td>
<td>23</td>
<td>23</td>
<td>.0004</td>
<td>.001</td>
<td>1.11 (p = .27)</td>
</tr>
<tr>
<td>Pre-W.E.A. Rescues</td>
<td>38</td>
<td>11</td>
<td>.0005</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Post-W.E.A. Rescues</td>
<td>5</td>
<td>5</td>
<td>.0001</td>
<td>.001</td>
<td>.91 (p = .37)</td>
</tr>
</tbody>
</table>

*Refer to data analysis (pg. 30) for an explanation of this calculation.
on the pre- and post-W.E.A. course evacuations, revealing no statistically significant differences at the .05 level of significance (p = .27).

Thirty-eight respondents reported eleven pre-W.E.A. course rescues (.0005 rescues per participant day) and five post-W.E.A. course rescues (.0001 rescues per participant day). A paired t-test revealed no statistically significant differences at the .05 level of significance in the number of pre- and post-W.E.A. course rescues (p = .37). However, the difference for both evacuations and rescues was in the hypothesized direction, suggesting that perhaps W.E.A. graduates are leading safer trips after their course than before.

The second research question asked was how much of an influence did W.E.A. graduates report that their courses had on the number of accidents occurring in their current outdoor leadership activities. Respondents were asked, "How much has your experience with W.E.A. and your outdoor leadership certification influenced the following characteristics of your current outdoor leadership activities?" The term "accidents" was listed as a characteristic, and responses were given on a four point scale: 1-had a negative effect, 2-had no effect, 3-helped somewhat, and 4-helped greatly. The mean score for the 120
respondents was $\bar{x} = 3.08$ (S.D. = .822). This placed the average response to W.E.A.'s influence on accidents as slightly more than "Helped somewhat" in reducing accidents.

The third research question asked how knowledgeable the graduates were concerning W.E.A. safety standards. A five-question scale was used to determine graduate knowledge of W.E.A. standard safety practices. Cronbach's alpha reliability coefficient (SPSS, Inc., 1983) was calculated on the scale to determine internal consistency. It revealed a coefficient of .0036 with the highest inter-item correlation being .13. Because of the low internal consistency of this group of items, Table 2 reports the percentage of respondents correctly answering each safety question. Forty and four-tenths percent of the sample responded correctly to question two -- a much lower correct response rate than for the other questions. The percentage responding correctly for the other four questions ranged from 59% to 78%, suggesting a low safety knowledge level among respondents.

**Ecological Impact**

The second research objective investigated changes in ecological impacts of trips led by W.E.A. graduates and ecological impact knowledge of graduates. This objective was addressed by research questions four and five. Research question four asked: To what extent do W.E.A. graduates
### Table 2

**Percentage of Respondents Correctly Answering Safety Knowledge Questions**

<table>
<thead>
<tr>
<th>Question*</th>
<th>Percent Answering Correctly</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>78.2</td>
<td>147</td>
</tr>
<tr>
<td>2</td>
<td>40.4</td>
<td>151</td>
</tr>
<tr>
<td>3</td>
<td>62.2</td>
<td>148</td>
</tr>
<tr>
<td>4</td>
<td>77.9</td>
<td>145</td>
</tr>
<tr>
<td>5</td>
<td>59.6</td>
<td>146</td>
</tr>
</tbody>
</table>

* The numbered key phrases below refer to the topic of each of the above questions. See Appendix B for a complete text of the questions.

1-Sterilization of dishes
2-Reason "release forms" are used in outdoor programs
3-Responsibility of the "runners" sent out by an expedition
4-Program participants rappeling unbelayed
5-Minimum safe number for a winter trip
report leading trips which emphasize and utilize low impact camping? Respondents were asked "How much has your experience with W.E.A. and your outdoor leadership certification influenced the following characteristics of your outdoor leadership activities?" The phrase "ecological impact of trips" was listed as a characteristic, and response was given on the same four-point scale as for accidents (1-had no effect to 4-helped greatly). One hundred twenty respondents answered this question with a mean score of 3.48 (S.D. = .71). This places the average response almost midway between "helped somewhat" and "helped greatly" in reducing ecological impacts.

