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State of environmental education in Montana public schools K-6

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THE STATE OF ENVIRONMENTAL EDUCATION IN MONTANA PUBLIC SCHOOLS, K-6

By

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Dedicated to the twelve
outstanding elementary education teachers
who shared their commitment
to children, to environmental education
and to the future
and
to the special people who have
contributed to my significant life experiences:
my husband Joseph
and
my friend Lori

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CHAPTER ONE: INTRODUCTION

> A child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had influence with the good fairy who is supposed to preside over the christening of all children I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantment of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength (Carson 1965).

Montana offers incomparable opportunities as an outstanding nature study site. It contains a unique, unparalleled spectrum of natural features. In the lower 48 states Montana ranks second only to California in total acreage designated as wilderness. Both Glacier National Park and portions of Yellowstone National Park lie within the boundaries of Montana. Due to the great physical size and low population density, a vast land base still remains relatively undeveloped. This provides essential habitat for wildlife, clear flowing streams, outstanding beauty, and numerous attributes which enhance environmental education opportunities. Despite the natural setting and repeated educational efforts to encourage environmental education in Montana public schools, few programs exist at a K-6 level. Although environmental education has not been fully implemented in Montana public schools, outstanding environmental education teachers and their programs do exist. This study will identify common characteristics of outstanding K-6 teachers of environmental education and their programs. This information could be shared throughout the state to develop environmental education programs.

Environmental Education in the United States

The decade of the 70's was noteworthy for development of public concern about the health of the planet, the dangers of over consumption and pollution, and ways for educating children to these concerns. President Nixon called for the development and teaching of environmental concepts at every point in the educational process. Congress passed an Environmental Education Act (Public Law 91-516) in 1970. However, the monetary support for the Act was short lived. By 1982 teacher training workshops, curriculum dissemination, and environmental education coordinators were all but gone (Steinhart 1985). As the 1990's approach there is a resurgent interest in dealing with environmental problems of global warming, acid rain, depletion of the ozone and oil slicks.

Environmental Education in Montana

There has been little consistency or solid support for the inclusion of environmental education as a fundamental element in the core curriculum either in Montana or nationwide. In 1974, John Jackson, an EdD student at the University of Montana, developed an environmental education plan for Montana. The plan called for the formation of an advisory council for environmental education; restructuring the curriculum so that environmental awareness and understanding were an integral portion of all subjects; development and implementation of pre-and-in-service teacher training programs for all teachers to prepare them to incorporate environmental education into their existing lessons; establishment of a minor

in environmental education at all state-supported teacher training institutions; employment by the Office of Public Instruction, herein referred to as (OPI), of a full-time environmental education specialist; a requirement that new schools set aside land for an outdoor environmental education laboratory at the time of construction; and, fostering in the citizens of Montana an appreciation of and commitment to the environment of all organisms (Jackson 1974).

Few of Jackson's goals have been achieved. An advisory council for environmental education was formed but has since dissolved. A minor in environmental education is offered at the University of Montana and Western Montana College but beyond personal interest in pursuing this option, there is no professional incentive to do so. There are no environmental education pre-and-in-service teacher training programs offered through the OPI. There is no one employed by the OPI with full-time responsibility for environmental education. The current Science Specialist voluntarily took on the responsibility so the OPI would recognize its importance. The time he devotes to environmental education is in addition to his official work load. There is no requirement in Montana education standards that new schools set aside land for an outdoor lab at the time of construction. Such sites that do exist are due largely to efforts of highly motivated individual teachers who recognize the importance of including environmental education in their curriculums. It is difficult to determine if Montanans have developed a set of values that reflect a desire to maintain or improve environments for all organisms. If these values and attitudes were firmly established however, formal environmental education programs would exist in all 567 schools in Montana and there would be no need for this study!

There are 388 elementary school districts in Montana. Out of these districts only two have formal environmental education programs at a K-6 level; these are located in Great Falls and Lolo. Presently there are only two full-time environmental education teachers statewide, both employed in the same school system in Great Falls, Montana, a program recognized by the National Science Foundation as an exemplary model (Thomson 1987).

Federal agencies such as the United States National Park Service and the United States Forest Service and state agencies like the Montana Department of Fish, Wildlife, & Parks (MDFWP), conservation organizations such as the National Audubon Society and the National Wildlife Federation, and public service groups like Campfire Girls and Boys offer teacher workshops, classroom instruction, professional expertise, field trips, summer camps, study site development, and resource materials to Montana public school teachers. A major contribution of the United States National Park Service to environmental education has been the National Environmental Education Development (NEED) program, integrating materials for school grades kindergarten through 8, in a multi-disciplinary approach. Slots for participation in these environmental education workshops are quickly filled. Workshops such as the "Glacier Eagle Watch Workshop" at Glacier National Park, PROJECT WILD offered through cooperative efforts of MDFWP and the OPI, and workshops offered at the National Bison Range and the Lee Metcalf Wildlife Refuge through the United States Fish & Wildlife Service (USFWS) are popular, well received, and fulfill for teachers a need to obtain re-certification credit.

The carry-over of environmental education concepts gathered from workshops and re-applied in the classroom is varied. While teachers

continue to attend in-service training in environmental education no one can verify how much and what kind of instruction actually reaches the classroom (Briggs 1987; Bishop 1987; Steinhart 1985; Rakow 1985).

Vince Yannone, Conservation Education Division for MDFWP, attempting to determine carry over from workshop attendance to classroom use, sent a questionnaire to 233 teacher participants of PROJECT WILD workshops. Of the 131 respondents who returned questionnaires, 95 percent said the PROJECT WILD guidebook and workshop had increased their interest in environmental education. These teachers have taught 6,140 students. The survey showed that for every teacher instructed, that teacher went back and contacted over 47 students (Yannone 1987). However, in interviews with a small group of outstanding environmental education teachers there was little evidence to support the use and effectiveness of the PROJECT WILD guidebook and workshops.

As indicated environmental education efforts in Montana public schools have been sporadic. There are several reasons for this: The definition of environmental education suggests that we examine the way in which we live and change basic cultural values. Many people feel this is not the role of schools and most teachers are hesitant to deal with controversial issues and values that come out in environmental education. In northwestern Montana where local economies are dependent on extractive industries, teachers come under fire for teaching a conservation ethic (Light 1985).

Presently no environmental education standards exist for Montana public schools at the K-6 level (Briggs 1989). The Board of Public Education, comprised of a group of Montana citizens appointed by the governor, is a governing body that sets educational standards for Montana public schools.

The OPI implements directives set by the Board of Public Education. In 1986 state legislature mandated that the Board of Public Education provide new educational standards for Montana public schools. The Board of Public Education created Project Excellence to develop recommendations for new accreditation standards. In 1988 Project Excellence recommended to the Board of Education that environmental education be included in the science and social studies curriculum in Montana public schools. However, these recommendations were not adopted as educational standards by the Board of Education.

Other reasons for Montana's failure to enact environmental education are that when budget cuts occur, environmental education programs are often one of the first items to be eliminated from public schools and agencies.

Environmental education is one more thing to fit into an already full curriculum competing for instruction time with fire safety, racism, drug prevention, AIDS education, and child abuse.

In a telephone interview, Joan Schumaker, Conservation Education Coordinator for the Montana Department of National Resources, shared some of the challenges for environmental education in Montana public schools when she stated, "Environmental education is being taught in various schools in Montana often by teachers who aren't aware of other environmental educators with whom they could collaborate, offer support, and exchange ideas and resources". There is a need to develop a statewide environmental education network and a reference manual explaining why environmental education should be taught, what resources are available, how they can be used, and where they can be obtained (Schumaker 1988).

There is a need, despite these adversities and limitations, to do something to bring environmental education to the children in Montana public schools. The objectives of this study are to: 1) identify factors which contribute to an exemplary environmental education program in K-6 public schools in Montana; and, 2) provide a document describing the state of environmental education in K-6 public schools in Montana. By understanding those factors which contribute to outstanding environmental education programs and assessing the state of environmental education in Montana, recommendations for expanding environmental education programs at the K-6 level in Montana public schools will be developed.

CHAPTER TWO: LITERATURE REVIEW

> People learn in different ways, at different ages and stages; I would hardly claim one approach to be most correct, but plainly it doesn't take a lot of lecturing when lessons are manifest in sky, earth, water, weather (Frome 1989).

No similar studies on common factors among outstanding environmental education teachers and their programs at a state, national, or international level were found in the literature. Areas reviewed included: outstanding elementary teachers, environmental education programs and their effectiveness in Montana public schools, environmental education program types and their effectiveness on a national scale, teacher influence on students' environmental attitudes and knowledge base, and what teachers know and feel about environmental education.

Outstanding Teachers

While the focus of this study is programmatic, the first essential component of an outstanding environmental education program is an outstanding environmental education teacher. For the purposes of this study the literature for information on characteristics of outstanding elementary education teachers was examined to see if such characteristics might be applied to environmental education teachers. A study entitled, "Perceptions of Outstanding Elementary Teachers About themselves and their profession", Easterly(1983) provided some methodology which can be applied to this study. Easterly interviewed twenty-four outstanding elementary teachers

about their values, beliefs, past experiences and future career plans. Criteria for identifying outstanding teachers were obtained from graduate students (teachers) enrolled in their last master's level practicum class and tested in a pilot study.

Criteria for identification included

1. Conveys enthusiasm to others.
2. Is a good organizer and plans ahead.
3. Treats each student as a unique personality.
4. Has a positive attitude toward his/her profession.
5. Is a continual learner.
6. Develops effective working relationships with other adults (parents, teachers, administrators).
7. Does creative thinking in his/her area of professional responsibility
8. Participates actively as a member of selected professional and educational organizations

Campbell and others (1983) identified characteristics and competencies needed for successful teaching in inner city or urban schools. Even though the study emphasized urban schools, these findings can be applied to other successful elementary teachers. Competent teachers were identified by principles in each of their respective schools. Criteria for identification included:

1) were enthusiastic about students and teaching
2) were happy about the students' learning gains
3) had an understanding of children's problems of various kinds
4) were able to manage their classrooms well by stimulating children's interest in learning and having activities that were appropriate to their levels of abilities and skills
5) were able to have the children learn in various groups as well as in independent activities
6) high attendance in the outstanding teachers' classroom

Based on these studies done by Easterly and Campbell, I developed the following criteria to identify twelve outstanding environmental education teachers in Montana K-6 public schools:

-1- conveys enthusiasm to others
-2- has a positive attitude towards teaching environmental education
-3- is knowledgeable of environmental education (principles, content, and grade level applicability)
-4- applies creative environmental education teaching skills with students
-5- participates actively in environmental education workshops, courses, volunteer work, and/or curriculum design,
-6- is a continual learner

I made personal contact with environmental education specialists in Montana who work for county, state and federal agencies. I chose these experts because they regularly offer environmental education workshops to teachers and are familiar with outstanding environmental education teachers and programs around the state. Using the criteria I developed, these experts were asked to identify outstanding environmental education teachers at a K-6 level in Montana public schools. The twelve teachers most often cited by the pool of experts as outstanding environmental education teachers constituted the interview sample.

Research on Environmental education Program Types and Their Effectiveness in Montana Public Schools

Environmental Education has been examined on a local level in Montana. In 1974, John Jackson, University of Montana, reviewed environmental education plans from other states and interviewed people in Montana who were highly active in environmental education to discuss diverse topics

relating to environmental education. This study provides a historical account of the state of environmental education in Montana.

OPI convened a conference in 1973 for school administrators, university and college personnel, governmental agency personnel and representatives from the OPI to discuss environmental education in Montana. Based upon an opinionnaire completed by all participants recommended goals to expand the presence of environmental education in Montana public schools. While few of his goals have been achieved, Jackson pointed out that:

> Many good teachers have been incorporating outdoor education and environmental education principles into their teaching style without attaching any label to what they were doing (Jackson 1974).

Ten years later, Ken Light, University of Montana, brought attention to the status of environmental education in Montana public schools:

> Most public schools are doing very little with environmental education. In the elementary schools, most teachers, besides lacking professional preparation, simply do not have the time to include environmental education into their classroom subjects. Because environmental education has been assigned a low priority, if given any consideration at all, there are no incentives or directions coming from administrators for teachers to make additions to their overloaded curricula (Light 1984).

Based on teacher interviews, he lists reasons for the low priority: 1) shifting priorities for funding; 2) a shortage of quality educational materials; 3) controversy; 4) no requirement or recommendation that environmental education be taught; and 5) the minimum time children are allowed to experience and interact with Nature through field trips or nature study sites near schools. This study points out how little has been accomplished since Jackson's study in 1974 to promote environmental education in Montana public schools.

Environmental Education Program Types and their Effectiveness

Elementary teachers have been surveyed on environmental education program types, and their use and effectiveness in the nation's public schools. This information presented in the literature review serves as a basis for background information on environmental education program types and their effectiveness at a national and local level.

Jim Norgaard (1986), in his master's thesis, examines why environmental education programs are not effective and offered an approach to expand environmental education programs in Montana. He contends that

> Many of the traditional environmental education exercises are at the periphery, not the heart of environmental education and have value only when built upon a firm foundation of developing loving ties with nature. To have our children merely study, define, and label nature from a position of emotional detachment is to objectify our environment". The core of environmental education is " to initiate children (or to support them) in their process of developing loving ties with the natural world. We cannot ensure this outcome or in fact "teach" it directly, but we can give the children situations where "significant life experiences" are likely to occur".

He refers to this approach as the "earth-bonding approach" to environmental education. Norgaard conducted a teacher inservice in environmental education utilizing this methodology and measured workshop effectiveness, carry over of workshop goals to the classroom, and teachers' use of the outdoors after the workshop. In a follow-up survey of workshop participants, he found that teachers had expanded their curriculums to include this approach to environmental education. Norgaard's research has great significance to my study as an important approach to be considered in the expansion of environmental education programs in Montana.

Childress (1978) attempts to identify, describe, and analyze general curricular characteristics of a national sample of public elementary and

secondary school environmental education programs and project curricula with respect to grade level, justification, objectives, personnel involved in content selection, factors influencing content selection, curriculum organization, sources of content and subject matter, sources of instructional materials, instructional strategies, and curriculum-development constraints. He found that student interest, the needs of the students, and teacher interest were the factors exerting the most influence on the selection of curriculum content. Developing an appreciation of the environment was considered of more importance in a majority of programs than was helping students actually solve environmental problems and develop problem-solving skills. Inadequate funding at all levels and insufficient time were seen as the greatest constraints on the development of environmental education curricula.

