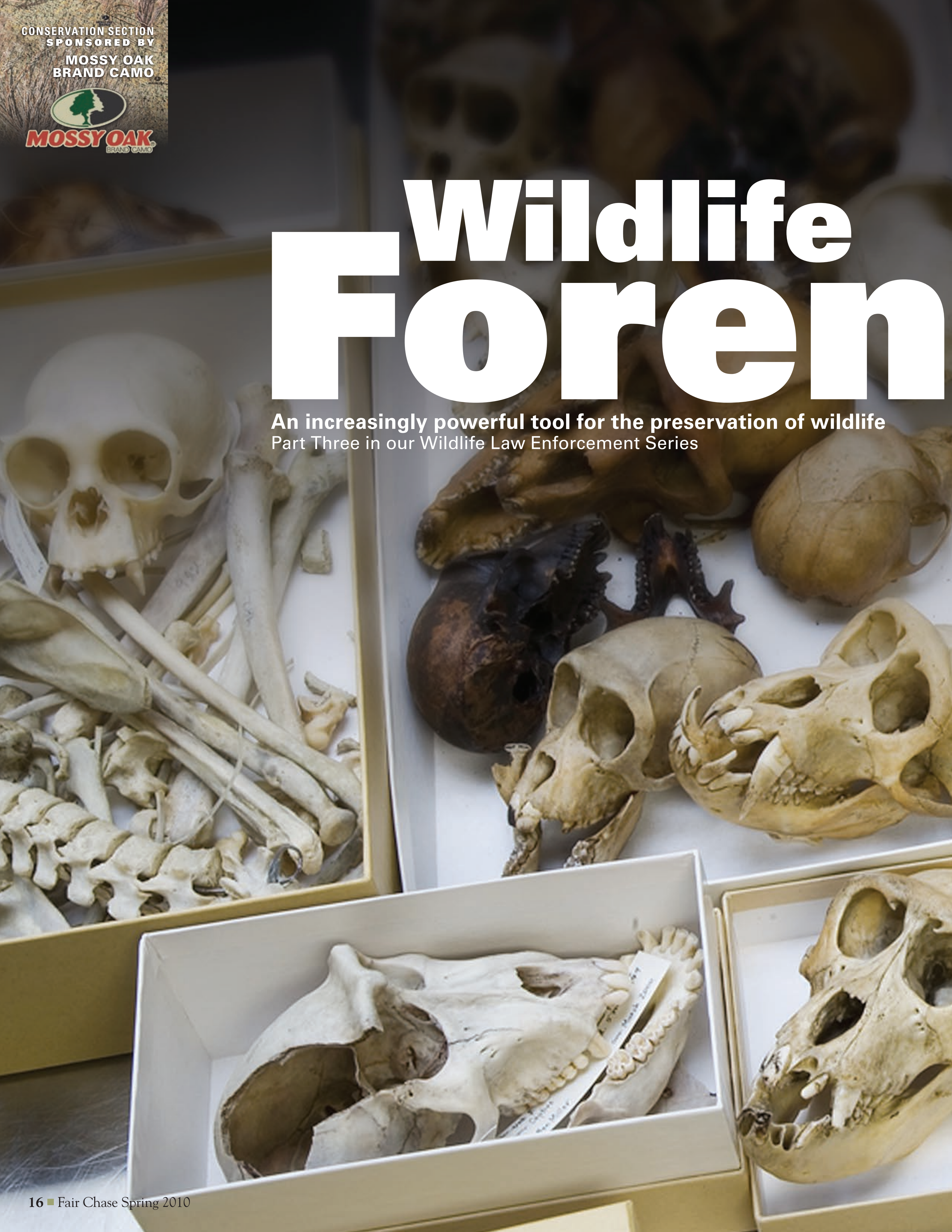
Wildlife Foren

An increasingly powerful tool for the preservation of wildlife

Part Three in our Wildlife Law Enforcement Series



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My first hint that there might be resistance to the idea of a crime lab for wildlife law enforcement within the U.S. Fish and Wildlife Service (FWS) came when I made the first presentation of my idealistic goals to our cadre of special agents at their annual in-service training session at the Federal Law Enforcement Training Center (FLETC) in Glynco, Georgia. I was halfway through my presentation, complete with colorful slides showing the forensic technologies and instruments I hoped to apply to their seized evidence items some day, when one of our visibly tough and field-hardened veteran agents—let's call him 'Doc'—apparently couldn't take it any longer. He stood up in the audience, raised his hand to get my attention, and then said in a gruff, Southern drawl, "Son, I'm sure you mean well, but I have to tell you something. I don't need that fancy crime lab you're talking about to help me count ducks."

