



College of

# Veterinary Medicine

WASHINGTON STATE UNIVERSITY

## Briefing Statement

### Elk Hoof Disease March 2019

#### OVERVIEW

*What is elk hoof disease?* Hoof disease, known scientifically as Treponeme-associated hoof disease (TAHD), is an emerging disease of elk in Washington. Elk with hoof disease have characteristic ulcers on their feet with associated overgrown, broken, or sloughed hooves. Affected elk are debilitated and can experience increased mortality.

*Where does hoof disease occur?* Prior to 2008, only sporadic cases of limping elk with hoof deformities had been reported to the Washington Department of Fish and Wildlife (WDFW). In 2008, those reports increased substantially, particularly in southwest Washington. The disease has now been identified in elk herds across most of western Washington, as well as east of the Cascades in the Trout Lake and Walla Walla areas. Additionally, cases have been diagnosed across northern Oregon and in western Idaho.

*Why are we concerned?* This disease has the potential to devastate the elk population in Washington and spread to other areas. Hoof disease is of concern to hunters, conservationists, and local communities. Additionally, because of the interaction of wild elk with domestic livestock, is also of concern by other Washington stakeholders including the livestock industry.

*What is WSU's role?* In response to intense stakeholder concern, in 2017 the Washington State Legislature unanimously passed Senate Bill 5474 to designate WSU's College of Veterinary Medicine as the state lead in developing a program to monitor and assess causes of and potential solutions for elk hoof disease. A \$1,519,900 biennial budget was allocated to the College to address this effort beginning on July 1, 2017.

*How do I find out more about WSU's work on hoof disease?* Visit the WSU [elk hoof disease website](#) or contact Dr. Margaret Wild at [margaret.wild@wsu.edu](mailto:margaret.wild@wsu.edu) or 509-335-6323.

#### WSU RESEARCH APPROACH

A new faculty position was created and on August 1, 2018, Dr. Margaret Wild was hired to lead the research. The first step in establishing the research program was to define research goals and identify key research questions. The goal of WSU elk hoof disease research is to identify the cause(s) of the disease and how to successfully manage it in the wild. Achieving this goal will require an incremental multi-pronged biological and social science research approach implemented over multiple years. The first phase of work (2019-2021) will address foundational questions. Successive phases of work will build on findings from these initial studies. The four principle areas of inquiry for these studies are:

- **Study the disease cause(s) and contributing factors in captive elk.**

*Need:* The definitive cause(s) of hoof disease are not known and are required for effective management as well as to identify risk to other species. Recent studies led by WDFW have identified Treponeme *spp.* associated with hoof lesions; however, it is unknown whether these bacteria are the primary cause of disease, or secondary invaders. Extensive stakeholder concern



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exists regarding elk exposure to herbicides, fertilizers, and habitat changes as a cause or contributing factor for disease. Controlled studies are needed to investigate the pathogens and other contributing factors to disease.

*Approach:* Pending funding to complete construction of the designed 4-acre research facility, initial work will focus on development of a disease challenge model to determine if the disease 1) is infectious and contagious and 2) can be reliably reproduced in elk following exposure to infectious material. Based on results, modifications to the challenge model will be investigated, including contribution of other risk factors.

- **Study disease agents in the laboratory.**

*Need:* Advanced approaches are needed to identify pathogens in samples collected from free-ranging and captive research elk to determine which organisms are contributing to disease. This work is needed to guide improvement of methods to isolate the causative agent(s) and develop tests to detect, and potentially treat, them.

*Approach:* Initial work is using metagenomics (looking at all the genetic material in a sample to determine which organisms are present) to identify bacteria associated with hoof disease in general, and at specific points during progression of the disease.

- **Conduct regional surveillance.**

*Need:* Disease surveillance and monitoring is key to documenting where a disease occurs and to estimate prevalence. It provides baseline data to measure changes in the future and can also be used to identify risk factors for disease occurrence.

*Approach:* In collaboration with wildlife managers, we are collecting and performing diagnostic evaluation of hoof samples from across Washington and other states in the northwest to document where TAHD occurs. Surveillance samples are also being used to address additional research questions, such as risk factors associated with disease spread.

- **Understand social aspects of the disease.**

*Need:* Effective outreach and education is an important companion to the implementation of biological research, particularly when addressing wildlife issues with multiple opposing stakeholder perspectives. Information gained from social science inquiry can guide outreach and education efforts and contribute to setting goals for research and management.

*Approach:* Initial research is underway in collaboration with the WSU Social and Economic Sciences Research Center (SESRC). We are collecting qualitative information using focus groups of interested stakeholders. This information will be used to develop a questionnaire for a statewide survey that will provide representation of public opinion.

In addition to these WSU research priorities, we are supporting related WDFW and tribal research and management as requested. This includes providing staff support for field work or diagnostic investigations, providing veterinary diagnostic services for hoof samples, and conducting collaborative research.