Bethel and Hord (1981) conducted a case study of change in teacher attitudes towards environmental science after teachers attended a nine month teacher in-service in environmental science education. The program evaluation showed that "positive attitudes about teaching environmental science can be significantly increased" by such in-service training. The program predicted and verified that during a year-long training program teachers express differential concerns and attitudes towards environmental science.

Karl Schwaab (1983), University of Northern Iowa, evaluated the use and effectiveness of instructional methods of environmental education programs by surveying 296 teachers in Illinois public schools. He looked at how environmental education is being taught by teachers in the classroom.

> Teachers are not using extensively those methods they value as being most effective. Field trips and direct experiences with the environment were extensively used as a learning experience. Teachers know which agencies are environmentally oriented and they tend to favor using personnel from such agencies. Resource materials, other than classroom textbooks, were used infrequently by the teachers.

Steven Rakow (1985) reviewed published studies from the 1970's dealing with teacher in-service training in environmental education. He concludes that student learning is influenced by treatment of their teachers through in-service education. Based on my discussions with environmental education experts in Montana, they agree with Rakow that most studies fail to observe how well and how much teachers implement environmental education content and activities in the classroom as a result of workshops or inservice attendance, or their effect on student achievement (Briggs 1987; Bishop 1987; Yannone 1985).

Teacher Influence

In reviewing program types, attention was directed toward literature examining teacher influence on students' views and information base regarding the environment. Teachers were asked to provide information on significant life experiences which influenced them to become environmental education teachers.

Thomas Tanner (1980), Iowa State University, in his research, "Significant Life Experiences: New Research Area in Environmental Education", surveyed "active, informed citizen conservationists" asking them to "describe those experiences which were significant in founding their current interest" (in the environment). He felt that if a major goal of environmental education was producing an active and informed citizenry, then environmental educators should know the kinds of learning experiences

producing such persons. Based on responses he identified nine categories of influence: outdoors, interactions with natural, rural, or other relatively pristine habitats; habitat; solitude; habitat alteration; parents; teachers; other adults; books; and, miscellaneous experiences. Youthful experience of the outdoors and relatively pristine environments--in other words, a love of a particular place and frequent time spent there as a child, emerged as a dominant influence in their lives. Predominant interest in conservation was not acquired in the schools. The influence of both parents and teachers emerged second in significance. However, most elementary teachers were mentioned by those surveyed as "enthusiastic about nature, supportive of their students' interests and fostering initial interest in nature or conservation".

A carry over study was done by Nancy Peterson and Harold Hungerford (1981) at Southern Illinois University to examine significant life influences among selected environmental educators. Twenty-two environmental educators were interviewed to determine what variables were of prime importance in developing their own environmental sensitivity. The authors report findings similar to those of Tanner. Of significance is the emphasis placed on role models and their importance in developing environmental sensitivity:

> Teachers constituted the greatest percentage of role models names, stimulating interest in environmental systems and providing educational and professional guidance. Oftentimes, the teacher(s) developed a close friendship with the participant. The frequent citation of teachers by respondents seems encouraging. Hopefully, as teachers become involved in environmental education and act as role models one will see an increase in individuals sensitive to the environment.

What Teachers Know and Feel About Environmental Education

Researchers have been able to identify factors which encourage as well as inhibit teachers from teaching environmental education.

George Mirka (1970) examined factors influencing elementary teachers use of the out-of-doors. He was able to identify factors which both encourage and inhibit teachers use of the out-of-doors. Mirka found that the most important factors influencing teachers' use of the outdoors were:
1) availability of outdoor areas; 2) personal knowledge of how to use the outdoors to teach; 3) availability of materials; 4) understanding of the application of classroom subject matter to the outdoors; 5) conflicts with regular classroom routine; and 6) class size.

Margaret Ferrier (1972) studied elementary teacher's opinions regarding environmental education in the State College Area School District, Pennsylvania. This study indicated favorable teacher attitudes toward environmental education and a willingness to learn more despite an inadequate background.

Steven McCaw (1979) surveyed Columbus, Ohio teachers of all grade levels and subject areas regarding attitudes towards environmental education--how teachers felt about environmental education and outdoor education in their classes, and what factors teachers felt inhibited them from teaching environmental education. His study showed that elementary teachers rank environmental education a highest priority among non-basic school activities and that they teach environmental education outside the school building 49 percent of the time. Teachers at the elementary level were most interested in attending teacher in-service in environmental education.

SUMMARY

The most important factors found in the review of literature are: 1) research done on the state of environmental education in Montana public schools; 2) significant life experiences which influence people to become outstanding environmental education teachers; 3) potential influence teachers have in developing attitudes in children for environmental awareness and concern; 4) what factors influence teachers' use of the outdoors; and 5) the lack of research done to verify the carry-over and effectiveness of environmental education workshops and in-service training for teachers.

There is no indication of research done to determine characteristics of outstanding environmental education teachers and their programs. Research findings verify that Montana environmental education programs share many problems found in other programs around the country. Review of the literature provides an overview of the state of environmental education at the local and national level. These findings point to the need to understand the characteristics of outstanding environmental education teachers and their programs.

CHAPTER THREE: DEFINITIONS AND METHODS

> Creativity, imagination, and determination are the ingredients of success. No two outdoor education people will ever be the same, nor will their program (Link 1987).

Since the early 1900's many terms have described environmental education. The term **nature study** was first introduced by Liberty Hyde Bailey at the turn of the century, followed by the term **conservation education** in the 1930's, and the term **outdoor education** in the 1940's. The latter two terms were used predominantly until the 1970's when the celebration of Earth Day, an event drawing attention to the ecological problems we face as a society, led to the term **environmental education**. This paper will use the commonly accepted term **environmental education**.

Defining environmental education is no easy task and few people agree on a definition (Stapp 1969; Arnstein 1971; Agne and Nash 1974; Towler 1980; Jeter 1982; Schwaab 1982; Connect Newsletter 1986; Greenall 1986). It is difficult to find a concise definition or statement of goals.

A definition for an outstanding environmental education program is chosen, based on the most commonly accepted definitions used in the review of literature. For the purpose of this paper an outstanding environmental education program is defined as

> a series of learning experiences, marked by eminence, designed to achieve, within a specific period of time during the school year, certain specific instructional objectives and learner outcomes dealing with humans' relationship with and appreciation for their natural and human-made surroundings with recognition of threats to the environment and examination of potential solutions to the problems.

To provide clarity for the reader, environmental education program types in Montana public schools will be discussed. According to the twelve teachers interviewed for this study, two types of environmental education programs exist in Montana public schools: formal and informal. Informal environmental education programs are originated by individual teachers and take a variety of forms. There are numerous informal environmental education programs in the Montana public schools but it is difficult to get an accurate count of these programs due to the variation of what constitutes such a program. In contrast, a formal environmental program has been adopted by a school board/district and incorporated into the science curriculum. There are only two formal programs in existence and a third program is currently being developed.

METHODS

In order to expand the presence of environmental education programs in Montana, commonalities of outstanding environmental education teachers and their programs in K-6 Montana public schools will be discussed.

Twelve outstanding environmental education teachers in the Montana public schools were interviewed. Results of this study will give elementary teachers and other educators around Montana an opportunity to examine what twelve outstanding teachers think and feel about themselves, their environmental education programs, and their interactions with students and others in their profession.

Easterly and Campbell's criteria were used to select twelve outstanding environmental education teachers as identified by environmental education leaders in Montana. The twelve teachers most often cited by these leaders make up the interview sample.

Interview questions were developed to determine the status of environmental education in twelve outstanding environmental education programs in Montana public schools at the K-6 level. The information gathered from these questions reveals information on teachers' personal backgrounds, their interests, descriptions of their environmental education programs, factors both preventing and encouraging environmental programs, and what the ideal environmental education program would be like. Professors and other environmental education specialists in Montana reviewed the questions. The final interview questions are

1. How do you define environmental education? What do you think it is?
2. How did you become involved in teaching environmental education?
3. Why do you teach environmental education?
4. What approach do you use to teach environmental education?
5. What are your goals in teaching environmental education? (What are your instructional objectives and learner outcomes?

6. Describe significant life experiences which have influenced you to become an environmental educator (people, places, activities, readings)?

7. In addition to your own environmental education program, describe the environmental education program which exists in your school and in your district (how did it get started, what keeps it going, is it supported by the administration, the school board, the community, the parents, how do you find time for it).

8. What factors prevent or detract from a strong emphasis on environmental education in your school?

9. What can be done to encourage teachers to include environmental education in their curriculums?

10. What would the ideal environmental education program be like?

A "Background Interview Information" questionnaire was completed by teachers prior to the formal interview. Before or after each interview, individual teachers were asked to complete a sheet entitled "Background Interview Information" (See Appendix B). The background information would yield personal information not covered in the interview questions. Questions asked were:

1. Where do you teach, at what grade level?
2. How long have you been teaching?
3. Where did you graduate from high school?
4. Where did you attend school for your teacher training program?
5. What types of advanced degrees do you hold (if any)?
6. Briefly, please describe where you were born, how long you have lived in Montana, and the setting of your upbringing (rural, suburban, or urban).

The Interviews

A pilot interview prior to the formal interviews was conducted. Final individual interviews took place in teachers' schools, homes or at the University of Montana campus. Nine interviews were conducted personally, two by telephone, and one was recorded independently by a teacher responding to the list of questions. Interviews took place between May 1988 and March 1989. Confidentiality of teacher responses was assured so the teachers could speak with openness and honesty. In each case, the order of questions was the same. Clarifying statements were given when teachers asked for elaboration. All the interviews were recorded on tape and sessions

varied from forty-five minutes to ninety minutes in length. Each tape was then transcribed.

The twelve teacher respondents are coded A through L to provide interest for the reader to develop a sense of what each teacher thinks about environmental education, while still protecting the identities of the teachers. Selected samples will be presented to illustrate key points when four or more teachers give the same response to a question. Categories with less than four teacher responses are displayed in Appendix D.

CHAPTER FOUR: RESULTS OF THE INTERVIEWS

> Probably one of the distinguishing marks of a master teacher is an unwillingness to stop growing, examining, and messing around with the job at hand (Watts 1982).

Profile Information

Nine elementary teachers selected for this study were female, and three teachers were male. Teachers teach in grade levels ranging from kindergarten through sixth grade. Five teachers teach more than one grade level. All twelve teachers have taken post-bachelor's courses while four teachers are working towards graduate degrees, and two have their master's degrees.

Years of teaching experience range widely. While one teacher is a first year teacher, he has one to three years prior experience working as an environmental educator at residential environmental education schools or centers. Three teachers have between five and nine years of teaching experience, five have ten to fourteen, two have fifteen to nineteen years experience, and one teacher has twenty-six years of experience.

Three teachers work in schools with a student population of 5 to 100; six teachers work in schools with a student population of 100 to 500; and two teachers work in schools with a student population of 500 to 1,100. One environmental education program is available to 12,000 students.

While four teachers graduated from high school in Montana, the remaining eight teachers attended high school in other states. Seven of the

twelve teachers attended Montana schools for their teacher training programs.

Four teachers are native Montanans. One teacher has lived in Montana seven years, three have lived in Montana ten to fourteen years, one teacher has been in Montana seventeen years, two have been residents for twenty to twenty-four years, one has lived in Montana thirty-three years, and, the remaining four teachers have lived in Montana between thirty-four and thirty-nine years.

The setting in which the teachers grew up varied among individuals. Three were raised in rural areas, five were raised in suburban areas, and four teachers grew up in urban areas

In summary, years of teaching experience affect the volume of environmental education resource materials teachers have collected, re-used and improved on over time. The location where teachers work provides information helping to explain how and why they are able to teach environmental education. Where teachers were reared plays a significant role in shaping their interests to become environmental educators. Childhood outdoor experiences served as an influence in environmental education program development for the twelve teachers.

Interview Questions

Interview results are presented on a question by question basis. Within each question commonalities, differences and interesting teacher view points are presented. By presenting selected teacher responses, the reader will gain a thorough understanding of twelve outstanding environmental education programs in K-6 Montana public schools.

1. HOW DO YOU DEFINE ENVIRONMENTAL EDUCATION? WHAT DO YOU THINK IT IS?

There were seven types of responses to the question, "How do you define environmental education?" They are: 1) developing a concern for the future of the planet and how peoples' actions affect the environment; 2) developing awareness, appreciation, and understanding; 3) providing information for students to make decisions: 4) providing a sequential learning process: 5) spending time in the outdoors; 6) teaching how nature works; and, 7) studying natural science, economics, politics, resource management and future dimensions.

Ten of the twelve teachers describe the importance of developing an awareness, or "sense of wonder", appreciation, and understanding of the environment. Selected teacher comments are presented to illustrate the potential influence. teachers can have in encouraging childrens' instinctual interest in the environment:

> Teacher G: I hope to develop their power of observation-just to make them look around the outdoors, to really see things, to get down on their hands and knees and find out what's underneath their feet, to be curious about, if they see a mountain or a butte, why is it there? Just to make them ask questions of wonder about things.

> Teacher C: A lot of kids here have been brought up in the outdoors and yet they aren't really aware of all the unique things that surround them, so first of all I always want to open their eyes to that, the awareness of their surroundings.

> Teacher A: . . . self-awareness is part of its definition, responsibility, and a person's role within the community--their local community and their global community. That's an awful lot to expect an environmental educator to get across to kids but I think that's sort of a working definition that I carry with me. It's a real push for awareness of one's place.

Nine of twelve teachers share the concern for how people affect the planet. They also express a concern for the future of the planet. Their comments are

> Teacher K:I believe it is to teach children and adults to be more aware of the environment and the impacts they create.

> Teacher A: I would be hard pressed to think of a more fundamentally important communication load to give students in today's world because we've lost our place--lost our sense of place. The earth and our society are reacting strongly and before we can ever hope to remedy some of those existing problems, we are going to have to start at home and on a fundamental basis just change the way we care about ourselves and the way we fit in. We've got some responsibilities that will affect us for along time. That's a finite relationship.

Seven of twelve teachers believe that environmental education should provide a knowledge base for children, should teach them how to make responsible decisions concerning their environment and should help them to apply this information as active citizens now and in the future.

> Teacher B: My feeling is that the earth is in trouble. We need to start teaching our kids a little bit or at least enough so that they can make wise decisions. I don't believe in teaching the kids that this is right and this is wrong. I just want them to have enough background so when they become the leaders, they can make wise decisions for the future.