Research question five asked how knowledgeable the graduates were concerning W.E.A. ecological impact standards. A five item scale was used to address W.E.A. standard ecological impact practices. Cronbach's alpha revealed a reliability coefficient for the scale of .24, with the highest inter-item correlation being .24. Though the alpha coefficient for this scale is higher than the coefficient for the safety scale, it is still too low to suggest acceptable internal consistency. Because of this, each item in the scale must be considered an independent backcountry use practice. Table 3 reports the percentage of respondents correctly answering each ecological impact
Table 3
Percentage of Respondents Correctly Answering Ecological Impact Knowledge Questions

<table>
<thead>
<tr>
<th>Question*</th>
<th>Percent Answering Correctly</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>74.0</td>
<td>146</td>
</tr>
<tr>
<td>2</td>
<td>89.9</td>
<td>138</td>
</tr>
<tr>
<td>3</td>
<td>24.3</td>
<td>144</td>
</tr>
<tr>
<td>4</td>
<td>74.3</td>
<td>148</td>
</tr>
<tr>
<td>5</td>
<td>96.7</td>
<td>151</td>
</tr>
</tbody>
</table>

* These numbered key phrases below refer to the topic of each of the above questions. See Appendix B for a complete text of the questions.

1-Type of wood burned in the backcountry
2-Unacceptable fire-building technique
3-Approach through muddy trail
4-Impact of size of hiking group
5-Acceptability of soap in stream
question. Only 24.3% responded correctly to question number three--a much lower correct response rate than for the other questions which were all 74% or greater. This suggests a moderate ecological impact knowledge level among graduates.

**Curriculum Standardization**

The final research objective investigated curriculum standardization, or the degree to which graduates implemented W.E.A. curriculum areas into their current programs due to their W.E.A. experience. Research question six asked the extent to which W.E.A. graduates implement W.E.A. curriculum areas into the programs in which they operate. Table 4 reports the curriculum area implementation of W.E.A. graduates. Column three does not equal the difference between column two and column one. The percentages in column one are apparently inappropriately low. This is likely because subjects misinterpreted the question. They evidently believed the question to mean "curriculum areas taught in their program prior to their W.E.A. course," and not simply "those curriculum areas currently taught in their program." Column three includes only those subjects who indicated that the curriculum area was currently taught, and reported no influence from W.E.A. Thus, column three is the most accurate measure of the degree to which a curriculum area was standardized without
### Table 4
Curriculum Area Implementation of W.E.A. Graduates*

<table>
<thead>
<tr>
<th>Curriculum Area</th>
<th>Taught in Current Program</th>
<th>Implemented Due to W.E.A. course</th>
<th>Taught in Current Program but not Implemented Due to W.E.A. Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Judgment</td>
<td>43.2</td>
<td>37.4</td>
<td>21.9</td>
</tr>
<tr>
<td>Leadership</td>
<td>44.5</td>
<td>27.7</td>
<td>31.0</td>
</tr>
<tr>
<td>Expedition behavior</td>
<td>49.0</td>
<td>45.2</td>
<td>19.4</td>
</tr>
<tr>
<td>Environmental ethics</td>
<td>67.1</td>
<td>29.7</td>
<td>44.5</td>
</tr>
<tr>
<td>Basic camping skills</td>
<td>66.5</td>
<td>21.3</td>
<td>49.7</td>
</tr>
<tr>
<td>Rations planning</td>
<td>41.9</td>
<td>36.1</td>
<td>20.0</td>
</tr>
<tr>
<td>Equipment selection and use</td>
<td>61.3</td>
<td>25.8</td>
<td>41.9</td>
</tr>
<tr>
<td>Clothing selection and use</td>
<td>64.5</td>
<td>23.2</td>
<td>45.8</td>
</tr>
<tr>
<td>Health and sanitation</td>
<td>56.8</td>
<td>30.3</td>
<td>37.4</td>
</tr>
<tr>
<td>Travel techniques in the wild outdoors</td>
<td>54.2</td>
<td>39.3</td>
<td>29.0</td>
</tr>
<tr>
<td>Navigation</td>
<td>52.3</td>
<td>20.6</td>
<td>40.0</td>
</tr>
<tr>
<td>Weather</td>
<td>43.2</td>
<td>21.9</td>
<td>32.9</td>
</tr>
<tr>
<td>First aid, emergency procedures, survival</td>
<td>53.5</td>
<td>23.8</td>
<td>38.7</td>
</tr>
<tr>
<td>Natural and cultural history</td>
<td>51.0</td>
<td>20.6</td>
<td>37.4</td>
</tr>
<tr>
<td>Specialized adventure activities</td>
<td>51.0</td>
<td>20.0</td>
<td>36.8</td>
</tr>
<tr>
<td>Group processes and communication skills</td>
<td>54.8</td>
<td>27.7</td>
<td>34.8</td>
</tr>
</tbody>
</table>

*All figures are percentages of the total sample (n = 155).*
W.E.A. influence. Column two is the most accurate measure of the degree to which a curriculum area was standardized due to the W.E.A. influence.

