COLLARS, CORRIDORS, AND CONSERVATION

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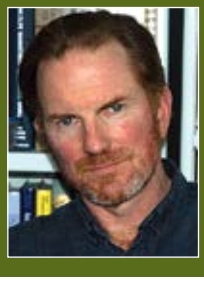
Chief of the Cooperative Fish and Wildlife Research Units

I would like to introduce Boone and Crockett Club Professional Member Dr. Jonathan Mawdsley, who will be taking over the Science Blast column for *Fair Chase*. I have enjoyed writing this column for several years and tried my best to follow in the footsteps of the great scientist Dr. Wini Kessler who preceded me.

Three years into retirement, I feel it is time to turn over the reins, and Dr. Mawdsley, who has succeeded me as Chief of the Cooperative Fish and Wildlife Research Units (Coop Units), is the perfect choice. He is the former Science Advisor for the Association of Fish and Wildlife Agencies, and his previous affiliations include the Smithsonian Institution and the National Fish and Wildlife Foundation. He has extensive research experience, including ongoing work in Africa. He has a B.S. degree from Harvard University and a Ph.D. from Cornell.

As Chief of the Coop Units, Dr. Mawdsley oversees 41 research units in 39 states embedded in the graduate faculty of major universities. Each unit is a partnership among the state fish and wildlife agency, the Department of the Interior, the Wildlife Management Institute, and the host university. The mission of the Coop Units is to help the cooperators solve real world fish and wildlife challenges using state-of-the-art science, while training the next generation of leaders. With more than 600 graduate students being trained by some of the finest fish and wildlife scientists in the world—all in cooperation with state, federal, and private partners—Dr. Mawdsley has access to groundbreaking science. I look forward to his forthcoming columns. Welcome Dr. Mawdsley!



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For this, my initial essay for *Fair Chase*, I wanted to highlight work being done by scientists at the USGS Wyoming Cooperative Fish and Wildlife Research Unit and their partners. This work has the potential to revolutionize the ways that we manage large ungulate populations in the western United States.

Building on pilot efforts in Wyoming, these scientists are tackling the ambitious goal of mapping the migration corridors used by mule deer, elk, and pronghorn across the entire western U.S. The project brings together a broad spectrum of state, federal, tribal, private sector and NGO partners, and combines state-of-the-art satellite tracking technologies, sophisticated computer modeling techniques, and plenty of good old-fashioned on-the-ground fieldwork. The goal of this work is to map all of the known migration corridors for these species in the 11 western states through five years of field work, data collection, and analysis. Maps and data from these efforts will be shared with state wildlife biologists who have direct management authority for these herds, providing these wildlife managers with critical information about herd dynamics and habitat use across broad landscapes. I'm tremendously excited about this work, and I hope you will be too! But first, a little background on wildlife tracking technologies.

Wildlife biologists around the world use radio tracking devices to improve our understanding and management of wildlife populations. Wildlife documentaries often show researchers in the field using a radio antenna to locate an animal that has been fitted with a tracking device. For larger animals, such as members of the deer family, big cats, or African antelope, these tracking devices are usually contained in a collar, which is fitted carefully around the animal's neck. In the jargon of wildlife biologists, these are usually known as "wildlife collars" or "tracking collars."

There is a long and distinguished tradition of using these collars to study animal movements and behaviors. Pioneering research teams at the Illinois Natural History Survey and the University of Minnesota developed methods in the early 1960s for using innovative (at the time) transistor and radio technologies to pinpoint the location of individual animals in the field. These researchers attached a radio signaling device to each animal and then used a radio receiver to locate the animal in the field. Initial studies involving ducks, rabbits, and other common wildlife species proved highly successful and led to widespread use of these tracking technologies.

This innovative use of new technologies opened up a whole new world to wildlife biologists and managers. Biologists could track animal movements and study animal behavior on a much finer scale than ever before, enabling them to track animal movements, locate animals at hibernation sites, better understand migration and dispersal, map calving and overwintering grounds, and investigate many additional scientific questions. Scientific information obtained from these studies could then be used by wildlife biologists at state and federal agencies to track wildlife herds directly and manage key habitat features for these wildlife species more effectively.

These maps are incredibly valuable tools for state wildlife managers, giving them precise information on the location of wildlife herds and helping them to identify the resources that are used by these species at particular points in time.

As computer technologies have continued to evolve, researchers have developed increasingly sophisticated wildlife tracking devices. Many of these new tracking devices rely on Global Position System (GPS) satellite technology to obtain a precise fix on a particular animal's location at a given point in time. Tracking devices have also become smaller and more lightweight, with transmitters now available for such tiny creatures as bats, songbirds, and even bumble bees. Waterproof transmitters help fisheries biologists track fish and other aquatic organisms. Wildlife biologists and managers can now choose from a wide variety of "off the shelf" solutions, available from commercial suppliers, for tracking and monitoring animals.

