A TOOLKIT FOR GRADUATE STUDENTS WORKING IN TRANSDISCIPLINARY CONSERVATION

COMPILED BY
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SOCIAL SCIENCE WORKING GROUP
STUDENT AFFAIRS SECTION

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WHAT IS THE GRADUATE STUDENT TOOLKIT?

We began developing this tool kit in fall 2005 after a series of discussions between graduate students working in the natural and social sciences. We all felt that conservation was an important goal, but one that is most effectively achieved when approached from multiple disciplinary angles. We felt that it was important to put together a tool kit for other graduate students who were interested in embarking on conservation projects that draw from multiple disciplines.

We are a part of the Social Science Working Group (SSWG) of the Society for Conservation Biology. The SSWG has over 600 members from a wide variety of academic backgrounds, from anthropology to zoology. What unites us is a desire to integrate the intellectual breadth of knowledge and criticism which social science has to offer with more traditional natural science based methods of conservation.

As graduate students we cover an impressive range of backgrounds from environmental anthropology to molecular genetics. Our geographic range is currently focused on North American institutions, however our fieldwork spans three continents and two oceans. We are actively seeking members from other areas, to allow for more representative society as well as different perspectives on conservation actions.

We have decided to focus on several areas where students may need the most help. These include:

- Defining the terms interdisciplinary, multidisciplinary and transdisciplinary
- Academic programs which are structured to facilitate multidisciplinary research;
- Advice on approaching advisors/committee members when proposing this kind of work, and other tips and helpful hints from graduate students who are going through similar experiences.
- A list of methods and techniques to carry out the work (on website);
- Funding opportunities at a variety of scales, with examples of successful proposals (on website);
- Advice on where and how to publish your results and how to bring your results to the right audience

This toolkit is a living document, and is meant to be a springboard for discussion and critiques, please check our website (http://www.conbio.org/workinggroups/sswg/toolkit/index.cfm) for updates. If you have any comments or suggestions, please feel free to contact us at SSWGTOOLKIT@gmail.com or the chair of the Student Affairs section, Joshua Drew at jdrew@bu.edu. If you wish to be more involved please let us know, we can only be as successful as our members allow us. The more participation we have the more cross-fertilization can occur and the stronger a product we can produce.

(INSERT PREFIX HERE)-DISCIPLINARY: A PROBLEM OF DEFINITIONS.

The terms “multi-disciplinary”, “transdisciplinary” and “interdisciplinary” are often used to define research that involves, to varying degrees, both natural and social sciences. This section provides a common linguistic foundation for conservation researchers. It is important for us to be clear about our terms in order to reduce confusion later on. This is more than just semantics; these terms have different applications and ultimately produce different conservation results. While this toolkit is not intended to be a definitive work, it will provide us with the growing consensus on specific definitions.

Interdisciplinary: research with a truly collaborative focus. Interdisciplinary research blends social and natural sciences. In theory this could be done by a single individual with a diverse background. It more often refers to projects where practitioners from two or more disciplines join together. Examples could include “watershed conservation” which might include chemists, biologists, urban planners and geographers.

Multidisciplinary: research that is approached from a variety of different backgrounds, but with researchers working within their own intellectual frameworks. Multidisciplinary research involves multiple parties working either concurrently or sequentially. An analogy from the childhood development literature is “parallel play” where children play next to each other, but not exactly with each other. For example, in setting up a system of marine protected areas, a biologist would identify critical habitat through underwater sampling, while an anthropologist would analyze the kinds and amounts of fish harvested through household interviews.

Transdisciplinary: a more inclusive term, which refers to research consisting of two or more different academic disciplines regardless of the interactions between them. According to Richard Wilk (2000), “Interdisciplinary work entails knowing enough about two disciplines to be able to apply one to the other, as in 'water economists' who are applying some economics to some hydrology. But their goal is never to question or broaden the assumptions, methods, or theories of either. Transdisciplinary scholars, in contrast, are versed in the paradigmatic assumptions of two (or more) fields, and their goal is a more fundamental contribution to both their cores, and the boundaries that separate them.”

