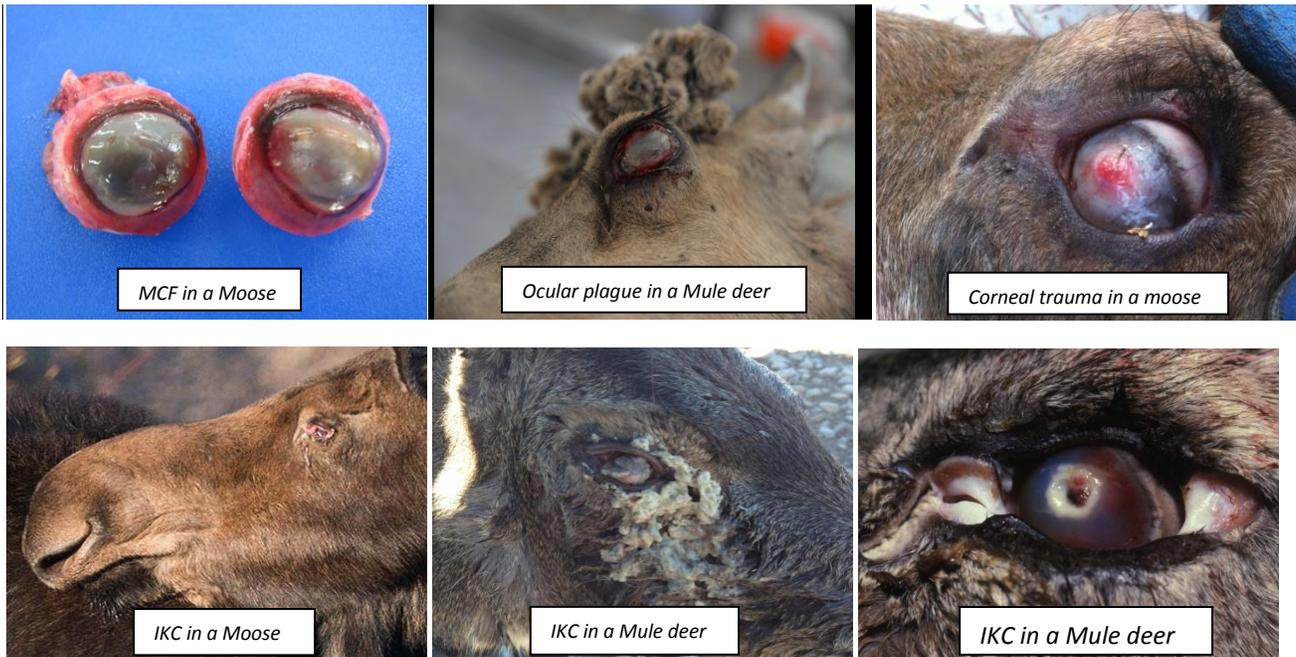


ABNORMAL EYE CASES IN CERVIDS

Information and background:

Multiple Western states/provinces have noticed increasing or at least occasional reports of eye disease in cervids. Of particular concern are those in moose. No single disease process or agent has been consistently identified; however, sampling strategies vary significantly. A simple standardized protocol for sampling is provided to help field staff, to guide decisions in the laboratory, and allow for comparisons across the West. This protocol is meant to be a guide to help wildlife health professionals prioritize sampling and test requests for abnormal eye cases in cervids.

Ocular (eye) diseases identified in cervids include: Malignant Catarrhal Fever (MCF); Infectious Keratoconjunctivitis (IKC), with numerous bacteria isolated associated with IKC lesions in wildlife including: *Moraxella ovis*, *Moraxella* spp., *Chlamydophila psittaci*, and *Mycoplasma conjunctivae*; herpesviruses (particularly cervid herpesviruses); *Elaeophora schneideri* (arterial worm); *Yersinia pestis* (plague). Additionally, simple end stage trauma (eye/corneal punctures) and non-ocular diseases may have clinical signs (circling, stupor or central nervous system signs) and mimic signs of ocular disease/blindness. These include: brain abscesses; *Parelaphostrongylus tenuis* (meningeal worm); neoplasias; polioencephalomalacia; and listeriosis.



