EDITORIAL

Walking the Restoration Plank: Where Will You Land?

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We may love natural habitats, but love, alas, is often unrequited. As we pursue our dream of restoring those habitats, we are often awakened by the constraints and pragmatic nightmares that stop us from replacing our lost natural heritage. Our community walks a thin plank between the degraded present towards the distant end, a fully restored historical biodiversity. Many forces can push us off the plank before we reach our end goal. We may end up falling into a programmatic abyss below.

We sometimes think the plank goes from historical nature to wholly degraded. Think of one end being Yosemite National Park, a magnificent and diverse community of organisms in a wide landscape. The far end is Times Square in New York City, a place devoid of all historic nature with no green anywhere except on carefully dyed hairdos. All restoration projects reach some place on this long plank. Sometimes projects have modest goals, adding a handful of ecological features to improve the setting, ecological services such as stormwater control or flowers for pollinators or seed supply for songbirds. No attempt is made at ecological richness that reiterates the past. But modest progress is, in fact, progress. The other end of the plank is a full reiteration of the historical nature with enough area to promise sustainability, even in a time of climate change. An honest restoration manager must look in the mirror and ask, where on this plank is my pragmatic goal? Where on the plank should I aim my efforts and my client's funds so that new ecological advantages can be achieved?

Many pushy ogres try to knock us off that plank, no matter where our goal lies. One challenge lurks in the world of landscape ecology. Do we have enough new spaces to work upon to elicit success? Is the scale large enough to provide for the species we wish to restore? Is the distribution of those spaces close enough so that dispersal of seeds or young can occur among the spaces? More subtly, is the quality of each restored space high enough so that the species we install, or attract into the new vegetation, can persist, complete their life histories, and reproduce? No matter how numerous, and how large the restored landscapes, several studies have shown that without internal quality the landscapes become sinks for species who wander in and then fail, unable to persist in the inadequately restored niche spaces. Sometimes improving the quality of existing landscape patches will be more valuable for restoration progress than the creation of additional patches. Site improvement rather than initiation of new sites may also be more financially viable to low-budget restoration groups.

Surrounding our restored spaces there can be barriers to colonization and movement. Sometimes this is unfavorable environments such as farm fields, shopping malls, or Disney theme parks. In cities these barriers are very tall, and this also can limit dispersal of seeds, butterflies, or naïve young birds. The quality of these barriers is only vaguely correlated with distance; barriers vary in how porous they are to movements of plants, animals, and microbes. For example, animals can cross landscape barriers in diverse ways. Some species are wide travelers and can fly easily over inappropriate landscape parcels. Other animals are pedestrians and must stay on the ground to discover and colonize newly restored land. There are also jumpers, saltators, which can move easily among separated landscape parcels, avoiding the stressful barriers. Finally, other species are homebodies. They do not move far from their natal areas. For example, the genetic profile of mice in New York City parks varies enormously among populations showing that the parks are effectively distant islands from even adjacent parks. Again, distance alone does not predict isolation. Animal behavior must be factored into population connectivity.

Decisions by the human community may also push us off that plank before reaching our restoration goal. Changes of land use zoning, activities of site visitors that damage our restoration efforts, the history of a parcel that has local value different from ecological goals, and species preferences among people who live near our restoration projects, all are powerful winds pushing us off our restoration plank. Sometimes we hold on to the plank by marrying human and ecological needs. Green streets, for example, can serve the public with stormwater retention and shade

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for pedestrians, then subtly become habitat for local biodiversity. In this way we compromise but still stay on the plank towards a richer ecological target.

Finally, our travel on that path from Yosemite to Times Square takes time. We cannot reach the restoration goals we dream of quickly. The study by Damschen et al. (2019) shows that there was no asymptote in species accumulation even after 18 years. Imagine going to our government body or client and saying we will need 20 years of monitoring before we can guarantee success. In an age of rampant attention deficit disorder, how would that go over? Sometimes we must stay on that plank for a long time before reaching our goal, despite the ill winds around us.

Travel on that restoration plank towards a preconceived landing spot is difficult, as all practitioners know. With climate change, that hot elephant in the room that is changing our biota even as we try to restore it, we are on a journey, like Ulysses, which is fraught with danger. Ulysses had a happy ending; may that encourage us.

Recommended Reading

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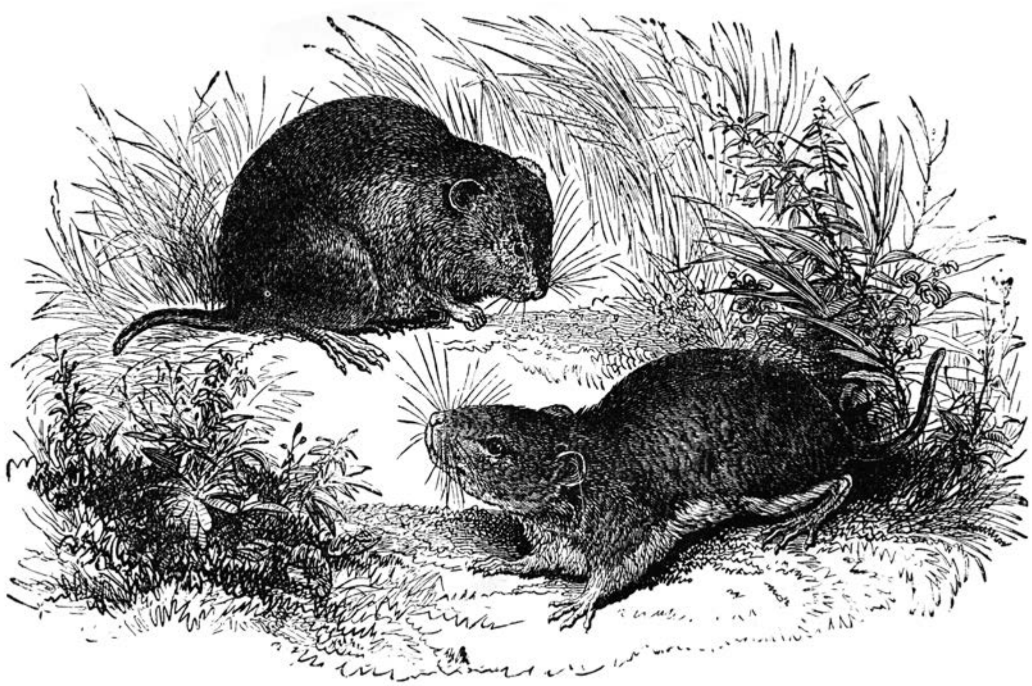

Field mice. Source: S. G. Goodrich. *The Animal Kingdom Illustrated* (New York: A. J. Johnson & Co., 1885) 428, The Florida Center for Instructional Technology, College of Education, University of South Florida, fcit.usf.edu.