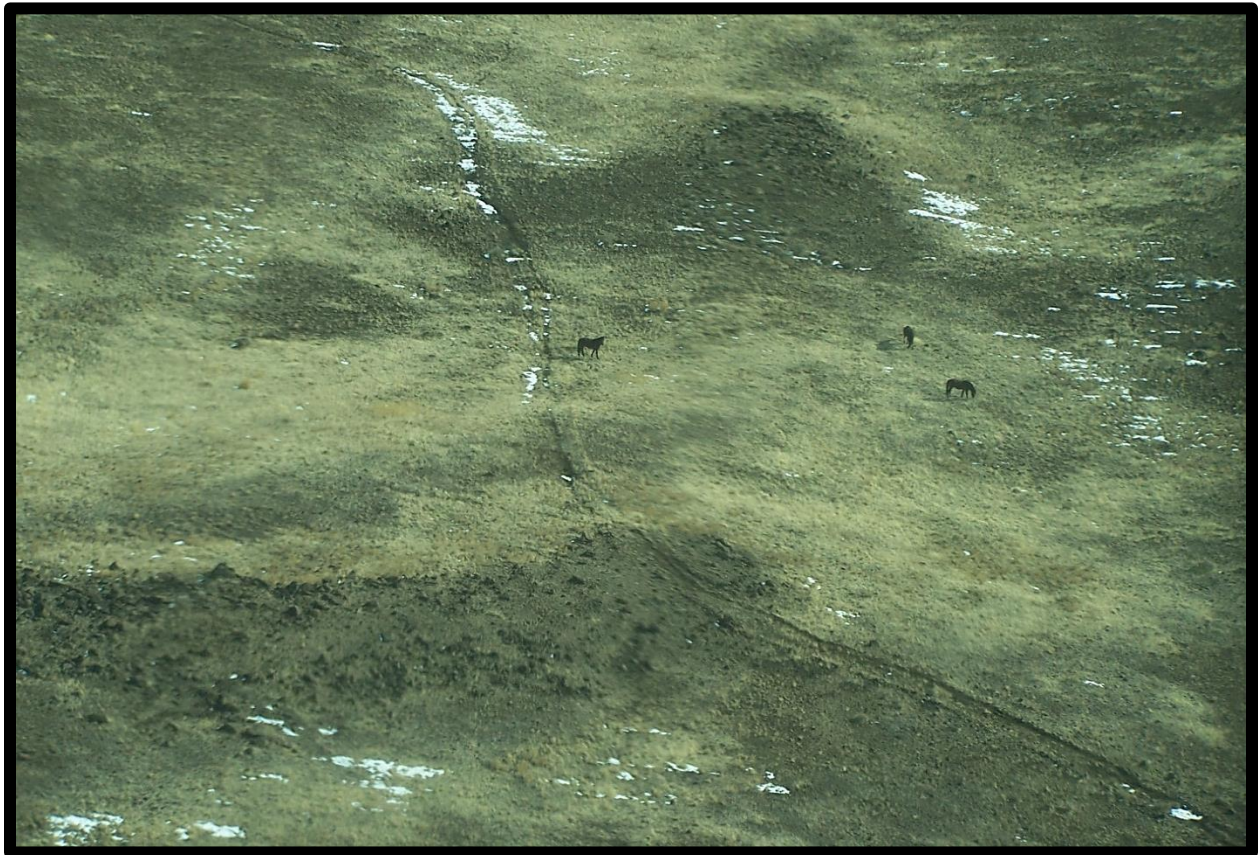


**Northern California/Nevada Border
Twin Peaks Wild Horse and Burro
Herd Management Area
Aerial Population Survey
November 26th 2013**



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Abstract

An independent aerial survey was completed over northeastern California and northwestern Nevada for the Twin Peaks Wild Horse and Burro Herd Management Area on November 26th 2013. The objective was to estimate the population of wild horses (*Equus caballus*) and burros (*Equus asinus*) and to monitor the habitat recovery from the Rush Fire, which burned 315,577 acres in August 2012. The flight and pilot were arranged through the LightHawk organization.

During the aerial survey a total of 44 horses and 36 burros were counted along the 207 miles of transect strips within the Twin Peaks Herd Management Area boundary.