For further reading and discussion please see an editorial letter from *Ecology and Environmental Anthropology*: http://www.uga.edu/eea/01_2006/letter01_01_2006.htm. The journal has also archived a discussion on the role of anthropologists in interdisciplinary conservation projects: http://www.uga.edu/eea/01_2005/eanth-archive_2005.html. Again we are not claiming that these definitions are set in stone, however we do argue for linguistic consistency.

There is a growing literature on both the conceptual and pragmatic applications of these kinds of resources. A brief overview can be found in the following sources:

Campbell, L. 2005. Overcoming obstacles to interdisciplinary research. Conservation Biology 19(2): 574-578.
Lélé, S. and R.B. Norgaard. 2005. Practicing Interdisciplinarity. BioScience 55(11): 967-975.
Mascia, M. et al. 2003. Conservation and the Social Sciences. Conservation Biology 17(3): 649-650
Metzger, N. and R.N. Zare. 1999. Interdisciplinary research: from belief to reality. Science 283(5402): 642-643.
Norgaard, R.B. and P. Baer. 2005. Collectively seeing complex systems: the nature of the problem. BioScience 55(11): 953-960
Wilks, Richard. 2000. Being Transdisciplinary. Available at: http://dizzy.library.arizona.edu/ej/jpe/transdisciplinarity.htm

WHAT INSTITUTIONS OFFER GRADUATE MULTI/INTER/TRANSDISCIPLINARY ACADEMIC/RESEARCH PROGRAMS?

Finding the right academic program to suit your needs and career goals is one of the first steps to doing transdisciplinary research. It can be a very challenging process to sift through the almost overwhelming amount of information out there on graduate research programs and pick the one that is best for you! We have compiled on our website (http://www.conbio.org/workinggroups/sswg/toolkit/index.cfm) is this the correct website? A list of programs to help narrow down your search by providing a quick reference to programs that support transdisciplinary research leading to a Masters or PhD degree. Each entry provides the name of the academic institution, name of the degree program, a brief description of this program from their website, and contact information to pursue your search further with that institution. In looking for a graduate program, department websites are an important source of information about program goals, requirements, and structure. However don't underestimate the information you can get from contacting students who are already in the program or have recently graduated from the program, as well as the academic faculty who are associated with the program. Good luck with your search!

SHORT COURSES RELEVANT TO INTERDSICIPLINARY RESEARCH IN CONSERVATION

Several institutions offer field courses or other short courses that provide an opportunity to carry out combined social and natural studies. Make sure to check your institution, or the one you are applying to, as each university offers field courses that may be relevant to interdisciplinary research. Below are a few

larger partnerships or collaborative programs that offer short courses in the area of the natural and social side of biodiversity conservation. Followed by the name of the institution is a brief description of the overall program, sample courses, and a website to obtain further information.

Organization of Tropical Studies, Costa Rica
The Organization for Tropical Studies provides creative, groundbreaking, and scientifically sound graduate education programs. Today the organization remains committed to making training in tropical biology part of the experience of students and professionals, both in the field of biology as well as in other disciplines. OTS offers courses for undergraduate students, graduate students, professionals and the general public in English, Spanish and Portuguese. In addition to traditional courses in tropical biology, OTS also offers courses and training in conservation biology, environmental policy, and in natural history. Example of interdisciplinary courses include: Conservation and Development in Tropical Countries: Insights and Implications (English), Ecological Principles for Sustainable Development in Latin America (in Spanish), Management of Tropical Forest Areas (in Spanish).

www.ots.ac.cr and
http://www.ots.ac.cr/~pcambientales/en/professional_courses.shtml

Community Agroecology Network (CAN), Santa Cruz, California
The community agroecology network offers courses, resources, and information focused on a holistic approach to agriculture and agricultural development based on traditional, alternative, and local small-scale agriculture, and linking ecology, socioeconomics and culture to sustain agricultural production, farming communities, and environmental health. The 2006 International Agroecology Short Course, held in Nicaragua, is entitled “Agroecology, community and action: integrating conservation and sustainable livelihoods in rural landscapes”.

