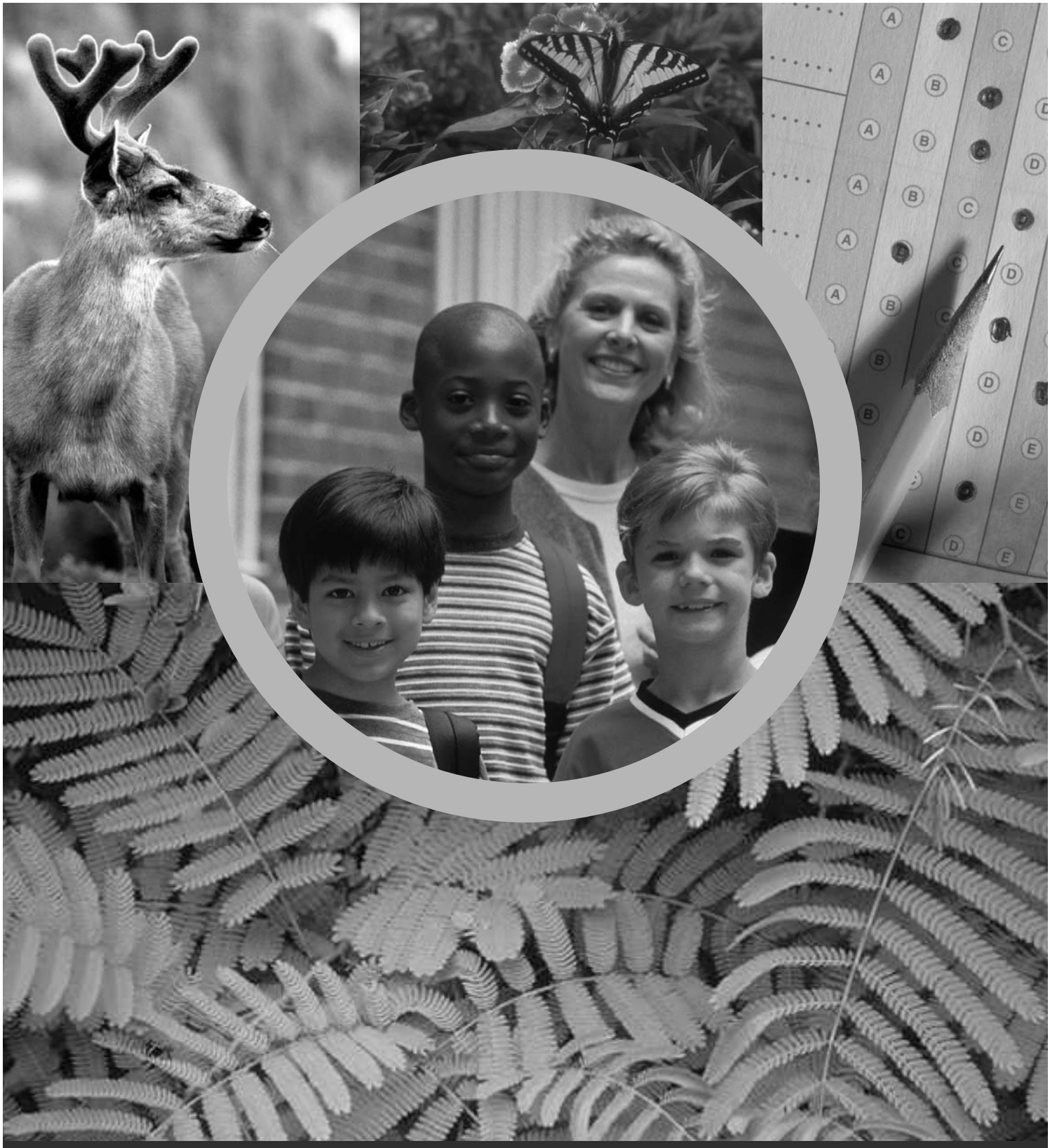

Project WILD®

A Summary of Research Findings
1983 - 1995 and 1996 - 2003

A Summary of Research Findings 1983 – 1995 and 1996 – 2003

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Introduction

Project WILD addresses the critical need for individuals to appreciate and understand the complexity and importance of wildlife and environmental issues and the connections to individual actions and choices. Since its beginning in 1983, Project WILD has been committed to producing quality environmental education materials and programs that meet the needs of both its sponsors and classroom teachers across the United States. The conceptual framework for Project WILD was developed through a rigorous process to ensure its accuracy, balance, and educational validity.

It was critiqued and reviewed by more than 500 professionals. Materials for the Project WILD activity guides were written by teachers, school administrators, university faculty members, wildlife professionals, and representatives of private environmental, youth, community, and conservation groups. These materials were then reviewed by scientists, curriculum specialists, and environmental experts for content accuracy, educational soundness, and balance. The materials and their activities were pilot tested by classroom teachers to ensure that stated instructional objectives were met, to evaluate grade level appropriateness, and to assess the quality of the activity and student involvement.

To maintain the standard of excellence established in its development stage, to continue to be implemented in increasing numbers of classrooms, and to effectively meet its goals and the goals of its sponsors, Project WILD has undergone regular evaluation and assessment. Research on Project WILD materials, workshops, programs, outreach, implementation, and effectiveness has been conducted by the National Project WILD office, Project WILD sponsors, and various other researchers. In response to research findings, education reform, and feedback from sponsoring state agency Directors, Project WILD Coordinators, facilitators, WILD trained educators, and others in the environmental education field, the WILD guides and training programs are regularly revised and updated. In addition, completed research is used to inform future research needs.

The Purpose of This Report

This report summarizes two groups of Project WILD research. The first set of research was conducted 1983–1995, and the second set was conducted from 1996–2003. This report is not an evaluation in and of itself, but rather it provides a summary of other evaluations, both national and state-specific. Nothing is reported here that has not been fully documented and supported in the original studies. For example, any finding stated as significant is a recap of the conclusions drawn by the original researchers and is presented as a significant finding in those reports, and is not an analysis made specifically for this summary.

The research cited in this report represents a variety of research strategies from short-term to long-term, from quantitative to qualitative, and from within a single classroom to a national study. Methods of study include personal interviews, focus groups, phone surveys, mail surveys, and questionnaires distributed at Project WILD workshops. The studies used in compiling this summary (28 from 1983–1995; 11 from 1996–2003) are listed at the end of the report. A brief statement of purpose, methodology, and audience is given for each.

Summary of Findings

1996–2003

Research from this period supported previous research and indicated that educators consistently rate the Project WILD program very highly, and that they consider Project WILD to be effective, easy to implement, and easy to adapt. Recent research also supports the findings of previous research indicating that users of Project WILD tend to have a strong personal interest in and a commitment to wildlife and wildlife issues, and perceive that Project WILD helps their students understand environmental issues, see many sides to environmental issues, and learn environmental and conservation behaviors.

Research that focused on student gains as a result of Project WILD indicated that the use of Project WILD has a positive impact on student attitudes toward wildlife, learning occurred as a result of using Project WILD, and that Project WILD was successful in helping to meet the objectives of content standards. Teachers reported that their students were enthusiastic and very engaged when participating in Project WILD activities.

In order to inform increased and broadened outreach, studies were conducted that focused on the Project WILD audience. Results indicated that the main audience continues to be elementary school students. The program is essentially used with students between the ages of 7–12, and use diminishes with students above the age of 15. However, results also showed an increase in workshop participation by pre-service and urban educators.

In general, research from this period indicated that the Project WILD program continues to be a strong and valuable part of environmental education today. It also indicated that many of the recommendations that came from earlier research were valuable in updating and revising the program and in increasing program outreach.

The research also provided insights into areas of focus for future Project WILD efforts and study. Educators continue to express concerns about the lack of available time for the use of Project WILD, which may be addressed by providing them with assistance in finding ways to integrate Project WILD into their existing curriculum and by providing them with correlations to state and local standards along with assistance in learning how to use the correlations and Project WILD activities to help meet standards. In addition, research indicated that a more sustained relationship with facilitators may have positive effects on the use of Project WILD materials, and that teachers would like sustained contact with facilitators, increased support from school administration, on-site Project WILD training, and a support network of other educators, environmental education experts, and community resource personnel.

1983–1995

Research from this period showed that Project WILD experienced a high level of success in developing quality programs, supporting their implementation, and affecting the level of teacher and student education about wildlife and the environment. Also, since the beginning, Project WILD has responded to evaluation findings and has made adjustments and advances in materials development, workshop content, increased workshop offerings, and a focus on action and support for student action projects. Project WILD also responded to the call for additional and topic specific workshops, and many states are now offering workshops on elk, habitat, action, and state-specific topics.

In planning for the future, several areas of focus emerged. Many educators were still not aware of Project WILD, or attending workshops and/or using the materials. This may have stemmed from state-wide implementation plans that had not been in place long enough to serve all educators within the states, especially in a few states where Project WILD had not been actively sponsored for many years. Or, it may have indicated that Project WILD needed to enhance its outreach and marketing efforts. In addition to indicating a need to add to the number of Project WILD trained teachers, the research indicated a particular need for outreach to teachers who do not have a personal interest in the environment.

Results from this evaluation period suggested that materials, including the activity guides and supplementary materials may require revisions and/or additions based on the needs expressed by educators. In addition, studies suggested that the development and production of new materials may be warranted, and that workshops may need revisions or enhancements based on content, length, and frequency. This included the initial workshop and possible follow-up and specialized topic-specific workshops. The needs expressed by educators suggested that changes include a focus on new directions, materials, and workshops, and that there is a need for Project WILD initiatives such as the *Action Grant Program* or *WILD in the City*.

