2. PROJECT SUMMARY.

Intellectual Merit.

Deliverables: The primary deliverables from this project will be a citizen science program including 1), a website that provides (a) a self-contained but fully integrated educational program on biodiversity and conservation, and (b) a portal to participation in a survey of ladybugs and interaction with a ladybug database, 2) a dedicated corps of trained volunteers that will visit interested groups and work with them to make full use of the educational resources and participate in the survey, and 3) one of the largest, most accurate, accessible biological databases ever developed. The educational program will encompass a package of educational materials and activities that can be used by adult mentors in youth programs or directly by youth as a self-directed learning experience. Users will learn about ladybugs, invasive species, biodiversity, and conservation through activities that connect culture and science. Although these materials will be designed to be independent, participation will usually culminate in the survey of a defined area for ladybugs followed by taking digital images of ladybugs and uploading these images onto the web for species identification and inclusion in a national database.

Project Design: Our proposal builds on a series of extremely successful programs that educate citizens regarding biodiversity while engaging them in the survey of specific groups (e.g. FrogWatch, Christmas Bird Count, and FeederWatch). We chose ladybugs as our focal group because in addition to being charismatic, easy to catch, and safe to handle they are vital components of our ecosystems that are currently undergoing unprecedented changes in species composition. Ladybugs have already been the focus of Canada's Spot the Ladybug citizen science program. Unfortunately, this data set is not utilized by scientists because of concerns over identification errors by non-specialists. In our program we propose to address these challenges and increase accessibility by 1) accepting only records accompanied by an identifiable digital image as certified data points, and 2) developing a web based interface to facilitate simple submission of data and digital images and to allow users to query and interact with the full database. This combination of education and data acquisition focused on ladybugs was very successful in our New York pilot program. Our end product will be a self-sustaining autonomous program that will continue to educate and gather vital data for decades.

Project Team and Partnerships: Lead PI John Losey teaches a course in insect conservation biology and has published papers on the decline of native ladybeetles. Team members Leslie Allee, Louis Hesler and Michael Cantangui have all been involved with ladybeetle surveys, outreach, and research on the role of ladybugs as predators. John Pickering has vast experience designing and maintaining web interfaces and databases for citizen science survey data. We are partnering with organizations including cooperative extension, 4H, and representatives from our target audience.

Broader Impacts.

Audience: Our primary audience is children ages five to eleven years of age. We are focusing specifically on underserved youth from Native American, rural, farming, or low-income communities. Our goal is to simultaneously foster an appreciation for the natural world and the scientific process. From our own outreach activities we know that a single positive experience at this age can greatly enhance the potential that a student will maintain a lifelong interest in science and the diversity of life.

Impact Evaluation: Our effectiveness at communicating the values of biodiversity and conservation and involving participants in the scientific process will be determined by established evaluation instruments designed by Bruce Lewenstein of Seavoss Associates.

Strategic Impact: This program offers the opportunity for hands-on interaction with charismatic animals in a way that is not possible with vertebrates. The simple but unique spot pattern of each species will allow the development of an automated identification system that will facilitate building a usable database with much greater size and accuracy than any previously assembled by a citizen science program. This combination of hands-on simplicity and accessible data will create learning opportunities unlike any others currently available.