Plan to promote environmental education learner goals and objectives in the Montana public schools

Richard T. Durgin
The University of Montana

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A PLAN TO PROMOTE ENVIRONMENTAL EDUCATION LEARNER GOALS
AND OBJECTIVES IN THE MONTANA PUBLIC SCHOOLS

by
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B.S., Lafayette College, 1984

Presented in partial fulfillment of the requirements
for the degree of
Master of Science
in Environmental Studies
University of Montana
1993

Approved by

[Signature]
Chair, Board of Examiners

[Signature]
Dean, Graduate School

Date
July 1, 1993
Dedicated
with love and appreciation

to my wife, Carolyn
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Education’s function is not to promote any propaganda, not to propound any principle as fixed for all time, not to assert that any belief is unchangeable, not to assert that any conclusion may not be mistaken—education’s one and overwhelming responsibility is to establish the inquiring habit of mind and a veneration for truth.

Earnest Martin Hopkins
CHAPTER ONE

Introduction

Educators widely accept that a focused environmental education (EE) program should teach problem solving, decision making, and citizenship action skills in addition to basic ecosystem principles (UNESCO 1978, Hart 1981). They also agree that successful integration of EE into the school curricula requires a multidisciplinary or interdisciplinary approach (Tanner 1974, Jinks 1975, Hart 1981). Unfortunately, there is little evidence that the public school system has embraced these fundamental precepts of EE. In fact, the literature suggests that both nationally and in Montana schools, EE: is not theoretical, systematic, or comprehensive (Ramsey, Hungerford, and Volk 1992); is not adequately integrated across the curricula (Simmons 1989, Palen 1991); rarely addresses problem solving or citizenship action skills (Childress 1978; Volk, Hungerford, and Tomera 1984); and with few exceptions, is planned and taught informally by individual teachers (Gunderson 1989, Palen 1991).

While informal programs are better than none at all, EE 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 (Gunderson 1989, 63).

One way to give Montana EE the focus needed to create a lasting impression on the students is with carefully designed goals and objectives. EE goals/objectives provide the structure needed for infusion of developmentally appropriate EE into the goals/objectives of traditional disciplines, and translation of fundamental precepts of EE into workable instructional units (Hungerford, Peyton, and Wilke 1980). Formal goals/objectives also provide the solid foundation necessary for meaningful EE program evaluation (Bennett 1988-89).

A number of state education departments across the country have recognized the advantages of a focused sequential approach to EE, and have developed public school EE goals/objectives. This study reviews the goals and objectives endorsed by these leading states, and proposes a plan for attaining similar state-approved goals and objectives for the Montana public schools.
The Status of Environmental Education in the Montana Public Schools

The importance of state-level support of EE has been evident since 1974 when John Y. Jackson produced "An Environmental Education Plan for Montana" (Jackson 1974). Jackson examined existing EE plans from other states, surveyed and interviewed educators, and organized a steering committee to formulate tentative goals for environmental education in Montana. The final plan recommended that the state:

1. Establish an EE coordinating committee.
2. Restructure the existing curriculum to include environmental awareness and understanding in all subject areas.
3. Develop pre- and in-service EE programs for teachers.
4. Establish a minor in EE at state supported teacher education institutes.
5. Require all new schools to provide field laboratories.
6. Employ a full-time EE specialist in the Office of Public Instruction (OPI).

To date, none of the above recommendations have been successfully implemented, and Montana Board of Public Education (BOPE), OPI, and legislative support for EE remains minimal.

Given the lack of state level involvement, it is not surprising that researchers have found that most Montana public school teachers rarely expose their students to EE.
Light (1984) and Gunderson (1989), for example, investigated the status of EE in the Montana public schools through a series of teacher interviews. Both reported that EE efforts have been inconsistent and lack solid support.

Jim Noorgard (1986) also found Montana EE programs to be ineffective and argued for an alternative approach, based on "earth-bonding" experiences:

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 insure this outcome or in fact "teach" it directly, but we can give children situations where "significant life experiences" are likely to occur (Noorgard 1986, 6).

Joseph Cornell (1979) and Steve Van Matre (1990) have advocated similar earth bonding experiences for years. However, these alternative techniques occur mostly in residential EE camps and rarely in the public schools (Van Matre 1990).

Recently, Palen (1991) surveyed Montana secondary school principals, and suggested that there is a significant discrepancy between what experts consider to be quality EE and the EE that is being taught in Montana schools.\(^1\) For example, she reported that:

1. On average, Montana students receive less than one hour per week of EE.

\(^1\)Palen's study was primarily intended for the secondary grades, however most survey respondents administered K-12 schools. Consequently, the survey results were often inclusive of the elementary grades.
2. Science is overwhelmingly the primary field of the teachers involved in the planning and teaching of EE.

3. Learning occurs mostly at the awareness and attitude stages, with little attention given to planning and problem solving skills.

4. Larger schools are more likely to provide EE than smaller rural schools.

Perhaps most disturbing, the survey suggests that schools have not taken advantage of the EE resources and training opportunities currently available throughout Montana.

According to Palen:

The planning of environmental education is usually done by the teachers who teach it, for their own classes. Rarely does a public high school in Montana have a committee on environmental education, nor do they often involve administration, parents, students, or professionally trained environmental educators, institutes, or agencies (Palen 1991, 70).

A number of the above researchers contend that teachers need incentives such as funding, training, time, and local administrative support to improve the quality and consistency of EE (Light 1984, Gunderson 1989, Palen 1991). Palen and Gunderson also argue that greater state involvement is necessary to help teachers with their needs. Palen, for example, challenges Montana to increase funding for EE and adopt an integrated interdisciplinary approach to EE, possibly in the form of a state-wide curriculum.
Gunderson calls for:
1. The Montana BOPE and OPI to re-examine the importance of including EE standards in the public school curriculum
2. Required EE courses in teacher training programs
3. The creation of a state wide EE organization

Few of the above ideas have been seriously considered. However, Gunderson's third recommendation became a reality in 1991 when the Montana Environmental Education Association (MEEA) officially formed. Its primary purpose is the integration of EE into the K-12 curricula by "fostering a relationship between educators, government agencies, resource and conservation groups, and private industries" (MEEA n.d.).

The creation of MEEA suggests that educators are increasingly committed to quality EE in Montana. Given the ongoing efforts of local districts to comply with the "Project Excellence" directives,² now is the time for the Montana EE community to aggressively advocate the integration of focused EE throughout the core disciplines.

²From 1987-88, the Montana BOPE undertook "Project Excellence: Designing Education for the Next Century", a comprehensive review of Montana's school accreditation standards. The result is a set of learner goals and outcomes which define a basic Montana education. Public schools are required to demonstrate that they provide programs which meet these standards in order to be eligible for state equalization aid. The guidelines are published in the Administrative Rules of Montana (Title 10, Chapter 55), and in the 1989 "Montana School Accreditation- Standards and Procedures Manual" (MT BOPE and MT OPI 1989).
Purpose and Scope of Study

This paper develops a strategy to design and promote a set of broad EE goals and objectives that the Montana BOPE and/or OPI will ultimately endorse. I limited research for the report to grades K-8. The separate discipline structure of the high school classroom introduces additional constraints for interdisciplinary EE that are beyond the scope of this study. Nevertheless, most of the conclusions presented herein are applicable to grades K-12.

Two major phases of research provide background for this study. In the first phase (Chapter 2), I identified states that have adopted EE goals and/or objectives, and reviewed how these guidelines compare to nationally recognized EE guidelines. Supporters of Montana EE should use the results of Phase I as:

1. A tool to stimulate discussion within the educational community about the role EE should play in Montana public schools
2. A guide to identify exemplary documents which can be used as models for broad EE goals and objectives in Montana
3. A basis for the integration of sound EE goals/objectives into the curriculum of traditional subjects

During the second phase of research (Chapter 3), I interviewed representatives from various Montana agencies, organizations, or school districts to determine:
1. Constraints that have inhibited the progress of state level EE during the past two decades

2. Factors needed to attain a broad base of support for formal EE goals and objectives

Finally, based upon the results of Phases I and II, I formulated a plan, outlined in Chapter 4, for attaining formal public school EE learner goals and objectives in Montana.
CHAPTER TWO

PHASE I

The Goals and Objectives of Environmental Education

A steady progression of thought concerning the major learner goals and objectives of EE has occurred over the past twenty-five years. Early EE guidelines focused solely on making students more knowledgeable about the environment and its associated issues, since most educators erroneously assumed that greater understanding would automatically result in positive environmental attitudes and actions (Hungerford and Volk 1990).

Stapp (1969) produced one of the first widely accepted definitions of EE that called for producing knowledgeable and motivated citizens. To accomplish this task, the author proposed objectives that emphasized both understanding and attitudes of concern for the environment.¹

Seven years later, Harvey (1976) challenged educators to raise EE teaching to higher levels of the cognitive and affective domains. He suggested that EE goals/objectives

¹Stapp (1969) suggested that an emotional concern for environmental quality would motivate individuals to participate in environmental problem solving.
should be strengthened to encourage environmental competence, dedication, and

...a values system in which one acts consistently in a manner compatible with homeostasis between quality of life and quality of environment (Harvey 1976, 200).

By 1977, educators from around the world agreed on a fundamental set of EE goals at the First Intergovernmental Conference on EE in Tbilisi, Georgia, USSR. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) and United Nations Environment Program sponsored the conference. Sixty-six UNESCO member states, twenty-three international organizations, and eight United Nations agencies endorsed five broad objectives. These Tbilisi objectives represent consensus within the international community that EE must stress environmental attitudes, skills, and participation in addition to basic understanding and awareness (UNESCO 1978).

Shortly thereafter, Hungerford, Peyton, and Wilke (1980) brought attention to the difficulties involved in translating the general Tbilisi recommendations into specific instructional objectives. In response, they produced the "Goals for Curriculum Development in Environmental Education", an internationally recognized set of twenty-eight sub-goals for increasing: ecological knowledge; awareness of issues and values; investigation and evaluation skills; and environmental action skills.
American EE leaders overwhelmingly agree that the U.S. shares EE goals and objectives with the internationally endorsed Tbilisi recommendations and with the "Goals for Curriculum Development in EE" (Hammerman and Voelker 1987; Hungerford, Peyton, and Wilke 1980; Rubba and Wiesenmayer 1988). The experts also agree that EE must encourage students to: explore the human-environment relationship; formulate an environmental ethic; act as responsible citizens; and develop a positive self concept (Harvey 1976, Hammerman and Voelker 1987).