The research on Project WILD during this period gave clear indications about outreach, materials, workshops, and specific projects. However, these indications were primarily related to the research that focused on program evaluation. The research on outcome evaluation was not as clear. This is due, in part, to the difficulties in measuring outcomes based solely on the use of Project WILD. The research on the effectiveness of Project WILD is limited and mostly anecdotal. This does not mean that research along with anecdotal evidence does not give an indication of the success of Project WILD. Connections *can* be drawn among Project WILD, an interest in and concern for the environment, and positive environmental actions and behaviors. The difficulty lies in drawing causal relationships. Based on research from this period and the anecdotal evidence, there was adequate support to conclude that Project WILD was successful in achieving its goals and objectives.

Educator Awareness of Project WILD

1996–2003 Findings

Regardless of its quality, if teachers aren't aware of Project WILD and don't participate in the workshops and use the materials, it cannot be a success. Most Project WILD studies were aimed at measuring the quality and effectiveness of Project WILD's workshops and materials, and therefore most of the research focused on teachers who were already aware of the existence of Project WILD. Very few previous and recent studies used an experimental design that assessed a general population of teachers to specifically indicate an awareness of the program. In response to findings from the earlier set of research, several studies were conducted to learn more about the Project WILD audience. A clearer understanding of who is likely to choose to attend Project WILD workshops is valuable in developing outreach strategies—both to the current audience demographic and in an attempt to reach new audiences. The latest findings on Project WILD audiences are reported in "Audience—Current Uses and Appropriate Audiences for Project WILD" on page 11. In recent years, Project WILD has drawn on previous research and broadened its

outreach efforts to a variety of audiences including expanded efforts to reach pre-service educators, outreach to urban educators through its *Wild in the City* program, and outreach to birders through its *Flying Wild* program.

1983–1995 Findings

In a random survey of all teachers in North Dakota in 1992, approximately one-third had received Project WILD training and materials. Also, a study was conducted of aquatic resource educators in New Mexico to determine awareness of materials and programs of the New Mexico Department of Game and Fish. It was found that knowledge of the department's program varied widely, however of the teachers who used New Mexico Department of Game and Fish materials, Project WILD was listed as their primary source of information on aquatic wildlife topics and as the material they used most (Shaw, 1993). A report from the Washington Department of Wildlife indicated that Project WILD provided the best "window" for teacher access to the materials and resources of the agency itself (Tudor, 1992). A 1992 survey in New Jersey showed that teachers learned about Project WILD from environmental education centers, teachers' union magazines, their school or board of education, and mailings from the N.J. Division of Fish, Game, and Wildlife (Dunne, 1992).

Several surveys of Project WILD users reported that teachers indicated a need for increased promotion of the program (Young, Thompson, & Thompson, 1995; Fleming, 1991; Standage Accureach, 1990; Farnsworth, 1989). This may have shown that these Project WILD trained teachers either had difficulty learning about the program themselves, or that they were aware of a large number of other teachers who were not aware of Project WILD. Finally, based on statistics reported by state sponsors and published by the National Project WILD office each year, it was clear that the number of teachers exposed to Project WILD continued to grow each year. But, based on the number of classroom teachers in the U.S., it was also clear that there was a large untapped market of potential Project WILD educators, which had implications for the marketing of the program.

Why Participants Choose to Attend Project WILD Workshops

1996–2003 Findings

In order to tap the pool of potential participants, it is important to understand what motivates teachers to participate in Project WILD workshops. Recent research supported the findings of previous research and indicated that educators who use Project WILD tend to have a strong personal interest in and a commitment to wildlife and wildlife issues. Teachers choose to attend Project WILD trainings because they perceive that Project WILD helps their students understand environmental issues, see many sides to environmental issues, and learn environmental and conservation behaviors (Heimlich, 2002).

Teachers also indicated that the kinds of things that attract them to workshops include incentives, workshop structures, materials, and convenience. Responses from 51 Utah public school educators interviewed in focus groups indicated that resources, both human and material, were key in implementing a program and getting it to work. Responses also indicated that teachers feel that successful conservation education is learning that is action-based, provides real-world examples and experiences, and provides immediate application, and that student knowledge and awareness is a most important element in defining success

in conservation education. Research suggests that teachers believe that Project WILD meets these needs (Thompson & Thompson, 1996).

1983–1995 Findings

The primary motivation stated by participants (by a significant majority) for attendance at a Project WILD workshop was a personal interest in wildlife and the environment (Shomo, 1993; Gigar, 1993; Dunne, 1992; Bissell, 1992; Greene, 1992; Fleming, 1991). Teachers also attended in order to receive natural resource materials and activity ideas (Greene, 1992; Zosel, 1988). In many cases, teachers who attended Project WILD workshops had previously been to other environmental or environmental education workshops (over 80%—Jackson, 1994; 27.5%—Shaw, 1993; Zosel, 1988). Again, there were marketing implications in these findings that Project WILD considered as in future years: a portion of its outreach efforts focused on those educators who have received training in other environmental education programs.

What Participants Hope to Learn at Project WILD Workshops

1996–2003 Findings

No new research was conducted to specifically assess this topic, as the results from earlier research, as indicated below, showed that Project WILD does a good job of meeting the needs and expectations of teachers and workshop participants. And although it was not the specific focus of research, this conclusion was supported throughout much of the studies conducted from 1996–2003.

1983–1995 Findings

Teachers indicated they wanted to learn:

- concepts and strategies for instilling awareness, understanding, and an appreciation of wildlife, its habitat, and the environment in their students,
- methods for integrating Project WILD information, materials, and techniques across the curriculum,
- new activity ideas,
- to develop better teaching methods and find instructionally sound programs that inspire students, and
- to prepare students to make responsible decisions affecting people, wildlife, and the environment

(Jackson, 1994; Zosel, 1988, Smith, 1988; Cantrell, 1987; Cantrell, 1986; Charles, 1986; Yannone, 1985). The needs expressed by these educators were compatible with Project WILD's mission and goals and suggested that Project WILD's ability to fulfill these needs should be emphasized in outreach efforts designed to attract new teachers to the program.

Quality of Project WILD Materials and Project WILD's Approach to Wildlife and the Environment

1996–2003 Findings

Supporting the findings of previous research, recent research indicated that educators feel comfortable using Project WILD resources and that this comfort relates to the training, the ease of use of materials, and the adaptability of activities. Educators consider Project WILD to be effective, easy to implement, and easy to adapt (Heimlich, 2002).

Telephone interviews with 420 past participants in Nevada Project WILD indicated that almost all teachers found the curriculum guide to be useful, and they thought the activities were easy to understand. Benefits given for using Project WILD included "activities are easy for teachers to understand," "provides alternatives for class activities," "makes integrating wildlife into the classroom easier," "provides greater student understanding of wildlife issues," "integrates well with classroom activities," "fits well into the state curriculum," and "is very adaptable for any grade level" (Woo, 1998).

Teachers from 51 Utah public schools, interviewed in focus groups, praised a range of elements in Project WILD, including the program's overall design, workshop training, teaching manual, and ways in which the curriculum impacts students (Thompson & Thompson, 1996). In a survey of 452 current and former Project WILD users, educators complemented the hands-on nature of Project WILD activities (Korn & Associates, 2000).

1983–1995 Findings

Teachers consistently rated the Project WILD materials as excellent, useful, and effective in meeting their goals. An overwhelming majority stated they felt the guide increased their general knowledge of wildlife, increased their interest in environmental education, and provided activities appropriate for integration in the classroom (Shaw, 1993; Dunne, 1992; Tudor, 1992; Bissell, 1992; Standage Accureach, 1991; Cotten, 1990; Zosel, 1988; Yannone, 1985; Fleming, 1983).

In a 1991 study of Project WILD's impact on the students of exemplary teachers, Fleming found that teachers used Project WILD because it enabled them to teach what they were required to teach—it worked with their curriculum, and because it was a fun way for their students to learn. These teachers also appreciated its interdisciplinary nature and how Project WILD reflected their beliefs regarding the need for wildlife and environmental instruction. A needs analysis for *WILD in the City*, conducted in 1995, stated that users generally found the materials easy to use and adaptable to various time frames, activity sites, and different subject areas (Young, Thompson, & Thompson, 1995).

97% of survey respondents in a study in Iowa indicated that the *Project WILD Aquatic Guide* provided adequate background material to teach the activities to students, 98% indicated the manual was easy to understand, and 97% indicated it was easy to implement (Gigar, 1993). The 1995 *WILD in the City* needs analysis also echoed these findings (Young, Thompson, and Thompson, 1995).

Research showed that a majority of Project WILD participants shared their guides with one or more of their colleagues. This was another indication of the positive feelings teachers had about the materials (73%—Shomo, 1993; 65%—Tudor, 1992; 79.5%—Standage Accureach, 1990; 75%—Cantrell, 1986; 75%—Charles, 1986; 45%—Yannone, 1985).

In all studies where the question was asked, a strong majority of workshop participants agreed that Project WILD provides a balanced and fair approach to the study of wildlife and environmental issues (84%—Tudor, 1992; 98.7%—Standage Accureach, 1990; 79%—Baldwin, 1990; Cotten, 1990; 88%—Charles, 1986).

Quality of Project WILD Workshops

1996–2003 Findings

Each participant in a Project WILD workshop is asked to complete a participant survey form. In addition, follow up research is conducted with those who have been trained. Recent research conducted on this topic supported the findings of earlier research and indicated that educators believe that the training offered by Project WILD is of benefit to them in terms of time, cost, and classroom value (Heimlich, 2002). In a survey of 452 current and former Project WILD users, educators gave a high rating to the Project WILD workshops (Korn & Associates, 2000).

