

Behavior-Specific Habitat Models as a Tool to Inform Ungulate Restoration

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GPS data is broadly used in wildlife research and management to construct habitat models and can help to inform translocation efforts. However, for species with both resident and migratory behaviors, a single population habitat model may not predict the varying selection patterns of residents and migrants as well as separate resident and migrant habitat models. Moreover, through developing behavior-specific habitat models managers can strategically target source populations with the behaviors that best match the landscape attributes of the areas being restored. Such targeted translocations may increase translocation success and help to build diverse migratory portfolios in restored populations. We used resource selection functions to develop an annual resident model as well as summer and winter migrant models using GPS locations from female bighorn sheep in eight (resident = 2, migrant = 6) populations that were broadly distributed across western Montana. We extrapolated each model with the purpose of generating broad spatial predictions of bighorn sheep habitat and informing future translocations. Terrain and landscape covariates most strongly influenced resource selection for both behaviors in all seasons. The habitat predictions from the annual resident and winter migrant model strongly overlapped on rugged and steep slopes at low to mid elevations across western Montana. The habitat predictions from the summer migrant model were largely nonoverlapping with residents and broadly distributed across high elevations. Our behavior-specific habitat extrapolations across western Montana serve as a tool to inform future translocations into new areas or expand the distribution and migratory portfolio of existing populations.