

# **Interim Report of the Review Team**

## **Tuscarora Gather**

**Elko, Nevada**

**July 15, 2010**

### **Introduction**

On July 12, 2010, following the deaths of eight wild horses from water starvation/dehydration or water intoxication, the Bureau of Land Management (BLM) Director temporarily suspended the Tuscarora Gather operation in the Elko District in Elko County, Nevada and formed a Review Team. The Review Team was directed, in part, to make recommendations as to if and/or when planned removal and related operations should be resumed and, if so, under what conditions.

### **Purpose of the Interim Report**

This Interim Report of the Tuscarora Gather Review Team is intended to address the emergency situation, due to the lack of water, that has been identified on the Owyhee Herd Management Area (HMA) in Elko County, Nevada. It is the Review Team's assessment that time is of the essence to ensure the welfare of the animals and to delay further rescue gather activities until a recommendation has been presented to the BLM Director through the Review Team's Draft Report on Friday, July 16 will likely lead to the deaths of a substantial number of wild horses – this is because the next 24 to 78 hours is critical.

The Review Team reached the conclusions that are documented here on Wednesday, July 14, after travelling to the gather operation site and assessing the existing conditions and offered this recommendation to the Nevada State Director and the Assistant Director of the BLM in Washington, DC at 1700 the same day, with the intention of getting concurrence immediately so that the recommendation could be implemented starting early on the morning of July, 15, in light of the emergency situation. However, given the Temporary Restraining Order (TRO), the recommended actions have been put on hold pending the results of the TRO hearing on July 15. The Review Team has prepared this Interim Report to document its recommendation presented orally on July 14 in order to seek formal concurrence from the Deputy Director or the Director of the proposed emergency actions if the TRO is lifted.

This Interim Report is limited to the immediate emergency situation. A Draft and Final Report will also be provided by the team consistent with the team's delegation of authority (see Attachment 1) and original scope of work. The Draft and Final Report will include the recommendations included herein, and will specifically address the other purposes of the review. The Review Team anticipates the Draft and Final Report will include other recommendations,

though none of those recommendations are likely to affect the recommendation described in the Interim Report.

## **Background**

**Note: This Interim Report reflects the observations of the Review Team based on initial communications, review of numerous reports and other materials, draft necropsy reports and mortality logs. Additional time is needed by the Review Team to check for any discrepancies in the information that has been provided and some numbers may be adjusted in the Draft and Final Report. The Review Team expects such adjustments to be minor.**

The Elko District of the BLM initiated the Tuscarora Wild Horse Gather in the Owyhee HMA in Elko County, Nevada at 0630 on Saturday, July 10, 2010. By 0900-0930, the BLM contractor had gathered 228 wild horses. Gather conditions were favorable as temperature was observed at a nearby weather station (within the HMA) to be 61 to 84 degrees on (see Attachment 2) during the gather operations. When the horses arrived at the pens, the BLM staff and on-site veterinarian noted the horses were "drawn up" or "tucked up" lacking abdominal fill, though generally in good body condition. The horses were provided hay and water through the afternoon and evening. One horse was euthanized after it broke its leg in the pens.

The morning of July 11, four horses were found dead in the pens and several horses were exhibiting signs of colic and general distress. Three horses were eventually euthanized that day. The BLM staff in consultation with the on-site veterinarian and the BLM contractor stopped the gather operations at that point, shifting the operation to focus on care of the animals in the pens.

Necropsies were performed by the veterinarian (see Attachment 3) on three horses on July 11 and cause of death was determined to be water starvation/dehydration and subsequent water intoxication. On July 12, one more horse died and three were euthanized. The veterinarian conducted two more necropsies and one partial review and confirmed the same causes of death as the previous day.

On July 12, the BLM Director temporarily suspended the Tuscarora Gather operations, formed a review team, and initiated a review of gather planning, pre-removal on-the-ground and animal condition monitoring activities, and the removal operations occurring on July 10 through July 13, 2010. The Review Team was directed to address several questions (see Purpose of the Review), including if and/or when planned gather operations should be resumed.

## **Review Team**

Members of the Review Team are as follows:

Mike Mottice, Associate State Director, Oregon/Washington (Team Leader)

Tom Pogacnik, Deputy State Director, Natural Resources, California

Dr. Boyd Spratling, DVM and member of the BLM's Wild Horse and Burro Advisory Board

Eric Reid, Wild Horse and Burro Specialist, Utah

Dr. Klell Ekins, Equine DVM

Robin Lohnes, Director, American Horse Protection Association and Chair of the BLM's Wild Horse and Burro Advisory Board

### **Purpose of the Review**

The purpose of the review is to document decision-making, communication and program oversight; the analysis in the environmental assessment concerning the situation observed at the time of the gather; the extent to which pre-removal on-the-ground conditions provided an indication of the condition of the horses; involvement of personnel in the decision to stop gather operations; causal factors of the deaths; and recommendations as to if and/or when planned gather and related operations should be resumed and, if so, under what conditions.

The review team met at the site of the pens on July 14, 2010. Given the Review Team's determination that there exists an immediate emergency situation due to the lack of water in the HMA that threatens the health and well-being of the wild horses in the Owyhee HMA, the review team recommends immediate action to gather and remove horses in portions of the HMA and offers this Final Interim report regarding the initiation of the rescue gather operation. A Draft Report will be provided to the Director on Friday, July 17 and a Final Report no later than July 23, 2010. The Draft and Final Report will specifically address the other issues included in the Delegation of Authority.

### **Brief Chronology of Events**

July 9

On-site: BLM staff, APHIS veterinarian, gather contractor

Conducted pre-gather meeting with contractor and set gather/holding facility.

July 10

On-site: BLM staff, USDA veterinarian, gather contractor

The BLM initiated gather operations in the northern portion of the Owyhee HMA at 6:30 a.m., Saturday, July 10. The temperature at the gather site was approximately 61 degrees as relayed by the local Remote Area Weather Station (RAWS) Site located approximately 8 miles west of the on-site temporary holding corrals. The gather contractor located approximately 32 animals within 1 mile of the holding facility and brought them into the facility at a slow trot. The animals were in good physical condition although showing some signs of being drawn-up due to lack of water.

The contractor located a second group of 196 horses approximately 8 miles from the holding corrals at about 9:00 a.m. At the time, the temperature was 81 degrees. Again, the animals came into the corrals at a slow trot and arrived in good physical condition. One mare broke a leg immediately upon capture and was euthanized by the USDA veterinarian. The helicopter pilot noted a foal that did not come in with the second group and a rider was sent to bring the animal into the corral to be reunited with its dam.

