

# Wildlife Health: Thirty Years of Science

***For three decades the USGS National Wildlife Health Center has responded to threats to the health of the Nation's wildlife with unparalleled science and field support.***

Just as the U.S. Geological Survey (USGS) is celebrating its 125<sup>th</sup> anniversary, the USGS National Wildlife Health Center is celebrating its 30<sup>th</sup> anniversary. In honor of these events, the Center is proud to present some brief highlights from our history.

Wildlife health and ecosystem health go hand in hand. The National Wildlife Health Center (NWHC) focuses on wildlife health issues, which are often associated with public health and domestic animal health. Established in 1975 in response to a devastating waterfowl disease outbreak in South Dakota, the NWHC became the first federal program devoted to investigating wildlife health on a national scale. Responding to wildlife die-offs, assisting in the diagnosis, prevention, and control of wildlife disease, and conducting research, have been central NWHC functions since its inception.

Large scale wildlife die-offs have occurred throughout the past century, and continue today. In 1973 over 40,000 waterfowl died at a Wildlife Refuge in the first recorded case of duck plague in free flying waterfowl. Avian botulism has killed over a million birds in localized outbreaks in a single year. Avian cholera has killed over 70,000 birds in a single outbreak. Large scale frog and tadpole die-offs are now being reported and investigated throughout the nation. West Nile virus quickly spread across the continent in a matter of years after it was found in New York in 1999.



USGS veterinarian places a transmitter on a goose

Some wildlife diseases are well-known because of their potential effect on humans and other animals, such as West Nile virus or rabies. Some wildlife diseases, such as avian botulism, are influenced by human effects on native landscapes and waters. Others, like avian influenza and SARS, sit poised as potential wildlife health issues. The Center maintains long-term integrated databases of all our wildlife disease work. These databases help scientists gain a perspective of wildlife health over time, and help us prepare for the challenges of new emerging or reemerging diseases.

Fast response to disease outbreaks is essential. Investigating and diagnosing the cause is key to preventing future problems. NWHC scientists have backgrounds in veterinary medicine, pathology, virology, bacteriology, biochemistry, parasitology, microbiology, and wildlife ecology. Laboratories at NWHC reflect these specialties and are where researchers begin to unlock the mysteries of wildlife disease mechanisms.

The NWHC began under the auspices of the U.S. Department of the Interior (DOI), as a program of the U.S. Fish and Wildlife Service that consolidated disease expertise into a single program. In 1996, many Federal biological research laboratories in DOI were shifted to USGS, providing the NWHC with new partnering opportunities with other Federal, State, regional, and international agencies working with free-ranging wildlife. The Center integrates field support for federal and state conservation agencies and wildlife disease research. The NWHC has expanded its expertise from migratory birds and endangered species to new areas of disease research and investigation: amphibians, fish, coral, wolves, deer, and sea turtles.



NWHC staff conduct diagnostics

## Milestones for the National Wildlife Health Center

### 2000–Present

- Coral Reef Health
- Avian Influenza
- Chronic Wasting Disease
- Monkeypox
- Wildlife Disease Information Node
- West Nile Virus

### 1990–2000

- Amphibian Diseases
- Amphibian Malformations
- Avian Botulism
- Avian Vacuolar Myelinopathy
- Sea Otter Mortality Investigation
- Wildlife Institute of India
- Honolulu Field Station

### 1980–1990

- Newcastle Disease in Wildlife
- Hawaiian Forest Bird Diseases
- Exxon-Valdez Wildlife Mortality
- Lead Poisoning
- Avian Cholera

### Pre-1980

- Inclusion Body Disease of Cranes
- Field Support for Refuges
- NWHC Officially Established
- Lake Andes Duck Plague
- Bear River Field Station

For more information about discoveries and milestones at the National Wildlife Health Center, visit our History Web site. Go to <http://www.nwhc.usgs.gov/> and click on the "History of NWHC" link.

# National Wildlife Health Center: Snapshots in Time



1973: Duck plague kills over 40,000 free-flying waterfowl.



