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Imagine you are a bear living in a lush forest with plenty of tasty berries. Resources are so abundant and predictable you don’t have explore much before you get full.

As summer leads to fall and fall to winter, the weather gets colder, and food becomes scarce. Fortunately, you knew resources would be low, so you put on enough weight to last you until spring.

The weather warms, you wake from hibernation, and you begin feeding on juicy young plants. However, this year seems to be different. Food is still abundant, but it hasn’t been raining as often, so it’s harder to predict when the forest will green up.

As summer brings warmer and drier weather, a fire sweeps through the forest. Suddenly, what was one a lush environment is now a barren landscape you can no longer rely on for food.

Resource abundance and unpredictability are two strong determinants of how much space animals need to survive and be healthy. In biology, we assume animals with high resources will need less space than those with low resources. Similarly, we assume animals with predictable resources will need less space than those with unpredictable resources. However, we don’t have formulas for how big the effects of resource abundance and unpredictability are. This is a problem, because it prevents informed decisions about where and how big protected areas should be.

These are critical issues, particularly since the federal government has committed to protecting biodiversity by conserving 30% of our land and waters by 2030. How do we choose which lands and how much to protect?

This is where my work comes in. The first step was to test how animals respond to resource abundance and unpredictability using simulated movement data. The simulations supported my hypotheses, but the real world is more complicated than simulations, so the next step is to test the hypotheses using a dataset of over 3,000 animals from more than 85 different mammal species around the world. The resulting models will allow us to ensure mammals habitats are of sufficient size and quality to ensure populations are healthy and resilient over the next century.

The next step of my thesis is to understand how climate change will affect animals’ behavior and spatial needs. By modeling how climate change affects when, where, and how animals move, I will create maps of current and future BC habitat quality for various mammal species under different climate change scenarios. Through my collaboration with BC Parks, I aim to inform the conservation of mammal species in BC so that, again, we can ensure the habitats we protect will be of high quality for decades and centuries to come.

We all know climate change is a serious threat to both us humans and Nature, but we do not know much about how climate change will affect animal movement. Well-informed predictions of habitat quality are the first step towards providing wildlife a safe place to live long-term and ensuring our children and grandchildren will be able to see wildlife without going to the zoo.