Column one in Table 4 ("Taught in current program") shows that approximately 40 to 70% of the graduates are working in programs where W.E.A. curriculum areas are being taught. Although there are exceptions, hard skills (those involving mainly psychomotor ability) are more commonly taught, and these include environmental ethics - 67.1%, basic camping skills - 66.5%, clothing selection and use - 64.5%, and equipment selection and use - 61.3%. Soft skills (more people-oriented and subjective in nature) were generally taught less frequently. These include judgment - 43.2%, leadership - 44.5%, and expedition behavior - 49.0%.

Column two ("Implemented due to W.E.A. course") reports the percentage of graduates who implemented the curriculum areas due to their W.E.A. experience. The five most frequent curriculum areas implemented due to W.E.A. course experience are expedition behavior (45.2%), travel techniques (39.3%), judgment (37.4%), rations planning (36.1%), and health and sanitation (30.3%). Three out of these five were among the least often taught curriculum areas in graduates' current programs (column 1 - rations planning, expedition behavior, and judgment). This suggests that W.E.A. is being more
effective for standardizing curriculum areas that were not already highly standardized.

Column 3 reports those curriculum areas which are taught in graduates' current programs but are not implemented by graduates due to their W.E.A. experience. Areas already highly standardized and which W.E.A. is not having as great an influence on standardizing (column three) include basic camping skills (49.7%), clothing selection and use (45.8%), environmental ethics (44.5%), equipment selection and use (41.9%), and navigation (40.0%).

Finally, graduates implemented an average of 4.54 (S.D. = 4.94) curriculum areas out of 16 into their current programs. Six and one-half percent implemented all 16 curriculum areas, while 33.5% of the graduates did not implement any areas. The response format for this item failed to distinguish between subjects not responding to the item and subjects who did not implement the curriculum area due to W.E.A. This allows for the possibility that the true mean number of curriculum areas implemented could be higher and the percentage of graduates not implementing any curriculum areas could be lower than reported here.

Thus, considering the results of this study, there is some indication that evacuations and rescues may decrease after a W.E.A. course, although the differences in this
study were not significant. Respondents reported a moderately high W.E.A. impact on improving their accident records, and a low level of knowledge concerning W.E.A. standard safety practices. A strong W.E.A. influence on reducing ecological impact for current outdoor leadership activities was reported, but graduates revealed a moderate level of ecological impact knowledge. A moderate percentage of graduates worked in programs where areas of the W.E.A. curriculum were being taught, and hard skills were taught more often in these programs than soft skills. W.E.A. is having an influence on curriculum areas which are not highly standardized. Finally, graduates reported implementing a low number of W.E.A. curriculum areas into current programs, and a moderately high percentage of graduates reported not implementing any curriculum areas into current programs.
Chapter V
SUMMARY

An increase in outdoor adventure activity and wilderness and backcountry use has caused concern by outdoor educators and wilderness managers regarding accidents, injuries, and negative environmental impacts. Outdoor leader certification is seen as a possible means for resolving these problems. This study investigated the effect of Wilderness Education Association certification on safety, ecological impact, and curriculum standardization of graduates.

Because this study was exploratory in nature, some problems occurred that suggest more refined study of W.E.A. graduates in the future. The first potential problem is the low return rate (41.1%). Nonresponse bias is a definite possibility. Because of this, the results may not be generalized to the entire population of W.E.A. graduates. Secondly, self-reports were used to measure safety through the number of evacuations and rescues per participant day for graduates. Even though the reports were kept confidential, the respondents were still being asked to report potentially harmful information about their leadership abilities. Cautela and Upper (1976) state that self-reports have not been shown to be more unreliable or
invalid than other types of measurement, and Walsh (1968) provides support for the validity of potentially negative self-reports. Nevertheless, opinion on the reliability of self-report measures is divided.

Thirdly, reliability problems with both safety and ecological impact scales suggest that the scale may not be valid. The author does, however, suggest that one possible reason for the low reliability of the scales might be due to failure of W.E.A. courses to cover the same safety and ecological impact content. If this occurred, graduates of W.E.A. courses could not be expected to respond to the scales in a similar manner.