Educators can empower learners to resolve environmental problems and make environmentally responsible decisions in their everyday lives if they make environmental issues more personally relevant and develop instructional techniques that incorporate the above goals (Hungerford and Volk 1990). Supporters of public school EE should not underestimate the significance of forming this solid foundation of EE goals. In the 1970's, the EE community spent a great deal of time and energy addressing the question, "What is environmental education?" Now, environmental educators can devote their efforts to more productive applications such as the design, implementation, and evaluation of EE experiences.

\(^2\)Topics such as ecology and conservation education do not address the human-environment relationship (HER). Rather, they are HER foundations, which, unlike HER topics, are taught in a non-values laden context, and at lower levels of the cognitive and affective domains (Harvey 1976).
Identification of States with Environmental Education

Goals and/or Objectives

In an effort to identify states that have adopted EE goals/objectives within the past decade, I performed a national literature review, including a comprehensive search of the Educational Resources Information Clearinghouse (ERIC) database. Additionally, I contacted state Department of Education representatives if there was any question as to whether or not a particular state had EE guidelines. A total of thirteen states confirmed that they had either adopted or were presently creating interdisciplinary EE guidelines. These states are: Arizona (AZ), California (CA), Hawaii (HI), Iowa (IA), Maryland (MD), Michigan (MI), Minnesota (MN), New York (NY), Pennsylvania (PA), Tennessee (TN), Washington (WA), Wisconsin (WI), and Wyoming (WY).

Several national surveys of the state education agencies were especially helpful when identifying the leading states with EE goals/objectives, including surveys by: Disinger (1986, 1987), the U. S. Environmental Protection Agency ([1991]), and Environmental Education Associates (1992).

State EE goals/objectives were only reviewed if they were interdisciplinary and applicable to grades K-8. Consequently, states with environmental guidelines in science only (Georgia, Louisiana, Nevada, and Vermont) were not reviewed. Similarly, Arkansas was eliminated from consideration because their guidelines are only applicable to grades 9-12.
Classification of Goals and Objectives

I used a three-tiered hierarchy to organize the state guidelines according to their level of specificity (Table 1). The three-tiered system is in accordance with the multi-level approach of Krathwohl (1965) for stating educational objectives, and consistent with the hierarchy adopted by Hungerford, Peyton, and Wilke (1980).

All thirteen states endorse general and/or intermediate EE guidelines, but let local districts design their own detailed instructional goals and objectives. The Montana Accreditation: Standards and Procedures Manual (MT BOPE and MT OPI 1989) is equally broad, and only specifies general "Program Learner Goals" and intermediate level "Model Learner Outcomes". Consequently, I only analyze program and sub-goals/objectives in this study.

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The states use different terminology to describe their EE goals and objectives. Additionally, they specify guidelines in varying degrees of detail. Consequently, I used the three-tiered hierarchy to organize the guidelines within a common framework.
Table 1.—Hierarchy of Environmental Education Learner Goals and Objectives

<table>
<thead>
<tr>
<th>Level</th>
<th>Type of Goal/Objective</th>
<th>Purpose of Goal/Objective</th>
</tr>
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<tbody>
<tr>
<td>General</td>
<td>Superordinate, Program</td>
<td>Program Planning</td>
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<tr>
<td>Intermediate</td>
<td>Sub-</td>
<td>Curriculum Development</td>
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<tr>
<td>Specific</td>
<td>Instructional</td>
<td>Design of Instructional Units</td>
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</table>

Note: Adapted from David R. Krathwohl, "Stating Objectives Appropriately for Program, Curriculum, and for Instructional Materials Development," *Journal of Teacher Education* 16 (March 1965): 84.
Summary of State-by-State Review

Eleven of the thirteen states forwarded documents containing their EE learner goals and objectives.® Telephone conversations with state EE representatives yielded additional information concerning the status of EE in the various state education departments. The results are summarized in Table 2, and additionally detailed on a state-by-state basis in Appendix A. Several significant trends emerged from this review.

First, there is a considerable amount of ongoing activity in the education departments of several states to promote focused EE. For example:

1. Maryland recently integrated EE-related material into their state assessment tools.
2. Arizona, Hawaii, Iowa, Pennsylvania, and Wisconsin are currently preparing EE learner goals or objectives for official adoption in 1993.
3. Arizona, Iowa, and Wisconsin are finalizing new EE curriculum development guides.

Second, nine of the thirteen states have demonstrated a long-term commitment to EE through passage of some form of

®Draft EE goals and objectives from Arizona and Wisconsin were not available for review.
Table 2.—Summary of State Environmental Education Efforts

<table>
<thead>
<tr>
<th>State Initiatives</th>
<th>AZ</th>
<th>CA</th>
<th>HI</th>
<th>IA</th>
<th>MD</th>
<th>MI</th>
<th>MN</th>
<th>NY</th>
<th>PA</th>
<th>TN</th>
<th>WA</th>
<th>WI</th>
<th>WY</th>
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<tr>
<td>Passed EE Act</td>
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<td>State EE Goals/ Objectives Mandated</td>
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<td>Employ EE Consultant in DOE</td>
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<td>Endorse Fundamental Principles of EE</td>
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<td>Endorse Core Themes for EE</td>
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Note: BOE = Board of Education, DOE = Department of Education

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state EE legislation. However, only four states presently require local schools to follow their EE goals and objectives.

Third, states have chosen to keep EE goals and objectives organized as a separate unit, rather than infusing them into the goals/objectives of other core disciplines. Michigan is the only state that integrates EE standards into their core disciplines. Six of the states present their guidelines in a document devoted strictly to EE, often a curriculum development guide; three states incorporate EE goals/objectives into their core education requirements as a separate section; and two states include EE guidelines directly in their state EE legislation.

Fourth, most of the states have strong support for EE goals/objectives within their departments of education. Nine of the thirteen states, for example, employ EE consultants in their Departments of Education. These specialists were instrumental in developing the goals/objectives and ultimately getting them approved by their state Board of Education (BOE). Of the states without Department of Education EE consultants:

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7According to the Supervisor of the Michigan Curriculum Development Program, there was no official process for integrating EE outcomes throughout the core curriculum requirements, and the outcomes "just occurred, rather than being planned" (Nancy Mincemoyer, telephone conversation, 23 June 1992).

2. Tennessee inserted environmental outcomes into their K-8 curriculum framework with support from Project CENTS, a conservation agency funded by four state agencies, including the Tennessee Department of Education (Cindi Smith-Walters, telephone conversation, 26 June 1992).

3. The New York Department of Environmental Conservation endorsed their own set of EE goals and fundamental principles, without pursuing legislation or BOE endorsement (Pomerantz 1991).
Content Analysis

In an effort to evaluate the content of the eleven state EE goals/objectives, I compared state program goals/objectives to the Tbilisi objectives (UNESCO 1978), and state sub-goals/objectives to the "Goals for Curriculum Development in EE" (Hungerford, Peyton, and Wilke 1980). To accomplish this, I independently analyzed the goals/objectives from each state, and identified where these state goals/objectives interfaced with the nationally recognized Tbilisi objectives (Table 3) and "Goals for Curriculum Development in EE". The results, summarized below, provide an indication of the relative completeness of the state guidelines.

Analysis of Program Goals/Objectives

Nine states specify program-level goals or objectives. These states identify between three and seven program goals/objectives that typically express desired goals for students to achieve upon graduation from a K-12 program. The results (Table 4) demonstrate that the states agree that public school EE must teach more than environmental knowledge and awareness. Eight of the nine

8Of the eleven states that forwarded their EE goals/objectives for review: seven (HI, IA, MD, MN, PA, WA, and WY) have program and sub-goals/objectives; two (CA and NY) have only program goals/objectives; and two (MI and TN) have only sub-goals/objectives.
Table 3.—The Tbilisi Goals and Objectives

The goals of environmental education are:

* To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas.

* To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment.

* To create new patterns of behavior of individuals, groups, and society as a whole towards the environment.

The categories of environmental education objectives are:

* Awareness: to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.

* Knowledge: to help social groups and individuals gain a variety of experiences in, and acquire a basic understanding of, the environment and its associated problems.

* Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvement and protection.

* Skills: to help social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

* Participation: to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

### Table 4.—State Program Goals/Objectives versus the Tbilisi Objectives

<table>
<thead>
<tr>
<th>State</th>
<th>Guidelines Reviewed</th>
<th>Source</th>
<th>Tbilisi Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>&quot;Goals&quot;</td>
<td>CA DOE (1990)</td>
<td>AWA X, KNO X, ATT X, SKI X, PAR X</td>
</tr>
<tr>
<td>Hawaii</td>
<td>Objective &quot;Strands&quot;</td>
<td>HI DOE (n.d.)</td>
<td>AWA X, KNO X, ATT X, SKI X, PAR X</td>
</tr>
<tr>
<td>Iowa</td>
<td>Draft &quot;Outcomes&quot;</td>
<td>IA DOE (n.d.)</td>
<td>AWA X, KNO X, ATT X, SKI X, PAR X</td>
</tr>
<tr>
<td>Maryland</td>
<td>&quot;Goals&quot;</td>
<td>MD DOE (1989)</td>
<td>AWA X, KNO X, ATT X, SKI X, PAR X</td>
</tr>
<tr>
<td>Minnesota</td>
<td>&quot;Program Goals&quot;</td>
<td>MN DOE (1991)</td>
<td>AWA X, KNO X, ATT X, SKI X</td>
</tr>
<tr>
<td>Washington</td>
<td>&quot;Goals&quot;</td>
<td>WA Division of Instructional Programs and Services (1987)</td>
<td>AWA X, KNO X, ATT X, SKI X, PAR X</td>
</tr>
</tbody>
</table>

Note: The X’s denote which of the Tbilisi objectives from Table 3 are addressed by the state guidelines. (BOE = Board of Education, DOE = Department of Education, AWA = Awareness, KNO = Knowledge, ATT = Attitudes, SKI = Skills, PAR = Participation)
states, for instance, encourage the development of positive environmental values and stewardship (attitudes); and all states include at least one goal or objective aimed at the development of problem solving and critical thinking skills.

