Agenda

- **8:30am – 12:00pm**
  - Vegetation exclosure tour

- **1:00pm – 4:00pm**
  - Welcome
  - WDFW Hoof Disease Investigations Update
  - Management Approach
  - Funding
  - Next Steps
  - Public Testimony
Hoof Disease Public Working Group

- Understanding hoof disease in elk is a priority and WDFW is committed to the sound management of these important resources

- WDFW established the Public Working Group as we believe it is important to work together as we try to better understand and address this issue

- The purpose of this Working Group is to provide the opportunity to:
  - share information about the hoof disease phenomenon and WDFW activities,
  - discuss research and management questions with regard to hoof disease and solicit feedback, and
  - public outreach
WDFW Hoof Disease Investigations Update
Collections

Four collections from affected and unaffected areas:
- March 2009: Adult elk
- March 2013: 9-10 month elk
- August 2013: 3-4 month calf elk
- January 2014: 7-8 month calf elk

Summary: 43 elk examined from March 2009 - Jan 2014
- 27 from affected area
- 10 from presumed unaffected area (westside controls)
- 6 from unaffected area (east of Cascades)
Sampling and Testing

- Gross necropsy
- Radiology
- Histopathology
  - Disease limited to hooves: Other tissues, including meat, are not affected
  - *Disease is infectious: no evidence for toxic, immune, or cancerous causes*
- Virology - lesions similar - were all negative
- Toxicology (=trace minerals) - low selenium and copper, as expected
- Bacteriology
- Parasitology
- Serology
- Molecular Diagnostics
Specialized Microbiology

Current diagnostic efforts are focused on specialized bacteriology testing to rule out known infectious hoof disease organisms

Including bacterium in:

- *Treponema* sp.
- *Dichelobacter nodosus*
- *Fusobacterium necrophorum*
- *Gugenheimia bovis*
Specialized Microbiology

- Specialized microbiology conducted at:
  - University of Liverpool, Washington State University veterinary diagnostic lab, USDA National Animal Disease Center, and Colorado State University

- Exhaustive pathological work has been conducted:
  - Treponema sp. detected ("genetic fingerprinting") in diseased samples from multiple collections in four independent labs
  - Showing that bacteria in the genus Treponema are present in affected hooves of elk with the disease
Additional results from samples collected in January 2014 support the association between presence of Treponema and diseased hooves.

Treponema are known to be highly associated with hoof disease in both cattle and sheep:
- The infection in sheep results in hoof abnormalities that are similar to the elk hoof disease.
- The rapid appearance and spread of the disease in elk is similar to the situation when Treponema first appeared in cattle in the United States in the early 1990s.
Samples will be submitted to the UC Davis veterinary diagnostic lab for immuno-histochemistry tests for spirochetes known to cause hoof disease in cattle

- Results pending

Slides will be sent to one of the world’s top bovine hoof disease experts in New Zealand for his opinion(s)

- Results pending
Pending Analyses

- All analyses to date point to this being an infectious disease
  - No evidence for toxic, immune, or cancerous causes
  - Additional analyses will continue by various veterinary researchers and work will add to the scientific knowledge of infectious hoof diseases in animals
  - Looked at management options to address this infectious agent
Additional Information

- The herds are influenced by a variety of issues: winter severity, nutrition/forage availability, land management practices, hunting, etc.

- **Nutrition**
  - Body condition similar to other areas in western WA – no connection to date

- **Timber practices have changed over the past 30 years**
  - Open landscape, increased canopy cover, burning, clear cuts (private), reduced timber harvest (federal), herbicides, etc.
  - Many questions about the role herbicides play in broader elk herd management issue; to date no evidence it is associated with hoof disease
  - NCASI Research: Relations among habitat characteristics, plant succession, and nutrition of foraging elk during summer and autumn in temperate Pacific Northwest forests
  - University of Alberta study: effects of herbicides and herbivory on elk forage abundance
    - Herbicide/Herbivory interaction

- WDFW Black Tailed deer study: effects of forest management on BT deer ecology

- WSU study – Availability of forage and affect on BTD body condition on treated and untreated sites with the same post-timber-harvest age
Management Approach
Management Challenge

- Once HD in a herd & landscape, extremely difficult to eliminate
- The challenge is to manage the disease
- Management Options and Research Questions
  - Reduce density, containment, treatment, let disease run its course, prevalence/distribution, survival, etc.
Compilation of Information

