Some Uses and Applications of Location Information

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I wish to respond to Barry Meyers-Rice's piece "CLODS, Collectors, and Pseudo-environmentalists" (Carniv. Pl. Newslett. 1996, 25: 122-124). As a person trained in botanical sciences and ecology, I might be able to challenge readers; this is good, for the subject Barry touches on is complicated and full of philosophical viewpoints. These viewpoints are important as we examine our own policies and intentions regarding the conservation of carnivorous plants.

Consider some of the concepts and statements made in the aforementioned article. Barry states, "In the genus *Sarracenia*, location information is only important when trying to puzzle the subspecific identity of *S. rubra* plants or perhaps naturally occurring hybrids." Plants with location information are "living herbarium specimens" in many ways. Like herbarium specimens, an accurately identified, geographically documented plant offers the observer a glimpse into the species. A taxonomist making a dried specimen does not need to collect every individual in a population nor can he or she really determine the "average." The underlying genetic makeup of the plant or its population is seldom obvious. Unlike the dead record, a living plant can contribute different data. For example, forms of *S. flava* from different locations may be genetically distinct. Some may require tannins to produce pigment, others may not. Plants from western Florida might possess a resistance to *Erwinia* bacteria while those from North Carolina are vulnerable. Suppose what looks like the same species from different locations is proven in time to be two or more similar species. If a researcher wishes to examine a larger sample size or habitat to explore the relationship between native environment and plant, site information is critical. Location information also enables researchers and growers to communicate about the plants in detail. If I say to Phil Sheridan, "Of sixteen different clones of *S. flava* from Bay County, Florida we have found twelve to be completely sterile," it has more meaning than if I were to say "Phil, we've found twelve sterile clones of *S. flava*." In short, the locality data of a plant can be more than a collector's fancy. It is a part of the plant's history, part of natural history. To many, this is useless information, but to claim it is only important in *S. rubra* shows a lack of understanding. Those interested in learning more about population/location breeding can read about this in The Virginia Journal of Science, 1995, Vol. 46, #2. Phil Sheridan and David Karowe wrote an article, "The Virginia Pitcher Plant Bogs, Part 3, Is There Inbreeding or Outbreeding Depression in the Yellow Pitcher Plant, *Sarracenia flava* L.?" More studies are currently being done.

As for Mr. Meyers-Rice's "theories" about why collectors want location information: The first, a paragraph suggesting a disease, is not really informative or appropriate, unless entertainment is part of this newsletter's function. The second point Barry makes is probably true for most collectors; site information adds to people's enjoyment. Collector's "mania" is the third theory and also may hold true with many people. One cannot generalize about people's motives and we all should be careful not to fall into the trap of categorizing collectors, lest prejudices form. The

article's last argument negating the thought that "at least the plant will be in collections" is perhaps the most thought provoking. Here, he states: "a few token plants do not represent a viable form of damage control." Further, "CLODS who claim to have conservation on their agenda are either misinformed or unwilling to face their collector's mentality."

Legitimate "rescue" attempts in doomed sites are not meant to be damage control; these are extractions of germplasm, an effort to preserve biodiversity by reducing the loss of organisms. Habitat loss is no less than a tragedy. Often it is too late to contact politicians or use other means of activism. When a bulldozer is clearing a site for tree production, is it a waste of time to collect? Is there any reason to go through the labor intensive process of relocation to a nursery or construct a man-made site? What are some of the considerations?

This is a subject of enormous complexity with countless philosophies. In the 1960's and early 1970's, species reintroduction was a popular notion. In 1885 the American bison population was reduced to about seventy-five animals. Breeders and the formation of sanctuaries have encouraged these "token" survivors to form herds containing tens of thousands of animals. Though success seems hopeless, one must remember that populations change over time. Genetic plasticity allows a population to produce new variations, even if the starting colony is small. Vast acreages of *Sarracenia* probably began as seeds washed into new, available habitats. Obviously, the larger the starter colony, the better. Barry touched on one of the pitfalls when he wrote about selecting an unusual plant for "preservation." In genetics the swing of gene pool makeup is called "genetic drift" and it can alter or destroy conservation efforts and/or radically change the population. It is of prime importance to try to sample, as much as possible, many different individuals. Given that we are finding self-sterility in many *Sarracenia*, saving one plant probably will not prevent the effective extinction of that group, should the habitat be destroyed. How many is enough? No one can say. It depends on each situation and species. When a dozen or more different plants can be shown to produce thousands of variable offspring, I feel some success has been achieved. If these offspring are made available to collectors and hobbyists, then the desire to steal from healthy, protected sites is reduced; even to the unscrupulous, it may not be worth the risk. Poaching can lead to genetic drift.

