

## A Passion for the Science of Wildlife

### MARK BOYCE CONNECTS MANAGEMENT DECISIONS TO ECOLOGICAL RESEARCH

By Dana Kobilinsky

At its warmest, the temperature reached -57 degrees Fahrenheit. Mark Boyce, who was 22 years old, had paid the Civil Air Patrol 50 bucks to fly him on a ski plane to a remote area north of Fairbanks, Alaska, where he had come to study beavers (*Castor canadensis*) for his University of Alaska master's degree. He didn't realize he would be stuck there on Birch Creek for days waiting for a trapper who would never show.



Courtesy Mark Boyce

▲ For as long as he can remember, Mark Boyce has spent time outdoors, enjoying wildlife. After a boyhood in Iowa, his passion for wildlife and science led him to an academic career at the University of Alberta.

When the plane touched down on an isolated lake, no one was waiting there to meet him. He snowshoed about a mile to the cabin where he would be living. No one was there either. Maybe, he thought, the trapper he would be working with had taken his dog team into Circle City, the closest town. Boyce built a fire at the cabin to keep warm and waited.

And waited.

After a week, as the temperature plunged to 65 below and the firewood and food supplies dwindled, Boyce decided it was time to go into town himself. He hiked 17 miles into Circle City, chugged down a cold root beer and finally met up with the trapper. Boyce had been ready to brave the cold at the site. The trapper, it turned out, felt otherwise. The beaver study would have to wait for warmer weather.

Throughout his career, extreme conditions have rarely kept Boyce from his passion — studying wildlife — and he's shared that passion with generations of students who have been inspired by the mathematical precision that underpins his conservation work.

#### Where it all started

"As long as I can remember, I would spend time outdoors, enjoying wildlife," Boyce said. Now a professor of ecology at the University of Alberta and

the Alberta Conservation Association Chair in Fisheries and Wildlife, he grew up on a farm in Iowa, where he devoted his free moments to hunting, fishing and outdoor activities.

Boyce was writing a high school term paper on red foxes (*Vulpes vulpes*) when he realized studying wildlife was a profession. He wrote to Ron Andrews, a furbearer biologist with the Iowa Department of Natural Resources. Andrews taught him about the foxes and encouraged him to study wildlife. Later, he would be instrumental in Boyce joining The Wildlife Society.

Boyce went on to study wildlife biology at Iowa State University, where he spent a summer at Iowa Lakeside Lab completing field biology coursework. During this graduate-level course, in which he researched plant systematics, Boyce realized he wanted to pursue an academic career. "The professors spent their entire waking hours doing research on cool stuff and asking interesting questions, and I was really intrigued with natural history and wanting to learn," he said. "It was really stimulating to me as an undergrad."

Boyce went on to work on beavers for his master's degree at the University of Alaska, then muskrats (*Ondatra zibethicus*) as he pursued his doctorate at Yale and great tits (*Parus major*) as a NATO Postdoctoral Fellow at Oxford. "It was all fun," he said.

#### Connecting with habitat

At Yale, Boyce became interested in stochastic demography — demographic changes in fluctuating environments — and other population models. "I realized none of it made any sense if you don't make the connection with habitats," Boyce said. At the time, he said, the most-used demographic-based models for population viability analysis had no connection with habitat. Boyce decided to change that.

"It's now one of the most dynamic areas in ecology as well as in species distribution models and spatial ecology," he said. "It's certainly a hot topic. We're figuring it out and getting better at it."

Recently, Boyce has been working on developing habitat selection models to predict where grizzly bears (*Ursus arctos*) can be found by using GIS data and telemetry. He hopes these models can identify critical aspects of the ecology to better conserve the bears.

These models have been central to Boyce's career. "He quantified while most people were doing it by the seat of their pants," said Tony Sinclair, professor emeritus at the Beaty Biodiversity Center at the University of British Columbia. The two met when Boyce was teaching at the University of Wyoming. "People saw species in a habitat and thought this has to be the habitat they like," Sinclair said, "but that's actually wrong. Mark quantified it in a sophisticated matter. He was really one of the leaders in quantitative analysis of populations and conservation."

