

**BIGHORN SHEEP UNIT MANAGEMENT PLAN**  
**BOX ELDER, PILOT MOUNTAIN WMU #1**  
**August 2019**

**BOUNDARY DESCRIPTION**

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Boundary begins at SR-30 and the Utah-Nevada state line; east on SR-30 to the township line separating Range 15 West and Range 16 West; south along this township line to I-80; then west on I-80 to the Utah-Nevada state line; north on this state line to SR-30. Hunters with this permit may hunt Nevada’s portion of this interstate unit (091).

**LAND OWNERSHIP**

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Table 1. Land ownership and approximate area of modeled bighorn sheep habitat for the Antelope Island bighorn sheep management unit.

Ownership	MODELED BIGHORN HABITAT	
	Area (acres)	%
Bureau of Land Management	72,892	85.6%
Private	6,312	7.4%
Utah State Institutional Trust Lands	5,544	6.5%
Utah State Parks	368	0.4%
Utah Department of Transportation	7	<0.1%
<b>Totals</b>	<b>85,123</b>	<b>100%</b>

**UNIT MANAGEMENT GOALS**

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The Pilot Mountain unit is located north of Wendover on the Utah/Nevada state line (Figure 1). The hunt unit is managed together with Nevada. Bighorn sheep have been on the Pilot Mountain range since February 1987 when 20 bighorn sheep were released. Specific goals are to:

- 1) Manage for a healthy population of Rocky Mountain bighorn sheep capable of providing a broad range of recreational opportunities, including hunting and viewing.
- 2) Balance bighorn sheep impacts with other uses such as authorized grazing and local economies.
- 3) Maintain a population that is sustainable within the available habitat in the unit boundary.

**HISTORY AND CURRENT STATUS**

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The Utah Division of Wildlife Resources (DWR) and Nevada Department of Wildlife (NDOW) have both engaged in translocating Rocky Mountain bighorn sheep to the Pilot Mountain range starting as early as 1987. The DWR translocated a total of 58 bighorns to this unit between the

years 1987 and 1998. This bighorn herd grew to approximately 100 animals by 2010, but suffered from respiratory disease shortly thereafter and has fluctuated between 40 and 70 animals since that time. The herd continues to struggle with respiratory disease and as a result, experiences low lamb recruitment and an inability to increase in size. The herd currently occupies the southern portion of Pilot Mtn, the Leppy Hills, and the Silver Island Mtns.

This herd is regularly surveyed via helicopter in conjunction with NDOW with the most recent survey being performed in 2018. The current population estimate for the Pilot Mtn bighorn herd is 58 bighorn sheep.

Trend Count Classification Data

Year	Pop Est	Total Count	Total Ewes	Total Lambs	Total Rams	Rams > 6 yrs old	Lambs/100 Ewes	Rams/100 Ewes
2003	27	16	7	4	5	-	11	89
2005	8	5	2	2	1	-	100	50
2010	102	61	23	22	16	3	96	70
2011	52	31	14	0	17	9	0	121
2012	70	42	25	1	16	6	4	64
2013	65	39	27	2	10	4	7	37
2014	47	28	17	4	7	5	23	41
2016	40	24	13	1	10	10	8	77
2018	58	35	29	5	10	10	17	3

**ISSUES AND CONCERNS**

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Potential Habitat: We modeled potential bighorn sheep habitat on the Pilot Mountains using methodology outlined by O’Brien et al. (2014). Bighorn sheep select habitat based on the proximity of steep-sloped escape terrain, forage availability, ruggedness, and horizontal visibility (Bleich et al. 1997, Valdez and Krausman 1999, Sappington et al. 2007). Bighorn sheep habitat is located throughout the mountain range (Figure 1).

