



Story by Elizabeth Boyle

Mark Waters stands in his lab on Ohio University's Eastern campus, a red-brown crayfish wriggling between his fingers. Over the gurgle of aquariums, he explains how the small lobster-like creature sustains the queen snake, the animal that's been at the center of his research for more than 10 years.

A crayfish is usually protected by a hardened shell, but a molting crayfish has a soft exterior that makes it the perfect meal for the queen snake, a reptile native to Southeast Ohio's rocky wetlands.

"As soon as they molt, they start to harden," says Waters, a behavioral biologist who focuses on the feeding and foraging behavior of snakes. "There's a six- to 12-hour window for the snakes."



The BBC crew visiting Sunfish Creek in Monroe County traveled the world to capture pioneering research on reptiles.

Secret World of Snakes

Professor's expertise draws a BBC film crew in search of never-before-seen reptile footage

Waters has logged hundreds of hours sitting on the banks of Ohio Valley creeks and streams observing the snakes' behaviors. Last summer, members of a BBC documentary film crew joined him, drawing from his expertise for a series on reptiles and amphibians called "Life in Cold Blood," a David Attenborough production.

Attenborough, known in Britain as the "Father of Natural History," has enjoyed a more than 50-year career with the BBC celebrated with such distinctions as being knighted and winning an International Emmy. To be consulted for one of his shows was an honor, says Waters, a native of Britain who began watching Attenborough shows as a boy.

“If you love science, you grew up watching David Attenborough,” he says. “He’s a British icon.”

Five one-hour programs comprise the series set to air in spring 2008, and the segment on the queen snake will be included during the fourth, “Sophisticated Serpents,” says Nikki Stew, whose team visited the Eastern campus in St. Clairsville to work with Waters. She was one of many producers collaborating on “Life in Cold Blood” all over the world.

“There’s one crew in Peru and Costa Rica. One crew just came back from Panama and Trinidad,” she says. “(We) get in on cutting-edge science — papers that are just being published.”

Thanks to the use of the BBC team’s tiny endoscopic cameras, the filming marked the first time scientists could see the snakes actually eat crayfish. The low light under the rocks, where the snakes hunt, is ordinarily too dark otherwise.

When light shines on the queen snake — which can range from 15 to 24 inches long and is brown with a yellow stripe on the base of each side — it usually stops what it is doing.

For Waters, who emphasizes that it takes years to accumulate data by observing snakes’ behavior from the banks of streams such as his favorite, Sunfish Creek in Monroe County, gaining that footage is a milestone.

“I’ve seen snakes go under the rock (to eat) and come out,” he says, but he’s never actually seen them consume their prey.

Waters’ work continues to focus on the snakes’ search strategy for food. In addition to observation, he uses a GPS program that lets him look at the snakes’ spatial movement in relation to their prey. Most recently, he’s also focused on the crayfish themselves.

“What I have to try to tease apart is where (the crayfish) are located and how the snakes are finding them,” he says. “So we have to shift to making sure we know as much about the crayfish as the snake.”

Waters’ interest in how the reptiles live and eat, which he chalks up to “an innate sense of curiosity,” led him to the United States in 1990. After graduating



Professor Mark Waters studies the queen snake and its prey, which includes crayfish found along the bottom of Sunfish Creek.

from the University of Westminster in 1987, he sought out scientists in his field, most of whom were based in the States and Australia. He ended up at Central Michigan University for his master’s and the University of Tennessee for his doctorate.

A faculty member at Ohio University—Eastern since 1999, Waters is an influential mentor and teacher as well as a researcher. He encourages interested undergraduates to go into the field with him, collect data and help with analysis.

“I felt that would help keep them in biology,” Waters says. “I want to engage

them and get them excited about doing science and basically train them.”

In fact, when he made his initial connection with the BBC in 2005 at the Fifth World Congress of Herpetology in South Africa, he had two students with him to present their research findings.

“To my mind, they put a lot of work into that research,” he says. “I felt it was important for them to see where you go when you get (the research) done.”

Engaging biology students in the field, coupled with his obvious dedication to teaching, earned the scientist Ohio University recognition as 2007 Regional Campus Outstanding Professor. He teaches courses ranging from human anatomy and physiology to introductory biology classes. Among his favorites is Biology of Sex Difference, a course that he designed and only is offered on the Eastern campus.

“I love to teach,” he says, explaining his difficulty in naming a favorite course. “There’s something challenging and interesting about each one, he says.

Elizabeth Boyle, BA '03, is a writer living in Newark, Del.

Waters (right) served as a consultant to a BBC crew filming “Life in Cold Blood,” the latest documentary in naturalist David Attenborough’s “Life” series exploring plants and animals.



PHOTOGRAPHY BY JENNIFER COMPTON-STROUGH