

Next Steps Toward a Natural History Renaissance

Summary of Workshop Ecological Society of America Annual Meeting

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What follows is a summary of ideas co-created by participants at the workshop, Next Steps Toward a Natural History Renaissance, which followed the Organized Oral Session, "Natural History: The Basis for Ecological Understanding and a Global Sustainable Society," at the Ecological Society of America (ESA) meeting. The nine presenters at the session laid out a variety of reasons why a revitalization of natural history was needed--to improve the quality of scientific research, to promote conservation, and to foster healthier, more sustainable human-nature relationships. (Session organizers and presenters have been invited to prepare a summary of this session for *Ecological Monographs*.) More than 300 people attended this afternoon session; audience participation was lively and engaged. The follow-up evening workshop, attended by 45 people, also demonstrated creativity and commitment to the restoration of natural history to an integral place in ecological science, and beyond.

Workshop participants were asked to join one of three groups, focusing on the importance of natural history in: a) *Science* (efforts to catalyze and organize the collection, organization, and dissemination of natural history information in ecological research); b) *Education* (how do we encourage support for natural history in education, from K-12 through university curricula? What are the challenges?); and c) *Society* (the importance of increased public appreciation of, and participation in, natural history). Each group was asked to articulate reasons why natural history mattered, and then to spend most of its time generating ideas for specific actions that could be taken in both short and long term time frames. This brief report represents a distillation of the many ideas shared within the three concurrent focus groups, and also includes ideas offered by a few people who couldn't attend the workshop. Not surprisingly, there was some overlap between the ideas of

the three groups. This document is the opening, not the end, of this discussion; we welcome continuing dialogue.

Abstract of Workshop (from program):

Natural history – the observational, descriptive, and comparative study of the natural world – forms the foundation of ecological research, the grist for the creation of both ecological and evolutionary theory, and the backbone for conservation. Natural history also provides a key pathway to nurturing the fundamental human emotional connection to the non-human world. Our sense of place, and our society’s willingness to prioritize open space, natural landscapes, and the species that inhabit these areas, depends upon a broad base of support for amateur and professional naturalists. Yet in the last 75 years, we have seen a steady decline in the practice of natural history in research, education, and society. This workshop will build on the energy generated by the related symposium “Natural History: The Basis for Ecological Understanding and a Global Sustainable Society” and explore practical steps to promote a renaissance of natural history in research, education, and society. We will use focus groups to examine: (1) efforts to catalyze and organize the systematic collection, organization, and dissemination of natural history information in ecological research; (2) barriers to support for natural history in education, from K-12 through undergraduate curricula, and strategies for overcoming these barriers; and (3) the importance of increased public appreciation of, and participation in, natural history. We will conclude with a discussion aimed at articulating pressing needs in each of these realms, and the identification of the most pressing priorities and promising opportunities for NGOs, including the Natural History Network, ESA, and The Nature Conservancy.

Reports from the Three Groups

Science

Concerns about the Marginalization of Natural History in Scientific Research

Traditional knowledge critical to science in general, but traditional observational work is often not valued. There's a need to incentivize this work.

Some practitioners have separated from the natural world as they age, and need to rekindle that young age interest in nature.

Climate and Conservation –solid natural history information has great utility in tracking changes.

Natural history is not just important for ecology, it goes much further: for example, effective agricultural practice depends on natural history; geology needs descriptive natural history. We have allies in other disciplines who see the same issues.

The phenomena of "physics envy" and the promotion of molecular biology at the expense of field biology has detracted attention from basic natural history.

There is a need to develop a standardized, yet flexible, format for collection of natural history field data (e.g., what are the five essential measurements every frog researcher should make?). But it is important to maintain a balance between standardization of data collection and still allow for creativity, and deductive leaps.

Steps Toward Solutions

Organizing the community: Develop and post a list of “card carrying” naturalists, allowing prospective students to see where to go to do this work and get this mentoring

Organizing observations: We need to think about a system for how we can store, mine, and distribute natural history information. (Examples of possible venues include: a) RCN--"Research Coordination Networks in Biological Sciences" program of the National Science Foundation; b) Nature Serve – our National Heritage Program; c) Morpho (KNCB)

Collecting the data:

Define the most important set of information that we should all be collecting based on taxa or process. Can we get NSF (RCN) to help us do this and create structure to do this?

NEON (National Ecological Observatory Network) could provide structure for systematic collection of information across the country. This could push other natural history observations across the US. NEON will not be a place to look for natural history information per se, but it could provide good technological inputs.