It may be important to remember that, as stated earlier, the majority of Project WILD workshop participants attend workshops based on personal interest and a commitment to the environment. For this reason, although the data on workshop quality is significant, it may be skewed, based on this "self-selecting" population of attendees. Recognizing this and based on the findings of earlier research, Project WILD increased its outreach efforts to new and broader audiences, such as in-service teachers fulfilling requirements for the teaching of environmental education, and conducted additional research on Project WILD audiences—both current and potential. (See "Audience—Current Uses and Appropriate Audiences for Project WILD" on page 11.)

1983–1995 Findings

According to an analysis of evaluation forms, 99% of Project WILD participants rated the workshops as either good or excellent. In fact, over 90% of the respondents in a 1990 national survey of use (Standage Accureach, 1990), 96% of Washington State respondents (Tudor, 1992), and 78% of Arizona respondents (Baldwin, 1990) agreed that Project WILD was one of their most valuable sources of support for teaching about wildlife and the environment. Teachers also agreed that the workshops were useful in helping them to implement Project WILD activities, and many participants encouraged others to attend (Tudor, 1992; Fleming, 1983; Standage Accureach, 1990; Charles, 1986).

Most teachers, when responding to general Project WILD surveys, even years after the date of their attendance at a workshop, recalled the workshop and evaluated it highly. Most comments that included suggestions for improvement were not critical of current practices, but rather made suggestions for additions to the program agenda (Zosel, 1988; Cantrell, 1987).

In a 1988 evaluation of teacher use of Project WILD, Zosel found that effective workshops:

- provide a maximum amount of time to practice teaching activities,
- provide a maximum amount of time in active participation in activities,
- provide an opportunity to develop a plan to use the new program within the teachers' curriculum,
- provide the opportunity to use the activities with students and then discuss their use with other teachers,
- provide follow-up communication and opportunities for future workshops, and
- are led by high quality presenters.

These findings were generally supported by research into the best practices in teacher development programs (*Designing Effective Workshops*—A Resource Manual from the

Environmental Education Toolbox; National Consortium for Environmental Education and Training; Braus & Monroe, 1994).

Rate of Implementation—Use of Project WILD Materials by Workshop Participants

1996–2003 Findings

Once educational materials have been developed, reviewed, and pilot tested, and teachers have been trained, a strong measure of success is whether or not teachers use the materials with their students. When 228 certified Project WILD, Project WILD Aquatic, or Project Learning Tree (the Projects) educators in Illinois were surveyed as to whether they had used the Projects since their certification workshop, 55% responded "Yes" (users), and 45% responded "No" (non-users). 56.8% of the participants indicated that they use Project activities two to three times per year, while only 30% use them at least seven times per year. The remaining 13% do not routinely use the activities (Paul, 1996).

Telephone interviews with 420 past workshop participants in Nevada Project WILD indicated that 20.5% of the teachers interviewed reported using Project WILD activities once a year or less, 37.5% use it once every few months, 32.0% use it once a month or a few times a month, and 8.6% use it once a week or more (Woo, 1998).

Most workshop participants use the activities with less than 41 learners per year. A higher usage was indicated in formal educational groups than in non-formal educational groups. Although a number of participants used the Project activities with more than one age group, the Projects were essentially used with students between the ages of 7–12. Data showed that after the age of 15, Projects are used a great deal less (Paul, 1996).

Although educators tend to use the activities from their training sessions, there are clear indicators that the educators do use other activities and supplemental resources in their use of the Project WILD program. The training programs provide educators with an overview of the materials and tools for accessing activities beyond those conducted during the training efforts (Heimlich, 2002). In general, educators use Project WILD as lessons within units, but do not infuse activities throughout the curriculum. Educators "clump" activities from Project WILD and Project WILD Aquatic in their teaching programs and generally do two to four activities at one time, but then use the books at several points during the year. Likewise, educators tend not to build units using Project WILD activities (Heimlich, 2002).

In assessing use patterns, the research found that most former Project WILD educators decided to stop using the program within two years of starting, that current Project WILD educators use a few activities each year—often the same ones, when the activities' content and skills match their regular curriculum—and that teachers are under pressure to fulfill state or district curriculum requirements (Korn & Associates, 2000).

1983–1995 Findings

While figures from this set of research varied, results indicated that the large majority of Project WILD workshop participants used the Project WILD materials in their classrooms (46%—Shomo, 1993; 73%—Baldwin, 1990; 74%—Zosel, 1988; 66%—Smith, 1988; Cantrell, 1987; 81%—Cantrell, 1986; 70%—Charles, 1986). In a survey of participants attending Iowa's Aquatic WILD workshops, 97% reported they had used the materials

(Gigar, 1993), and in a 1990 national survey, Standage Accureach found that 37% of workshop participants had used the Aquatic Guide.

In addition to the specific use of Project WILD materials in their classrooms, almost all teachers indicated that attending Project WILD workshops and receiving the materials resulted in changes in teaching and personal practices. Teachers incorporated wildlife concepts into the curriculum, increased the time they spent teaching students about wildlife and the environment, used more "hands-on" and higher order thinking activities, and displayed more wildlife-related artifacts such as books, posters, bulletin boards, aquaria, bee hives, bird nests, rocks, plants, etc., in their classrooms. Project WILD trained teachers also began networking within schools, between school districts, and across the state to increase awareness about wildlife and environmental issues. These teachers also indicated an increased personal commitment to the environment, enjoyed more outdoor activities and contributed to more environmental, conservation, or sportsman's organizations. These changes may indicate that Project WILD does impact teachers and teaching practices, which indirectly has an impact on students. In addition, many of the changes in teachers' behavior, both in the classroom and in their personal lives, directly support wildlife, habitat, and wildlife-related recreation. These behaviors and outcomes are closely linked to the priority goals of many Project WILD sponsors (Shomo, 1993; Tudor, 1992; Greene, 1992; Fleming, 1991; Standage Accureach, 1990; Baldwin, 1990; Gilchrist, 1990; Farnsworth, 1989; Cantrell, 1986; Charles, 1986).

Program Implementation Based on Workshop Attendance and Workshop Length

1996–2003 Findings

During the development phase of Project WILD, there was much discussion about the need for training. The leaders of Project WILD felt it was important that educators understand the goals of the program, use the materials appropriately, and connect to an environmental education support network. To support this goal, educators typically receive the Project WILD guides only by attending a workshop. Earlier research on this topic was comprehensive and conclusive and supported this model, and therefore was not the specific topic of new research. However, findings from earlier research on this topic were supported peripherally in more recent research, and findings from earlier research assisted Project WILD Coordinators and Facilitators in making decisions about Project WILD workshops.

1983–1995 Findings

According to Jensen's 1992 North Dakota survey, teachers trained in Project WILD used the materials more than non-trained teachers and were more likely to include environmental education in their curricula and teach a longer unit than those teachers with little or no environmental training. Also, in a 1990 study of users and non-users, Standage Accureach reported that there was a direct correlation between the implementation of Project WILD and attendance at Project WILD workshops. There was more use of the materials among those who had attended workshops. In their addendum to the report, Standage Accureach reported that those teachers who received the Project WILD Aquatic Guides through the mail were much less likely to use them than those who attended either a combined or specific aquatic workshop. Those who received the Aquatic Guide at a specific aquatic workshop had the highest use of that guide (Standage Accureach, 1991). Also, in a 1983 study, 71% of teachers who had attended workshops agreed that the

workshops were useful in helping them to implement Project WILD (Fleming, 1983). In addition, the practice of teaching activities at workshops was found to be significantly associated with the use of Project WILD (Zosel, 1988; Cantrell, 1987).

It is interesting to note that there were more non-users among participants who were required to attend workshops rather than among those who chose to attend on their own. Teachers who felt strong pressure to attend the workshop had almost no success with the program (Cantrell, 1986; Fleming, 1983). This may have implications for Project WILD outreach efforts and for workshop design, as indicated earlier in reference to the broadening audience of teachers who may attend Project WILD workshops because of a reason other than "self-selection."

As for attendance at more than one workshop, Shaw (1993) showed that when respondents attended two or more workshops, their reported use of program materials increased. Standage Accureach (1991) observed that specific use of the Aquatic Guide nearly doubles for each additional workshop attended. In two studies, teachers who attended a follow-up workshop or took the initial workshop for university credit (more than one session) used more Project WILD activities than teachers who did not. It was also shown that teachers attended other training programs and university courses in environmental education and wildlife as an extension of their Project WILD experience (Tudor, 1992). Teachers' reports and comments indicated that workshops may increase their environmental concern and involvement.

Teachers also indicated a need for specialized workshops (grade level, subject area, special education) in the use of Project WILD (Zosel, 1988). A number of other reports also indicated that more workshops are in high demand (Cotten, 1990; Baldwin, 1990; Yannone, 1985). In addition, implementation was shown to fall off after the first year following training, and teachers expressed an interest in follow-up and more training in the form of workshops (Bissell, 1992). Teachers indicated that Project WILD workshops provided excitement about wildlife education, contacts with people and agencies, and additional content information and resources. In general, teachers were very positive about their Project WILD workshop experiences (Fleming, 1991).

Regarding workshop length, Standage Accureach reported in 1991 that those who attended shorter workshops (6 hours or less) used fewer activities per year than those with longer training (9 hours or more), and that students of teachers who took part in longer workshops were more likely to do more action projects. In 1992, Greene compared the average six-hour Project WILD workshop with longer workshops (2-day, week-long, etc.) and stated that the length of the workshop and use of the materials were not significantly related, however a need for continued training over time was indicated to insure successful implementation.