All states also include program goals or objectives intended to improve the student’s environmental action skills. However, only four advocate that schools provide opportunities for students to act in accordance with their skills and values. Maryland, for example, states that students must "develop and apply knowledge and skills at the community level for cooperative action to protect and sustain the environment" (MD State Department of Education 1989, Sec. .03); and the Pennsylvania draft document requires students to "plan and complete a project or action which demonstrates their stewardship for the environment" (PA State BOE 1991). These states, along with Hawaii and Washington, endorse program goals that meet all five Tbilisi objectives.®

®A review of state sub-goals/objectives reveals that Iowa, Minnesota, and Wyoming also encourage schools to participate in environmental action. This is not, however, emphasized in the states' program goals/objectives.
Analysis of Sub-Goals/Objectives

Nine states endorse intermediate-level EE goals or objectives. The degree of detail of these state sub-goals/objectives differs slightly from the detail of the twenty-eight "Goals for Curriculum Development in EE" (Hungerford, Peyton, and Wilke 1980). I therefore compared state sub-goals/objectives to a condensed list, adapted from Hungerford, Peyton, and Wilke (1980), that identifies fourteen major components of the twenty-eight sub-goals (Table 5). The analysis (Table 6) shows that:

1. Hawaii, Minnesota, Pennsylvania, Washington, and Wyoming address the most major sub-goal components. These states tend to have very well organized guidelines that give equal emphasis to each of the four sub-goal levels. Level II and III components are covered especially well in Hawaii and Minnesota, while action skills development (Level IV) are strongest in Pennsylvania and Washington.

2. Iowa and Maryland guidelines are also thorough in most areas. Maryland, however, fails to stress the need for environmental issues investigation and evaluation; and Iowa does not call for students to clarify values or identify how values perspectives influence environmental issues, although they do provide an exceptional environmental action section.
Table 5.—The Goals for Curriculum Development in EE

**Level I: Ecological Foundations Level**

A. Understanding of various ecological concepts.
B. Understanding of the interrelationship between humans and the ecosystem.

**Level II: Conceptual Awareness—Issues and Values**

A. Awareness of the many ways in which human activities influence the environment from an ecological perspective.
B. Awareness of how individual behaviors impact the environment from an ecological perspective.
C. Awareness of a variety of environmental issues, the alternative solutions to these issues, and their implications.
D. Awareness of the roles played by differing human values and cultures in environmental issues.
E. Awareness of the need for responsible citizenship action to resolve environmental issues.

**Level III: Investigation and Evaluation Level**

A. Ability to identify, investigate, and analyze environmental issues, alternatives, and their associated values perspectives with respect to their ecological and cultural implications.
B. Ability to identify alternative solutions for discrete issues and the values perspectives associated with these solutions.
C. Ability to identify and clarify personal value positions, and the ability to change these positions in light of new information.
D. The opportunity to participate in environmental issue investigation and evaluation, and the valuing process.

**Level IV: Environmental Action Skills Level—Training and Application**

A. Development of action skills which will permit students to work toward ends which are consistent with their values.
B. The opportunity to apply and evaluate the environmental action skills to specific issues.
C. The opportunity to evaluate the actions taken with respect to their influence on achieving or maintaining an equilibrium between quality of life and quality of environment.

Table 6.—Sub-goals/objectives versus the Goals for Curriculum Development in EE

<table>
<thead>
<tr>
<th>State</th>
<th>Guidelines</th>
<th>Source</th>
<th>Goals for Curriculum Development in EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI</td>
<td>Objective &quot;Clusters&quot;</td>
<td>HI DOE (n.d.)</td>
<td>Level I A</td>
</tr>
<tr>
<td>IA</td>
<td>Learner &quot;Indicators&quot;</td>
<td>IA DOE (n.d.)</td>
<td>X</td>
</tr>
<tr>
<td>MD</td>
<td>&quot;Subgoals&quot;</td>
<td>MD DOE (1989)</td>
<td>X</td>
</tr>
<tr>
<td>MI</td>
<td>&quot;Student Outcomes&quot;</td>
<td>MI BOE (1991)</td>
<td>X</td>
</tr>
<tr>
<td>MN</td>
<td>&quot;Learner Outcomes&quot;</td>
<td>MN DOE (1991)</td>
<td>X</td>
</tr>
<tr>
<td>PA</td>
<td>&quot;Benchmark Learner Outcomes&quot;</td>
<td>PA BOE (1991)</td>
<td>X</td>
</tr>
<tr>
<td>WA</td>
<td>&quot;Objectives&quot; and &quot;Learner Outcomes&quot;</td>
<td>WA Division of Instructional Programs and Services (1987)</td>
<td>X</td>
</tr>
<tr>
<td>WY</td>
<td>&quot;Learner Outcomes&quot;</td>
<td>WY EE Task Force (1991)</td>
<td>X</td>
</tr>
</tbody>
</table>

Note: The X's denote which of the sub-goals from Table 5 are addressed by the state guidelines. (BOE = Board of Education, DOE = Department of Education)
3. Michigan and Tennessee address few of the fourteen major EE sub-goals. This may, in part, be due to the fact that these are the only two states that endorse sub-goals/objectives without having a structured set of general EE goals.\textsuperscript{10}

4. States overwhelmingly include sub-goals/objectives that calls for learners to develop and apply environmental action skills. However, no state specifies that students should evaluate the success or implications of their environmental actions (Table 5, Component IV-C).

\textsuperscript{10}Michigan recently endorsed a superordinate EE goal statement, but only after their sub-objectives had been written.
CHAPTER THREE

PHASE II

Methodology

Chapter 3 examines reasons why Montana has not yet produced EE goals and objectives, and identifies possible strategies to overcome these constraints. I interviewed twelve leaders active in the Montana educational community, including: elementary and middle school teachers, principals, the Chairman of the Montana Board of Public Education (BOPE), the coordinator of the Great Falls Environmental Science Program, and individuals from a variety of state agencies and educational organizations (Table 7).

Bob Briggs (telephone conversation, July 1992), Science Specialist at OPI, recommended the principals selected for interviews, and two of the teachers selected were among the "outstanding environmental educators" interviewed by Kari Gunderson for her 1989 thesis (Gunderson 1989). The remaining interviewees represented MT agencies, boards, educational associations, or school districts that could potentially be effective advocates of state EE guidelines.
### Table 7.—List of Interviewees

* Bob Briggs, Science Specialist, Montana Office of Public Instruction
* Kurt Cunningham, Youth Education Coordinator, Montana Department of Fish, Wildlife, and Parks
* Jack deGolia, Past-President, Montana Environmental Education Association
* Bob Edwards, Principal, Somers School
* Lynn Kelly, Teacher (7th Grade Science and Math), Polson School
* Marlene LaCounte, President, Montana Council of Teachers of Social Studies
* Rich Micheletto, Past-President, Montana Science Teachers Association; and Teacher (7th Grade Science), Meadow Hill School in Missoula
* Joan Shumaker, Conservation Education Specialist, Montana Department of Natural Resources and Conservation
* Bill Thomas, Chair, Montana Board of Public Education
* Janet Thompson, Curriculum Development Coordinator, Great Falls Public Schools
* Carla Wambach, Teacher (3rd Grade), Helena School District
* Gary Weber, Principal, Alberton School
Pilot interviews conducted with two Missoula school teachers in June 1992 helped improve the clarity and focus of the interview sessions. Final interviews took place between July 1992 and January 1993, and lasted from forty to seventy minutes. I performed eleven of the interviews in-person, and one, at the request of the interviewee, by telephone.

Each interviewee responded to a series of twelve questions (Appendix B). Their comments were recorded on tape, transcribed, and then reviewed. The results, summarized in the following pages, provide insight into the challenges proponents of formal EE learner goals/objectives will encounter in Montana.
Interview Results

Status of EE

Overall, those interviewed convey a general impression of Montana EE consistent with the previously mentioned findings of Gunderson (1989) and Palen (1991). Respondents unanimously agree that EE should be integrated across the curriculum, but do not believe that this goal has yet been achieved. Eleven of the twelve responses stressed that students in Montana will receive EE only if teachers want to teach it. In fact, fifteen years after its inception, the Great Falls Environmental Science Program still offers the only structured K-12 EE program, and employs the only two full-time EE teachers in Montana.

It is therefore not surprising that the teachers and school administrators interviewed reported very different levels of EE activity in their districts. One respondent, for example, is pleased with the number of teachers who integrate EE into their classroom; another does not see EE taught until the third grade; a third believes that EE is strongest in the secondary grades but ignored by the K-6 teachers; and a fourth feels that there is very little EE activity at all.¹

The responses also suggest that EE is not yet integrated across the curricula. Three respondents, for

¹Such varied responses may partially be due to the fact that the respondents disagree about what constitutes a basic EE program.

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instance, feel that EE continues to be relegated to science class; one believes it is being taught in science and math; two contend that it is slowly becoming multidisciplinary, although it still receives most attention in science; and two feel that it is currently the strongest in the social studies. Only one believes that EE is presently multidisciplinary.

Consequently, in the words of the respondents themselves, public school EE remains fragmented, scattered, and disarticulated in Montana. One respondent summarized the current situation well when he said:

There are a few good teachers who go under different titles maybe, but who weave the environment into what they do. And there’s probably some who are interested if they only had the means. There are some who would get excited if they only knew about it. And there’s probably a whole bunch who are too strapped doing whatever it is they do now and don’t want to change (Jack deGolia, interview by author, 5 August 1992).

School Needs

The respondents expressed strong opinions about what MT schools need to improve the quality, quantity, and consistency of EE. Their responses fall within five broad categories, all of which have been frequently cited in the EE literature (Stapp 1973, Childress 1978, Tewksbury and Harris 1988, Ham and Sewing 1987-88). They include the need for:

1. Teacher pre- and in-service training
2. Support from administrators and policy makers
3. Instructional time
4. Funding
5. Quality instructional materials

Several respondents expressed the above needs in more specific terms, and call for:

1. Training opportunities that show teachers how EE concepts can be integrated into the classroom so that they address the objectives of the core subjects
2. Easy ways for teachers to secure money for EE lessons that do not require grant proposal writing
3. An EE specialist at the Office of Public Instruction
4. Political support from the MT School Board Association (MSBA) and local school boards
5. An agreed upon scope and sequence for each grade level, accompanied by developmentally appropriate instructional materials

Board of Public Education (BOPE) and Office of Public Instruction (OPI) Involvement

According to the respondents, the state can and should take steps to assist local districts with their EE needs. At a minimum, those interviewed feel that the BOPE and OPI should encourage EE and promote it as a legitimate discipline. Unfortunately, the Board and OPI presently have no formal plans, programs, or designated funds for EE, and
whatever encouragement they do is informal (Bob Briggs, interview by author, 4 August 1992; Bill Thomas, interview by author, 7 July 1992).

