

Forging Research Partnerships across the Academic–Agency Divide

You are a professor of conservation biology at an academic institution of considerable repute. Your research on the state-listed spotted pygmy sedge is really beginning to take off, and the best student you've advised in years is champing at the bit to complete an honor's thesis on the species. You track down your local conservation organization, which owns and manages several sites with the sedge, and call to explain your research program. For some reason, the manager seems less thrilled than you are about providing logistical support for your promising student's field research.

Or, perhaps you are that manager, charged with care and feeding of the spotted pygmy sedge and 24 other rare species at your preserves. You're excited about the interest of scientists in studying this plant, about which almost nothing is known. But you're having trouble seeing how a study of herbivory by striped thrips on the sedge is going to yield concrete management recommendations in the year's timeframe of an undergraduate thesis. You really need to know whether garlic mustard is shading out your sedge and whether mowing or burning may benefit the plant. You both end your conversation, somewhat puzzled, with a promise to schedule a meeting. How can one forge a successful collaboration from that inauspicious start?

Basic and applied research in conservation biology can make a difference for rare species by translating often complex and seemingly arcane findings into clear information, recommendations, and "rules of thumb" for practical action that managers can apply toward protecting and restoring rare species and habitats. There are three primary means by which this information transfer occurs: (1) internships placing undergraduates and graduate students with nonacademic institutions; (2) research projects taking place directly on conservation lands; and (3) publication of research findings in journals read by both camps. However, information transfer is too frequently hampered by obstacles that emanate both from the disparate structures of the academy and conservation organizations and from misconceptions held by both parties.

From the academic perspective, scientists are under pressure to publish frequently on cutting-edge, fundable,

scientific topics and perceive that conservation programs formulate research questions or requests for proposals that are conceptually narrow and uninteresting. It can be challenging to identify and make contact with managers to pin down research projects that are of scientific and pragmatic interest to both parties—word of mouth and Web sites do not easily lead one to the key contact at conservation organizations. Professors trying to set up service-learning practica, internships, and thesis projects for their students face tough timing issues when the semester does not coincide with the growing season or with the availability of funding for projects.

From the manager's perspective, academics often address esoteric questions that appear to have little bearing on the protection or management of rare species. There is minimal time or resources for managers to access scientific journals and become well-versed in the significant, up-to-the-minute theoretical implications of such research. Happy as they are to foster learning, managers may be reluctant to take on enthusiastic but often inexperienced students who need supervision when there is precious little time to give. Managers are also concerned with maintaining the confidentiality of rare species' sites and minimizing inadvertent damage by scientists who are initiating field research for the first time. Even organizations that actively recruit student interns face declining application numbers because students can now choose among a plethora of internship opportunities.

These issues echo the perceptive analyses that have appeared for more than a decade in the pages of *Conservation Biology*. Academic institutions and conservation organizations have a lot of potential to collaborate on sound science, but a gulf caused by differences in culture, timing, and goals continues to divide us. Speaking as a person who works jointly in academe and a nongovernmental organization, I offer some lessons from collaborations between the New England Wild Flower Society (NEWFS) and academic partners, and some practical recommendations for overcoming this divide.

The New England Wild Flower Society depends on outreach to academic researchers to answer basic ecological questions about the rare plants we are striving to manage. In 1991, with a flagship grant from the Jesse B. Cox

Charitable Trust, NEWFS founded the New England Plant Conservation Program, a voluntary association of 65 organizations working to prevent the extinction and promote the recovery of our region's endangered plants. Professors throughout New England participate in this coalition, encouraging research and disseminating new information about the basic ecology and habitat requirements of rare plants.

The NEWFS has also contracted with professors and students to write conservation and research plans (see <http://www.newfs.org/conserves/plans.htm>)—non-regulatory, regional planning documents analogous in scope and implementation to the Endangered Species Recovery Plans of the U. S. Fish & Wildlife Service. These monographs comprehensively review the ecology, biogeography, and conservation status of each rare taxon and make cogent, prioritized recommendations for conservation actions. More than 100 academics and conservation professionals from across North America have participated in rigorous peer review of these documents. Four students have written these plans as a basis for undergraduate or graduate theses.

