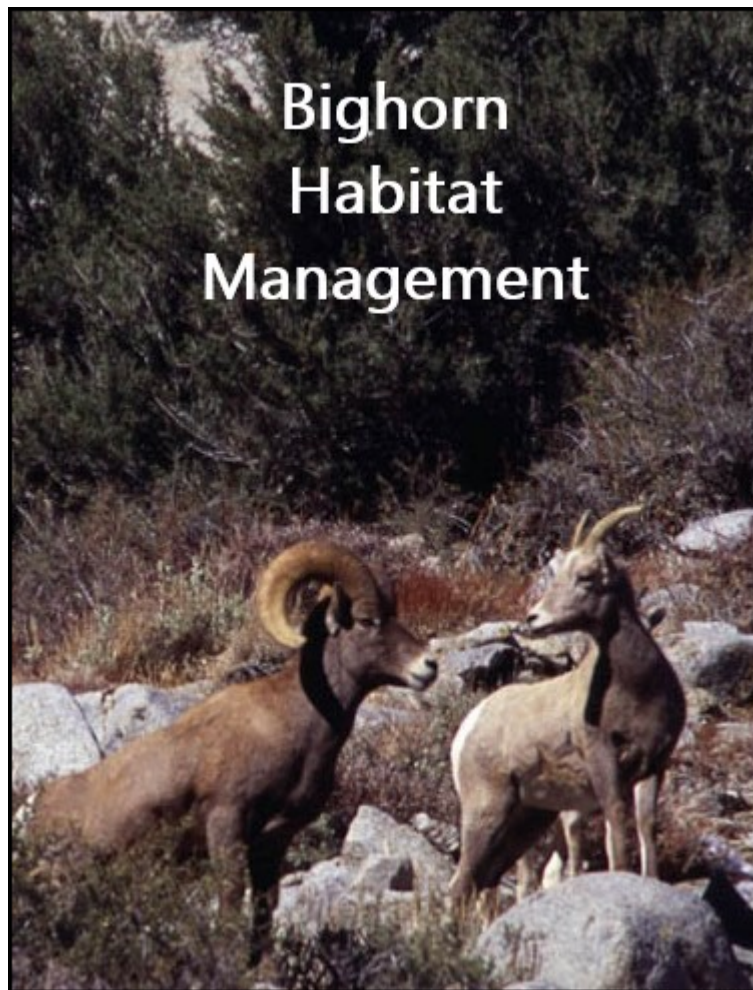


## **Habitat: The Missing Element in Montana's Bighorn Strategy**

Let's face it. Bighorn conservation and management throughout the West, maybe especially in Montana, has been a failure. We have mostly small, isolated, inbreeding herds scattered across a miniscule portion of their native range. There are periodic dieoffs followed by persistent lamb mortality. Abundant habitat, too close to ubiquitous domestic sheep, is off limits for bighorns. Montana has been unable to transplant animals to establish a new herd in over a decade. A huge demand for hunting permits is unfulfilled. It is time to reevaluate strategies and test new tactics.



Aside from its social/political aspects, wildlife management has two parts: population management and habitat management. Montana's bighorn strategy emphasizes population management, largely neglecting habitat management. Activities include transplants, harvest management, and elimination of foraging bighorns.

Bighorn transplants were once common, returning the species to many areas where they had been eliminated. Some transplants flourished temporarily. But the many small, struggling herds of today are the primary legacy of past transplants. Montana has not found a suitable new transplant site in almost ten years.

Today's herd management consists largely of harvest control. Rams are taken, even from the smallest herds, despite probable negative effects on already compromised herd genetics. Rarely, ewes are harvested to limit already small herd sizes, largely to forestall "excess animals" from traveling toward disease-carrying domestic sheep or goats.

The major emphasis of management is to prevent contact of bighorns with domestic sheep or goats. Such contact almost always produces lung disease in bighorns, often resulting in a dieoff of over half the bighorn herd. Preventing contact includes eliminating any bighorn approaching a domestic flock.

The policy of maintaining small and sedentary bighorn herds has not been satisfactory. Small bighorn herds are normally limited or diminished by predation. Their inbreeding produces low-quality animals that are especially susceptible to disease and some inbred animals persist as carriers that infect lamb crops for years. The process of genetic drift further diminishes and disorganizes the once-adapted herd genetics.

**Is there a solution to this bighorn problem in habitat management?** First, we must consider the history and nature of bighorn habitat.

Bighorn sheep are habitat specialists. They are designed to forage in large groups within secure habitat. Habitat security is largely a function of visibility and proximity to steep, broken terrain where they may outmaneuver predators. Visibility is important in detecting danger, and in visually communicating any detected threats among animals. Habitat security is reduced by trees or shrubs that diminish visibility of the surroundings.

A robust bighorn herd uses six seasonal ranges connected with secure migration corridors. Males and ewe/juvenile groups have separate winter and summer ranges and there is a rutting area and a lambing area, the latter on especially steep, cliffy terrain.