> Teacher F: It's teaching children how to make responsible decisions as they grow up to be adults, to make responsible decisions concerning their environment so that we don't waste it, so that it's around for others to enjoy.

> Teacher C: They have some tough decisions coming up that involve environmental issues. They might be the people that make or break what happens to our planet.

Teacher D: I try to take it from the standpoint of problem-solving activities and let them come up with their own choices, situations and conclusions.

Teacher H: We have a real opportunity with elementary age school children to start giving them the chance to develop some attitudes and guide them through some of this thinking. Kids will learn about the input citizens have and the crucially important decisions leaders make who are the managers or legislators.

Six teachers explain the sequential process whereby children can learn about the environment:

Teacher J:That's where it starts with-- the wondering part. And then it goes into appreciation and then that develops into a concern for what is happening. Just a classic example would be a bird feeder. We have little finches outside. We are watching these birds and that is where the wonder begins. You begin to notice their colors and notice their patterns and you begin to notice that they are feisty little buggers and they are territorial over whatever little feed they can manage to get before somebody else can get it. And that develops into an appreciation for those particular birds, perhaps a wider range of birds. And so then you begin to ask questions like, "I wonder where they are in the summertime and I wonder what their habits are and what kind of habitat they need." Then, maybe through reading an article, something will catch your eye. And just an off the wall example: perhaps you find out they are going to South America and the next thing you do is read in National Geographic about deforestation and suddenly, you are connecting into an international thing. You have gone from a local thing that started out with a sense of wonder and you have expanded it into an international concern in this case. And if I can just start that process, if I can just make a spark and cause that sense of wonder to begin, then hopefully the rest of the process, it'll take time, I'm not going to be able to do it in the sixth grade, but you hope it will grow out of that. I guess that's how I define it. It's rather abstract, but I think in environmental education you have to be thoroughly abstract about things.

Teacher H: First of all, you have to have some background knowledge. There just has to be some knowledge and at every level there is knowledge that kids can handle and that can be taught. And then it also, there has to be some real understanding about how this all fits together and the interrelationships that are there between the plants and animals and us as human beings. And then you want to take it beyond that even further. Even after they get some of that understanding, then you are working more in the affective area of trying to get them to develop some attitudes and values so that you are looking at kids who will eventually be not only citizens but could well be leaders and real decision makers and how they are going to continue to manage the resources we have.

Five of the twelve teachers discuss how everything in nature works together in an ecosystem.

Teacher C: . . . awareness, appreciation and then discovering how they are related to all the things that are going on around them, whether we are talking about nuclear energy or if we are talking about acid rain.

Teacher E: I think there is a question, "What is life?" Well, environmental education is sharing with students or adult groups some of the neater things about the environment--how Mother Nature works in patterns, how she or how everything in our planet is not just a series of parts. That all the parts work together and that they make a wholeness.

Five teachers mention the importance of time spent in the outdoors as a positive, memorable and meaningful experience:

Teacher I: I define environmental education as a process of teaching, learning and experiencing the natural environment. The process would involve some research or some hands-on--in other words, kids would probably get dirty. Hopefully, they can have an opportunity to make a product, express or communicate, in some way, what they learned.

Teacher E: One of the criticisms we've had from the district is that we could do what we're doing now with a series of slides. Like on the fall trip, instead of taking them to the woods, we could show them

> pictures of the woods. Instead of doing water testing from the creek, we could bring in a bucket of creek water and then we could test it. It's just isn't the same. You gotta get out there!

Only one teacher gives a technical definition for environmental education incorporating much of what is stated in the Environmental Act of 1970. She is in the process of writing a complete, multi-level course curriculum for environmental education which may have some direct implications for the specificity in her definition. She states:

> Teacher D: I would probably define environmental education as the study of the environment and that encompasses not just the natural sciences but all dimensions of the environment and probably I would go from three different dimensions. I would probably go from the natural side, studying the ecology-type of environment, probably from the economic base and maybe the political side of the environment, and then from possibly the resource management side. There's a fourth dimension--the future of the environment.

Summary

Over half the teachers questioned believe that development of attitudes in children is a key element in an outstanding environmental education program. They view themselves as dispensers of knowledge providing students with the necessary information base to make present and future decisions regarding the environment. Teachers shared the importance they place on providing sequential steps for learning. Five teachers emphasize experiential learning experiences in the outdoors as part of their programs.

All twelve teachers wanted to explain **how** they teach environmental education rather than **what** they teach. Since teachers are involved in activity-oriented approaches to environmental education, they wanted to share approaches they're using. It is significant that most teachers see the need to help develop the natural sense of wonder in children since this is the

key element and starting point of an outstanding environmental education program! Teachers stress that they must teach children to assume responsibility for how our actions will affect the environment. This goes beyond teaching content matter and can involve role modeling by the teacher as an informed, involved citizen. Peterson and Hungerford's research findings confirm that teachers have great potential to serve as role models, stimulating interest in environmental systems and providing education and professional guidance to their students. If a sequential environmental education program is developed, children will learn the skills they need to make responsible decisions concerning their environment and apply these skills as adults. A well planned, sequential environmental education program will insure that students will receive instruction at progressive steps in their education with each level building upon the one before it. The two teachers who work in formal programs stressed the importance of this in program effectiveness.

II. HOW DID YOU BECOME INVOLVED IN TEACHING ENVIRONMENTAL EDUCATION?

Responses to this question are as varied as the personalities of each teacher. Teachers give more than one example to explain their involvement in environmental education. Some responses involve a condensed version of their life history while others are unable to cite specific events leading up to their involvement in environmental education. Nine categories evolve from this question. Teachers' responses can be grouped into nine categories.

They are: 1) love for the outdoors; 2) college courses or programs; 3) environmental education workshops; 4) influential people; 5) involvement in conservation organizations, environmental education centers, or field jobs; 6) involvement with PROJECT WILD; 7) happenstance; 8) science curriculum; and 9) availability of grant money.

Nine of the twelve teachers believe that their love for the outdoors, developed through childhood experiences or through some significant event happening in their lives. Teachers shared some of their childhood experiences contributing to their love for the outdoors:

> Teacher H: Well, it was a real easy thing for me because I have lived in Montana my whole life and I really appreciate what is here.
>
> Teacher J: I started out at a really young age just being interested in the outdoors. I suppose it goes way back to my own actual history when I was between five and seven. I'm sure the only time I came inside was when there was a severe enough thunderstorm, when I felt sure I was going to get killed if I stayed out there. I just loved being outside
>
> Teacher G: Since I was young it's been an interest of mine--hiking and camping and backpacking, so it just felt natural that I wanted to share my love of the outdoors with kids.

University course work and science education professors play a significant role in helping teachers to appreciate the importance of environmental education. Six of twelve teachers mention their course work and/or a college professor as key factors initiating their involvement in teaching environmental education.

Teacher E: In college it was _____. He kind of shared with me his ideas about environmental education, not so much through the classroom but just talking about it. I picked up on that and I thought, I like that--that's kind of a neat thing and I want that in my room.

Teacher C: When I went to college, the science courses I took were ecology, limnology, and environmental studies. They were new--this was in the late sixties. And, those were some of my favorite classes

The next three categories receive equal mention in teacher responses:

Four of twelve teachers mention influential people involved in the outdoors, environmental education workshops, and involvement in conservation organizations or environmental education programs.

Teacher C: My husband influenced me a lot. . . . he is a real outdoors person. When I first met him, everything we did was related to the out-doors and he just strengthened that interest.

Teacher B: I worked with _____ He was full of enthusiasm in the woods. He would be driving along and all of a sudden, he say, "Oh, there's a Phoebe". The doors would open and everybody would pile out. He taught us to identify birds by sounds and he would take us out into an area where there was a chorus of birds chirping and he would say, "Listen for the Lazuli Bunting ". That's like listening to the french horn in an orchestra when you don't know what that sounds like. He got us so we could isolate the bird calls and identify more birds like that one.

One teacher recalls time spent at the Teton Science School:

Teacher A: That was a very dynamic, excellent program and I speak highly of it. They weren't just a bunch of fanatical ecologists. They really did care about the earth and they communicated that to the kids. They did a good job at communicating care and respect--exposing kids to amazing facts and relationships. And I think they followed that philosophy exposing them to this plethora of information nurturing a new awareness and information that would spark this respect.

Three teachers mention PROJECT WILD. Their involvement as PROJECT WILD facilitators has been a major influence in their inclusion of environmental education into the curriculum. They are enthusiastic and full of praise for PROJECT WILD.

> Teacher L: I guess that PROJECT WILD has done more to get me involved in environmental education than anything else.

Three teachers talk about their involvement in environmental education as a matter of happenstance. Their responses are of great interest because they accidentally stumbled upon the path of environmental education and found a clear trail to follow. Their stories paint a vivid scenario of the journey:

> Teacher I: I became involved in teaching environmental education about fifteen years ago when I was at my second try at finishing college. I had some compelling draw to do something more--I wasn't sure I wanted to really teach in a regular classroom and initially it didn't interest me at all. And I was really at a loss as to what I was going to do. It seems like I was more involved with my science classes and also the methods of teaching social studies more than I was in any other college classes. And I went to one of my science teachers one day and said, "You know I'm just not happy about the field; I don't want to do this and I want to do something more and I want to be outside". I was in one of those real cloudy areas where you don't know what's going on. He said to me, "I think I have just the thing for you. There's somebody out at _____ that's been combing the halls looking for somebody that is compatible with her to work on environmental education projects." And he said maybe I should go out there and meet her and check out the job. And it was a situation where I earned my college credits, so I earned my college concentration in my bachelor's degree by getting in on the ground floor of the environmental education project. My very first experience in teaching environmental education involved teaching adults and teachers even before I had taught children. I guess that was kind of a backwards way to go, but it was just something I fell into.

Another story of happenstance:

Teacher A: It's kind of a funny story, but I spent several years as a professional"schlepp" shovelling horse manure and chasing cattle for fun and a little profit and took about four or five years just kinds of traveling around and hoboing. One of the jobs I took, I worked on this horse ranch in Vermont and we had paddocks adjacent to the pasture and there were little alleyways between the paddocks and we had this fleet of 90 or 100 cats. Maybe it wasn't quite that many, but we had this army of cats that prowled these alleyways. For some reason the mice used these things like highways and one day I was out there feeding or something and I found this little robin, this little bird. It was hobbling along in the grass, it had broken wing or something. I thought, "these cats are going to come along and finish off this bird and I've got to do something". So, I got the bird and I put it into a shoe box. I put a little bit of grass in there and made a couple holes in the top and called the local Audubon society and they said, "Well, take it up to the Modern Institute of Natural Science". So I carried this thing full circle and put the bird in the truck, hopped in, and drove, encased in horse manure, up to this fancy institute where they have--I had always been told they have scientists lurking behind microscopes dissecting God knows what. I got up there and took the bird in and I was forced into staying there and just kind of hanging out in this place. A group of kids sort of jogged by with a teacher with them. After another minute or two another group jogged by in the opposite direction in front of the window. I began to wonder what was going on. It didn't seem like a place where you would see a lot of children. So I went out and the end result was that they were teaching an environmental ed field studies course for second graders in the local schools. So I went out and jogged with them back and forth and took part in some of these activities. I was completely fascinated with what I saw happening. The children were excited and inquisitive. I guess about as turned on as a second grader can be. I saw these light bulbs going off and at that time in my life I was really lacking in direction. I knew I didn't want to shovel large livestock manure for the rest of my life. I wasn't sure where to go and I had always been really fond of children and strongly inclined toward being in the outdoors. And almost instantly that afternoon I saw this all happen.It just hit me hard that here was the perfect combination of my greatest loves--working with kids and being outdoors. It started off as just a curiosity thing and the more research I did at the libraries and writing to different institutes, I got more and

more tuned into it. There were a lot of personalities and circumstances along the way, but it was being directionless as the thing that brought me to it. Just something brought me up to that place that day. My exposure to that particular program that particular day was really inspiring.

SUMMARY

In response to the question, how did you become involved in teaching environmental education, nine of twelve teachers mention a personal interest in the environment, stemming from childhood experiences or through influential people or experiences which occurred sometime in their lives. These experiences have stimulated many of these teachers to pursue college degrees tied to natural science, science education, or environmental education. Later, teachers incorporated these interests and convictions into their classrooms. The respondents believe that teachers must have an interest and feel comfortable in the outdoors in order to incorporate environmental education in their curriculum. These teachers hope other teachers attending workshops will include environmental education in their curriculum and can influence a large number of children in future years.

Childhood experiences in the outdoors is a critical element in an outstanding environmental education program. Through outdoor experiences, a teacher can grow to understand and appreciate the outdoors and can apply these convictions through life both personally and professionally. Because these teachers spent considerable time in the outdoors as children, they feel comfortable teaching in the outdoors. This is not to suggest that teachers who did not have meaningful childhood experiences in the outdoors will not develop an interest in teaching environmental education. However, this points to the importance of offering environmental education workshops and

in-service training to teachers where they can spend time in the outdoors learning to understand and appreciate the environment.

III. WHY DO YOU TEACH ENVIRONMENTAL EDUCATION?

Six categories of responses emerged. They are: 1) importance; 2) influence on childrens' attitudes; 3) develop a curiosity; 4) develop decision making skills; 5) something kids are interested in; and 6) job relevancy.

One commonality all twelve teachers share is the importance they place on teaching environmental education concepts to children. Some teachers believe it is important to them personally while others emphasize its importance to their students. Several examples are given for clarification:

> Teacher I: Teaching environmental education somehow was the only thing that made sense to me and it still does. It is still one of the only things that makes sense to me.
>
> Teacher A: I don't think there is anything more important in my life. I've always been a strong advocate of environmental education in the public school realm because that's what we've got to do--that's where the consciousness needs to be changed. That's where the work needs to be done.
>
> Teacher D: I have an inner need to probably serve the society and also to stimulate kids into learning more about where they are and how they fit into the picture.
>
> Teacher K: There are areas I love being in and seeing. Areas I enjoy being in and seeing are beginning to have impacts taking their toll. It's important to pass the love, enjoyment, and enthusiasm to younger kids. In doing so they will develop this love. I have a responsibility as a teacher. We're caretakers. There are so many problems with the depletion of the ozone layer and loss of the rain forests. Children need the background so they have the desire to solve problems.

Six of the twelve teachers acknowledge the influence they have in shaping their students' attitudes and values, particularly the impact they have on children's attitudes about the environment. When a teacher stays in one school for an extended period of time, he/she can see the change over time, in his/her students' attitudes concerning the environment, and the teacher can feel part of that change. One teacher gives this example:

> Teacher J: I can impact a hundred kids at this level for a year or nine months' time. I feel that's really important. I feel that is really the only way we are going to eventually make any sort of inroads into the present state of mind that the almighty dollar is the only way to do things.

