

TAKING STOCK

The word "inventory" brings with it a faint whiff of the discount store or factory warehouse. "Taking inventory" is often equated with dull but necessary drudgery. It is not a word that immediately jumps to mind while walking the moorlands of Nantucket or the woods of the Berkshires.

As any manager can attest, however, inventories are indispensable when it comes to making good management decisions. The Massachusetts Audubon Society, the manager of 12,000 acres of properties, is in the beginning stages of "taking inventory" of all its sanctuaries—a project which involves three departments (Conservation, Sanctuary, and Environmental Science) and is designed to go on in perpetuity. And far from considering it a tedious chore, at least some of the inventory staff seem to find the task fascinating.

Ecological inventories take a natural community, such as an upland meadow or red maple swamp, and attempt to record a complete and accurate description of all its flora and fauna. In addition to noting all of the plant, invertebrate, fish, amphibian, reptile, bird, and mammal species in a given area, qualitative information such as the density and distribution of species is also gathered.

According to Chris Leahy, assistant director for conservation and one of the overseers of the project, inventories fall under the ecosystem conservation priority of Mass. Audubon and have both long-term scientific goals and short-term benefits. "Inventories are the first step in describing, studying, and coming to understand how major ecosystems in Massachusetts work," he explains. By recording what these communities look like at various times—the province of descriptive natural history—one can gain insight into how these communities *behave*—the province of ecology and the cornerstone of sound land management.

Inventories will facilitate scientific research by Mass. Audubon scientists and university researchers; for example, a project studying the changes wrought in a white cedar bog from acid rain would benefit greatly from the data

base put together by an inventory. A mycologist could more easily compare the fungal populations of a wet year—such as this one—to normal years if a "control" inventory were available.

"Once a certain amount of data is generated, we can make rational rather than off-the-cuff decisions about how to manage the communities we're trying to preserve," says Leahy. For example, the moorlands of Nantucket are the subject of an ongoing study, begun by Mass. Audubon plant ecologist Bob Zaremba and now continued by plant ecologist Peter Dunwiddie, to determine how this community (created by a complex interaction of grazing, wind, and fire) is changing and what steps (such as controlled burning, mowing, or grazing) might be necessary to preserve it.

The second aspect of the inventory project, says Leahy, "is the practical matter of knowing what's on the properties—the generation of complete accurate floral and faunal lists for the sanctuaries." Besides helping visitors and aiding sanctuary staff in interpretation, this compilation will also serve to point out what representative communities Mass. Audubon does not already have and might wish to acquire.

Since the value of inventories depends on the ability to re-sample an area over and over again, permanent data-collecting sites are established in each community. Three representative plots of 10 meters by 20 meters are chosen and marked with "cornerstones" of concrete-filled pipes. The southwest cornerstone has a brass cap marked with survey coordinates so that it can be precisely located decades hence. Sampling is usually done during the main growing season (June to September) along random lines running north to south in the plot.

The percentage of groundcover taken up by each species is recorded and the observer also notes the height of the plants, what vegetative stage they are in (budding, flowering, fruiting) and other pertinent information.

What works well in a meadow may need some modification in a dense forest or bog and methodologies have to



Broadmoor Sanctuary



Drumlin Farm



Wachusett Meadow Sanctuary



Pleasant Valley Sanctuary



Broadmoor Sanctuary

be adjusted accordingly. It has even been necessary to invent ("several times") a periscope-like instrument for sampling the forest canopy. Eventually mammals, birds, and other faunae will be sampled with similar care in a way that can be integrated with the vegetation data. There are no shortcuts in the inventory process. Observers must be willing to spend long hours in the field, know their natural history well, and not be afraid to make educated approximations. Natural systems are too varied, complex, and mysterious to fit neatly or easily on a computer grid.

Designing the methodology for sampling, in fact, is probably the most tricky phase of the project, and Leahy explains that after three years of work they are just moving out of the groundwork-laying phase of putting together "how-to" manuals for inventories (the plant one is complete; others are in progress) and proceeding into actual fieldwork.

Faced with the gargantuan task of inventorying 12,000 acres of sanctuaries, how do they decide where to begin? Explains Leahy: "Rather than trying to complete all the plots on one sanctuary after another, we're trying to select communities that can offer interesting comparisons with other, similar communities (such as two types of bog), or that are changing and may need some kind of management (such as a moorland undergoing succession)."

During the past season the inventory field team put in plots at Canoe Meadows in the Berkshires and Laughing Brook near Hampden. The "grassy bald" at Flat Rock was created by the selective pressures of wind and fire; keeping it in its current condition may eventually require human intervention. Three different types of meadow at Canoe Meadows were selected because they offer comparisons between similar but subtly different communities, and because of their notable populations of invertebrates, including rare species of harvestmen, spiders, and butterflies.

The recent renovation of the parking lot at Laughing Brook left "a muddy and empty section in the middle," according to Leahy, "and the question arose: 'what can we do that's more ecologically sound and interesting than plant grass and petunias?'" In the spring na-

tive New England grasses and flowers were planted, and though, at present, "as we expected, there are a lot of weeds," the inventory team hopes to monitor the metamorphosis of a vacant lot into a native wildflower meadow.

Plans for next season may include putting in plots at two bogs and a mature hardwood forest. Although one of the bogs, Cedar Pond in Ipswich River Sanctuary, has a number of unusual species, Leahy emphasizes that one thing the inventory project is *not* is an all-out search for hitherto undiscovered rare species. "The whole point of the ecosystems conservation priority is that we're trying to get away from species-oriented conservation and crisis-oriented ecological management. Instead of saying 'let's save the whooping crane' or 'let's save the Furbish lousewort,' we want to be able to say 'let's save the ecosystem that the Furbish lousewort belongs to!'"

The link between inventories and conservation is not always readily understood, admits Leahy. "People tend to say 'Plant plots? Who cares!' All this seems arcane and not very sexy, so it's hard to convince people that the outcome is actually very pragmatic, and the reason it's complex and time-consuming is that natural systems are complex."

Leahy terms the contributions of sanctuary field staff "invaluable," particularly since only three staff members at headquarters can devote significant time to the project, and says "with more people we could go a lot further faster." He also stresses the "tremendous interdepartmental effort" that has gone into the project. The inventory process "is producing very good side effects in that three different components have to work together, knocking down barriers that inevitably form between departments in organizations."

Leahy's enthusiasm for the project is no doubt a factor in this smooth cooperation. "It's not just scientific drudgery. I find it all fascinating," he says. "There's the knowledge that you're doing something to help save these places. And it requires especially intimate contact with all the beauty of natural things. I believe the closer you are to that, the more you see." Δ

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