Using an aerial strip transect method, the survey estimates the populations of wild horses and burros in the Twin Peaks Wild Horse and Burro Herd Management Area as follows:

- (a) 351-459 wild horses (includes some mules)
- (b) 230-287 wild burros

Over 300 photographs and continuous video footage were taken during the flight. Photos were taken by Craig Downer, Jesica Johnston and Catherine Scott, and video footage was courtesy of pilot Ney Grant. All this was made possible due to the coordination and support from LightHawk.

Photos can be found at the following link.

<http://www.flickr.com/photos/88871101@N06/sets/72157639786054204/>

A short summary video by pilot Ney Grant can be found at <http://vimeo.com/81195843>.



Background

This report is part of an ongoing body of independent research consisting of both field and aerial surveys in the Twin Peaks Wild Horse and Burro Herd Management Area in order to provide data and input to the Bureau of Land Management (BLM) for consideration toward the management decisions in this area.

The Twin Peaks Herd Management Area covers 789,852 acres of mostly public land with some small privately owned land interspersed. The Herd Management Area (HMA) is approximately 35 miles wide and 55 miles long north to south and is bordered by Highway 395 on the west, Honey Lake on the south, Cottonwood Mountains on the north and the Smoke Creek Desert on the east. In addition to being legal habitat for wild horses and burros, the Twin Peaks HMA encompasses seven Wilderness Study Areas, provides habitat for populations of the greater sage-grouse (*Centrocercus urophasianus*) and the pygmy rabbit (*Brachylagus idahoensis*), which are both candidate species for listing under the Endangered Species Act, as well as many other native wildlife species.

In August and September of 2010 the BLM's Eagle Lake Field Office removed 1,581 wild horses and 159 wild burros from the Twin Peaks Wild Horse and Burro Herd Management Area. Therefore, a total of 1,740 wild equids were removed from this section of public land legally designated for wild horses and burros. At that time the BLM claimed they were "overpopulated" as determined by the "appropriate management level" assigned by the BLM; not ecological carrying capacities.

The BLM allocates 18% of the forage to the wild equids living in the Twin Peaks HMA, with the majority or 82% provided to permitted livestock. This is in conflict with the mandate in Section 2 c of the Wild Free-Roaming Horses and Burros Act of 1971 which states that herd areas managed by the BLM or territories under the USFS shall be "devoted principally" to their welfare and benefit (WFRHBA, 1971).

In 2013, the National Academies of Science (NAS) completed a comprehensive review and report that concluded the Bureau of Land Management's Wild Horse and Burro program has not used scientifically rigorous methods to estimate population sizes and growth or to assess the impacts of intensive management actions on genetics (NAS, 2013). The NAS report found no evidence of excess wild horses and burros and questioned the basis of all management decisions for wild horses and burros and other range issues based on scientifically under-informed or inaccurate population and range information.

Previous Independent Surveys

In October of 2010, an independent aerial survey and analysis was completed using straight line strip transect methodology. This survey estimated that between 84 and 265 wild horses, and a relatively small population of burros, remained in the Twin Peaks HMA after the massive removal in the summer of 2010. These results were supported by the historic population data and viable reproductive rates and ground observations (Downer, Johnston, 2010).

A second aerial survey was completed in October 2012, after the Rush Fire burned 315,577 acres in the Twin Peaks area in August 2012. The objective of that survey was to estimate the population of wild horses and burros and to assess the ecological damages from the Rush Fire. The survey estimated that between 312 and 387 wild horses including mules and a small population of wild burros remained in the Twin Peaks HMA. The survey also showed that the affected burn area resembled a patchwork mosaic pattern with many non-burned areas of different sizes within the perimeter of the fire boundary, which could act as seed sources for the natural regeneration of the burned areas (Downer, Johnston, 2012).

Fire

Wild horses and burros are natural restorers of burned-over areas. This is due both to their post-gastric digestive systems, typical in all families of the taxonomic Order Perissodactyla, and to their mobile, wide-ranging behavior. They are well adapted to reduce coarse, dry, flammable vegetation without overly expending metabolic energy in the digestive process (Downer, 2011) (Downer, 2014).