In general, the one-day workshop was commonly cited as the strongest and most often used initial strategy for Project WILD implementation. This, along with follow-up has been shown to result in consistent and regular use of Project WILD (Jensen, 1992; Standage Accureach, 1990; Standage Accureach, 1991; Cantrell, 1987; Cantrell, 1986). This model of initial training and follow-up is in-line with current educational trends in best practices in teacher development programs.

Although much discussion has occurred about workshops, workshop length, and additional workshops, the research seems to provide strong implications for Project WILD. Margaret Tudor summed this up in her 1992 report when she stated, "Project WILD introductory workshops lead teachers to a broader understanding of environmental education, and the Project WILD Sponsors benefit from the wildlife content and its potential to raise awareness. Project WILD carefully injects a wildlife message into the ecological/ environmental picture. There is no other conceivable opportunity [within the wildlife agency] to offer this strong an emphasis on wildlife in formal pre-service and in-service teacher education programs."

Audience—Current Uses and Appropriate Audiences for Project WILD

1996–2003 Findings

Results of earlier research and an ongoing interest in reaching out to new and broader audiences encouraged additional research on Project WILD audiences to assess success in expanding reach based on previous findings and to inform continued audience growth.

Findings from a study of 452 current and former Project WILD users indicated that Project WILD has a core audience of experienced elementary school teachers who teach a range of subjects rather than one specific discipline and that there has been a drop in Project WILD use by "other" educators (para-professionals, librarians, day-care providers, home-school parents), science/environmental education teachers, and language arts teachers. It was recommended that to expand the audience base, Project WILD should target teachers at all grade levels and increase efforts geared toward those educator groups that have dropped off in their use of Project WILD (Korn & Associates, 2000).

In a survey of 49 sponsoring state Agency and Division Directors, classroom teachers were rated highest as the primary audience that Project WILD addresses, with students, particularly elementary students, receiving the next highest score, closely followed by future teachers and then non-formal teachers. When these Agency and Division Directors were surveyed as to how they viewed Project WILD in relation to other environmental education programs, the answer chosen most often was, "Project WILD is an essential component of our educational outreach, but no longer the primary component." It was suggested that this may be due to the increased availability of other environmental education programs and curricula, which have been developed since Project WILD was introduced in 1993. It was also noted that many sponsoring agencies have developed their own educational offerings, which are often based upon, or adapted from, the Project WILD instructional model (Asbury, 1998).

A survey of 228 certified Project WILD, Project WILD Aquatic, or Project Learning Tree (the Projects) educators in Illinois indicated that most participants (47%) were certified as part of an in-service session for formal educators, 39% had been certified as a college student, and 12% were certified in a general-type session (scouts, resource conservation personnel, etc.). This survey also indicated that most participants held a Bachelor's degree, and that the majority of workshop participants were elementary school teachers. However, college students are becoming certified as part of their curricula. Statistical significance showed an inverse correlation between frequency of use and the highest educational degree of the workshop participant. Those participants with higher educational degrees (Masters and Doctorates) do not use the Projects as frequently as those with a Bachelor's degree.

The majority of respondents were female, and survey results indicated that female participants used the Projects more than male workshop participants. The majority of respondents were under 55 years of age. A low, but statistically significant inverse correlation was revealed between the perceived importance of environmental education and the age of the participant, therefore implying that the older the workshop participant, the less important they believe environmental education to be for students with regard to the other studies required of them. Results indicated that formal educators used the Projects more frequently than non-formal educators. Results also indicated that those who live in greater populated areas use the Projects less frequently (Paul, 1996).

By far, most educators responding to Project WILD programs are classroom teachers. There is an opportunity for Project WILD to focus on several strategies to reach additional educators. While increasing the number of educators trained, gaps continue to exist in small cities and urban/inner-city schools (although these numbers have increased in recent years). Teachers tend to receive Project WILD through in-service training rather than pre-service. Researchers suggested that Project WILD could focus on the breadth of non-formal organizations (zoos, aquariums, youth groups, nature centers, etc.) to broaden its reach. Certified educators tend not to be members of state environmental education associations or of the North American Association of Environmental Education (NAAEE), so cross-fertilization is possible. Researchers also suggested that attempting to work with local and state chapters of related organizations may reach additional educators and that becoming a member in various wildlife organizations may be an important additional action step taught in Project WILD training programs (Heimlich, 2002).

1983–1995 Findings

The highest use of the Project WILD guides was found to be in the elementary grades, by a margin of almost three to one. In general, elementary teachers seemed to be more interested in teaching about wildlife than their secondary counterparts, and may have been better able to incorporate Project WILD into their curricula. The Project WILD Guide was distributed more often than the Aquatic Guide, also by a margin of almost three to one. However, participation at the secondary level was greater for the Aquatic Guide than for the K–12 guide, with grades 7–9 more active than grades 10–12 (Young, Thompson, & Thompson, 1995; Shomo, 1993; Gigar, 1993; Shaw, 1993; Tudor, 1992; Bissell, 1992; Standage Accureach, 1991; Zosel, 1988; Charles, 1986; Fleming, 1983).

In recent years, there has been an increased urban focus by environmental educators to ensure that students from urban areas have an opportunity to learn about wildlife and environmental issues. This may be due to a recognition that more of the population is living in urban areas, and city dwellers have become increasingly disconnected from the natural world. While workshop statistics indicate that Project WILD may not be reaching large numbers of urban students, survey responses indicated that Project WILD materials were seen as relevant by urban teachers and that students made gains in their understanding of wildlife and environmental issues when the materials were used. It is interesting to note that urban teachers who use Project WILD tend to use more activities than their rural counterparts. This may be a result of teachers recognizing that there is less of a connection to the natural world for urban students, and Project WILD activities may be seen as a way of compensating. Overall, no significant differences were found in gains of students in rural, suburban, and urban areas. Project WILD was equally effective in all

three settings; neither student learning nor student attitudes differed from area to area (Young, Thompson, & Thompson, 1995; Dunne, 1992; Race, 1990; Gilchrist; Smith, 1983; Fleming, 1983).

Use of Project WILD Guide—Number of Activities Used and Types of Activities Used Most Often

1996–2003 Findings

Both recent and earlier research support the value of the training program in encouraging activity use and indicate that the use of specific Project WILD activities is influenced by those experienced at workshops. However, some of the recent research also indicates that teachers feel the training programs provide them with an overview of the materials and tools for accessing activities beyond those conducted during the training efforts (Heimlich, 2002). The "Project WILD Network" section of this report on page 19 indicates that regular contact and an ongoing relationship with workshop facilitators may encourage Project WILD trained educators to use both a greater number of the activities and to use them more frequently.

When 228 certified Project WILD, Project WILD Aquatic, or Project Learning Tree (the Projects) educators in Illinois listed the three Project activities they had used most often, and those were compared to the activities that had been used during their own certification training, over half of the respondents had used one to all three of the activities with their learners that were used during their training. It was suggested that this may imply that they are using only the activities shown to them during their certification workshop, and may have not yet investigated the various Project activities on their own (Paul, 1996).

1983–1995 Findings

Approximately 50% of all participants used less than 6 activities per year, with another 25% using less than 10, and the most active instructors using more than 10 activities (Shomo, 1993; Gigar, 1993; Tudor, 1992; Fleming, 1991; Cotten, 1990; Baldwin, 1990; Gilchrist, 1990; Smith, 1988; Cantrell, 1987; Cantrell, 1986; Charles, 1986). The impact of Project WILD varied based on the number of Project WILD activities a teacher used in one year. The more activities a teacher reported using in a year, the more likely it was for the teacher to report a gain in student understanding about less obvious wildlife topics such as cultural influences related to wildlife. In addition, the more environmental education programs teachers used, and the more training they had in environmental education, the more Project WILD activities they used. Teachers who had been involved in projects to benefit wildlife or the environment also used more activities than teachers who had not been involved in such projects (Standage Accureach, 1990; Zosel, 1988). These findings have implications for instruction at Project WILD workshops.

The Project WILD activities used most often are typically those that involve direct environmental exploration and study and active participation by students. The most popular provide opportunities for students to interact with live animals and animal parts (skulls, owl pellets, tracks, etc.) or are environmentally oriented and focus on an action such as recycling and clean-up projects (Shaw, 1993; Jensen, 1992; Bissell, 1992; Green, 1992; Fleming, 1991; Standage Accureach, 1990; Cantrell, 1987).

In choosing activities to use with their students, teachers said they tended to use the activities they experienced at the workshops (Young, Thompson, & Thompson, 1995; Tudor, 1992). Other reasons given for choosing particular activities were that they complete an environmental education curriculum objective and they take little time to plan (Greene, 1992; Cantrell, 1987).

Use of Project WILD—Curriculum Placement and Implementation Strategies

1996–2003 Findings

Because Project WILD is a supplementary program and is not usually the core curriculum, particularly in formal education settings, there is great variety in the way the program is implemented and in ways activities are placed within the curriculum. Findings indicate that in general, educators use Project WILD as lessons within units, but do not infuse activities throughout the curriculum (Heimlich, 2002).

Interviews with 51 Utah public school teachers in focus groups indicated a need for conservation education to be better integrated with other subjects in order to be more widely accepted and perceived as better fitting curriculum standards. These teachers also expressed a need for support for conservation education from within the local community and the school administration, a need to find ways to integrate conservation education into the curriculum—including addressing the requirements for meeting curriculum standards, and the need for support from and networking with other educators addressing the same issues in their classrooms (Johnson & Johnson, 1996).

