REVIVING THE CONNECTION BETWEEN CHILDREN AND NATURE

through service-learning restoration partnerships

| Jennie R Cramer

ABSTRACT

Engaging students in environmental restoration through service-learning partnerships is an effective tool for restoring native ecosystems while simultaneously rebuilding relationships between children and nature and inspiring future stewards of the land. Place-based education provides a framework for connecting students to the land. Stewardship-based service-learning provides a productive means by which to accomplish both education and restoration goals. The Restoration and Reintroducion Education Partnership at the Institute for Applied Ecology is a stewardship-based service-learning program that pairs local schools with natural areas. Students grow threatened and endangered plant species for reintroduction. By including students in the restoration process, we can create a landscape network of highly functioning native ecosystems and give students the skills and relationships necessary to continue to protect ecosystems in the future. Each of us in the field of native plants has a role in cultivating stewardship, a sense of place, a connection with nature, and hope.

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place-based, education, community, stewardship, schools

NOMENCLATURE

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Students from Kings Valley Charter School seed Kincaid's lupine on private land enrolled in the Partners for Wildlife Incentive Program.
Photo by Jennie R Cramer

Leith Huddleston, a 7th grader at Cheldelin Middle School in Corvallis, Oregon, is covered in mud. He and his class have just finished planting 200 Nelson's checkermallow (*Sidalcea nelsoniana* Piper [Malvaceae]) at Jackson-Frazier Wetland, just 400 m (0.25 mi) by foot from the school. He and 15 classmates in Restoration Club have grown these Federally listed plants in the school greenhouse (Figure 1). When the students began this project, only 9 Nelson's checkermallow plants were known to be growing in Jackson-Frazier Wetland. Today, 3 y into the project, more than 800 individual plants in 3 subpopulations are thriving in the wetland. Leith and his classmates are stewards of Jackson-Frazier, and they are proud of what they have accomplished. Participating students have shared with us that Jackson-Frazier, and the rare Willamette Valley wetland prairie, have come to hold an important spot in their heart. They have come to love the place in which they live.

As a restoration ecologist and a concerned citizen, I am worried that children who lack connection with nature are less likely to exert energy to protect it. Children have an inherent desire to chase after butterflies, watch in awe at soaring birds, and stop to smell the flowers (Pandey 2003). In *Biophilia*, EO Wilson (1984) suggests that humans have an innate desire to know and be with nature and all that it sustains. I am saddened, though not surprised, to learn that children who lack the calming influence of forests, streams, meadows, and bird song may develop attention deficit disorders and anxiety or become depressed or overweight (Taylor and others 2001). Play within the realm of nature appears to be important for developing the capacities for creativity, problem-solving, and emotional and intellectual development (Kellert 2005). Today, poorly designed subdivisions, overscheduled lives, and a culture of fear disconnect most children from opportunities to explore their relationship with the place they live (Louv 2006). In his groundbreaking book *Last Child in the Woods*, Richard Louv (2006) describes the epidemic of "Nature-Deficit Disorder" as the cumulative effects of withdrawing nature from children's lives. It has long been clear that the ecosystems of the earth have been suffering as a result of the increasing disconnect between humans and nature. Louv states, "Your child is really involved in not only the life of the planet but the ongoing life of a butterfly." Evidence is now mounting that humans, too, are becoming ill from the same lack of contact (Wells 2000; Taylor and others 2001; Wells and Evans 2003; Burdette and Whitaker 2005; Taylor and Kuo 2006).

As we work to restore landscapes, we also have an opportunity to revive connection to nature and a sense of place in the next generation. By engaging youth in restoration activities, we can share with them hands-on scientific techniques, applied research, and the importance of native plants. At the Institute for Applied Ecology (IAE) in Corvallis, Oregon, the RARE (Restoration and Reintroduction Education) Partnership, a place-based education and service-learning program, engages middle-school and high-school students in the process of restoring ecosys-

Figure 1. Students from Lincoln Environmental Middle School outplant Nelson's checkermallow along transects at William H Finley National Wildlife Refuge. Photo by Jennie R Cramer

tems in their communities. This article outlines one approach to merging conservation and education in a format that benefits the community while meeting student learning goals and creating a sense of place. By sharing with you the educational tools of place-based education and service-learning, and by demonstrating how we incorporate these into the RARE Partnership to enhance the effectiveness of our program, I hope to inspire native plant enthusiasts and restoration ecologists to include young community members into their work, creating a lasting effect not only on the landscape but also on the people who will live on and interact with that landscape for the generations to come.