The animals were sorted, watered and fed. The USDA veterinarian observed that some of the animals remained drawn-up but none showed signs of distress. The contractor and BLM crew left the site at approximately 1630.

July 11

On-site: BLM staff including District Manager and Field Manager, USDA veterinarian, gather contractor, arrived 0630-0645.

Four animals were found dead in the pens and several others showed signs of significant physical distress. Despite attempts at treatment, three additional animals were euthanized. The USDA veterinarian completed necropsies on three animals and determined that the animals had died from colic and brain swelling attributed to water starvation/dehydration and subsequent water intoxication. The necropsy findings, including dry gut contents and cerebral anemia, are consistent with a conclusion that the animals were suffering from a pre-existing water deprivation condition. On-site BLM staff, in consultation with the USDA veterinarian, suspended gather operations for the day and made the decision to not ship horses. Several animals were provided treatment by the USDA veterinarian.

Washington Office suspends all gather operations.

July 12

On-site: BLM staff, USDA veterinarian, gather contractor

Upon arrival at holding corral, three additional animals were observed in severe distress having not responded to treatment and were euthanized by the USDA veterinarian. One additional animal died during the day. Two additional necropsies were completed, again finding the animals died from colic and brain swelling due to water starvation/dehydration and subsequent water intoxication. The gather contractor completed two survey flights to identify availability of water, animal location and condition. Water troughs and a water tender (water truck) were ordered to begin supplemental watering.

July 13

On site: BLM staff, USDA veterinarian, Dr. Boyd Spratling, gather contractor.

Those on-site discussed animal conditions and options for water hauling, moving animals to available water. At approximately 2:00 p.m., the Battle Mountain Fire Crew delivered about 3,000 gallons of water to six, 500 gallon troughs and into one of the dry ponds.

July 14, 2010

On site: BLM staff, BLM Technical Review Team, USDA veterinarian, gather contractor

Delivered an additional 3,000 gallons of water and discussed gather operations to date and future options.

### **Animal Condition**

On July 10, many horses appeared to be tucked up abdominally, lacking abdominal fill and moderately dehydrated. However, the body condition of the horses was generally good with most having a Henneke body condition score of 4 or 5. There were several horses, mostly young wet mares that were in a condition class of 3. Horses had been sorted during the day and provided with water and mixed grass/alfalfa hay in each pen. One 16 year old mare exhibited signs of colic (abdominal distress) and was treated four times with Flunixin. The mare responded slowly but positively and was transported Wednesday morning.

On Sunday, July 11 at 0630, three horses were found dead in the pens and others were showing signs of distress, central nervous system signs and some with colic. Eventually, four were euthanized. Three of the mortalities were necropsied. Two showed dry tissues and dry intestinal contents. One had excess water in the cecum and other segments of the Gastrointestinal (GI) tract had moisture in the contents indicating he had drunk heavily after arriving at the gather site.

Two possible outcomes of water deprivation can be death due to dehydration and electrolyte loss, and death due to water intoxication.

Dehydration and electrolyte loss will present itself with clinical signs such as decreased skin elasticity, dry mucous membranes, colic due to fecal impaction and decreased motility of intestinal tract, and finally death as a result of multiple organ failure. On necropsy or post-mortem findings these horses may exhibit sunken eyes, dry tissues, and dry fecal matter in cecum and large colon. These animals can respond favorably to treatment and supportive care.

Water intoxication is a condition where a horse or animal is extremely dehydrated. All tissues including the brain have higher than normal electrolyte levels. When water is consumed, either orally or given parenterally, those dry tissues pull the fluids from the vasculature into the extravascular space. This causes swelling of tissues. When the brain swells we see Central Nervous System signs, such as head pressing, blindness, teeth grinding, abnormal gait/posture and eventually death. These animals have a grave prognosis and treatment is mostly unsuccessful.

On Monday, July 12, three more horses required euthanasia and one expired. Two more post-mortems were conducted. Written necropsy reports were not yet available for Monday's post

mortems. Oral discussions with the on-site veterinarian, Dr. Al Kane, were used to evaluate his findings. Dryness of intestinal contents in some horses, coupled with cerebral edema and excess intestinal fluids in other horses, support the conclusion that the animals suffered from longer term water deprivation rather than short term dehydration caused by exertion, overheating, and fluid/electrolyte loss from sweating that might occur in a two hour period.

The necropsy findings associated with the horses in the Tuscarora Gather are consistent with a conclusion that the animals were suffering from a pre-existing water deprivation condition.

Since water intoxication occurs from rapid intake of water following periods of water deprivation, measures were instituted to slow the initial intake of water by horses that may not have ventured to the troughs in the pens. The pens are on a slope, and water was run on the ground through the pens thus allowing more horses access with smaller volume and slower intake. Drinking from small pools on the ground also simulates the natural water sources on the range. Another action taken was to add modest levels of electrolytes to at least one trough in each pen.

By Tuesday morning no additional mortalities occurred and horses were exhibiting normal energy and behavior. Because of space considerations and the normal behavior in the absence of death loss for more than 24 hours, Dr Al Kane and Dr Boyd Spratling concluded the best course of action for the welfare of the lactating mares and foals was to transport these animals to larger facilities early Wednesday morning.

### **Options Considered**

The contractor completed scouting the area and founds large bands of wild horses that are currently without water. Efforts to haul water to locations where the horses might access the water and to give the horses an opportunity to find other sources of water have been minimally successful in addressing the immediate emergency situation.

No Action – The option of taking no action on the horses located on the Owyhee HMA within the Star Ridge and Dry Creek Pastures would leave them in the current situation of no water in the catchment ponds with limited access to the South Fork Owyhee River. A high percentage of mortality, possibly 75% or higher, is expected if no action is taken within the next 1-3 days considering that a majority of the horses have already been without water for at least five days from the start of the gather operations, when the BLM first became aware that all the ponds had completely dried up and began monitoring the situation.

Water – Water is the limiting factor within the two pastures of the Owyhee HMA where wild horses are currently without water. The option of moving the horses by helicopter toward the river and them finding and using the pipeline crossing trail to access the river could place undue stress on the horses, with an uncertain probability that the horses would actually go to the river and drink. Once the horses reach the trail and due to the pressure from the move, those horses not familiar with the trail are very likely to turn back without attempting to go down the trail.

The risk of not being able to get the horses on the trail the first try would limit other attempts at the trail and the ability to implement other options involving moving the horses.

The BLM began hauling water in the hopes of providing a temporary means of watering the animals. The BLM placed six 500 gallon water troughs to a dry water catchment located within ¼ to ½ mile of horses within in the Star Ridge pasture. These actions were initiated as a short term measure to stabilize the horses while other rescue operations were considered. Wild horses that are not accustomed to using water troughs as a source on the open range could take a couple of days to figure out that the troughs are holding available water. The risk associated with allowing the horses to accustom themselves to the troughs is that it places them in a higher mortality percentage than acceptable. In addition, given the relative lack of access, long hauling distances and poor road conditions, hauling water as a long term solution is impractical.