http://www.agroecology.org/shortcourse/index.html

Tropical Agricultural Research and Higher Education Center (CATIE), Costa Rica
CATIE is a leading research and training institute on sustainable rural development and tropical agricultural issues. It offers several education and training opportunities, including courses, workshops and seminars, conferences, service training, and on-line courses. Topics include watershed management, sustainable living, and resource management.

www.catie.ac.cr

ADVICE FOR GRADUATE STUDENTS INTERESTED IN TRANSDISCIPLINARY RESEARCH:

Many graduate students interested in conservation recognize the importance of approaching conservation issues from a variety of angles, which is why there is a desire to participate in transdisciplinary research. However given the constraints from committee members, research directions and funding sources, it is often difficult to get these projects started. In this section we will provide advice from our own research projects, and ask those of you who have your own stories to share them with us so that we can learn what does and does not work.

A major obstacle to transdisciplinary research is institutional inertia. Academic departments may not be keen on having their graduate students focus on more applied conservation work. This is particularly true in the natural sciences. By framing the research as part of larger dissertation project, you can slide some transdisciplinary research in with the other more traditionally focused chapters. Also, by focusing on conservation questions, you open up your dissertation to a wider spectrum of methodological approaches than by having your dissertation being narrowly framed as a simple taxonomic or ethnographic exercise.

Another way to conduct interdisciplinary research is to obtain your own funding. Professors have to justify paying you on a TAship or RAship because you are working on a segment of their research. If you can find ways to pay for yourself, and are able to justify the research within the larger context of your dissertation (above), then you may find yourself with considerable latitude in terms of project design and development.

One potential problem graduate students face is finding a collaborator from a different academic discipline to work with. This cross-fertilization is the hallmark of transdisciplinary research, yet is often one of the most difficult aspects. There are several ways to identify and contact potential collaborators.

The first way to identify potential collaborators is to network. While it may sound simple, going to meetings is a great way to meet others doing very interesting work. When attending meetings and conferences try to attend some talks outside your major area(s) of interest. If you have the money and/or time, you may also consider going to meetings outside your academic area. Many biology based meetings host special social science or transdisciplinary research symposia so take advantage of these. You may find yourself serving as the voice for your discipline, and it is a great way to see what folks in other disciplines are doing.

Also, while at meetings, don't just stand around with the four lab-mates you came with. Make a point of introducing yourself to someone whose talk interested you and whose work or perspective seems to compliment your own. Don't forget to hand them a business card at the end of your conversation. This will help people remember your name and let them know how to contact you later. If you don't

have business cards handy, you can make them easily with your own printer. Just pick up a package of blank business cards at your local office supply store and create your own using the “Letters and Mailings” tool in Word.

Although it is difficult to find time, reading the literature from other disciplines can be very rewarding. Journals such as the ones listed in the publications section often have interesting transdisciplinary articles, but within the references of those papers are journals that you may not have thought of reading. Finally subscribing to list-serves can provide you with access to hundreds of potential collaborators. If you can succinctly phrase your question and have a specific “ask”, you may find people who are willing to give you invaluable advice.

PUBLISHING YOUR RESULTS:

Publishing in the peer-reviewed literature is the currency of academia and presents several difficulties for transdisciplinary research. Although not as easy as single discipline research, with a little thought and careful preparation it is possible to publish these kinds of research.

The first difficulty is finding an appropriate journal. Because of the rapid proliferation of journals, many are becoming more specific in their content and transdisciplinary research may be seen as outside their scope of interest. Transdisciplinary research is often seen as being too biological for a social science journal, and too “touchy feely” for straight biological journals.