A survey of 452 current and former Project WILD users indicated that Project WILD needs to demonstrate how activities match curriculum standards (Korn & Associates, 2000). Research also indicated that there is value to correlating Project WILD and state standards to state and local curricula. Teachers who use Project WILD to help meet standards are more likely to be motivated by correlations of Project WILD activities to state standards and curriculum (Heimlich, 2002).

Findings on this topic indicate that Project WILD would be well served to focus efforts on helping teachers find ways to integrate the program into their curriculum. One suggestion that would help focus this effort on specific school systems and curricula came from telephone interviews with 420 past participants in Nevada Project WILD who indicated that on-site Project WILD training would be very valuable (Woo, 1998). Findings also indicate that helping teachers understand and use correlations of Project WILD to state and local standards would assist in curriculum placement and increased use of the program.

1983–1995 Findings

Project WILD activities were most often integrated into the curriculum across all subject areas, with science as the most common. Teachers considered the materials to be truly multidisciplinary, and most selected and included activities where appropriate in the curriculum. Some said they used Project WILD as the basis for one or more instructional units. An appreciation for the flexibility of the program was a major theme that permeated every level of implementation (Shomo, 1993; Gigar, 1993; Tudor, 1992; Bissell, 1992; Standage Accureach, 1990; Cotten, 1990; Zosel, 1988; Smith, 1988; Schwartz, 1987; Cantrell, 1987; Charles, 1986; Yannone, 1985; Fleming, 1983).

Student Gains as a Result of Project WILD Use

1996–2003 Findings

In reviewing these findings, it is important to note that Project WILD is an education program designed to be integrated into a variety of curricula. Also, its subject matter is not unique to Project WILD. For these reasons, it is difficult to isolate and evaluate the effectiveness of Project WILD alone, without also accounting for gains in an understanding of wildlife and environmental issues that come from a variety of outside influences, such as books, television, movies, other environmental education materials, scouting, hunting, fishing, and other related activities.

In addition, Project WILD reflects educational reform issues of the 1970s–1980s (Project WILD's development phase) that emphasized the relevance and value of "hands-on," experiential learning and the importance of higher order learning (how to think, not what to think). Because Project WILD learner outcomes cannot always be stated as one correct answer, quantitative studies are not an accurate measure of the program's success. Finally, the types of changes in knowledge, attitudes, and behaviors that Project WILD hopes to foster are long-term, cumulative, and evidenced throughout a lifetime.

The evaluations of the effectiveness of Project WILD have looked at teacher perceptions of student gains, what students have learned from Project WILD (based on their own perceptions and on measurements from instruments such as tests, interviews, surveys, and observation), and a comparison of student achievement in groups who participated in Project WILD activities and those who did not.

Findings from a highly controlled study using a variety of pre- and post-measures with treatment and control groups (eight classrooms total) to measure the impact of Project WILD on student learning and on attitudes indicated that Project WILD does have an impact on knowledge about wildlife and attitudes toward wildlife and constructs of wildlife in general. It was determined that no single activity can teach all the concepts of the framework, but when a series of activities are used within a unit of the framework, the desired learning about these concepts is achieved. There was a clear pattern of knowledge gain through Project WILD. Students in the control groups tended to have consistent or negative gain scores in pre- and/or post-measures, while students in the treatment groups had positive gain scores overall. In general, there were no significant differences between treatment and control group scores in pre-measure comparisons, which suggests that any gains could be attributed to the use of Project WILD. Findings also indicated that using Project WILD does have an impact on student attitudes toward wildlife and related constructs of wildlife. As attitudes are slow to change, the immediacy of the measure serves as an indicator for directional attitudinal shift: students participating in Project WILD activities had a slightly higher attitude measure, but with a lower standard deviation, indicating a consistency in the response patterns of the students. This study supports previous studies of the impact of Project WILD participation on attitudes toward wildlife and constructs of wildlife. The verification of this controlled study suggest that other findings are likely generalizable to larger populations (Heimlich, Cantrell, Duan, 2001).

A study of 12 classes of fifth grade students indicated that significant learning occurred as a result of using Project WILD, and that Project WILD was successful in assisting to meet

the objectives of content standards. Findings suggested that Project WILD is capable of meeting goals set by state science standards, and when used as a supplement to the curriculum provides a strong method of teaching environmental science. It was also suggested that when used as an integrative curriculum supplement assimilated across subjects, Project WILD may prove to be useful in meeting other standards beyond science. The report emphasized the usefulness of multiple methods of teaching and suggested that education would benefit from encouraging the use of multiple approaches to teaching, which include experiential components (Powell, 1996).

A study of both short- and long-term effects concerning the implementation of selected activities from Project WILD on six classes of fifth-grade children's knowledge about, and attitudes and behaviors toward, wildlife and the environment in Taiwan, R.O.C., indicated that the selected Project WILD activities positively affected the participating fifth-grade children's short-term knowledge about and attitude toward wildlife and the environment in Taiwan. Both of these attenuated over the long-term, but were still shown to be higher than those of students that were not exposed to Project WILD activities. Findings also indicated that the fifth-grade children exhibited responsible behaviors toward wildlife and the environment in Taiwan after experiencing the Project WILD activities, particularly in the long-term (Hua, 1996).

The majority of 420 past participants in Nevada Project WILD interviewed by telephone reported that students got "totally involved" or "quite involved" when they participated in Project WILD activities (Woo, 1998).

When 228 certified Project WILD, Project WILD Aquatic, or Project Learning Tree educators in Illinois were asked to rate their perceptions concerning learner's enthusiasm towards learning about the environment, respondents indicated that most learners were enthusiastic (Paul, 1996).

1983–1995 Findings

The majority of teachers surveyed (higher than 90% in all cited studies) indicated that students exposed to Project WILD activities increased their awareness, knowledge, and skills related to wildlife and the environment. Teachers also noticed a change in the attitudes of their students toward wildlife and the environment. Teachers perceived that their students gained respect for the environment and developed more responsible attitudes toward wildlife and the environment through these activities. They also felt their students had fun while engaged in Project WILD activities. Additionally, teachers perceived that the messages of wildlife survival, habitat, ecological systems, and responsible decision-making were being received by their students (Shomo, 1993; Tudor, 1992; Standage Accureach, 1990; Baldwin, 1990; Smith, 1988; Cantrell, 1986; Charles, 1986).

Anecdotal comments largely reflected the opinion that Project WILD offered content and information. The teachers' primary goal was to make students aware of certain facts about wildlife and the environment. An understanding of what wildlife is and what it needs to survive was observed as the leading result of teaching Project WILD to students. Other objectives achieved through the use of the program included motivating students, an awareness of current environmental problems, an understanding of personal responsibility to the environment, and enhanced thinking skills. Students may not have remembered all

the content they were taught, but overall, students who were interviewed felt they had learned a great deal about wildlife over the school year. It is also interesting to note that when both students and teachers were asked to recall the most interesting and successful activity related to wildlife that they had done during the year, the most frequent response was a Project WILD activity. Students stressed how much they cared about wildlife and the environment. While classroom activities were identified as the primary influence on student learning about wildlife, participation in wildlife-related activities outside the classroom was shown to have a significant effect on student knowledge and attitude. Project WILD can play an important role in synthesizing a variety of wildlife information gained from sources outside the classroom (Shomo, 1993; Dunne, 1992; Tudor, 1992; Bissell, 1992; Fleming, 1991; Race, 1990; Cantrell, 1990; Cantrell, 1990; Farnsworth, 1989; Schwartz, 1987).

In 1983, Fleming established that Project WILD had a definite impact on students and teachers, and in 1985 she established that there were significant differences between students exposed to Project WILD and students who were not. In her study, students scored better on both cognitive and affective instruments than students in the non-exposure control groups. A study in North Dakota in 1992 found that overall, students in Project WILD classrooms performed better than other students, and that this was especially true at grades 7+ (Jensen, 1992). In a 1990 study in Wisconsin, Cantrell found that in a comparison of student scores on fall and spring pre- and post-tests, a higher percentage of learning occurred in the Project WILD exposed classes. Also, students whose teachers were trained in Project WILD knew significantly more about four wildlife concepts (definition of wildlife, carrying capacity, food chains, and interdependence) than students in the control group. In a 1985 study of several schools in Florida, Fleming found that schools that implemented Project WILD were found to have done significantly better than the control school on both cognitive and affective instruments. Also, in her 1983 evaluation of Project WILD, Fleming found that Project WILD had a definite impact on students and teachers. Students showed significant gains in learning and developed attitudes toward wildlife that were consistent with Project WILD goals.

Student Action Component

1996–2003 Findings

Environmental educators have stressed that in addition to providing students with an awareness and knowledge of wildlife and environmental issues, it is important to help students develop a strong environmental ethic and increase their sense of personal competence. Additionally, students need to understand that their behaviors and actions have the power to bring about positive and significant change. This focus on action is consistent with the goals of Project WILD and Project WILD sponsors. Earlier research, the development of *TAKING ACTION: An Educator's Guide to Involving Students in Environmental Action Projects*, the implementation of the Project WILD Action Grant Program, and continued efforts to include an action component in updated and revised activities are all steps that Project WILD is taking to ensure that it is meeting this need.