ABNORMAL EYE CASES IN CERVIDS – STANDARD PROTOCOL

Postmortem Samples (Head only):

1. Photograph eyes (as soon after death as possible)
 2. Provide history including:
 - a. Clinical signs – circling, stumbling, running into things, unreactive (to audio? visual?)
 - b. Location – site descriptors including proximity to agriculture or industrial infrastructure
 - c. Age
 - d. Sex
 - e. Species
 3. Remove, double bag and submit intact head. Label well and freeze if more than 24 hr to reach local diagnostic laboratory.
 - a. **Pathologist will:**
 - i. Head:
 1. Examine whole brain grossly for a brain abscess (central blindness) and histologically for polioencephalomalacia, listeriosis, viral infections
 2. Examine oral cavity for erosions or ulcerative lesions
 3. Examine internal carotid arteries for *Elaeophora schneideri* (arterial worm)
 4. Check meninges and cranial vascular sinuses for *Parelaphostrongylus tenuis* (meningeal worm). If appropriate, conduct histology of brain and optic nerves for embedded nematodes.
 - ii. Eyes:
 1. Remove one eye whole, both if apparent bilateral blindness **
 2. Inject at the limbus with formalin and fix in formalin – histopathology
 3. **OR** immerse entire globe in formalin
 4. **OR** immerse entire globe in Davidson’s solution
- **check with pathologist for fixation preferences
5. Corneas
 - a. Remove fresh cornea and fresh conjunctiva (pool them for diagnostics). Flame instruments between samples. Sample conjunctiva from above/below middle of eye, avoiding medial and lateral canthus regions where secondary agents accumulate.
 - b. Some pathologists prefer to leave cornea intact. Leaves option of PCR on paraffin tissues if appropriate
 - c. Sample or swab (BD Culture swab) cornea at ulceration or visible lesions.
 - i. Submit for:
 1. Aerobic culture
 2. *Mycoplasma* PCR
 3. *Chlamydophila* PCR
 4. IBR PCR

- iii. Submit samples for:
 - 1. aerobic culture (pooled conjunctiva and ulcerated cornea), include in history “possible *Moraxella*” so that lab will optimize growth media for *Moraxella* species.
 - 2. PCR (conjunctiva, pool with cornea if a corneal lesion present)
 - a. *Mycoplasma* species – genus level-*Mycoplasma* PCR with sequencing of product, or PCR specific to each *Mycoplasma* of interest
 - b. IBR PCR
 - 3. *Chlamydophila* PCR
 - 4. Specific herpesvirus PCR (not currently available, but WY is working on PCR development for cervid herpesviruses).
 - 5. *Moraxella* species – would be nice but not currently available
- b. Archive a small (pencil eraser sized) piece of conjunctiva/cornea, freeze at -20C
- c. Lymph node (any node is fine but retropharyngeal is easy to access)
 - i. Submit for MCF PCR, retropharyngeal LNs for CWD

Live Animal Sampling:

- 1. Photograph eyes
- 2. Provide history including:
 - a. Clinical signs – as above
 - b. Location – as above
 - c. Age
 - d. Sex
 - e. Species
- 3. Swab conjunctiva – sample directly above/below center of eye and do not touch other surfaces with the swab. Swabs for bacterial culture should be placed in transport media (check with your diagnostic lab for preferences). Swabs for PCR should be placed in a small amount of sterile saline.
 - a. Submit for:
 - i. Aerobic culture
 - ii. *Mycoplasma* PCR
 - iii. *Chlamydophila* PCR
 - iv. IBR PCR
- 4. Collect blood - take at least 15 mls of blood and archive serum. Could consider serum testing for herpesviruses.