Man-made or synthetic sites are not popular at this time with conservation groups. I know because I spoke with upper level staff of The Nature Conservancy regarding this and other subjects. This was a wonderful opportunity to discuss the above issues and understand the strategy behind their efforts. There are current tactics that could change as more information accrues and habitat disappears. If synthetic sites were established for *Sarracenia*, or any organism, the best available material would come from location-specific parent stock put back into the same location, as much as possible, so that natural selection could, over time, keep the population evolving.

Documentation is paramount, if reintroduction were attempted. Random planting can lead to confusion of native ranges. Also, natural barriers to prevent local intact communities from intrusion should be considered. Yes, this is a complicated theoretical approach and certainly not a substitute for habitat protection. Often, we can not achieve the best results. That does not mean the activist should give up. I feel a combination of connected growers, conservation organizations, researchers, political activists and others can make a partnership, each respectful of the other, to reduce the devastation and loss of biodiversity as humans reshape the planet. We have no guarantee that our government will continue to preserve habitats. Poachers, political climate and even natural disaster can wipe clean a protected

site. All the legal approaches should be explored. The desires and needs of the people must not be ignored either.

Nearly everyone agrees that education is one of the most powerful tools in conservation efforts. One supporter of preservation can inspire many to join the effort. It is here, too, that location information can be very important. The connection is not immediately obvious, and requires forethought. As a lecturer I bring live carnivorous plants with me to gain audience appreciation for carnivorous plants and their habitats. There is no substitute for a living example. Routinely, we ship plants to schools, universities and to educators across the country so that they too can be more effective. Gardeners are an important force, as they share their work and demonstrate a connection between humans and plants.

As more species are added to the endangered list, our ability to exchange the plants becomes restricted by law, namely the Endangered Species Act and CITES. It is probable that most of the *Sarracenia* will eventually be listed as endangered. To continue to exchange "artificially propagated" plants, a permit is needed. To get that permit, one has to complete an application (among other things) and have it accepted. Page 2, number 3 of the permit application for an endangered species license requires the applicant to "Provide state and specific location of wild origin or captive/artificial propagation:" One needs to list, and verify if necessary, the source. If you can show the plants were legally removed before restriction, then you are more likely to be granted the permit. If you thought specific location information unimportant and your records are weak, you probably will be denied a permit; you must stop shipping those plants. Educators, gardeners and audiences do not see them as often or at all, and the ability to gain support for preservation is weakened by the "distance" between the general population and the plants/habitats.

We produce many thousands of *Sarracenia* in a nursery. Our goal is to educate, preserve what we can, and distribute/develop new horticultural entities. Location information is one of our tools. Due to limited numbers, and to keep existing sites a bit less vulnerable to intrusion, we do not casually distribute location specific plants, unless to botanical gardens or researchers; please do not ask us to sell them or provide a list of these. When we have extra plants, we network to find homes for them. We use location information to prevent identity/source loss, examine inheritance, to gain insight into possible habitat or cultural requirements and to communicate with others about what we discover. Greed or status is not part of the equation. Before my time is through on this planet, I can only hope to have helped people appreciate and in some small way encourage the survival of carnivorous plants and their habitats. My collection will ultimately be left behind.

From the pages of Carnivorous Plant Newsletter 25 years ago

"Don Schnell at last is able to report some good luck with finding pollen in greenhouse grown *Heliamphora heterodoxa*. The plants are becoming quite adapted and mature and seemed to bloom continuously all winter....after a recent two weeks of very damp and misty weather followed by several days of full sun and unseasonably warm temperatures...a fine shower of pollen was seen."