Four of twelve teachers mention that kids need to have a sense of curiosity--to look in depth and wonder.

Four teachers also mention the need for children to develop decision making skills to solve immediate and local environmental dilemmas as well as decisions they will face as adults. The emphasis on decision making skills is a key ingredient in recognizing the responsibility humans have as caretakers of the earth.

Two of twelve teachers use a child-centered approach to environmental education. Learning about the outdoors is a natural interest of children so teachers can capture their students' interests if they include instruction about the environment utilizing the outdoors as their classroom. Since the outdoors is something kids are interested in these teachers teach to the kids' interests:

> Teacher H: It's real to the kids. We have a lot of kids that are in the scouting programs or they go hunting with their families or they go out fishing and camping. And to know more about their

world around them is something that all kids are interested, but particularly here it's real--it's not like you're talking about the mountains out west or the rivers in some other place. They are here. And they can see this uniqueness and this beauty in the creation that maybe kids in the cites might have more difficulty appreciating. There is a natural interest for them. I always emphasize to the kids that I've been fishing and hunting in places where I used to go with my dad and I'm looking forward to taking my kids and my grandchildren to some of these places. What will it be like when you take your grandchildren there? We need to have people who are continually thinking of that. What's it going to be like? What can I do to insure that the changes made will be least negative as possible or maybe there will be positive changes? So kids need to just be able to develop those attitudes that are necessary so that we can continue to enjoy Montana the way it is.

Teacher G: I would like a teacher to take a survey of their class the first day of school and say, "What are you interested in?" And if they look down that list, they would find nine out of ten things would be outdoors related. You would see, "I'm interested in rocks." "I'm interested in birds." "I'm interested in football." That's where kids interests lie and teachers don't realize that's how you motivate kids, is to touch on something interesting to them.

Summary

In response to the question, why do you teach environmental education, all twelve teachers talk about its importance to them and their students. Because these teachers value the environment and its preservation, they try to educate their students to these concepts. Teachers recognize the influence they have in helping shape their students' attitudes about the environment.

If teachers value the environment they will find ways to incorporate environmental education in their classrooms. The teachers interviewed share a deep concern for the environment, are active in environmental causes, and feel obligated to educate their students to these concerns. Children posses an innate interest in the environment.

IV. WHAT APPROACH DO YOU USE TO TEACH ENVIRONMENTAL EDUCATION?

All twelve teachers believe that a variety of teaching approaches should be used. Seven response categories were developed. They are: 1) time spent in the outdoors; 2) use of instructional materials and techniques; 3) teaching across the curriculum; 4) incorporating students' interests in current, local, and seasonal events; 5) utilizing natural resource specialists; 6) parent participation; and 7) practical application in the classroom.

A significant commonality all twelve teachers share is the importance they place on time spent in the outdoors with children. This response is confirmed in studies done by Mirka(1970) and Norgaard(1986). Rural teachers tend to spend more time in the outdoors with their students than teachers in other school settings because of their location and small class size.

> Teacher B: I do as much field work as I can.
>
> Teacher G: I take the opportunity in any units that I can to get the kids out of doors to study and to get them into hands-on activities to get their eyes open.

In some cases teachers place a higher priority on learning by just "being there" with no specific instructional objectives in mind. Teachers share ways they use the outdoors to teach:

> Teacher G: We take long walks. We go along the river; we go up on the butte and we just look, discover, find and question constantly. I don't have answers, but to me it's not important to put a name on something, but to just wonder about it.
>
> Teacher A: I know some teachers just go out there (nature study site) and read to their kids. Every day after lunch they will go out there

and read. They will just sit out there in the grass and listen to the birds tweet and watch butterflies fly under their nose.

Three teachers talk about environmental study areas where they take their students. If a nature study site is located near the school there is an increase in time spent in the outdoors with children. Other teachers said they no longer use the study sites because it requires additional travel funds, the frills currently being cut from school budgets. One teacherfortunate enough to have access to study sites describes her experience:

> Teacher G: It was just a seven acre knapweed patch which really kind of bothered me. When I took my students out of doors, there was nothing to show them--nothing much. We really had to get down on our hands and knees and dig to find even ants. When I approached my principal with the idea of let's do something out there, he said o.k. I got in touch with the Soil Conservation Service and got some help from them on how to develop an area and talked to the State Department of Lands and got a forester out. He set up a planting plan for us on what types of trees to plant and other windbreaks. The Soil Conservation Service did a study and told us what types of soils we had and even ordered some native grasses to use. My superintendent got the Vo-Tech to plow out there so we plowed and seeded native grasses and planted about 500 trees and shrubs. We got a grant to put water in. I would love to put water in there, like a pond the kids could study. I'd like to get some study tables in to sit down and observe . . .

All twelve teachers identify specific environmental education curriculum materials and techniques they use in their programs. Instructional materials they use include textbooks and curriculum developed by national conservation groups, such as the National Wildlife Federation. Teachers who are PROJECT WILD facilitators all use PROJECT WILD activities as a supplement to their curriculum. Most teachers however, use instructional materials they develop:

Teacher C: I don't use the textbook per se for anything because I use what is around us. But I do refer to it as a source of extra reading that they can do for vocabulary they might need. Over the years, I have gathered so many materials to use that I really don't rely too much on the text. I do a lot of units that I have written.

Teacher L: I incorporate PROJECT WILD activities right into the curriculum.

These twelve teachers give examples of a variety of real-life, hands-on approaches including use of the out-of-doors, simulation games and activities, and problems solving skills:

Teacher G: We do a lot of outdoor studies when the weather permits. I also take them out in the winter and we look for tracks. When we are studying an animal, we will take the concerns, like the carrying capacity of an area, and act it out. We will have people be the animals and certain people will be the amount of food and, as they interact, they will see how one depends upon the other. We try to get the kids experiencing it as much as possible.

Teacher D: I've done what's called convocations and that's a pretty formalized problem-solving, two day seminar where we pull a hundred kids together and debate something and learn as much as we can about it to come up with some kind of solution.

Teacher I: . . . leading someone down a path you know where you want the learner to be at the end of the path and you want to offer experiences along the way that will help them reach the end of the path. That's the kind of approach I use to teach environmental education. For instance, if I want the learner to learn about trees, then I will offer certain experiences to lead them to that--knowing about the tree. Knowing what it smells like, looks like and that it is a home and will be home--all of the things that it offers to us.

Twelve respondents teach environmental education across the curriculum. Even though this approach takes more time, they feel if teachers

have personal interest in the environment they will develop ways to teach this way:

> Teacher G: Within a lesson, if we are writing sentences, using plurals, we will use an environmental topic. Maybe we are doing math story problems, we will put it in some way so that it concerns an environmental topic.
>
> Teacher J: In my math classes, we do hunter regulation booklets as a math book. We have to work through problems in math that I figure up. I'm teaching them how to read maps and how to figure out all kinds of stuff--like the geography of the state of Montana.....

Nine teachers teach environmental education based on local, current, and seasonal events which their students can relate to. Teachers who use this approach have been successful at capturing students' attention. These are some of the approaches teachers use:

> Teacher J: Keep it local and keep it seasonal. That has the greatest impact because the kids can walk right out side. For instance, in November we started talking about Montana's raptors. I picked that because migration was occurring, it was a season event. We had a new hawk entering the valley at that time. The Rough-Legged Hawk was coming in; it was very conspicuous on every phone pole and fence post you could find a Rough- Legged Hawk. Since the foliage on the trees had dropped the hawks are more visible. That brings the whole realm of food webs and pesticide accumulations up the food chain and food webs and the importance of raptors.
>
> Teacher D: The first part of the period we talk about issues and different things and of course when the Yellowstone fires were going on, we were discussing that, so we were integrating ideas and talking and sharing.

Seven of the teachers utilize natural resource specialists from colleges and universities and county, state, and federal agencies to share their

expertise. Teachers invite specialists into the classroom to talk and give demonstrations; they involve specialists in planning environmental education units; and they assist or lead field trips. Teachers offer examples of their use of natural resource specialists:

> Teacher K: We use experts from the Park Service and Forest Service to help us study the outdoors.

> Teacher F: You'd be surprised how much you can use different resource people to help teach, when you don't really have that much expertise yourself.

Three teachers mention parent participation as an approach they use to teach environmental education. This involves bringing parents in to share their expertise, helping chaperone on field trips, and assisting students with special projects. Teachers gain support and enthusiasm as a result of parent involvement in their environmental education programs.

> Teacher E: Because I've worked with these kids for a number of years now some of them come back saying, "Oh remember _____, you told us about _____ Well we went up and showed Mom and Dad that". It's getting home. We like it to get home.

> Teacher J: I've had more than one parent come up to me.....the parents are more impressed than the kids because the kids think this is really neat stuff. The parents come in and say, "Well, we were driving down the highway and my kid pointed out a duck. I couldn't even see it".

Of significance, only two of the twelve teachers interviewed mention the importance of actively practicing environmental education concepts in the classroom. They felt that this technique continuously reinforces concepts and helps develop attitudes toward appreciation for the environment and related environmental issues. One teacher explains how she uses this approach:

Teacher G: I have my students live with an environmental concern within the classroom--we don't waste paper; we use the front; we use the back; we use the edges and we put three or four lessons on one sheet. When my students leave the room they automatically turn off the lights. Just real basic concerns.

Summary

The twelve teachers in this study who answered the question, what approach do you use to teach environmental education, believe they should use a variety of teaching approaches but concentrate their instructional time in the out-of-doors. All twelve teachers mention teaching environmental education across the curriculum yet they recognize the problems such an approach poses. Nine teachers explain how they incorporate their students interest in current, local, and seasonal events. Seven teachers use natural resource specialists to provide expertise in teaching lessons and helping plan and implement field trips.

A key stumbling block to incorporating environmental education into the curriculum is how it is done. These outstanding environmental education teachers recognize the importance of teaching environmental concepts across the curriculum but mention the difficulty in doing so because of other competing time demands. Many teachers simply have no idea how to teach using interdisciplinary methods because this approach wasn't included in their teacher training. Textbooks fail to encourage this approach so it is up to the individual teacher who has an interest and willingness to take the extra time to apply this methodology. Teachers in rural schools said it was easier for them to teach across the curriculum because they had greater freedoms in curriculum design and implementation. Regardless of subject matter, students will take a greater interest in topics which are of local

interest and directly affect their lives. Teachers who apply this approach are successful in reaching their students and generating an interest in environmental education. Citing a lack of knowledge of environmental concepts, many teachers do not include environmental education in their curriculum. Interview responses indicate access to natural resource specialists can help fill that gap so teachers don't have to be environmental education experts to teach.

V. WHAT ARE YOUR GOALS IN TEACHING ENVIRONMENTAL EDUCATION? (What are your instructional objectives and learner outcomes)

There are six categories for teacher responses. They are: 1) provide information, awareness, appreciation; 2) specific instructional objectives and learner outcomes; 3) teach children to apply knowledge to solve problems; 4) generate enthusiasm in children for the outdoors; 5) teach it across the curriculum; and 6) prepare students for the next level of comprehension. Teachers first answered this question from a philosophical basis referring back to question three, why do you teach environmental education? The teachers were hesitant to give specific objectives and learner outcomes but instead chose to speak of general goals.

All twelve teachers believe they should provide a knowledge base of environmental concepts to develop an awareness and appreciation for the environment in their students. This area was the strongest common goal held by the teachers.. They said:

> Teacher J: . . . creating a sense of wonder and appreciation which would lead, in giving them specific pieces of information, so that they know enough about that particular creature or whatever it is, to know what it is and have a vague idea of how it fits in. My big goal is to create a data base and a sense of wonder for them.

Teacher I: . . . my goals were to have an involved citizenry, to have a group of people that were knowledgeable and informed in every level of learning. I would let them listen and feel and smell and just use every kind of learning experience to learn about something before decisions are reached and action is taken.

Teacher D: My goals in teaching environmental education would be to stimulate awareness of the environment and as many aspects of the environment as possible--to any and all ages. If I was teaching bird migration, then I would probably want to teach to the objective of broadening awareness and insights into why birds migrate, how they migrate, where they migrate, what kind of problems they have migrating.

Seven teachers identify instructional objectives and learner outcomes for their environmental education programs. Specific goals they suggest are:

Teacher D: My instruction objectives would relate to what specifically I was teaching. Learner outcomes would be relative to the instructional objectives and I think that would really depend on what specifically I was doing.

Other teachers share very broad based goals for their environmental education programs. Five teachers believe they should teach kids to apply what they know in solving problems relating to the environment. Some goals are long term:

Teacher K: My goal in teaching environmental education is getting kids aware of the environment, and teaching them to become future problem solvers.

Teacher G: . . . to give students enough experience to be good voters and good citizens.

Other goals are of local interest requiring direct involvement by students:

> Teacher G: I am looking at preparing the citizen and having him or her to be aware of environmental concerns and how they affect their lives, how they affect their state, how they affect the nation and our interactions with other countries.
>
> Teacher L: We're trying to give a little knowledge, but get beyond that to an application phase where kids are really seeing that we as human beings here have a tremendous impact on our environment and we can make a decision as to how great that is going to be by how we act and the decisions we make.
>
> Teacher H: Kids usually haven't had a great opportunity to make poor decisions, so since they haven't made poor decisions yet, they are on the side of the white knight and they think well, o.k. and they will listen to what you have to say and they won't try to make poor decisions. They will go ahead and do role playing and do it in a way we think is socially acceptable. It's a real good age level to let kids go through making some real good decisions and see how they work out and practice having them be successful because when they get to be a little older, what they do is really important. Then they have already had some chances to develop some attitudes and role play some situations where they made some good decisions. It's easy for them to do it in the real world.

Summary

Teachers identify attitudinal and behavioral changes as primary goals of their environmental education programs. A majority of teachers. mention a clear sequence of how objectives are to be achieved. The objectives of a program include activities to build understanding, awareness, and appreciation in children for the environment. Teachers say that students need to have tools and knowledge to then act and make responsible decisions.

If an environmental education program is to be successful it should include instructional objectives and learner outcomes which increase

students' information base, awareness and appreciation for the environment. This is a very broad based goal but one that gives teachers freedom to decide how they would specifically teach these goals. In the learning process students need to apply what they know in order to make responsible decisions affecting the environment.