1979: NWHC leaves borrowed space for a new modular unit.



2004: NWHC's current campus has multiple facilities and labs.

## Wildlife Health: Past and Present

As long as wildlife has been around, so has wildlife disease, but until the early 1900s, wildlife disease was largely ignored, especially at the national level. After all, “You can’t do anything about wildlife diseases,” a university professor is rumored to have argued to a microbiologist, “so why do you need to *know* anything about them?”

“Well,” the microbiologist argued, “if you don’t know anything about them, of course, it’s a cinch you can’t do anything about them—do anything intelligent, at any rate.”

That microbiologist was Dr. Wayne Jensen, the lead researcher at the U.S. Fish and Wildlife Service Bear River Field Station in Utah, whose research on avian botulism spanned decades and remains immeasurably valuable in understanding the impact of that disease on birds. Prior to World War II, before Jensen’s work at Bear River, efforts in wildlife disease were sporadic. Some regional efforts, like the work of the California Department of Fish and Game, as well as the Southeast Cooperative Wildlife Disease Study, produced excellent results, and the first complete study on avian botulism was published in the early 1930s by the U.S. Department of Agriculture. Yet, there was no single agency involved in wildlife disease to serve the whole Nation, and the Bear River station was, until the mid 1970s, one of no more than a handful of federal places where wildlife disease was the subject of serious scientific inquiry.

But the Nation would not remain oblivious to wildlife diseases for long. In January 1973, more than 40 thousand mallards died at the Lake Andes National Wildlife Refuge in South Dakota. This die-off was one of the largest ever recorded, and represented a mortality rate of over 40 percent. The culprit was duck viral enteritis, also known as duck plague. The situation was widely covered by the national news media, and a sensational debate ensued over the best ways to control the disease.

Before the event was over, U.S. Fish and Wildlife Service Director Spencer Smith would come under intense pressure to “do something” about wildlife disease. Smith, advised by a panel of disease experts, called for the creation of the National Fish and Wildlife Health Laboratory in Madison, Wisconsin. The Laboratory started with the idea that fast and useful response to events like the Lake Andes duck plague would be essential. A commitment to exceptional diagnostic and research capability, as well as dedicated field support, would be needed to successfully launch a nationwide wildlife health program.

Several years later, the name would change, but the mission would not. The National Wildlife Health Center, as it is known today, focuses on wildlife health as its top priority. At the same

time, wildlife health touches a broad range of issues including both public health and domestic animal health. This focus on wildlife as a function of ecosystem health is unique to NWHC.

In keeping wildlife as a central focus, the Center has achieved a national and international reputation. The Center has emerged as a leader in wildlife health through preeminent science, innovative technology, and responsive service. The NWHC’s campus has become the most comprehensive facility in the world dealing specifically with wildlife health and disease.

The Center’s integrated approach to wildlife health often leads to significant findings. NWHC waterfowl research, coupled with long term wildlife mortality records contributed to the national ban on the use lead shot for hunting waterfowl. The tracking of

West Nile virus throughout North America is another example of how the NWHC remains at the forefront of wildlife health science. The Center also investigates exotic diseases that could ravage wildlife populations, despite remaining out of view of the general public. Diseases, wildlife, habitats, and dozens of

### National Wildlife Health Center Objectives and Themes

#### Objectives

- Advanced Disease Detection, Control, and Prevention
- Wildlife Disease Dynamics, Risk Analysis, Surveillance, and Effective Sampling
- Innovative and Cutting-Edge Science and Communication Education

#### Themes

- Wildlife Disease and Ecosystem Function
- Zoonoses and Wildlife, Human, and Domestic Animal Interactions
- Environmental Health and Degradation

other factors, all make up larger ecosystems. Understanding the role of disease agents in ecosystems is critical to managing natural resources and preserving ecosystem function under ever-increasing demands placed upon our planet’s natural resources.

The history of the NWHC, like the history of wildlife health management itself, is short, yet dynamic. The past has put the Center in a unique position to understand the present, and to help shape the future of wildlife disease research and management.

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