Toward Transformative Natural History Education: A Few Principles

Thomas L. Fleischner, Tom Wessels, R. Edward Grumbine, and Saul Weisberg

Thomas L. Fleischner (tfleischner@prescott.edu) is a professor in the Environmental Studies Program at Prescott College, 220 Grove Avenue, Prescott, Arizona 86301 U.S.A., and Director of its Natural History Institute. Tom Wessels (twessels@antiochne.edu) is an emeritus professor in the Environmental Studies graduate program at Antioch University New England in Keene, New Hampshire. R. Edward Grumbine (ed.grumbine@gmail.com) is a fellow at the Kunming Institute of Botany, Chinese Academy of Sciences in Kunming, Yunnan, China. Saul Weisberg (saul_weisberg@ncascades.org) is Executive Director of the North Cascades Institute in Sedro Woolley, Washington.

Four long-term teachers of field natural history discovered that their insights on critical aspects of success in natural history education were convergent. Here, they share nine principles related to pedagogy, management of group dynamics, and the fostering of emotional receptivity to learning. The authors suggest that these principles are applicable to a wide variety of age groups and program lengths.

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Winter sun glints through the mesquite bosque as we stride along the dirt road almost in sight of the imposing border wall that cleaves the Sonoran Desert into two diminished fragments. Members of a group drawn together to advance a strategy to revitalize natural history in the 21st century, we take this opportunity to walk deeper into the rolling hills and compare notes about our collective teaching practice. Accompanied by Gila Woodpeckers, Verdins, and Black-throated Sparrows, we begin to share stories and discover a remarkable confluence of ideas and experiences.

Collectively we have taught field natural history for over 120 years; some of us taught together long ago, while some of us met for the first time this week. As we walk and talk, it becomes clear that our teaching methods and pedagogical insights are remarkably similar and have evolved convergently over the years. We have taught natural history on trips ranging from two hours to two months, and in a wide variety of ecosystem types – desert canyons, alpine meadows, temperate and tropical forests, coastlines, and continental interiors.

But our conversation reveals our agreement on several primary educational principles, regardless of the experience, age, or background of participants. While we concur with Chawla (2001) and Louv (2005) that childhood experiences help to establish lifelong values about nature, our experience suggests that adult learners also have the capacity to be transformed through engagement with the fundamentals of natural history practice.

For the purposes of this paper, our definition of natural history follows Fleischner (2001, 2005): "a practice of intentional, focused attentiveness to the more-than-human world, guided by honesty and accuracy." Natural history is not some ancient practice to be read about in dusty field guides; it is alive in the 21st century. It becomes ever more clear, from a perceptual physiology standpoint, that due to neural plasticity we can literally learn to see in new ways throughout our lives, and that looking at nature helps us to see more (Sewall 2012). The practice of natural history widens, deepens, and sharpens our vision.

Our intention here is to share simple principles that promote the practice of natural history. We offer them as models, as an exchange of ideas, springboards for innovative variations, and points of contention for discussion. We welcome dialogue amongst all of us who engage in this work of sparking interest in the world around us, and of creating an atmosphere in which the world's wisdom can be revealed (as described by Barry Lopez, in Lueders 1989).

Our collective experience has shown us that the most transformative experiences come from *extended* trips, due to deeper immersion in nature and the interplay of

group dynamics. But obviously there are many obstacles – personal, institutional, logistical, financial – that discourage or prevent participation in extended field courses. Thus, it is important to foster discussion of ideas on how the approaches we describe below can be applied in more common, shorter-term educational contexts, and in informal learning beyond traditional classrooms (Feinsinger et al. 1997). With this in mind, here are our ideas.

Principles

- Begin by exploring why all of us – learners and leaders – are here. Understanding the outcomes that each person is seeking begins the process of group cohesion and illuminates the role that natural history plays in our lives.

- It is important to have some warm-up, pre-trip assignments to expand our common ground, and also to share teaching responsibility with students during trips. Both practices engage learners more deeply and break down the barriers between "instructor" and "student."

- Flexibility is key. Be willing to change plans frequently, especially on longer trips. Weather, terrain, and individual ability can be counted on to add complexity to even the most mundane experience in the outdoors.

- Pay attention to rhythms – of landscape, individual learners, and the group. Every extended trip we have been involved with has benefited from intentional focus on group dynamics. This provides regular opportunities for members to be heard, for tensions to dissipate, and cohesion to be solidified. Changes in the place – weather, sounds, wildlife presence and absence – affect our receptivity to learning. Each individual has her or his own emotional rhythms, all influencing the collective experience.

- It is essential to provide opportunities for learners to explore on their own. Lectures and other structured activities certainly provide "scaffolding," but the richest, most durable insights often come about during exploration and discovery by small groups and individuals. Don't overbook learners' time. We often set aside a few hours each day for students to explore surrounding habitats on their own. Typically, we all scatter in the afternoon – like the "out breath" of our collective organism. Later, we are drawn back in for dinner – our collective "in breath" – where we share various discoveries. In this way the group is enhanced by the many different experiences of solitary and small group explorations.

- Find a balance between intensive and expansive types of inquiry. Allow time for in-depth immersion into particular fascinations – for example, keying out wildflowers, identifying birds, drawing landscapes, observing insect behavior – but also promote open-ended, open-minded wandering that allows unexpected discoveries.

- Stay curious. Leaders/teachers can model the process of being transformed by natural history inquiry. Watching teachers continue to learn new species and taxonomic groups can be inspiring. For example, some of us just started to learn insects in our 50s, and our feeling is that students found this both entertaining and motivating. Leaders' expressions of emotion – awe, surprise, delight – can play a key role in the collective learning experience.

- Finding a balance between natural history as a scientific practice and the artistic and imaginative side of the same experience deepens them both. Field programs often include students and teachers from many different backgrounds. Combining the strengths of the ecologist with the eye of the artist allows all parts of human consciousness to focus on "attentiveness to the more-than-human world," and showcases different skills among group members.

- We have discovered that near a trip's conclusion it is important to build bridges back to the "normal" world that we will return to. The point is not to place nature "here" and culture "there"; the goal is to clarify connections between the two by using natural history to open us up to new relationships.

What has been your experience as a student or teacher of natural history? Have your experiences in the woods and fields been different than ours? Although we have a great stock of teaching experience, we know that there is tremendous variation in these matters. We are especially interested in your insights into the issue of how to foster educational intensity outside of extended trips – how can depth of natural history learning and

appreciation of nature occur in an afternoon or on an overnight trip? We offer these thoughts as a starting point for ongoing dialogue.

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