Cultivating curiosity

Paul J CaraDonna[1,2], Nicholas N Dorian[1], Dylan T Simpson[1], and Mark EK Dorf[2]

[1]Chicago Botanic Garden, Negaunee Institute for Plant Conservation Science & Action, Glencoe, IL; [2]Electronic Image, Art & Science Department, Brooklyn, NY

Dust settled as we stepped out of the car. A kinglet chattered in an alligator juniper. We (three ecologists and a conceptual media artist) had just arrived at our field sites in the Santa Catalina Mountains outside of Tucson, Arizona. Our bags were packed with vials and nets, forceps and paint pens, cameras and notebooks. We were there to investigate how a small metallic-green bee makes a living in a rapidly changing world. We had worked in this mid-elevation desert shrubland before and we knew of its natural history. Our starting point would be to look for flowering manzanita shrubs, which are the only plants in bloom this time of year and serve as the bees' exclusive food source.

We surveyed the dry hills, examining hundreds of manzanita shrubs. But after nearly twenty hours of searching, we could not find a single flower, let alone a single bee. Field work does not always go according to plan, but this was extreme. As we came to the realization that all the flower buds had aborted this year because of drought, our confusion shifted to despair. We had received funding for a multi-year project contingent on finding these flowers and the bees that forage from them. If there were no flowers this year, then a population crash for the bees seemed plausible, and our entire project might very well be jeopardized.

Unsure of our next steps, we wandered and wondered. At first, our conversations attempted to reconcile what we were seeing with our prior understanding of the system. But as we slowed down, our confusion and despair morphed into inquiry and curiosity. What was actually going on here? Had the bees emerged and died? Or instead dispersed, flying epic distances in search of a manzanita oasis? Had they sensed portending drought and entered dormancy, skipping the dry year altogether? Maybe they had emerged and were hiding in plain sight? Digging into any of these hypotheses would teach us new things about how these organisms make—or do not make—a living in a rapidly changing world.

Many months and miles removed from The Catalinas, we continued to ruminate on the enduring and grounding value of cultivating curiosity in our practice. From one perspective, our expedition was a fruitless failure, but from another, it delivered in abundance. We asked questions that we had not planned on asking; we imagined experiments that we could not have otherwise imagined; and we were able to chart a path forward that was rooted firmly in our observations of time and place. We had found ourselves with an entirely different set of ideas, studies, and experiments that would help propel the project forward.

Confronting uncertainty head-on can be confusing, slow, and uncomfortable; and it can also be at odds with the very real incentive structures (jobs, promotions, grants) and value systems (publications, grants, citations) that shape our practice in the product-oriented culture of contemporary science. But engaging with this discomfort can lead to growth. Through a non-linear cycle of observing, reflecting, reading, and conversing amongst ourselves and with others, we began to navigate the contours of our unexpected observations. In time, what seemed an insurmountable wall resolved into a doorway that was always there.

Granting ourselves permission to pursue unexpected observations is important not only for growing our basic understanding of nature, but also for broadening how we understand ecology, evolution, and conservation at this very moment in time. In the current era of rapid environmental change, existing paradigms to make sense of the natural world are increasingly likely to become insufficient to explain the processes playing out now. For us, we found ourselves in the middle of a historic drought, needing to re-interpret a system we thought we knew, and not quite sure how or where to begin. Rather than dig our heels into our preconceptions, the way forward was to attend to our unexpected observations. Operating with a sense of non-prescriptive openness ultimately rescued our thinking, but the bigger challenge is that the unexpected is the new normal everywhere.

Soon after our return from the field, we learned of long-term botanical records revealing that manzanita had failed to flower in The Catalinas before (the most recent evidence of such failure occurring about 21 years ago). Something about the life cycle of these small metallic-green bees has allowed them to persist through these extreme events. But we also received photographs from a hiker showing bees that had emerged and died this season. As we map the space between the known and unknown, we have come to realize that it is precisely the mystery that energizes and sustains our practice.

Acknowledgements

We thank Nick Waser, Mary Price, and Amy Iler for their intellectual support, and Ceci Rigby and Boaz Hill for sharing photographs. This work was funded by the US National Science Foundation (DEB 2409302).