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Whether you are teaching undergraduate or graduate-level field ecology, or you are a full-time researcher and in the midst of gleaning the maximum amount of information from your most recent field research sampling trip, I think you will agree that we almost never remember everything needed in the field, and likewise almost never have a perfectly smooth and uneventful field trip or season. Thanks to Carmen Wong, University of British Columbia, we can take a few moments, sit around the fire, feel her pain, and start planning for next season.

I would encourage you to share one or two of your field season horror stories with your peers through this column.

Preparing for the Field Season

I thought I was entering the field season for my Ph.D. research in good shape. I had over 5 years of experience as a consultant working on various field research projects. And, I had spent time in the field during my Master's research ziplocking grizzly bear feces in the Yukon. So, as a seasoned field biologist embarking on my Ph.D. research, I finally had my research permit in place, lined up two great field assistants, and purchased several boxes of waterproof paper and printed colored maps of my potential study sites. But, I should have known that you can never be too prepared for fieldwork.

My first challenge was losing a field assistant on the first day. I didn't actually lose him in the forest; rather, he took a permanent job with a consulting company. My promise of helicopter rides in the Rockies could not compare to a decent salary with health benefits. I spent the next month looking for another field assistant. It turns out the good candidates get snapped up early.

My second challenge was with my sampling design. I had wanted to use stratified random selection of stands containing whitebark pine in order to describe dynamics across large landscapes. Random selection using a vegetation inventory and GIS had worked in a pilot study the year before in another park. Using my beautiful colored maps, my remaining field assistant and I spent a week bushwhacking to mountaintops, only to find no whitebark pine where it was supposed to be. It seems that I was mistaken in my assumption that I was using a vegetation inventory. An inventory did not exist and I was actually using a coarse-grain classification. Polygons indicated only a potential for containing whitebark pine ... and clearly that potential was low. It turns out that having the

home number of a biometrician is handy when one is revising a sampling design in the field.

My third challenge was in vexing the park wardens. We left the door of a warden cabin in the backcountry unlocked. We almost lost the privilege of using these cabins, which would have made my research impossible, but luckily the supervisory warden was understanding. It was clear, however, that a moment of carelessness can jeopardize one's research.

So what should you walk away with after reading the above tales? Here are a few lessons I learned this summer that may help you during your next field project:

1) *Apply early for your research permits.* I knew of a Masters' student who spent the entire summer waiting for his research permit and was not able to collect any data. As an example, it takes over 6 months to go through the application process to work in the provincial parks of Alberta and British Columbia in Canada. If you want to handle wildlife or do destructive sampling, count on much longer.

2) *Make contacts with the relevant organizations.* It is very likely that people are interested in your research and can contribute expertise. This summer numerous people in Parks Canada helped locate whitebark pine stands and gave ideas on how to apply my research results to management recommendations. Organizations such as protected area agencies or forestry companies are also often able to offer significant in-kind support. By contacting the right people, I was able to tag along on the survey flights of the fire crew; these flights saved us days of hiking and innumerable dollars.

3) *Understand your sampling scheme.* A pilot study is critical. Pilot data can indicate the amount of variability you can expect and thus guide you on your sampling intensity. If you can't do a pilot study, then I recommend at least trying a couple of days in the field with your supervisor. Even the best methods devised in the office will be modified in the field due to some unforeseen variable. If your supervisor can't come out, work together through different scenarios of what could affect your sampling plan and derive alternate methods. If possible, having the home phone number of your supervisor could prove useful. Both my supervisor and the biometrician on my committee were indispensable in the first 2 weeks of my field season. Decisions about what is done in the field take only a second to make. However, the statistical consequences of that decision could be untenable down the road.

4) *Be safe.* After working in the private sector and returning back to the university environment, I was appalled by how little attention most supervisors give to safety in field. There are crazy true stories of graduate students working in the backcountry with chainsaws with no means of communication and a 30-km hike to the nearest road. The most dangerous situation my field crew and I faced this summer was a bout of food poisoning. Normally, this would not have been a big deal, except we were 26 km from the nearest road and the day we hiked out was one of the hottest days of the summer. Take your responsibility as a crew leader seriously. At minimum, this means having safety protocol discussions with your field crew, regular check-ins at the end of the day, a regulation first aid kit (an Epi-pen would not be excessive), first aid training, and either a radio or a satellite phone with the relevant emergency contact numbers. If your supervisor is as smart as mine, they should provide these to you without question. Furthermore, educate yourself on the guidelines to be followed in order for compensation to be paid for injuries on the job.

5) *Treat your field assistants well.* Pay your field assistants well, which means paying them at least or above

the average wage for field assistants. If you cannot afford this, then try to compensate with providing room and board. Feed your field assistants well because food makes people happy. Budget at least \$10/person per day and do not complain if they want to look for fresh basil in the middle of small-town Alberta. Most important, be flexible to their needs, within reason, of course. Often fieldwork requires people to work long hours and weekends on a project they probably do not love as much as you do. The least you can do is to give them flexibility in choosing their days off or ending the day early so that they can run errands, visit the bank or post office.

6) *Treat yourself well and remember your loved ones.* Take time off for yourself, plan a debriefing with friends or others in your laboratory halfway during your field season, and realize that your friends and family are more important than another sample point. I lost a boyfriend this way after I spent two summers away from him.

7) *Prepare for the worst.* I know this sounds pessimistic but I think it makes you prepared. Assume that everything is going to break, that it will rain ... hell, that it will snow every day. That way your field season can only be better than expected.

Finally, get out there and enjoy yourself. If you aren't enjoying what you are doing, why are you doing it?

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