Move the Gather Site – Moving the gather site closer to the horses so they are herded for a shorter distance could have the unintended consequence of pushing the horses further away and once they have knowledge of the gather site location, it would require increased pressure to guide them to the new location resulting in increased stress to the animals. This increased stress could result in otherwise avoidable mortalities or and increased rate of mortality. The Review Team has therefore determined that the present gather site allows for the greatest likelihood of success in safely gathering the horses and limits the amount of stress the horses would be subjected to.

Rescue, Treat, Stabilize, and Transport – Gathering the horses as soon as possible will allow the veterinarians to treat any horses showing signs of water deprivation, providing time for them to stabilize and physically adjust to water intake, and allow them to be transported safely to the preparation facilities. The gather site will be increased to accommodate a large number of horses with pens to hold horses by sex and those requiring veterinarian treatments. Holding pens will be built for those horses that have stabilized and are strong enough to transport to the preparation facilities. Handling of the horses would be limited to sorting studs from the mares and foals. Immediate water availability will be provided by allowing water to flow down slope though the holding pens allowing it to collect into depressions. This tactic was observed while trying to control the dust within the holding pens. All of the horses were able to access some water without “tanking up”. The horses will then be moved to pens with free choice water provided by water troughs including at least one trough per pen with electrolytes. While this option will result in substantial mortality associated with gathering and transportation of the animals given the nature of the horses current, pre-existing condition related to water deprivation on the range, the Review Team has determined that this option allows us the best opportunity to save horses and reduce the number lost compared to other options.

<b>OPTION</b>	<b>LIKELIHOOD TO SUCCEED (ie, ability to minimize wild horse mortality from water dehydration/starvation and water toxicity)</b>	<b>ESTIMATED % MORTALITY</b>
No Action	Extremely low (based on potential horses saved)	3 times greater than that

		of Preferred Option
Move To Water (by use of helicopter)	Low	2 times greater than that of Preferred Option
Haul Water	Medium	1.5 to 2 times greater than that of Preferred Option
Move Gather Site	Low	2 times greater than that of Preferred Option
Rescue, Treat, Stabilize, Transport (Preferred)	High	Mortality will increase each day over the next several days as the horses condition continues to deteriorate on the range. Initial mortality of 5-10% can be expected, and could easily approach 30% or much more at the end of the rescue operation in 4-6 days.

### **Recommendation**

Implement the Gather Rescue, Treat, Stabilize, and Transport Option as described above immediately. In summary, gather all the horses in the Star Ridge and Dry Creek pasture that are not showing obvious signs of water starvation (very gaunt abdominal appearance, unable to keep up with the group, horses down on the ground, and horses non-responsive to the helicopter), bring them to the existing pens, treat and care for them in the pens until stable and ship them to other holding facilities.

For those horses on the range that are showing obvious signs of distress from water dehydration, they would not be trailed into the gather pens and would be left on the range, likely to experience a high degree of natural mortality. For horses that are clearly down and unable to be trailed and are not responding to the helicopter, the BLM would attempt to humanely euthanize those animals.

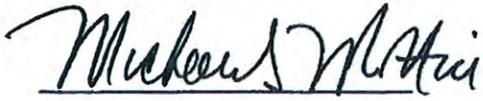
### **Rationale**

Emergency conditions are present at the HMA. There is no water in the ponds (see photographs attached to the end of this report). Horses are generally not using the water placed in the six troughs or the waterhole where the BLM placed water. While some of the horses may be using the IL Reservoir or the Owyhee River, the nearest available water sources for these animals, observations indicate such use is minimal. The vast majority of the horses have likely been without water for five days or more. As a result, the health of the animals will deteriorate rapidly.

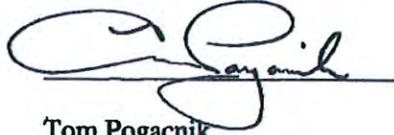
The BLM will ensure the survival of substantially more wild horses by rescuing and treating the horses than by leaving them in the HMA. The BLM expects potentially high mortality due to water starvation or water intoxication (salt poisoning) of the horses brought into the pens due to pre-existing conditions due to the lack of water on the range. The BLM, however, expects the mortality of horses left on the range could be up to 3 times higher (up to 75% or more of the wild horses could die) without prompt action.

Given the current weakened condition of the wild horses, the BLM staff and contractor will adjust the gather technique (smaller groups to enable faster sorts and treatment) and adjust the water techniques (run some water of the ground as well as have water in the troughs to make more water available to more horses, but in smaller amounts initially) to decrease incidence of water intoxication and increase likelihood of successful treatment of the horses in the pens. Sorting techniques will also be adjusted (sort studs from mares /foals only, no sort by age at this time) to decrease stress on the animals. While some mortality is unavoidable, given the current condition of individual horses, these measures would help minimize mortalities of gathered horses.

**Concurrence of the Review Team:**



Mike Mottice



Tom Pogacnik



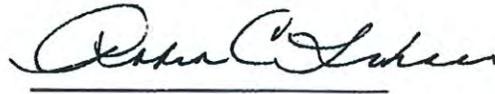
Dr. Boyd Spratling



Eric Reid



Dr. Klell Ekins



Robin Lohnes

**Approval:**



Bob Abbey

Director, Bureau of Land Management

JUL 15 2010

**Delegation of Authority for the Tuscarora Gather Review Team**

You are hereby authorized to conduct a review of gather planning, pre-removal on-the-ground and animal condition monitoring activities, and the removal operations occurring on Saturday, July 10 through Tuesday, July 13, 2010 associated with the Tuscarora Wild Horse gather in the Elko District Office in Elko, Nevada.

Members of the team are as follows:

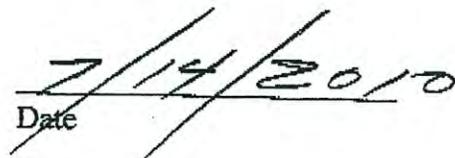
Mike Mottice	Oregon/Washington Associate State Director (Team Leader)
Tom Pogacnik	Deputy State Director, Natural Resources
Dr. Boyd Spratling	DVM & BLM's National Wild Horse Advisory Board
Eric Reid	Wild Horse/Burro Specialist, Fillmore, Utah
Dr. Klell Ekins	Equine DVM
Robin Lohnes	American Horse Protection Association & BLM National Wild Horse Advisory Board

The purpose of the review is to (1) document the decision-making and communication between the gather site, field and district office, and state office in program oversight and the approval of the gather plan; (2) document whether the analysis in the gather plan/EA addressed the potential for the situation that occurred in the gather, including seasonal timing and other factors; (3) document pre-removal on-the-ground conditions and whether the pre-gather reconnaissance provided indicators of the condition of the horses; (4) document the involvement of the field, district and state office in the decisions to initiate and subsequently suspend the gather; (5) document the causal factors associated with the deaths of eight wild horses which occurred on July 10 - 11, 2010; and, (6) provide recommendation(s) as to if and/or when planned removal, fertility control and sex ratio adjustment operations should be resumed and, if so, under what conditions.