Conclusions

While recognizing the problems noted above, some conclusions about the issue of certification for outdoor leaders seem warranted. A basic research question was whether W.E.A. certification is reaching its goals concerning safety, ecological impacts, and curriculum standardization. Concerning safety, this study is inconclusive. Though graduates were leading safe trips after their W.E.A. course, they were also leading safe trips before their W.E.A. course. Graduates did report that W.E.A. had a moderately high, positive impact on their
accident records, but results also revealed a low level of graduate knowledge concerning W.E.A. standard safety practices -- an apparent contradiction. Because of this, it is difficult to determine if W.E.A. is reaching its goal concerning safety.

In regard to ecological impact, there is some indication from the data that W.E.A. is closer to reaching its objectives for this goal than for safety. Graduates reported a high, positive influence on reduction of ecological impact due to their W.E.A. experience, and a moderate level of ecological impact knowledge. Both of these findings are in a positive direction, thus suggesting a degree of success for W.E.A. in this area.

The final W.E.A. goal this study investigated was curriculum standardization. The results suggest that the W.E.A. curriculum is not being widely implemented by graduates. Only approximately one-fourth of the curriculum areas are being implemented by graduates due to their W.E.A. experience. One-third of the graduates were not implementing any of the curriculum areas.
Discussion

Safety

W.E.A. graduates who worked in outdoor education-related positions both before and after the successful completion of their W.E.A. course did not show a statistically significant decrease in the number of pre- and post-course evacuations and rescues for trips led. There are various factors, though, which must be considered. First of all, even though the decrease in rescues was not statistically significant, there is the potential that it may be considered practically significant. Rescues pre-W.E.A. went from a total of eleven (.0005 rescues per participant day) to five (.0001 rescues per participant day). Rescues can be extremely expensive operations, with highly trained specialists and expensive procedures and equipment (e.g., a helicopter rescue). A difference of six rescues could save a considerable amount of time and money. Secondly, it is difficult to put a value on a person's health. Rescues and evacuations usually entail a serious injury, and if the W.E.A. course experience can contribute to the prevention of even a small number of serious injuries, it is worthwhile. Thirdly, W.E.A.'s goal is to teach outdoor leaders to safely lead others in the outdoors. There were almost 51,000 post-W.E.A. course participant days
led by graduates who worked in outdoor education-related positions pre- and post-W.E.A. Although no comparable data are available, total post-W.E.A. evacuations and rescues of twenty-three and five, respectively, seem small totals for this large number of participant days. W.E.A. graduates may not show a statistically significant difference in evacuations and rescues pre- and post-W.E.A., but they are still leading safe trips. Finally, the lack of a significant difference in evacuations and rescues pre- and post-W.E.A. does not take into consideration previous outdoor education training experiences. Graduates may have had training other than W.E.A. which influenced their safety records.

W.E.A. graduates reported that their course "helped somewhat" in reducing accidents in their current outdoor leadership activities. The reason this characteristic didn't receive a higher score may lie with related curriculum areas. Results from part of a larger study not entirely reported in this thesis reveal that the degree to which objectives were met for the curriculum area of first aid, emergency procedures, and survival was rated by graduates as midway between "partially met" and "largely met." Only 23.8% of the graduates reported implementing this curriculum area into their current programs due to
W.E.A. Perhaps W.E.A.'s influence on accidents would have been stronger if the objectives for the first aid curriculum area had been more fully met.

Because of the low reliability for the safety knowledge scale (alpha = .0036), it is difficult to determine graduate knowledge of W.E.A. standard safety practices. This low internal consistency of the scale suggests either inadequate item development or a lack of consistency in the safety knowledge curriculum of W.E.A. courses. The content for the questions was taken from the W.E.A. curriculum, and the author has concluded that the items were developed in a sufficiently rigorous manner to be a valid representation of W.E.A. standard safety knowledge. The lack of internal consistency for the scale may therefore indicate that W.E.A. curriculum practices are not actually covered in the same manner across courses. The courses are conducted through twenty-three affiliating universities in addition to the headquarters in Idaho. In its attempt to standardize its curriculum by decentralizing, W.E.A. may actually be hindering its efforts to promote a basic standard of outdoor knowledge. Standards are difficult to maintain when instructors and programs are dispersed throughout the country. Additional training experiences of W.E.A. instructors may influence the curriculum content they
communicate, and this would have an effect on whether the W.E.A. standard is accurately taught.

