



YOUNG SCIENCE COMMUNICATORS COMPETITION 2016/2017

ARTICLE CATEGORY

RUNNER UP

Listen Up! Eaves-Dropping on Cape Peninsula Endemics

Providence can come in many forms, and on one memorable day it came in the form of two stow-away cereal bars buried beneath the heavy field equipment in my 70L hiking bag. Disbelief, gratitude and jubilation crept across my field assistant's hungry face following the snacks' seemingly magical manifestation.

Mid-winter. Table Mountain. The cold wind pierced our clothing with chilly persistence on this deceptively sunny day. Our lunch was sitting forgotten at the base of the mountain, and we had been trudging around the summit for 7 hours. But hurrah! Our unintended fast was over!

If you are a population biologist and your study species is tiny, visually cryptic, shy, and has a very particular preference for a very specific habitat; I'd like to meet you, shake your hand, look into your eyes with empathy and say, "Don't worry. I understand."

...Then we can share a resounding

high-five because man, is our research flippen exciting or what?!

That day on the mountain, cold as it was and hungry as we were, was another marvellous field day spent in the Fynbos recording the calls of the minute Cape Peninsula Moss frog, *Arthroleptella lightfooti*.

Until 2012, the Cape Peninsula Moss frogs had been calling away in their unquantified groups. We care about their numbers for many reasons. They exist *only* in the moist seepages on the mountains of the Cape Peninsula – nowhere else in the *world* will you hear their cheerful chirps. The metropolis of Cape Town surrounds them and continues to spread with time, isolating them even more dramatically. Changes in their population might indicate a change in the state of the fynbos, and can bring our attention to management practices that should be implemented in order to conserve this unique biome. Very little is known about their ecology and their functional role in the specific

By Marike Louw

Marike Louw is a student at the University of Stellenbosch.

This is what she says:

About the topic:

"There are techniques out there that need attention. I want the readers to know that if innovation, exploration and adventure calls to them, there are avenues to pursue them. The more brains that can work on acoustic spatial capture-recapture, the greater is the use of this tool in our quest to understand and conserve our world. Acoustic spatial capture-recapture can offer a place for a wide range of scientists: statisticians, engineers, acousticians, zoologists and conservationists."

About science communication:

"I love science and I love writing. I am just beginning to discover that there is a world where the two can meet - one where science is not necessarily reserved solely for fellow scientists and where writing is not bound by the rigid laws of journal publications. "

environment that they inhabit. Their tiny size (the largest individuals are a mere 22mm in length! Crazy!) and visually elusive nature make it near impossible to study their populations with traditional population estimation methods.

The solution?

Acoustic Spatial Capture Recapture (aSCR) is a statistical technique that can be used to finally provide reliable density estimates of calling animals from recordings data from the field. Monitoring this species of frogs previously relied on experts listening and roughly quantifying the number of individuals calling. This is much easier said than done, because you can only imagine what it must be like to decide whether a large chorus of frogs consists of 10 or 100 individuals. And what happens when your experts, with their extensive experience, retire?

Gathering acoustic data for aSCR involves hiking to sites all over the Cape Peninsula and essentially eaves-dropping on the calling males. In my study, six microphones are placed in a rough circle in the midst of the calling frogs. These microphones are attached via cables to a single recorder which will record the entire soundscape in the vicinity – we call this setup an “acoustic array.” Back in the confines of civilization, the frog calls are isolated and are analysed by being run through an Acoustic Spatial Capture-Recapture analysis, which looks at the in-

formation of the calls gathered across the six microphones and uses this to estimate the density of the calling animals.

One of the greatest benefits of this technique is that it addresses a problem that often leaves scientists scratching their heads in indecision: deciding on the size of the area in which to count the number of individuals. This problem is addressed with aSCR because each acoustic array determines its own “listening area” by taking into account that the probability of picking up frog calls decreases as the distance from each microphone increases. With aSCR, the irksome problem of arbitrarily deciding the sampling area is overcome.

There is much more to learn with this powerful form of sampling in our hands. The frogs will start calling again in winter and we will be there to record them. Who knows what this year in the field will bring?

All I know for sure is that cereal bars will always accompany me on my future adventures to find these Moss Frogs.

ABOUT THE YOUNG SCIENCE COMMUNICATORS COMPETITION

The South African Agency for Science and Technology Advancement (SAASTA's) Young Science Communicators competition is an initiative that aims to encourage young scientists to communicate their world to the public, beyond their academic peer community.

It is one of a number of initiatives at SAASTA aimed at developing science communication skills in scientists and researchers.

The competition awards four categories, namely: popular article; video clip; audio clip; and an open category. Participants are encouraged to explore their creativity in communicating their work.

For more information visit www.saasta.ac/competitions/young-science-communicators

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