PLACE-BASED EDUCATION AND SERVICE-LEARNING: POWERFUL TOOLS FOR ENGAGING TOMORROW'S STEWARDS

Place-Based Education

Many authors have attempted to define place-based education. Each approaches the pedagogy differently. Woodhouse and Knapp (2000) describe place-based education as a major component of the larger goal of achieving local ecological and cultural sustainability. Most important, in place-based education the local community is the starting point for teaching concepts in science; students learn about where they live. To explain place-based education, Smith (2002) notes the characteristics that are ubiquitous among place-based programs: cultural studies, nature studies, real-world problem-solving, entrepreneurial opportunities, and induction into community processes. Through place-based initiatives, children create schoolyard gardens, restore wildlife habitat, design and build walking trails through public parks, celebrate their cultural heritage, mentor younger students, and help community elders and local organizations (Sobel 2004). Place-based education is a meeting ground for cultural ecology, scientific exploration, political dialogue, community stewardship, and nature study (Sobel 2004). It fosters community while reconnecting kids with the place they live.

Service-Learning Programs

Service-learning is "a teaching and learning strategy that integrates mean-

ingful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities" (NSLC 1994). By engaging students in active citizenship through the stewardship of natural areas, the RARE Partnership enables them to learn planting and research skills; integrate knowledge of cultural history of the Willamette Valley with botany, ecology, and even math; and develop relationships while helping organizations and agencies meet local, regional, and national conservation and restoration goals (Jordan 2003). The community is served while the student learns. Land managers with limited time, energy, and funds can benefit from an enthusiastic workforce, eager to learn outside the walls of the school in a setting that has meaning to their daily lives. By combining restoration activities with opportunities that link self-reflection, self-discovery, and meeting learning objectives, we can inspire a new communion with nature while restoring native ecosystems (Jordan 2003).

Volunteers are the backbone, heart, and soul of the restoration movement. And whatever the eventual results of their labors may be, working to revive damaged ecosystems is transforming and strengthening their relationship with the rest of nature.

—WILLIAM K. STEVENS, *MIRACLE UNDER THE OAKS*

THE RARE PARTNERSHIP: A COMMUNITY STEWARDSHIP, PLACE-BASED, SERVICE-LEARNING PROGRAM

One of the most endangered ecosystems in the US is the prairie of the Willamette Valley. Less than 1% of this habitat remains (Ingersoll and others 1991), and over 15 prairie endemics are in decline. Their recovery will require habitat protection, restoration, and reintroduction. Vital to the process is the interest and involvement of young community members who will steward these landscapes into the future.

In response to the decline in prairie habitat, IAE launched the RARE Partnership in 2004 with a grant from the National Wildlife Federation's Species Recovery Fund. Classrooms from throughout Benton County that participate in RARE meet weekly with an IAE conservation biologist to grow threatened and endangered species in school greenhouses and to outplant them at local restoration sites. We begin our process by choosing a restoration site where reintroduction success is a possibility. We look for prairies that may link currently isolated populations of the target species such that we may restore not only individual prairies but a network of prairies in order to stimulate genetic interaction between sites, reducing the likelihood of genetic bottlenecking for these species. Because so few parcels of Willamette Valley prairie remain, we have established working relationships with both public and private landowners to make this network a viable possibility. Following prairie selection and building relationships with landowners, we determine from historical records and habitat assessments which rare species were likely to have existed on the property or, when no species were documented, we do an ecological assessment to determine which species may be most appropriate for the site. We then locate the closest seed sources and mark plants to return to for seed collection in the late summer.