VI. DESCRIBE SIGNIFICANT LIFE EXPERIENCES WHICH HAVE INFLUENCED YOU TO BECOME AN ENVIRONMENTAL EDUCATOR?

Teachers say "significant life experiences" serve as a basis for why they teach environmental education and how they got involved teaching it. Twelve teacher response categories are derived from their answers. They are: 1) teachers; 2) time spent in the outdoors; 3) authors; 4) parents; 5) conservation organizations; 6) natural resource professionals; 7) college courses or programs; 8) summer jobs; 9) spouse; 10) other adults or experiences; 11) traveling; and 12) kids' interests.

Clearly, the predominant influence on this group of teachers is "other" teachers. Ten of twelve teachers remember other teachers who were a major influence in stimulating their interest in the environment. Of the ten teachers, seven list college professors; four mention high school teachers; and four mention elementary teachers. Five of the teachers mention only teachers at the college level. Two teachers recall teachers of significance at all three levels. Also, two teachers cite both high school and elementary teachers while one teacher cites only elementary teachers.

Selected comments made by teachers who remember their teachers at the elementary level are

Teacher L: We did a lot outdoors . . . it depended on who the teacher was of course because some teachers were not going to go down the cooley or down to the creek. One man in particular who is no longer alive, took the time and it was just second nature to him. He had reasons to go down and sit by the creek with us and explore the creek and the animals there. I know that when I was in about the third grade, the school was only about a half a mile from my home. I rode home with him a few times from Camp Fire Girl meetings; he was at some other meeting. He would stop along the way and look at the stars and pick out different constellations.

Teacher E: I remember my fifth grade teacher here in town. His classroom was much like mine when I was a fifth grade teacher. He can't remember a lot of these things, but I can. Things like we did in the room. We always had fish tanks; we always had animals. We had alligators and snakes . . . He was one that had us out a lot doing things around the school grounds.

Comments made about high school teachers include

Teacher G: I had a wonderful high school teacher whose environmental education program really prepared us for biology. Whatever we did, she would say, "Now I want you to go home and I want you to go in your backyard and look for this type of leaf or this type of plant. So, she made us get out and it really perked a lot of kids' interests.

Teacher A: Oddly enough, I had a physics teacher. Now you'd think physics would be a pretty dry science. But there is a lot. This particular teacher, in grade eleven, made things real relatable, real understandable. There was a lot of cognition involved. She communicated the beauty in the movement of things and the basic laws of the world. It wasn't just "the way it is". There was a lot of "Isn't this neat? Think about that!"

In contrast to those teachers who mention elementary and high school teachers some respondents recall teachers who taught science courses in college:

Teacher C: Key teachers . . . I would have to say, college instructors. I remember the "get me out there, put rubber boots on me, wade me through the bog and back." One time I didn't have rubber boots to put on, so somebody had to carry me over. But that professor who taught ecology and limnology classes really triggered something there.

Teacher E: But, _____ probably was the first one that really changed my life. He was really one of the first professors that gave me the time of day. So much of the time, you are just a name and number and a warm body in that desk and you are filling their class load and that's great. They were up and out of the room before you were and on to their next class. Well, _____ would say, "For those of you who want to sit around and talk for a little while, if you've got some free time, let's sit down and talk. _____ was the one who would say, "We're having a barbecue over at the house; we're going to eat some of the rabbits I raise." And things like that. So many times kids/students criticize teachers like that. But I can see why teachers do that. You can really connect with kids like that. And that's what I did. I connected with _____ and he cut me some slack and I just thought, well that's my type of guy. Then when I got in the classroom, I carried a lot of that over I guess. Just showing kids little things.

Equally important was the time teachers spent in the outdoors. While most teachers discuss outdoor time as a childhood experience, one teacher shares that this formative influence has only taken place in recent years: "I really started my life over again five years ago." When responding to this question, three teachers give specific examples of childhood experiences:

Teacher I: I was raised on a farm way up on the Canadian border and it was forty miles from town. I don't even remember eating in a restaurant until I was in junior high. Being that far away from town, it seemed like my eyes were thirsty for any new thing that I could see and I appreciated all the colors and all the scents carried in the wind; I appreciated dust, bugs, birds, weeds, different grasses, and the different colors the grasses were at different times of the year on the prairie. I appreciated how all the different weeds felt on my bare feet at different times of the year and even the different smell that the soil had. Those things just stuck with me and it's really nice to answer these questions and think about that again. Because it never leaves you. You can picture the fields.....

Teacher D: I'm coming from a family that spent a lot of time outdoors. We used to spend our summers up in Colorado in the mountains near Rocky Mountain National Park. My uncle had a cabin. We would go up there for four to six weeks and spend time among the spruce and pines. On weekends my dad would always take us out one or two days up in the mountains of Arizona. I had a lot of experience in high mountain ranges and high peaks and then where I lived--our back gate for acres and acres was the desert so I roamed the desert. You know, by myself or with friends and we would play in the desert. I was a tomboy and I spent a lot of time just outside; we used to call it "Playing imagination."

Teacher J: I think that the childhood in a country situation--I could always remember the fireflies blinking on and off and the skunks. I remember trying to help a killdeer egg hatch. That didn't work out too good. Little baby rabbits in the springtime. That's where I got my sense of wonder as a kid. I was able to roll around in the bushes and the trees and we had a creek behind the house. We had a little stream back there where we caught crawdads, snakes and turtles. That was really kind of an early spring of interest for because I remember that so vividly and had so much fun.

A third category teachers remember is the influence of authors they read. Seven teachers report authors have and continue to influence their attitudes about environmental education. Those authors mentioned include John Muir, Ralph Waldo Emerson, Walt Whitman, Herman Hesse, Benedictus de Spinoza, Sigurd Olson, Aldo Leopold, Steven Van Matre, David Brower, David Quammen, Rachel Carson, Brad Andrew, and James Michener. Aldo Leopold and Rachel Carson were the only authors mentioned by more than one teacher.

Of interest, one teacher mentions an author of children's books written about horses:

Teacher K: As a kid I read horse books by Margarite Henry who wrote about horses and being outdoors.

The next most important influences six teachers mention in equal frequency of response are parental influence, involvement in conservation organizations (the NationalAudubon Society, 4-H, Camp Fire Girls), and time spent with natural resource professionals. Native Montanans tell stories of parental influence in their lives:

> Teacher I: My folks probably inspired me, being raised on a farm. My dad was the kind of farmer that when he was plowing a field he would go all the way around the duck nests that were in his field and I always admired that. He even felt bad if he ran over a mouse nest. I suppose I really do think that my folks influenced me more than I even know at this point in my life.
>
> Teacher L: I grew up on a farm and my father had been real active in outdoor life. He was real influential in bringing us kids up and knowing how to take care of ourselves in the outdoors and that we were capable of surviving. He taught us survival skills and taught us a lot about plants and animals. As a kid I just took this for granted. As I've grown up, I've gained a lot of respect for this. We were taken camping and taught to fish and to hike and what to look for, what to do with the animals and plants and to respect them.
>
> Teacher H: Every Sunday in the afternoon after church, we would take off and we would go on a picnic somewhere. We would go fishing somewhere and usually with another family or two. It was great family time. My greatest childhood memories are Sunday afternoons and the things that we did.

Another teacher discusses the encouragement her parents provided:

> Teacher D: I would always bring home pets and animals and things that my Mom didn't want me to bring home. But my parents were very, very tolerant and encouraging in those aspects. I was free to express myself at all times. My dad encouraged me. He's always said, "Think for yourself".

One teacher shares the special relationship she had with her father in the outdoors:

> Teacher K: My dad was into prospecting--walking around. My dad is a **GREAT** storyteller, interested in South West Indians. He had a blood brother.He fostered my interest in desert areas in the southwest.

Another teacher discusses the special relationship she developed with a professional ornithologist who influenced her:

> Teacher J: I wouldn't be where I'm at today if it weren't for _____. Because in order to become a "birder" you have to have a bird book, you have to have binoculars, and you have to have a one-on-one birding partner. She was my partner. And, so, down the road she invited me to help her out with a teacher's workshop. We were doing the wetlands and water fowl workshop there and I helped her several times as a co-leader. Eventually she took over the workshop and I took over that section. It was sort of a thing of wanting to practice what I was preaching more than going form the kids to the teachers. I started with the teachers. And I thought, well, maybe I'd better do this in the classroom and I'm supposed to be doing there in the first place. And so that was a challenge to me, to move it into the classroom on a heavier basis.

The responses of five teachers indicate college field courses like ornithology and limnology were memorable influences. It is difficult to determine if this influence stems from the course content or outdoor location. While these teachers mention field courses no particular instructors stand out in significance.

Another teacher tells an unusual story which has had a profound influence on her life both personally and professionally:

> Teacher B: About a year ago I was driving with another teacher in the Seeley/Swan area. We were on our way up to do some water skiing.There, on the side of the road, was a bird trying to lift off. The bird had been feeding. He didn't get the lift off so the car, five cars ahead, hit the bird and it was dead on impact. All the other cars just went around it. I persuaded my friend to stop. It was a golden eagle. I picked it up and put it in a plastic bag and put it in the car. It was Sunday so the next morning I took it over to the Fish and Game

and they told me, "You have a license to pick up road kills but not to keep an eagle". I wanted to keep the eagle. It went to his freezer because I had to get the proper permits. This was in August. It was November before I got the permits back. When I brought it to a taxidermist. He quoted something like $400. There was no money in the school district; there was no money in Fish and Game and so it had to come out my pocket. So he lowered the price to about $200 when I told him it was for educational purposes. So then I waited and waited, but in the meantime, I took a petition to the Audubon Society and told them this story. They voted to fund the whole thing. In March we finally got the bird back. My principal said, "Oh, that's wonderful." He got very excited. He got the school district to build a gorgeous glass case and a special shelf in the library. He insisted that we have an assembly. We had an assembly where I had somebody from the Audubon come in and talk; and I had somebody from Fish and Game talk about why the bird was so special and then somebody from the rehabilitation unit in Fish and Game came with a live golden eagle. The kids just went "Ahhhh." I talked with the kids and said, "You know, this is a thing of beauty and a thing of beauty is a joy forever".

Summary

In response to the question, describe significant life experiences which have influenced you to become an environmental educator, ten of twelve teachers cite time in the outdoors and other teachers as influences. Even though teachers were not asked to rank in order the importance of these categories of influence, six teachers first mention time spent in the outdoors and second mention parental influence. At least half of the teachers mention authors, involvement in conservation organizations, time spent in the outdoors with parents, and college field courses as significant life experiences influencing their decision to become environmental educators. Thus, directly and indirectly all influences teachers mention have something to do with the outdoors.

Contrary to Tanner's findings, a clear majority of these teachers mentioned other teachers they had when they were students as contributors to significant life experiences. Having chosen teaching as a profession, teachers interviewed probably value teachers more than other people so they are better able to recall teachers who had a positive influence on them. Even though college level teachers were most frequently mentioned, elementary teachers who have outstanding environmental education programs in the public schools have tremendous potential to become primary contributors to a child's significant life experiences. There is no better time than at the elementary school level to initiate an environmental education program for young children who have a natural curiosity in the outdoors and are eager to learn. No environmental education courses are required in the teacher training program at the University of Montana.. An environmental education course requirement in teacher training programs can serve to stimulate elementary teachers' interest in the outdoors This type of course requirement will give teachers an opportunity to spend time in the outdoors and familiarize them with effective teacher methods and materials. It seems that we are ignoring an area of great importance which could contribute significant life experiences for children regarding the environment.

VII. IN ADDITION TO YOUR OWN ENVIRONMENTAL EDUCATION PROGRAM, DESCRIBE THE ENVIRONMENTAL EDUCATION PROGRAM WHICH EXISTS IN YOUR SCHOOL. IN YOUR DISTRICT?

Six teacher response categories are developed. They include 1) teacher initiated; 2) parental and community support; 3) school board support;

4) administrative support; 5) informal programs; 6) district-wide programs; and, 7) formal programs .

Teachers interviewed describe two types of environmental education programs in Montana public schools: formal and informal.

Formal programs are described as:

> Teacher H: .....three years specifically noted in the curriculum, grades 3, 5, and 7 with specific objectives--each one of those programs builds on the one before it.
>
> Teacher E: The program uses the outdoors as a classroom to help students develop a greater awareness, understanding, and respect for the natural environment. Students learn through first-hand experiences, complemented with textbooks and audiovisual material. The program is available to the over 12,000 students in grades K-12. Actual field experiences begin in grade three and are available through grade twelve. Each grade has a specific focus. The program is reviewed and revised every five years, in conjunction with the district's science curriculum. The activities and issues for each grade are carefully designed so as to be consistent with the developmental maturity of the learner. Balanced presentations are provided when discussing controversial resource issues. Various sites through the area are utilized for field experience.

Informal programs are described as:

> Teacher D: . . . elementary teachers integrating units designed as supplementary material under the supervision of a science education university professor
>
> Teacher C: In rural schools we have a lot of freedom to teach what we think is important
> Teacher B: . . . incorporating PROJECT WILD activities into the science curriculum
>
> Teacher F: . . . each teacher is doing their own thing in the classroom

Teacher L: I use a multi-disciplinary approach teaching the kids to investigate and be curious and knowledgeable about the world they live in planning curriculum to include environmental concepts in all subject areas across the curriculum

Teacher F . . . taking field trips with natural resource specialists or inviting them into the classroom

Teacher K: We pursue whatever interest comes from the kids

Teacher J: Sometimes it can be done through a report; sometimes it can be done through lab work; sometimes through field trips; it can be done through story, role-playing, or small group discussion.

HOW DID YOUR PROGRAM GET STARTED?

Most of the programs were started by concerned, motivated individual teachers who felt that environmental education is important. Teachers from rural schools stress the flexibility they have to design and plan curriculum. . One teacher has developed a nature study site adjacent to the school and designs learning activities on site. Teachers share how their environmental education programs got started:

Teacher L: I started the program and my program is what the school has. That's one of the things about a rural school. I can do a lot more of this because I plan the curriculum and I work around as much as possible for it. I am responsible that our kids are on top of things and that they are scoring very highly on their tests. I also have the freedom to analyze what I want and to do it the way I want to do it.

Teacher H: First of all, it is only in one school because we are a one school district. We kind of started it in the fifth grade and then the third grade teacher saw where it could be a real advantage at the third grade level and then the seventh grade also kicked in. There was some continuity there because one of the teachers who originally started the third grade program became the fifth grade teacher so it

was a very easy thing to coordinate. Then she became our seventh and eighth grade science teacher. We experimented until we got to the point where things were kind of balanced and I think we are that way now.

