Predicted Habitat and Movement Corridors for Grizzly Bears in Western Montana

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Once-contiguous grizzly bear (*Ursus arctos*) populations remain largely isolated in the western US. Research has been needed to understand habitat use and assess potential corridors that could promote genetic and demographic connectivity among recovery ecosystems. Accordingly, our objective was to model grizzly bear habitat use, movements, and population connectivity. We employed GPS data from male and female grizzly bears in Montana's Northern Continental Divide Ecosystem (NCDE) and an integrated step selection function approach to test hypotheses of habitat selection and simulate movements. Results demonstrated highly individualistic behaviors, with some individuals avoiding and others preferring various features like forest edge, riparian areas, and secure habitat. Such individualism supported the need for an individual-based modeling approach to understand and predict grizzly bear behavior. Simulation of movements using each individual's model within and near the NCDE produced habitat maps with high predictive power. Simulated pathways from the NCDE to nearby recovery areas revealed corridors bears may use under varying levels of exploratory versus optimal movements. The predicted habitat and corridors identified by our study can be targeted for proactive conservation efforts such as conservation easements, conflict prevention, and road mitigations to help recover grizzly bears in western Montana and beyond.
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