Lisa Komoroske

Lisa Komoroske is an Assistant Professor at the University of Massachusetts Amherst, USA. The Komoroske lab aims to understand the fundamental biology of wildlife and to apply this knowledge to mitigate human impacts and inform conservation management.

Tell us about your background. How did you first become interested in conservation ecology?

Like so many people, as a kid I was fascinated by nature and was fortunate to attend a summer science camp where I learned the power of science to understand our natural world. I also became aware of the many negative impacts that humans have on the environment and how conservation ecology was one (of many) paths to combine science with action to protect and restore biodiversity. After that, I sought out every opportunity I could to learn and gain experience, but I think it wasn't until I joined conservation ecology and physiology labs during my graduate degrees (led by Drs. Rebecca Lewison and Nann Fangue, respectively) that I began to fully understand and appreciate the many facets of the field. The science must be rigorous, but other aspects like partnering with conservation managers and communicating the value of our world's biodiversity and our stewardship of it are just as critical to affect real-world positive change.

What is your lab working on currently?

Research in my lab integrates measures at the molecular, organismal and population levels, and projects broadly fit into one or more focal areas: biological responses to global change, ecological adaptation, and metrics for conservation management. We have projects studying the physiological and evolutionary mechanisms underlying plasticity and local adaptation in body size-temperature relationships, and how these shape biological responses to ocean warming. We have also created genome resources for non-model species that are allowing us to ask research questions that weren't possible to study before, such as the molecular drivers of navigation and migration in sea turtles and gene families underlying ecological specialization. Conducting this integrative work across biological levels requires a combination of multi-disciplinary approaches, such as growth experiments, respirometry, high-throughput sequencing and remote sensed environmental data.

Another important aspect of our work is collaboration with scientific agencies and NGO partners,

Above: Heading out for leatherback in water field work in Monterey Bay, California.

particularly for projects that aim to develop metrics that inform conservation management. For example, we have developed a network of scientific and NGO collaborators throughout South America for a range-wide conservation genomics study of Golden Dorado, a highly prized recreational fishery freshwater species threatened by habitat fragmentation.

What does a typical day look like for you?

This is a very exciting time because many projects that we launched when I started the lab in 2018 are now reaching the stage where the results are coming together to tell us their stories and guide us to next steps. So right now, a lot of my time is spent supporting my team with analyzing data, writing up papers and brainstorming grants for the next research questions. While it's more computer time than I've had previously, it's been so fun and rewarding to see the products of years of work in the field and lab take shape!

What do you most enjoy about your work?

The diversity of projects, perspectives and people I get to work with is hands down my favorite part. When I was considering career paths after graduate school, I was pretty skeptical that academia was right for me, however the freedom to work on projects that I feel passionate about and to choose collaborators that I truly enjoy working with is fantastic. Being in a department of environmental conservation where expertise ranges from ecology to renewable energy and green building design, I feel very privileged to be a part of a community that shares my values of bridging fundamental and applied interdisciplinary work, and which exposes me to perspectives very different from my own so that I can keep learning and improving as a researcher and educator.

Left: Field work at the Smithsonian Field Station at Carrie Bow Cay, Belize.

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What is your lab hoping to work on in the future?

It's hard to know what opportunities are around the corner, especially in fields like genomics where things are changing so quickly. I think projects will generally fall under the same focal umbrellas, but we will be able to take them to new depths and evaluate similarities and differences across systems. For example, we are just beginning to understand the genomic and epigenomic drivers of animal migration, and as we gain more tools and data for wild species, we'll be able to understand if the same or unique genes and/or evolutionary processes underlie complex behavioral phenotypes across taxa.

My research group also spends a lot of time and effort thinking about how to advance diversity and inclusion in STEM and society, and we have been engaged in a number of efforts at the local and national scale to this end. But, we still have a LOT more work to do, and I definitely envision my efforts continuing to increase in this realm in coming years.

What advice would you give to aspiring scientists in this area?

Firstly, there is not one right path, and in my experience it can often be the 'detours' that give diverse perspectives and insight that are needed for solving complex scientific and conservation challenges.

Secondly, a huge part of conservation is about people, and being able to communicate and work with people with different viewpoints and priorities is critical for your science to have an impact. This doesn't mean you have to become an expert in 'all the things' (unless you want to!), but it's absolutely not a waste of time to get some training in and/or build collaborations with experts in the social sciences, science communication, education, and so on.

Selected Publications from SEB or affiliated journals.

Connon RE, Jeffries KM, Komoroske LM, Todgham AE, Fangue NA. 2018. The utility of transcriptomics in fish conservation. Journal of Experimental Biology 221, jeb148833.

Davis BE, Komoroske LM, Hansen MJ, Poletto JB, Perry EN, Miller NA, Ehlman SM, Wheeler SG, Sih A, Todgham AE, Fangue NA. 2018. Juvenile rockfish show resilience to CO_2-acidification and hypoxia across multiple biological scales. Conservation Physiology 6, coy038.

Jeffries KM, Connon RE, Davis BE, Komoroske LM, Britton MT, Sommer T, Todgham AE, Fangue NA. 2016. Effects of high temperatures on threatened estuarine fishes during periods of extreme drought. Journal of Experimental Biology 219, 1705–1716.

Komoroske LM, Connon RE, Lindberg J, Cheng BS, Castillo G, Hasenbein M, Fangue NA. 2014. Ontogeny influences sensitivity to climate change stressors in an endangered fish. Conservation Physiology 2, 2014, cou008.

Marancik DP, Perrault JR, Komoroske LM, Stoll JA, Kelley KN, Manire CA. 2021. Plasma proteomics of green turtles (Chelonia mydas) reveals pathway shifts and potential biomarker candidates associated with health and disease. Conservation Physiology 9, coab018.

Villeneuve AR, Komoroske LM, Cheng BS. 2021. Diminished warming tolerance and plasticity in low-latitude populations of a marine gastropod. Conservation Physiology 9, coab039.