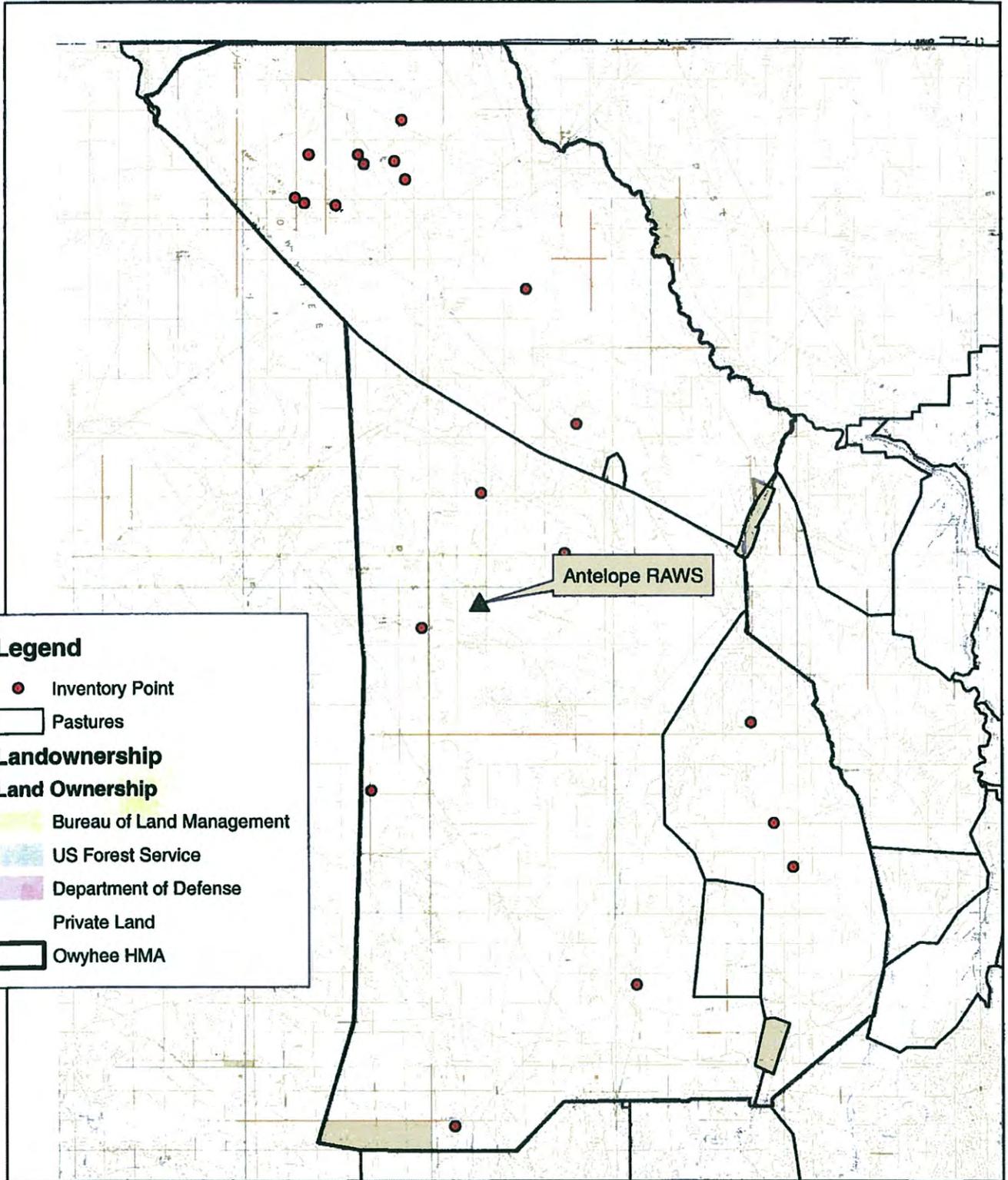
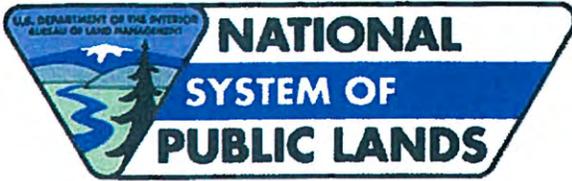
A draft report covering the items identified above should be completed and provided to the BLM Director with a cc: to the Nevada State Director and AD-200 no later than the close of business on Friday, July 16. A final report should be provided to the BLM Director with a cc: to AD-200 and the Nevada State Director and no later than Friday, July 23.

The team's primary Nevada BLM contact is Ken Miller, Elko District Manager at (775) 753-0201. The primary National Program Office contact will be Dean Bolstad at (775) 861-6611.

  
Mike Pool  
Deputy Director

  
Date

*attachment #1*



**Legend**

- Inventory Point
- Pastures
- Landownership**
- Bureau of Land Management
- US Forest Service
- Department of Defense
- Private Land
- Owyhee HMA



1:300,000

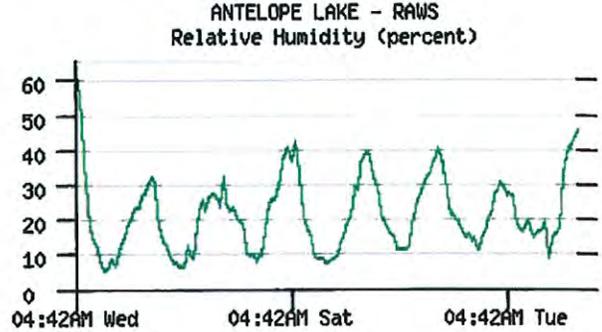
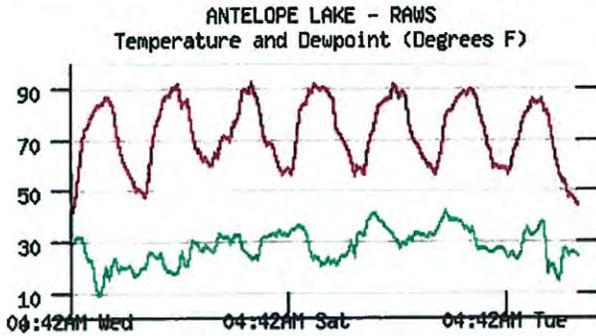
Data published in:  
 North American Datum 1983 (NAD83)  
 UTM coordinates, Zone 11, meters

