

# Black Hills warbler population not so isolated after all

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Virginia's Warbler populations are maintaining their genetic diversity despite recent range expansion. Credit: C. Bubac

Though separated from the rest of their species by hundreds of kilometers, the Virginia's Warblers that colonized South Dakota's Black Hills two decades ago continue to maintain genetic ties with the rest of their species, according to a new study in *The Auk: Ornithological Advances*. These results provide some of the first insights into how the

genetic diversity of species around the world may be affected as ranges expand and shift due to climate change.

Virginia's Warblers first appeared in the Black Hills about eighteen years ago, colonizing an island of forested habitat cut off from the next nearest Virginia Warbler population in Wyoming by 370 kilometers of prairie. However, genetic analysis by Christine Bubac and Garth Spellman of Black Hills State University shows that the Black Hills population has maintained continuous gene flow with the rest of the [species](#), suggesting that new individuals have continued to arrive in the area over the ensuing generations.

This is good news for the Black Hills population, suggesting they will escape the negative effects of inbreeding. "The relevance of a lack of significant patterning among Virginia's Warbler populations, coupled with evidence of recent population expansion, is that [global climate change](#) may be continuing to shuffle the genetic deck of highly-mobile species," according to Jeremy Ross of the Oklahoma Biological Survey, an expert on the evolutionary and conservation implications of bird movements. "It is refreshing that, despite such knowledge running counter to prior publication biases toward reporting significant differences among populations, Bubac and Spellman provide another example of the insights that could drive future conservation planning in the face of expected habitat shifts."

To perform their analysis, Bubac and Spellman captured 20 Virginia's Warblers at three sites in the Black Hills and compared their DNA with samples from 112 museum specimens of Virginia's Warblers from around the continent. "The Black Hills provides an opportunity to study in a really neat setting," says Bubac. "It has many of the same species that you would find in the Rocky Mountains, yet it is isolated from the mountain range by Great Plains habitat. I learned a hard lesson while doing field work in the Black Hills: Mind your mist nets near mountain

mahogany, a plant that seems to catch everything!"

Bubac hopes to return to South Dakota in the future. "To build upon this study, I think it would be interesting to perform a survey to gain a better understanding of Virginia's Warblers' complete distribution throughout the Black Hills," she says. "Monitoring of the Virginia's Warbler will be necessary as this species continues to expand its range northward."

**More information:** "How habitat connectivity shapes genetic structure during range expansion: Insights from the Virginia's Warbler" will be available Feb. 17, 2016, at [www.aoucospubs.org/toc/tauk/133/2](http://www.aoucospubs.org/toc/tauk/133/2)

Provided by The Auk

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