

Biodiversity Counts

ESSAY:

Responsible Collecting

When it comes to plants and arthropods, should specimens be taken from their habitats and kept in collections? Nearly every scientist we talked to agreed that collecting and keeping specimens are essential to the work they do. Botanist Brian Boom from the New York Botanical Garden said, "In systematic botany, if you don't have a specimen, you don't know what you're talking about. The voucher specimen—the evidence that you have found what you say you have found—is of absolute importance."

Arachnologist Kefyn Catley of the American Museum of Natural History said, "You can't do this kind of work without collecting. I can't persuade people that I have a new species of spider by sending them a picture of it; they want to see the specimen." Another AMNH entomologist, Eric Quinter, referred to his collection as his "library," the place he goes to find important information about what he is studying. Still other scientists spoke of "responsible collecting."

To find out what responsible collecting means and how to go about it, we talked to Liz Johnson, Manager of Metropolitan Biodiversity Programs at the American Museum of Natural History's Center for Biodiversity and Conservation. "Responsible collecting is really a series of behaviors and attitudes," she told us, adding that it makes no difference if you are a scientist working in a museum or research institution or a student at a university or middle school. Here are the behaviors and attitudes Liz thinks are most important.

Know your purpose.

"No matter who you are or what level you are working on, before you go out to do collecting, you have to have a plan." Speaking directly to students, Liz said, "You need to think about what the purpose of your study is, what exactly you want to accomplish, what the questions are that you want to answer."

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We asked her to give us some examples of purposes and to tell us what would be responsible collecting for each.

"If, as a scientist, your purpose was to go to a brand-new place somewhere in the tropics that no one had ever studied before and you wanted to know what was living and growing there, then you'd want to collect samples of everything, since nothing was known about the habitat.

"In a school science class, collecting as a way to learn about studying plants is also a valid purpose," Liz said. In both of these cases, collecting specimens of everything would be appropriate.

"There are times when selective collecting is what is responsible. Say someone was studying only one or two species," Liz continued. "He or she would target only those particular things for collecting." Everything else in the habitat would be left alone. "If a scientist is studying a site in an area where the plants and arthropods are well known, there may be no need to collect at all. The scientist would go out and identify things in the field but would not collect them." There would be exceptions, Liz said. "It would make sense to collect a specimen that could not be identified without further study, such as some moth species that are so similar looking that you really need to take them in and look at them more closely under a microscope."

Liz summarized: "It all comes back to what is your question, what do you really need to get your answer?"

Find out what other scientists already know.

Once you decide what you want to find out, do some research. Often scientists go to a museum or botanical garden to talk to people and look through their collections to find out what has already been collected from the site. Liz thinks it is a good idea for students to do this, too. "It's a lot easier to know what you can expect to see out in the field if you've done this background research. Also, you can get a historical perspective: You see what has been found there, and then you can go out and see if it's still there. You see what was common and what was rare, and then you go out and see how those populations are doing now."

Never take rare or endangered specimens.

"It is the collector's responsibility to find out if anything is rare or endangered,"

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Liz warned. She said that there are both state and federal lists of protected, rare, or endangered species, and in many states it is possible to obtain lists on a county-by-county basis. In some localities, there may be laws against damaging or removing certain species from their habitats. Liz advises consulting with a local expert to find out what is rare in your area and what rules apply. "A responsible collector knows to be on the lookout for what is very special and knows never to collect any species that is rare or declining," she said.

Do not overcollect.

"Don't go crazy," Liz advised. "Don't take more than you need. And don't take something of which there are not very many." Even an arthropod or plant population that is not rare can be damaged by overcollection, she warned.

"Some butterfly species have a flight period of only one or two weeks over the whole course of a year, and where they live is so localized that a collector in that particular place could easily wipe out the entire population," Liz told us.

"A plant might not be rare in general, but it might be rare in that location. Some botanists will not take a specimen unless there are at least 100 individual plants within one quarter mile of the site." For a small plot, Liz suggests asking a local expert what is a reasonable minimum number.

Take a good specimen.

Make the most of the specimens you do take by taking ones that are in good condition and are representative. That is, they should show what you need them to show for purposes of identification.

"For arthropods, one specimen may not be enough. The male and female might look different, so it would make sense to have one of each, if you can find them," Liz explained. "Or if you find different stages in the life cycle of the same insect, you'd want to take an example of each. And since many arthropods are fragile, it's not a bad idea to take more than one in case one gets broken as you're preparing it."

For herbaceous plants, Liz advises taking the entire plant, including the roots. If the plant is too big to take the whole thing—a shrub or tree, for example—take a twig with leaves and, if possible, flowers, fruit, and seeds. "And take lots of notes," Liz added.

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Collect good data along with good specimens.

"Your field notes should include everything you cannot collect or that is fleeting: observations about insect behaviors and sound (many insects make sounds), and about color, fragrance, how a plant is growing—is it clumped or solitary, is it entwined around something else, or is it a creeping ground cover? What is its relationship to other plants or insects or other living and nonliving things on the site?" Liz emphasized that all of these observations belong in a field journal, and "they must be keyed to that particular specimen, by number."

Find out what the laws are and obey them.

"A responsible collector needs to abide by all legal issues that exist," Liz insisted. "Who owns the property you're going to? Is it private property, a national or state forest, or nature preserve? Do you need permission to go there? Do you need permission to do the sort of work you plan to do? What are the limitations of any permits you may obtain?"

Analyze your resources.

It is easy enough to take specimens in the field, but responsible collectors know what they will do with their specimens afterward. If you cannot prepare and maintain a collection, you have no business taking specimens, Liz believes. "It's a good idea to find out what is involved in making and maintaining a collection so you can match how much you collect with the time, space, ability, and interest you have in preserving and keeping your specimens in good condition," she said.