Livestock Competition: Interactions of bighorn sheep with domestic cattle and domestic sheep are anticipated seasonally. Dietary overlap between cattle and bighorns has not surfaced as a concern with other bighorn populations in the state and is not expected for the Pilot Mountain herd. Bighorn annual use of forage classes, when compared to cattle, differ significantly (Dodd and Brady 1988). Likewise, bighorn sheep generally avoid areas where cattle are present (Bissonette and Steinkamp 1996), and also select areas with a much higher degree of slope (Ganskopp and Vavra 1987), which also minimizes competition for water. Bighorn sheep have the ability to utilize metabolic water formed by oxidative metabolism, preformed water found in food, and surface water, including dew. The amount of surface water required by bighorns is dependent on many factors, including body size, activity, forage moisture content, temperature, and humidity (Monson and Sumner 1980). In hot, dry periods, bighorns will water daily if possible but

have remained independent of surface water for periods of 5-8 days (Blong and Pollard 1968, Turner and Boyd 1970, Turner 1973, Welles and Welles 1961, 1966). Across all seasons, bighorns drink on average every 10-14 days (Welles and Welles 1961). It has been reported, in extreme cases, that bighorns did not drink for a period of several months (Monson 1958, Mendoza 1976). Koplín (1960) found that a captive herd of bighorn sheep that were fed a dry ration and provided unlimited water drank an average of 4.9 liters (1.3 gal) per day.

Disease: Disease, especially bacterial pneumonia, has been responsible for numerous declines in bighorn populations throughout North America (Cassirer and Sinclair 2007). Pneumonia outbreaks typically affect all age/sex cohorts and are usually followed by several years of annual pneumonia outbreaks in lambs that dramatically reduce population growth (Spraker et al. 1984, Ryder et al. 1992, George et al. 2008). These events are attributed to the transfer of pathogens from domestic sheep (*Ovis aries*) or goats (*Capra aegagrus hircus*) to wild sheep through social contact (Singer et al. 2000, Monello et al. 2001, Cassirer and Sinclair 2007). Disease-induced mortality rates in bighorn sheep vary substantially by population due to multiple processes including contact rates, social substructuring, pathogen virulence, and individual susceptibility (Manlove et al. 2014, 2016). Pathogens are known to be in this herd. The DWR is not looking to augment this herd until spatial separation with domestic sheep is solved.

Therefore, spatial separation from domestic sheep and goats is the most important factor in maintaining overall herd health. It is not the intent of this plan or the DWR to force domestic sheep operators off of their ranges or out of business. Rather, the intent is to look for opportunities that will protect bighorn sheep populations while working with the domestic sheep industry.

Predation: Cougar predation may limit bighorn sheep in locations where predator populations are largely supported by sympatric prey populations (Hayes et al. 2000, Schaefer et al. 2000, Ernest et al. 2002), which, in this case, includes mule deer, domestic cattle, and elk. It has been hypothesized that declines in sympatric ungulate populations can increase predation on bighorn sheep as cougars switch to bighorns as an alternate prey source (Kamler et al. 2002, Rominger et al. 2004). It is anticipated that cougars will be the main predator of bighorns on the Pilot Mountains. If predation becomes a limiting factor, predator control work will be administered within the guidelines of the DWR Predator Management Policy. Predator management is coordinated with USDA Wildlife Services.

## **POPULATION MANAGEMENT**

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### **Population Management Objectives:**

- 1) Achieve and maintain a population objective of 125 total Rocky Mountain bighorn sheep.

## **Population Management Strategies:**

Transplant Plan: There are no plans to transplant bighorn sheep into the unit unless domestic sheep grazing is discontinued on the adjacent allotments and prevalence of infected individuals is significantly decreased. Likewise, this population is not suitable to be used as a source herd for transplants because of the high prevalence of infected individuals.

Monitoring: Monitoring of bighorn sheep will be conducted every 2 years by aerial survey to determine lamb recruitment, population status, ram-to-ewe ratios, range distribution, and ages and quantity of rams. This population will likely require 8 hours to conduct a complete trend count and survey adjacent areas to evaluate wild sheep dispersal. Additional ground classification may be conducted as conditions permit. If bighorn sheep are found wandering into areas where there is high risk of contact with domestic sheep or goats, the DWR may remove these animals in accordance with the Utah Bighorn Sheep Statewide Management Plan.

