

Long-time white-tailed deer study a training ground for young researchers

December 28 2015, by Kristen Kilker



An Indiana State University student looks at genetic samples of white-tailed deer in biology Professor Rusty Gonser's lab. Credit: Indiana State University Photography Services file photo

Winter in Indiana: if you're not in the woods trying to catch a deer, you're on the road trying to avoid them.

Rusty Gonser, professor of biology, has been conducting research since 1998 into the white-tailed [deer](#)'s genetic variations and bottlenecks from hunting controls. Gonser's primary interest is conservation of species due to habitat loss or fragmentation—a problem that affects the area's deer, and once led to their scarcity in Indiana long ago.

It was estimated that when the European settlers came to America, there were 12 million deer across North America. By 1900, the estimate was reduced to 100-500,000 deer across North America.

Habitat destruction and unregulated hunting led to a number of species' extinction. The deer began to return to Indiana when Teddy Roosevelt began conservation efforts in 1900s, restricting hunting to "antler-deer" and establishing state parks and reserves. Agricultural improvements and vegetation in subdivisions also aided the migration of white-tailed deer back to Indiana. By 1996, the [deer population](#) reached 26.5 million—more than twice what it was before European settlers.

"White-tailed deer may be the single most successful conservation effort in the history of the U.S.," Gonser said. Since the growth occurred and such a short time span, Gonser and others wonder how going "through the genetic bottleneck" impacted the population.

"One thought in conservation biology is that when populations get to lower numbers, their genetic makeup won't be diverse enough to survive and thrive," Gonser said. "Did the genes also diversify as the population grew in size? That's where we're coming at it."

Along with studying deer movement and deer-vehicle collisions, Gonser's research also aims to avoid problematic deer-aircraft collisions.

Gonser studies a closed deer population that originated in Maryland. Studying this population will help minimize deer-aircraft interactions at the Tucson Naval War Airbase in Maryland.

"That's why you see big fences around airports. Deer get on runways the same way geese do," Gonser said.

Other locations, such as some state parks, are using the Maryland population as a model to curate their harvest. The degree of population reduction should keep the deer population healthy while reducing deer-vehicle collisions.

Gonser considers the white-tailed deer research to be a good "training ground" for student researchers, because everyone is familiar with white-tailed deer.

"Particularly in a rural community—a lot of our students are rural in this area—hunting has been a part of their culture," Gonser said. "For some communities, it's big revenue. All the people who are drawn to those areas to go hunting are spending money and making an economic impact on the towns."

While research on some other species forces Gonser and his researchers to work with "a very finite sample," Gonser and his students can count on new deer tissue every year from hunting. Gonser says as the students become more efficient, they can start working with more difficult.

Since much existing research has been done on deer, Gonser's student researchers can focus on skill building instead of designing experiments or DNA primers.

Biology major Brianna Wells of Rockville has participated in the white-tailed deer study since the summer and until the end of this semester.

"It was my first experience researching in my field of study," Wells said, aside from her mandatory lecture-laboratories. "Working in the lab helped me to apply the scientific knowledge from my lecture courses."

Eric Hibbets, a senior biology major from Monticello, has helped Gonser's research project since the summer of 2014.

"When I first started the white-tailed deer project, I had no idea what to expect," Hibbets said. Like Wells, the white-tailed deer harvest study was his first research experiment in a lab setting. Evolution has always fascinated Hibbets, and the white-tailed deer project explored the important aspects of evolutionary biology—the founder and bottleneck effect, which white-tailed deer experience very year.

Wells and Hibbets helped to study the effects of the bottleneck and founder effects of a controlled white-tailed deer population in the Patuxent River and Webster Field Annex naval bases in Maryland. The two students extracted DNA samples from the deer tissues and organized and inventoried the samples for test-preparation, as well as using buffers and detergents to clean the samples. Wells and Hibbets also ran "PCRs" on the extracted DNA samples to analyze specific samples, which Wells says was more difficult, but Gonser, Hibbett, and Sarah Ford were always nearby for help. The also presented weekly to the rest of the Summer Undergraduate Research Experience participants.

"Some days we would read research papers and discuss them with the Gonser research lab, other times we would use a spreadsheet to check which samples we had in the freezer," Hibbets said.

Wells learned a lot about proper safety precautions to take when working with biological material and properly handling temperature-sensitive chemicals and solutions. "This was a two day process and pretty rewarding to know that I could isolate genetic material from a

recognizable tissue sample," Wells said.

The [white-tailed deer](#) project helped Hibbets to understand the importance of research papers, having all research materials ready and the importance of less stimulating tasks like reading those papers and labeling containers and tubes - all crucial to the research project.

"Originally I did not know if the research was for me," Hibbets said. "At first, I only wanted to study the big cats—tiger, lion, jaguar, leopard and snow leopard. But after the first summer of research, I began to realize that I cannot isolate myself in the field of research."

Hibbets said Gonser's research helped him in his own personal research and in his classes. "Research is not for everyone, and working on this project for the past couple of years has gravitated my career on the research track," Hibbets said.

Provided by Indiana State University

Citation: Long-time white-tailed deer study a training ground for young researchers (2015, December 28) retrieved 11 May 2024 from <https://phys.org/news/2015-12-long-time-white-tailed-deer-ground-young.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.