The plans frequently call for specific research activities related to rare plants. The NEWFS publicizes these potential projects on its Web site (<http://www.newfs.org/conserves/planres1.htm>), disseminating research questions with both a species-specific focus and a set of foci with a broader theoretical context. For plants, these research avenues include: (1) demographic and life-history studies on guilds of species to inform population viability analysis, estimates of minimum viable population size, and strategies for restoration; (2) in situ and ex situ seed banking studies; (3) assessments of the impacts of habitat management and land-use history on plant fitness, population persistence, and distribution on the landscape; (4) studies documenting mutualistic and antagonistic interactions between rare species and other taxa; (5) genetic analyses to evaluate uniqueness, hybridization, and nativity of populations, levels of gene flow, and the advisability of reintroduction or augmentation programs. These questions echo general themes for new scientific directions articulated in 2001 by the Society for Conservation Biology. Since publicizing these research areas, we are increasingly contacted by students and professors proposing new studies. Obviously, fielding phone calls from potential research partners takes time, and not all projects bear fruit. Likewise, conservation organizations only rarely have dedicated funding to support the research directly; funds must be sought, often cooperatively, from a variety of sources. One such grant was awarded by the National Science Foundation to NEWFS, supporting independent research on rare plants by six advanced undergraduates and graduate students on rare plants from Michigan to Maine. These fellowships have generated publications, provided the preliminary data for theses and dissertations, and trained students on how to

present their findings to a generalist audience of conservationists at the end of their projects.

This is one example of a successful academic-agency partnership in which the agency has reached out to academia, publicizing compelling research ideas that help guide conservation efforts. In turn, academic scientists can ask themselves how they can couch their research in a way that it will answer interesting questions and meaningfully inform the choices a manager will make. The most useful research should address hypotheses that do not necessarily require inordinate quantities of difficult-to-collect data or extremely sophisticated mathematical or statistical expertise to test. Such methods can then be adapted by conservation organizations to address other species in future studies.

The academic advisor, manager, and student involved must sit down together at the outset to hammer out a timeline and research design and to decide whether the project should take the shape of a large, multiyear research program, a service-learning course, or an individual student internship or thesis. Initial strategy sessions should help dispel stereotypes: academics do not all have their heads in the intellectual clouds, and managers, with or without a Ph.D., are often very well versed in the theory and practice of biology. The partners also need to jointly ensure strong, individualized academic and professional advising throughout by both institutions and to clarify the division of labor for this advising at the outset.

Nonacademic organizations should be written explicitly into research grants. Even if a short-term project is envisioned, the academic institution can seek ways to modestly compensate the logistical support of the conservation organization involved. In times of shrinking budgets, this step is arguably the critical key to promoting lasting research relationships. Collaborative grants will help pay fairly for managers' time, to provide permits, collate data on rare-species occurrences, enforce ethical research practices, check on progress of studies, advise students, and interpret findings to other staff. Such collaboration also raises the profile of the excellent conservation science being done outside academe, which builds credibility of an organization toward submitting proposals for large-scale research support from the National Science Foundation and other funding sources.

Collaborators must update each other frequently about all aspects of the research, advising, and writing. Students and professors must communicate research findings in a timely way (or at various intervals throughout the work, if it is long term) in language that is understandable and compelling not just to managers, but—and this can be a greater challenge—to their employers and funders. Caveats, inconclusive data, and surprises need to be communicated forthrightly. Students can gain a valuable opportunity to express their research findings in a concise and relevant way. In addition to being published in articles in scientific journals, it is critical that the data find their

way back to the managers and decision-makers on the ground. Researchers and managers should coauthor publications for both peer-reviewed journals and the “gray” literature. Coauthors with diverse affiliations are likely to produce high-quality, cross-disciplinary papers with wide readership.

These suggestions bring together the points raised many a time in *Conservation Biology*. Authors of editorials, diversity columns, and education features have long asked how academic biologists and conservation professionals can become more effective partners in conserving rare species and habitats. Professors have pondered ways to devise real-world curricula to train students for conservation careers outside the ivory tower and to link classroom studies with internship experiences. Meanwhile, conservation professionals have expressed concern about how to integrate volunteers and student interns more fairly and meaningfully into the daily activities of their organizations.

The lack of practical talks on actual management, implementation, and assessment in recent meetings of the

Society for Conservation Biology has been lamented. Despite years of self-criticism, conservation organizations and the academy continue to operate in parallel—but separate—universes, using different languages, timelines, measures of success, and approaches to research. Although some ambitious programmatic ventures in collaboration and joint meetings can generate creative collaborations in the short term, the day-to-day interactions between individuals from disparate careers make or break the success of cooperative research ventures and will determine whether the spotted pygmy sedge gets the attention it deserves. With dramatic reductions in funding within conservation organizations for scientific research amidst a worsening extinction crisis, there has never been a greater need for such cooperation.

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