1983–1995 Findings

In a 1993 survey of West Virginia teachers who had attended Project WILD workshops, 55% of the respondents indicated that Project WILD had led their students to take responsible action toward wildlife and the environment (Shomo, 1993). Anecdotal

evidence from the state of Washington suggested that individuals had taken positive action following Project WILD workshops. To support these efforts, the Washington Department of Wildlife offers a number of programs that support teachers in the development and implementation of action projects (Tudor, 1992). In a 1991 study, Fleming noted that most students did not know how to act individually to help wildlife and they did not feel that individuals had the power to make any difference. A 1990 study in North Carolina also showed that although many teachers and students were involved in action projects, a good number were not, and that guidance and support for action projects was warranted. Prior to 1990, few studies mentioned an action component, and those who did indicated that students did not have confidence in their ability to implement change through their actions (Cantrell, 1990; Zosel, 1988).

In recent years, Project WILD has responded to the need for more of an emphasis on student behaviors and actions, as well as the need for guidance and support for teachers as they facilitate student action projects. The Project WILD Action Program, implemented in 1992, has been successful in assisting teachers and students with habitat improvement projects. During Phase I, more than 300 projects were funded, involving approximately 1,100 educators and 38,000 students (Project WILD *Action Grant Program*, Phase I—Final Report, October 1994). Also, in 1995, Project WILD produced *TAKING ACTION: An Educator's Guide to Involving Students in Environmental Action Projects*. This guide inspires ideas, provides models for conducting action projects, and provides guidance for educators as they help their students plan, implement, and evaluate their own projects.

The Project WILD Network

1996–2003 Findings

Each Project WILD state sponsor has developed a structure and delivery system for Project WILD in accordance with the guidelines of the individual sponsoring agency. There are both similarities and differences between states, and each state regularly reviews its program and makes adjustments as needed. While earlier research addressed the identification, motivations, and needs of volunteer facilitators, more recent research focused on a more sustained relationship between facilitators and the educators they train and the positive effects this relationship can have on the use of Project WILD materials.

Findings from a mail survey of 515 teachers from the United States and Canada who attended Project WILD workshops indicated that practices using sustained interactions between Project WILD Coordinators as a strategy are likely to have the effect of enhancing a) teachers' learning about Project WILD, b) teachers' use of Project WILD in practice, c) the implementation of it, and d) how teachers are affected because of their participation in Project WILD. Survey findings also suggested that encouraging teachers to engage in collective discussion about Project WILD at their school and increasing teachers' engagement and involvement in Project WILD will likely enhance teachers' use of Project WILD in their practice and the extent to which it is implemented within the school systems. This research encourages sustained contact between Project WILD Coordinators and their facilitators and workshop attendees (Mycio-Mommers, 2001).

A survey of 452 current and former Project WILD users indicated that educators need a support network to enhance their use of Project WILD materials (Korn & Associates, 2000). Echoing this, interviews with 51 Utah public school teachers in focus groups

indicated that networking ranks highly as a means of reducing teacher isolation, both with colleagues and peers and between themselves and various community resources (Johnson & Johnson, 1996).

In a survey of 49 sponsoring state Agency and Division Directors, the directors indicated that the most valued benefit from Project WILD to the agencies was the visibility and connections it fostered. Most of the Directors indicated that they were faced with increased educational demands, and that their educational needs are important and growing, but the investment in Project WILD is not. Project WILD is still highly regarded, but there is an increased availability of other environmental education programs and curricula, which have been developed since Project WILD was introduced in 1993. It was also noted that many sponsoring agencies have developed their own educational offerings, which are often based upon, or adapted from, the Project WILD instructional model (Asbury, 1998).

1983–1995 Findings

Two formal evaluation studies conducted as part of the 1983–1995 research addressed the identification, motivations, and needs of volunteer facilitators. Since most states use volunteer facilitators, these findings may be of interest to sponsors.

Summary of findings (Gomon, 1991; Greene, 1992):

- A commitment to environmental education and a high personal level of environmental concern were identified as the most important motives for volunteering as facilitators.
- Facilitators who had the ability to conduct Project WILD workshops as part of their job maintained the highest level of involvement with the program.
- Proper training of facilitators is essential; pairing new facilitators with those with experience proved valuable; and facilitators should have the opportunity to acquire new skills and refine existing ones, just as staff does.
- A communication system with regular and formalized contact between facilitators and the coordinator or sponsoring agency should be established.
- Monetary compensation for services and/or expenses was shown to have validity as a motivator and measure of effectiveness.

Reasons for Non-use of Project WILD Materials by Workshop Participants

1996–2003 Findings

Project WILD workshop and materials are consistently rated highly by workshop participants, however as indicated earlier, research on use indicates that there are still some Project WILD trained educators that do not use the materials or that use the materials infrequently. It is important to understand the reason this is occurs. Newer research on this topic echoes the findings of earlier research, and as before, no teachers have indicated a negative reaction to the program as a reason for non-use. The reasons for non-use, as indicated in earlier research findings, continue to inform Project WILD outreach efforts and the targeting of new audiences (e.g., administrators).

A survey of 228 certified Project WILD, Project WILD Aquatic, or Project Learning Tree educators in Illinois indicated that the primary reason for not using the Projects was a result of not enough time to incorporate the activities into the curriculum (Paul, 1996).

Educators stated that they see value in Project WILD, but believe that administrators and other teachers see less value. Research indicates that Project WILD should focus promotion of the program to administrators and educators who are not necessarily drawn to Project WILD by the wildlife and wildlife conservation issue by focusing on benefits to educators, the value of the materials, and the benefits educators' perceive Project WILD offers students (Heimlich, 2002).

Barriers to the use of Project WILD expressed by 51 Utah public school teachers in focus groups included the challenge of instructional fragmentation; time constraints; the need to address state core standards; the perception that Project WILD is only for science, or is only science on a peripheral, recreational level; limited ability and motivation to attend workshops; and reluctance or indifference on the part of school administrators (Johnson & Johnson, 1996).

1983–1995 Findings

The reasons most often given for not using Project WILD materials were: teachers were planning to use them in the future (either they had just completed training or were planning a specific unit later in the year), lack of planning time, lack of time in the school day, difficulty incorporating the program into their curriculum (particularly secondary teachers), their job did not provide an opportunity to use Project WILD materials (principals, supervisors, etc.), and lack of administrative support (Greene, 1992; Standage Accureach, 1990; Baldwin, 1990; Gilchrist, 1990; Zosel, 1988; Smith, 1988; Cantrell, 1987; Charles, 1986; Fleming, 1983).

While the quality of materials does not appear to be a reason for non-use, Project WILD can look at the reasons given and determine actions that can be taken to assist in an increased use of the program. Some of this is already being done. For example, several states are assisting teachers in their planning by providing links to the curriculum through written and computer-based correlations to objectives. Also, the 1995 *WILD in the City* needs analysis indicated that Project WILD may be able to assist in generating administrative support for environmental education programs. This report stated that documentation should be provided for environmental education programs that show measurable outcomes in student motivation, academic performance, and community awareness (Young, Thompson, & Thompson, 1995).

Needs Expressed by Educators

1996–2003 Findings

As suggested in the earlier sections of this report, current research indicates that the needs of educators include assistance in integrating Project WILD into the curriculum and the providing of correlations to state and local standards along with assistance in learning how to use the correlations and Project WILD activities to help meet standards. Teachers also suggested that increased support from school administration, on-site Project WILD training, sustained contact with facilitators, and a support network of other educators, environmental education experts, and community resource personnel would be valuable.

In addition, a survey of 228 certified Project WILD, Project WILD Aquatic, or Project Learning Tree (The Projects) educators in Illinois suggested that there is a critical need for pre-service environmental education in the college system and that it should be infused

into all subjects of pre-service training for educators to understand that the Projects are interdisciplinary (Paul, 1996).

1983–1995 Findings

In many studies, educators made suggestions for improving or adding to the Project WILD program. Overwhelmingly, the most common requests were for additional workshops and materials. Comments regarding workshops indicated a need for follow-up workshops (shorter in length than the initial workshop) that focus on the activity guides, advanced workshops on specific topics, such as action, urban wildlife, special education adaptations, non-native English speakers, state-specific resources, and grade-level groupings. Materials requested included activities and materials with a focus on student action, correlations to textbooks and state objectives, additional hands-on activities and background information, more appropriate materials for high school students, lists of related children's literature, information on state-specific wildlife, slide shows, videos, wildlife fact sheets, artifacts, and activity specific kits of materials (Young, Thompson, & Thompson, 1995; Shaw, 1993; Tudor, 1992; Bissell, 1992; Greene, 1992; Fleming, 1991; Standage Accureach, 1990; Gilchrist, 1990; Farnsworth, 1989; Zosel, 1988; Smith, 1988; Cantrell, 1986; Charles, 1986; Yannone, 1985).

Other comments included a need for more frequent communication about Project WILD; information on speakers, materials, and artifacts (skulls, owl pellets, tracks, etc.) available for loan from the state agency; a need for more time to prepare and use materials (Project WILD cannot give teachers "time," but materials can be produced with this in mind and can be "user friendly"); increased opportunities for high school students to participate in wildlife management activities; support for action projects and student activities; and a need for links to current events (Shaw, 1993; Greene, 1992; Fleming, 1991; Gilchrist, 1990; Zosel, 1988; Charles, 1986).

Studies Used in Compiling this Report

1996–2003 RESEARCH

2003 **Effectiveness of Project WILD Classroom Instruction at the Middle School Level in South Dakota**

Maria Swain Kearns. Master's Thesis, Master of Science—South Dakota State University. April 2003.

This study, conducted during the 1998–2000 school years, measured the short- and long-term effectiveness of Project WILD versus non-WILD methods of instruction in addressing environmental education objectives with South Dakota middle school students. The content material used in the study focused on ecosystem function. A total of 26 teachers/classrooms participated. Students were assessed at three different times during the study, and the assessment tool consisted of a dilemma statement that prompted students to respond, in writing, to a situation involving an environmental conflict.