Ten of the twelve respondents believe that teachers and schools could benefit if the BOPE and OPI took a more active approach to EE. Seven of these people offered specific formal steps that they believe would be appropriate for the Board or OPI to take to promote EE. Suggestions include:

1. Endorse EE guidelines.
2. Hire an EE specialist at the Office of Public Instruction.
3. Mandate minimum EE teacher training requirements.
4. Stay actively involved with MEEA.
5. Help local districts to integrate EE across the curriculum by providing curriculum development assistance, instructional materials, and in-service EE workshops.

There are, then, a number of meaningful actions that the BOPE and OPI could take to help schools incorporate EE into their curriculum, including adoption of EE guidelines. In fact, when I asked respondents specifically about the potential for state-endorsed EE goals and objectives, eleven reacted favorably and ten suggested that the goals/objectives could be successfully incorporated into the MT.

Format of EE Goals/Objectives

Those supportive of state-endorsed EE guidelines proposed different and often conflicting formats for effective guidelines. For example, two respondents feel strongly that EE goals should be added to the accreditation standards as a tenth core discipline because: the goals would have more clout as a separate strand; and integration of EE goals into the existing core areas is logistically unrealistic since it would require amending the work of nine separate disciplines.

However, three respondents feel just as strongly that EE goals should not be a separate strand in the accreditation standards, because: there would be no way to ensure that the various disciplines were implementing the guidelines; there are already too many requirements in the accreditation manual to add another discipline; and separate guidelines would discourage integration of EE into the core subjects. Consequently, two of these individuals believe that the EE goals should be integrated into the existing core discipline requirements. The third respondent is

²The only respondent uncomfortable with the concept of state EE guidelines worried that anything more specific than a statement encouraging "a general understanding of EE" would be too political for the BOPE, since it would promote the special interest goals of environmentalists.
opposed to adding any EE goals to the accreditation standards, and instead argues that they should instead be presented in an EE curriculum development guide, modeled after the OPI Science Tool Kit (MT OPI [1990]).

The interviewees also disagree about whether EE guidelines should be required for accreditation or simply encouraged. For example, three respondents feel that schools would ignore goals unless they are mandated, one is supportive of recommended goals but opposed to any EE requirement; and another believes that broad mandated goals would be ineffective.

Three local school representatives cautioned that, regardless of how the guidelines are endorsed, they will only be effective if districts are given the time and money to implement them. However, others feel that state-endorsed goals would, at a minimum, add credibility to the field and prompt teachers to evaluate how they currently address EE.

Barriers to State-Endorsed EE Goals/Objectives

Those interviewed cite five major reasons why the BOPE and OPI have been unwilling to endorse EE learner goals and objectives:

1. EE is too controversial.

[3] Three other respondents suggested that EE goals/objectives would have the most impact if they were incorporated into both the accreditation standards manual and an EE curriculum development guide similar in scope to the Science Tool Kit.
Education is locally controlled in Montana.

There has not been a champion to promote the guidelines.

EE is a low-priority.

EE is assumed to be the responsibility of the science educators.\(^4\)

The first two of these barriers were emphasized by a number of respondents, and deserve elaboration. The most frequently mentioned constraint involves the controversial and political nature of EE. Half of those interviewed believe that the BOPE and OPI are extremely wary of taking actions that could be perceived as promoting an environmentalist agenda. According to one respondent:

Montana is really split right now on environmental issues. We have a great controversy across the state, and we're having to choose between resource utilization and resource preservation, and we really have not chosen a route. And until we do, we probably won't see those standards in place (Bob Briggs, interview by author, 4 August 1992).

A second critical barrier, cited by four of those interviewed, is the local control philosophy of public school education in Montana. The BOPE believes very strongly that individual districts should be responsible for what is and is not taught in the local community. Therefore, the Board only endorses goals and programs that

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\(^4\)Two respondents did not mention any barriers, and feel that it is only a matter of time until EE goals/objectives are incorporated into the traditional disciplines.
they consider to be basic to a quality education. Bill Thomas, Chair of the BOPE, provided an indication of how difficult it will be to convince the Board that EE goals/objectives should be basic to a Montana education when he said:

The Board does not want to dictate to local school districts what is being taught as far as subject material and curriculum. We have standards that we want met, but it’s up to the local districts to establish the content within those core areas. So if EE wants to go into a local school district, they have to sell that [to the] local school board. And it’s not only EE. That’s what we’ve done in most areas...You have to bring it down one level to the local districts because the Board simply will not impose those restrictions on the local school districts (Bill Thomas, interview by author, 7 July 1992).

Suggestions for Reducing the Barriers

Seven of the twelve respondents suggested possible ways to reduce the above mentioned barriers, and prompt the BOPE and OPI to endorse state EE goals and objectives. Four categories of responses emerged:

1. Board members should attend EE related workshops and meetings to become better educated about what EE is and how it is presented in the classroom.

2. The Board and OPI should not be expected to spend a lot of time or money to develop EE guidelines. Instead,

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5 The BOPE debated the prospect of endorsing EE several years ago, but chose not to because of their local control philosophy, and because they felt the curriculum was already overcrowded (Bill Thomas, interview by author, 7 July 1992).
proponents of the EE guidelines should be responsible for securing the funding and support for the goals and objectives.

3. Guidelines should be written by school teachers.

4. Any goals and objectives presented to the Board should have a broad base of support from within the Montana educational community and the traditional Montana agricultural, timber, and mining groups.

Three of the interviewees suggested that the MEEA is the logical group to lead an effort to attain state EE guidelines. However, two people cautioned that MEEA's image is not politically balanced, and that it will be important to develop guidelines that are not perceived to be promoting strictly an MEEA point of view.
CHAPTER FOUR

Summary

My findings demonstrate that state endorsed goals and objectives are needed to give consistency and focus to EE in the Montana public schools. However, the interview results, summarized in Chapter 3, suggest that the Montana Board of Public Education (BOPE) and Office of Public Instruction (OPI) will be reluctant to adopt EE guidelines until they believe that the measures are a necessary component of a basic Montana education, non-controversial, and supported by the majority of Montanans.

Consequently, efforts to influence the content of EE in the local schools must be initiated by respected individuals within the Montana educational community, and supported by a wide array of groups that are not perceived to be pursuing a hidden agenda. Furthermore, the guidelines must be designed and presented in a way that gives teachers the means to integrate EE into their curricula without adding extra instructional units, and provides local districts the freedom to address EE in ways that they deem appropriate.
Recommendations

Based on the results from this study, I recommend six actions that could help overcome the above constraints and prompt the BOPE to adopt state EE learner goals and objectives. The EE community should pursue these recommendations concurrently, and determine the priority actions based upon available time, funding, and support.

Recommendation 1: Hire a full-time EE specialist at the Office of Public Instruction.

EE needs a credible individual with the time, motivation, and experience to advocate and obtain support for EE learner goals and objectives. This can best be accomplished by employing a full-time specialist within the OPI who is not affiliated with outside interest groups or state agencies, not responsible for a specific discipline, and has the integrity and backing of the Montana public schools.

An EE specialist can: ensure that interdisciplinary EE goals/objectives, once adopted, are implemented by the nine existing core disciplines; help teachers to find the funding, instructional materials, and training they need to incorporate EE into their classroom; and provide incentives for local schools to increase the quality and consistency of
EE without interfering with local control. It is time for a unified EE community to make it very clear to the BOPE, OPI, state legislators, and Governor's office that hiring an EE specialist at OPI is the single most important action that Montana can take to assist local schools with their EE needs.

One way to establish the EE specialist position as a significant issue would be to raise the topic frequently during the upcoming campaign for Superintendent of Public Instruction. More specifically, I recommend that the EE community, led by the MT Environmental Education Association (MEEA):

a) Request candidates to respond in writing to questions concerning an EE specialist position at OPI.
b) Inform the candidates that their responses will be distributed to many environmental and educational organization newsletters.
c) Encourage proponents of the EE specialist position to attend debates among the candidates and ask questions.

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1Florida, for example, has implemented numerous programs at the state level to encourage EE even though the state believes strongly in locally controlled schools. The state does not endorse goals and objectives in EE, however their Department of Education employs several EE consultants who help schools to develop their own goals and objectives (Georgia Jeppesen, telephone conversation, 19 June 1992).

2The Wisconsin Association for EE and the Wisconsin Citizens Environmental Council used similar tactics to successfully build support for mandated pre-service teacher training in their state (Wilke 1985).
d) Support the candidate most receptive to the EE specialist position.

**Recommendation 2: Assess the level of support for the EE goals and objectives.**

Members of the EE community should design a questionnaire and send it, along with sample EE guidelines, to educational leaders throughout Montana. Primary goals of the survey should be to determine:

a) The extent to which local districts are supportive of state EE goals/objectives

b) If the EE goals/objectives should be mandated or recommended

c) If the EE goals/objectives should be incorporated into the Montana accreditation standards or included as a separate document

**Recommendation 3: Create a model set of environmental education guidelines.**

A productive debate concerning the content and format of state EE goals/objectives is not possible without a working set of EE guidelines. Therefore, I recommend that MEEA design a model EE curriculum development guide and distribute it to teachers and administrators throughout Montana. The document should outline EE program and sub-goals/objectives within a practical and developmentally
appropriate context. Furthermore, I recommend that MEEA include the following K-12 interdisciplinary learner goals in their guidelines:

Program Goal A. Understand ecological systems and the relationships of humans within these systems. Specifically, the learner should:

1. Observe and investigate the biological and physical environment through first-hand experience with the natural world.

2. Understand a variety of ecological principles, including:
   a) Energy flow
   b) Materials cycling (ie. biogeochemical cycling)
   c) Interactions and interdependence
   d) Homeostasis
   e) Ecosystem and community concepts
   f) Population dynamics
   g) Change (adaptation, succession, etc.)
   h) Environmental influences and limiting factors

3 The document should be similar in function to the MT Science Teachers Association’s "Model Science Curriculum Guide", which was ultimately incorporated into the OPI Science Tool Kit [1990].

