

Place-based
Conservation
Education

Programs:

What WORKS AND Why?

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In the end, we conserve only
what we love.
We will love only what we
understand.
And we will understand only what
we are taught.

These timeless words by Senegalese scholar and statesman Baba Dioum reveal why environmental education is so critical to conservation. Reading and hearing about nature are not enough; children learn to connect with nature through active engagement. The greater the connection, the more likely these children will become adults who understand and care enough about the natural world to take action on its behalf.

Stephen Kellert, a Yale professor who studies these relationships, noted that “people need to learn about the connection between human life and the health and abundance of the natural world not just cognitively but emotionally and in terms of value as well.” A recent book by Richard Louv, *Last Child in the Woods*, goes even further by linking outdoor experiences in nature to reduced health problems, such as attention deficit disorder and depression.

Place-Based Education Programs

Both Kellert and Louv note a societal trend in which children, out of fear for their safety and other factors, are discouraged from play and other spontaneous, unstructured activities in the outdoors. Countering this trend is the growing importance of place-based conservation education programs designed to provide safe outdoor experiences and engagement with the natural world. “Place-based” means that the emphasis is on getting students out of the classroom to learn about nature and forge personal connections to local landscapes. Participating youth explore and discover what natural resources are, how they are used, and how they can be sustained through shared use and sound management.

Such programs aim to enhance knowledge, understanding, and skills about natural resources and the environment. Building on this knowledge, the programs strive to help youth develop positive attitudes, such as respect for nature, and personal behaviors consistent with conservation objectives.

A great deal is riding on the effectiveness of such programs. Every year, billions of dollars are spent on conservation education, including thousands of programs supported by public and private funding. Are such programs raising the level of environmental literacy? Are they helping to develop a new generation of citizen-stewards of natural resources?

Sadly, there has been little guidance and even less funding to evaluate the effectiveness of placed-based conservation education programs.

A Meeting of the Minds on Conservation Education

In 2004, the Association of Fish and Wildlife Agencies (AFWA) held a National Conservation Education Summit to develop a strategic vision for conservation education programs in the 21st Century. The summit was premised on the need for effective conservation education opportunities that

provide youth with hands-on field experiences to facilitate learning about peoples’ interdependence with nature.

Participants from state fish and wildlife agencies, federal agencies, and non-governmental organizations discussed current trends and the future of education. They shared information on best practices and, most importantly, charted a strategic course for conservation education in the next decade. The shared vision has helped to unify and strengthen the formal and non-formal conservation education efforts of AFWA member agencies and non-governmental partners.

The summit also demonstrated that today’s leaders in conservation education are questioning whether their programs are achieving the intended results. They are seeking ways to measure participant outcomes to determine whether program goals are being met or not.

Hooked On Fishing—Not On Drugs

The national Hooked On Fishing—Not On Drugs program is one of more than 400 conservation education programs currently supported by state fish and wildlife agencies in partnership with the Future Fisherman Foundation.

The program’s mission is to promote public knowledge about sport-fishing, with the aim of increasing participation in fishing and resource stewardship. It also aims to prevent drug use and other destructive behaviors by actively engaging youth in positive experiences relating to sport fishing and aquatic resources education.

Program activities revolve around four educational themes:

- 1) Angling skills include learning about equipment, knot tying, casting, and safety.
- 2) Fish biology includes lessons on fish anatomy, identification, behavior, habitat, and aquatic ecology.
- 3) In human dimensions, students explore human impacts on the environment, fishing regulations, ethics, conservation, management of resources, and stewardship of the environment.



Flowers participating with students in Helena, Montana.



Student with fish



Learning to tie flies



Charlotte students dissecting perch

4) Life skills development delves into

decision making, peer and community relationships, problem-solving techniques, setting goals, strengthening parental relationships, and making the commitment to remain drug free. The program is most commonly taught in physical education classes.

The Montana Fish, Wildlife and Parks (MFWP) Department adopted the national Hooked On Fishing Program (HOF) in 1996. They crafted a made-for-Montana approach to suit the particular needs of local and regional partner organizations, participating schools, and teachers. Montana named the program Hooked on Fishing and assigned it to the MFWP Conservation Education Division's Angler Education Coordinator stationed in Helena, Montana.