By Ken Goddard
Director, National Fish & Wildlife Forensics Laboratory

Images courtesy of the author

FROM THE TOP: Lab director, Ken Goddard began as a forensic scientist for FWS in 1979. Ten years passed before the National Fish and Wildlife Forensics Lab opened. ■ Dr. Pepper Trail examining bird breast bones. ■ The National Fish and Wildlife Forensics Laboratory is located in Ashland, Oregon, and is the only one of its kind.

LEFT: Four forensic scientists use the lab's standards collection, which includes roughly 100,000 items such as these rhinoceros horns and other skulls, to determine the species source of hairs, furs, feathers, claws, teeth, bones, shells and skulls submitted as evidence. **ABOVE:** Lab Director Ken Goddard (with camera) and forensic scientist Mike Scanlan examine a bullet-impacted elephant tusk smuggled from Africa.

My surprised reaction was something along the line of "Well, no, I suppose you wouldn't."

And no, Doc really didn't need my help to count his bags of seized ducks. At that early date in my wildlife law enforcement career, I'm not sure I would have been able to distinguish the duck carcasses from all of the other waterfowl species I might have found in a poacher's game bag or boat, much less separated and identified each of them as to "kind of duck." The head-shaking disgust of Doc standing over my shoulder while I was trying to do so can only be imagined. Unknowingly, Doc did something very helpful to my quixotic mission that day: he made me aware of the tension that existed within the law enforcement division between the older agents—who saw their proper role being in the wetlands and waterways, checking hunting licenses, shotgun plugs, and bag limits—and the younger agents who had hired on to investigate a wider scope of wildlife crimes.

There I was, a youngish scientific cop, standing up at that FLETC lecture podium with my colorful slides, seemingly intent on making things even more divisive with my promises of incredible forensic technology hovering on the distant horizon.

The decade of the 1970s was a transitional one for wildlife law enforcement. Those years would forever change my life, as well as the lives of the 35 forensic scientists, technicians, and support staff who now work within the white concrete and blue glass walls of the U.S. Fish and Wildlife Forensics Laboratory in Ashland, Oregon.

In retrospect, it wasn't an easy transition.

In 1972, the FWS moved its law enforcement officers into a separate division of law enforcement. This organizational change was followed in 1973 with the passage of the Endangered Species Act and the transition of the service's game management officers to "special agent" criminal investigators, the establishment of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975, and, in 1979, to the amazement of a lot of folks within and outside the FWS, the establishment of what would become the first crime lab devoted to wildlife law enforcement.

In 1979, the FWS hired a police forensic scientist and crime lab director (me) to fill a new forensics branch chief position. My initial job was to write a series of law enforcement manual chapters on such things as crime scene investigation (CSI), evidence handling, etc., for our special agents and wildlife inspectors. Once I completed that task, I was expected to assist our agents and inspectors in the field, using the CSI, evidence handling and technical surveillance skills I'd honed in several hundred police raids, warrant searches, and homicide investigations, while trying to garner support for the wildlife crime lab I'd been hired to create.

I quickly learned the "garnering support" part of my new job wasn't going to be easy. In fact, "not going to be easy" was turning out to be a huge understatement.

Luckily, I discovered that help was available in the form of a small handful of wildlife forensic science pioneers. Five or six scientists who had been laboring in small, one- or two-person labs within their state fish and game agencies or at a nearby university during the 1970s, trying to apply microscopic and serological techniques routinely used in police forensic science to identify wildlife hair and blood and tissue evidence. Tommy Moore, the lone forensics and game management scientist at the Wyoming State Fish and Game Lab, was one such fellow. Tommy helped me understand, among many other things, that identifying the species sources of hair, blood, and tissue evidence submitted to a state fish and game lab—where one could reasonably assume that "fresh-kill" evidence probably came from a resident species—was far from easy, and by no means well-established science. Which meant my job of trying to create a wildlife forensics lab for the entire United States of America—where our scientists wouldn't be able to make assumptions as to the country (much less state) source of the wildlife evidence in question—was going to be a mindboggling task.