Through the public comment process, the BLM was advised not to reduce the wild horse and burro populations as planned in August 2010. This was not only because these reductions would set back the wild horses and burros respective ecological adaptations and undermine their long-term viability, but also compromise self-stabilization components of the population due to mature social units being disturbed (Downer, 2010) (Johnston, 2010).

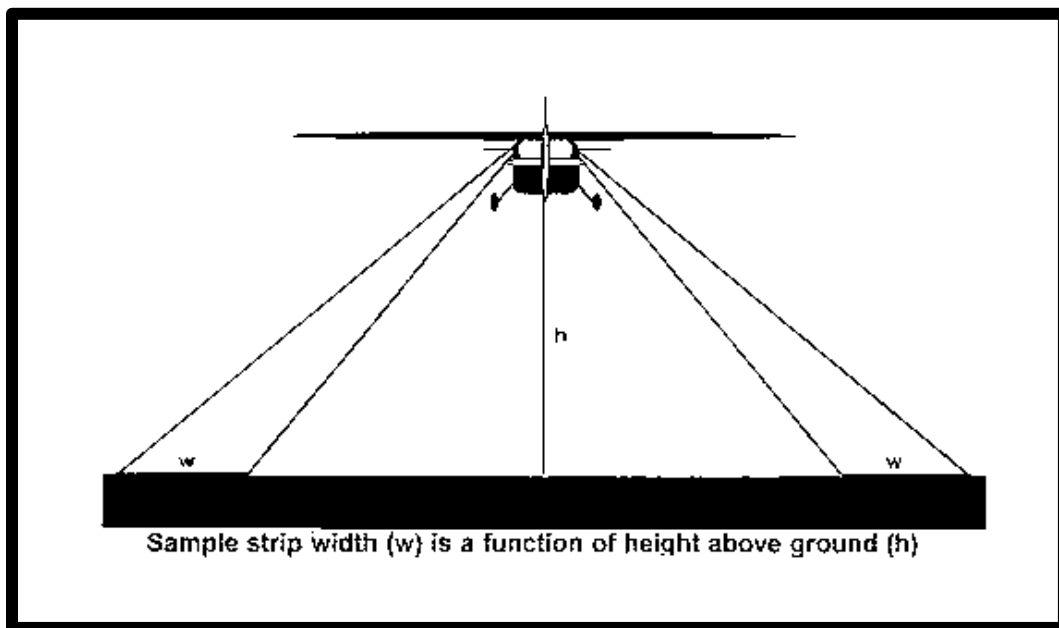
Both aerial and field surveys have indicated that significant wild horse and burro population reductions had caused this region to be more susceptible to catastrophic fires; as the Rush Fire in 2012 subsequently demonstrated (Downer, Johnston, 2010). Wild equids complement the ecosystem and fill an important niche that enhances the life community and biodiversity of this Great Basin ecosystem. Such mutualism has been proven through meticulous ecological studies in the Serengeti of Africa as well as in other regions of North America. (Bell, R.H.V., 1970; University of Wyoming, 1979),

see also similar studies cited in (Downer, 2007) (Downer, 2011) (Johnston, 2011) (Downer, 2014).

Survey Methodology

The November 26, 2013 flight was completed in a Cessna T210 Centurion six-seat plane with three experienced wildlife observers who are familiar with the Twin Peaks Herd Management Area, in addition to the pilot.

There are several scientifically accepted methods to estimate wildlife populations within a large area. This survey used the aerial, straight-line-strip-transect method for estimating the relative density. The transect strip establishes a density ratio that is used to estimate low and high population densities. This method was adapted from methodology used for estimating pronghorn and other wildlife (Guenzel, 1997).



It should be noted that conducting a flight that samples a variety of habitats with adequate transect spacing over a single day provides greater accuracy and minimizes concerns of equid movement that could lead to multiple counts of the same individuals.

