



## The Critical Importance of Vegetation Surveys

Scott Namestnik

Perhaps the glam metal band Cinderella said it best in the chorus of their classic 1988 power ballad “Don’t Know What You Got (Till It’s Gone)”:

Don’t know what you got till it’s gone  
Don’t know what it is I did so wrong  
Now I know what I got  
It’s just this song  
And it ain’t easy to get back  
Takes so long

Sure, they were describing a failed relationship, but this anthem can easily be related to stewardship of our natural areas, with which many of us have our own relationships in much the same way. As a society and scientific community, we truly know very little about the intricate details of the natural areas and preserves that we are tasked with managing and preserving. Species new to science are still being described; in fact, some species are not described until after their entire global population is critically imperiled or has gone extinct. In a similar manner, our natural vegetation communities are undergoing changes as a result of climate change, habitat fragmentation, invasive species introductions, artificial drainage, chemical input, and other development-related activities, and without a better understanding of what is happening these valuable resources will be gone with no way to bring them back within our collective lifetime.

### Sampling Isn’t Happening

A staggeringly minimal amount of plot and quadrat-level vegetation sampling (i.e., the close study of distribution within defined parcels of land) currently is being conducted in our natural and naturalized landscapes. Much of the sampling that is taking place is required by regulatory agencies, such as that required to monitor mitigation wetlands or government-funded restoration projects. Although this sampling is useful for regulatory enforcement and provides a snapshot view of newly created or restored sites, it does not typically show what is happening at these mitigation and restoration sites long-term. Vegetation sampling is also conducted on public lands by government organizations, but this sampling is typically very limited and conducted only to obtain results relative to a specific disturbance type. Many of our natural areas simply go without the most basic type of site stewardship: vegetation sampling and monitoring to determine how conditions are changing and how management activities are realistically affecting the properties themselves.

### Floristic Inventories

Many not-for-profit organizations have conducted surveys of their properties in the simplest sense, which includes a botanical or biological inventory of each property. In

some instances, these inventories consist of a single visit to the site. In others, a preserve steward, who may or may not be well versed in identification of difficult plant groups such as sedges (family Cyperaceae), grasses (family Poaceae), and composites (family Asteraceae), compiles a list of plants observed during routine visits to the site to conduct site management. Surveys such as these are definitely useful, but they do not provide the type of data that can be used to guide management decisions on one of our precious preserves. A plant inventory can be used to calculate the mean Coefficient of Conservatism (C) value or the Floristic Quality Index (FQI), but it does not describe the distribution and relationships among species, or give any sense of abundance rankings of the species present. To obtain data that can be used to provide this level of analysis, plot or quadrat sampling is necessary. With plot or quadrat level sampling, there are numerous other calculations and statistics that can be used to determine the true quality of a site, and because plots or quadrats can be made permanent, it is easy to track changes at a site over time.

### **Plant Community Mapping**

Another type of ecological survey that is sometimes conducted on managed lands is plant community mapping and grading. This type of “landscape-level” survey provides a useful snapshot of the spatial distribution and quality of the plant communities on a property, but many of the grading mechanisms for plant communities involve a high level of subjectivity. Combining community mapping and grading with plot or quadrat sampling can provide not only a more accurate representation of the true quality of a given plant community, but can also be used to compare how succession is affecting the quality of the community as it naturally changes through time.

### **Plot/Quadrat Sampling**

No one sampling technique by itself provides all data that one would need to successfully steward a natural area, and thus a combination of techniques (such as meander surveys, community mapping and grading and plot or quadrat sampling) is needed to obtain a full picture of existing site conditions or how a property is changing over time. That said, installing permanent plots or quadrats and sampling them at regular intervals through time will give a land manager an excellent representation of what is going on in the larger community. This level of sampling is important in natural areas that are undergoing no restoration activities, but it is even more critical for managed natural communities. Although a qualified natural areas manager can walk through a preserve after restoration activities have taken place and say at a coarse level whether the management activities were successful, the only way to really know how the community is responding to management activities is to conduct quantitative sampling in permanent plots or quadrats.

Many invasive species need a disturbance to become established. Invasive species control, itself, is a disturbance. In many cases, control of one invasive species can give rise to another, and the only way to catch a flush of invasive species seedlings before they become established is to be on hands and knees sampling at the quadrat level; invasive species seedlings would likely not be observed by even the keenest of land managers during a post-treatment walkthrough inspection. It is easy to become stuck in our ways and continue using a treatment method because that’s what everyone before us has done, but it is possible that the treatment method being employed is causing greater damage to the natural area, and unless sampling is being conducted

we may not know how the treatment is affecting the preserve. It was not that long ago that some of our worst invasive plant species, such as multiflora rose (*Rosa multiflora*), honeysuckle (*Lonicera* spp.), Autumn olive (*Elaeagnus umbellata*), and European highbush cranberry (*Viburnum opulus* var. *opulus*) were touted by well-intentioned conservationists as prime species to plant for wildlife, and we all can see how these species have affected our natural areas. I would hate to look back in 50 years and see that our restoration and management techniques of the early 21<sup>st</sup> Century were actually detrimental to our natural areas, but that we didn't find out until it was too late because we weren't sampling to determine the real effects of our well-intentioned efforts (“/don't know what it is I did so wrong/”).

### **Species of Concern and Invasive Species Monitoring**

Finally, every land manager has the goal of preserving the species of conservation concern that are present on their properties and of preserving the natural integrity of the plant communities that they manage. The unfortunate truth is that environmental conditions are changing rapidly, resulting in widespread declines in populations of at-risk species globally. Without regular surveys of at risk species populations (including stem counts, data on flower/fruit production, population densities, and data on threats from invasive species), there is no way to know how a population of a species of conservation concern is reacting to successional changes, invasive species pressures, or management activities. In much the same way, invasive species populations can rapidly engulf a site, leading to overall loss of biodiversity on a preserve. Managing invasive species begins with knowing where the invasive species are located and how rapidly they are expanding. Surveys for invasive species on a preserve should be conducted at least annually to determine how (or if) to manage a given invasive species population.

The Earth we have inhabited (in much the same way as an invasive plant species becomes established in a cherished wetland) is not a static place, as climatic changes through history have given rise to novel plant communities that have evolved through different seed dispersal mechanisms and species interactions in a weathered landscape. On a landscape scale, it is probably more important to maintain large tracts of land that can adapt without anthropogenic hand-holding than to continue to dump herbicides into a postage-stamp sized nature preserve that will naturally evolve with inevitable changes to average temperatures and rainfall patterns. Given the fact that funding sources have been cut dramatically for those admirable organizations that preserve and manage the last of our spectacular natural areas, it seems only logical that we need to be prioritizing the act of determining what is going on in our natural areas and what we have left before those species and natural areas are gone for good.

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