

# Grizzly spoken here!

Canadian scientists who have noticed a strong link between the distribution of different Indigenous languages and the distribution of genetically different grizzly bears are now trying to work out why this is so. Roman Goergen reports on the study's implications for conservation research

**W**hen traditional leaders of the First Nations in Canada's province of British Columbia talk about the different grizzly populations in the region, they use the term 'our bears' to identify the ones living in their own communal areas. They mean it in a sense of kinship and even family.

At the end of 2021 a group of scientists led by geographer Lauren Henson from the University of Victoria, British Columbia published a research paper showing a baffling correlation between the distribution of different Indigenous language families of the area and genetically distinctive grizzly populations.

The elders of the nations that supported the study, however, were not baffled at all. "Those were their tribal bears. Some of them they were even acquainted with personally," recounts Niko Balkenhol, a landscape geneticist from the University of Göttingen in Germany, who advised Henson on the analytical methods by which the spatial distribution of the gene pool of mammal species can be determined.

## "Language communities should always be consulted in all matters of conservation"

Henson, Balkenhol and their colleagues studied an area of more than 23,000 square kilometres. First they examined the distribution of Indigenous languages. Then they looked at grizzly populations – and their unique DNA – in those same regions.

"When looking at the topography of this region and at how bears normally roam we would have expected just one genetically distinct population. But to our surprise there were three sub-populations showing rather strong genetic differences," Balkenhol explains.

Genetically distinct populations usually form when geography prevents biological exchange with neighbouring groups, so it was clear that applying the typical explanations offered by landscape genetics did not work in this instance.

"When it came to classic barriers like roads or settlements, but also rivers or mountains, there weren't that many in the area – at least, not enough to prevent grizzlies

from roaming," adds Balkenhol. So, with nothing stopping them, why did the bears not just leave?

Next the authors found that there was a spatial alignment between Indigenous language families and these grizzly populations. The three groups settled respectively in areas where the languages of the Salishan Nuxalk, the Wakashan or the Tsimshian were spoken.

Looking for theories to explain this, one idea the researchers came up with was the First Nations' concept of the 'tribal bears'.

"One hypothesis was that the tribes that had their own language also had their own tribal bears. And those were bears they peacefully coexisted with. But if foreign bears entered the territory the people expelled them," Balkenhol explains. Thus, according to the hypothesis, the protected bears remained in the area of the tribe they coexisted with, and their DNA became unique in the same way as the language of that tribe.

Scientists also seek to explore such links using research methods under the umbrella term 'biocultural diversity'. The concept was defined by, amongst others, Luisa Maffi, director of the organisation Terralingua, as "the diversity of life in all its manifestations: biological, cultural, and linguistic – which are interrelated, and possibly coevolved, within a complex socio-ecological adaptive system".

The extent of such interrelated co-evolution is still being researched. Scientists such as Larry Gorenflo from Penn State University in the United States are now actively in search of a functional link beyond mere plausibility that irrefutably shows how cultural diversity and biological diversity affect each other. Even connections that follow the principle of common sense can be hard to prove on a scientific level.

Over the years, Gorenflo's research has repeatedly shown a correlation of areas hosting an abundance of languages with regions of high biodiversity. In 2012 he and his research colleagues showed that out of the more than 6,900 languages that exist on this planet, 3,202 were being spoken in just 35 so-called hotspots for biodiversity – in other words, in regions with the highest number of unique species.

How these numbers are directly related to one another in specific cases is still mostly explained by hypotheses that have yet to be adequately evaluated. "But the



Artwork by Shirley Babcock  
shirleybabcock.com

evidence for co-occurrence is so strong that some sort of causal link is likely," Gorenflo says. He hopes to prove this link by "developing a more refined understanding of traditional ecological knowledge". Indigenous cultures often spent thousands of years to become acquainted with their specific part of Nature. This familiarity can be expressed by language, for instance through instructions on how to preserve a species or how to use a plant for medicinal purposes. And sometimes it is only an Indigenous language that has a vocabulary specific enough to serve that purpose.

As far as the grizzly study is concerned, Gorenflo, who was not involved in the project, thinks "the authors are on the right track when they propose ecological explanations." Certain landscapes, such as the forests of Western Canada, present contrasting adaptive challenges and, according to Gorenflo's assessment, "yield parallel grizzly and human responses".

Researchers point out that for both animals and humans it may be key to find an advantageous niche use for the respective landscape, and use that niche in similar ways. "For instance, the grizzlies and humans of the area may have focused on the availability of resources," explains Balkenhol, pointing to seasonal food such as salmon or berries that both humans and bears consume. "It is even possible that through the seasons the bears moved together with the humans to different areas, following

their common food sources," he adds.

Experts say that it is the medium of such niches that explains common effects, rather than a direct causality. If both a language and a species settled in a niche that supports their existence, then the destruction or impairment of that niche may very well cause both to disappear at the same time too.

Christian Döhler from the The Leibniz-Centre for General Linguistics in Berlin elaborates on this point: "The extinction of languages and the loss of biodiversity are being caused by very similar processes". Gorenflo points out that language loss "often signals impacts from more modern, often Western, economic activities that tend to adversely affect both Nature and Indigenous culture". Linguist Döhler offers further examples: "If you take soya fields in the Amazon forest or palm oil plantations in Indonesia and Papua New Guinea, either destroys the livelihood of both people as well as biological species." Of course, unlike plants or wild animals, people can escape and relocate. However, "the subsequent socio-economic upheavals like resettlement mostly prevent the next generation from learning their native languages and dialects," Döhler adds. R

Roman Goergen is a London-based German journalist. Previously he worked and lived in Canada and South Africa, where he reported extensively on conservation and biodiversity.