How Natural History Shapes Purpose, Culture, and Identity in Ecology

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Natural history is who we are as ecologists. I understand such a general statement is not quite this simple, but as natural history informs our purpose and identity, it is a big part of the story.

Natural history shaped many of our individual identities as ecologists (McKeon et al. 2019). I remember when I was about six or seven wanting so badly to see the baby robins in our birdhouse that I tipped one out and held it. I still feel a little guilty about that, but the chance to look at it and touch it spurred love of the living world and got me started in this direction.

This identity is also intergenerational, in both formal and informal contexts (e.g., Cristancho and Vining 2009, Zimmerman and McClain 2014). My parents, who immigrated from mountain cultures, centered family time in natural areas when I was little. They did this even though we lived in the city.

My nine-year-old daughter, who wants to be an ecologist too, has grown up chasing and catching animals. Last August, she drove us in a friend's skiff off the California coast to get in the middle of one of the great remaining animal migrations on Earth, of sooty shearwaters traversing the Pacific. These birds come down the California coast each summer on their way to New Zealand.

My husband and I are sharing with our children our lifelong fascination with migratory animals and tying that to a family culture that values understanding how these migrations bind us to other places, cultures, and history.

Place and migration, and my fascination for people's relationships with them, led me to my master's work in the Yukon-Kuskokwim River Delta in the early 1990s. There, Yup'ik communities depend on arriving migratory waterfowl as spring food, when ice melt impedes ground travel (Zavaleta 1999). My time in Alaska revealed not only how inseparable natural and cultural history can be, but also how bodies of intertwined knowledge grow and are transmitted over time and how individuals and families in such communities carry that knowledge on and up in daily life. Working in the Delta taught me that natural history is also, always, cultural history. Nearly every landscape has a peopled history, and its ecology reflects that long human relationship.

Figure 1. Leticia Santillana, a Doris Duke Conservation Scholar at UC Santa Cruz, meets the Pandora moth (Coloradia pandora) in forest lands of the Northern Paiute. (Photo by Diana Martinez.)

Today, teaching natural history in connection to cultural values and shared history can bring it alive for students from a wide range of backgrounds. This happens because students want to integrate natural history with their experience, which for some of them has little nature in it but for all has relationships, place, and history in it.

I have been thinking a lot about identity and belonging over the last five years as I build two programs aimed at inviting broader perspectives and voices into the fields of ecology and conservation through shared field

experiences – the Doris Duke Conservation Scholars Program (https://conservationscholars.ucsc.edu/) and the CAMINO (Center to Advance Mentored, Inquiry-based Opportunities, http://camino.ucsc.edu/) at the University of California, Santa Cruz. Identity – who we are – and belonging – how this situates us in community with others – are discussed little in the field of ecology, but they guide whether and how we choose this field. Understanding ecology's roots in natural history, and natural history's roots in wider and deeper knowledges across cultures, connects them to shared human experience.

Today when my students and I learn about the piagi, which is the Pandora moth larva's Paiute name (Fowler and Walter 1985), its relationship to frequently burned Jeffrey pine forests east of the Sierra, and the ways in which logging and fire suppression had made a mess out of them throughout the 20th century, we learn it in the field (Figure 1). We learn it from Paiute elders and Bishop Paiute youth who speak from the lens of accumulated cultural knowledge of the moth as food and relative, tended with care for hundreds of generations. Natural history is cultural history.

And what is culture? Like genes, it can be transmitted vertically to subsequent generations. Unlike most genes – bacteria and viruses notwithstanding – it can also be transmitted horizontally, among unrelated individuals, like we are doing through this journal. Culture also includes a cumulative accretion of knowledge that builds on what came before, like new sediment in a lake core that knows all the layers below it.

The kind of cultural history I am talking about includes other parts, not only indigenous cultures. If we look at the transmitted, collective, cumulative knowledge of ecology as a field and a community, it is natural history. Natural history has fed, responded to, and co-evolved with ecological theory throughout our field's history (Hagenbuch 2006, McKeon et al. 2019). A concept like the Grinnellian niche was born from Joseph Grinnell's careful observation of species like the Gray-crowned Rosy-Finch in the California Sierra Nevada (Grinnell 1917). Now that niche concept underpins how we understand and model all kinds of ecological responses.

As scientists we might think of ourselves as outside of any culture (Forsyth 2011), but we have a cultural story. That cultural story is natural history. Natural history is ecology's cultural foundation (Jardine et al. 1996, Wessels 1997). I want to be clear; I am not saying that natural history is just our past and currently out of style. I am saying that it has driven theory-building and testing throughout the history of our field, and it continues to do so today (Dayton and Sala 2001). Ecological hypotheses still come from observation, and field knowledge is still the only way to ground truth and validate our conclusions (Sagarin and Pauchard 2012).

These days I study the several species of rosy-finches in North America. I use both my lab's present-day observations and those made by Grinnell a century ago to build models of the rosy-finch's niche as it is today and projected to be in the future. In doing this work, I feel as though I am part of something bigger than myself. Some of this feeling comes from knowing the birds and the ecological system of which they are a part, because who would really care about these birds without knowing them? And part of this feeling of belonging comes from being able to build on the intertwined ecological and natural history knowledge of my predecessors in our field – those relationships and history – and being able to share that with others.

To say that ecology requires natural history is true, but it is not the whole point. Natural history defines who we are as ecologists. We depend on it for our work, and we need it for our shared sense of purpose in the body of understanding and relationships that make up ecology.

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