Find funding possibilities for observational science

Citizen Science:

Challenges: gray area between excellent citizen science and the peer review process – could we have a peer review processes that helps

Make information from citizen science available to professional scientists, and to the public. Tree of life / wikipedia models are available for disseminating information from citizen science.

Promote Natural History as an essential part of Civics (E.g., In Florida, half the state became meteorologists after hurricanes)

Professional development and professional societies:

Develop prizes and incentives at conferences of scientific societies: For example, a) a prize for the best natural history “essay / supplement / report” on their poster, which would allow people to expand creatively on the scientific themes of their poster; b) prize for best natural history content in a paper or poster.

Create a list of 10 or 20 great natural history stories

Create better emissaries for natural history

Foster better communication skills

Promote the importance of outreach

Build links between arts and ecology (including, but not limited to, scientific illustration)

Create a Natural History Section of ESA

Education

Issues with and barriers to inserting natural history into national curricula

There is a dearth of individuals available to consult who actually know natural history. We need teachers who are versed in the taxonomy of particular organisms and how to identify them—botanists, entomologists, mycologists, ornithologists—and we need those teachers to apply their skills to natural history—range tolerances, reproductive strategies, physiological tolerances, etc.

Specialization tends to be encouraged at the university level—that is the bad news. Good news is that graduate students, especially, have the enthusiasm necessary to broaden their knowledge base. In one case, a doctoral committee apologized for a student’s need to specialize in order to succeed.

Our current generation of children are not getting out into the field. Field trips are expensive and difficult to schedule and the logistics of moving students from campus to field sites can be challenging for schools with limited budgets.

Structure of the educational system currently forces students to shuttle from one classroom to the next throughout the day and their schedules don’t lend themselves to participation in field trips. This is compounded by the problem of unsupportive administrators at schools.

The current disconnect between society and natural history means that parents are often not the conduit for natural history education for their children. There is a need to engage parents in this process so that they can share this information with their children.

As natural history education disappears from the academic realm, conservation organizations increasingly rely on “citizen science” but we aren’t always educating our citizen scientists well. We need to formalize the training of our citizen participants in natural history science.

A passion for natural history is necessary to be good at it. Natural history needs to be incorporated into people’s life styles if they are to be truly good at it.

University focus is often on the ability of their communities to generate income. The creation of intellectual property is incentivised. One path to raising the profile of natural history in the university level curricula would be to find ways to create and generate new intellectual property income.

Our education system is driven by a need for careers. Educational system is not being employed for teaching but for preparing students to enter the work. The current focus is on hard sciences instead of the natural world.

Many of the heroes and mentors who are presented to high school kids are rap stars and sports personalities. Few, if any, of these role models are scientists of any stripe.

At present we are employing a generation of teachers who are uncomfortable with the outdoors and who are not well versed in techniques for exploring or teaching natural history.

Natural history education is important for the following reasons:

Our future is tied to understanding how the world functions.

Natural history is the foundation for the rest of our ecology.

Humans relate to and respond to natural history. If natural history education conveys a strong message of crisis then people will listen. (think: images of polar bears on ice floes)

We need to distinguish between natural history and related but distinct concepts like environmental literacy.

It's hard for humans to feel motivated to protect things they do not feel passionate about, but in the absence of exposure to natural history, it is difficult to develop the necessary passion for the natural world.

Rural areas see landscapes as a resource instead of through the lens of natural history.

Too much natural history information is being written by people that aren't well versed in the subject. There is a need to get the people who are writing the scripts to be well informed.

Solutions

Cultivate an acceptance of broader definitions of nature. Encourage the valuation of different sources of knowledge.

Recognize that the university cooperative extension system can be a channel for NH information, as can organizations such as the boy scouts and girl scouts, 4H, etc.

Get ecologists in to local schools and get the learning objectives changed to reflect a focus on natural history.

Encourage ecologists and natural historians to participate in local school board meetings. This is a powerful and often neglected way to change the objectives of a school system (remember Dover and the creationism conflict).

Redefine the meaning of educational success—present legislators with the reality that only 14 out of 400 biology majors will be accepted into medical school and fewer still will complete that course of education.

Create internship opportunities for high school teachers that will include getting them into the field for natural history education training.

Weave outreach into graduate programs.

Require that educators take science and natural history classes.

Draft standards for natural history education and publicly endorse them.

Create a web page listing resources and funding organizations for natural history education.

Contact and enlist Teachers Unions/NEA and submit articles on natural history education to their journals.