2002 **Project WILD Educator Survey: Instrument Development and Pilot Study Findings**

Joe E. Heimlich, Ph.D. Ohio State University. May 2002.

This report summarizes the process of development, testing, and revision of an evaluation instrument that would provide Project WILD coordinators with the information they most need from educators that use Project WILD. Seven states piloted the instrument, with a total of 231 educators completing the evaluation, and the findings were aggregated and summarized in this report.

2001 **Project WILD Evaluation: Learner Knowledge and Attitude Gains**

Joe E. Heimlich, Ph.D., Diane Cantrell, Ph.D., Hongxia Duan, MS. The Environmental Program Evaluation Working Group, Ohio State University

This report summarizes the findings of a highly controlled study using a variety of pre- and post-measures with treatment and control groups to measure the impact of Project WILD on student learning and attitudes. One unit from the Project WILD framework was selected and participating teachers from eight classrooms conducted five activities from that unit. The evaluation instrument consisted of three parts: a knowledge test of twenty-three items, an attitude measure of twenty-nine items, and five demographic characteristics.

Survey On the Usefulness of Project WILD

Luba Mycio-Mommers, Doctoral Candidate. Faculty of Education, University of Ottawa. October 2001.

This document provides the results of a survey of 515 teachers from the United States and Canada who attended Project WILD workshops. The purpose of the study was to investigate how Project WILD was being used by teachers and other professionals in school settings and how direct and indirect contacts between teaching professionals and Project WILD Coordinators contribute toward teachers' use of the program. The study was not an evaluation, but rather an academic research effort with the objective of improving an understanding of dissemination practices that contribute toward teachers' use of the program.

2000 **Project WILD Evaluation Impact Studies I and II: Findings from Questionnaires, Observations, and Interviews**

Prepared by Randi Korn & Associates, Inc. for Project WILD. March 2000.

This report presents the findings from a study of 452 current and former Project WILD users, based on the results of a mail-back questionnaire. The two main goals of the evaluation were to provide Project WILD staff with reliable information about the program's audiences to assist the organization's planning efforts and to involve Project WILD State Coordinators in evaluation training and data collection in an effort to institutionalize evaluation.

1998 **Nevada Division of Wildlife Project WILD Survey: Summary of Results**

Prepared by Grace M. Woo, Ph.D. Cannon Center for Survey Research, University of Nevada, Las Vegas. April 1998.

This report summarizes the results of telephone interviews with 420 past participants in Nevada Project WILD workshops to determine whether these teachers are actually using Project WILD in their classrooms and what they think of the activities.

Project WILD Directors' Survey Report

Donna Asbury, Director, Project WILD. June 1998.

In the spring of 1998, the Project WILD National Office conducted a survey of sponsoring state agency Directors to establish the extent to which Project WILD is perceived as meeting their agency's educational objectives. This report summarizes the results of that survey. A total of 49 Agency and Division Directors from 41 states responded to the survey.

1996 **Measuring the Effectiveness of an Experiential Learning Approach: A Case Study Using Project Wild**

Kristin Shari Powell. Master's Thesis. Department of Natural Resources Recreation and Tourism. Colorado State University. Spring 1996

This study assessed Project WILD, an experiential learning curriculum, in its ability to meet the goals and objectives set by Colorado content model science standards. Involving 12 classes of fifth grade students, it compared Project WILD to Colorado's chosen curriculum to determine effectiveness in meeting science standards.

Utah Project WILD Needs Analysis

Prepared by Bruce S. Thompson and Pamela K. Thompson for the Utah Division of Wildlife Resources. July 1996.

This report provides the findings of a needs analysis to systematically investigate Utah teacher perceptions and attitudes about Project WILD and "conservation education" in general in order to assist in improving teacher participation in Utah Project WILD. Data was collected through numerous focus groups from a total of 51 Utah public school educators from five target districts in the state. Educators included a mix of those trained and those not trained in Project WILD.

Project WILD, Project WILD Aquatic, and Project Learning Tree Participants: Characteristics and Applications

Regina J. Paul. Master of Science Thesis. Department of Forestry in the Graduate School, Southern Illinois University at Carbondale. August 1996.

This document summarizes the findings of a mail survey of participants that were newly certified in any or all three of Projects WILD, WILD Aquatic, and Learning Tree across the state of Illinois between July 1994 and August 1995. Surveys were sent to 474 certified participants, and 228 surveys were returned and are reported on in this research. The purpose of the survey was to 1) determine if environmental educators in Illinois perceived Projects Learning Tree, WILD, and WILD Aquatic as successful tools for helping their students/learners develop into environmentally knowledgeable and active citizens, and 2) learn about the participants and determine their needs in order to successfully implement the Project activities.

Effects of the Implementation of Selected Activities from Project WILD on Fifth-grade Children's Knowledge about, and Attitudes and Behaviors toward, Wildlife and the Environment in Taiwan

Hsaio-Peng Hua. B.S., M.A. Dissertation, Doctor of Philosophy. University of Texas at Austin. 1996.

This study examined both short- and long-term effects concerning the implementation of selected activities from Project WILD on fifth-grade children's knowledge about, and attitudes and behaviors toward, wildlife and the environment in Taiwan, R.O.C. Six primary school classes participated in the study with three of them receiving instruction using seven Project WILD activities over a four-week period. (The other three classes were used as a control.)

1983–1995 RESEARCH

1995 **A Needs Analysis for Project WILD's *WILD in the City* Initiative**

Young, Thompson, and Thompson. October 1995.

Initiated by Project WILD, this report contains information collected in six states from urban educators (both users and non-users of Project WILD): 96 classroom teachers, 4 principals, 9 science supervisors, 12 specialist educators (e.g., nature centers). Information was also collected from 31 Project WILD coordinators and 6 colleague organizations (e.g., National Geographic). Group interviews, focus groups, and written surveys were used.

1994 **A Critical Evaluation of Training Workshops for Facilitators of Project WILD Workshops in New Hampshire for Instructing Practitioners Using These Materials**

Jane Jackson. Master of Education Thesis. Plymouth State College, New Hampshire. May 1994.

Study based on a workshop evaluation and pre-test and a follow-up questionnaire and post-test given to teachers, environmental agency docents, and youth leaders who attended Project WILD workshops in New Hampshire from August 1990–February 1991. 96 participants completed the evaluation and pre-test, and 33 participants completed the follow-up and post-test.

1993 **West Virginia Project WILD Survey of Use**

Art Shomo. DNR Wildlife Resources. Charleston, WV. 1993.

Results of a survey of 575 participants who attended Project WILD workshops in West Virginia from 1988–1993. Surveys were mailed November–December 1993. 245 recipients responded to the survey.

Project WILD Aquatic (K–6 Aquatic Education Program) Research Summary

Barbara D Gigar, Aquatic Education Coordinator. Iowa Department of Natural Resources. Fall 1993.

A 32-item data collection instrument was sent during the fall of 1993 to a random sample of 500 individuals who had been trained in Iowa Project WILD Aquatic workshops. The sample was drawn from a pool of 1683 names, which included all individuals who had been trained through pre-service science methods classes and in-service teacher workshops prior to 1993. 110 instruments were returned, including 95 with usable data.

An Assessment of an Aquatic Resources Education Program—New Mexico Study

Daniel Shaw. Master of Arts in Secondary Education Thesis. University of New Mexico. December 1993.

A self-administered, six-page questionnaire was mailed to a random sample (1,016) of the 4,062 New Mexico educators in the New Mexico Department of Game and Fish Project WILD database as of April 1993. 222 surveys were returned and used as the basis of this study.

1992 **A Preliminary Survey of Use of Project WILD/Aquatic WILD by Urban Teachers**

Miriam L. Dunne, Senior Wildlife Biologist/Project WILD Coordinator. New Jersey Division of Fish, Game & Wildlife. August 1992.

A two-page survey was mailed in August 1992 to a selected group of 150 elementary, secondary, and pre-service teachers from urban areas in New Jersey who completed Project WILD or Aquatic WILD workshops from 1985–1992. 15 teachers responded.

Environmental Education Survey for Project WET/WILD: Results of Teacher and Student Responses in the State of North Dakota

David T. Jensen. Bureau of Educational Services and Applied Research, University of North Dakota. Grand Forks, ND. September 1992.

In the spring of 1992, over 1,000 surveys were distributed to elementary teachers of grades K–9 at randomly selected sites in North Dakota. 584 teachers responded. A second survey was administered to randomly selected classrooms in grades 5–8, and 1,230 students responded.

Evaluation of Project WILD: The State of Washington 1984–1992

Margaret Tudor, Ph.D. Washington Department of Wildlife. March 1992.

A document that includes the evidence of eight years of Project WILD program operation in Washington. The program was reviewed for the purpose of program improvement and to enable informed decision-making by the Department of Wildlife. Includes an evaluation designed to estimate how the Department of Wildlife's goals have been affected by Project WILD. Several Washington studies are referenced in this report.

Evaluation of Project WILD Delivery Activities in Colorado

Steven J. Bissell. Colorado Division of Wildlife (unpublished report). August 1992.

A look at Project WILD in Colorado including a discussion of Colorado results of National Research, and the informal results of a focus group of 10 Project WILD trained teachers from the Denver area, and 5 interviews with Project WILD trained teachers.

An Evaluation of Volunteerism in Project Learning Tree and Project WILD in Texas

Janice Schnake Greene. Doctor of Philosophy Dissertation. Texas A&M University. December 1992.