But such a complete bighorn habitat may be diminished as some habitats are degraded by visibility-obstructing forest or shrub encroachment and/or by human developments including housing, roads, railroads, reservoirs and fences. Bighorn herds that have declined may lose their herd-memory of such degrading ranges and migration corridors. Moreover, newly transplanted herds will require years to reestablish a complete pattern of habitat use, especially if the herd remains small, and if attractive habitat is not nearby a transplant site.

The historical decline of bighorns from unregulated hunting and livestock diseases was followed by decades of fire suppression that allowed visibility-obstructing tree encroachment to degrade bighorn ranges and migration corridors. Seasonal ranges and migration corridors were abandoned and lost from herd memories. Bighorns, males and females, concentrated more in time and space. The number of separate seasonal ranges declined, increasing impacts on forage resources and enhancing transmission of diseases, such as lungworm, that are transmitted through the environment.

### **Are there opportunities to improve bighorn habitat on Forest Service lands?**

In western Montana, much historical bighorn range is on Forest Service land where tree encroachment has degraded habitat, especially in the interiors of Forest Service lands. Much remaining bighorn habitat is at and near the upper tree line and, especially, the lower tree line where forest encroachment has least degraded bighorn habitats.

Lower treelines tend to be along Forest boundaries. Thus, many of today's bighorn ranges include considerable private land, or Bureau of Land Management land, where domestic sheep are grazed in commercial herds or in small herds on small family tracts. Research suggests that the more private land within a herd's range, the more likely the herd has suffered a pneumonia dieoff, most likely from contacting domestic sheep or goats.

Habitat improvement has great potential for reestablishing larger, more resilient bighorn herds on Forest Service lands in Montana. The goal must be to reestablish a complete suite of year-round ranges and migration corridors in the interiors of Forest Service lands where contact with domestic sheep is less likely. Apparently, the Forest Service does not recognize this need or potential. It seems satisfied with several small, struggling bighorn herds, mostly along the boundaries of Forests.

Usually, the Forest Service contends that its mandate to provide secure bighorn habitat is fulfilled using a "coarse filter" strategy to guide habitat assessment. This strategy assumes that if the amounts of several broad categories of vegetation (aspen, meadows, mixed-conifer forests, etc.) are maintained within their historical

ranges of variation across the Forest, the habitat needs of all native species must be met. The approach fails for bighorn by neglecting the species need for the spatially combined habitat factors of visibility and steep terrain, and for spatial connectivity of habitat units. Moreover, the approach neglects substantial separation from domestic sheep or goats as a habitat-security requirement.

The potential for mechanical tree or shrub removals to enhance bighorn habitat by increasing visibility is limited - because they are expensive. Offsetting expenses by cutting commercial timber will generally fail in that it directs activity toward areas with larger densities of larger trees. Such areas lack steep terrain and have environmental conditions favoring rapid reforestation. Prescribed fire, located strategically to benefit bighorns, has the most habitat management potential. Aside from enhancing habitat visibility, forage conditions on recent burns often attract bighorns. Wildfires can likewise benefit bighorn habitat, but such fires are, at best, located randomly, not strategically, in potential bighorn ranges.

There has been a tendency to focus big-game habitat improvements on the currently known and used ranges of the animals, especially winter ranges. For bighorns, this is only an attempt to maintain the status quo. To enhance most bighorn herds, habitat management must also be focused on expanding the currently inadequate suite of bighorn ranges.

### **How to proceed?**

- 1) Montana Fish, Wildlife & Parks and the Forest Service should jointly recognize the need to enhance the abundance, security and resiliency of bighorn herds in western Montana. A joint commitment to a long-term strategy is necessary.
- 2) Based on existing knowledge of bighorn herds, and environmental and social conditions, at least two herds should be selected for implementing an initial recovery strategy.
- 3) Using marked bighorns and radio telemetry, year-round use of habitat should be determined. Using these data with vegetation and topographic data, the focus would be to locate existing sex-specific winter and summer ranges, lambing areas, rutting areas and likely migration corridors. The data would also be used to identify areas for likely expansion of seasonal bighorn use toward the interiors of the Forests.
- 4) Strategically located habitat improvements should be initiated, most likely with prescribed fire. Strategic locations would include the perimeters of current use-areas and likely migration corridors. Cliffy areas, southward-facing slopes and ridgelines will be the best candidates for long-lasting forest removal. Annual evaluations of habitat changes and bighorn responses would be used to sequentially expand the program, generally in the interiors of the Forests.

- 5) It is possible that a small bighorn herd may not respond to habitat improvements due to population limitation by predation and/or due to poor genetic quality of a herd that has been small for a long time. It may be necessary to rectify these limitations. Predation might be rectified with control of likely predators, especially mountains lions, and by improving visibility and habitat security first in areas where bighorns, especially lambs, are known to be killed. Genetic limitations may be removed by adding new animals for outbreeding. Local transplants may be used to hasten herd recognition of newly improved habitats that have been abandoned for years.

Jim Bailey, Belgrade 2019