4 I developed these program and sub-goals to address all of the Tbilisi objectives and "Goals for Curriculum Development in EE" (Hungerford, Peyton, and Wilke 1980). The majority of sub-goals have been adapted from the Minnesota, Pennsylvania, Washington, and Wyoming guidelines.
3. Recognize that humans are an integral part of the ecosystem, influenced by natural processes:

Program Goal B. Understand how human attitudes and behaviors affect ecological systems and environmental quality. Specifically, the learner should:

1. Recognize how family, peer, school, community, and national beliefs and values influence environmental decisions.

2. Understand how individual attitudes and behaviors impact the environment.

3. Explore ways in which environmental problems are caused by unforeseen consequences of human actions.

4. Understand how habitat manipulation affects plant and animal populations.

5. Understand how varying levels of pollutants affect the environment.

6. Identify the link between environmental degradation and human health problems.

7. Possess knowledge of the positive and negative impacts of technology on the environment.

8. Recognize how a decision made at the local level can affect distant communities.

Program Goal C. Develop a sense of wonder for the natural world and a personal commitment to a healthy environment. Specifically, the learner should:
1. Evaluate her or his own positive and negative impacts on the environment.

2. Determine how her or his values influence personal use of resources.

3. Assess her or his personal commitment to the environment.

4. Demonstrate feelings about living things in the environment through creative expression.

5. Experience the aesthetic value of nature and the bonding process that occurs between humans and other living things.

6. Act respectfully toward natural and human environments.

7. Exhibit a preference for first-hand contact with the natural world for discovery, recreation, and personal enrichment.

Program Goal D: Possess in-depth knowledge about environmental issues and recognize that these issues stem from diverse cultural, economic, political, and historical perspectives. Specifically, the learner should:

1. Identify, investigate, and analyze a variety of environmental issues with respect to their ecological and cultural implications.

2. Understand the relationship between political and economic power and environmental decisions.
3. Understand the relationships between beliefs, political structures, and environmental values in various cultures.

4. Recognize the inequity of resource distribution and how it affects diplomacy.

5. Understand the environmental impacts of supply and demand components of the economy, and recognize that a viable economy is dependent upon the responsible use of natural resources.

6. Evaluate the multiple uses of a resource or site.

7. Analyze how environmental factors have affected the distribution and interactions of humans historically.

8. Understand the functions of resource, corporate, public, and governmental agencies that work directly with the environment.

9. Analyze how the mass media influences perceptions of environmental issues.

10. Understand the intent of environmental laws and recognize how these laws affect public policy.

Program Goal E. Develop problem solving skills and action strategies necessary to resolve environmental issues.

Specifically, the learner should:

1. Apply critical thinking skills to generate alternative solutions to environmental issues, and evaluate the consequences of each alternative.
2. Analyze personal feelings about an environmental dilemma. Select and defend a position consistent with these personal values.

3. Demonstrate the ability to clarify, re-evaluate, or change her or his positions in light of new information.

4. Evaluate reasons to participate or not participate in an environmental activity in the home, school, or community.

5. Recognize that individual actions such as consumerism, recycling, conservation, and persuasion are necessary and effective tools to promote environmental change.

6. Recognize that citizens, businesses, interest groups, and government agencies must cooperate to resolve environmental issues.

7. Contrast the advantages and disadvantages of short and long-term solutions to environmental dilemmas, and evaluate the effects of these actions on human social systems.

8. Evaluate management alternatives that help preserve finite resources.

9. Use political processes to gain support for a position.

10. Explore and evaluate careers in the environmental field.

Program Goal F. Apply environmental knowledge and skills to promote a dynamic equilibrium between quality of
life and quality of the environment. Specifically, the learner should:

1. Work cooperatively in groups to plan and complete a project that demonstrates a commitment to protect and sustain the environment.

2. Participate in a school, home, or local based action that demonstrates her or his concern for a specific environmental issue.

3. Apply environmental knowledge and attitudes to patterns of personal behavior and choice.

4. Evaluate her or his actions, and the extent to which these actions achieve or maintain a dynamic equilibrium between quality of life and quality of the environment.

Recomendation 4: Organize an EE Writing Committee to design the state EE goals and objectives.

The EE community should approach Nancy Keenan, Superintendent of Public Instruction, with a detailed proposal to create the goals/objectives. To ensure that the goals/objectives produced are credible, the proposal should stress that the Montana EE community will organize and fund the project, but wants public school teachers to lead the effort to write the guidelines. The proposal should also request that OPI help to identify respected and knowledgeable individuals to serve on the EE Writing
Committee and, if possible, lend their name to the final product.

The Writing Committee should be composed of a variety of representatives from the Montana educational community who are supportive of state EE goals and objectives. Members should include: teachers, administrators, local school board members, OPI specialists, state agency personnel, and educational association leaders. Furthermore, I recommend that the EE Writing Committee:

1. Design EE guidelines similar in format and scope to the "Program Area Learner Goals" and "Model Learner Outcomes" (sub-objectives) of the MT Accreditation: Standards and Procedures Manual (MT BOPE and MT OPI 1989).

2. Develop EE program goals with the intent of addressing all five Tbilisi objectives (UNESCO 1978), and create learner outcomes in accordance with the "Goals for Curriculum Development in EE" (Hungerford, Peyton, and Wilke 1980).

3. Use the suggested program/sub-goals (Recommendation 3) and the EE guidelines from Hawaii, Maryland, Minnesota, Pennsylvania, Washington, and Wyoming as model
documents.\(^5\) (Sample goals/objectives from Maryland, Minnesota, and Wyoming are presented in Appendix C.)

4. Produce a rationale statement that convincingly explains the purpose of the EE goals/objectives and why they are needed.

**Recommendation 5: Sponsor workshops to reduce misconceptions about EE.**

A number of conceptual barriers exist that could inhibit groups and individuals from enthusiastically supporting state EE learner goals/objectives. Therefore, I recommend that the EE community sponsor workshops aimed specifically at reducing the following common misconceptions:\(^6\)

a) EE promotes a political point of view.

b) EE is primarily a topic to be taught in science.

c) EE lessons require a lot of funding.

\(^5\)As reported in Chapter 2, the program goals/objectives from HI, MD, PA, and WA address all five Tbilisi objectives (Tables 3 and 4); and the sub-goals/objectives from HI, MN, PA, WA, and WY address twelve to thirteen of the fourteen major components of the "Goals for Curriculum Development in EE" (Tables 5 and 6).

\(^6\)Ham, Rellergert-Taylor, and Krumpe (1987-88) demonstrated that a workshop designed specifically to reduce barriers to EE resulted in: (a) an increase in the perception that EE is interdisciplinary, (b) an increase in the number of subjects teachers used to teach EE concepts, (c) an increase in knowledge concerning where to find EE resources, and (d) a decrease in the perception that funding is a major barrier.
EE can only be integrated into the curriculum if there is time for extra lessons. Target audiences should be the BOPE, educational organizations, local school boards and administrators, and other groups whose support will be needed to attain the state endorsed EE guidelines. Presentations should be made at meetings or annual conferences of these groups when possible.

**Recommendation 6: Establish a broad base of support for the EE goals and objectives.**

In addition to the above workshops, I recommend that the Montana EE community consider the following steps to build support for EE goals/objectives:

a) Enlist support from several natural allies within the Montana educational community. Possible allies include the MT Science Teachers Association (MSTA); MT Council of Teachers of Social Studies (CTSS); MT Department of Fish, Wildlife, and Parks (FWP); and the MT Department of Natural Resources and Conservation (DNRC).

---

7Representatives from the MSTA (Rich Micheletto, interview by author, 23 July 1992), CTSS (Marlene LaCounte, interview by author, 6 August 1992), FWP (Kurt Cunningham, interview by author, 4 August 1992), and DNRC (Joan Shumaker, interview by author, 23 July 1992) are optimistic that their organizations would support state EE initiatives and consider endorsing a well-designed set of EE goals and objectives.
b) Ask the BOPE to call a public meeting of all interested parties to comment on the content, format, and need of the proposed EE goals/objectives. The meeting should be funded by supporters of the goals/objectives, but run by the BOPE and one or more professional facilitator.®

c) Proponents and opponents of the guidelines should be encouraged to attend, including: teachers, school administrators, parents, environmentalists, and members of the Montana agricultural, timber, and mining communities.

d) Pursue endorsements from as many organizations as possible, especially large or influential groups such as the MT School Board Association and MT Education Association.

Any formal proposal requesting the BOPE to adopt state EE goals/objectives must be sensitive to the local control orientation of the Montana public schools. However, this should not dissuade advocates of EE goals/objectives from pursuing an EE mandate. I strongly recommend that the proposal ask the Board to require EE program learner goals.

®Vermont and Wyoming used facilitated meetings to hear comments and successfully build support for their state EE guidelines (Donn Kesselheim, telephone conversation, 25 June 1992; Alan Kousin, telephone conversation, 18 June 1992). The Science Specialists from these states helped organize the meetings, and should be contacted for additional details.
in the accreditation standards, or at a minimum, encourage model EE goals/objectives in conjunction with a requirement that all schools incorporate EE into their curricula. Furthermore, I recommend that any EE goals/objectives added to the accreditation standards be placed as a capstone over the existing nine disciplines or added as a separate strand.
Conclusion

The above recommendations provide the means to depoliticize public school EE and attain a broad base of support for state EE goals and objectives. Although the six major actions should be pursued concurrently, I stress that initial efforts focus on getting a full-time EE specialist hired at the Office of Public Instruction. The entire process will be greatly facilitated by a person in OPI who is able to dedicate one-hundred percent of her or his time to EE. Also, once the goals/objectives are in place, the specialist will be needed to help produce an EE curriculum development guide that shows local schools how to integrate the broad EE goals/objectives into their instructional units.

This plan will likely take several years of effort. However, with the patience and perseverance of a few individuals, the unified support of the Montana EE community, and a little funding, I am confident that the strategy will persuade the BOPE and OPI to adopt a quality set of EE goals and objectives.