Teacher K: . . . concerned parents seceding from the existing school district to form a new district. The parents wanted a strong science emphasis and interviewed/hired teachers with a similar philosophy. The location is a factor--being adjacent to a national park where many of the parents are employed and the close proximity of a residential environmental education center. We set up an environmental education week in the spring with classes outside.

WHAT KEEPS YOUR ENVIRONMENTAL EDUCATION PROGRAM GOING?

Teachers give several reasons for continuity of their programs: support from other teachers, administrators, parents, students and community members; teacher initiative and interest; flexibility of rural schools in curriculum design and implementation; responsibility of teachers, chaperones, and students; safety; clear directives to the students; and, careful planning and workability of concepts into the curriculum. One teacher mentions the importance of having federal money to get the program started in the early 70's but the remaining teachers feel money is a minor issue in keeping a program alive. The following excerpts illustrate how these programs survive:

Safety

Teacher H: We just don't tolerate kids doing ridiculous things out there or they won't be included. We fully explain this to them. We walk around the perimeter of the area where they can be during their free time. We explain how we expect them to behave and if the kids can't handle that, we give them a time out. They don't come back if it happens again. One year we had a couple kids decide to take off and check out the creek for awhile. There was some pretty high water at that time so they didn't rejoin us, but that's the only time. You let the

kids know the great responsibility they have and they hear and realize the uniqueness of the opportunity. Our kids have been real good.

Teacher E: We've never done anything to endanger the lives of the kids; we don't do crazy things. We try to be super responsible much of the time. Probably even too responsible at times, but it's better to be safe than sorry.

Workability

Teacher D: I think the workability--that's the key to it. If it works in their curriculum, if it works time-wise, they feel success. I don't think money has a thing to do with it. Originally, it probably would to get the program started. When teachers have materials ready, available and they've done it once or twice and find it works and it's successful, they will do it again.

Support

Teacher L: I've had really strong support in the rural schools I've taught in from the school boards and the parents. In a small school, if you don't have that support, you don't do it. The projects are nearby the school. They are important to the kids. It gets them involved with something local. As those kids have grown up, they are going to see their ideas come to life.

Organization

Teacher D: I think in other districts if they have a well-organized plan, I think usually a lot of school districts will acknowledge that. When you get a half-cocked idea that doesn't go anyplace, then you get the door shut.

One teacher was involved in a unique environmental education program developed from a cooperative venture between the school district and a public land agency that donated land for a nature study site outside of town. It was an exemplary program at the time but unfortunately has been discontinued. She explains the reasons for its demise:

> Teacher I: What killed it was a combination of the site itself being too far from town. For some schools it was fifty miles and it was just too far. And there was the big gas crunch in the mid-seventies--you know the big energy scare. It was sacrilegious or unpatriotic to drive that far for a class so that hurt. Another thing that hurt, I don't think anybody, even the range specialists, or anybody involved in this project understood the kind of impact that 8000 pairs of feet would have on the site and while we did have something like a thousand acres we probably only used a tenth of it. To take so many kids through there the first three years definitely impacted what we would see. The trails were getting deeper and wider and you could tell there had been a lot of children out there. So we did slowly cut back.

IS YOUR PROGRAM SUPPORTED BY THE ADMINISTRATION, THE SCHOOL BOARD, THE COMMUNITY, AND THE PARENTS?

Overwhelmingly, all twelve teachers admit that they had to have support from several different sources or their programs wouldn't go. Eleven teachers have administrative support; eleven teachers have support from the school boards; and, all twelve teachers have support from parents and community. One teacher who discusses her frustration with the lack of administrative support at her school still expresses optimism for other schools in the district.

She explains her situation in the following statement:

> Teacher I: My administrator wants everybody in rows and wants things pretty quiet and doesn't want anything dirty and doesn't want any kid to be anywhere they are not supposed to be at all. He's very structured, very conservative and everything is absolutely by the book. I have felt more than a little stifled. So it is almost like I have to sneak in anything that is not right out of the book and just kind of shut the door and do it. We are not encouraged to see other teachers, curriculum, or content things. (Speaking of other administrators in the district) I think more administrators are interested in it now; people who were teachers then (1970's), but so many administrators now are people who were teachers then and they are very interested in it. I think they had a positive feeling and they want to share that now

with the students in their schools. I think the school board that we have now is of the same mind. They are about the same age, coming out of the sixties and seventies, kind of the hippie era. We were more environmentally aware then than we are now. We had problems that we needed to solve. We still have problems that we need to solve, but they aren't at the front of the news anymore.

There are teachers who expound on the support from their administrators:

Teacher A: We have a lot of support from our immediate administrator. He would love to see what we're doing in environmental education multiplied by a hundred.

Teacher D: I don't think the school district administrators have ever said no to anything I've ever wanted to do. And to me that says something. They won't go out on a limb unless there is money to go with it. But they have never said no. They might have said, slow down, but they have never said no. So, that's a plus.

Teacher H: The administration does support the program and probably the reason they support it is because it is a low cost program. We are not talking big bucks--a few hundred dollars a year.

Teachers explain the importance of parental and community involvement and support for their environmental education programs:

Teacher H: It's a program really well accepted by the community. The community is supportive and the parents like it. It was planned pretty well in the beginning so it came off well with no parent objections because we incorporated parents right from the beginning.

Teacher G: We got good support from the parents' group. When we asked for help, they offered money to develop a study site.

Teacher A: I think probably a quarter or a third of the parents would be supportive of any kind of environmental activities. But I think the larger majority would go for the safe environmental ed; there's the safe realm and the controversial realm and the controversial realm is

the application of everything else, as far as I'm concerned. I think the parents of this area are pretty wary of those things. I feel cautious when I tread on that ground.

HOW DO YOU FIND TIME FOR ENVIRONMENTAL EDUCATION?

Most teachers express difficulty in finding time to incorporate environmental education concepts in their curriculum. However, they apply a variety of techniques which include integrating it in the science curriculum, using an interdisciplinary approach, designing a well organized program, or teaching it in activities at their nature study sites. Teachers explain these techniques:

Teacher D: It is mainly integrated in the science curriculum. Social studies is on the fringe. In the science curriculum there is a clause that we are to encourage environmental education and integrate it in our curriculum.

Teacher A: That's extremely difficult. I don't as often as I would like to. It's very hard to find time to do it. I guess the key is integration. It's demanding of the teacher to rely on that as your mode of expressing those things. It's hard to weave subjects together. In terms of planning, I do it, but I don't plan for it. It's more spontaneous.

Teacher K: It's real hard. So much is demanded of things we should be teaching. Sometimes it's exhausting. We are trying to incorporate environmental education within the curriculum with social studies, art, and science in blocks of time.

Teacher L: I do it across the curriculum. It's not as hard as if I were trying to dig out something every day to do for environmental education. You could say my classroom is pretty much surrounded by environmental education. It's part of the curriculum throughout. If we are doing poetry--quite often our poetry has something to do with the environment and so on down the line. I work it into the process. So it isn't really hard. In P.E., I use environmental games. I guess this is the way I find time.

Teacher H: . . . identify your aims in the curriculum that are basically environmental education. Take it a little bit farther- if you want to plan something small. And then after you have had success and feel confident and able to show off your success, you can talk about it. Now that we have done this and this and this, and you have seen us do that, this is what we would like to do. Build it up a little bit in a grade level or a couple of grade levels. But I think just like in anything, if you can work with some success, then you have a better chance of being able to do more of what you would like to do.

Summary

When asked to describe their environmental education programs, only two of twelve teachers had formalized environmental education programs in their schools. Programs were started by individual teachers who feel environmental education is important. Whether programs were formal or informal, all teachers emphasize the crucial element--support from administrators, school boards, parents, and the community if the programs are to survive. A good program was one that is well organized and involves parents in the planning process. Even though money is needed to begin a program, teachers say their programs require very little money to keep them going. Safety for children was a concern of teachers. Teachers agree that it is difficult and time consuming to incorporate an environmental education program in their curriculum. Instructional methods for teaching environmental education include incorporating it in the science and social studies curriculum, using an interdisciplinary approach, designing workable curriculum, and taking time to plan a well organized program.

While informal programs are better than none at all, environmental education will continue to be neglected and ineffective until a stronger effort is made to develop more formal programs. Students can benefit from a carefully planned program. A formal program can provide scope and sequence of knowledge and skills which children are able to comprehend at

appropriate grade levels. Programs would not exist if it weren't for teachers who have an interest in the environment and value environmental education. If a program is to survive support from administrators, school board, parents and community members must exist..

VIII. WHAT FACTORS PREVENT OR DETRACT FROM A STRONG EMPHASIS ON ENVIRONMENTAL EDUCATION?

Teachers identify fourteen different factors they feel prevent or detract from a strong emphasis on environmental education. They are: 1) scheduling and planning; 2) controversy; 3) lack of teacher interest; 4) safety and liability factors; 5) inadequate teaching materials; 6) fear of science; 7) lack of administrative support; 8) disgust with science; 9) inadequate background; 10) discipline; 11) funding; 12) utilitarian attitudes; 13) textbook companies; and 14) no environmental education mandate.

Six teachers talk about the difficulty they have in trying to fit environmental education into an already full curriculum. There are no other response categories where more than three teachers agree . Teachers discuss how constraints on time affect the amount of environmental education incorporated in the curriculum.

> Teacher K: Time! We'd do a lot more environmental education but we have other subjects to teach. We all put more time in than required by our contracts. We experience seasonal burn out and realize our personal time is also important.
>
> Teacher H: There is additional planning that needs to be done. In some districts they are really concerned about getting through the curriculum, textbooks and things.

Teacher L: I know that in larger schools, quite often people feel that they just can't work it in and that's the beauty of teaching it across the curriculum rather than just teaching another isolated thing. And so I feel like, especially in my situation, the key is the teacher.

Teacher E: . . . the calendar is only so many days long. Problems arise in scheduling before holidays, after holidays, and this and that. When you take those days out, and you look at all the other days that you've got, there is only so much time that you can work with. There is only so much time and that's probably one of the factors that prevents us from doing more things. Classroom teachers are many times overworked but if they have release time they could attend environmental education workshops and in-service training, develop curriculum, and visit other exemplar programs.

Teachers express difficulty teaching environmental education in a community where extractive industries such as logging or mining make up the economic base.

Teacher J: I think there can be what I call the red neck pressure. There is an element in any community that feels anything that has something to do with environmental issues or conservation is immediately implied conservationist/radical/environmental. There is no problem if you are going to teach classical biology. But as soon as you bring in anything and get into, "OK well, what could happen, what could cause the demise of this particular bird or this particular creature?" In logging communities I would not be surprised to get a knock on my door or a phone call and I think that is an underlying pressure. I know that I feel it as an educator. You have to try to present both sides to an issue but sometimes the case for the one side is so heavy that it's impossible to bring any cerebral or logical approach on the other side. You do try to bring in the other side, but I think the other side is presented too much as it is and so sometimes I don't feel any qualms about just presenting a kind of balance to what they are getting somewhere else. I think they just hear the almighty buck at home and the hear it on TV and the press and the radio and the newspapers and sometimes you just go ahead and give it to them the way you feel and of course you can label it as your opinion. You can do this when you've got a scientific case on your hands or are not too worried about presenting two sides.

> Teacher C: We got into an issue last year that, I don't know, it just happened by accident, really. But the kids got really interested in studying the oil drilling that is proposed for the Arctic region in the wildlife preserve up there. That got to be pretty controversial, even amongst the kids in the class. I don't really think their parents were a part of it because I don't think their parents were thinking too much about the issue.

Lack of teacher interest in science and environmental education is mentioned as a problem preventing stronger environmental education programs. The respondents point out that a teacher must be motivated and show enthusiasm for science and environmental education for students to think it's important. One teacher suggests that teachers who showed no interest in environmental education never had the opportunity to develop a "sense of wonder"--an essential element of an environmental education program. One teachers discusses her concerns:

> Teacher B: I just get so frustrated with teachers who get locked into the textbook approach. You have the reading book and it has what the teacher is supposed to say; what the student response is supposed to be. They (teachers) are stagnating. And if you try to stir them up, sometimes they feel threatened. And I have run into that. And if you are trying to change things, well, we like it the way it has always been. I've come up against that.

Teachers indicate that safety, responsibility, and liability are problems preventing stronger environmental education programs. A teacher states how he feels about this:

> Teacher E: Teacher Liability-wise, it is always in the back of your mind.

Equally important, teachers mention the lack of teaching materials that provide background information for the teacher, are easy to use, and appeal to the teacher and students. These teachers share their thoughts:

> Teacher F: If you're going to ask teachers to teach environmental education you'd better have some materials for them to use because otherwise it will not happen. A lot of teachers will not go out on their own looking for things. There is just not time for it.

Teachers discuss the fear of science that many other teachers have due to the way traditional science courses are taught; the lack of information available to the teacher; the fear of admitting to their students that they (teachers) don't know all the answers; the discomfort teachers experience when they step into an unknown area of knowledge; and, inadequate teacher training in science.

> Teacher J: The biggest factor I deal with, especially among elementary teachers, would be a fear of science. A real fear of science. And it comes from the classical science approach--the long face, the big words. No humor in the classroom. Anything that is too serious and they just scare these kids to death. And so all of a sudden, they have teachers that are supposed to be doing something scientific and they say, I'd rather have them read a book or something that is very safe for them.

Other problems teachers cite and are important considerations in program development include lack of administrative support; disgust with science, especially among women who are hesitant and squeamish around insects, reptiles, and other creepy/crawly things; teachers who have inadequate backgrounds in environmental education and science; discipline problems with children in the outdoors; inadequate funding; utilitarian attitudes people have for the earth; the power and influence textbook companies have in controlling the curriculum content; and, the lack of an environmental education mandate. Excerpts from teacher interviews discussed these problems:

Lack of Administrative Support

Teacher I: Our administrator is definitely conservative. The staff really does feel inhibited from doing a full-blown environmental education program every day.

Disgust With Science

Teacher J: A disgust with science . . I'm going to single out women here because they generally have more of a problem with this than others Not only is there a fear of science, but there is a disgust of whatever little creepy, crawly that some little boy wants to bring in and they immediately react with "Uuuuh. Put it back in the jar." That's something that I won't tolerate in my class with my kids. I will nail kids who give me that reaction. I just think that is something that you hammer into elementary school teachers. I really find that to be a disturbance to science and to the kids because they (teachers) have instilled, especially in girls, that science is not something you get involved in.

