How OSU's Dr. Ripple Has Helped Rewrite the Laws on Predators

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Predators often get a bad rap in our densely populated modern world. Between the billions of livestock roaming the countryside and our ever-expanding city limits, predators are regularly removed from the environment. For much of our history this meant little to us; not all that long ago there was a marked absence in our understanding of how these animals fit into the ecosystem as a whole. However Oregon State University's own Dr. Bill Ripple made a discovery in the late 90s that shed some light on their unique roles and has ultimately led to collaboration with researchers around the world.

Ripple, now a Distinguished Professor and well known researcher, was just doing what comes naturally when he is curious. We call this the Ripple Effect. What exactly is the Ripple Effect you may wonder? In short it is the insatiable quest to unravel the mysteries of the natural world that is triggered when Ripple gets intrigued. However the easiest way to understand this phenomena of nature is to study the habitat, if you will, in which Ripple has evolved – and that is what we are here to do.

Rural South Dakota

For Ripple, life began in the low-income Midwestern town of Lesterville, South Dakota. During the late 50s when Ripple was a boy, rural Lesterville boasted a whopping population of around 200 folks. Since then the population has dipped to 127 in 2014.

Two miles outside of town was the 160-acre Ripple family homestead. Both sets of great grandparents homesteaded 160 acres in the late 1800s, and although Ripple did not live on the farm, the influence of that early experience has stayed with him.

Reflecting on his early life, Ripple explained that becoming a successful researcher was not necessarily part of the plan. Owing to the fact that so few people within his community even had a Bachelor's degree, there was no real role model for Ripple in that respect.

"My parents didn't have college degrees and my siblings didn't have them, so there was really no plan, it just sort of happened," said Ripple. But it did not happen without the generous support of his family.

When Ripple did head off to South Dakota State University (SDSU) at age 18 in the 1970s, it came at a cost to the family homestead. To finance Ripple and his brother's education, their father decided that 40 of the 160 acres must be sold.

Once in school Ripple, like many people pre-2000s, got himself a summer job. The largest park in the country, the 72,000-acre Custer National Park right next to Mt. Rushmore, hired Ripple as a park ranger. "That was really a big event in terms of setting the course," said Ripple. "I was still pretty young at that point, 19 years old going on 20."

During this time, Ripple lived in a cabin in the woods right on a beautiful mountain stream. "I got to wear an official ranger patch on my left arm and talk to the campers," jokes Ripple. He also gave nightly talks about park ecology and took pictures around the park to be displayed in the visitor's center.

"That was all setting the stage for appreciating nature. Eventually, I think it just turned out that I liked nature so much that ended up fashioning my career around nature so I could do what I love instead of going to a job and have that be very different than my interests," explained Ripple.

However Ripple's scholastic experience was not without its hang-ups. SDSU had a mandatory speech class in which students delivered three speeches to their classmates. As a shy 19-year-old from a very rural area, Ripple was scared to death. So scared, in fact, that Ripple resolved to avoid the class at all costs and nearly dropped out.

"Rather than take the required class, my plan was to quit school and go back home and be a farmer as a career," said Ripple.

Needless to say, he got his wits about him, took the class, and after receiving As on the speeches, his confidence soared. After that, Ripple found the school library and things became somewhat clearer. "I just very much liked searching out new information on just about any topic," explained Ripple. "I think I was kind of born a researcher, asking questions and trying to dig up the answers."

It was soon to be that Ripple would meet his new SDSU mentor, a recent OSU graduate named Dr. Ron Weinkauf. Dr. Weinkauf spoke so highly of OSU and Corvallis that the 19-

year-old Ripple had Oregon shaped stars in his eyes. Although a number of years would pass before Ripple would find his way to OSU, the idea had been planted.

To Yellowstone

By 1996, Ripple had been studying the old growth forest habitats where Northern Spotted Owls live for a number of years. However after attending Dr. Beschta's presentation on the declining Yellowstone tree species, Ripple began preparations to conduct a vegetation study in Yellowstone the following summer.

Armed with basic field equipment and graduate student, Eric Larson, Ripple set out to gather core samples from the aspen trees. One day Ripple and Larson were looking around the visitor's center when Ripple noticed something curious.

"There was a picture of a gray wolf standing in a healthy grove of aspen trees," said Ripple. "So then I said to Eric, 'Hey maybe those wolves protect the aspen.'"

While not quite that simple, Ripple was pretty close to the mark. After analyzing their core samples, a connection was found between the absence of wolves and the decline in aspen and other woody plants. "We call this the tropic cascades. It's simply how predators affect other animals and plants or how predators affect ecosystems," said Ripple.

