Status of Goslin Unit Bighorn Sheep Pneumonia Outbreak in Utah

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Abstract: During the month of January 2010 The Utah Division Of Wildlife (UDWR) found a dead male Rocky Mountain bighorn sheep (*Ovis Canadensis canadensis*) in the Goslin bighorn sheep herd near Flaming Gorge. A field necropsy found evidence of chronic pneumonia. After closer observation we determined that other animals were affected. In February 2010, bighorn sheep exhibiting signs of coughing and lethargy were euthanized by UDWR employees and biological specimens from 16 animals of varying ages were collected. Samples included the cranial and caudal lobes from both lungs, a section of liver, 40mL of blood, and oropharyngeal swabs. We hand delivered samples to the Utah Veterinary Diagnostic Laboratory in Logan, Utah and forwarded some to the Washington Animal Disease Diagnostic Laboratory in Pullman, Washington. Cultural isolates from lung tissue included *Pastuerella multocida* in large numbers from 14 of 16 lung samples. *Arcanobacterium pyogenes* was also isolated in addition to *P. multocida* in 5 of 13 animals. In lung tissue from one animal the only isolates were *Moraxella* spp. in conjunction with *Arcanobacterium pyogenes*. Isolates in lung tissue from one animal contained a Beta-hemolytic strain of *Pasteurella trehalosi* in conjunction with *Arcanobacterium pyogenes* and in one specimen *Arcanobacterium pyogenes* was the only isolate. Lungworm species were not detected through Baermann testing however they were detected histologically in 12 of the 16 animals. Most species were likely *Protostrongylus stilesi*, although, a *Dictyocaulus spp* was detected in one sheep. *Mycoplasma ovipneumonia* was isolated from 8 of 10 lung samples using PCR and was not found in any of the samples through culture. Mineral analysis of the liver samples revealed that most concentrations were within normal levels for Rocky Mountain bighorn sheep. However, 10 of 16 samples had less than normal copper content (normal = 25 to 100 ppm) and 9 of these had suggestive increases in molybdenum. Two additional animals had molybdenum contents at the very high end of normal for other ruminants. Thirteen of 16 samples had low liver selenium content and 8 of these had increased liver zinc. Of unusual note, two of the liver samples also had increased manganese content. In an effort to control the bronchopneumonia outbreak and prevent the bacteria from spreading to larger neighboring bighorn sheep herds, an effort was made to eliminate the entire herd. A total of 51 sheep were culled by UDWR and Wildlife Services employees and it is unknown how many sheep succumbed to the disease.

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