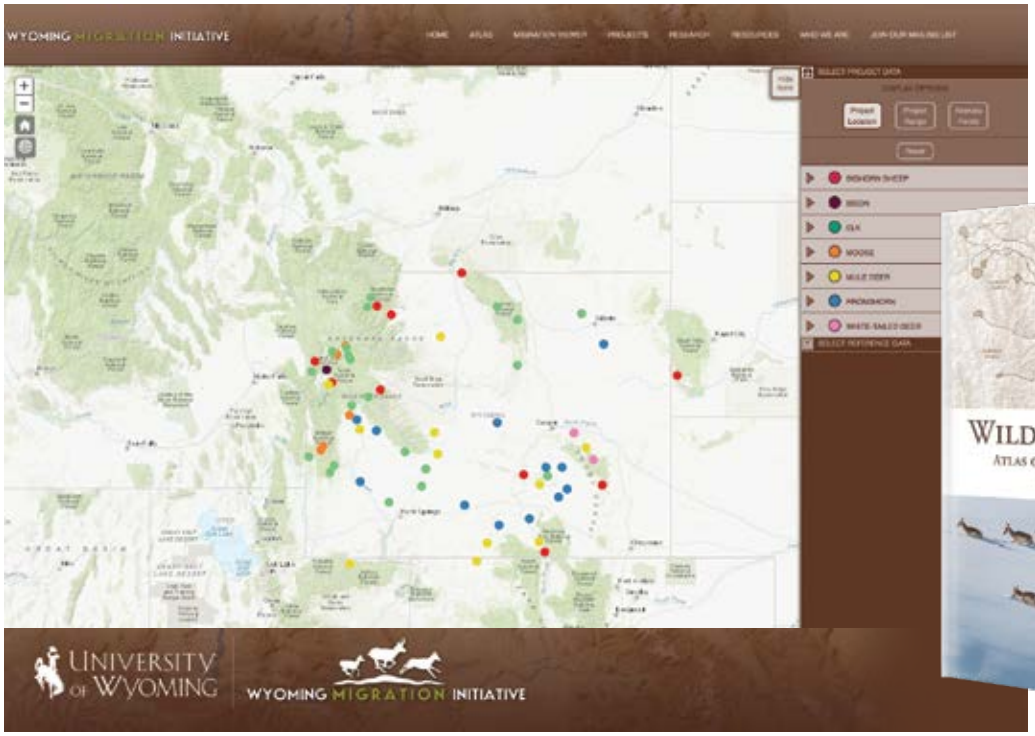
One of the most exciting applications of these new technologies has been the mapping of migration corridors for big game species in the western United States. A team of researchers, led by Dr. Matt Kauffman at the USGS Wyoming Cooperative Fish and Wildlife Research Unit, are now mapping the migration corridors of large ungulates (mule deer, elk, and pronghorn) across the western United States. Matt and his team use high-resolution GPS collars to obtain precise information on animal locations at specified time intervals. They place collars on multiple animals within a single herd, making it possible to record the precise location of multiple animals at the same time. Over the course of a year, these precision measurements provide the researchers with an exact map of the path traveled by each animal in its annual migration cycle.

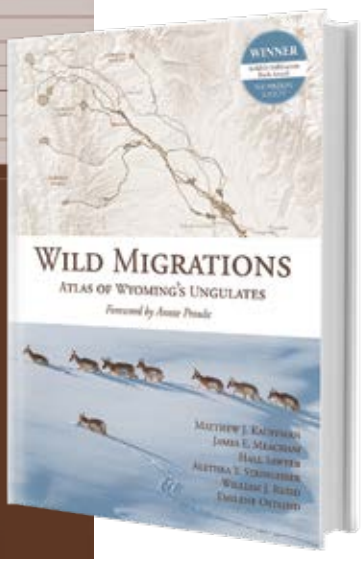
Once they have the raw data on animal movements, Kauffman and his team use sophisticated, state-of-the-art computer modeling techniques to provide a "best estimate" of the migration pathway or corridor used by each wildlife herd over the course of the year. These maps are incredibly valuable tools for state wildlife managers, giving them precise information on the location of wildlife herds and helping them to identify the resources that are used by these species at particular points in time.

Data from these studies can help pinpoint key features such as overwintering areas, calving grounds, summer foraging areas, and the migration pathways used by animals over time. Such information can also help state and federal agencies manage key habitat features on public lands more effectively for wildlife. Combined with traditional field observations and hunter reports, these new maps give managers a wealth of information for the management of wildlife herds and habitats.

Mapping migration corridors is an ongoing process, and Kauffman and his team have recently published an updated set of digital maps and a hardbound atlas that present information on ungulate migration corridors in Wyoming. The team is now working with current and prospective partners in all 11 western states, with an eye toward mapping all of the known migration corridors across the West over a five-year timespan. This ambitious project would give us—for the first time ever—state-of-the-art maps showing the location of migration corridors for our key big game species across the entire western United States.

Kauffman and colleagues are already working with state, federal, and tribal wildlife managers across the West and welcome collaboration with interested partners in all sectors. ■





To learn more about this effort and to see the maps that have been produced to date visit www.migrationinitiative.org.