Inadequate Background

Teacher G: There is a lack of input in their teacher training program in science. I had to take four different courses in science and it really was a good background and I don't feel that there is anything I come across in a science book that I haven't at least had an introduction to.

Teacher J: They have never had that sense of wonder created in them. If you like to teach something, you are going to teach it. And if you are interested in it, you are going to bring it up and that makes you a better teacher because if you are interested and the kids can see your interest and they are going to say there must be something in here besides just math because she's all fired up about it. Something should be done to allow the teachers the chance to develop that sense of wonder, provide free bird feeders for the classrooms and see--just fill up the thing and hope to goodness the grosbeaks show up at least.

Discipline

Teacher G: I think a lot of teachers are just afraid of what happens when the kids get out of doors and they just scatter. You don't have good discipline unless you really have concrete tasks for them to work

on. But you can't go out and say, "Let's look at flowers". You have to say, "We're going to take these kinds of flowers and we are going to go outside and see what color they are". You have to have something for them--a structured goal set for them to accomplish within that amount of time. Some teachers just don't do that enough and so when they get out there and the kids scatter and start running around and playing--they just say,"That's enough of this; I can't handle this".

Lack of Funding

Teacher K: Money--we'd like to go to the residential environmental education center more often.

Utilitarian Attitudes

Teacher A: The mind set of the earth as a utility. That's it in a nutshell. The earth exists for the purpose of man's manipulation.

Textbook Companies

Teacher D: ~~Teacher~~ I think the textbook companies have a lot to do with dictating curriculum and information. Since most of them are owned by about eight major multi-national companies, it can get really complicated in trying to move a dinosaur.

No Environmental Education Curriculum Requirement

Teacher J: I would support an environmental education curriculum mandate. It might not be a bad idea. I think it would have to be incorporated into the regular science program because science needs to be taught. It would have to be a unit or two in every grade level having to do with environmental education.

Teacher J: . . . some sort of class or credit hours that requires being outside and just being, taking a walk, noticing something, going to PROJECT WILD workshops. Somehow getting the person into an area, maybe assigning a place where they have to visit at least once a week. . . . like the Metcalf Wildlife Refuge or some thing where they have to go down there and look, listen and keep a journal. There has to be someway of getting them exposed to the environment before they are going to teach it.

Teacher F: I certainly wouldn't be against a state mandate that environmental education will be taught. I would be for it and support it. The mandate would say "it will be taught in the school". That's the only way everybody's going to be doing it.

Teacher B: Oh, that would be a backward step. You can't jam it down teacher's throats either, or they are going to resist it. You have got to capture their interest. That's what PROJECT WILD does.

Summary

Even though teachers identify fourteen problem areas hindering environmental education programs, there are few common responses. In their responses, teachers cite several different factors preventing or detracting from environmental education.

One commonality six teachers share is the difficulty they experience trying to fit environmental education into their curriculum. Teachers recognize the time and extra effort it takes to incorporate environmental education across all subjects. They point out that elementary teachers often lack an adequate background in science to feel comfortable teaching it. These teachers believe that if teachers don't have an interest in science or environmental education, they probably won't teach it. Beyond providing a knowledge base of environmental facts, teachers feel controversy might arise over issues conflicting with how parents make a living. Safety and liability are factors teachers identify as growing concerns in environmental education programs.

Of greatest significance are those responses which discuss the problems involving scheduling time to fit environmental education into the curriculum and providing release time for teachers to develop programs; controversy surrounding environmental education in many Montana communities; growing concern for safety and liability factors; the fear some teachers have

toward science; discipline; influence of textbook companies; and, the lack of environmental education standards in Montana public schools.

If teachers learn how to teach environmental education across the curriculum, the time factor will not be a major problem in program development. However, teachers need incentives such as time to attend workshops, develop curriculum, and visit other exemplary programs if they intend to include environmental education into their classrooms.

Until the political climate in Montana changes, the conservative, pro-development political movement will remain at odds with the environmental movement and will continue to hamper environmental education efforts in the state.

The liability issue is a very real factor for consideration. Teaching children in the outdoors opens up new areas for concern. One teacher said that if he has one accident his program will be cancelled. One outstanding environmental education program takes great care to warn children of potential dangers on field trips and the program does not involve any risk taking activities.

The fear of science was mentioned by only two teachers as a significant factor inhibiting environmental education programs. Research indicates this to be a prevalent problem contributing to inadequate science instruction at the elementary school level (Steinhart 1985; Yager 1986).

Discipline is an area of genuine concern for teachers. While teachers may have an effective discipline plan for the classroom they may fear how children will behave in the outdoors. The fear originates from a lack of exposure to effective discipline models for environmental education which could be part of workshops and in-service training.

Teacher responses discussing the power and influence textbook companies have on what is taught in the schools is a significant factor. Teachers must demand that environmental education be included in science and social studies textbooks.

An unsettling question is if an environmental education mandate will expand the presence of environmental education programs in Montana public schools. Three teachers discuss this factor in more than one question area. It is an area where further research is needed to better understand the pro's and con's of such a proposal and its applicability to Montana public schools.

IX. WHAT CAN BE DONE TO ENCOURAGE TEACHERS TO INCLUDE ENVIRONMENTAL EDUCATION IN THEIR CURRICULUMS?

There are thirteen teacher response categories developed from this question. They are 1) offering environmental education workshops and inservices training sessions at schools; 2) sharing materials knowledge with colleagues; 3) providing workable, easy to use teaching materials; 4) making it a curriculum requirement; 5) getting teachers outdoors; 6) attending residential environmental education centers; 7) teaching to the students' interests; 8) providing a nature study site; 9) utilizing natural resource experts; 10) hiring a science coordinator for the school district; 11) providing scholarships for teachers to attend environmental education summer camps; 12) support from OPI; and, 13) program planning.

Nine teachers suggest that more environmental education workshops or in-service training should be provided in the schools for teachers. They acknowledge that teachers are busy with the demands of a daily teaching load and have little time or background to plan for the inclusion of

environmental education in their curriculum. They indicate that other teachers will attend environmental education workshops if they are scheduled as in-service days. Some teachers are unwilling to sacrifice their weekend free time to attend teacher training workshops in environmental education. The respondents believe that more teachers will include environmental education in their curriculum if they are able to get outdoors, play games and participate in environmental education activities, and are given teaching materials with minimal time in lesson preparation and background information they can readily use with their students. Teachers cite PROJECT WILD workshops and environmental education workshops held at the National Bison Range, Flathead Biological Station, and the Lee Metcalf Wildlife Refuge as opportunities for teachers to learn how to include environmental education in their curriculums.

One teacher brings up a good idea for encouraging teachers to include environmental education in their curriculum:

> Teacher J: I was thinking about the National Audubon Society and our local chapter, possibly paying the way of a teacher, a local elementary teacher, who may not have an interest in us at all but wants a vacation to one of the Audubon camps. Just to spark that sense of wonder which will then develop over time to appreciation and concern. Again, it's along term process but I really feel that one of the reasons why environmental science is not taught is because there is no interest, no concern. No sense of wonder at all. They are so caught up in making the everyday dollar, getting the bills paid, making sure the kids don't get sick and their house doesn't burn down, and the paying the mortgage, the last thing on their mind is taking a hike and enjoying the birds.

Summary

Responding to the question, what can be done to encourage teachers to include environmental education in their curriculums, each of the twelve

teachers shared one or more methods. Nine of the teachers share the idea of offering environmental education workshops or in-service training to other teachers to stimulate their interest in the outdoors. While this seems like an easy solution to the problem, answers are not so easy to find. Workshops and teacher in-service training are being offered by agencies other than the OPI. What is offered is not adequate to provide comprehensive environmental education in Montana public schools. There has to be a commitment by the administrators, teacher training programs, educators, and other citizens of Montana to encourage more training in environmental education for teachers.

X. WHAT WOULD THE IDEAL ENVIRONMENTAL EDUCATION PROGRAM BE LIKE?

Teachers describe fourteen different categories that can make up the ideal environmental education program. Categories are 1) teach it across the curriculum; 2) a sequential program; 3) access to a nature study site; 4) time in the outdoors; 5) teacher support; 6) adequate funding; 7) time at environmental education residential centers; 8) year-long program; 10) change the science curriculum; 11) attitude development; 12) administrative support; 13) incorporate information on Native American culture; and 14) provide environmental education materials to teachers

Seven of twelve teachers discuss the need to teach environmental education across the curriculum.

> Teacher B: It would be an across the curriculum program, a multi-disciplinary program that included the environment in every part of our curriculum. Incorporate it, giving teachers enough experience, enough dabbling in environmental education so that they love it too. And that they want to do it. That's what we've got to do.

Teacher K: A curriculum where you could have curriculum covering reading, environmental science, language, writing, etc. Teach through content areas, not isolated subject areas--an interdisciplinary approach!

Of the twelve teachers, six teachers express the importance of sequential program development, building environmental education concepts at every level, kindergarten through grade twelve.

Teacher G: That would start with kindergarten, getting the kids outside. Just having a wonderful area where there is water; there is wildlife; there is woods and there is prairie and everything. Just a little spattering of it. Getting the kindergartners out and just letting them take a walk and getting their feet in the mud and catch a frog. And being able to build that up every year.

Teacher J: A collective program, kindergarten through grade twelve, would be a much heavier impact than a single rifle shot in the middle of the curriculum.

Teacher I: The ideal program should definitely be disciplined and sequential, cyclic and have a variety of experiences.

Six teachers discussed the need for a nature study site to visit, enjoy and learn.

Teacher F: You need an outdoor classroom where you could take the kids outdoors. You would have a stream and you would have trees and you would have some open space, maybe some grassy areas as well as some wooded area, so you could study some different types of insects and soils and trees and things that grow in those areas. Well, and also wildflowers growing.

Teacher I: The ideal environmental education program would be one that had pleasant surroundings physically--all around and I'm not saying you need a mirrored lake or a babbling brook. A swamp would be nice but you wouldn't have to have a swamp. But a place that is pleasant to go to. I would like an outdoor space that is pleasant to go to. It wouldn't necessarily have to be completely natural, so maybe if

you planted a few things here and there, that's ok. It would be nice to have a variety; but if we didn't necessarily have a variety, I'm sure that we could figure out one with our imaginations. I would like to have an environmental education program where you have to smell things and you have to taste tings and you have to touch things and you have to be aware of the clouds.

While only four teachers specifically stated that time spent in the outdoors with children is an important element in an ideal environmental education program, all twelve teachers implied this in their responses.

> Teacher C: . . . using the environment as the main teaching tool. And building a lot of the curriculum around it. Starting out with lots and lots of hands-on activities and working out there in the environment, teaching the kids from day one. Using what we have around us and exploring all the possibilities that are out there. It is important for teachers to take the time to get kids outdoors, make it part of the regular school year and make it more applicable.

> Teacher G: . . . getting the kids out of doors at least once a month. And they would have to do it even in the winter for the whole day. Maybe if the kids get outdoors, they'll let the teachers know how fun that is and encourage them on their own. Kids really can be the impetus to a lot of changes, too.

The response of four teachers indicated that elementary teachers need support from administrators, involvement in planning a program, and release time to attend in-service training sessions in environmental education.

> Teacher E: Classroom teachers are many times overworked but if they had release time they could devote it to development of a curriculum. You need support from other teachers to produce a quality product for the kids.

The opportunity to take extended field trips to other sites such as residential environmental education centers, national parks, or a wilderness area was mentioned by four teachers.

Teacher H: What I would really like to do is be involved in more of a longer trip or backpacking thing. To get kids more immersed in a wilderness area and get them away from a TV-microwave setting so that they can get a real appreciation of being able to actually live quite differently. Also, I think it gives kids a real appreciation for some of the difficulties pioneers had and people who came to settle Montana. Not the one has that freeze-dried food in your aluminum backpack. It's not the same as trudging across with a yoke of oxen. You can face some of the daily challenges they had--food preparation and finding a suitable place to camp and so on.

Teacher A: I'd like to have time to leave the school property and travel to a residential facility or a national park in a more intense exposure.

One area teachers mentioned is making environmental education a year-long program instead of a once-a-year spring field trip:

Teacher I: I think it's important in an environmental education program that it not be a special thing that you do only on a Thursday or that it not be a special thing that you only get to go for two days in April. I think environmental education should be all year long. I think that it

Teacher L: It should be something that is special, that is taught by someone special and thereby it becomes something special. I think it should be part of everyday life that makes your life special.

An ideal two teachers strive for involves a scheme for changing the science curriculum:

Teacher D: I would like to change the curriculum in the whole nation. I think we are trying to put the forest in the trees. We are trying to put environmental education into the sciences. Environmental science is the science--biology, physics, all those others go into it. That's why environmental science has the problems it does. We are trying to fit it, when it's the fit. And I would of course, have to buy a major publishing house to get that changed. I think that's the real crux of the problem. The ideal environmental education system for me would be to change the whole curriculum in the whole nation and reassign

and realign all the sciences under the umbrella of environmental education.

Teacher J: In the middle school spend an entire year talking about environmentally related things, natural history of the area. I'm at the point now, I used to do all my environmental education in one quarter. But now it takes two quarters. And I'm still frustrated because when we hit cells, I don't want to talk about cells, I want to talk about owls because they're breeding right now. I get so frustrated because I can't follow the natural course of the year. That would be the emphasis of my class if I could do that--I would take it season by season and discuss what is going on. Maybe that's where you would find that sense of wonder in those kids.

One teacher gives an interesting response to the question:

Teacher I: The program should include information about Native American ancestry. I also think it's vital that reservation schools become a driving force in environmental education. I think it's vital that Indian people become aware of the degradation their reservations are going through by natural resource loss; that they are incurring this upon themselves and that they are selling and giving away and losing everything else; their hunting practices are atrocious and I think the place to start is in the school, with the children just like all the other movements that America has seen.

Another interesting response one teacher shares involves discussion on attitudes:

Teacher E: You need the right attitude. Start out slow and stay slow to try to change peoples' attitudes toward Mother Nature and the Earth. We just want the kids to have a positive experience in the outdoors--that's all--not too many facts although they do come away with more than many times we ever hope for. And the ideal environmental education program would include A LOVE FOR MOTHER EARTH!!!

Summary

When teachers are asked to describe the ideal environmental education program they give a variety of responses. Fourteen categories are developed from their responses. The ideal program over half the teachers mention includes interdisciplinary, sequential lessons and access to a nature study site. An interesting response incorporates the inclusion of Native American culture into the program.

