What Is Translational Ecology?

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Article published in Integration and Implementation Insights [1].

The term ‘translational ecology’ was coined by eminent natural scientist William Schlesinger in a 2010 editorial in Science magazine. He wrote, “Just as physicians use ‘translational medicine’ to connect the patient to new basic research, ‘translational ecology’ should connect end-users of environmental science to the field research carried out by scientists who study the basis of environmental problems.”

Further, Schlesinger posited that without such communication, ecological discoveries “will remain quietly archived while the biosphere degrades.” The editorial chafed some ecologists whose work is motivated by increasing our understanding of natural systems. Others, however, were inspired by this call to action and sought ways to (re)orient their careers from inquiry toward impact.

Our group, which includes natural and social scientists, educators, and practitioners from both academic and non-academic institutions, expanded Schlesinger’s vision of “two-way communication between stakeholders and scientists.” We define translational ecology as follows:

Translational ecology is a boundary-spanning environmental science that leads to actionable research focused on maintaining or enhancing the resilience of social-environmental systems. Using an adaptive and iterative mode of inquiry, it uses broadly accessible models and tools that span scientific disciplinary boundaries, enabling the co-production of knowledge by ecologists and intended beneficiaries of ecology.

Unpacking this definition, we see that translational ecology is grounded in research of complex social-environmental systems; this means it is necessarily multi-, inter-, and often also trans-disciplinary.

Transdisciplinary ecology is done not in a linear fashion by a single scholar, but iteratively by teams comprised of diverse stakeholders, potentially including donors, scientists, resource-managers, resource-users, policy-makers, and others. And because translational ecology is a team science [2], its practitioners work together to frame the problems and agree on research questions. They use an iterative process of inquiry as context and questions shift. The outcome of translational ecology is mutual learning that can be acted upon to address socio-environmental challenges.

The iterative process of enquiry is illustrated in the diagram below and is loosely based on the T1-T4 phases of translational research in medicine [1]. Each stage may require different team composition and different forms of participation.
In subsequent blog posts, our group will describe the knowledge, skills, and dispositional attributes we think a translational ecologist needs (see right sidebar for links or dates for all four related blog posts).

**Reference:**


Online: [http://science.sciencemag.org/content/329/5992/609](http://science.sciencemag.org/content/329/5992/609) [3]

**Endnote:**

1. The figure was developed by a Translational Ecology class run by Mark Brunson in 2011 based on the following article: M.J. Khoury, M. Gwinn, and Ioannidis, J. P. A. (2010). The emergence of translational epidemiology: From scientific discovery to population health impact. American Journal of Epidemiology, 172, 5:517-524. In this article T0 - T4 are described as follows: T0 is description and discovery; T1 is from discovery to health applications, such as tests and interventions; T2 is from health application to evidence guidelines; T3 is from guidelines to health practice; T4 is from health practice to population health outcomes.

**Participants:** These ideas are a product of the SESYNC Translation Ecology pursuit [4]. The principal investigators were Mark W. Brunson and Michelle A. Baker, both from Utah State University.

Other participants were Gabriele Bammer (Australian National University), Carol Brandt (Temple University), Alexis Erwin (USAID), David Feldon (Utah State University), Rebecca Jordan (Rutgers University), Sunshine Menezes (Metcalf Institute for Marine & Environmental Reporting, University of Rhode Island), Mark Neff (Western Washington University), Colibrí Sanfiorenzo-Barnhard (Grupos Ambientales Interdisciplinarios Aliados), Julia Svoboda Gouvea (Tufts University) and Eric Toman (Ohio State University.) This blog post was written by Michelle Baker and Alexis Erwin on behalf of the group.
For more about this project see: Brunson, M.W., and M.A. Baker. 2016. Translational training for tomorrow’s environmental scientists. Journal of Environmental Studies and Sciences, 6, 2: 295-299.

Photo (L-R): Front row - Carol Brandt, Eric Toman, David Feldon, Mark Brunson. Back row - Sunshine Menezes, Gabriele Bammer, Colibri Sanfioenzo-Barnhard, Mark Neff, Alexis Erwin, Michelle Baker and David Hawthorne from SESYNC.

Associated Project:

Source URL: https://www.sesync.org/what-is-translational-ecology

Links
[1] https://i2insights.org/2016/06/14/what-is-translational-ecology/