
GENETIC TECHNOLOGY:

The Next Chapter in Whitetail Conservation



As modern society began to unfold and industrial food production evolved, the dependency of many on the hunter-gatherer lifestyle faded and hunting transitioned from a necessity to a popular interest and hobby.

Fast forward a few thousand years, without proper regulations in place, utilization of our wildlife species drove many to the brink of extinction. The most notable case is that of the whitetail deer, arguably the most popular big game animal on the planet. With population numbers reaching record lows, deer were nearly eradicated!

Thankfully, the 20th century pioneers of modern-day hunting and conservation, such as Theodore “Teddy” Roosevelt and Aldo Leopold, recognized the importance of North America’s natural resources. Thus, was born an alternative to the exploitation model that was occurring, the North American Model of Conservation. While the evolution of this model was developed and implemented, one core tenant stood above the rest: **Scientific Management of Wildlife**. The best science available will be used as a base for informed decision-making in wildlife management. It’s important to note that management objectives are developed to support the species, not individual animals. With common vision, those involved forged the way for conservation as we know it today.

On the brink of extinction, landowners, ranchers, biologists and conservationists set out to protect deer from total decimation. Funding initiatives, land designations, bag limits, translocations and many other efforts began. Despite all the challenges that arose, including drought, habitat loss and disease, their efforts were ultimately successful and the deer population began to rebound.

However, in 1967, a new threat arose, this time from beyond the influence of hunters and outdoor enthusiasts. A Colorado-based government research facility first identified Chronic Wasting Disease (CWD). Since 1967 CWD has spread to 34 US states, several Canadian Provinces and multiple countries

around the globe threatening long-term health of cervid populations. With limited tools, researchers began exploring this prion disease from many aspects. Some, focused on identification, others studied the prions themselves. A smaller group took a pragmatic approach looking into our history to find potential answers.

Our nation's early settlers raised sheep and goats across our beautiful landscapes. As time passed, a disease known as scrapie was identified in Europe in the 1700's and later in the USA in the 1940's. This discovery of what some today call a "close cousin" to CWD marked the beginning of the prion livestock disease journey. Fortunately, with advancements in science and technology, a genetics-based solution was discovered. It was realized that sheep had certain genetic markers that made them more resistant to being infected with scrapies. Through the implementation of this gene-marker technology, the sheep industry has been successful at eradicating scrapies from their herds across North America. This begged the question: Could the CWD crisis be resolved by looking at our past scientific success with scrapies?

Over the past decade, renowned geneticist and Professor at Texas A&M University, Dr. Christopher Seabury, executed a novel research project. His groundbreaking peer-reviewed research was released in April 2020. Dr. Seabury mapped the entire genome of the white-tailed deer in relation to CWD susceptibility. 200,000 genetic markers were identified to aid in unlocking the answers to CWD. After further refinement, a commercially available 50,000-marker testing array, known as Chronic Wasting Disease-Genomic Predictive System (CWD-GPS) was developed and released for utilization across the country. This revolutionary technology provides a simple and efficient result, a Genomic Es-

timated Breeding Value (GEBV), of the tested animal. This GEBV represents the animal's durability or susceptibility to CWD.

As part of the research and development of ***Accurate Genomic Predictions for Chronic Wasting Disease in U.S. White-Tailed Deer***, Dr. Seabury completed his work with a United States Department of Agriculture double-blind study. USDA supplied genetic material from hundreds of whitetail deer for analysis using CWD-GPS. Upon completion Dr. Seabury provided USDA with his results. He was able to achieve an 81% accuracy rate for which animals had CWD and which did not. These results yielded unprecedented optimism from hunters and deer farmers alike.



Currently, the most popular management strategy among wildlife agencies is to drastically reduce populations where disease has been discovered to limit the prevalence and spread. However, the adoption and widespread implementation of Dr. Seabury's technology may provide a more effective, permanent solution to the long-term management of CWD and its eventual suppression in both public and private whitetail herds.

The preservation of the white-tailed deer is something worth fighting for. Hunters and whitetail enthusiasts relish the challenge to save this species. Amongst this group of conservationists, deer farmers and private deer managers have emerged as willing partners in the whitetail conservation story. In fact, private deer managers and farmers are already actively utilizing this technology to facilitate the production of CWD resistant animals in their herds.

These existing farms and ranches are ideal locations for the implementation of Dr. Seabury's CWD-GPS technology. It's possible that these working properties hold the key to unlocking what nearly every wildlife agency has been yearning for: a long-term solution to CWD. Hunters, deer farmers, private deer managers, wildlife agencies, conservation groups, and our state and federal governing bodies all have the responsibility to consider incorporating this genetic technology into policy programs that offer potential to reduce the negative impacts of CWD and ultimately conserve the North American whitetail deer population. By reflecting on and mirroring the collaborations of the 20th century conservation movements, Pennsylvania stakeholders can lead the way and help bring an end to CWD.

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