Many of the actions proposed in this Chapter have been successfully implemented by other states with only limited funds. For example: (a) Wisconsin spent less than $3000 to build support for mandated pre-service training for teachers (Wilke 1985); (b) Wyoming spent only $2500 to assemble a fifty member EE task force and design their EE goals (Bill Futrell, telephone conversation, 25 June 1992); and (c) Vermont spent only $5000 to develop draft EE guidelines for science and math (Alan Kousin, telephone conversation, 18 June 1992).
Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has.

Margaret Mead
APPENDIX A

STATE-BY-STATE REVIEW

Arizona

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In June 1990, Arizona passed legislation that requires public schools to integrate EE into the K-12 curriculum (Kristina Allen, telephone conversation, 18 June 1992). Subsequently, a governor appointed task force produced the Comprehensive Plan for EE (Governor’s Task Force on EE 1992) in January of 1992. The plan contains a "Framework for Environmental Literacy" that organizes fundamental principles of EE within five broad categories: (1) awareness and appreciation; (2) ecological systems and interrelationships; (3) culture and society; (4) resource, resource management, and environmental issues; and (5) responsible action.

A committee composed of teachers, administrators, non-profit groups, and government officials formed in 1992 to design EE guidelines that illustrate how to integrate the "Framework for Environmental Literacy" concepts across the
K-3, 4-8, and 9-12 curricula. The Arizona Department of Education hopes to officially release these guidelines to local districts in April of 1993 (Kristina Allen, letter to author, 1 February 1993).

**California**

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Although EE is not mandated in California, 1970 EE legislation encourages public schools to teach principles of the human-environment relationship, and to help students "develop a healthy attitude of personal responsibility toward their environment" (California 1970, ch. 4, sec. 8705).

During the spring of 1990, the state issued a position statement to all public schools that summarizes their philosophy of EE and promotes three K-12 EE program goals. In support of these goals, the Department of Education is developing grade-specific materials for the following thematic areas: water, air, and energy resources; human, wildlife, and plant communities; marine resources and communities; and integrated waste management (U.S. EPA [1991]).
The Department of Education is also updating *Ekistics* (CA Department of Education 1973), a 1973 EE curriculum development guide that outlines a conceptual framework for grades K-6, 7-9, and 10-12. The revisions will make the curriculum guide more thematic in nature. Unfortunately, due to budget constraints, the Department of Education is presently unable to complete the revisions (Bill Andrews, telephone conversation, 22 June 1992).

**Hawaii**

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Hawaii does not require public school EE. However, in 1991, the HI Department of Education inserted EE guidelines into their recommended "Foundation Program Objectives" (EE Associates 1992). Program Objective X calls for the development of "global awareness, knowledge, and understanding", and Program Objective XI encourages teachers and students to "develop a concern for preserving and restoring our environment" (HI Department of Education n.d.).

Presently, the state is finalizing sub-objectives and learner outcomes for grades 3, 6, 8, 10, and 12 that address the broad program objectives in detail. The Department of

Iowa

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Iowa does not require multidisciplinary EE in the public schools, although 1977 legislation requires Iowa schools to include environmental awareness and resource reduction in science (EE Associates 1992).

Duane Toomsen, the state EE Consultant, is currently leading the effort to design a state EE curriculum development guide. The Iowa Department of Education organized a sixteen member advisory board and hired a full-time staff member to create the document (Duane Toomsen, telephone conversation, 18 June 1992).

A draft copy of the guide includes three general learner outcomes with multiple indicators. The outcomes encourage environmental knowledge, appreciation, and problem solving skills. A curriculum framework provides examples of how to integrate environmental themes and issues into the traditional subjects (IA Department of Education n.d.). Five pilot schools are testing materials proposed for the framework.
There will be no mandate backing the guidelines. However, the Department of Education may pursue some form of EE legislation after completing the curriculum development guide (Duane Toomsen, telephone conversation, 18 June 1992).

**Maryland**

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A 1989 Maryland Department of Education issued bylaw mandates that a multidisciplinary EE program be taught in public schools at least once in elementary, middle, and high school. The Department of Education includes required program and intermediate learner goals directly in the bylaw (MD State Department of Education 1989, Sec. .03).

EE related learner outcomes and indicators are also an integral part of the science and social studies (geography) sections of the 1992 Maryland School Performance Assessment Program (MD Division of Instruction 1992). For example, in the "Science Outcomes Model and Content Indicators" section, fifth grade assessment materials challenge students to:

- describe a local environmental problem,
- use their knowledge of science to make a decision about what they can do to address this problem,
- and devise and carry out a plan of action that addresses the local environmental problem.
Michigan

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Michigan has not passed any EE legislation, nor do they have an EE office or specialist within the MI Department of Education (EE Associates 1992). The state Board of Education did, however, approve an EE mission statement on March 10, 1992. According to the statement, the goal of Michigan EE is to develop an environmentally responsible citizenry by "empowering people, individually and collectively, to address environmental issues, whether they live in urban, suburban, or rural communities" (MI State BOE 1992).

The Department of Education submitted the mission statement to local school districts in 1992, accompanied by highlighted portions of the 1991 Model Core Curriculum Outcomes (MI State BOE 1991) that identify where the state has integrated EE outcomes into science, social studies, physical education and health, life management, and cultural and aesthetic awareness.
Minnesota

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Minnesota passed legislation in 1990 that established an Office of EE within their Department of Education, and outlined seven broad EE goals. Also in 1990, the state BOE required integration of EE into all K-12 courses, and adopted five of the seven goals from the EE act (Charlotte Shover, telephone conversation, 22 June 1992).

The newly established Office of EE assembled a twelve member writing committee and thirty-four member review team to produce the 1991 curriculum guide, *Model Learner Outcomes for EE* (MN Department of Education 1991). The guide presents learner outcomes for each of the five K-12 program goals, and outlines a general framework for sequencing the learner outcomes.

The EE Office is currently developing model curricula and teacher in-service programs based on these learner outcomes and mandated program goals (Charlotte Shover, telephone conversation, 22 June 1992).

New York

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New York public schools are not required to teach EE, and the New York Department of Education does not endorse interdisciplinary EE learner goals. However, the New York Department of Environmental Conservation promotes a set of goals and fundamental principles for natural resources education. The five sub-goals and twenty-one principles call for elementary students to develop knowledge, skills, and attitudes that will result in "a commitment to informed decisions and responsible actions" toward wildlife and the environment. More recently, the Department of Environmental Conservation has designed materials and lesson plans to assist teachers with implementation of these goals (Pomerantz 1991).

Pennsylvania

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Since 1985, EE has been one of ten core program areas required in Pennsylvania. On May 14, 1992, the state BOE adopted legislation requiring that schools teach EE using active learning experiences. Students must also receive a

1Using the classification system adopted for this study (Table 1), the sub-goals are actually program goals.
planned EE course in both middle and high school (Patricia Vathis, telephone conversation, 23 June 1992).

Section 5.202 of the legislation mandates broad learner outcomes\(^2\) for each of the ten program areas, including EE (PA State BOE 1992). Draft "exit outcomes" (sub-objectives) were subsequently written to focus the broad learner outcomes into a K-3, 4-6, 7-9, and 10-12 framework. When adopted, schools will be required to develop specific outcomes in accordance with these exit outcomes.

The state plans to update their 1985 K-12 "EE Scope and Sequence" after the official adoption of the outcomes (Patricia Vathis, telephone conversation, 23 June 1992).

**Tennessee**

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EE in Tennessee is administered through Project CENTS (Conservation Education Now for Tennessee Students), a joint office of the Tennessee Department of Education, Department of Resources and Conservation, Conservation League, and Wildlife Resources Agency.

\(^2\)Using the classification system adopted for this study (Table 1), the learner outcomes are actually program goals.
Recent legislation mandated that Tennessee's core curriculum requirements be rewritten. The resulting BOE guidelines mandated that EE be one of the thirteen major required program areas (Cindi Smith-Walters, telephone conversation, 26 June 1992). Subsequently, learner objectives for EE were incorporated into the 1991 Tennessee K-8 Curriculum Frameworks (TN State Department of Education 1991) as a separate "Environment" strand. The framework outlines intermediate level objectives for each grade level.

Washington

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In August 1990, the Washington Code was amended, making EE a mandatory area of study in the public schools. The legislation requires that schools provide interdisciplinary EE at all grade levels, with an emphasis on solving environmental problems (EE Associates 1992).

The state may require local districts to meet EE guidelines in the future, however districts are presently responsible for developing their own program goals and objectives. To assist schools, the Department of Education published EE Guidelines for Washington Schools (WA Division of Instructional Programs and Services 1987), a curriculum guide that outlines a model framework of K-12 program goals,
sub-objectives, and learner outcomes. The document recommends that local districts design their instructional objectives around the following core themes: air quality; water quality; soil and land use; plants, food, and fiber; human populations and society; wildlife and domestic animals; minerals, energy, and resource recovery; aesthetics and the built environment; and environmental hazards. The WA Office of EE hopes to update the 1987 curriculum guide sometime in 1993 (Tony Angell, note to author, December 1992).

**Wisconsin**

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1985 state legislation mandated that districts integrate EE objectives and activities across the curricula, with the greatest emphasis in art, health, science, and social studies (EE Associates 1992).

Also in 1985, the Department of Public Instruction issued *A Guide to Curriculum Planning in EE* (WI Department of Public Instruction 1985). The document has served as a model for a number of states designing their own EE guidelines including Arizona, Minnesota, Iowa, Wyoming, and Washington.
Rather than developing their own unique set of EE goals and objectives, Wisconsin chose to adopt nationally recognized guidelines. For example, the guide endorses the superordinate goal of Hungerford, Peyton, and Wilke (1980), the five broad Tbilisi conference objectives (UNESCO 1978), and a set of fundamental EE principles based on a 1976 Federal Interagency Committee on Education report. Supplemental curriculum development materials provide a conceptual structure recommending the appropriate grades for elements of the framework to be introduced, reinforced, developed further, and applied.