Because we believe that restoration projects are greatly enhanced by community support and education, we choose the secondary school closest to our restoration site and find a teacher interested in participating with her students. Or, more commonly, a new teacher calls us following press coverage of our student-led plantings, and we locate the restoration site closest to her school. We develop a reintroduction plan and customize the educational program for each school and site, taking into consideration the site characteristics, species occurrences, abilities of the students, and needs of the teacher.

After learning about native prairie ecology and the ecological history of the Willamette Valley in the classroom, the students learn hands-on, rare plant propagation techniques and complete an inquiry-based conservation research project. The research projects require germinating, growing, planting, and monitoring endangered plants in school greenhouses where students are responsible for care of the plants. In spring, students outplant on the restoration sites, working with site

Figure 2. Students from Cheldelin Middle School work in pairs to outplant Nelson's checkermallow at Jackson Frazier Wetland. Photo by Jennie R Cramer

Figure 3. In lieu of fire, students from the Corvallis Waldorf School remove thatch prior to seeding with native species at Owen's Farm, managed by the Greenbelt Land Trust. Photo by Jennie R Cramer

managers to ensure proper site preparation and protection. The restoration and reintroduction activities we do with students are part of a broader effort to improve native prairie habitat and re-establish populations of endangered species in accordance with the Willamette Valley Endangered Species Recovery team recommendations. Restoration site managers contribute labor and funding for site preparations, such as burning, mowing, and invasive species removal. Additionally, we work with community groups, such as Friends of Finley Refuge, to enlist support. We truly believe that integrated community efforts involving excellent science, up-to-date restoration techniques, and community involvement are the keys to successful conservation of endangered prairies and to the inspiration of a new generation of land stewards.

In engaging students in service-learning restoration, we use 2 approaches—restoration and education—to reach the goal of creating a landscape network of highly functioning native ecosystems. This dual approach increases our chances of successfully meeting our objectives. When both approaches work synergistically, this long-range objective becomes more tangible. Students develop a sense of place and gain valuable restoration skills as they work to save imperiled species. They also gain problem-solving skills and an understanding of the value of functioning ecosystems (Stevens 1995; Jordan 2003).

Locally focused service-learning allows students to work close to home, providing future opportunities for them to see the success of their efforts (Leslie and others 1996). By engaging students from multiple schools, IAE maximizes their cumulative impact. We are also better able to monitor our work with the help of our students. At Lupine Meadows, owned by the Greenbelt Land Trust, biologists were aware of just a few individuals of Nelson's checkermallow, a threatened species, when our program began. In the 3 y RARE has partnered with the Greenbelt Land Trust and Philomath High School students, participating students have grown and outplanted an additional 400 individuals of Nelson's checkermallow at this site, along with 2 other listed species and several common natives. As a result of this work, some participants develop self-confidence and skills they may have never considered. After planting, a 6th grader stated: "I felt great because I didn't think I'd be good at planting and I'm great at it and I love it." Regardless of the future career choices of the hundreds of students who participate in RARE, they will be part of a future populace that will not only think but also act on behalf of these species and ecosystems.

TAKING ACTION: EFFECTIVE SERVICE-LEARNING IN RESTORATION AND CONSERVATION

As the RARE Partnership has grown from one school-site pair in 2004–2005, to eight in 2008–2009, we have observed many examples of what constitutes suc-

cessful programming. Successful place-based education focuses on local themes and concepts and is personally relevant to the learner (Sobel 2004). By providing students with opportunities in which their learning experiences contribute to the community's vitality and environmental quality, we enrich young lives as well as the cultural value of our restoration work. By working to reintroduce rare species to Corvallis area wetlands and upland prairies, students in the RARE Partnership contribute to the sustainability goals of Corvallis' citizens and local government. In the meantime, we help the community meet its need for critical thinking and problem-solving skills in young people as they help us choose planting sites, thwart greenhouse pests, use our funding economically, and garner further community support. All of these are essential to the success of our program. Service-learning education programs help us make education integral to achieving other organizational goals (Sobel 2004).