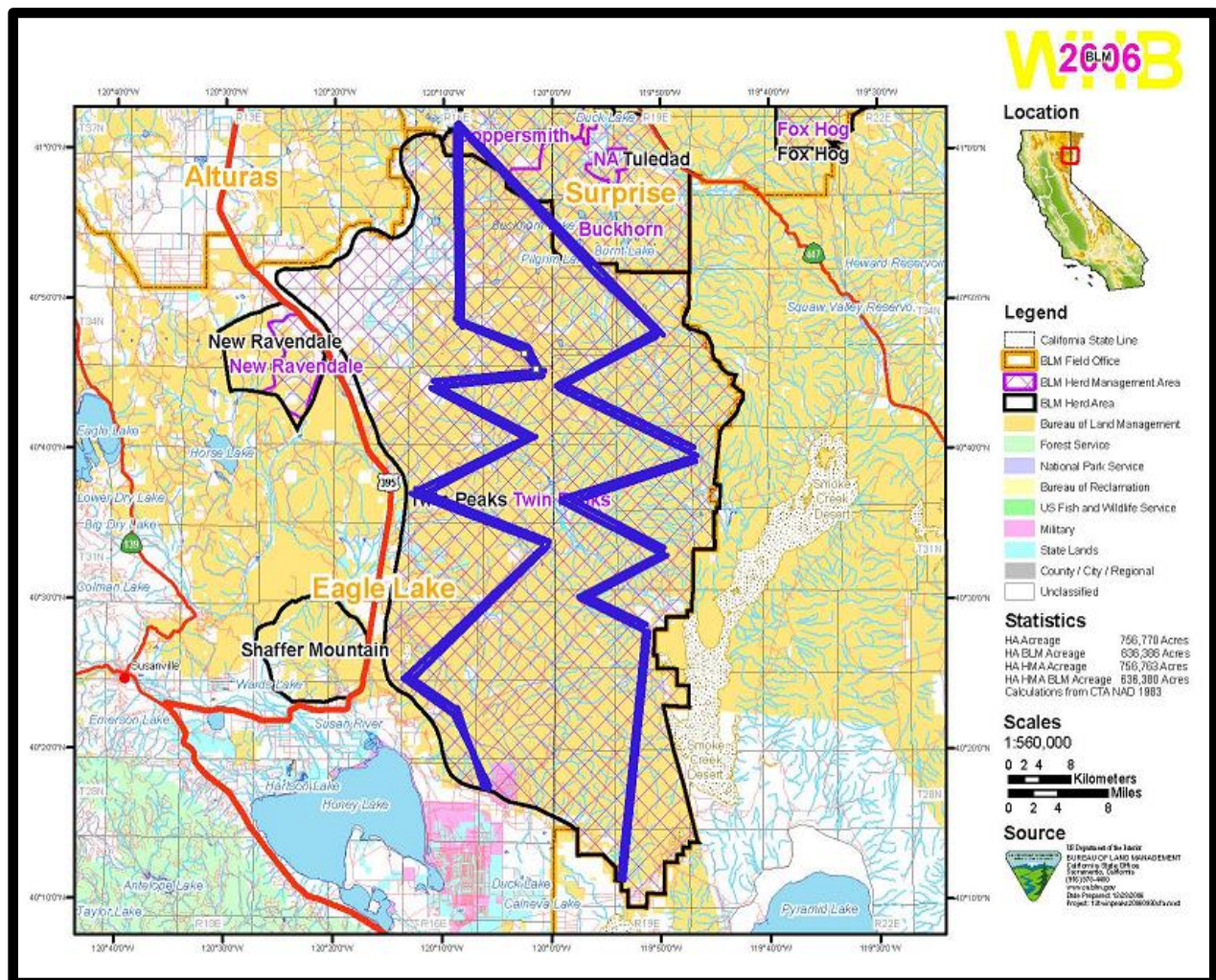
Data

On November 26, 2013, the aerial survey flight left the Truckee Airport at 9:30 AM and returned at 11:55 AM with no stops. The weather was clear with light wind and only a few high-lying cirrus clouds, 10 mile visibility, and a temperature reading of 43 degrees Fahrenheit at departure.

The transects were randomly selected and flown to cover both the burned and unburned portions of the Twin Peaks Herd Management Area (HMA). A total of 207 miles were flown on 18 transect lines surveying approximately 13% of the study area and all 5 BLM-assigned home ranges within the Twin Peaks HMA. The average flight height above ground level was 800 feet with an adjusted offset of 0.33 of a mile survey strip on each side of the plane. The transects covered all 9 of the major grazing allotments within the HMA. These allotments are separated by fencing and/or natural boundaries to control livestock. Consequently these barriers restrict wild horse and burro movement contrary to the “free roaming” lifestyle mandate under the Wild Free Roaming Horse and Burros Act (WFRHBA, 1971).