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*Attachment #2*

Show 2 Days

For Information Regarding the Accuracy of This Data: [MesoWest Disclaimer](#)



### Weather Conditions for: ANTELOPE LAKE, NV (ALRN2)

Elev: 5460 ft; Latitude: 41.6869; Longitude: -116.7661

Current time: Wed, 14 Jul 5:30 am (PDT)

Most Recent Observation: Wed, 14 Jul 4:42 am (PDT)

Time (PDT)	Temp (f)	Dew Point (f)	Relative Humidity (%)	Wind Direction	Wind Speed (mph)	Fuel Temp (f)	Solar Radiation (W/m²)	Solar Pct of psbl	Precip Accumulated (Inches)	Precip 1 hour (Inches)	Precip 6 hour (Inches)	Precip 24 hour (Inches)	Quality Control
14 Jul 4:42 am	45	25	46	SSE	G10	32	0	--	6.37				OK
14 Jul 3:42 am	47	26	43	N	9G11	37	0	--	6.37				OK
14 Jul 2:42 am	49	26	41	NNE	5G08	37	0	--	6.37				OK
14 Jul 1:42 am	48	25	41	NE	7G12	40	0	--	6.37				OK
14 Jul 12:42 am	54	28	36	NNE	10G16	46	0	--	6.37				OK
13 Jul 11:42 pm	54	26	33	ENE	8G13	43	0	--	6.37				OK
13 Jul 10:42 pm	58	15	18	N	8G15	50	0	--	6.37				OK
13 Jul 9:42 pm	64	17	16	N	10G21	57	0	--	6.37				OK
13 Jul 8:42 pm	69	21	16	N	8G18	59	24	--	6.37				OK
13 Jul 7:42 pm	77	21	12	N	16G28	70	90	34%	6.37				OK
13 Jul 6:42 pm	82	18	9	NNW	19G29	77	85	16%	6.37				OK
13 Jul 5:42 pm	82	37	20	NW	16G27	77	183	23%	6.37				OK
13 Jul 4:42 pm	86	38	18	W	12G23	88	568	54%	6.37				OK
13 Jul 3:42 pm	85	35	17	WSW	14G26	88	643	52%	6.37				OK
13 Jul 2:42 pm	85	34	16	W	17G28	96	935	68%	6.37				OK
13 Jul 1:42 pm	86	33	15	W	17G30	97	973	67%	6.37				OK
13 Jul 12:42 pm	82	34	18	WSW	14G25	93	852	59%	6.37				OK
13 Jul 11:42 am	81	36	20	WSW	10G27	92	882	65%	6.37				OK
13 Jul 10:42 am	79	32	18	NE	6G13	86	769	63%	6.37				OK
13 Jul 9:42 am	75	27	17	S	2G11	84	621	61%	6.37				OK
13 Jul 8:42 am	68	23	18	NNW	5G10	70	375	49%	6.37				OK
13 Jul 7:42 am	66	25	21	SSE	5G09	65	261	53%	6.37				OK
13 Jul 6:42 am	60	26	27	SSW	1G03	52	91	42%	6.37				OK
13 Jul 5:42 am	57	24	28	NW	2G07	40	3	--	6.37				OK
13 Jul 4:42 am	59	25	27	N	6G09	48	0	--	6.37				OK
13 Jul 3:42 am	59	28	30	N	6G09	48	0	--	6.37				OK
13 Jul 2:42 am	59	28	31	N	7G10	48	0	--	6.37				OK
13 Jul 1:42 am	60	28	29	NNW	9G11	52	0	--	6.37				OK
13 Jul 12:42 am	59	26	28	NNW	7G09	50	0	--	6.37				OK
12 Jul 11:42 pm	65	26	23	NW	5G09	55	0	--	6.37				OK

