

Conservation Education

Mission Accomplished: Evaluating Education and Meeting Conservation Goals

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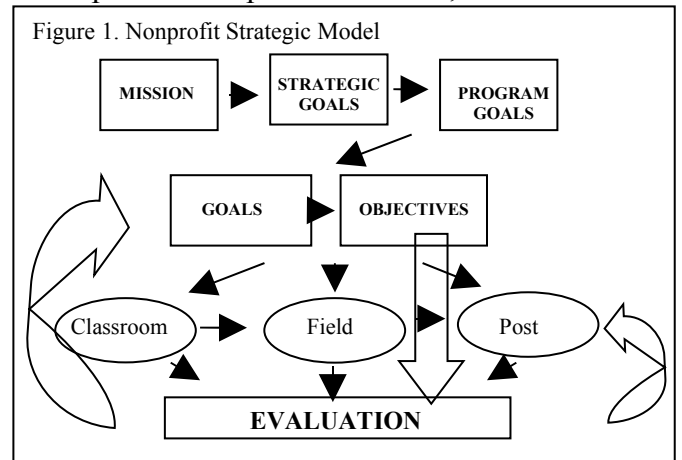
Using evaluation research in a practical application can help strengthen natural resource organizations in meeting their mission and goals. This paper demonstrates how to incorporate evaluation research and its concepts into practice. Evaluation research planning, implementation, and incorporation of results can help strengthen conservation education program goals and objectives and demonstrate how education programs are meeting those goals and objectives. A case study of Klamath Bird Observatory fourth/fifth grade science education program illustrates how program development with the end goal of evaluation aids an organization in achieving intended outcomes. This study used both quantitative and qualitative methods to gather a rich understanding how the fourth/fifth grade bird science program met its goals and objectives. The evaluation research results revealed how this program contributed to the overall mission and goals of the organization and further revealed areas to improve the program.

Using evaluation research in a practical application can help strengthen natural resource organizations in meeting their mission and goals. Evaluation research provides an opportunity for natural resource organizations to assess whether their programs are meeting their conservation goals. Evaluation is a systematic approach to assess your programs processes, outcomes, and/or impacts (Patton 1987 & Weiss 1998). By using evaluation, natural resource organizations can systemically understand how their programs work in meeting their conservation goals. Klamath Bird Observatory, a natural resource organization, developed a

process to evaluate their programs and started an evaluation of their Songbirds, Science and Schools to understand how this program meets its conservation goals.

Klamath Bird Observatory developed and used a model for program development, implementation, and evaluation that reflects best practices of nonprofit organization management (Murray 2005) (see figure 1). The mission drives all other steps. Based upon the mission,

strategic goals were designed for the Research and Monitoring team and for the Education and Outreach team. These strategic goals aid the Education and Outreach team in creating goals for each of their program areas with distinct target audiences. Within the program areas are education projects with their



own goals and measurable objectives. Typically in the K-12 program area, as shown here, there is a classroom and field component and follow-up post activity to the project—all of which are influenced by the goals and objectives. With these goals and objectives clarified, outcomes-based evaluations can be conducted on the project, which then can feed back to the project design and implementation in an adaptive management-type mechanism.

Klamath Bird Observatory (KBO) is 501(c)3 nonprofit whose mission is to advance bird and habitat conservation in the Americas through science, education, and partnerships. KBO works regionally in the Klamath-Siskiyou Bioregion of southern Oregon and northern California and internationally in Latin America where many of the bioregion's neotropical migrants spend their winter. KBO strives to meet the education aspect of their mission through a variety of education programs serving land managers and private land owners, birders, community members, K-12 students and teachers, and young biologists and environmental educators. The

K-12 Education program offers educational opportunities at schools and camps. Songbirds, Science, and Schools is KBO's longest standing and most comprehensive school offering.

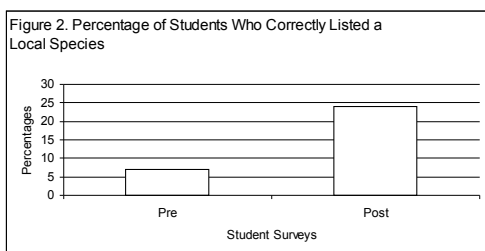
Songbirds, Science, and Schools is guided by the strategic goal of "educate about birds, their environments and the link between science and conservation." The K-12 Education program goal is "to increase K-12 grade students' awareness and knowledge of birds, nature, and conservation while increasing interest in birds, science, and stewardship." Songbirds, Science, and Schools goals are specifically to provide education opportunities with hands-on activities and guided field study; to increase awareness of birds and their environments; to increase knowledge of birds, their environments, and conservation; and to support science education in local schools. These goals are further followed by the objectives which state that the project will enhance teachers' abilities to meet science curriculum goals according to Oregon Department of Education Standards; provide a quality educational experience for students and teachers; expose students to birds and their environments in the classroom and the outdoors; incorporate the most recent ornithological knowledge in an age-appropriate manner; and increase interest in protecting birds and their environments. For each grade level's classroom and field lessons, the instructional goals and objectives are stated and the Oregon science state benchmarks. This structure allows KBO to evaluate whether their education programs are meeting their mission. We evaluated the Songbirds, Science, and Schools, specifically the fourth/fifth grade version, which is most frequently offered, to assess whether this program is meeting its goals and objectives and ultimately our mission.