This study examined differences between active and inactive facilitators and educators. 191 Project WILD facilitators and 600 Project WILD trained educators were sent a self-administered mail questionnaire. 147 facilitators and 332 educators responded.

1991 **Characteristics and Motives of Volunteer Facilitators of Project WILD in Ohio**

Barbara Scott Gomon. Master of Science Thesis. Ohio State University. 1991

This study was a descriptive-relational study designed to describe Project WILD facilitators in Ohio and their motives for participating as facilitators. Data for this study was gathered through a mail survey and was primarily quantitative. A random sample of 170 out of 450 Ohio Project WILD facilitators trained prior to July 1989 was surveyed. 115 facilitators responded. The level of involvement was measured over a two-year period from July 1, 1989 to June 30, 1991.

A Study of Project WILD's Impact on the Students of Exemplary Teachers

M. Lynette Fleming, Ph.D. June 1991.

This study was initiated by Project WILD. The purposes of the research were to examine instructional methods employed by teachers using Project WILD and determine the beliefs, attitudes, and behaviors of their students after nine months of instruction. Students, teachers, and parents from four classrooms (two in Arizona and two in Colorado) constituted the subjects of the study. The primary method of data gathering was interviews.

Project WILD: Report Addendum—Usage and Workshop Length; Aquatic Guide

Standage Accureach, Inc. January 1991.

This report is an addendum to the report filed in June 1990.

1990 **User and Non-user Assessment Study of Project WILD Materials**

Standage Accureach, Inc. June 1990.

Initiated by Project WILD, this report provides an evaluation of Project WILD including workshops and activity guides, and its application in the classroom and other situations. The primary objectives of the study were to analyze the use and non-use of Project WILD, the impact of Project WILD, and areas for improvement. 1,330 respondents, who had attended Project WILD workshops, were drawn from 44 Project WILD states. The target was 30 respondents per state with some adjustment for states with a small pool of potential respondents. The interviewing for this research was conducted by telephone in June 1990, by trained interviewers, using a questionnaire.

Summary: Arizona Project WILD 1990—Survey of Use

Kerry Baldwin. Arizona Fish and Game. Phoenix, AZ. 1990.

This study used the results from Arizona participants in the 1990 Standage Accureach study cited above, and added additional Arizona participants in order to create a statistically valid sample of teachers in the state. The same methods and survey were used. A total of 147 participants took part in the Arizona survey.

Results of the Project WILD Survey—1990: North Carolina

Randy Cotten. North Carolina Wildlife Resources Commission. Raleigh, NC. 1990.

A 15-question survey on Project WILD use in North Carolina was included in the January, 1990 issue of North Carolina WILD Notebook, a free environmental education newsletter which has a distribution of approximately 10,000 educators. 189 responses were received and included in the results.

An Evaluation of Project WILD's Effect on Student Knowledge and Attitude Toward Wildlife in Colorado

Therese M. Race. Department of Fishery and Wildlife Biology Master's Thesis. Colorado State University. Fort Collins, CO. Spring 1990.

The primary purpose of this study was to assess Project WILD's effect on student knowledge and attitude toward wildlife. Project WILD's effect was also tested across an urban-rural gradient to determine if the program affects children from different communities equally. Study included twelve school districts from rural, suburban, and urban areas in Colorado. A total of 26 classes (680 students) of sixth- and seventh-grade students participated in the evaluation.

Effects of Project WILD on Fourth Grade Students in Wisconsin

Susan Cantrell Gilchrist. Wisconsin Department of Natural Resources. Madison, Wisconsin. 1989–1990.

The purpose of this study was to determine the effectiveness of Project WILD in Wisconsin. Research took place during the 1989–1990 school year. 24 fourth-grade classes participated. Half of the classes were located in rural communities and half in urban communities. Half of the participating teachers had attended a Project WILD workshop and used some of the activities. The other half had not been exposed to Project WILD. Both quantitative and qualitative methods of data collection were employed. Students and teachers were surveyed in September and again in May. Parents of participating students were surveyed once. In 16 of the classes, students and teachers were interviewed and classroom observations were conducted.

1989 A Study of Environmental Education: Attitudes and Practices Among Teachers at the Secondary Level

Margo Farnsworth. Department of Elementary and Secondary Education Graduate Seminar Paper. Southwest Missouri State University. June 1989.

The purpose of this study was to answer questions about environmental education at the secondary level including student gains, perceived value of environmental education, use of environmental education materials, and teacher attitudes and practices. Secondary science teachers from northwest Arkansas and southwest Missouri (the Ozarks), who had attended Project WILD workshops participated in the study. 250 surveys were sent to teachers in this area, and 99 responded.

1988 Evaluation of Teacher Use of Project WILD

Dorothea A. Zosel. Science in Land Resources Master's Thesis. University of Wisconsin-Madison. 1988.

The purpose of this study was to assess the use of Project WILD in Wisconsin by elementary and secondary teachers and examine possible determinants of use. A mail survey was the primary method used in collecting data and was sent to 300 elementary and 200 secondary teachers selected randomly from the 2,861 classroom teachers who had participated in Project WILD workshops through July 1987. 352 surveys were returned, approximately two-thirds from elementary teachers and one-third from secondary. In addition, 7 teachers participated in a focus group interview and 10 teachers participated in individual telephone interviews.

An Assessment of the Use and Effectiveness of Project WILD (Wildlife in Learning Design) by Teachers and Youth Leaders in Oklahoma

Cynthia Leann Smith. Doctor of Philosophy Dissertation. Oklahoma State University. July 1988.

The purpose of this study was to ascertain the pervasiveness of the use of Project WILD materials by teachers and youth leaders within the state of Oklahoma and compare Project WILD use by elementary and secondary instructors and use by rural, urban, and suburban instructors. The population for this study consisted of all teachers and youth leaders who attended Project WILD workshops since the introduction of the program in 1983. 2,032 self-administered, mail-back questionnaires were mailed, and 780 were returned.

1987 **Environmental Education and its Effect on Students' Attitudes Toward the Curriculum**

Denece Gleed Schwartz. Master of Education in Curriculum and Instruction Thesis. Idaho State University. 1987.

While not specifically focused on Project WILD, the purpose of this study was to determine if incorporating environmental education instruction into the curriculum would have a positive effect on students' attitudes toward the school curriculum. It is relevant to the evaluation of Project WILD in that many of the activities included in the environmental education packet in this study were Project WILD activities. 24 classrooms, made up of 580 students in grades 4–6 were administered pre- and post- tests to survey attitudes. The tests were administered four weeks apart. During that four-week period half of the teachers used materials in an environmental education packet provided to them, and the other half did not.

A Case Study Analysis of Curriculum Implementation as Exemplified by Project WILD in One Midwestern State

Diane C. Cantrell. Doctor of Philosophy Dissertation. Ohio State University. 1987.

The purpose of this study was to examine the process of curriculum implementation as exemplified by Project WILD in one Midwestern state in order in increase understanding about this process and its relationship to what is currently known about curriculum implementation. The study focused on the three major phases of program adoption and planning, in-service workshops, and classroom use of materials. Data was gathered from June 1984–January 1986 and included 52 interviews across four levels of implementation (i.e., facilitators, coordinators), over 35 observations of meetings, workshops, and classrooms, and a review of documents (agendas, newsletters, memos, etc.).

1986 **A Statewide Survey of Project WILD in Ohio: Final Report**

Diane C. Cantrell. Ohio Department of Natural Resources, Office of Public Information and Education. August 1986.

This report summarizes the findings of a user survey of participants who attended either a facilitator workshop or a teacher workshop during the first year of Project WILD implementation (November 1984–October 1985). The 12-page survey was mailed to 551 people (141 facilitators, 410 teachers) in April 1986. 429 questionnaires were returned for use in this study.

Project WILD Survey of Use and Needs

Cheryl Charles, Ph.D. Project WILD National Office. 1986.

A questionnaire was mailed to a random sample of teachers nationwide, who participated in Project WILD workshops since the fall of 1983. 4,945 questionnaires were mailed, and 2,423 were returned.

1985 **Evaluation Report of the 1985 Implementation of Project WILD in the Elementary Schools of Lee County, Florida**

M. Lynette Fleming. August 1985.

The primary purpose of this evaluation was to discover what effect Project WILD had on K–5 students in the Lee County, Florida schools, over the course of one school year. These effects included changes in student learning and attitudes about wildlife. The project was field tested in three elementary schools in the district with students in one school serving as the control group. To assess outcomes, cognitive and affective instruments were administered to students. These tests were the basis for the quantitative segment of this evaluation, which sought to accurately measure the student learning and attitude changes that occurred as a result of exposure to the activities. The control group provided a base line against which Project WILD students could be compared. Qualitative information was gathered from teacher surveys and interviews.

Montana Project WILD Survey Results

Vince Yannone. Montana Department of Fish, Wildlife, & Parks. Fall 1985.

This report is a summary of responses to a questionnaire about the Project WILD activity guides and activities. 233 questionnaires were mailed to teachers who had attended Project WILD workshops. 131 were returned.

1983 **Project WILD Evaluation: Final Report of Field Test**

M. Lynette Fleming. July 1983.

The primary purpose of this evaluation was to discover what effect Project WILD had on students and teachers. These effects included changes in student learning and attitudes about wildlife, as well as teachers' reactions to the Project WILD implementation and materials. 259 teachers and 6,000+ students from Colorado, Virginia, and Washington were involved in the study. (These states were sponsors of Project WILD and met other criteria needed to generalize from the study.) Cognitive and affective instruments were the basis for the quantitative segment of the evaluation. A control group was established to provide a base line against which Project WILD students could be compared. The qualitative segment included interviews, classroom observations, and surveys.

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