Discovering the Future, Creating the Past: Some Reflections on Restoration

by Don Falk

Biological "restoration" is not really about re-creating the past, except as a reference point. Therein lies its chief difference from restoring paintings, original manuscripts, or architectural treasures. In such cases the restorer seeks literally to halt, and even to reverse change, like Seraut in Barry Lopez's story "Restoration."¹ If Michelangelo's *David*, Gutenberg's *Bible*, and Notre Dame could be preserved for ten thousand years without fading, tearing, or crumbling, we would judge that their curators had done their job well.

Not so with biological restoration. In this case, we seek not to "preserve" a static entity but to protect and nurture its capacity for change. In the world of living things and systems, only the dead stop changing. And even they change, as we know; no sooner has a fly dropped from the ceiling, or an elephant to the ground, than the recyclers of the living world are fast at work disassembling one life form and, without intention, creating new substance and new life.

Change is the dominant characteristic of all living things, and all levels of biological organization. Individual organisms come and go, reproducing and dying, and populations fluctuate in size constantly. Gene frequencies shift from generation to generation, responding to both stochastic and selective forces. Populations also migrate across the landscape, responding to changing environmental conditions and the effects of competition. In some cases these populations develop into distinct ecotypes, representing localized adaptations to an ever-changing environment. Species are also in constant flux, emerging by a variety of processes still imperfectly understood, and spending anywhere from decades to millennia in one form before facing the imperative to change or die. Communities sweep across the landscape, in some cases rapidly, as in periods of glacial recession or advance; perhaps such a period is upon us now, if predictions of global climate change are correct. And even whole ecosystems—seemingly eternal, boundless, enduring—change at a pace virtually undetectable to medium-lifespan organisms like ourselves.

Restoration thus uses the past not as a goal but as a reference point for the future. If we seek to recreate the temperate forests, tallgrass savannas, or desert communi-

Figure 1: A conceptual model for relating restoration goals to processes and trends on long-term change.

ties of centuries past, it is not to turn back the evolutionary clock but to set it ticking again.

Schematically, one might conceive of this process as in Figure 1. The "parameter value" can refer to a measurable aspect of any level of biological organization: the frequency of an allele, size of a population, average number of offspring, dispersal distance of seeds, latitudinal range of community, frequency of fires, and so on. Along the *x* axis (with time moving obediently left to right), the history of a place, a species, or a site falls into four phases: *predisruption*, *disruption*, *restoration*, and *postdisruption*. The pathway during the *predisruption* phase is represented here as linear, although of course most processes of change are multivariate and highly reticulated.

"Disruption" in this context refers to the interruption of natural equilibria or trends, producing for example: a) a sudden *increase* in an earlier value (such as the population of an introduced species or the global atmospheric temperature); b) a sudden *decline* in an earlier value (number of populations of a native species suffering from competitive exclusion, the frequency of fire, global species diversity ...); or c) an *oscillation* in any of these values.

Seen from this perspective, the goal of restoration is to *re-establish the pre-disruption value* of a given parameter. However, the most significant aspect of restoration is not the point at which this value has been attained. Rather, restoration seeks to permit the processes of balanced change to begin again.

This orientation toward the process of change has profound implications for the practice of restoration. For one thing, it will make careful restoration more difficult. How can we know what the population of a species would be in its natural state? How can we guess at allele frequencies in a species whose populations, pollinators, and distribution have been altered by centuries of human impact? How can we fully understand the forces that move deserts,

Don Falk is the executive director of the Center for Plant Conservation, 125 the Arborway, Jamaica Plain, MA 02130, (617) 524-6988.

melt ice caps, elevate sea level, build mountains, float continents, and cause species to emerge and disappear like so many fireflies on a summer night? Some humility is in order here. As Wes Jackson has observed,² we are better off admitting our ignorance than doing something dumb in a really big way.