12 Jul 10:42 pm	68	27	21	N	7G13	57	0	--	6.37	OK
12 Jul 9:42 pm	74	28	18	NNW	10G15	65	0	--	6.37	OK
12 Jul 8:42 pm	78	28	16	NW	10G22	69	24	--	6.37	OK
12 Jul 7:42 pm	85	27	12	WNW	14G26	79	88	33%	6.37	OK
12 Jul 6:42 pm	88	29	12	WNW	17G25	85	48	9%	6.37	OK
12 Jul 5:42 pm	90	36	15	W	17G24	89	512	63%	6.37	OK
12 Jul 4:42 pm	90	34	14	W	15G28	96	693	66%	6.37	OK
12 Jul 3:42 pm	88	36	16	WNW	14G29	95	812	65%	6.37	OK
12 Jul 2:42 pm	89	35	15	WSW	15G31	100	920	67%	6.37	OK
12 Jul 1:42 pm	88	38	17	WNW	13G27	101	956	66%	6.37	OK
12 Jul 12:42 pm	86	39	19	WSW	17G29	98	946	66%	6.37	OK
12 Jul 11:42 am	84	39	20	W	15G31	94	885	65%	6.37	OK
12 Jul 10:42 am	82	39	22	W	19G26	89	772	64%	6.37	OK
12 Jul 9:42 am	82	39	22	SW	11G21	86	626	62%	6.37	OK
12 Jul 8:42 am	79	43	28	SW	5G09	80	453	59%	6.37	OK
12 Jul 7:42 am	71	40	32	SSW	4G07	69	269	54%	6.37	OK
12 Jul 6:42 am	63	37	38	SSW	3G05	54	97	44%	6.37	OK
12 Jul 5:42 am	57	34	41	WSW	3G05	48	3	--	6.37	OK
12 Jul 4:42 am	58	33	38	WSW	3G06	47	0	--	6.37	OK
12 Jul 3:42 am	61	34	36	WNW	4G07	48	0	--	6.37	OK
12 Jul 2:42 am	60	32	34	W	5G06	49	0	--	6.37	OK
12 Jul 1:42 am	63	33	33	SW	4G06	51	0	--	6.37	OK
12 Jul 12:42 am	65	33	30	WSW	3G10	54	0	--	6.37	OK
11 Jul 11:42 pm	68	34	28	NNW	7G09	58	0	--	6.37	OK
11 Jul 10:42 pm	70	34	26	NW	4G06	57	0	--	6.37	OK
11 Jul 9:42 pm	71	31	23	NW	5G08	59	0	--	6.37	OK
11 Jul 8:42 pm	77	32	19	W	6G14	64	20	--	6.37	OK
11 Jul 7:42 pm	86	29	13	WNW	10G20	77	91	34%	6.37	OK
11 Jul 6:42 pm	89	30	12	W	12G21	86	68	12%	6.37	OK
11 Jul 5:42 pm	87	28	12	WNW	12G22	86	442	54%	6.37	OK
11 Jul 4:42 pm	91	31	12	W	11G24	96	644	61%	6.37	OK
11 Jul 3:42 pm	92	32	12	WNW	13G24	100	578	46%	6.37	OK
11 Jul 2:42 pm	87	34	15	WNW	10G19	87	354	26%	6.37	OK
11 Jul 1:42 pm	86	35	16	SW	8G20	89	633	44%	6.37	OK
11 Jul 12:42 pm	86	36	17	W	9G18	95	866	60%	6.37	OK
11 Jul 11:42 am	85	38	19	ESE	4G16	99	877	64%	6.37	OK
11 Jul 10:42 am	83	39	21	WNW	5G10	96	763	63%	6.37	OK
11 Jul 9:42 am	78	41	27	N	4G16	88	623	61%	6.37	OK
11 Jul 8:42 am	73	41	31	N	7G14	77	448	58%	6.37	OK
11 Jul 7:42 am	71	40	33	NNE	9G16	68	266	53%	6.37	OK
11 Jul 6:42 am	64	38	38	N	4G07	56	84	38%	6.37	OK
11 Jul 5:42 am	57	33	40	NNE	6G07	46	2	--	6.37	OK
11 Jul 4:42 am	59	34	39	NNW	G08	47	0	--	6.37	OK
11 Jul 3:42 am	60	33	36	NNE	7G08	51	0	--	6.37	OK
11 Jul 2:42 am	56	24	29	NW	3G11	44	0	--	6.37	OK
11 Jul 1:42 am	63	31	30	NE	10G12	56	0	--	6.37	OK
11 Jul 12:42 am	65	27	24	N	7G11	54	0	--	6.37	OK
10 Jul 11:42 pm	68	25	20	S	6G13	56	0	--	6.37	OK
10 Jul 10:42 pm	71	25	18	NE	6G12	58	0	--	6.37	OK
10 Jul 9:42 pm	73	23	15	NW	3G09	59	0	--	6.37	OK
10 Jul 8:42 pm	75	21	13	WNW	7G17	64	18	--	6.37	OK
10 Jul 7:42 pm	86	23	10	WNW	9G25	77	96	35%	6.37	OK
10 Jul 6:42 pm	88	22	9	W	14G25	85	69	13%	6.37	OK
10 Jul 5:42 pm	90	24	9	W	8G28	93	480	59%	6.37	OK

10 Jul 4:42 pm	91	22	8	W	14G26	95	625	59%	6.37	OK
10 Jul 3:42 pm	90	21	8	WSW	15G28	95	809	65%	6.37	OK
10 Jul 2:42 pm	91	24	9	W	13G31	100	909	66%	6.37	OK
10 Jul 1:42 pm	92	25	9	WSW	16G27	102	991	69%	6.37	OK
10 Jul 12:42 pm	89	23	9	WSW	13G23	99	968	67%	6.37	OK
10 Jul 11:42 am	90	28	11	SW	10G25	99	890	65%	6.37	OK
10 Jul 10:42 am	85	32	15	WSW	10G17	93	778	64%	6.37	OK
10 Jul 9:42 am	84	36	18	SW	6G10	87	631	62%	6.37	OK
10 Jul 8:42 am	81	37	21	SW	1G04	79	456	59%	6.37	OK
10 Jul 7:42 am	72	37	28	NNW	2G04	68	271	54%	6.37	OK
10 Jul 6:42 am	61	35	38	NW	1G03	53	96	43%	6.37	OK
10 Jul 5:42 am	57	35	43	ESE	1G05	45	3	--	6.37	OK
10 Jul 4:42 am	59	33	37	N	3G05	44	0	--	6.37	OK
10 Jul 3:42 am	58	34	41	N	2G08	45	0	--	6.37	OK
10 Jul 2:42 am	57	33	40	NNE	5G09	46	0	--	6.37	OK
10 Jul 1:42 am	61	35	37	ESE	8G11	52	0	--	6.37	OK
10 Jul 12:42 am	62	32	32	E	7G12	52	0	--	6.37	OK
09 Jul 11:42 pm	68	34	28	NE	9G14	57	0	--	6.37	OK
09 Jul 10:42 pm	69	33	26	NNE	5G15	57	0	--	6.37	OK
09 Jul 9:42 pm	68	32	26	ENE	7G10	59	0	--	6.37	OK
09 Jul 8:42 pm	73	32	22	ENE	8G12	63	7	200%	6.37	OK
09 Jul 7:42 pm	79	31	17	E	7G11	72	55	20%	6.37	OK
09 Jul 6:42 pm	86	23	10	WNW	6G14	79	109	20%	6.37	OK
09 Jul 5:42 pm	88	25	10	WSW	9G20	89	458	56%	6.37	OK
09 Jul 4:42 pm	93	23	8	NNE	4G20	101	734	70%	6.37	OK
09 Jul 3:42 pm	89	25	10	SSE	4G18	98	822	66%	6.37	OK
09 Jul 2:42 pm	90	26	10	N	9G19	101	895	65%	6.37	OK
09 Jul 1:42 pm	89	28	11	WNW	6G14	101	1018	70%	6.37	OK
09 Jul 12:42 pm	82	33	17	WNW	9G21	93	310	22%	6.37	OK
09 Jul 11:42 am	77	33	20	SW	11G19	72	277	20%	6.37	OK
09 Jul 10:42 am	77	33	20	WNW	3G08	79	265	22%	6.37	OK
09 Jul 9:42 am	70	29	22	NNW	5G12	68	130	13%	6.37	OK
09 Jul 8:42 am	71	32	24	W	6G21	66	138	18%	6.37	OK
09 Jul 7:42 am	72	32	23	N	7G18	67	95	19%	6.37	OK
09 Jul 6:42 am	70	33	25	ENE	7G16	64	81	36%	6.37	OK
09 Jul 5:42 am	64	34	33	NE	14G21	53	1	--	6.37	OK
09 Jul 4:42 am	65	27	24	N	5G16	55	0	--	6.37	OK
09 Jul 3:42 am	61	26	26	N	10G13	56	0	--	6.37	OK
09 Jul 2:42 am	61	28	28	N	7G13	53	0	--	6.37	OK
09 Jul 1:42 am	64	29	27	N	8G14	56	0	--	6.37	OK
09 Jul 12:42 am	62	27	26	N	9G15	54	0	--	6.37	OK
08 Jul 11:42 pm	67	28	23	NE	12G16	59	0	--	6.37	OK
08 Jul 10:42 pm	66	30	26	NNE	9G12	57	0	--	6.37	OK
08 Jul 9:42 pm	71	31	23	ESE	4G14	61	0	--	6.37	OK
08 Jul 8:42 pm	76	31	19	ENE	7G17	67	15	200%	6.37	OK
08 Jul 7:42 pm	86	21	9	ENE	2G09	76	148	54%	6.37	OK
08 Jul 6:42 pm	85	22	10	N	6G12	82	86	16%	6.37	OK
08 Jul 5:42 pm	83	27	13	SSW	14G28	78	75	9%	6.37	OK
08 Jul 4:42 pm	92	19	7	NW	4G19	94	695	66%	6.37	OK
08 Jul 3:42 pm	91	18	7	S	6G18	102	873	70%	6.37	OK
08 Jul 2:42 pm	91	18	7	WSW	8G20	102	941	68%	6.37	OK
08 Jul 1:42 pm	88	19	8	SW	3G13	102	969	67%	6.37	OK
08 Jul 12:42 pm	88	19	8	ENE	5G12	105	961	67%	6.37	OK
08 Jul 11:42 am	85	22	10	ESE	3G12	99	901	66%	6.37	OK