I remember Tommy patting me on the shoulder, wishing me luck, and promising to share his standards collection with whatever lab staff I managed to assemble. I'm sure neither of us imagined that, one day, the lab I was trying to create would endeavor to service the world.

Another decade would go by before those white concrete and blue-glassed walls would finally start to rise on a vacant patch of Southern Oregon University land in Ashland, Oregon. I would love to describe all of the people involved, all of the serendipitous events that took place to make this national laboratory a reality, but to do that, I'd have to explain a covert investigation that went awry, a chiropractor from Eagle Point, Oregon, who listened to a lecture from one of our agents then began pounding on the doors of a couple of very powerful Oregon senators, and, well …

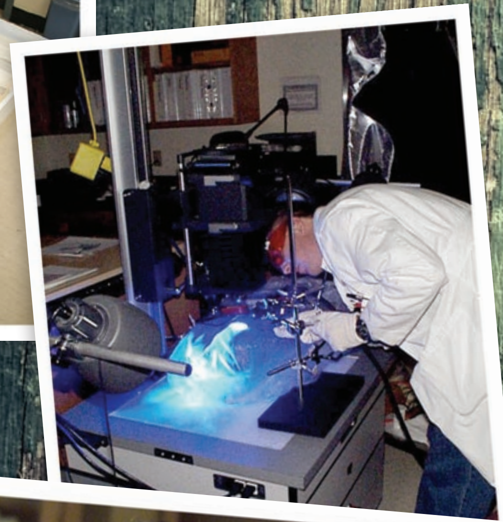
The hunt was on to build a team of forensic scientists who were up for the challenge of their careers. And in 1989, a ribbon was cut by those same two Oregon senators at the entryway of a beautiful 23,000-square-foot building.

Today, the U.S. Fish and Wildlife Forensics Laboratory, recently expanded to 40,000 square feet of modern lab and office space, houses 23 wildlife forensic scientists working in six forensic disciplines with 12 technical and clerical support staff helping to ensure quality control and maintain the flow of evidence and paperwork.

In addition to supporting our approximately 200 special agents and 120 wildlife inspectors, our lab provides forensic assistance to all 50 state fish and game agencies. When time allows, we provide support to the 175 signatory countries of the CITES Treaty, as well as the wildlife working group of Interpol. The four forensic scientists in our morphology section work with microscopes, magnifying glasses, hundreds of reference books, innumerable computer databases, and roughly a 100,000-item standards collection to determine the species source of a wide range of hairs, furs, feathers, claws, teeth, bones, shells, and skulls submitted as evidence. The work is challenging because these scientists cannot make assumptions as to the country of origin; and the piece, part, or product of the animal in question may or may not possess any of the species-defining characteristics that a biologist would routinely use to identify the whole creature.

The six forensic scientists in our genetics section apply some of the latest DNA analysis techniques to identify the species source of blood and tissue samples and to match those submitted samples back to a single animal source. The technologies are well-established and easily modified to wildlife forensics work; but the volumes of incoming evidence items are often overwhelming. A few years ago over a three-year period, five of our six DNA experts were doing little else besides analyzing the thousands of caviar samples sent to us by overnight mail for species identification, so that huge shipments of caviar entering our ports could either be seized (if the tin contents didn't match the accompanying permit) or allowed to go on their way to market.

FROM TOP TO BOTTOM: **The "paw" portion of our comparison standards collection. ■ Forensic scientist Andy Reinholz uses a monochromatic light source to examine evidence items for latent prints. ■ Chief morphologist Bonnie Yates examines a bear paw.**



The two veterinary pathologists in our pathology section apply old-fashioned scalpels and modern digital imagery to the necropsy (an autopsy of a nonhuman animal) process of determining the cause of death of submitted carcasses. The possibilities are mainly limited to bullet, arrow, poison, trap, vehicle impact, predation, starvation, disease vector, or simply old age—and there may be more than one cause. But it's up to these medical doctors to figure out exactly how and why the animal on their table died, and then convey that information to the waiting investigators who will figure out the "who" and the "where" if a violation of law is involved.

