

S.O.S.—SAVE ORCHIDS IN YOUR STATE

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ABSTRACT. When considering orchid conservation, we often think of faraway tropical places, but native plants are being driven to extinction right in our own backyards. The author outlines a program to organize local groups to survey and protect native orchids. The Partners for Colorado Native Plants (PCNP) is working with the Denver Botanic Gardens to recruit and train teams of volunteers to help census and monitor wild orchid populations. Together they are gathering the data needed to have appropriate species designated as threatened, as well as developing site management plans to protect these vanishing treasures. PCNP, which is modeled after the Plants of Concern program run by the Chicago Botanic Garden and Chicago Wilderness, is uniting orchid hobbyists, gardeners, students, retirees, and plant lovers to take on scientific fieldwork usually conducted by professional botanists. After completing the free training, volunteers are deployed by many state and federal agencies to staff programs otherwise stymied by a lack of funding. PCNP is building a grassroots organization to extend the reach of existing botanical institutions to achieve shared conservation goals.

Key words: grassroots organization, volunteers, survey, census, conservation, education

INTRODUCTION

Though the Colorado Rocky Mountains is not one of the red biodiversity hotspots on the planet, the region does have native terrestrial orchids, and local orchidists want to conserve these treasures. This account details the mobilization of a group of 40 volunteers in Colorado. These people help collect population data to monitor wild orchid populations toward the goal of preserving and protecting them. Stuart Pimm (see Pimm this issue) challenged the scientific community to know where our orchids are; but in Colorado, we don't really know where our orchids thrive. The immediate need is to inventory the 27 endemic orchid species in Colorado.

The Conservation Action Plan of the Orchid Specialist Group states, "The main goal is to insure that orchid conservation is promoted by a wide array of people and organizations. It is recommended that all members of the Orchid Specialist Group be used as focal points for regional orchid conservation activities."

The United States is one of the most developed countries, and we are fighting to protect our endemic plants. If we don't take steps to protect these plants, nobody will.

Chicago, Illinois: Plants of Concern

The pilot project in Colorado is modeled after the very successful program being conducted in Chicago, by the Chicago Botanic Garden and Chicago Wilderness, where volunteers conduct rare plant monitoring. In May 2002, I attended their course, Rare Plant Monitoring Techniques, which leads to a Naturalist Certificate. The pro-

gram, called Plants of Concern, is entering its fourth year. A total of 153 volunteer scientists are working in six Illinois counties on 281 populations at 113 sites with 122 species of rare plants. The program has accomplished this in 3 years. Pati Vitt, conservation biologist with the Chicago Botanic Garden, is a manager of the program, along with Susanne Masi.

During the workshop, we were trained in the specific protocol of a Level 2 Population survey; a demographics survey which involves laying out a transect plot and recording the x, y coordinates and other data of the individual plants. We learned how to take measurements of plant height, to count the number of plants, flowers, and seed pods, and to note any damage or threats to the plants. The same group of volunteers, or at least one individual in that group, goes back to the same population each year, so that the data-collection methods used are consistent from year-to-year, and the data is reliable. Training includes data-collection protocols for the particular species that is being studied.

A site in northern Illinois, which we have been monitoring under The Plants of Concern program, is the little white lady's-slipper, *Cypripedium candidum* Muhl. ex Willd. I learned the hard way that it often occurs in association with poison ivy, so training of volunteers also involves identification of toxic plants, along with the subject species.

Perth, Australia: First IOCC

In September 2001, I attended the First International Orchid Conservation Congress in Perth, Australia, which featured the terrestrial orchid

restoration work being conducted by Andrew Batty, Kingsley Dixon, and their team at the Kings Park Botanic Garden and the University of Western Australia (see Batty et al. this issue). Terrestrial orchids are very difficult to restore because their relationship with the mycorrhizal fungi is a delicate balance. Visitors often are surprised to find orchids in the very dry, red Australian outback, but they are there, if you just look closely. For example, you can find *Elythranthera emarginata* (Lindl.) A.S.George, the pink enamel orchid, and it shines just like nail polish. The grasslands are also the home of the fair dinkum true-blue orchid, *Thelymitra crinita* Lindl., which grows in this hostile environment. The grand spider orchid, *Caladenia huegelii* Rchb. is a beautiful plant, which at almost a meter tall is very exciting to find in the forest. The progressive restoration work being conducted in Australia involves identifying and inoculating with the mycorrhizal fungi associated with these terrestrial orchids and propagation of the seedlings in the lab. Then the botanists go back and restore those orchid seedlings into the original site. Their work provides hope that these methods can be successfully applied to other locations.

