Transplant Species: Bighorn Sheep

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Addison Stott
Research Assistant

Cade Bloomer
Research Assistant

UVU GARY R. HERBERT INSTITUTE *for* PUBLIC POLICY
800 W University Pkwy, Orem, UT 84058
801-558-9371 | uvu.edu/herbertinstitute/

Introduction

Utah is home to two native types of bighorn sheep, the desert bighorn sheep and the Rocky Mountain bighorn sheep. Both play a crucial role in the ecosystems in Utah and within their respective biomes. Petroglyphs across the state depict bighorn sheep, indicating that they not only serve an important role now but have done so since Indigenous people occupied the region. Due to disease, habitat loss, and overhunting, the population of these sheep has steadily declined in recent years. Translocation efforts are hoping to address these challenges; some have already been successful. These efforts are not only helping to restore populations but they help to increase biodiversity and ecosystem balance and even support the state's economy through wildlife tourism and hunting. This paper will analyze the history of bighorn sheep transplant efforts—their successes and their remaining challenges.

HISTORY

Bighorn sheep have a long-standing history in Utah. Archaeological evidence indicates they were important historically to Indigenous People. Early explorers in the region documented an abundance of bighorn sheep, highlighting their ecological prominence in Utah's diverse landscapes.[i] By the late nineteenth century, however, their populations began to decline sharply due to overhunting, habitat fragmentation resulting from agricultural and urban expansion, and diseases introduced by domestic livestock. One particularly devastating disease, *Mycoplasma ovipneumoniae,* led to fatal pneumonia outbreaks, significantly reducing bighorn populations across the region.[ii]

Recognizing the urgency of the decline, conservationists' efforts began in the mid-twentieth century. Early projects primarily focused on desert bighorn sheep, considered the most at-risk subspecies due to their already diminished populations and the challenges of surviving in Utah's dry southern landscapes. Initial efforts aimed to establish protected habitats, reduce predator threats, and reintroduce desert bighorn sheep into areas where they had been eradicated. Translocation programs were critical in these early stages, relocating bighorn sheep from healthier populations in neighboring states to restore herds in Utah. These projects helped stabilize desert bighorn populations and provided a foundation for expanding conservation efforts to include other subspecies, such as the Rocky Mountain and California bighorn sheep.[iii]

As conservation strategies evolved, the Utah Division of Wildlife Resources (UDWR) implemented additional measures to address the growing threats to bighorn sheep. These included intensive monitoring programs to track population health, disease management initiatives to reduce the impact of pathogens like *Mycoplasma ovipneumoniae*, and habitat enhancement projects to ensure the availability of critical resources such as forage and water. Collaborative partnerships with organizations like the Utah Wild Sheep Foundation further supported these efforts, fostering public awareness and funding for continued research and habitat protection.[iv]

Today, Utah is home to three primary subspecies of bighorn sheep—the desert bighorn sheep, Rocky Mountain bighorn sheep, and California bighorn sheep. These populations inhabit a range of ecosystems, from the desert landscapes of southern Utah to the rugged mountainous terrains in the northern part of the state. For example, desert bighorn sheep have adapted remarkably well to southern Utah's extreme heat and limited water availability, with an estimated population of approximately 2,900 individuals—a testament to the success of conservation initiatives targeting this subspecies.[v]

Despite significant progress, challenges remain. Disease transmission from domestic livestock continues to pose a critical threat, requiring ongoing collaboration between wildlife managers, ranchers, and conservation organizations. Habitat fragmentation from development and recreational activities also necessitates careful planning to ensure long-term protection for bighorn sheep populations.

TRANSPLANT METHODS AND TECHNIQUES

Before relocating animals, thorough research must be done to determine if the new habitat meets specific requirements. If it's an area of human activity, a balance must be maintained between animals and people. For habitat sustainability, the location should provide ample space, resources, and a low risk of disease. Humane methods are used to capture animals with minimal stress, such as corral traps, which create large, fenced enclosures where animals are lured with bait and cannot escape. Drop-nets, another method, involve suspending a net above bait and releasing it remotely once animals gather beneath.[vi] Helicopter netting allows teams to track animals from the air, deploying a net when the animal is in position.[vii] After relocation, specialists closely monitor the animals using GPS, cameras, remote collars, ground surveys, and helicopter observation to ensure they are adapting well.[viii] Sick animals are removed to control disease spread, while data is gathered on movement, survival, and herd distribution in the new environment.[ix]

KEY TRANSPLANT PROJECTS IN UTAH

According to the Utah Department of Wildlife Resources (DWR), there are approximately 1,500 Rocky Mountain bighorn sheep that live mostly in the northern and eastern parts of the state, a testament to many successful bighorn sheep transplants to the region.[x] Some key transplant projects for these sheep have occurred on Antelope Island. Sheep have historically been on the Island but nearly went extinct in the early twentieth century. They were reintroduced to the island in 1997 but suffered a disease outbreak that took the population from over 200 animals at their reintroduction to less than 10 in late 2019.[xi] The DWR's current plan to supplement the sheep population is to transplant sheep, while maintaining the habitat and health of these sheep. Their population objective is 125 sheep.[xii]

Roughly 2,900 desert bighorn sheep reside in canyonland areas of southern Utah.[xiii] A major transplant project for these sheep is in Zion National Park. Up until their near extinction in the 1950s,

there was an abundance of bighorn sheep in and surrounding Zion National Park. Between 1970 and 1990, reintroduction efforts waxed and waned between successful reproduction and detrimental diseases. The population started to stabilize in 2008. The DWR's current plan is to maintain a population of 500–600 sheep while, again, monitoring for disease and for competition with local livestock to make sure there are enough resources to maintain both populations.[xiv] These are just two examples of the many projects the DWR is working on to maintain a healthy population of bighorn sheep throughout the state.

BENEFITS OF BIGHORN SHEEP TRANSPLANTS

Reintroducing sheep into areas with dwindling populations restores balance. When a variety of sheep from a variety of locations come together, it enhances genetic diversity and the health of the sheep.[xv] Transplanting bighorn sheep also helps restore predator-prey dynamics. When a species is lost or its population declines, the food chain is disrupted. This can lead predators to target prey they wouldn't normally hunt, causing further problems for other species that rely on that prey as a food source.[xvi] Bighorn sheep transplantation provides economic benefits as well. Increasing their population can boost wildlife tourism, generating more funding for state parks and wildlife conservation efforts.[xvii] Additionally, stabilizing bighorn sheep populations creates opportunities for regulated hunting. Permits for bighorn sheep hunting are limited, and are also among the most expensive available.[xviii] In Utah, hunting permits are used to fund wildlife management programs.[xix]

Bighorn sheep also hold cultural significance. Petroglyphs found across Utah frequently depict horned sheep, emphasizing their importance to Indigenous peoples. Native tribes relied on these animals for food, tools, and clothing, making bighorn sheep conservation vital to preserving cultural heritage.[xx] Conserving bighorn sheep through translocation provides ecological, economic, and cultural benefits, making it a worthwhile investment.

CONCLUSION

Bighorn sheep have had, and continue to have, an important place in Utah. Despite different diseases, climate change, and agricultural and economic expansion, their presence within the state has persevered. Conservation efforts by the Department of Wildlife Resources and the Department of Natural Resources have helped significantly to ensure bighorn sheep continue to play an important role in the ecosystem as well as the economy of Utah. Ongoing funding and advocacy for the bighorn sheep across Utah would continue to provide conservation and growth for these valuable species.

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