

**BIGHORN SHEEP UNIT MANAGEMENT PLAN  
WASATCH MOUNTAINS, WEST  
Provo / Timpanogos  
August 2019**

**BOUNDARY DESCRIPTION**

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Salt Lake, Summit, Utah and Wasatch counties –

**Provo** – Utah and Wasatch counties--Boundary begins at US-189 and US-40 in Heber; south on US-40 to the Strawberry Bay Marina road; south on this road to USFS Road 042 (Indian Creek road); south and west on this road to USFS Road 051; south on this road to US-6; northwest on US-6 to I-15; north on I-15 to I-80 in Salt Lake City.

**Timpanogos** – Salt Lake, Summit, Utah and Wasatch counties—Boundary begins at I-80 and I-15 in Salt Lake City; east on I-80 to US-40; south on US-40 to US-189; southwest on US-189 to 800 N in Orem; west on 800 N to I-15; north on I-15 to I-80.

**LAND OWNERSHIP**

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Land ownership and approximate area of modeled bighorn sheep habitat for the Wasatch Mountains, West bighorn sheep management sub-units.

**Provo**

Ownership	MODELED BIGHORN HABITAT	
	Area (acres)	%
National Forest	132,436	78.1%
Private	29,633	17.5%
Utah Division of Wildlife Resources	6,500	3.8%
Utah State Institutional Trust Lands	513	0.3%
Bureau of Land Management	451	0.3%
Utah State Parks	123	0.1%
Utah Department of Transportation	3	<0.1%
<b>Totals</b>	<b>169,659</b>	<b>100%</b>

## Timpanogos

Ownership	MODELED BIGHORN HABITAT	
	Area (acres)	%
National Forest	71,298	58.2%
Private	37,568	30.7%
Utah State Parks	10,587	8.6%
Utah Division of Wildlife Resources	1,927	1.6%
Bureau of Land Management	409	0.3%
Bureau of Reclamation	265	0.2%
National Parks	205	0.2%
Utah State Institutional Trust Lands	171	0.1%
Utah Department of Transportation	43	<0.1%
Department of Defense	21	<0.1%
<b>Totals</b>	<b>122,495</b>	<b>100%</b>

## BACKGROUND AND CURRENT STATUS

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Bighorn Sheep are native to the Wasatch Mountains (Dalton and Spillett 1971). Bighorns were reported in 1926 and 1927 on Mount Timpanogos, which was one of the last sightings prior to extirpation from Utah, and skeletal remains have also been found at various locations across the Wasatch Mountains (Dalton and Spillett 1971). Between 2000 and 2007, eighty-two bighorn sheep were released on Mount Timpanogos. The first release was 25 individuals from Desolation Canyon, UT in 2000. Ten from Hinton, AB were released the following year. Nine bighorns from Sula, MT were released in 2002. Twenty from Sula and 18 from Alomosa, CO were transplanted in 2007 (Shannon et al. 2008). Additional transplants were conducted in Rock Canyon east of Provo, 22 from Hinton, AB in 2001 and 10 from Sula, MT in 2007. Cause specific mortality studies conducted in this unit have identified cougar predation, automobile collisions, and disease as the main causes of mortality (Shannon et al. 2008). Commingling of bighorn sheep with domestic sheep and goats has been documented multiple times with resulting die-offs (Shannon et al. 2014) and subsequent poor lamb recruitment. Due to this herd's proximity to urban interface and domestic farm flocks, disease risk remains the biggest threat to the persistence of this population. The estimated population size typically hovers between 40 and 60 individuals with a recent uptick to approximately 80 individuals.

## ISSUES AND CONCERNS

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Habitat: We modeled potential bighorn sheep habitat on the Wasatch Mtns, West unit 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 unit (Figure 1). Additional habitat exists in areas that have become

dominated by old growth vegetation that have reduced value to bighorns. Fire would help return these areas into productive early successional stages and would allow bighorn sheep to expand their range throughout the Wasatch Mtns, West unit.

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). 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, mountain goats, 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). Cougars are the main predator of bighorns on the Wasatch Mtns, West unit. 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. Predator reduction work already occurs on the unit in conjunction with livestock losses, and therefore any additional work that may be done would be mutually beneficial to both livestock and other big game species.

## **POPULATION MANAGEMENT**

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### **Population Management Objectives:**

- 1) Achieve and maintain a population objective of 250 total Rocky Mountain bighorn sheep, ideally with 125 animals in each subunit.

### **Population Management Strategies:**

Transplants: Given the exposure of this herd to pneumonia related pathogens, it is not anticipated that transplants to or from this unit will occur unless repeated testing shows that the pathogens are cleared from the population. This is to protect naïve bighorns from being exposed to disease and to prevent disease outbreaks.

Monitoring: Monitoring of bighorn sheep will be conducted every 2-3 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 4-6 hours to conduct a complete trend count. Additional ground classification may be conducted as conditions permit. GPS collars with mortality signals may be used to document cause-specific mortality and identify annual survival estimates. 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: Predator management will be coordinated with USDA Wildlife Services on an as-needed basis. 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 Rocky Mountain bighorn sheep on the Wasatch Mtns, West unit.
- 2) Maintain spatial separation from domestic sheep and goats.

### **Disease Management Strategies:**

Disease Monitoring: The DWR may perform periodic live captures to assess herd health, as well as take advantage of opportunistic sampling of hunter harvested bighorns or bighorns that are found dead.