Songbirds, Science, and Schools involves a 60 to 90 minute classroom lesson with a presentation and hands-on activity. Then students take a morning field trip that includes a 75 minute structured visit at an ecological monitoring station where KBO mist nets and bands

songbirds and an exploration of the habitat and its birds using binoculars. Teachers are provided with an optional post activity to analyze and discuss data collected on the field trip. Lessons and activities vary due to age level in order to have meaningful age-appropriate science lesson. The fourth/fifth grade classroom visit allows students to explore study skins of local birds and teaches ornithological skills of field sketching, field mark identification, field guide usage, and hypothesis development as to whether their birds will be found in the field trip habitat at this time of year. The field visit provides students the chance to test their hypotheses, recording all birds captured at the banding station and seen with binoculars. They practice data collection and two ornithological research methods, bird banding and area searches. Teachers have the option to analyze the data with a series of guided questions with their students as a post field activity.

Our evaluation sought to determine whether Songbirds, Science and Schools for fourth/fifth grade met its goals and objectives as delineated above. Those we will discuss here from preliminary analyses of data relate to increasing students' knowledge of birds and science and enhancing their intentions to protect birds. Multiple methods were used including a pretest-posttest survey of students, a follow-up survey of teachers, teacher interviews, staff follow up reflection forms, and observer observations. Preliminary results include a sample of 115 students and 11 teachers.

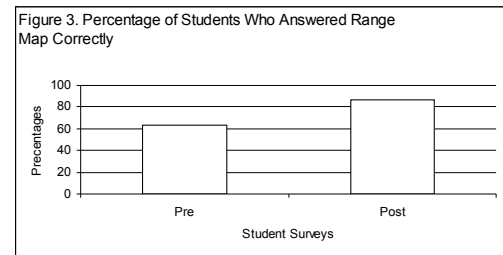
Several survey questions were designed to assess changes in student knowledge and science skills. Preliminary results indicate that there is significant knowledge and skill gain. To



test their knowledge and skill, we asked four multiple choice questions and three fill-in the blank questions. The fill-in the blank questions asked students to 'give one example of a bird that lives near your school.'; 'a scientist

who studies birds is called'; and 'what time of the year would you find Pine Siskins in Ashland?' that included the Pine Siskin's range map for Oregon. Students increased their knowledge of

local species from seven percent to twenty-four percent (see figure 2), and their recall of the term "ornithologist" from twenty-five percent to fifty-one percent. Students' ability to determine the time of year a bird is found in their



area using a range map increased from sixty three percent to eighty-seven percent (see figure 3).

The teacher surveys corroborated these findings. Teachers felt students were increasing their knowledge and science skills from the program. Mean values on questions related to knowledge and skill gain were between "moderately" and "strongly" agree.

Preliminary results are inconclusive as to whether students are increasing their conservation intentions as a result of Songbirds, Science, and Schools. A conservation intention scale was created from six questions asking students how they will behave related to protecting birds in the future (pre-test Cronbach's alpha = 0.80; post-test Cronbach's alpha = 0.87). Results from paired t-tests of student responses indicated no difference from pre to post-test ($t=-0.31$, $p=0.76$). In contrast, teachers indicated on surveys that the program increased students' intention to protect birds with a mean of near "strongly agree." However, in their interviews most teachers struggled to offer specific examples of students intending to protect birds.

From these results, we have learned that our program does increase students' knowledge and skills but it is inconclusive as to whether it influences students' intentions to protect birds. We need to determine whether the conservation goal best fits the program as is or if the program activities need to be modified to meet this goal. Then, reassess the program once those modifications occur. This cyclical nature of evaluation allows us to adapt our program which

provides us with the opportunity to strengthen our activities in meeting our conservation goal. This systematic approach to evaluating our program has also influenced the organization in a better understanding on how this program meets the larger organizational goals and its mission.

In conclusion, this model for program development, implementation, and evaluation provided immediate impacts to our organization and to the Songbirds, Science and Schools program. This model had us established clear goals and objectives, created a learning culture, and developed an evaluation plan. We have also learned from the preliminary results that the program does not influence students' intentions to protect birds, which does not completely reflect our goal of 'educate about birds, their environments and the link between science and conservation.' Once the evaluation results have been completed, we will further assess this issue to determine whether we need to review the program to meet our conservation goal. This demonstrates the adaptive management of the programs in meeting conservation goals. From this model, KBO will continue to determine long-term evaluation strategies and will continue to evaluate its program to its conservation goals, which will ensure ongoing improvement to our program. KBO's program development, implementation, and evaluation demonstrate that without evaluation you can not guarantee your program is meeting your conservation goals. We recommend that other natural resource organizations assess whether their programs are also meeting their intended conservation goals and if their current activities reflect their conservation goals.

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