**Ecological Impact**

Of the three goals investigated in this study, W.E.A. is being most effective with ecological impact. W.E.A. graduates reported midway between "helped somewhat" and "helped greatly" for the influence that their W.E.A. experience had on the ecological impact of their current outdoor leadership activities. The degree to which objectives were met for the curriculum area of environmental ethics was rated by graduates as slightly more than "largely met" (5.3 out of 6.00). Much emphasis is placed on environmental ethics throughout the course. Students concern themselves with environmental interaction on a daily basis in various ways -- meal preparation, personal hygiene, travel, and campsite selection. This consistent reinforcement of environmental ethics would probably tend to strengthen the students' knowledge and skill in this area, and thus account for these positive results.

As with the safety scale, the ecological impact scale showed low reliability and was thus limited in its use as a measure of W.E.A. standard ecological impact knowledge. The same considerations as were stated concerning the validity of the safety scale apply to this scale. The
author suggests the possibility that the W.E.A. environmental ethics curriculum is not consistent for all W.E.A. courses. Overall, though, W.E.A. seems to be reaching its goal with ecological impact moreso than with safety.

**Curriculum Standardization**

W.E.A.'s goal is the standardization of its curriculum. One-third of the graduates did not implement any of the sixteen curriculum areas into their current programs. The average number of curriculum areas was 4.54 out of sixteen. Twenty percent implemented three curriculum areas or less, meaning that approximately 53% of W.E.A.'s graduates are implementing three or fewer curriculum areas. There may be several explanations for this. Perhaps these graduates are working in outdoor education-related positions which are unlike W.E.A. and do not utilize its type curriculum. If so, they would not have the opportunity to implement any curriculum areas. An example might be a day camp counselor. Another possibility is that these graduates work in programs where most if not all of W.E.A.'s curriculum areas are already used. The results of this study suggest that W.E.A. has the most influence on the implementation of curriculum areas which were previously not highly standardized. For example, more than a third of the respondents who include
judgment, expedition behavior, rations planning, and travel techniques (curriculum areas that are not highly standardized) said they did so because of W.E.A. It should be noted that the curriculum areas which are being implemented by graduates are those which W.E.A. feels are most important (S. Braun, personal communication, December 18, 1984).

**Implications**

In light of the previous discussion, W.E.A. might consider discontinuing those curriculum areas which are highly implemented but which are not highly implemented due to W.E.A. course experience. This would allow W.E.A. to put more emphasis on curriculum areas which they feel are more important, but which are not having their objectives fully met (e.g. safety).

Also to be considered are the graduates' generally positive results concerning ecological impacts. This would suggest to wilderness managers and wilderness researchers that certification or merit can be an effective means for reducing negative ecological impacts.

Finally, W.E.A. needs to maintain accurate year-by-year records on graduates in areas such as employment, curriculum standardization, and safety so they can evaluate and compare the effectiveness of their courses over time.
Future research should address the various limitations of this study: low return rates, the use of self-report data, and the validity and reliability of the knowledge scales. Operationalizing each of the three research objectives more specifically and comprehensively would prove valuable. Evaluating judgment, the one W.E.A. goal not investigated in this study, would be extremely useful and interesting. An investigation is needed to determine why certain graduates are not implementing the W.E.A. curriculum. Finally, a comparison of W.E.A. graduates with graduates from other outdoor education schools or programs not offering certification would help to further determine the effectiveness and value of W.E.A.'s outdoor leader certification.
LITERATURE CITED


Appendix A

COVER LETTERS
February 28, 1984

Dear Deborah:

The certification of wilderness leaders is becoming a more pertinent issue in the field of outdoor recreation. As you know, the Wilderness Education Association (W.E.A.) is a leader in this certification process. With W.E.A.'s National Standard Program for Outdoor Leadership Certification (N.S.P.O.L.C.) continuing to expand nationwide, it is essential that the process and the outcomes of this program be evaluated. To do this we need your help.

With the benefit of a grant secured from the Division of Health, Physical Education and Recreation at Virginia Polytechnic Institute and State University, we are investigating the effectiveness of the N.S.P.O.L.C. Of course, information from graduates is the most important indicator of W.E.A.'s effectiveness. Therefore, we are anxious to learn of your W.E.A. course evaluations, outdoor leadership experiences, and outdoor knowledge.

Before we ask for this information from every W.E.A. graduate, we are conducting this pilot study with graduates of Virginia Tech's affiliate course, The Wilderness Institute. We invite you to comment on the relevance of the questions in the margins of the questionnaire.

Since our pilot study is small, it is extremely important that each of you complete and return the questionnaire by March 16. The results will be strictly confidential. Your copy of the questionnaire is enclosed with this letter. You will be asked to remember information from past years, so please answer as accurately as possible. Your cooperation will allow us to make important recommendations to W.E.A. for improvement of the certification process.