Effective place-based service-learning is not rocket science (or plant breeding for that matter) but at times, environmental education can be confused with indoctrination by the uninitiated. Although getting your message across may be your ultimate goal, education is well-received when it is student-driven. As you inspire students to make observations, they may make discoveries similar to your own. The RARE Partnership encourages students to discover on their own that endangered species have value and should be saved, rather than telling them this is so. In RARE, we empower students to ask and answer questions and to reflect on the actions they take, which we hope will give them a sense of their role as citizens.

To maintain the integrity of the many successful service-learning programs, we must know when it is appropriate to use citizens to help collect data and when it is not. Some researchers are skeptical about the use of local citizens in the collection of ecological data. Subjective measures or those involving identification of difficult species can be left to professionals. In addition, difficult to plant or highly sensitive species can frustrate kids and sour your results if additional measures are not taken to ensure success. When we plant horticulturally challenging species with kids, we pair each student with a trained adult mentor. This allows students to be successful and encourages them to interact with community elders. Understanding the limits of service-learning helps protect its integrity as a valid and valued method in restoration and research.

When designing a service-learning program, partnerships are essential. Our partnerships with the City of Corvallis, Benton County, Oregon Department of Fish and

Figure 4. Students from Cheldelin Middle School plant Nelson's checkermallow seedlings into 4-in pots to grow in the school's greenhouse. Photo by Jennie R Cramer

Figure 5. Students from Crescent Valley High School outplant Kincaid's lupine, the primary host plant for Fender's Blue butterfly, at Fitton Green Natural Area. Photo by Jennie R Cramer

Wildlife, the Greenbelt Land Trust, Finley National Wildlife Refuge, Partners for Wildlife, and the Mary's River Watershed Council have yielded technical expertise, additional funding, volunteer support, equipment donations, and landowner participation. In addition, our experiences show that restoration education programs are attractive to grant funders. Our grants from the National Fish and Wildlife Foundation and the US Environmental Protection Agency emphasize that well-developed partnerships with diverse specialties can work together to meet community objectives. Effective service-learning programs partner closely with local teachers and administrators to determine the needs of each classroom. RARE programs are tailored to meet the needs and resources of the teacher and student, which has helped each of our classrooms to return to work with us again in subsequent years.

Effective serving-learning also includes a component of reflection for students. RARE students write in field journals,

