# Examining the Influence of Ecotypic Variation and Environmental Factors that Contribute to the Success of Translocated Bighorn Sheep

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**ABSTRACT:** Bighorn sheep (*Ovis canadensis*) were extirpated from much of their historic range in the 19th and 20th centuries because of widespread disease. In response, translocations emerged as a valuable restoration tool to return bighorn sheep to their native range in North America, but many of these translocated populations were characterized by low recruitment, limited range expansion, and poor population performance. Some investigators have implicated a failure to consider local adaptations to environmental conditions as a factor limiting translocation success, but research examining region-specific environmental factors has been limited. Our objective is to examine the spatial and temporal differences in resource selection between male and female bighorn sheep in the Little Missouri River region of North Dakota, an area that is most appropriate for the Rocky Mountain ecotype, and Antelope Island in Utah, which is most appropriate for the desert ecotype. Historically, populations at both locations experienced poor performance because of possible ecotype mismatch, but they are now improving after the addition of stock from source locations that more closely align with their release sites. The addition of bighorn sheep ecotypes from source environments that more closely align with the target environment might appear to be a strong predictor of improved population trajectories. To evaluate factors that might positively influence population trajectories, we are using resource selection functions to compare selection patterns in both locations. Our results will contribute to the improvement of restoration strategies and enhance translocation success.

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**KEYWORDS:** Antelope Island, bighorn sheep *(Ovis canadensis)*, desert ecotype, Little Missouri River, North Dakota, resource selection, Rocky Mountain ecotype, spatial temporal distribution, translocation, Utah.