Thank you for your participation in this important project.

Very truly yours,

David Cockrell, Ph.D.  
Assistant Professor  

David Detzel  
Research Assistant

Enc.
July 5, 1984

Dear Wilderness Education Association Graduate:

The certification of wilderness leaders is becoming a more pertinent issue in the field of outdoor recreation. As you know, the Wilderness Education Association (W.E.A.) is a leader in this certification process. With W.E.A.'s National Standard Program for Outdoor Leadership Certification (N.S.P.O.L.C.) continuing to expand nationwide, it is essential that the process and the outcomes of this program be evaluated. To do this we need your help.

With the benefit of a grant secured from the Division of Health, Physical Education and Recreation at Virginia Polytechnic Institute and State University, we are investigating the effectiveness of the N.S.P.O.L.C. Of course, information from graduates is the most important indicator of W.E.A.'s effectiveness. Therefore, we are anxious to learn of your W.E.A. course evaluations, outdoor leadership experiences, and outdoor knowledge.

You may be assured of complete confidentiality. The enclosed questionnaire has an identification number for mailing purposes only. This allows us to check your name off our mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

The results of this research will allow us to make important recommendations to W.E.A. for improvement of the certification process, but you may also receive a summary of the results by writing to us at the above address. A prompt return of the questionnaire would be greatly appreciated. Thank you for your participation in this important project.

Very truly yours,

David Cockrell, Ph.D.
Assistant Professor

David Detzel
Research Assistant
Dear W.E.A. Graduate:

About seven weeks ago I wrote to you seeking information regarding your Wilderness Education Association (W.E.A.) evaluations, your outdoor leadership experiences, and your outdoor knowledge. As of today we have not yet received your completed questionnaire.

This study has been undertaken with the belief that the information gathered will allow us to make important recommendations to W.E.A. for improvement in their certification process.

I am writing to you again because of the significance each questionnaire has to the accuracy and usefulness of the study. Because of the small number of W.E.A. graduates, it is extremely important that each questionnaire be completed and returned.

In the event that your questionnaire has been misplaced, a replacement is enclosed. Your cooperation is greatly appreciated.

Cordially,

David Cockrell, Ph.D.
Project Director
Appendix B

QUESTIONNAIRE
YOUR VIEW COUNTS

DIVISION OF HEALTH, PHYSICAL EDUCATION AND RECREATION
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
BLACKSBURG, VA 24061
Part I: EVALUATION OF YOUR W.E.A. COURSE

Q-1. Which type of Wilderness Education Association course(s) have you participated in? (Please circle the number of each type you have participated in.)

1. NATIONAL STANDARD PROGRAM
2. SPECIAL PROGRAM FOR PROFESSIONALS
3. ALASKA PROGRAM
4. SEMESTER PROGRAM
5. OTHER (please specify) _______________________

Q-2. How many W.E.A. courses have you completed? 

________ course(s).

Q-3. What were the dates of the course(s) in which you participated?

MONTH      YEAR

_____ _____  FIRST COURSE
_____ _____  SECOND COURSE
_____ _____  THIRD COURSE

Q-4. Please list below the sponsoring institution of your course(s). (Write "Home Office" for courses administered from Driggs, Idaho).

SPONSORING INSTITUTION

________________________  FIRST COURSE
________________________  SECOND COURSE
________________________  THIRD COURSE

Q-5. Overall, how satisfied were you with the quality of the W.E.A. course(s) in which you participated? (Please circle the number of your response.)

1. COULDN'T HAVE BEEN MORE DISSATISFIED
2. EXTREMELY DISSATISFIED
3. SOMEWHAT DISSATISFIED
4. NEITHER SATISFIED NOR DISSATISFIED
5. SOMEWHAT SATISFIED
6. EXTREMELY SATISFIED
7. COULDN'T HAVE BEEN MORE SATISFIED
Q-6. Below are listed 16 curriculum areas for which W.E.A. has established instructional objectives. Please rate the degree to which you feel your course(s) met instructional objectives in each curriculum area. (Circle the numbers of your responses.)

