

## Understanding Bluetongue Disease in Wild Ruminants: A Growing Concern

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Bluetongue disease, caused by the bluetongue virus (BTV), is a significant health issue affecting ruminants—animals like deer, antelope, sheep and goats. While it's more commonly associated with domestic livestock such as cattle and sheep, its impact on wild ruminant populations is increasingly alarming. As climate change and global trade reshape ecosystems, bluetongue is emerging as a critical challenge for wildlife conservation and ecosystem health. This article explores what bluetongue disease is, how it affects wild ruminants, and why it matters to both nature and humans.

### What Is Bluetongue Disease?

Bluetongue is a non-contagious, insect-transmitted viral disease primarily spread by biting midges of the *Culicoides* genus. The virus belongs to the *Orbivirus* family and has over 30 known serotypes, each posing varying levels of threat. Named for the characteristic blue or purple tongue seen in severe cases (due to oxygen deprivation), bluetongue affects ruminants differently depending on the species, virus strain, and environmental factors.

While domestic sheep are often the hardest hit, wild ruminants like white-tailed deer, mule deer, pronghorn, and bighorn sheep are also highly susceptible. The disease can cause fever, respiratory distress, lameness, and swelling of the face and tongue. In severe cases, it leads to internal haemorrhaging, reproductive issues, or death. However, many infections are subclinical, meaning animals may carry and spread the virus without showing obvious symptoms, complicating detection in wild populations.

### How Does Bluetongue Spread in the Wild?

The primary vector for bluetongue is the *Culicoides* midge, a tiny insect that thrives in warm, moist environments. These midges feed on the blood of infected animals, picking up the virus and transmitting it to others during subsequent bites. Unlike domestic livestock, which can be monitored and vaccinated, wild ruminants roam vast areas, making control efforts nearly impossible.

Climate change plays a significant role in the spread of bluetongue. Rising temperatures and altered rainfall patterns have expanded the range of *Culicoides* midges, bringing them into new regions where wild ruminants have little natural immunity. For example, warmer winters in North America and Europe have allowed midges to survive in areas previously too cold for them, exposing species like elk and deer to greater risk. Global trade and movement of livestock also introduce new BTV serotypes to regions, which can then spill over into wildlife populations.

### Impacts on Wild Ruminants

Bluetongue disease can have devastating effects on wild ruminant populations. In North America, white-tailed deer are particularly vulnerable, with mortality rates in some outbreaks reaching 20-50%. Symptoms in deer include fever, excessive salivation, and lesions in the mouth and feet, which impair feeding and movement. In severe cases, affected animals may die within days, while survivors can suffer long-term reproductive and health issues.

For species already under pressure from habitat loss, hunting, or climate change—like

bighorn sheep or endangered antelope—bluetongue outbreaks can push populations closer to the brink. For instance, a 2015 outbreak in Montana decimated local white-tailed deer populations, disrupting ecosystems and affecting predators like mountain lions that rely on them. These ripple effects can destabilize entire food webs, as wild ruminants are key to maintaining biodiversity.

## Why Should We Care?

The spread of bluetongue in wild ruminants isn't just a wildlife issue—it has broader implications for humans and ecosystems:

1. **Ecosystem Health:** Wild ruminants play critical roles in their environments, from grazing that shapes vegetation to serving as prey for predators. Declines in their populations can disrupt ecosystems, leading to cascading effects on other species.
2. **Economic Impacts:** While bluetongue primarily affects wildlife, it can spill back into domestic livestock, threatening agriculture. In 2023, outbreaks in Europe cost farmers millions due to livestock losses and trade restrictions. Wildlife can act as reservoirs, making control harder.
3. **Human-Wildlife Connection:** Hunters, conservationists, and ecotourism operators rely on healthy ruminant populations. A decline in species like deer or antelope can affect local economies and cultural practices tied to hunting and wildlife viewing.
4. **Climate Change Indicator:** The spread of bluetongue highlights how climate change is altering disease dynamics. Monitoring its impact on wildlife can help scientists predict and manage other emerging diseases.

## What Can Be Done?

Managing bluetongue in wild ruminants is challenging but not impossible. Here are some strategies being explored:

- **Surveillance and Monitoring:** Wildlife agencies are ramping up efforts to track bluetongue in wild populations through

blood testing and satellite tracking. Early detection can help predict outbreaks and inform management decisions.

- **Vector Control:** Reducing midge populations in key habitats, such as through targeted insecticides or habitat management, could limit transmission, though this is tricky in wild settings.
- **Vaccination:** While vaccines exist for livestock, they're not practical for wild ruminants due to logistical challenges. Research into oral or bait-based vaccines is ongoing but still in early stages.
- **Climate Action:** Addressing the root cause—climate change—requires global efforts to reduce greenhouse gas emissions and protect habitats, which can help limit the spread of vectors like *Culicoides* midges.
- **Public Awareness:** Educating hunters, landowners, and the public about bluetongue can aid in early reporting of sick animals, helping wildlife managers respond faster.

## A Call to Action

Bluetongue disease in wild ruminants is a wake-up call about the interconnectedness of wildlife, climate, and human activity. As the planet warms and ecosystems shift, diseases once confined to specific regions are becoming global threats. Protecting our wild ruminants means investing in research, conservation, and climate solutions to ensure these iconic animals—and the ecosystems they support—thrive for generations. By staying informed and supporting wildlife conservation efforts, we can help mitigate the impact of bluetongue and safeguard the delicate balance of nature.