Identify and/or create summer programs in natural history for teachers of all levels.

Create a natural history resource Clearing House that would include sources for natural history educators.

Create natural history modules that can be taken off the web and taught—units in urban ecology.

Don't ignore local organizations. By engaging with local organizations we can build confidence and take advantage of local knowledge.

Create faculty exchanges between programs that are doing natural history education [already commenced by the EcoLeague consortium]

Society

Issues and barriers to raising public awareness of Natural History:

Evolutionary and environmental sciences are often portrayed as being in conflict with each other. Natural History can be used as a bridging mechanism between these two areas of study and should be used as a lens to allow participants to get past the conflict.

Humans have an innate need to interact with and experience the unpredictable natural world.

Science is currently suspect in our culture and there is a disconnect between science and society that separates and isolates people from science. When society fails to value science, we lose access to people with traditional knowledge reflective of natural history.

Natural history has two dichotomous sides—a solitary side, such as one would experience while walking alone in nature, and a social side reflected in our ability to connect with almost any other person on the level of natural history.

Natural history is a stepping stone to teaching ecology. When we connect to people while they are experiencing the natural world, we open a doorway to ecological education.

Much social dysfunction stems from humanity's lack of connection with nature. Experiencing natural history is transformative in that it makes us more compassionate to the world around us and to other people.

Urban dwellers often find themselves disconnected from "place" which feeds into our disconnect from the natural world.

The electorate is a powerful target demographic. By raising awareness of natural history in the minds of the electorate, we can impact policy decisions made at all levels through our society.

Natural history humanizes us; it is a cultural "corrective" that improves our societies from esthetic and ethical viewpoints; it grounds us. Both the "soft" aspects of natural history and the rigor are equally important.

In the context of global change, we're going to see much environmental change. Valuing natural history is a prerequisite to dealing with these problems proactively.

The "job" of natural history is to transform ecology into a discipline that respects and incorporates all of the elements of the human experience. As mentors and educators we are creating one-dimensional ecologists. We need to find a way to transform our ecologists (and biologists in general) into natural historians as well.

Short and Long Term Solutions to Raising the Awareness of Natural History in our Society

Writing

Encourage those who value natural history to write letters to their senators and representatives—if we can activate our base, we can raise our potential to affect policy development. Further, the act of letter writing empowers the electorate.

Encourage commitments from natural historians to write for the general public. This does not necessarily need to be at a 'high level', but can be anything viewable by the public, op-ed pieces, letters to the editor, short pieces for publication in local papers, etc.

Engagement

Seed the idea that natural historians should invite their legislators on a nature walk. By simply exposing those who make policy decisions for us to nature, we can promote the valuation of natural history in the creation of public policy. It's important to act at the level of "citizen" instead of as a representative of an organization while doing this. This can be powerful at both a local and national level.

The concept of the "digital native" was brought up. Digital natives are those individuals in our society that were born into a world already dominated by technology (think 15 and under). Their experience is becoming increasingly common. To reach this portion of the population, four distinct steps were suggested:

1. get people (read: digital natives) out into nature
2. place them on well-defined, easily accessible trails
3. assist them in interpreting what they are observing by leveraging current technology to provide them with a “trail guide”--potentially creating interpretive podcasts or recordings that can be stored on a portable media player. Another approach might be to create interactive maps (think iPhone) with natural phenomena reflected in the icons/markers.
4. at the end of each recording, encourage the user to “unplug” and listen to what is going on around them

Discourage people from staying separate from nature. When possible, let people step away from the beaten path, sit down, get dirty, struggle to identify things, and rediscover the wilderness that Thoreau and others wrote about. Unstructured time outside allows people to interact with nature in a way that encourages the public to engage.

Public education

Call natural history what it is. People do notice natural history, even if they don't realize it. Everything from recognizing the flowering phenology of ornamental plants to the yearly emergence of biting flies is encompassed in natural history. One way to do this is by harnessing the recent resurgence of an interest in gardening. Alerting these new gardeners to the opportunity to observe and document natural history in the context of their back yards will foster greater awareness of natural history.

Create a "road show" of traveling naturalists and natural history educators/promoters (The Forgotten Language Tours of The Orion Society as a model).

Create a clearing house of natural history resources and tools.

Declare a Natural History Day to promote awareness. (Can we harness the environmental stance of the current administration and the synergy with University administrators to launch this in a way that draws on a number of our resources at once? Perhaps roll out the Natural History Road Show on Natural History Day at a participating university).

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