

Investigation of Nevada's 2009-2010 East Humboldt Range and Ruby Mountain Bighorn Dieoff

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Abstract: Coughing Rocky Mountain bighorn sheep were first reported by sportsmen the second week in December 2009 in the Ruby Mountains. In late December sportsmen again reported coughing and ill bighorn sheep but this time in the adjacent East Humboldt Range approximately 30 miles from the Ruby Mountains core bighorn area. Rut-related ram movement between these 2 ranges mostly likely occurs. Nevada Department of Wildlife (NDOW) quickly confirmed that bacterial pneumonia was present in the bighorn herds in both mountain ranges. The NDOW veterinarian and biologists developed an investigative and surveillance plan to learn the extent of the disease event, and administer an antibiotic treatment to a subgroup of animals. Objectives of the plan were to 1) compare and contrast bighorn sub-herds at different sites within the 2 mountain ranges with animals evaluated for respiratory pathogens and nutritional status (forage quality and trace mineral levels); 2) measure the benefit and effectiveness of the antibiotic Draxxin administered to bighorn sheep as measured by survival, lamb recruitment, body condition, residual lung pathology, and detected pathogens in collared and treated animals vs collared and untreated animals.; and 3) compare and contrast forage, soil, and blood and/or liver selenium levels; pathogen profiles; spring/early summer 2009 precipitation amounts; and forage quality measures among the East Humboldt Range and Ruby Mountain bighorn herds and other bighorn herds in Nevada that were captured in January 2010. During several ground capture events, 31 bighorn were tranquilized and marked between the 2 mountain ranges; (5 with eartags only; 14 in East Humboldts and 12 in Ruby Mountains with radio collars). All 31 animals were administered Banamine (anti-inflammatory) and Vitamin E, with 19 of these treated with the antibiotic Draxxin. An additional 46 bighorn sheep were free-darted with Draxxin. As of late April 2010, 11 radiomarked animals treated with Draxxin have died. All 31 live animals captured tested PCR+ on nasal swabs for *Mycoplasma ovipneumoniae*. *Bibersteinia trehalosi* has been cultured from the majority of the pharyngeal and lung samples with *Mannheimia haemolytica* & *Pasteurella multocida* being cultured at a much lower percentage. As of April 30, a total of 103 bighorn have been found dead in the East Humboldts (summer 2009 population estimate of 180) and 34 in the Ruby Mountains (summer 2009 population estimate of 160). An aerial netgun crew on March 16 attempted to locate and sample a small isolated bighorn group that was apparently unaffected by the disease in the East Humboldts. The crew was only able to locate 1 bighorn sheep. In addition, 3 mountain goats wintering in the same area were captured, sampled, and collared to discern what pathogens they were harboring. There were also 3 bighorn ewes on a distant mountain range that were captured and sampled for pathogen testing that were part of the translocation group (still eartagged) from the East Humboldts in January 2006. All 3 mountain goats and 3 bighorn sheep were PCR+ on nasal swabs for *M. ovipneumoniae*. Vegetation and soil samples have been collected from bighorn winter use areas on various mountain ranges identified in the investigation. Monitoring will occur of surviving ewes this summer to discern lamb birth and follow through until mortality or weaning.

Information was gathered on potential interaction with domestic livestock. No active domestic sheep grazing allotments are present in the East Humboldt's. Hobby flocks have always existed on private lands at the base of the range. Domestic sheep were used on private land adjacent to the USFS boundary the past 2 summers for fuels management with reports from sportsmen, bighorn tagholders, and permittees that domestic sheep were observed beyond the private land boundary in known summer bighorn use areas in late summer 2009. Approximately 2,000 meat goats grazed the southern end of the East Humboldt's on high elevation private lands in 2006, straying was documented, and known contact with at least a single bighorn ram occurred in 2007 (ram euthanized and full necropsy performed). Approximately 19 cattle died in the East Humboldt's in early summer 2009 from pneumonia (confirmed in 1 animal) in proximity to a water tank in the core of the die-off area where rams were observed using this water tank with dead cattle around it.

Within the Ruby Mountains, an active domestic sheep summer grazing allotment has existed since before the first reintroduction of bighorn sheep in 1989. A previous die-off occurred in 1995-1996 where approximately 70-80% mortality occurred.

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