Money is not a major factor in program development. While funding is necessary for initial planning and development, there are few expenditures involved in maintaining a program. Funding is necessary to provide teachers with release time to attend workshops and in-service training, develop curriculum and visit other outstanding environmental education programs. Many teachers in the public schools already have professional days they can use at their own discretion so there would not be an increase in school expenditures to accommodate the suggestions made. Access to teaching materials does not appear to be a stumbling block to teachers who describe ideal program types. However teaching approaches and access to the outdoor sites are important elements in ideal environmental education programs. Teachers mention a variety of elements they view as necessary for an ideal program but there is very little agreement on what these elements are. This suggests that a statewide environmental education organization could study program models in other states to determine what makes an outstanding program. If other models are studied Montana can benefit from this information in expanding environmental education programs in K-6 Montana public schools.

CHAPTER FIVE: CONCLUSIONS

> A sense of joy should permeate the experience, whether in the form of gaiety or calm attentiveness. Children are naturally drawn to learning if you can keep the spirit of the occasion happy and enthusiastic. Remember that your own enthusiasm is contagious, and that it is perhaps your greatest asset as a teacher (Cornell 1979).

This study is being completed during a time of growing ecological crises and concern for preservation of the planet. Present and future generations of **all** species are depending on us to make sound decisions to preserve the earth. Within the context of environmental education programs, this study explores with twelve outstanding teachers their joys, their concerns, and their dreams for the future. Results of the study provide information on common characteristics of outstanding K-6 teachers of environmental education and their programs in Montana public schools.

There are common factors among outstanding environmental education teachers and their programs: The **first essential component** of a successful environmental education program is an **outstanding teacher!** These teachers have an interest and love for children, the outdoors, and are creative, energetic individuals.

Other teachers had a predominant influence in shaping environmental values and attitudes for these twelve teachers. Accordingly, these teachers realize what powerful role models they can be for children. Childhood experiences in the outdoors contributed "significant life experiences" for these teachers. They recall parents as facilitators of these outdoor experiences. Because these teachers have had memorable, meaningful, outdoor experiences they see the value in using the outdoors in their

environmental education programs. They teach environmental education across the curriculum rather than as an isolated subject or a once-a-year field trip. This interdisciplinary teaching approach makes environmental education a daily process throughout the school year taking on meaning and providing reasons for students to learn about the environment and finding ways to take care of it.

Most outstanding environmental education programs in K-6 Montana public schools are started by concerned teachers who value the environment and see the importance of passing this concern on to their students. All twelve teachers acknowledge the importance of using the outdoors as a classroom where they can apply an "earth-bonding" approach.

An outstanding environmental education program needs access to nature study sites where children can have learning experiences which will enhance their interest in the environment. Study sites need not be pristine wilderness areas but can take on a variety of forms. One teacher began her outdoor studies in a knapweed patch adjacent to the school grounds. Study sites must be close to the school and easy to access. When teachers describe their programs they all emphatically state that their programs could not survive without the **involvement** and **support** of **administrators, parents** and **other community members**. With involvement comes investment and caring. If an environmental education program is to be successful, these teachers believe there must be **sequential program planning** to examine developmental characteristics of children and their implications for teaching environmental education. Developmental steps in an environmental education program include: awareness; nuturing a "sense of wonder"; understanding environmental concepts, principles of and

existing threats to the environment; and, appreciation for the components of a healthy environment. Given these tools, children are better able to become responsible caretakers of the environment. With guidance from outstanding environmental education teachers and programs, students can get involved in more complex environmental issues as they progress through their education.

Challenges to Environmental Education Programs

Common challenges to environmental education programs focus on **scheduling and planning**; trying to fit environmental education into an already full curriculum. Outstanding environmental education teachers emphasize the effectiveness of teaching across the curriculum, in all subject areas. However, this approach takes **interest** from the teacher, instruction in learning how to apply this technique, and **time** to plan the program. The **controversial nature** of environmental education poses a challenge to teachers in Montana public schools. These twelve outstanding teachers of environmental education are risk takers in the sense that they are willing to present issues that conflict with traditional values held by some members of our society who believe it is man's role to control the landscape at the expense of the environment. Environmental education programs should include controversial issues but teachers should present all sides of an issue to their students allowing the students to form their own opinions. **Money** is not a primary concern for the success of a program, however funding is needed for initial program development and field trips. Potential **safety and liability issues** present concerns for administrators, teachers and parents and should be carefully considered in program development.

The Ideal Environmental Education Program

Teachers stress the importance of **spending time in the outdoors** with children. Earth-bonding, feeling comfortable in the out-of-doors, is a precursor, particularly at the primary school level, to more sophisticated environmental education curriculum offered in advanced grade levels. Children are naturally attracted to the outdoors and teachers can experience success in an enviromental education programs if they utilize the outdoors as a teaching tool. Teachers in rural schools tend to spend more time outdoors teaching environmental education because of access to nature study sites, small class size and freedom to develop curriculum and teaching approaches. This finding raises serious concerns because there is an urgent need to offer environmental education programs in city schools where the greatest number of children are educated. Environmental education can and should be taught in city schools but programs must include time in the outdoors, particularly at the lower grade levels, so students can develop "loving ties with the natural world" (Norgaard 1986). **Careful program planning** with administrative support, parental and community involvement and teacher interest are necessary elements of an ideal environmental education program. Informal environmental education programs are a good starting point in program development but they are not enough; they provide bits and pieces of information but don't provide comprehensive continuity in a child's learning experiences; and, reach a limited student population.

PRACTICAL IMPLICATIONS

If school administrators or teachers take these factors and other related research into account, it will help them in program planning. Teachers must have **incentives** to develop programs. To encourage teachers to include environmental education in their curriculums, they need **time** to attend **environmental education workshops** and **in-service training, visit exemplary programs,** and **plan their programs**. Workshops should offer teachers outdoor experiences, disciplinary techniques, information on safety and liability factors, and teaching resources. More emphasis needs to be placed on projects such as PROJECT WILD because in these workshops, teachers spend time in the outdoors participating in environmental education activities they can use with their students when they return to the classroom. These activities are fun and provide teachers with exposure to environmental education ideas, techniques and teaching materials.

Montana citizens who are concerned with the environment should work together to promote environmental education in the public schools. The **formation of a statewide environmental education organization**, with the collective efforts and expertise of educators, natural resource agencies, conservation organizations, public service groups and interested community members will encourage environmental education expansion in Montana public schools.

With suppport from the Board of Public Education, the OPI needs to re-examine the importance of including environmental education standards in public school curricula. Bob Briggs, Science Specialist for the OPI, conducted a statewide needs assessment to examine the status of science in Montana public schools. According to Briggs, a random sampling of elementary

education teachers ranked environmental science fourth out of eleven items, preceding physics, chemistry and earth science, as an area where teachers want content information and teaching materials (Briggs 1989). Elementary teachers have indicated what they need and the Board of Education should be responsive to teachers' needs.

Teacher training programs should require courses in environmental education. These twelve outstanding environmental education teachers indicate that environmental education should be an important component of teacher training programs in preparing new teachers to include environmental education in their classrooms.

Environmental education programs can be expanded in Montana public schools if factors identified in this study are considered and acted upon by individuals and organizations concerned about children, the environment and the future of MOTHER EARTH!

RECOMMENDATIONS FOR FURTHER STUDY

More comprehensive research is needed to better understand outstanding environmental education teachers and programs. Teachers should be asked what the characteristics are of a person who is an outstanding environmental education teacher. This information will provide clarity to the needs of the classroom teacher.

All twelve teachers believe environmental education workshops and in-service training will encourage other teachers to include environmental education in their curriculum and will expand the presence of environmental education in K-6 public schools. Follow-up studies of environmental education workshop effectiveness and classroom application should be done.

If workshop effectiveness and classroom application are measured and found to be a significant contributor to successful environmental education programs, this information will offer justification to the Board of Public Education, school administrators, teachers and community members that environmental education programs are important!

Information about outstanding environmental teachers and programs must be expanded so that a solid foundation of knowledge can be shared with educators around the state. Outstanding environmental education program models can be evaluated for consideration of program development in K-6 Montana public schools. From this knowledge, new ways of identifying outstanding environmental education teachers and expanding programs will be developed.

APPENDIX A

INTERVIEW QUESTIONS

-1- How do you define environmental education? What do you think it is?

-2- How did you become involved in teaching environmental education?

-3- Why do you teach environmental education?

-4- What approach do you use to teach environmental education?

-5- What are your goals in teaching environmental education? (What are your instructional objectives and learner outcomes?)

-6- Describe significant life experiences which have influenced you to become an environmental educator. (people, places, activities, readings)

-7- In addition to your own environmental education program, describe the environmental education program which exists in your school, in your district. (How did it get started? What keeps it going? Is it supported by the administration, the school board, the community, parents?) How do you find time for it?)

-8- What factors prevent or detract from a strong emphasis on environmental education in your school?

-9- What can be done to encourage teachers to include environmental education in their curriculum?

-10- What would the ideal environmental education program be like?

APPENDIX B

BACKGROUND INTERVIEW INFORMATION

NAME:_____

SCHOOL ADDRESS/PHONE:_____

HOME ADDRESS/PHONE:_____

Where do you teach, at what level?

Where did you graduate from high school?

Where did you attend school for your teacher training?

What type of advanced degrees do you hold (if any)?

Briefly, please describe where you were born, how long you have lived in Montana, and the setting of your upbringing (rural, suburban, or urban).

APPENDIX C

CRITERIA FOR IDENTIFYING TEACHERS

1. Conveys enthusiasm to others

2. Has a positive attitude towards teaching environmental education

3. Is knowledgeable of environmental education (principles, content, and grade level applicability)

4. Applies creative environmental education teaching skills with students

5. Participates actively in environmental education workshops, courses, volunteer work, and/or curriculum design

6. Is a continual learner

APPENDIX D

TABLE 1

(Components of an environmental education definition)

Rank		Number of teacher responses
1.	To develop an awareness-a sense of wonder, appreciation, and understanding of the environment, both locally and globally	10
2.	To develop a concern for the future of the planet and how people's actions affect the environment	9
3.	To provide information and teach children how to make responsible decisions concerning their environment and apply these skills as adults	7
4.	A sequential process including: knowledge, understanding, and application	6
5.	Experiential-spending time in the outdoors as a positive learning experience	5
6.	Interrelationships/interdependency-how organisms work together and depend on each other	5
7.	Study of the environment encompassing natural science, economics, politics, resource management, and future dimensions	1

APPENDIX D

TABLE 2

(Involvement in environmental education)

Rank	Number of teacher responses
1. Love for the outdoors	9
2. College courses or program	6
3. Environmental education workshops (attending or teaching)	4
4. Influential people involved in the outdoors	4
5. Involvement in conservation organizations/ environmental education centers/field jobs	4
6. Involvement with PROJECT WILD	3
7. Happenstance	3
8. Science curriculum	2
9. Availability of grant money	1

APPENDIX D

TABLE 3.
(Why do you teach environmental education)

Rank	Number of teacher responses
1. It's important and they enjoy it!	12
2. Influence on the kids' attitudes	6
3. To develop a curiosity--to look in depth and wonder	4
4. To develop decision making skills	4
5. It's real to the kids, something they're interested in	2
6. It's my job	1

APPENDIX D

TABLE 4
(What approach do you use)

Rank	Number of teacher responses
1. Time spent in the outdoors	12
2. Use of environmental education curriculum materials and techniques	12
3. Teaching across the curriculum	12
4. Incorporating students' interests	9
5. Utilizing resource specialists	7
6. Parent participation	3
7. A daily process practiced in the classroom (developing attitudes, energy conservation, recycling)	2

APPENDIX D

TABLE 5

(Goals in environmental education)

Rank	Number of teacher responses
1. Provide information, awareness, appreciation for the environment	12
2. Instructional objectives and learner outcomes	7
3. Teach kids to apply what they know to make responsible decisions	5
4. generate enthusiasm for the outdoors	2
5 Teach environmental education across curriculum	2
6. Prepare students for the next level of comprehension	1

APPENDIX D

Table 6
(Significant Life Experiences)

Rank	Number of teacher responses
1. Teachers	10
2. Time spent in the outdoors	10
3. Authors	7
4. Parents	6
5. Conservation organizations	6
6. Natural resource professionals	6
7. College courses or programs	5
8. Summer jobs	3
9. Spouse	3
10. Other adults or experiences	2
11. Traveling	2
12. Students' interest	1

APPENDIX D

TABLE 7

(Describe your environmental education program)

Rank	Number of teacher responses
1.. Teacher initiated	12
2. Parental and community support	12
3. School board support	12
4. Administrative support	11
5. Informal programs	10
6. District-wide programs	6
7. Formal Programs	2

APPENDIX D

TABLE 8

(Factors preventing environmental education)

Rank	Number of teacher responses
1. Scheduling/Planning (How to fit in curriculum)	6
2. Controversy	3
3. Lack of teacher interest	3
4. Safety & Liability factors	3
5. Inadequate teaching materials	3
6. Fear of science	2
7. Lack of administrative support	2
8. Disgust with science (discomfort with touchy/feely)	1
9. Inadequate background (teacher training program)	1
10. Discipline	1
11. Funding	1
12. Utilitarian attitudes	1
13.Textbook companies	1
14.No environmental education mandate	1

APPENDIX D

TABLE 9
(Encouraging Teachers)

Rank	Number of teacher responses
1. Offering environmental education workshops/inservices at schools	9
2. Sharing materials and knowledge with colleagues	2
3. Providing workable, easy to use environmental education materials for teachers	2
4. Curriculum requirement	2
5. Getting teachers outdoors	2
6. Attending environmental education residential centers	2
7. Teaching to the students' interests	1
8. Providing a nature study site	1
9. Utilizing natural resource experts	1
10. Hiring a science coordinator	1
11. Environmental Education Summer Camp Scholarships for Teachers	1
12. Support from the Office of Public Instruction	1
13. Program Planning	1

APPENDIX D

TABLE 10

(Ideal environmental education program)

Rank	Number of teacher responses
1. Teach it across the curriculum	7
2. Sequential program	6
3. Nature study study site	6
4. Time in the outdoors	4*
5. Release time for teachers	4
6. Adequate funding	2
7. Time at environmental education residential centers	2
8. year long program	2
9. environmental education curriculum requirement	2
10. Change the science curriculum	2
11. Attitude development	1
12. Administrative support	1
13. Incorporate information on Native American culture	1
14. Incorporate a world view	1
15. Provide environmental education materials to teachers	1

*Specifically mentioned by four teachers, but implied by all twelve teachers.

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