--- WERE OBJECTIVES MET? ---

<table>
<thead>
<tr>
<th>CURRICULUM AREAS</th>
<th>AREA NOT AT ALL MET</th>
<th>SLIGHTLY MET</th>
<th>PARTIALLY MET</th>
<th>LARGELY MET</th>
<th>COMPLETELY MET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Judgment</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>1 2 3 4 5 6</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expedition Behavior</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Environmental Ethics</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Camping Skills</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Rations</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Equipment</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Clothing</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Health and Sanitation</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Travel Techniques</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Navigation</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Weather</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>First aid, emergency procedures, survival</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Natural and cultural history</td>
<td>1 2 3 4 5 6</td>
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<tr>
<td>Special travel/adventure activities</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group process and communication skills</td>
<td>1 2 3 4 5 6</td>
<td></td>
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</tbody>
</table>
Q-7. Please rate the usefulness of each of the W.E.A. evaluation techniques below in helping you improve your leadership skills. Rate only the techniques used in your course. (Circle the number of your response.)

**EFFECTIVENESS RATING**

<table>
<thead>
<tr>
<th>EVALUATION TECHNIQUE</th>
<th>POOR</th>
<th>FAIR</th>
<th>GOOD</th>
<th>VERY GOOD</th>
<th>EXCELLENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-course self evaluation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>End-of-course self evaluation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Mid-course peer evaluation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>End-of-course peer evaluation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Mid-course instructor's conference</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>End-of-course instructor's conference</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Mid-course instructor's numerical ratings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>End-of-course instructor's numerical ratings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Leader of the day feedback</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tbody>
</table>

Q-8. Do you feel your performance in your course was evaluated fairly? (Circle one number).

1. VERY UNFAIR
2. SOMEWHAT UNFAIR
3. UNCERTAIN
4. SOMEWHAT FAIR
5. VERY FAIR
Q-15. How much has your experience with W.E.A. and your outdoor leadership certification influenced each of the following characteristics of your current outdoor leadership activities? (Circle the numbers of your responses.)

<table>
<thead>
<tr>
<th>INFLUENCE OF W.E.A.?</th>
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<tbody>
<tr>
<td>DESIRED PROGRAM CHARACTERISTICS</td>
</tr>
<tr>
<td>---------------------------</td>
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<tr>
<td>Enrollments</td>
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<tr>
<td>Recruitment of participants</td>
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<tr>
<td>Public image</td>
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<tr>
<td>Program funding opportunities</td>
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<tr>
<td>Attraction of quality staff</td>
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<tr>
<td>Liability insurance rates</td>
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<tr>
<td>Ecological impact of trips</td>
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<tr>
<td>Teaching effectiveness</td>
</tr>
<tr>
<td>Accidents</td>
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</tbody>
</table>

Q-16. Does your current program have written standards or operating policies which guide program development and operation?

1. YES
2. NO
Q-17. For each of the curriculum areas below, please check the ones you teach in the programs you currently lead, and the ones you implemented because of your contact with W.E.A.

<table>
<thead>
<tr>
<th>Curriculum Areas</th>
<th>Taught in Your Programs</th>
<th>You Implemented Due to Your W.E.A. Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. JUDGMENT</td>
<td></td>
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<tr>
<td>2. LEADERSHIP</td>
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<td>3. EXPEDITION BEHAVIOR</td>
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<td>4. ENVIRONMENTAL ETHICS</td>
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<tr>
<td>5. BASIC CAMPING SKILLS</td>
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<td>6. RATIONS PLANNING</td>
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<td>7. EQUIPMENT SELECTION AND USE</td>
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<td>8. CLOTHING SELECTION AND USE</td>
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<tr>
<td>9. HEALTH AND SANITATION</td>
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<tr>
<td>10. TRAVEL TECHNIQUES IN THE WILD OUTDOORS</td>
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<td>11. NAVIGATION</td>
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<td>12. WEATHER</td>
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<tr>
<td>13. FIRST AID, EMERGENCY PROCEDURES, SURVIVAL</td>
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<tr>
<td>14. NATURAL AND CULTURAL HISTORY</td>
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<tr>
<td>15. SPECIALIZED ADVENTURE ACTIVITIES</td>
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<tr>
<td>16. GROUP PROCESSES AND COMMUNICATION SKILLS</td>
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</table>

Part III. YOUR OUTDOOR KNOWLEDGE

This section asks your understanding of various outdoor living and travel practices for formal group leadership. For each question, please indicate the W.E.A. STANDARD PRACTICE.

Q-18. Which of the following types of wood should be burned in backcountry campfires? (Circle all the answers that apply.)

1. CAMPFIRES SHOULD NOT BE BUILT IN THE BACKCOUNTRY.
2. DEAD AND DOWN WOOD IF IT IS PLENTIFUL.
3. WOOD FROM STANDING DEAD TREES, IF IT IS PLENTIFUL.
4. WOOD FROM LIVING TREES IF IT IS PLENTIFUL.
Q-19. Which of the following fire-building techniques is **never** an acceptable method? (Circle one answer.)