### Passing it on

While some of Boyce's earliest students are retiring, he continues to pursue his passion for wildlife research.

"I don't like to use this term lightly, but I truly think Mark is a brilliant scientist, and he was a very compelling teacher," said Sam Zeveloff, Boyce's first PhD student at the University of Wyoming and now a presidential distinguished professor emeritus of zoology at Weber State University in Utah. "I was very taken by his brilliance not only as a wildlife biologist but also as a theoretical ecologist, given his grasp of the principles and the math that underlined those principles."

Boyce is just as taken by his students as they are of him. "They are my life source," Boyce said. "I've had some amazing graduate students. They've sort of kept me going. They're my best friends, and I'm proud of them."

### An active member

Boyce's involvement in The Wildlife Society began in 1971 when he was an Iowa State undergrad. At Yale, he started a student chapter and became its president, and he has been active ever since.

Throughout his career, Boyce has been president of the Wisconsin Chapter of The Wildlife Society, the Alberta Chapter and the Canadian Section. A Certified Wildlife Biologist, Boyce is a TWS fellow and served as editor-in-chief of the *Journal of*

*Wildlife Management* from 1995 to 1997, with Sinclair as one of his associate editors.

"TWS is just a wonderful assemblage of colleagues who think the same way and interact on various items of mutual interest," Boyce said. "TWS meetings are always great fun and a wonderful place to see old friends."

Boyce has received several prestigious awards over the years. In 2014 he was elected to the Royal Society of Canada. Then in 2016 was awarded the Miroslaw Romanowski Medal by the Royal Society for his lifetime contributions using science to help solve environmental problems.

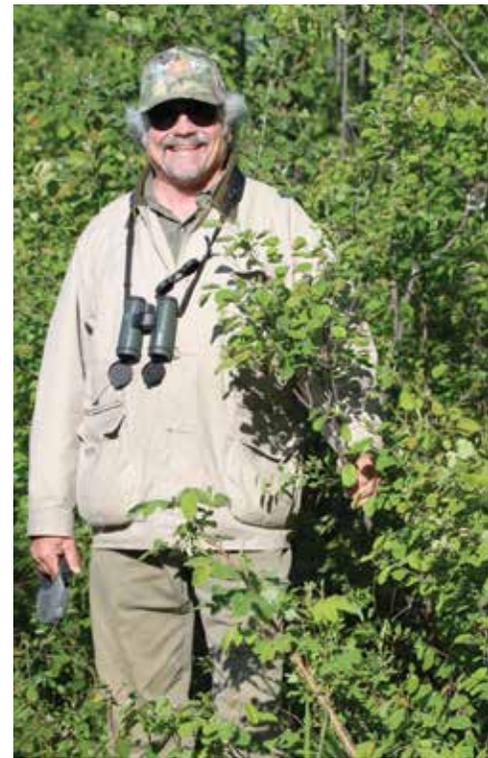
### A legacy of science

Boyce's colleagues — students and mentors — look up to him for not only his mathematical and scientific skills but for his communication skills.

"He is an excellent writer," Zeveloff said. "Whatever extent I feel my writing has improved I can attribute to his guidance in writing."

Even if he's teaching complicated ecological theories or applying difficult mathematical skills to population models, Boyce's ability to communicate with a professional or general audience shows through, Zeveloff said. And he is always available to answer questions for his students. Zeveloff recalls Boyce responding to a raccoon management question from as far as Uganda. "You can always count on him to give you great advice," Zeveloff said. "And he does it from this position of being so knowledgeable about the way in which ecological research ought to be conducted and continuing to pose these very interesting questions about how we should be looking at issues."

Boyce hopes to continue asking these types of questions. He hopes to instill in his students "a spirit of wanting to ensure good science behind wildlife management decisions," he said, "and having solid science as a basis for what we do." ■



Courtesy Mark Boyce

▲ Mark Boyce stands among the vegetation in Uganda, where he was working with a PhD student on a study of a species of spiral-horned antelope.



Dana Kobilinsky is a science writer for The Wildlife Society.