Spatial Separation: Active domestic sheep allotments and farm flocks with domestic sheep will be evaluated for potential of disease risk. The DWR may delineate areas where there is high risk for domestic sheep and goats to come in contact with wild sheep or where wild sheep may stray and come in contact with domestics. These areas will be considered areas of concern. A major source of potential pathogen transmission for the bighorns in this unit is commingling with farm flocks in the residential areas directly beneath the suitable bighorn habitat. Lethal or non-lethal removal of bighorns may be warranted in these areas to prevent comingling. Likewise, wandering domestic sheep or goats found near bighorn where not permitted may be removed in accordance with DWR guidelines GLN-33. The need to test wandering sheep or domestics from this unit will be evaluated on a case by case basis.

## **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 Wasatch Mtns, West unit.
- 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 sought out and initiated. The DWR will cooperate with land management agencies to utilize seeding, prescribed 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 other species are given priority.

## **RECREATION MANAGEMENT**

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### **Recreation Management Objectives:**

- 1) Increase hunting opportunities while maintaining quality hunting experiences.
- 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. Permit recommendations will be made based on 12-25% of the counted ram population (yearling and older) or 30-60% of the counted rams 6 years of age or older. Hunting seasons will be recommended to provide maximum recreational opportunity while not imposing on UDWR management needs. Hunting may be used as a tool to regulate density of bighorn sheep to reduce risk of pathogen transmission. Size and age class of harvested rams will be monitored. Ewe hunts may be utilized as a tool for maintaining population objective.

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.

## **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, unit boundary, or other key components of this plan are to be revised in the future, the public will be allowed to be included in the decision making process through public RAC and board meetings.

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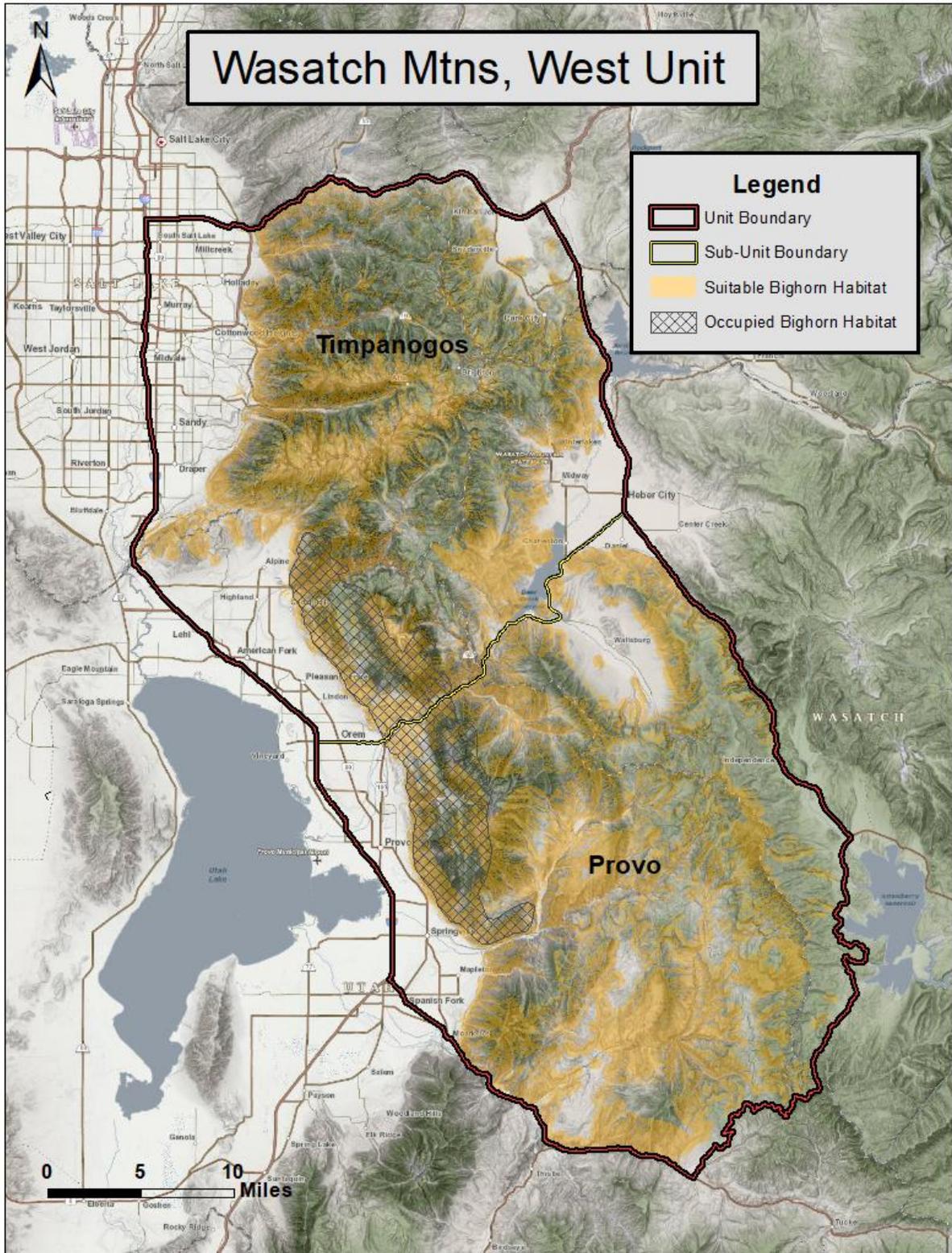


Figure 1. Wasatch Mountain, West unit management boundary, modeled suitable bighorn sheep habitat, and currently occupied bighorn habitat.