Our acceptance of change will also partly determine how others perceive the restoration community. If we are seen as a group of people intent on re-creating a gone world and resisting the tides of change, we will be misunderstood and dismissed by many as mere curators of biological antiquities. If, on the other hand, we embrace change and work with it as only the restorationist can, we will build our image as a future-oriented group of people who understand and use the forces of nature and humanity to a constructive purpose. It seems contradictory, but the more we aim to facilitate future change, the better job we will do of preserving the past intact.

Pantarei, goes the ancient Greek saying: "everything flows." Restoration should be a conversation with nature based on what the landscape *wants* to be, rather than an industrial process. We are not restoring the past—we are discovering the future.

References

1. Lopez, Barry. "Restoration," in *Winter Count*. Avon Books, New York, 1981.
2. Jackson, Wes. "The necessary marriage of agriculture and ecology." *Restoring the Heartland Symposium*. Society for Ecological Restoration, 2nd Annual Meeting, May 1990. Chicago, IL.

Guest Editorial

No End to Nature

by Steve Packard

In his recent book *The End of Nature* (Random House, 1989), Bill McKibben makes the case that nature no longer exists. He says preserves aren't nature anymore because we have to take care of them. In his view nature is now degraded and uninspiring because people are a part of it. As he sums up:

"The end of nature probably also makes us reluctant to attach ourselves to its remnants for the same reason that we usually don't choose new friends from among the terminally ill."

Our experience is the opposite. Unprecedented numbers of people are becoming passionately involved with the environment. It's an honor to be among the first to have a nurturing relationship with wild nature.

We know we're dependent on nature for replenishing the oxygen we breathe and for maintaining soil for the food we eat. If we're dependent on nature, what's so terrible about nature being dependent on us, too. We can help nature maintain its health. And, at least for the prairies, savannas and oak woodlands of Illinois, we have to help those areas or they'll be lost.

Responsibilities can be enriching. Nature doesn't end as we become a part of it, any more than our parents cease to be our parents once they become older and we have to take care of them. In some ways nature was our parents, and now we're its parent. Now it depends on us.

There's a component of our American character—some call it "rugged individualism"—that urges us to be totally independent. Kids go through this in spades, and all of us feel it at some time. We don't want to depend on anyone, and we don't want anyone to depend on us. As we mature, however, most of us come to realize that this attitude is ultimately pretty boring and empty.

It's wonderful to have been a child and been able to depend on people.

Dot and Charles Brownold, two of the Nature Conservancy's first stewards, once gave a presentation in which they built an elaborate metaphor describing their site, Nelson Lake Marsh west of Chicago, as a child. They said the marsh was so much like a child that you almost hated it sometimes because its demands were so great.

It was one emergency, and then another. People were dumping garbage there. The brush was moving in. Purple loosestrife threatened to take over. Even good developments brought complications: new beaver dams threatened to flood out some endangered plant populations. And, when sandhill cranes returned to the marsh one summer, poachers appeared as well.

The Brownolds could hardly take a vacation without worrying what was going to happen to the marsh while they were gone. Then, as with their children, the Brownolds realized that they'd developed a powerful relationship with that preserve—in part because the people and the marsh depended on each other.

Other stewards have said they initially had this sense of dread. They wondered what they were getting themselves into—because by loving something you end up picking up responsibility for it. But there are a lot of people who think the rewards resulting from accepting responsibilities are worth the pain, time and trouble.

Excerpted from an article in the Spring 1990 issue of "The Conservator," published by the Illinois office of The Nature Conservancy.

SER Membership?--R&MN Subscribers should be aware that, though all members of the Society for Ecological Restoration receive R&MN, not all subscribers are members of SER. Members pay an additional \$15/year and receive a quarterly newsletter, reduced rates for conferences and other privileges. To join, contact the SER office, 1207 Seminole Highway, Madison, WI 53711 608-262-9547.

SER-89 Conference Proceedings Available--More than 600 pages of papers on a wide range of subjects related to restoration, now available from SER for \$33 (\$28 to SER members; outside U.S. add \$2).

Recycled Paper--Since last summer's issue (Vol. 8, No. 1) R&MN has been printed on recycled paper.