Wisconsin is currently moving toward state-wide educational goals and learner outcomes. EE goals and outcomes will be part of the new state education standards, although it is not known whether they will be included as a separate section or integrated throughout the traditional subjects. The EE goals/outcomes, when adopted, will be incorporated into an updated version of the 1985 curriculum planning guide (Dennis Yockers, telephone conversation, 29 June 1992).
Wyoming

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Wyoming has no state EE mandate and no EE specialist in their Department of Education. However, with support from the Department of Education Science/Math Coordinator and the Wyoming Outdoor Council, the state organized a fifty member volunteer EE Task Force to design a set of K-12 EE goals and learner outcomes. After drafting the standards, the Task Force invited a wide range of groups and concerned individuals to comment on the goals and outcomes. The standards were then modified to address as many comments as possible. The state sent approximately 11,000 copies of the final product, Learner Outcomes for Environmental Literacy (WY Environmental Education Task Force 1991), to elementary, intermediate, secondary, and university educators in December 1991. A strong letter of endorsement from the Superintendent of Public Instruction and University of Wyoming president accompanied the guidelines (Donn Kesselheim, telephone conversation, 25 June 1992).
APPENDIX B

INTERVIEW QUESTIONS

1. How would you define environmental education (EE)?

2. Where do you think EE belongs in the public school curriculum? What grades and what subjects?

3. What is your understanding of the current state of EE in Montana's K-6 public schools? Is it being taught by a sufficient number of teachers throughout the state? Is it being taught in the appropriate grades and subjects?

4. What organizations, agencies, or schools do you respect for promoting quality EE programs in Montana?

5. To the best of your knowledge, what has (respondent's group or school system) done during the past decade to encourage EE in the (public schools or classroom)?

6. Specifically, what factors do you think have discouraged (respondent's group or school system) from placing a higher priority on promoting EE in the (public schools or classroom)?

7. Do you envision (respondent's group or school system) being receptive to public school EE initiatives during the next five years? To what extent?
8. Question for teachers and principals: What do you need to get good EE into your school system? What one or two things would help the most? Question for organization, state agency, and Great Falls public school representatives: What do you believe is needed to get good EE into the public schools? What would help the most?

9. To what degree should the BOPE and OPI encourage EE efforts in the elementary and middle schools? What is the ideal level of state involvement?

10. A number of states either mandate, recommend, or endorse EE learner goals and objectives for their school districts. Why do you think that Montana has not yet adopted similar goals and objectives?

11. Do you feel that learner goals in EE could be successfully incorporated into the MT Accreditation: Standards and Procedures Manual?

   If no: Why not? Would you look favorably upon EE learner goals endorsed by the state, but not required for accreditation?

   If yes: what issues do you think need to be addressed or resolved for the BOPE to seriously consider such a proposal?

12. What factors might encourage (respondent’s group or school system) to endorse or support a set of EE learner goals and objectives?
APPENDIX C

SAMPLE STATE GOALS AND OBJECTIVES

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<th>State</th>
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LEARNER OUTCOMES
FOR
ENVIRONMENTAL LITERACY

Rationale

"It is difficult to conceive of anything much more basic about which to become educated than an understanding of how the systems of life function and how we humans fit into them."

Charles Roth

An environmentally literate person

-- has a working knowledge of those cross-disciplinary concepts pertaining to the sustainable use of an environment hospitable to the diversity of Earth’s species, including man. (Goal I)

The student will:
1. . . . demonstrate a working knowledge of the basic resources of air, water and soil, their properties and the dynamics of their interaction with the rest of the living and non-living environment.
2. . . . understand the dynamics of human population growth, inferring future population fluctuations and their likely impact upon the environment.
3. . . . understand the relationship between beliefs, political structures, and environmental values of various cultures.
4. . . . demonstrate knowledge of an environmental issue influenced by political, educational, economic and governmental institutions.
5. . . . comprehend human dependence upon the utilization of natural resources for the satisfaction of such basic needs as food, shelter and clothing.
6. . . . understand and value the roles undertaken by agriculture, by business and industrial organizations, and by different levels of government in converting natural resources such as grass, minerals and trees to forms suitable for human use.
7. . . . recognize that technological growth, which can have both positive and negative consequences, is exceeding our understanding of its impact upon the environment.
8. . . . explain how conservation practices affect natural resources.
Learner outcomes for environmental literacy

seeks to expand direct human experience with the natural world, to satisfy an insatiable curiosity about “how things work.” (Goal II)

The student will:
1. . . . exhibit a preference for “hands-on” contact with his or her natural environment, for discovery, recreation and personal enrichment.
2. . . . experience and describe the aesthetic value of nature.
3. . . . understand that humans are a part of nature, not separate from it.
4. . . . engage in the reading of current and historic literature written by important authors in natural history and conservation.
5. . . . possess skills in conducting formal and informal research investigations in ecology and natural history.
6. . . . demonstrate affective and cognitive skills in documenting personal experiences through the use of writing and sketching.

understands and values natural systems; comprehends that all life is connected, and that, before any part of an ecosystem is changed, the impact of the change on the ecosystem and the biosphere must be considered. (Goal III)

The student will:
1. . . . understand that the biosphere is a dynamic system.
2. . . . demonstrate a working knowledge of what an ecosystem is and how it functions. More specifically, s/he will
   a. . . . demonstrate an ability to trace the flow of energy through an ecosystem.
   b. . . . demonstrate knowledge of the roles of producers, consumers and decomposers in ecosystems.
   c. . . . describe a food chain, including interdependency and its consequences.
   d. . . . understand that humans affect ecosystems, and ecosystems affect humans.
3. . . . define pollutants, and describe the effects of increased levels of pollution upon an ecosystem.
4. . . . describe how manipulating habitat affects animal populations.
Learner outcomes for environmental literacy

-- thinks critically about environmental issues, communicates effectively about them, and is motivated to help resolve them. (Goal IV)

The student will:
1. . . . have the capacity to make useful predictions, based upon available data.
2. . . . work cooperatively in groups for the accomplishment of a goal.
3. . . . prioritize environmental problems, on the basis of their present and likely future impact.
4. . . . predict and evaluate the consequences of alternative decisions producing environmental change.
5. . . . understand that both action and inaction affect the outcome of environmental issues.
6. . . . analyze how the economic values held by individuals, companies, and communities influence final decisions.
7. . . . analyze the influence of mass media in shaping perceptions of the environment.
8. . . . establish and defend a position on an environmental issue.

-- is committed to the continuing development and application of a sustainable land ethic. (Goal V)

The student will:
1. . . . describe generally accepted elements of a high quality environment.
2. . . . compare, contrast, and evaluate responsible and irresponsible use of our natural resources.
3. . . . comprehend the intent of an environmental law and the public policies derived from it.
4. . . . identify and understand the role of resource agencies in enhancing the environment.
5. . . . demonstrate stewardship practices that show respect for the earth and its living things.
6. . . . justify treating public and private property with equal regard.
7. . . . clarify personal feelings about an environmental dilemma, by the selection and defense of a position.
8. . . . plan and implement an activity that enhances environmental quality for a local area -- e.g., classroom, schoolground, home, neighborhood park.
9. . . . assess personal commitment to protecting the environment, by evaluating himself or herself as a role model.
**Minnesota Model Learner Outcomes for Environmental Education**

<table>
<thead>
<tr>
<th>STATE BOARD LEARNER GOALS</th>
<th>ENVIRONMENTAL EDUCATION LEARNER OUTCOMES</th>
<th>DEVELOPMENT AND CONCEPT EMPHASIS</th>
</tr>
</thead>
</table>

**Program Goal A:** Learners should understand ecological systems.

**Contexts:** Natural, Social

The learner will be able to:

A, B, C.5  

1. Demonstrate knowledge of the basic concept of an ecosystem, its components, and physical factors;  

B.11  

2. Trace a flow of energy through an ecosystem and demonstrate knowledge of the roles of producers, consumers, and decomposers in ecosystems;  

A, C.5  

3. Demonstrate knowledge of cycles in the biosphere;  

A, C.5  

4. Identify a living organism characteristic of a particular ecosystem and describe why it is found there;  

A, D.2  

5. Describe an interdependency that occurs in the environment;  

A, C.2, C.5  

6. Describe an environmental change and give a consequence;  

B.7  

7. Recognize humans as an integral part of the natural world influenced by natural processes;  

A, B.7, D.3  

8. Describe a relationship between an ecological and sociological or political system.
<table>
<thead>
<tr>
<th>STATE BOARD LEARNER GOALS</th>
<th>ENVIRONMENTAL EDUCATION LEARNER OUTCOMES</th>
<th>DEVELOPMENT AND CONCEPT EMPHASIS</th>
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</thead>
<tbody>
<tr>
<td>Program Goal B: Learners should be provided with experiences that will assist in the development of personal appreciation, sensitivity, and stewardship for the environment.</td>
<td></td>
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<tr>
<td><strong>Contexts</strong>: Social, Valuing, Action</td>
<td></td>
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<tr>
<td>The learner will be able to:</td>
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</tbody>
</table>

1. A, C.5: Appraise and give examples of diversity in nature; **Applying**

2. B.3, B.4, B.6: Differentiate appetite (I like), knowledge (I know), influence ethics (I judge), morals (I act), desire (I want), and necessities (I need), relative to environmental issues; **Applying, Integrating, Affective**

3. C: Differentiate between waste and resource; **Knowing, Applying**

4. A, B.6: Demonstrate an understanding of precycling, reducing, reusing, and recycling of resources; **Applying, Integrating**

5. D.2: Understand the bonding process between humans and other living things; **Knowing, Applying**

6. D.3, E: Understand the relationships between beliefs, political structures, and environmental values of various cultures; **Applying, Multicultural, Gender Fair**

7. E: Describe some cultural differences and their influence on the environment; **Integrating, Multicultural**

8. E: Evaluate an argument where economic and cultural interests either contradict or enhance aesthetic or environmental concerns; **Integrating, Multicultural**

9. E, F.1, F.2, G: Work cooperatively in groups toward the accomplishment of a goal; **Applying, Affective**

10. A, C.3, C.5, C.8: Identify and evaluate the multiple uses of a resource or site; **Knowing, Applying, Integrating**

11. C.3: Analyze the influence of the mass media on shaping perceptions of the environment; **Integrating**
B.6  12. Develop a sense of place—recognize the inherent value of a location—without comparison to other environments;  
    Applying Integrating Affective

B.6  13. Express personal perceptions of a place or event that demonstrate an appreciation of the environment;  
    Applying Integrating Affective

H  14. Investigate the environmental history of a site;  
    Applying

C.3, J.2  15. Assess his or her personal commitment to the environment;  
    Integrating

L3, L.1, L.5  16. Develop outdoor recreational skills and ethics.  
    Applying Psychomotor Disability Awareness

Program Goal C: Learners should understand the cause-and-effect relationship between human behavior, attitudes, and the environment.