08 Jul 10:42 am	81	26	13	SE	3G09	93	792	65%	6.37	OK
08 Jul 9:42 am	77	24	14	NE	3G10	86	644	63%	6.37	OK
08 Jul 8:42 am	74	25	16	NE	4G08	76	471	61%	6.37	OK
08 Jul 7:42 am	66	26	22	NE	5G09	63	288	57%	6.37	OK
08 Jul 6:42 am	56	26	31	N	4G07	48	112	49%	6.37	OK
08 Jul 5:42 am	48	20	33	NNW	3G09	35	4	--	6.37	OK
08 Jul 4:42 am	50	20	30	N	8G10	41	0	--	6.37	OK
08 Jul 3:42 am	51	19	28	N	8G11	40	0	--	6.37	OK
08 Jul 2:42 am	50	17	27	NW	5G09	39	0	--	6.37	OK
08 Jul 1:42 am	53	17	24	NNW	5G08	42	0	--	6.37	OK
08 Jul 12:42 am	57	21	24	ENE	6G14	44	0	--	6.37	OK
07 Jul 11:42 pm	59	20	22	NE	10G15	50	0	--	6.37	OK
07 Jul 10:42 pm	61	20	20	NE	10G16	52	0	--	6.37	OK
07 Jul 9:42 pm	66	21	18	NE	12G16	56	0	--	6.37	OK
07 Jul 8:42 pm	69	19	15	NE	11G23	60	28	200%	6.37	OK
07 Jul 7:42 pm	79	24	13	NE	16G24	70	106	38%	6.37	OK
07 Jul 6:42 pm	83	23	11	NE	14G20	79	35	6%	6.37	OK
07 Jul 5:42 pm	87	16	7	ENE	8G18	88	541	66%	6.37	OK
07 Jul 4:42 pm	87	21	9	N	6G18	93	710	67%	6.37	OK
07 Jul 3:42 pm	85	14	7	SSW	5G13	95	855	68%	6.37	OK
07 Jul 2:42 pm	84	10	6	WNW	4G14	100	938	68%	6.37	OK
07 Jul 1:42 pm	84	10	6	NE	5G12	102	932	64%	6.37	OK
07 Jul 12:42 pm	81	17	9	SE	4G14	97	979	68%	6.37	OK
07 Jul 11:42 am	80	23	12	NE	5G20	95	919	67%	6.37	OK
07 Jul 10:42 am	76	23	14	NE	5G11	91	810	66%	6.37	OK
07 Jul 9:42 am	74	28	18	ENE	4G10	84	661	65%	6.37	OK
07 Jul 8:42 am	69	32	25	NE	4G10	71	485	62%	6.37	OK
07 Jul 7:42 am	58	32	37	WSW	1G04	54	297	58%	6.37	OK
07 Jul 6:42 am	50	32	49	N	1G07	42	116	50%	6.37	OK
07 Jul 5:42 am	43	30	61	N	5G09	33	5	--	6.37	OK
07 Jul 4:42 am	44	31	60	N	9G12	33	0	--	6.37	OK
07 Jul 3:42 am	46	31	55	N	10G13	38	0	--	6.37	OK
07 Jul 2:42 am	46	27	48	N	9G14	39	0	--	6.37	OK
07 Jul 1:42 am	50	26	39	NNE	12G15	42	0	--	6.37	OK
07 Jul 12:42 am	51	21	31	NNE	12G16	45	0	--	6.37	OK
06 Jul 11:42 pm	54	21	27	NNE	11G14	44	0	--	6.37	OK
06 Jul 10:42 pm	54	18	24	NNE	10G14	47	0	--	6.37	OK

**DRAFT**  
**Necropsy and Veterinary Report**

**Date:** July 11, 2010

**Prepared by:** Albert Kane, DVM, MPVM, PhD

**Location/Event:** Owyhee HMA, Tuscarora Gather

**History:** On arrival at the temporary holding corals this morning several horses were noted to be down or dead in the pens. The horses that were down were generally exhibiting neurologic signs and signs of colic (abdominal discomfort). There were 2 additional horses (young studs) that were stuporous and ataxic. These horses were all treated with banamine by injection. Plans to ship horses to the BLM facility were immediately cancelled for the day and the gather activity was suspended by the COR until the situation at hand could be addressed.

The horses had all been gathered the previous day. Approximately 230 total horses gathered that day. On arrival at the trap many appeared to be tucked up, lacking abdominal fill of feed and water, and moderately dehydrated. However, the body condition of the horses was generally good with most having a Henneke body condition score of 4 or 5. There were several horses, mostly young wet mares, that were in a condition class of 3. Horses had been sorted during the day and provided with water and mixed grass/alfalfa hay in each pen. ] ➔

**Examinations:**

On arrival at the temporary holding corral, approximately 6:30AM 2 grey mares in the small wet mare pen were down, showing signs of colic. The 16YO grey had been observed lying down twice the previous day but did not appear painful at that time. The 8YO grey mare was also showing signs of colic. Both had obviously been down and struggling for several hours during the night. Both were treated with banamine first thing in the AM. Both were retreated approximately 4 hours later. The 8YO was showing neurologic deficits and no signs of improvement. She was euthanized. The condition of the older mare waxed and waned throughout the day. She was retreated 4 times, stood for short periods of time and was observed drinking a small amount of water on two occasions. Her clinical signs were mostly attributed to colic pain. About 50% of the time she was bright, alert and responsive (BAR) but reluctant or unable to rise. After her final treatment, she was BAR and sternal at the end of the day.