During the aerial survey a total of 44 horses and 36 burros were observed along the 207 miles of transect strips within the Twin Peaks Herd Management Area boundary.

Flight Transect Map



Results

Using the relative density of the wild horses and wild burros observed along all of the transects it is estimated that there are between 351 - 459 wild horses (including mules) and between 230 - 287 wild burros remain in the Twin Peaks Wild Horse and Burro Herd Management Area. These results are consistent with previous population estimates using the same transect methodology (Downer, Johnston, 2010) (Downer, Johnston, 2012).

Aerial Survey Population Estimates					
2010		2012		2013	
Horses	Burros	Horses	Burros	Horses	Burros
84-265	NA	312-387	NA	351-459	230-287

Resource Allocation

The Twin Peaks Herd Management Area (HMA) is the largest remaining population of wild horses and burros in California even with a portion of the HMA occurring in Nevada. An analysis of the population estimates together with the assigned BLM appropriate management levels and forage allocations for the Twin Peaks HMA demonstrates that the wild horses and burros here are neither adequately represented nor fairly allocated resources by BLM's management plans. Privately owned domestic livestock interests are favored with over 82% of forage resource being allocated to domestic livestock despite the legal provisions and principal allocations set forth under the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA, 1971).

The appropriate management levels that the BLM has set for the wild horses and burros in the Twin Peaks HMA are as follows: 448 – 758 for wild horses and 72-116 for wild burros. Relative studies of the carrying capacities, as they pertain to wild horses and burros in similar habitats, indicate that both populations are far below their respective carrying capacities.

An in-depth assessment found the Bureau of Land Management's management decisions for wild horses and burros in the Twin Peaks Herd Management Area are politically driven and reflect a loose interpretation of both the legislative requirements and scientific findings, in favor of livestock interests (Johnston, 2011).

Genetics

Since their massive removal in 2010, the Twin Peaks wild horse and burro populations have slowly rebounded, but significant concerns remain for these relatively small, isolated populations, which have been subject to reduced genetic diversity.

Furthermore, the wild horse and burro home ranges within Twin Peaks correlate with livestock allotment boundaries. These livestock allotments are based on fence-lines and natural boundaries designed to restrict livestock movement and control grazing, but they negatively impact wild equid free-roaming behavior and restrict gene flow resulting in small sub-divided populations.

Genetic testing was completed on 94 wild horses removed from the Twin Peaks Herd Management Area (Cothran, 2011). The genetic testing results identified the population subdivision within the Twin Peaks Herd Management Area, and concluded that the heterozygosity or genetic variation is “*approaching concern levels*” (Cothran, 2011). This report reflects the population in 2010 prior to the removal of 1,637 wild horses, which significantly reduced the population, and compounded concerns regarding genetic variation for the remaining wild horses.

Genetic testing was also completed on 39 wild burros removed from the Twin Peaks Herd Management Area. The genetic testing results identified evidence of population subdivision and indicated that the “*population size based upon appropriate management levels is somewhat below the minimum viable population level*” and below levels of domestic breeds (Cothran, 2012). This report reflects the population in 2010 prior to the removal of 160 wild burros, which significantly reduced the population, and compounded concerns regarding genetic variation for the remaining wild burros.



Reduced genetic diversity can “*impair vigor, fertility, and disease resistance and could limit ability to respond to environmental variation*” (Goodloe et al., 1991). In addition, research has shown that: (a) significantly reducing populations, as the BLM did here in 2010, can result in genetic bottlenecks; and (b) hidden population structures which can result in behavioral isolation; further restricting gene flow (Ashley, 2004). This indicates that further removal of compromised and underpopulated wild horses and burros could further jeopardize their long-term adaptation and survival.

Conclusion

This aerial population survey and other supporting research indicates that the remaining wild horse and burro populations in Twin Peaks are at risk. These small isolated populations have been repeatedly subject to a significant population reductions, resulting in a loss of genetic variation, genetic bottlenecks, and detriment to the populations viability. Further loss of genetic variation combined with future disturbances to social infrastructures will negatively impact both equid species and their respective ability to adapt to the changing ecological conditions.



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