The goals of Hooked On Fishing were to introduce students, teachers, and parents to the fish and aquatic resources of Montana, and to promote fishing and outdoor recreation. Specific objectives were aimed at developing knowledge, skills, and attitudes in students, including: awareness and appreciation for Montana's fish and aquatic resources; interest in fishing and outdoor recreation; and, safe and responsible outdoor skills. Other objectives aimed at helping teachers become more effective in teaching natural resource topics.



Testing the Waters: Hooked on Fishing

How effective is Montana's version of Hooked On Fishing in meeting its desired outcomes? This important question became the focus of my PhD Research at the University of Montana. For me, conservation education is a personal passion as well as a career focus. I am highly interested in

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finding ways to better evaluate programs so that we can apply that information toward continual improvement.

Hooked On Fishing provided an opportune test case for me to pursue two lines of investigation. First, I wanted to determine how effective Montana's program is in providing science-based field experiences, skills, and content for teachers interested in using outdoor and classroom environments for teaching. Second, I wanted to assess desired student outcomes (knowledge, skills, attitudes, and intended behaviors) with respect to Montana fish aquatic habitats and local conservation and stewardship.

In the course of these investigations, I tested whether the frequency of field experiences (none, one, or more than one) had a measurable effect on student outcomes. I also sought to develop an evaluation process and assessment tools that could be used to evaluate the effectiveness of other place-based conservation programs.

I based my study on the Utilization-focused Evaluation (UFE) approach. This meant that key Hooked On Fishing participants (stakeholders) were involved in development and implementation of the program evaluation, from beginning to end. My motive was to increase the likelihood that evaluation results would be adopted by the intended users.

I used the UFE approach to design, pilot-test, and implement three instruments, which were reviewed and approved by the University of Montana's Institutional Review Board. The instruments included: 1) a web-based survey of teachers; 2) a before-and-after survey of students; and, 3) a structured interview guide for instructors.

I combined multiple methods of evaluation, a process called triangulation, to strengthen the study. Together the methods aimed to determine what program practices, activities, and materials were most effective for developing young citizens who are more likely to enjoy fishing and to practice stewardship skills. The methods also sought to inform future planning and decisions about

Hooked On Fishing and similar conservation education programs.

I also incorporated measures to enhance the value of the data and findings to the intended users—teachers and instructors. This was accomplished by engaging the intended users in follow-up discussions in which the interpretations were carefully considered. This reflection period allows the users to revisit what it was they wanted the evaluation to accomplish, and whether the program

inputs (investments) and outputs (activities and participation) are producing the desired outcomes in both the short and the long term.

My study subjects were the 2,277 Montana students who participated with their teachers in Hooked On Fishing during the 2005–06 school year. They received a pre-survey at the beginning of the year, a post-survey at the end of the year, and an extended post-survey 12 to 14 weeks after completion of the program in May 2006. The teachers of these students, 114 in all, were queried in an Internet survey during May 2006. Finally, 16 Hooked on Fishing program instructors participated in a structured telephone survey in June 2006. These surveys aimed to provide a comprehensive and systematic program evaluation of HOF by assessing the outcomes (knowledge, attitudes, skills, and intended behaviors) for all third- to eighth-grade students.

The comparison or “control” group consisted of 229 students in fourth and fifth grades who had not participated in Hooked on Fishing. Fifty-five of these students participated in the pre- and post-surveys, and 174 took part in the post- and extended post-surveys. The control group had similar characteristics and geographic distribution to students in the experimental schools, as well as willing teachers who committed time to participate in my study.

What Was Learned

The evaluation process revealed some surprising findings that could be useful in future program improvements.

Results for attitude and intended behavior outcomes indicated there was no

significant difference between students who had participated in the program and those who did not. There were some differences in the students' responses to questions on how they felt about learning science, both in the classroom and outdoors; whether they thought it was important to use water carefully; and how their actions affected plants, fish, and wildlife. However, these findings of significant differences did not carry over into the extended post-survey. In considering the possible reasons, I think it likely that these learning outcomes were not directly addressed by program instructors or emphasized in the activities throughout the academic year.

The post-survey results revealed that Hooked On Fishing students were not more motivated to learn about fish and water in Montana than were students who had not participated in Hooked On Fishing. This response was not expected, and was just the opposite of the findings from the extended post-survey.