METHODS AND MATERIALS

Returning to Colorado, I worked with Tom Grant, research manager of Denver Botanic Gardens, to set up a new organization, called Partners for Colorado Native Plants, with the specific goal of networking existing programs having to do with native orchids and other rare plants in our state. Among the Partners are the Denver Botanic Gardens; the Denver, Boulder, and Colorado Springs orchid societies; Colorado Natural Heritage Program; USDA Forest Service; Rocky Mountain National Park; state and local park services; Colorado Rare Plant Technical Committee; Colorado Native Plant Society; four local universities; Denver Garden Club; and the Betty Ford Alpine Gardens.

The problem was that these groups were not coordinated; they weren't sharing data or information or resources. Although we know that many of these plants are in trouble, they're not getting the legal designations that they deserve, and the protection that they need, which comes from long-term studies of the populations and determinations based upon those findings. In Colorado, we have a real deficit of long-term data.

Advertising for volunteers, I put up a poster in the universities that read, "Have you seen this missing orchid?" and managed to get several botany students into our volunteer program.

Other volunteers were recruited through announcements and sign-ups at the local orchid society and native plant society meetings. We organized a site visit to an area where we found 700–800 plants of the yellow lady's-slipper, *Cypripedium parviflorum* Salisb. var. *pubescens* (Willd.) O.W.Knight in a 5 m × 400 m area. Thirty volunteers participated. On this trip, the people had to be monitored, to keep them from stepping on the plants, but the many pairs of eyes helped us find many plants. Later in the summer, we went back for a second visit to count the fruiting.

Denver Botanic Gardens has an active rare plant monitoring program, which takes volunteers out across the plains and up into the mountains, where the terrain can be challenging. Just getting to some of these study sites can be like an Outward Bound experience. So having young, fit, student volunteers is really helpful. The staff at the Botanic Gardens gives their time and guidance to the Orchid Survey Project. Our volunteers also become volunteers of the institution, which provides benefits, such as liability insurance coverage, special training, and events planned just for volunteers.

Teams of volunteers receive training in identification of species, recognition of habitat of subject plants, hiking safety, and correct reporting on their field forms. An additional outdoor simulation exercise requires participants to locate a predetermined species given coordinates and using a hand-held GPS. Having found the subject species, the volunteers fill out the survey form, jot down any questions that arise, and return to the starting point to debrief their experience.

One of the species that we count is *Spiranthes diluvialis* Sheviak, which is of special interest because it's a naturally occurring primary hybrid. The parents are *S. magnicamporum* Sheviak crossed with *S. romanzoffiana* Cham. The parent, *S. magnicamporum*, is no longer extant in the state. One of our study sites is a boggy area, which happens to be right under the bridge of a major intersection west of Denver. While we were there on one visit, a fisherman walked right across the middle of this population, and he had no idea that he was violating federal law. Of 30 orchids in Colorado, this is the only one listed as threatened by the U.S. Fish and Wildlife Service. Many of the other endemic orchids in this state are rare and in need of protection. The IUCN, which recommends Red Listing of rare orchids, is available to assist the federal and state governments on establishing the appropriate legal status for native orchids.

Malaxis monophyllos Sw. var. *brachypoda* (A.Gray) F.Morris is the rarest of the orchids in

Colorado. It is more common across Canada, but in Colorado it's relatively rare and deserves to have protected status in the state.

Goodyera repens (L.) R.Br. has a basal rosette of variegated leaves, a handy characterization trait. This plant's common name, rattlesnake plantain, is a throw-back to the Doctrine of Signatures (herbalist idea that plant shape, color, etc., relate to medicinal use) and apparently was believed to heal rattlesnake bites.