As it turns out, gray wolves had been driven from Yellowstone and remained absent for 70 years until their reintroduction in 1996 and 1997. In that time elk populations, unhampered by predation, swelled and exerted greater pressure on vegetation within the park – a type of ecological ripple effect whereby removing wolves had implication that cascaded down the food chain.

This discovery opened the way for many more studies in Yellowstone and beyond. Over the next eight years, Ripple and Dr. Beschta would conduct similar studies in Jasper National Park, Wind Cave National Park, Zion National Park, Yosemite National park, and Olympic National Park.

"What we found was that in every case where there was a loss of a large predator, certain tree species were not able to regenerate after that loss," explained Ripple. "That showed us that Yellowstone wasn't different or special in that regard."

After publishing this research, Ripple took the next "natural step" and began working more closely with large animal scientists from other areas. Eventually Ripple connected with researchers from all over the world. "That's one of my roles now, to bring together other scientists," said Ripple. "Especially for conservation work where we end up publishing together."

Ripple and colleagues first published on Yellowstone 16 years ago and it became fairly big news. Ripple attests that although there were and are others with differing views, their

findings were largely supported within the scientific community. Furthermore, media outlets spread the story to the general populace.

The Bigger Picture

The discovery in Yellowstone led to a greater understanding of predators' role in the environment. Moreover, the realization that the same patterns applied not just in Yellowstone, but worldwide opened the door to the Ripple curiosity cortex. The next major step for Ripple, and most current step, is to work on global issues and inspiring conservation.

It began in 2014 when Ripple and 14 other scientists from different regions and countries published an article in Science Magazine. In their article, the researchers first explained the effects of certain large animals on their ecosystems then described their statuses.

"What we found was that 60 percent of the large carnivores of the world are threatened with extinction," said Ripple. Through this insight, correlations were drawn to dwindling populations of the world's large herbivores. They reported that up to 59 percent of large herbivores are threatened as well, largely due to human activity such as hunting and the production of human goods like livestock.

"The more I look into it, the more I see significant converging conservation issues for Earth and the animals that live on this planet," said Ripple. But so what if we lose a few species here and there, there are plenty of animals around right?

"First of all, I think we could talk about the intrinsic right of these animals to exist here on Earth with us," said Ripple. "I believe that we have a moral obligation to keep them around, to not let them go extinct."

However, a more tangible way of looking at animals is in terms of their ecosystem services. Ecosystem services are basically services that benefit humans. All over the world, large predators are responsible for regulating ecosystems from the top down. Large herbivores help regenerate trees by ingesting fruit and dispersing the seeds – a very important process in tropical ecosystems, therefore a very important process in the carbon cycle and mitigating climate change.

"It would just be a sad future for people not to be able to experience many of these species of large animals," said Ripple.

This is why Ripple along with 43 scientists from every continent recently released another article urging swift action be taken to save large animals. This time the story was picked up by 68 news agencies that spread it around the world in a variety of languages.

"That was an effort by us to try to stimulate more thinking, talking, and action about the global conservation of wildlife species," explained Ripple.

Drawing inspiration from the climate movement successes, Ripple advocates grassroots initiatives when it comes to wildlife and habitat conservation. He explains that we need multiple groups working synergistically towards a common goal and that while scientists turn out factual information, the general public is where the grassroots are.

While donations to conservation organizations and writing letters to local leaders is important, much progress can be made within our everyday lives. Often the biggest risk to large animals comes from developing countries, countries where we get many of our raw and manufactured goods. By fostering good conscience in your consumer habits, eating lower on the food chain, and even just considering the impact family size can have on the world's ecosystems, we can help ensure the persistence of iconic species here and abroad.

Conclusion

Ripple purchased the wolf and aspen picture from the Yellowstone visitor's center on that first trip. It is now framed and hangs proudly from his Richardson Hall office. In the picture, a bushy gray wolf stands confidently in the snow before a grove of robust aspen trees.

The picture reminds us that in nature all things are connected in some way. In Yellowstone the wolves indirectly facilitated the regrowth of trees, in Australia the dingo fills a similar role controlling the overabundant fox population, and in Africa baboons terrorize villages in the absence of lions and leopards.

For Ripple, the intrigue of these intricate relationships is a thing of curiosity and beauty. The environment is to be respected for its intrinsic merits as well as the vital services it provides. The mystery as to how and why these relations develop and function are what drives the Ripple Effect.

By Anthony Vitale