Context: Natural, Social, Valuing, Action

The learner should be able to:

B.14, C  1. Describe the concept of human population growth and infer future population fluctuations;  
    Knowing Applying

B.14, H.1  2. Identify and analyze the way in which the environment affected the distribution of humans historically;  
    Integrating

A, C.5  3. Describe how modern agriculture and technology affect the land and water;  
    Knowing Applying

D.2  4. Describe how manipulating habitat affects plant/animal populations;  
    Knowing Applying

D.2  5. Analyze and relate ways in which environmental problems are caused by unforeseen consequences of human actions;  
    Integrating

B.6  6. Demonstrate knowledge of the renewability of natural cycles and the need for establishing sound resource use policies;  
    Knowing Applying

C, D.2, K.3  7. Identify those resources subject to overuse, misuse, or change, resulting from human intervention in the natural environment;  
    Applying
### Program Goal D:

Learners should analyze, develop, and use problem-solving skills to understand the decision-making processes of individuals, institutions, and nations.

Contexts: Natural, Social, Valuing, Action

The learner will be able to:

<table>
<thead>
<tr>
<th>A, D, F.2</th>
<th>1. Describe the roles of citizens in policy formation.</th>
<th>Knowing</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>STATE BOARD LEARNER GOALS</th>
<th>ENVIRONMENTAL EDUCATION LEARNER OUTCOMES</th>
<th>DEVELOPMENT AND CONCEPT EMPHASIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, C</td>
<td>8. Describe and analyze environmental threats and hazards after considering all the available information;</td>
<td>Applying Integrating</td>
</tr>
<tr>
<td>A, C.5</td>
<td>9. Define pollutants and describe the effects of varying levels of pollutants on the environment;</td>
<td>Knowing Applying</td>
</tr>
<tr>
<td>A, C.5</td>
<td>10. Understand the concept of exported/imported pollution, e.g., smokesacks, watersheds, and weather systems;</td>
<td>Applying International</td>
</tr>
<tr>
<td>D.2, D.3</td>
<td>11. Explain a short-term and long-term effect of an environmental action on human social systems;</td>
<td>Applying Integrating</td>
</tr>
<tr>
<td>C</td>
<td>12. Describe and evaluate management alternatives that help preserve the earth’s finite natural resources;</td>
<td>Integrating</td>
</tr>
<tr>
<td>B.4, B.6</td>
<td>13. Describe how his or her own values influence personal use of resources;</td>
<td>Integrating Affective</td>
</tr>
<tr>
<td>B.6, D.2</td>
<td>14. Propose a human social system in harmony with the environment;</td>
<td>Integrating</td>
</tr>
<tr>
<td>A, B.9, M</td>
<td>15. Explore the career/life paths that directly or indirectly imply involvement in making decisions about the environment;</td>
<td>Knowing Applying</td>
</tr>
<tr>
<td>B.1</td>
<td>16. Demonstrate an environmental service to the community and understand that this is a lifelong process.</td>
<td>Knowing Applying Integrating Multicultural Disability Awareness</td>
</tr>
</tbody>
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<tbody>
<tr>
<td>C.1, C.2</td>
<td>2. Identify and evaluate the central issue and policies in an environmental dispute;</td>
<td>Knowing Integrating</td>
</tr>
<tr>
<td>C.3</td>
<td></td>
<td>Multicultural International Gender Fair Disability Awareness</td>
</tr>
<tr>
<td>E, F</td>
<td>3. Describe how a decision made at a local level can affect distant communities nationally and internationally;</td>
<td>Knowing Integrating Multicultural International</td>
</tr>
<tr>
<td>B.3</td>
<td>4. Identify and analyze examples of the influence of beliefs and values on environmental decisions (e.g., family, peer, school, community, national, and international);</td>
<td>Knowing Integrating</td>
</tr>
<tr>
<td>D.3</td>
<td>5. Identify the relationship between political and economic power and environmental decisions;</td>
<td>Applying</td>
</tr>
<tr>
<td>B.2, D.3</td>
<td>6. Demonstrate knowledge of an environmental issue influenced by political, educational, economic, and governmental institutions;</td>
<td>Applying</td>
</tr>
<tr>
<td>A, E</td>
<td>7. Recognize the inequity of resource distribution and how it affects diplomacy;</td>
<td>Knowing Integrating</td>
</tr>
<tr>
<td>A, B.8</td>
<td>8. Demonstrate knowledge of some effects of technology on the environment;</td>
<td>Applying</td>
</tr>
<tr>
<td>A.4, A.6, C.1, C.2, C.3</td>
<td>9. Describe the influence of science, technology, and communications on individual and institutional decision making;</td>
<td>Knowing Applying Integrating</td>
</tr>
<tr>
<td>C</td>
<td>10. Identify a trend and infer the environmental consequences;</td>
<td>Knowing Integrating</td>
</tr>
<tr>
<td>C, E</td>
<td>11. Contrast the advantages and disadvantages of short-term and long-term solutions to an environmental dilemma;</td>
<td>Integrating</td>
</tr>
<tr>
<td>D.3</td>
<td>12. Identify agencies/interest groups/local, national, international concerns that would need to cooperate to ensure the success of a specified environmental plan;</td>
<td>Multicultural International</td>
</tr>
<tr>
<td>F</td>
<td>13. Suggest some constructive ways of resolving an environmental conflict;</td>
<td>Applying</td>
</tr>
<tr>
<td>B.4, B.6</td>
<td>14. Give examples of his or her own positive and negative personal impacts on the environment;</td>
<td>Affective</td>
</tr>
</tbody>
</table>

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<tr>
<td>B2</td>
<td>15. Use political processes to gain support for a position.</td>
<td>Applying</td>
</tr>
</tbody>
</table>

Program Goal E: Learners should evaluate alternative responses to environmental concerns or issues before deciding on a course of action or no action.

Contexts: Valuing, Action

The learner will be able to:

- **C, E, J.6**
  - 1. Identify at least two alternatives for dealing with an environmental dilemma. Evaluate the consequences of each alternative, and select and defend a position; Knowing
  - Integrating
  - Affective

- **C, K.3, K.6**
  - 2. Decide which environmental topics are most important in the world today and predict which will remain important/grow in importance/diminish in importance in his or her lifetime; Applying
  - Integrating
  - Multicultural
  - International

- **B.3, C, J**
  - 3. Evaluate reasons to participate or not participate in an environmental activity in the home, school, or community; Integrating
  - Affective

- **B.4, B.6 C, J.6**
  - 4. Analyze and describe personal feelings about an environmental dilemma. Select and defend a position. Integrating
  - Affective
MARYLAND STATE DEPARTMENT OF EDUCATION
ENVIRONMENTAL EDUCATION BYLAW

.01 Program.
Each local school system shall provide a comprehensive, multi-disciplinary program of environmental education within current curricular offerings to be taught at least once in the early, middle, and high school learning years.

.02 Purpose.
The purpose of this environmental education program is to enable students to make decisions and take actions that create and maintain optimal relationship between themselves and the environment, and to preserve and protect the unique natural resources of Maryland, particularly those of the Chesapeake Bay and its watershed.

.03 Goals.
The following environmental education goals and subgoals should be incorporated in local school system curricular offerings:
A. Understand and value the diversity and interdependence of the biological and physical environment, which includes to:
   (1) Observe and investigate the biological and physical environment,
   (2) Understand that plants and animals that use the environment to satisfy their needs are linked with biological and physical components of their environment,
   (3) Understand that people have a powerful impact on and responsibility for environmental conditions,
   (4) Recognize that as human population increase, its impact on the environment becomes more pronounced;
B. Understand and value the interdependence between the environment and our health, economy, and culture, which includes to:
   (1) Participate in activities that demonstrate the relationship between personal health and the quality of the environment,
   (2) Recognize that a viable economy is dependent on responsible use of natural resources,
   (3) Understand that impact of interaction of culture and technology on the use and alteration of the environment,
C. Understand and value how aesthetic experiences provide insight and enrich interactions with the environment, which includes to:
   (1) Develop an understanding of the aesthetic qualities that exist in the environment,
   (2) Develop the skills and sensitivities to apply aesthetic criteria to environmental concerns,
   (3) Develop the ability to formulate, apply, and communicate personal aesthetic criteria for assessing environmental issues.
D. Develop and apply their knowledge and skills to protect and sustain environmental quality, which includes to:
   (1) Understand how individual decisions and actions impact the environment,
   (2) Apply knowledge of environmental concepts to patterns of personal behavior and choice,
   (3) Apply responsible decision-making to home-related activities impacting the environment,
   (4) Explore and evaluate careers in the environmental field;
E. Develop and apply knowledge and skills at the community level for cooperative action to protect and sustain the environment, which includes to:
   (1) Understand how cooperation among communities (including citizens, businesses, interest group, governmental agencies, and others) is essential to maintain and improve the environment,
   (2) Work with others in groups and organizations to maintain and improve the environment.

.04 Certification Procedures.
By September 1, 1990, and each 5 years after, each local superintendent of schools shall certify to the State Superintendent of Schools that the comprehensive programs of environmental education meets, at a minimum, the requirements set forth in Regulations .01 and .03. This certification shall describe how the regulations are being met at each learning level in accordance with reporting standards developed by the Department of Education.
APPENDIX D

PERSONAL COMMUNICATIONS CITED


Cunningham, Kurt, Youth Education Coordinator, Montana Department of Fish, Wildlife, and Parks. Interview by author, 4 August 1992.


LaCounte, Marlene, President, Montana Council of Teachers of Social Studies. Telephone interview by author, 6 August 1992.


Thomas, Bill, Chairman, Montana Board of Public Education. Interview by author, 7 July 1992.


Yockers, Dennis, Environmental Education Consultant, Wisconsin Department of Public Instruction. Telephone conversation, 29 June 1992.
REFERENCE LIST


Iowa Department of Education, Bureau of Instruction and Curriculum n.d. [Draft effective learner outcomes and curriculum framework for environmental education]. Iowa Department of Education, Des Moines, IA. Photocopy.


Van Matre, Steve. 1990. Earth education... a new beginning. Warrenville, IL: The Institute for Earth Education.


