



Photo Credit: Erin K. Buchholtz

# Putting the “Applied” in Applied Biodiversity Science

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A great strength of the ABS program is the impetus and opportunities for students to not only do rigorous research, but to do research that is applied. As a first-year PhD student in the Wildlife and Fisheries Sciences Department, I was immersed in this aspect of the program during the summer of 2015 as I transitioned from two semesters of class-work into hands-on learning out in the field.

The ABS program focuses on developing students’ disciplinary expertise that can then be applied to interdisciplinary problem-solving. To that end, I spent most of my first year in classrooms attending lectures and seminars in order to develop my disciplinary toolkit: building up my skills in ecological theory,

GIS technology, and statistical methods. Spring semester included ABS I, a course that served as a springboard to thinking more broadly about the challenges of taking an interdisciplinary, applied approach to science. Class discussions brought in not only students’ academic knowledge but also a variety of life and work experiences. Throughout the semester, we discussed many of the relevant challenges to biodiversity and conservation science and got exposed to many different trains of thought.

In May, the Amazon Field School brought ABS out of the classroom and into the field. While there would have been sufficient material to cover even if we just focused on the wildlife (or just the plants, or just the

people), in keeping with the ABS objectives we took a much more integrative and comprehensive approach. Numerous hikes through the Peruvian Amazon Rainforest and boat rides on lakes and rivers were complemented with dialogues with native communities, discussions with local guides and business-owners, and a trip to see the complex devastation associated with gold mining in the region. We got to play the roles of scientists as well as tourists while visiting lodges and learning about eco-tourism. Aspects of communities and governance structures were brought to light that otherwise may have been absent had we simply focused on the flora and fauna. Overall, it was a fantastic trip, which brought to light the conservation successes and challenges faced outside the world of academic journal articles and classroom discussions.

Four days after returning from Peru, I flew to Botswana, the location of my dissertation research. The overall goal for my time there was to better develop my understanding of the region in preparation for a full year in the field beginning January 2016. Moreover, the trip would be my introduction to the ground operations of the Eco-exist Project, under which I am a PhD Fellow. Eco-exist is a holistic organization working to reduce human-elephant conflict (HEC) and facilitate co-existence in the Okavango region of Botswana. They incorporate many different aspects in their endeavor, including ecology, conservation agriculture, land-use management, and economics.

My research focuses on elephant movements and landscape ecology, and how those tie into HEC in the Western Okavango Panhandle. The basis of my elephant movement research comes from GPS data, transmitted from eight bull elephants with GPS collars. I’ll analyze the GPS data in order to determine how landscape features influence elephant movements and to create a predictive model for elephant resource selection. This falls neatly into the discipline of landscape ecology. And yet, it seems incomplete to think about this research without



Above, part of the Veterinary Cordon Fence that has been recently trampled by elephants.  
Top, My research assistant, Kerumotsemang, taking GPS coordinates in the field.  
Photo Credit: Erin K. Buchholtz

acknowledging the useful application of the results: if patterns of elephant movements can be predicted, the regional Land Boards can begin to allocate fields away from those areas where elephants will be present, and thus reduce the opportunistic crop-raiding that occurs when elephants movements and agricultural areas overlap.

I was fortunate over the summer to be able to see several facets of the Ecoexist Project and the region, not just those that relate directly to my research. For example, Ecoexist hosted a Cultural Fair in July that featured performers

Aerial survey practice; counting an elephant family crossing through Moremi Game Reserve, Botswana.  
*Opposite. A human-elephant conflict skit at the Cultural Fair.*  
*Photo Credit: Erin K. Bucholtz*



from 13 villages and performances related to elephants and human-elephant conflict. A particular crowd favorite was a skit where young adults acted out the way a farmer could protect his field from elephants, with the elephant played by a student in a hand-made elephant costume who had a convincing elephant alarm trumpet.

In order to better understand the perceptions and experiences of HEC in my study area, I also conducted some preliminary surveys this summer with local farmers. In addition to providing useful data, these surveys really drove home the difficulties that individuals face when elephants raid their crops or come onto their property. There is no way to overlook the true danger and destruction that elephants represent. The surveys also help me to design my research project so that it is not only well-grounded scientifically but that it is relevant and useful.

A highlight at the end of my trip was learning how to conduct an aerial survey for elephants. Along with my colleagues, we went up in a 4-seat airplane and flew transects over the Okavango Delta region, practicing counting elephants and other species. Aerial surveys are the best way to estimate a population of elephants and will hopefully be something I can implement for my research in the future.

It is nearly impossible to think about my research without the applied aspect of it. I can't help but connect the elephants and signs of elephants I see in the field with the impact they have on the local farmers, the implications there are for the tourism industry, and the ways that their day-to-day existence interrelates with the lives and livelihoods of so many people. While driving down the Samochima Veterinary Cordon Fence, which stretches approximately 100km from the Okavango River to the Botswana-Namibia border, I have seen countless elephant footprints and many areas where the fence has been damaged or knocked down. It triggers questions in my mind - How does this fence

impact elephant movements? Can breeding herds with infants cross it? How often does the Department of Agriculture have to fix the fence? Do many cattle get through where the fence is broken? How can farmers cultivate their crops safely here with so many elephants? These are the type of questions that the ABS Program stimulates and encourages. The questions come from my background and strengths in ecology, but are situated within the much larger context surrounding the issue of elephants in this region. They take into account not just the science, but how that science can be applied.

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