Fortunately, there are several journals that focus on these unique kinds of research (see http://www.conbio.org/workinggroups/sswg/toolkit/index.cfm for more information on specific journals). Identifying one of these journals and tailoring your paper to their recommendations for authors will greatly improve your chances for being published.

Although it may seem obvious, remember that each journal has a specific audience. It is common for authors to write several very different papers from the same initial research depending on which journal they intend to submit to. For instance, a researcher submitting to a society and development journal would have a much different focus than one submitting to an ethnobiology journal, even if the data are drawn from the same set of interviews.

The first task is to review the journal website and carefully consider its aim and scope. Once you determine that the journal seems like a ‘good fit” contact an editor to see if they agree. Managing editors do not want to overly burden their staff and editorial board with inappropriate papers so they are going to be willing to give you a quick idea of how well the paper matches their aim and scope. Don’t take it personally if the editor does not think the paper a good match. Rather, there may be real and fundamental differences in philosophy. Helpful

editors will occasionally suggest other journals to submit to, although this often requires tweaking of the manuscript for the new journal.

Additionally, writing an introductory letter describing the paper's hypothesis, results and importance to the journal's readers will help properly frame your research. Within this letter it is often useful to suggest one or two people who you feel are appropriate to review your paper, (however do not suggest your major professor). This is especially true if the journal to which you are submitting does not often carry papers similar to yours (i.e. different geographic, taxonomic or disciplinary focus).

Don't forget to follow up on your correspondence. Editors are often inundated with requests and other duties and responsibilities. Being polite yet persistent with your questions can often times be to your advantage.

Meeting and talking to editors at conferences and other meetings is a great way to improve your chances. You can often find information through these informal situations that is not available on websites. You can also sell your research in person! Giving a talk before submitting is also a wonderful way to get comments. These can vastly improve your manuscript, and identify any assumptions you may have. This last point is especially pertinent to transdisciplinary research as each academic discipline has its own assumed body of knowledge and language. Identifying and expressing these assumptions in clear language is critically important when preparing a manuscript for publication.

Finally, Jack Duffy Ph.D., Interdisciplinary PhD Program, Dalhousie University, Canada) has given us this sage advice:

1. Choose a journal where most of your references are from. (Highlight this in the letter to the editor – see #4).
2. Aim for a journal one level higher than you think you should publish.
3. Look at the editorial board, and what research they do.
4. Send a letter to the editor, highlighting why you think the editor's readers would be interested in your paper.
5. Be positive in your write up.
6. Send the paper to colleagues you trust for comments
7. Register your abstract to receive e-mails of other research related to your paper and to find out what other people are doing.
8. Collaborate with a good publisher.
9. Collaborate with others besides your supervisor and committee.
10. 48 hour rule – after receiving a rejection letter, fix your paper and send off a response within 48 hours.
11. It is okay to argue points in the rejection letter (justify why you don't want to take their recommendations).
12. Revise and re-submit.
13. Have some 1st author articles.
14. Have some solo author articles.

15. For graduate students and assistant profs especially – quantity trumps quality.

References for publishing:

Booth, W.C., G.G. Colomb, and J.M. Williams. 2003. The Craft of Research. 2nd Edition. The University of Chicago Press: Chicago.

Day, R.A. 1998. How to Write & Publish a Scientific Paper. 5th Edition. Oryx Press: Phoenix.

Nair, P.K.R. 2005. How (not) to write research papers in agroforestry. Agroforestry Systems 64: v-xvi.

CONCLUDING REMARKS:

We at the SSWG student affairs section wish to provide such a valuable service. The more members we have, the more voices we have and the greater amount of knowledge we can draw from. We are also all students, and learning together. We hope that this section can provide the seed for the next generation of innovative conservation science. If you have anything to add, please feel free to contact us. The more students participating the better off we will be.

We will continue to grow this document, so please check our website (http://www.conbio.org/workinggroups/sswg/toolkit/index.cfm) for updates. We are currently interested in developing:

- A bibliography of transdisciplinary research:
- A database of researchers interested in conducting this kind of research
- A section on research methodologies