- Compiled and assessed all HDPWG, HDTAG, and WDFW staff input and developed the following management approach
Completed

- Developed WAC to leave hooves on site from elk harvested in SW Washington
- Two citizen and two WDFW public meetings
- Reviewed and approved joint Department of Health and WDFW Game Meat Safety flyer
  - Pending posting on-line
- Developed management approach from multiple input
The current needs are to:

- Continue to identify/understand the causative agents
- Determine the prevalence and distribution of the disease in the population
- Document the effects on elk population dynamics (survival, reproduction), and
- Where feasible, manage the disease
Need

- Identify/understand the causative agents:
  - Technical Advisory Group will meet to review latest results and will be asked to develop a consensus statement about the likely cause(s) of the disease
Prevalence and Distribution

- Determine the prevalence of the disease in the population:
  - Accomplished by:
    - Hiring a Coordinator and
    - Working closely with a cadre of citizen science volunteers to collect prevalence and distribution information
      - Protocol being developed
Survival and Reproduction

- Determine the effects of HD on elk population dynamics:
  - Accomplish by an extensive, new effort by existing biological staff to radio-collar afflicted animals and monitor survival, reproduction, and movements relative to non-affected animals
  - Study design is being developed;
  - Coordinated by Elk Specialist in concert with both Regions and HD Coordinator
Infectious Hoof Disease Management

INDIVIDUAL ANIMALS/HERDS

- Good biosecurity
  - quarantine new animals
  - isolate newly infected animals from the rest of the herd?
- Aggressive treatment (clean and pare out hoof, apply topical antibiotics, bandage, injectable antibiotics)
- Regular footbaths
- Keep on clean dry ground
- Rotate pastures
- Vaccinate if effective vaccine available
- Select for genetically resistant animals?
- Cull individuals that are severely affected or fail to respond to treatment?
Animal Disease Eradication

- Requires the following:
  - Ability to identify all infected animals, even if they are not showing signs of disease yet
  - Ability to locate and remove all infected animals
  - Ability to prevent movement of infected animals
  - Access to property inhabited by animals

- Difficult to do on a large scale without extensive resources
  - Try to approximate it
Animal Disease Eradication

• Concept:
  • Core animal removal and disinfection area
    • Remove all animals in core
  • Buffer control zone surrounding core disease area
    • Remove only affected animals, quarantine the rest
  • Perimeter surveillance area
    • Enhanced disease surveillance outside infected area
Manage

- Work with landowners on possible fencing options:
  - pro-actively reduce possible risk of transmission
  - address elk crop damage

- Coordinate staff and others to respond to sightings of elk with severe clinical symptoms to cull them from the population
  - with a focus:
    - in core areas of disease to reduce prevalence and
    - in the observed perimeter of the disease to attempt to reduce spread of the disease
Manage

- It is very important to acknowledge up front that any approaches that have successfully been used to manage disease in domestic animals will be entirely experimental when applied to free-ranging elk.
Current Funding

- Coordinator:
  - Primary responsibilities will include:
    - coordinating Department response to hoof disease;
    - conducting citizen science prevalence and distribution study;
    - management options implementation, etc.
  - Funding from the 2014 $200,000 supplemental budget
- Survival study
  - $180,000 prioritized from Pittman Robertson funds
- Rocky Mountain elk Foundation
  - $8,000 sample analyses
Future Funding

- 2015-17 Budget Request is in development
  - Understanding cause, prevalence/distribution study, survival study, protocol development, management implementation, statistical input/analyses, GIS support for citizen science effort, veterinary assistance, etc.
Next Steps

- Developing position recruitment to coordinate implementation of management and research
- Implement prevalence & removal/containment effort
  - Develop core and perimeter map, prevalence transects, plan removal logistics
- Develop survival study
- Develop policy to no longer translocate elk outside of SW Washington
Next Steps

- Continue working with HDPWG and HDTAG as moving forward
- Assess monitoring of live animals with hoof disease
- Reach out to National/Washington Academy of Science on guidance and assistance to look at questions regarding herbicide
- Landowner and hunter outreach on HD information
Public Testimony

- Members of the public are requested to fill out a Public Testimony Form
- Members of the public will be requested to provide their public testimony to the HDPWG in the order the Public Testimony Forms were received
- Each member of the public wishing to relay their comments will have 3 minutes each to do so
  - This time frame is provided to allow the opportunity for all members of the public to provide their testimony to the HDPWG
Thank you
....any questions....