Predator Management: Cougars are likely to be the primary predator of bighorns in this unit. Pilot Mountain is part of a harvest object cougar unit. Very few cougars are harvested in this unit. Predator management will be coordinated with USDA Wildlife Services prior to bighorn release. If predation becomes a limiting factor on bighorns, predator control work will be administered within the guidelines of the DWR Predator Management Policy.

## **DISEASE MANAGEMENT**

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### **Disease Management Objectives:**

- 1) Maintain a healthy population of bighorn sheep on the Pilot Mountains range.
- 2) Maintain spatial separation from domestic sheep and goats.

### **Disease Management Strategies:**

Spatial Separation: There are active domestic sheep allotments with domestic sheep in this unit boundary. The bighorn sheep have been in contact with pathogens and currently there are not efforts to introduce new bighorn sheep until domestic allotments are resolved. DWR is interested in voluntary actions by individual grazers that promote spatial separation.

## **HABITAT MANAGEMENT**

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### **Habitat Management Objectives:**

- 1) Maintain or improve sufficient bighorn sheep habitat to achieve population objective.
- 2) Support and encourage regulated livestock grazing and maintain/enhance forage production through range improvement projects on the Pilot Mountains.
- 3) Improve habitat and water availability where possible.

## **Habitat Management Strategies:**

Monitoring: The DWR will assist land management agencies in monitoring bighorn habitat to detect changes in habitat quantity and quality.

Habitat Improvement: Vegetative treatment projects to improve bighorn habitat lost to natural succession or human impacts will be considered on a case by case basis. The DWR will cooperate with the BLM to utilize seeding, controlled burns, and/or mechanical treatments for conifer removal in order to increase and improve bighorn habitat across the unit. Habitat restoration projects will be planned and executed through the Utah Watershed Restoration Initiative program, allowing for public input to ensure that projects that are beneficial to both bighorn sheep and sympatric cattle are given priority. Until there is no longer domestic sheep grazing lots there is not a high priority to do habitat projects for bighorn sheep. However, if projects come up that can help bighorn sheep and other wildlife species these will be considered. There are portions of Pilot Mountain that are susceptible to juniper encroachment. The majority of the Leppy Hills and Silver Island Mountains are susceptible to short fire cycles and cheat grass monocultures. Areas where habitat improvement projects would immediately improve bighorn habitat include Bettridge Canyon, Miner's Canyon, and Raven's Roost.

Water Improvement: The DWR will work with the BLM and private stakeholders to locate and cooperatively modify or improve existing water sources or install new water developments across bighorn habitat. Current waters that could be improved include Raven's Roost, Leppy Pass overflow tank, and the Silver Island guzzlers.

## **RECREATION MANAGEMENT**

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### **Recreation Management Objectives:**

- 1) Provide quality hunting opportunities on the Pilot Mountains.
- 2) Increase public awareness and expand viewing opportunities of bighorn sheep.

### **Recreation Management Strategies:**

Hunting: Hunting and permit allocation recommendations will be made in accordance with the Utah Bighorn Sheep Statewide Management Plan and in conjunction with NDOW.

Non-Consumptive Uses: The DWR will look for opportunities to increase public awareness and expand viewing opportunities of bighorn sheep through viewing events and public outreach. Significant viewing opportunities exist at Leppy Pass and Miners Canyon.

## **PUBLIC INVOLVEMENT**

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### **Public Involvement Objective:**

- 1) Provide opportunities for local stakeholders and cooperating agencies to be involved in the management process and to jointly resolve potential issues involving bighorn sheep.

### **Public Involvement Strategies:**

Plan Revision: If the population objective or other key components of this plan are to be revised in the future, affected cooperating agencies, local stakeholders, and grazing permittees will be invited to take part in the decision-making process.

