



# Hemorrhagic Disease of Deer



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## CAUSE

Hemorrhagic disease of deer (HD) can be caused by either epizootic hemorrhagic disease virus (EHDV) or bluetongue virus (BTV), which are related viruses in the family *Reoviridae*, genus *Orbivirus*. Various serotypes of each virus exist, some of which have been present in the US for a long time and some of which have been detected more recently.

## DISEASE SIGNIFICANCE

HD is considered to be the most significant, widespread, viral disease of white-tailed deer in the US. It occurs seasonally and annually in most regions of the US, but the frequency, distribution, and severity vary. In the Southeast, disease ranges from mild to inapparent in southern and coastal areas, to outbreaks of less frequent but fatal disease in more northern areas (Piedmont and Appalachia). In parts of the Northeast, Midwest, and West, outbreaks may be explosive with significant mortality.

## AFFECTED SPECIES

EHDV and BTV can infect a variety of wild and domestic ruminants (e.g. cattle). Among wildlife, the white-tailed deer is considered the most susceptible species. However, these viruses are also reported in mule deer, pronghorn, elk, and bighorn sheep, among others.

## GEOGRAPHICAL DISTRIBUTION

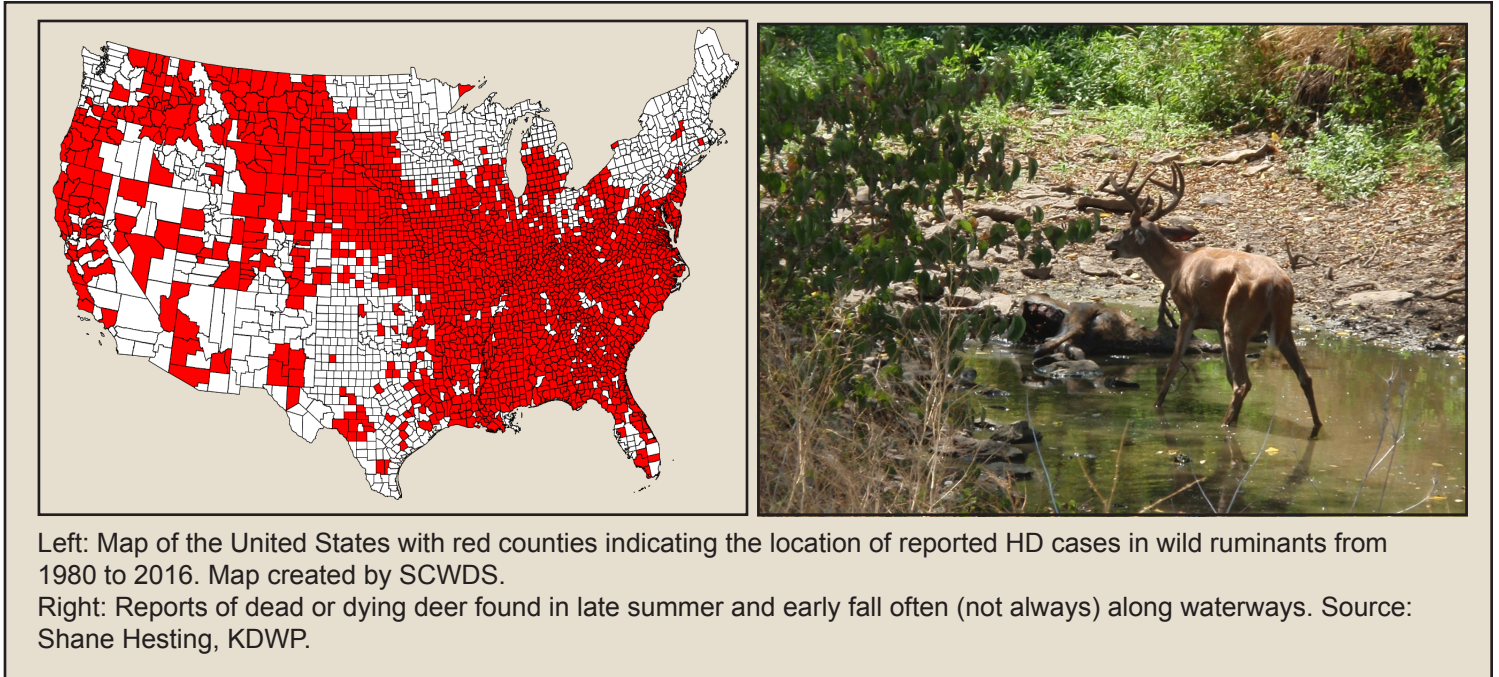
Both EHDV and BTV have been reported throughout the US except for a handful of New England states. However, frequency and severity of outbreaks vary greatly. Most outbreaks occur in a band extending from the southeastern and mid-Atlantic US, diagonally through the central and northern Great Plains and Rocky Mountains to California and the Pacific Northwest. The viruses are considered common and stable in some regions, such as south Florida and parts of the Southwest. Outbreaks are less common in the upper Midwest and Northeast, but are increasing in frequency and can result in widespread mortality.

## TRANSMISSION

EHDV and BTV are transmitted by biting midges in the genus *Culicoides*. These small, blood-feeding insects breed in semi-aquatic habitats, such as mud or moist tree cavities. Seasonal HD trends are related to the lifecycle of the biting midges, with more disease seen in the late summer and early fall, coinciding with the peak biting midge activity. Freezing weather typically kills adult biting midges, which ends disease outbreaks. Transmission of EHDV and BTV is suspected to occur through contact between animals under unique circumstances. For example, EHDV and BTV may be shed in oronasal secretions or feces, but such mechanisms are not thought to be epidemiologically significant in wildlife populations.

## FIELD SIGNS

EHDV and BTV cause identical field signs, hence use of the common term HD. The viruses damage the lining of blood vessels, resulting in bleeding throughout the body and fever. Classically, HD has caused explosive outbreaks that result in rapid death clusters of sick and dead within a localized area or region, often along waterways. However, infected deer may also show no observable signs, or only mild disease. Although finding dead deer is the most common field sign observed, sick deer may be occasionally observed. Early signs of HD may include depression, trouble breathing, lameness, swelling of the head, neck, eyelids, or tongue. Some deer survive acute disease but lose body condition over weeks to months because tissue damage results in chronic lameness and disrupts food consumption and digestion.



## RISK TO HUMANS & DOMESTIC ANIMALS

Neither EHDV nor BTV are infectious to people. Domestic cattle are susceptible to both viruses, but most infections are inapparent or, rarely, result in mild disease. Sick cattle often develop fever, lameness, and sore mouths. Reproductive problems have been reported in cattle with BTV. EHDV does not cause disease in domestic sheep, but BTV causes severe, and sometimes fatal, disease in certain breeds.

## PREVENTION & MANAGEMENT

There is no treatment for HD and there are no wildlife management tools available to prevent or control it. Dead animals may be reported to state agencies for additional testing to track the epidemiology of the various EHDV and BTV serotypes. Although die-offs of whitetails due to HD often cause alarm, past experiences have shown that mortality will not decimate local deer populations and the outbreak will be curtailed by the onset of cold weather. However, populations should be monitored as outbreaks become increasingly common and severe. Livestock owners who suspect EHDV or BTV infections should seek veterinary assistance.

## REFERENCES

Southeastern Cooperative Wildlife Disease Study. 2021. Field Manual of Wildlife Diseases in the Southeastern United States. Fourth edition, Athens, GA.

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