1. DIG A PIT ABOUT 10 INCHES DEEP, PREFERABLY IN MINERAL SOIL. SCATTER THE ASHES AND REPLACE THE SOD AFTERWARD.
2. CLEAR A SMALL AREA OF VEGETATION AND RING IT WITH ROCKS TO PROTECT THE SURROUNDING PLANTS.
3. BUILD THE FIRE ON A LARGE FLAT ROCK COVERED WITH SOIL. SCATTER ASHES AND RINSE THE ROCK AFTERWARD.
4. BUILD THE FIRE DIRECTLY ON A SANDY BEACH. SCATTER ASHES AFTERWARD.

Q-20. When you are faced with a deep, muddy, trail through a meadow, which one of the following approaches is most appropriate? (Circle one answer.)

1. STAY ON THE TRAIL REGARDLESS OF CONDITIONS.
2. WALK AROUND THE MEADOW IN THE SURROUNDING FOREST.
3. WALK JUST TO THE SIDE OF THE TRAIL.
4. START A NEW TRAIL ON HIGHER GROUND.

Q-21. One hiking group of 12 people will cause **less** impact to other visitors' experience than 3 hiking groups of 4 people each. (Circle one answer.)

1. TRUE
2. FALSE

Q-22. When is it acceptable to use soap directly in a stream? (Circle one answer.)

1. NEVER
2. IF THE STREAM IS POLLUTED.
3. IF THE SOAP IS BIODEGRADABLE.
4. IF NO ONE IS CAMPED DOWNSTREAM.

Q-23. Sterilization of dishes is a desirable sanitation aid but is not of primary importance under severe weather conditions. (Circle one answer.)

1. TRUE
2. FALSE

Q-24. The reason "Release forms" or "waivers" are used in outdoor programs is to get participants to assume the risks of participation. (Circle one answer.)

1. TRUE
2. FALSE
Q-25. Which of the following is not a responsibility of the "runners" sent out by an expedition to secure help after an accident in the backcountry? (Circle one answer.)

1. WAIT UNTIL THE EXTENT OF THE INJURY HAS BEEN DETERMINED.
2. CONTACT THE AGENCY THAT MANAGES THE AREA.
3. GIVE THEIR DIAGNOSIS OF THE INJURY TO A PHYSICIAN.
4. GUIDE THE RESCUE PARTY TO THE RENDEZVOUS POINT.

Q-26. During a course, when is it acceptable for an experienced outdoor program participant to rappel unbelayed? (Circle one answer.)

1. NEVER.
2. WHEN SPEED OF DESCENT IS IMPORTANT FOR SAFETY.
3. WHEN THE RAPEL IS SHORTER THAN 40 FEET.
4. WHEN THE PARTICIPANT FEELS COMFORTABLE WITHOUT A BELAY.

Q-27. What is the minimum safe number for a winter backcountry trip? (Circle one answer.)

1. TWO
2. THREE
3. FOUR
4. FIVE

IV. BACKGROUND INFORMATION
Finally, we would like to ask a few questions about you. Your answers to these questions will be kept confidential.

Q-28. What is your age? ______ years.

Q-29. What is your sex?

1. FEMALE
2. MALE

Q-30. What percentage of your 1983 income was attributable to outdoor education-related employment? __________ %

Q-31. What is the highest level of education you have attained?
(Circle the number of the highest level.)

1. SOME HIGH SCHOOL
2. HIGH SCHOOL DIPLOMA
3. SOME COLLEGE
4. BACHELORS DEGREE
5. MASTERS DEGREE
6. DOCTORATE OR PROFESSIONAL DEGREE
Appendix C

FOLLOW-UP POSTCARD
Last week a questionnaire was mailed to you concerning your evaluations of your Wilderness Education Association (W.E.A.) course, your outdoor leadership experiences, and your outdoor knowledge. As a W.E.A. graduate, you are an important indicator of W.E.A.'s effectiveness in outdoor leadership training.

If you have already completed and returned this questionnaire, please accept our sincere thanks. If not, please do so today. Because the number of W.E.A. graduates is not large, each questionnaire returned is vitally important to the accuracy of the study.

If by some chance you did not receive the questionnaire, or it was misplaced, please call me right now (703) 961-6561, or write to the address below, and I will get another one in the mail right away.

Div. of H.P.E.R.
V.P.I. & S.U.
Blacksburg, VA 24061

Sincerely,
David Cockrell, Ph.D.
Project Director
The vita has been removed from the scanned document