

**Andrew Shirk, Research Ecologist, Climate Impacts Group, University of Washington**

Ecology is the study of how species interact with their environment and each other. I have devoted my career to ecological studies because I'm alarmed at the rate at which we are losing biodiversity (i.e. the diverse array of species on Earth). Biodiversity provides us with clean air, clean water, food, natural resources, and the amazing experiences that that come from interacting with and observing species. The field of ecology can help us to not only understand the root causes of extinctions but also offer solutions to help conserve our natural heritage.

There have been 5 'mass extinctions' (i.e. a widespread loss of biodiversity over short time periods) in the history of life on Earth. The last mass extinction occurred 66 million years ago when an asteroid impact killed 75% of all species, including most of the dinosaurs. Recently, over the past century or so, extinctions are occurring over 1000 times more often than the typical background rate observed in the periods between mass extinctions. The causes include a slew of human influences on the planet, including conversion of native habitats into farms and cities, over exploitation (e.g. fishing, hunting, logging, etc.), pollution, and spread of disease and invasive species. As an example of the magnitude of the problem, one quarter of all species of mammals are now at risk of extinction. This has led scientists to declare the onset of a 6th mass extinction. Unlike past mass extinctions, this time, the cause is largely man-made.

As we enter an era of rapid climate change, the threat of extinction is expected to increase even further for many species. That's because climate change often forces species to move to find suitable habitats when their currently occupied habitat changes and becomes unsuitable. In the past, these 'range shifts' generally occur over hundreds or thousands of years. But the recent rapid pace of climate change is forcing these shifts to occur much faster - on the order of decades. To make matters worse, as species shift their ranges, they now have to navigate through a host of man-made migration barriers (e.g. highways, cities, and farms). If they are unable to move fast enough and far enough through this modern landscape to track their suitable habitat over time, they will reach a 'dead-end' and go extinct.

I think the threat climate changes poses to our biodiversity is not fully appreciated, and a game is a brilliant way to help tell this story. To 'survive climate change', species will need to navigate a perilous and constantly changing landscape to track suitable habitat over time and space. A game based on this concept could raise public awareness of this issue and hopefully compel people to support actions to help solve the problem - things like limiting greenhouse gas emissions, protecting habitat, protecting wildlife corridors, and finding ways to mitigate the movement barriers (e.g. wildlife overpasses on roads) we've created.

If this interests you, please contact me by email at [ashirk@uw.edu](mailto:ashirk@uw.edu) or by phone at 360-753-8516 (9a - 5p, and I'm also available 6-9p during the April 6th 'mixer'). If you want to learn more, you can also find a technical review of conserving biodiversity under climate change [here: https://depts.washington.edu/landecol/PDFS/Schmitz%20et%20al.2015.pdf](https://depts.washington.edu/landecol/PDFS/Schmitz%20et%20al.2015.pdf) and a more general discussion of climate impacts on ecosystems, species, and habitats [here: https://fortress.wa.gov/ecy/publications/publications/1201004g.pdf](https://fortress.wa.gov/ecy/publications/publications/1201004g.pdf).