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JUST ASK A SCIENTIST!

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Question: ***I have seen some fieldwork pictures on your website. How are you conducting your trips to catch livebearers, and what are you actually doing in the field?***

Answer: As for many biologists, working in the field was the primary reason that got me interested in pursuing a career as a scientist. Fieldwork actually remains the favorite part of my job, even though I now only get out a few weeks each year, and I spend way too much time on my computer. Despite the limited time we can spend on expeditions these days, they are absolutely critical to our work. Fieldwork helps us to understand organisms in the context of their natural environment, allows us to vet the relevance of findings from laboratory studies, and provides us with a fundamental source of novel ideas about the behavior, ecology, and evolution of our fishes.

The logistics of field expeditions has become fairly involved. We typically travel in a group of six to twelve people. To assure maximum productivity, all aspects of our trips are planned to the finest detail. So, after the expedition is always before the expedition, as we start planning each trip almost a year in advance. The first step each year is securing the necessary permits to conduct fieldwork abroad, collect fish in their natural habitats, and export specimens for additional analyses in our laboratory at Kansas State University. This process requires us to have a thorough plan about the type of work we want to do, the specific places we want to visit, and the species we want to collect. In most countries, navigating the permit process would not be possible without the help of dedicated local scientists with whom we collaborate to achieve our research goals. Even with help, the permitting process can draw out, and we occasionally have to cancel expeditions last minute, just because the permits could not be issued on time.

As the time of an expedition comes closer, we secure flights and rental cars before creating a day-to-day schedule. Based on that schedule, we try to organize accommodations in advance, so we don't have to worry about where to eat and sleep while we are traveling. About two weeks ahead of the trip, we start packing equipment and supplies. For all participants of an expedition, checked bags are reserved for work-related items, since we often travel with several hundred pounds of equipment. Some of the key items on our packing list are gear to catch fish, air pumps and filtration supplies to keep fish alive in a mobile aquarium room, an assortment of tubes and vials filled with different preservatives that allow us to secure tissues for laboratory analyses, probes for the assessment of water chemistry, dissection tools and balances, and an assortment of specialized experimental contraptions. That leaves only the carry-on bags for personal items. If you bring along your camera equipment, a laptop, and a good book for nighttime reading, you can imagine how precious little space is left for cloths and other personal items that may have to last for multiple weeks.

And then comes to most cumbersome day. Hauling all the equipment to the airport, sweating about missed flights and lost bags, until – finally – we arrive at our final destination. The night of the arrival day is always the night when the whole team has the most energy and is full of anticipation. We tend to celebrate accordingly with some cold beer and gas station snacks (banana chips are the best!). The next morning is reserved for visiting with various officials to secure all

necessary paperwork and running errands to make sure all required supplies are packed and ready for use.

The day-to-day routine after that is different every year and for every destination. On our annual expedition to southern Mexico, we stay at a local field station, which provides us with a dormitory as well as space to set up a simple fishroom and conduct experiments. We get up before sun rise and visit the town market to eat breakfast. Markets are great, because they provide a variety of breakfast options (empanadas, panuchos, tortas, tamales, tacos… hungry yet?) at a reasonable price ($1-2 per person). After that, we typically split up into teams to tackle the to-do list. Some people stay behind at the field station to conduct experiments, others drive out to field sites to sample fish. Either way, the days tend to be long, as we skip lunch and rely on small snacks for sustenance during the day. In the evening, everybody takes turns to shower (since there is only one), and it is often 8 or 9 pm by the time we head out for dinner (tacos, of course). After dinner, we wrap up laboratory experiments, take care of the live fish, and prepare for the next day. So, there is little room for free time. We essentially sleep in the same room, eat at the same place, and work together all day. Every day.

The type of work we do on each expedition largely depends on the participants, which are mostly graduate students that work toward a Master's degree or a Ph.D. In addition, undergraduates frequently join us to get training in basic skills required for careers in the life sciences. While fieldwork obviously involves catching different fish species and characterizing their natural habitats, we also use the time on site to do other work necessary to understand the biology

of our fishes. Over the past years, tasks have included field experiments to measure the responses of fish to different environmental conditions, behavioral and physiological experiments that are conducted at the field station, and securing preserved samples that are later analyzed in the laboratory at K-State. We frequently spend time exploring new sites, trying to find species we have not previously worked with and observing intriguing phenomena that may lead to unexplored questions about the biology of livebearing fishes. All along, we try to keep detailed notes of our observations and document habitats and species with photographs. Each expedition offers something new; even after 15 years, it has not become boring.

We have been lucky and rarely faced serious problems. Sure, we sometimes bust a tire and face other car issues. Team members have to cope with bouts of traveler's diarrhea, cuts and bruises, insect bites, and feet full of blisters after hiking for miles in wet shoes. The weather can be unforgiving, with hot days and torrential storms. Once or twice, we have been mugged. But our experience traveling in Latin America has been overwhelmingly positive, and we have been able to build relationships with people from the local communities.

As an expedition winds down, everybody becomes focused on packing. We always reserve the last day to make sure everything is in place and return equipment and supplies to our collaborators. The night before the flight home is spent at a hotel near the airport. This means the first hot shower in weeks (finally

feeling clean again) and a soft bed with fresh sheets. The last big hurdle is clearing customs in the United States and meeting with a representative from the U. S. Fish and Wildlife Service to assure all samples and live fish are imported legally. Sometimes the trips back home go well. Sometimes they involve driving through half of the country for a day, because frozen samples and live fish do not handle flight delays very well. Invariably though, coming home means working on all the samples and data that were collected in the field, which easily fills the time until the next expedition.

"Ask a Scientist" requires your input. Submit your questions directly to Michi (tobler@ksu.edu). He will do his best to answer your question or find somebody that can!