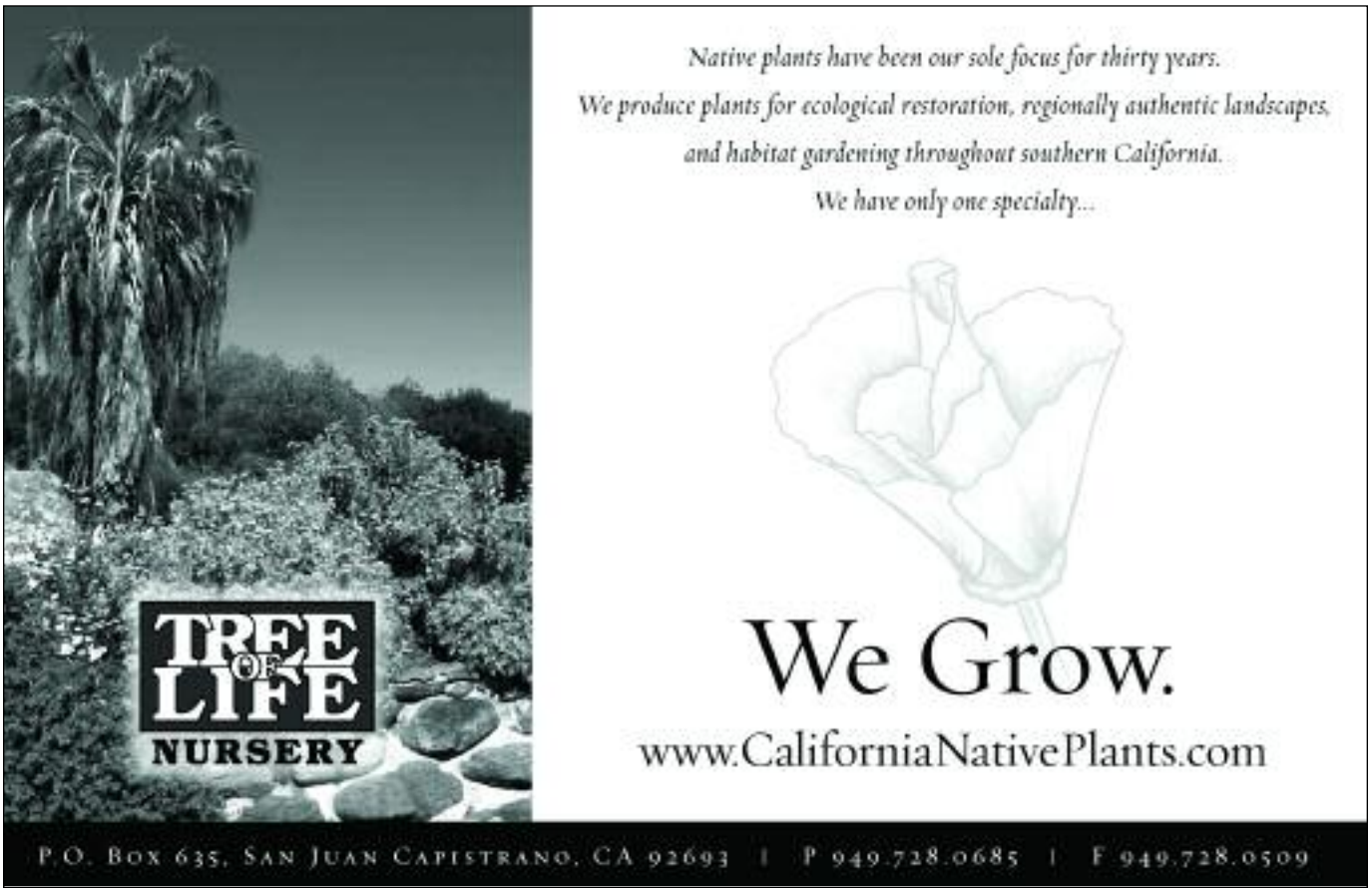
complete art or presentation projects, lead tours, and converse with fellow students, teachers, and mentors about their work. Reflection and presentation allow student participants to think critically about their service. They can begin to understand the complexity of their experience and place it in a larger context to challenge their own attitudes, beliefs, assumptions, and privileges. It can transform a single project into further involvement and broader issue awareness.

As native plant enthusiasts, our passion for protecting and restoring habitat for local species will safeguard the landscape only until our time of service has come to a close. Every person with a mission to protect native plants can increase their impact by investing time and energy into inspiring future caretakers of the earth.

CULTIVATING HOPE AND STEWARDSHIP

As landowners, managers, growers, educators, and researchers, each of us has a role in cultivating hope and stewardship in young people. By utilizing stewardship-based service-learning opportunities, we can inspire a new generation to become the stewards of tomorrow. Restoration and education share one important characteristic: they are both disciplines based on hope. The actions we take at IAE help meet the restoration needs and the educational goals of our local community. Whether you spend long hours in the field, in the lab, in front of the computer, or in front of a classroom, perhaps you are also motivated by the hope that our actions to restore native plant communities are effective and make the landscape a more livable and sustainable place.

While the media bombard us with images of melting ice caps and rain forest destruction, it is vital to counterbalance this with messages that provide visions of a livable future. Those of us who recognize the value of native ecosystems are charged with the responsibility of introducing children to a safe and rewarding relationship with nature. In your roles of native plant growers, researchers, managers, educators, and enthusiasts, I call on each of us to engage today's youth in the stewardship activities we do. Welcoming students into place-based, service-learning restoration activities offers a perfect opportunity to meet restoration goals while reconnecting participants to the place they live and to the hope they will need to inspire them into the future.



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