Two possible explanations for this unexpected result are as follows. First, the post-survey was conducted at the end of the school year. Students may have been preoccupied with thoughts of summer vacation, and/or they had already encountered the question on the pre-survey and had less enthusiasm when answering it again. Second, it is possible that the HOF students who participated in the extended post-survey went fishing during the summer months, and their experience(s) encouraged them to want to learn more.

Extended post-survey results showed that positive effects and significant differences were mostly retained for knowledge and skill outcomes. Interestingly, more skill outcomes retained their positive effects for Hooked On Fishing students than knowledge outcomes, which indicated less change in students' self-reported knowledge from post-survey to extended post-survey.

The correlated-paired sample findings between pre- and post-survey data and between post- and extended post-survey data for HOF students provided additional detail about the significant differences for all outcomes. The findings for attitude and intended behavior outcomes showed no significant difference because, as the data revealed, the Hooked On Fishing program was not designed to affect these outcomes even though teachers and instructors thought these outcomes were being covered implicitly in their teachings.

On the other hand, significant differences were predominately in positive directions for skill and knowledge outcomes.

This is because the Hooked On Fishing activities were designed to meet these outcomes, as outlined by the program goals and objectives. The extended survey findings did not show these as persistent results. Perhaps this was because the students had not done anything that made them want to change their responses, or their selected answer was at the top of the scale.

The frequency of more than one outdoor field experience did have significant, positive effects for improving knowledge and skill outcomes for Hooked On Fishing students between the pre- and post-surveys. This was especially evident for the two-to-three outdoor experience categories, which positively correlated at a high statistical level. This provided supporting evidence for the program requirement that teachers arrange at least one outdoor field trip as part of their Hooked On Fishing program during the school year. The findings clearly demonstrated that several trips were superior to a single trip. Findings obtained through systematic evaluation ran counter to some of the assumptions and expectations of those who deliver the program.

Putting New Information to Use

My study demonstrates that educational activities delivered through a program such as Hooked on Fishing can have significant and positive effects on the knowledge and skill outcomes of students. It also shows the importance of defining program goals and objectives in terms of the knowledge and skill gains that are desired as outcomes. If the sponsoring agency or organization—in this case the Montana Fish, Wildlife, and Parks Department—wants to affect student attitudes and intended behavioral outcomes, then program administrators will need to rewrite program goals and objectives to specifically address those desired outcomes.

For example, if the aim is to foster responsible use and stewardship of natural resources, then, the word "conservation" should be expressly included in the goals and objectives. Also, suggestions and recommendations from participating teachers and instructors should be considered and used in program modifications. Instructors may recommend hands-on field experiences such as adopting and caring for a local fishing access site, or helping to restore a stream reach or wetland area. It will be important to incorporate such activities if supporting resources and logistics allow.

The participation of stakeholders in this program evaluation was imperative for

success. Common values coalesced around benefits that students received through experiential learning. Students benefited from the support and involvement of parents and community. They also benefited from the program's high-quality instructional and support materials consistent with educational expectations and academic content standards. Stakeholders benefited as well by objectively evaluating the program's merit and considering where and how improvements can be made.

It's my hope that these study results will be a useful resource to Montana Fish, Wildlife, and Parks in making future decisions about the Hooked on Fishing Program. Further, I hope that my evaluation process and findings are seen as a model that other conservation agencies and organizations may use to evaluate the effectiveness of their conservation education programs.

The AFWA Vision for Conservation Education in the 21st Century seeks to recruit and retain more citizens in outdoor recreation activities. It goes much further in recognizing that the future of resources stewardship requires more than just getting students into the out-of-doors. Conservation education programs must strive to increase people's understanding of fish and wildlife resources as a valuable public trust. Such programs must also foster appreciation of conservation and management strategies that sustain desired quality of life. And, they must inspire personal commitment and active participation in the stewardship and support of natural resources.

Richard Louv, author of *Last Child in the Woods*, expressed these needs in the following way:

Healing the broken bond between our own young and nature is in our own self-interest, not only because aesthetics or justice demand it, but also because our mental, physical, and spiritual health depend on it.

In other words, what's at stake is the future of wildlife resources and the quality of life as we know it. ■

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