A 3YO stud in the end stud pen was found dead against a panel (see necropsy reports below).

*Attachment #3*

A 5MO bay colt was down and unable to rise in the middle mare side pen. He was treated with banamine. On re-examination 2 hours later the colt's condition had deteriorated. He was unresponsive, given a hopeless prognosis for survival and euthanized as an act of mercy.

A 2YO palomino stud was found in the large stud pen, bleeding from the mouth. He was mouthing the air and a panel, was disoriented and unaware of his surroundings, he circled left when moved and was severely ataxic. He apparently had sustained a serious head injury and possible jaw fracture during the night. These serious injuries were considered incurable and he was euthanized following the initial examination as an act of mercy.

A 2MO old colt and 6YO mare were found dead in the wet mare pen first thing in the morning (see Owyhee Mortality Log and necropsy report below).

A 6YO roan mare died suddenly during sorting of other horses in the pen (see necropsy report). This mare had been moderately lame the previous day so had specifically been re-examined in the morning and was showing no signs of neurologic impairment at that time.

Two young studs (flea bitten grey and black) were found to be standing but dull, weak, ataxic and unresponsive. A big bay stud was exhibiting signs of colic; he was up and down throughout the day. The grey and the bay were treated with banamine, twice during the day. The black stud could not be approached in the pen and sorting the pen through the chute was not warranted to treat that individual at this time.

The leppy colt from the grey mare that was euthanized was sorted into the alleyway near the loadout, hand fed and watered and appears to be doing well.

#### **Necropsy #1**

Jerrie Bertola accompanied me during this necropsy examination.

3 year old, black stud had been found dead in a corner of the pen this AM. Carcass was moderately bloated. There were small amounts of subcutaneous fat present. On opening the abdominal cavity the serosal surfaces were tacky. The small bowel was distended and discolored dark red in places. The small bowel was grossly distended with gas, no fluid was present. The small colon contained well formed, brownish/green fecal balls that were course and fibrous with very little moisture content. Portions of the small colon appeared moderately impacted. The cecum contained unformed dry manure material that was very dry. About half the cecum contained this material. The large colon contained scant pasty manure. The stomach was empty. No other abnormalities were noted.

#### **Necropsy #2**

Jerrie Bertola accompanied me during this necropsy examination.

6 year old, dark bay mare had been found dead in the lactating mare pen this AM. The carcass was only slightly bloated. There were large amounts subcutaneous and abdominal fat present. This fat was dark yellow. There was a large amount of subcutaneous edema. Findings in the small intestine, small and large colons, cecum and stomach were the same

as those for the first necropsy examination described above. There were no other abnormalities noted.

### **Necropsy #3**

Alan Shepherd accompanied me during this necropsy examination. 6 year old, red roan mare, reportedly died suddenly following a brief seizure that occurred during sorting of other horses in the pen. Approximately 2 hours earlier this mare had been seen acting normally. There were moderate amounts of dark yellow subcutaneous and abdominal fat present. The small colon contained moist, green, unformed fecal material. The large colon contained a large amount of wet, normal looking fecal material. The cecum contained very scant amounts of fibrous plant material and a large amount of free fluid. The stomach contained water and feed material. No other abnormalities were noted.

### **Differentials/Dx:**

The findings of the first two necropsies suggest these horses died from complications related to short term (few days duration) water starvation and dehydration. These horses had physiologic if not physical impactions of the small colon and cecum. Water starvation (also called water deprivation) in this case is supported by the history of the area and observations of the BLM staff and helicopter pilots.

Results of the third necropsy and the clinical signs of other horses in this group suggest the third horse died from complications related to water intoxication following water starvation. This condition (also called water toxicity or water poisoning) is characterized by neurologic signs attributable to severe electrolyte imbalances (primarily hyponatremia) and cerebral edema.

### **Summary/Conclusions:**

The history of this area is that water holes being used recently are drying up and horses were blocked from accessing a singular access point to a river that has historically been a watering point during dry conditions. There are seeps in the area that are also drying up. The river access point is very narrow, steep and long because of high canyon walls. These conditions support the diagnosis of water starvation with subsequent dehydration. Although not common, water intoxication has been previously documented in wild horses following water starvation. These animals have severe electrolyte abnormalities (primarily severe hyponatremia) but do not necessarily have a whole body deficiency in electrolytes. The intra- and extra-cellular sodium balance is affected such that sodium is sequestered intracellularly, serum becomes hypo-osmolar, and cerebrospinal fluid becomes hypo-osmolar resulting in swelling of the brain. Coincident with the neurological condition are the effects on the gastrointestinal tract, physical or physiologic impaction, colic and the typical colic sequelae.

Treatment with banamine is palliative, to relieve pain as much as possible and encourage animals to eat, drink and move about. These benefits are of course balanced against the risk of using this medication in a under hydrated animal.

Treatment of water starvation is providing water. Prevention of water intoxication is primarily oriented toward providing only small amounts of water initially, but this is not possible with large groups of wild horses on the range or in a corral setting. It is very difficult to identify which horses are most affected by the under hydration and the signs of water intoxication range from very subtle to sudden and obvious. Restricting access to water may create even more problems in more horses than providing free access to water. Even with intensive nursing care as can be provided for domestic animals it can be difficult to save affected individuals. Similarly, specific treatment with diuretics may cause more problems that it cures. These treatments are best done while monitoring specific electrolyte levels several times a day. This kind of intensive nursing and supportive care is not practical with an ungentled wild horse under any circumstance.

In this instance the water intoxication was unforeseen as the water starvation only came to light during the time the horses were falling ill. The recommended course of treatment is providing a moderate amount of hay initially (followed after 24 hours by free choice hay), free choice access to water and a choice of an electrolyte solution as a free choice alternative. Banamine can be used to relieve pain, particularly in horses with signs of colic. Animals which are unresponsive, deteriorating despite treatment or showing severe neurologic signs should be euthanized as an act of mercy. This is the course of treatment being followed at this time.



Two dead horses on 12 Mile Flat; photo taken Monday July 12



Dry Creek Pond 1; photo taken Tuesday July 13



Dry Creek Pond 1 with young stud; photo taken Tuesday July 13



Star Ridge Pond 1; photo taken Tuesday July 13



Star Ridge Pond 2; photo taken Tuesday July 12



Star Ridge Upper North Pond; photo taken Tuesday July 13



BLM transporting water to pond; Photo taken Tuesday July 13



Same pond BLM transported water to on July 13; photo taken Wednesday July 14



Dead horse within Owyhee HMA; photo taken Monday July 12