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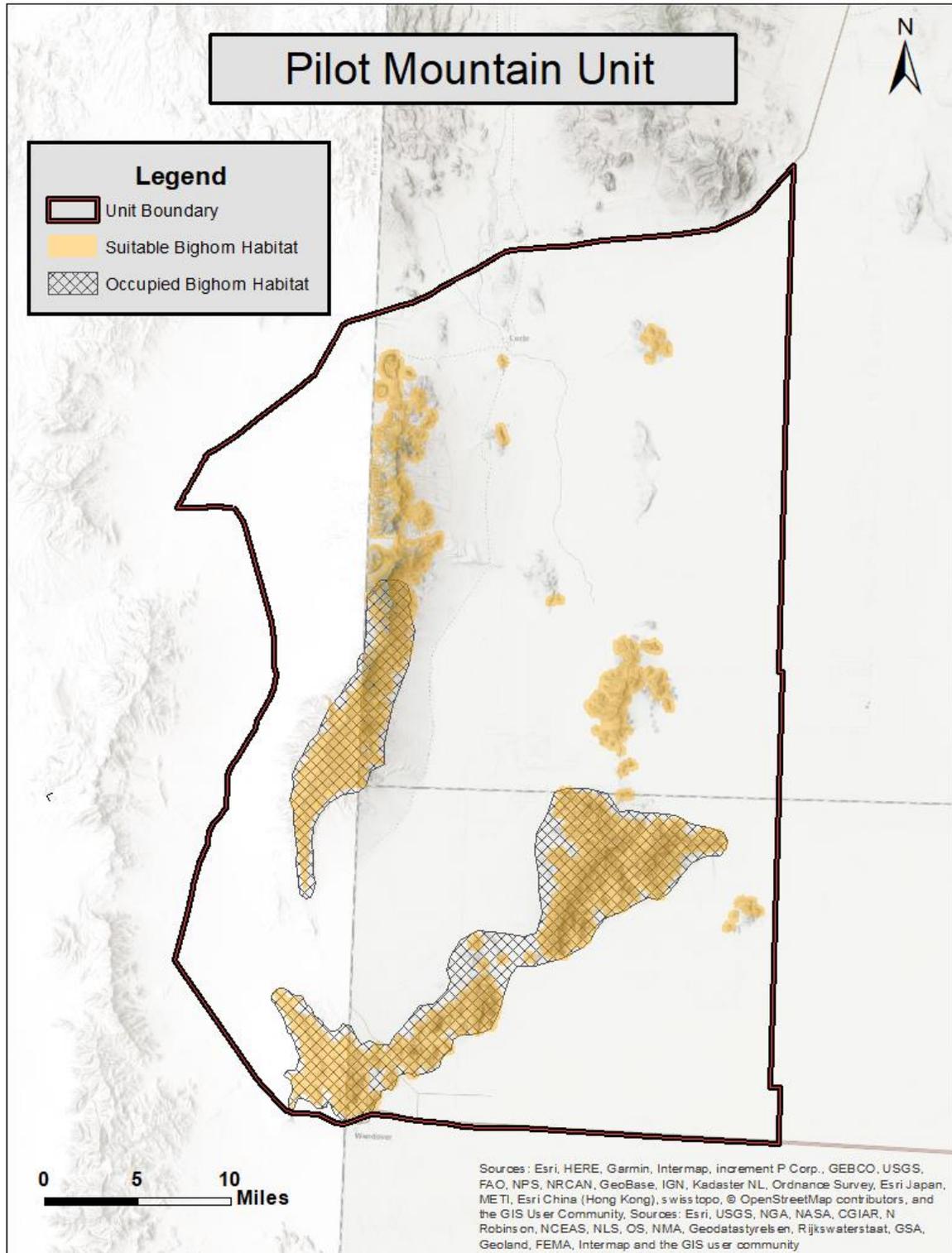


Figure 1. Box Elder, Pilot Mountain unit management boundary (including Nevada portion for hunting), modeled suitable bighorn sheep habitat, and currently occupied bighorn habitat.