Cypripedium fasciculatum Kellogg ex S.Watson is a lady's-slipper that grows flush to the ground, with a nodding flower, in a bed of decaying pine needles. Virtually every picture you'll ever see of this orchid was shot at one particular site near Bear Lake in Rocky Mountain National Park. The reason is that it's right off the trail. You can literally park your car and walk 20 feet and look down at the stream and view these orchids. Even though they're very accessible, this doesn't seem to be a threat to the population. Or is it? The site has been known for a hundred years, and the plants still grow there, even though the trail is nearby. Statistical data needs to be gathered to support or refute the threat. The most recent Element Occurrence Record on this population is 3-years old.

A very tiny orchid, *Listera cordata* (L.) R.Br., is so small and inconspicuous that if you didn't know what you were looking for, you wouldn't find it. Both *L. borealis* Morong and *L. cordata* are very rare in Colorado. *Listera cordata* looks very similar to *L. borealis*, which is actually the rarer plant with a spatulate lip, while the lip of *L. cordata* is narrower at the base. Volunteers need to be equipped with accurate pictures and location data to successfully locate any member of this genus. Volunteers need to be trained to know which plant they're looking for, what habitat to look in, and the different stages of the plant's growth.

For each native orchid site visited, we file a Colorado Natural Heritage Program Rare Plant Survey form, with the goal of updating all records within the Program's database, which is the most extensive source of plant information regionally. Every state in the USA has a Natural Heritage Program, whose mandate is to keep track of endangered animals and plants. Many of the institutions and agencies that work with plant conservation look to the Natural Heritage Program for plant data. In Colorado, we have a more challenging environment to work in than that of the Chicago suburbs, because of rugged terrain and the lack of accurate historical records. Some of the Element Occurrence Records within the Heritage Program database have not been updated in 20 years, so we first have to

establish that these plants still exist at designated locations.

This is a controversial point, because some people believe that the very disclosure of the locations constitutes a threat. We address this issue by asking each volunteer in our program to sign a confidentiality agreement, in which they agree not to take any plant material and pledge not to disclose the location of the plants outside the program. Our experience is that these volunteers become very territorial and protective of the populations they adopt. They are effective stewards, monitoring the plants from year-to-year and conferring with the landowner on appropriate management of that population, which might include fencing it off or allowing limited grazing or moving a trail to keep it out of the public eye.

CONCLUSION

In April 2004, I spoke in California, where the Native Plant Society is very active and works closely with the California Division of Fish and Wildlife. The California Native Plant Society has an extensive website that lists 14 different rare orchids, and anyone can access the site to learn about a particular orchid species. Information on the website includes the status of that plant within California and a map of the counties where the plant has been sighted. Volunteers refer to the website for basic species facts; they just eat up this information; they love it.

I also addressed the Reno Orchid Society. Nevada has a program that is just getting started. They have an orchid species, *Spiranthes infernalis* C.J. Sheviak, that exists nowhere else in the world. Although extant, the plant grows in a very small area, and little information is available on the status of that sole population.

Sometimes we have to go out on a limb, if we want to accomplish something. My orchid conservation work started 5 years ago, jummaring up a rope in a rain forest in Costa Rica. I've since gone back to school to complete first a bachelor's degree in biology, and eventually, a masters degree in botany. Even though I'm not a scientist (at least not yet), I've been amazed at how much good science we've been able to accomplish. I was amazed to find that there were all these organizations already doing conservation work, and even more amazed that they weren't coordinating their efforts or sharing their findings.

Start a program like Partners for Colorado Native Plants on your own, or find one and get involved, just as soon as you get home. Time is not on our side, but the good news is that you're

not on your own. There are hundreds of enthusiastic, motivated hobbyists and students out there, just like me, who are ready and willing to pitch in. The scientific community, however, needs to take the lead to provide basic skills training, so that volunteers can identify plants and compile good Level 1 and Level 2 survey data over several years. Finally, we need to get that data to the appropriate agencies to develop management strategies so that these plants can get the protection they deserve.

ACKNOWLEDGMENTS

Thanks go to Pati Vitt and Susanne Masi, Chicago Botanic Garden; Tom Grant and Michelle DePrenger-Levin, Denver Botanic Gardens; and

Bill Eichelberger, Susie Crane, and Orvel Ray Wilson.

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