Two forensic scientists in our chemistry section use highly sensitive gas

Senior Pathologist Barry Fickbohm conducts a necropsy on a bald eagle.

chromatograph/mass spectrometers to detect trace amounts of pesticides and poisons in samples of blood, urine, and liver tissues. Their work is often crucial to the necropsy process; poisoning is a simple way to weaken a trophy animal and make it easier to hunt or to clear out a population of protected animals that are in the way of "progress."

In our criminalistics section, there are two forensic scientists who use a wide range of old and modern police forensic technologies. They may have to visualize and compare latent fingerprints from a wide range of objects collected from poaching crime scenes or match mangled bullets taken from dissected carcasses to submitted firearms. And because we often receive large bullets that have come apart after hitting large animals, we have a scanning electron microscope that allows our examiners to dig deep into the striation evidence of a single land (ridge) or groove before declaring the bullet and firearm a match.

Four computer and electronics experts in our new digital evidence section apply highly sophisticated technological devices and software to search the hard drives of seized or "mirrored" computers for evidence of wildlife crimes and to enhance or restore damaged video and audio data. Many poachers have taken to digital imagery and computer processing to share images of their illegal activities with their peers with great enthusiasm. It is a rare raid or warrant search that doesn't involve the seizure of a computer or mirroring of its hard drive.

And last, but certainly not least, we have one full-time forensic scientist as our quality control manager, spending her days calibrating our scientific instruments, truing our known-standards collections, and proficiency-testing our scientists to make certain that the results and comparisons described in our signed laboratory reports are both precise and accurate.

The work is daunting, because the possible sources of the submitted evidence items are huge, the items and/or carcasses often arrive in a decomposed or compromised state, time is often of the essence because suspects may be on the loose or trial dates may be looming, and the need for unbiased accuracy and precision in our results and conclusions is always paramount.

But the work is also fascinating because we are constantly endeavoring to develop new technologies and protocols to answer the needs of the investigators in the field as well as the expectations of a new generation of jurors who have grown up on increasingly tech-filled episodes of "Law and Order" and "CSI". The problems seem endless at times, but the scientific approach to problem solving is a powerful tool, indeed, and rarely a week goes by without one of our scientists finding a peer on the Internet who has at least a partial answer to one of our questions.

Occasionally, we are able to provide a wide range of international wildlife officers with forensic tools to help them in their heroic efforts to preserve wildlife populations from the malicious poachers and the greedy profiteers who are intent on taking more than their fair share at the expense of law-abiding hunters and the world at large. Last year, we helped train 45 wildlife rangers from eight sub-Saharan Africa nations in modern crime scene investigation (CSI) and other investigative techniques to help them take on the lethally-armed poachers and smugglers going after their resident populations of elephants and rhinos that fuel the lucrative ivory and traditional Asian medicine trades. We initiated the use of a new elephant and rhino kill-site evidence kit designed to collect evidence in the field necessary to match seized ivory tusks and rhino horns back to the respective crime scenes. I handed the first of those kits to a Kruger National Park ranger at a rhino-kill site in June of last year. Sadly, by the time you are reading this article, it is expected that over 100 of those kits will have been utilized in Kruger alone.

Looking back over the past twenty-some years, I can easily smile at how much we've managed to accomplish, then frown at how much there is left to do. One thing we know for certain: we are only setting the foundation—built on the shoulders of those few early wildlife forensic pioneers—for our new and rapidly growing field of science. The next generation of wildlife forensic scientists (ideally housed in several wildlife forensic labs located around our planet) are going to have to keep pushing the scientific envelopes and deal with the increasingly clever games played by a new generation of wildlife poachers and smugglers, while working hard to keep up with the ever-growing needs of wildlife investigators in the field.

Looking back further, I have to concede that for all our accomplishments, we probably haven't done much to help 'Doc' count his ducks. But I'd like the think that if he was still working the field with badge and gun, he'd have a couple of our evidence collection kits in his backpack, and the phone numbers of all of our scientists listed on his speed-dial. 'Doc' was a little old-fashioned in his approach to modern technology, but I honestly think he'd be the first to admit that a useful tool is simply that—something to be utilized to its fullest potential in an effort to accomplish something he deeply cared about: the preservation and protection of our nation's wildlife. ■