Corridors for Conservation: Integrating Pattern and Process

Cheryl-Lesley Chetkiewicz, Colleen Cassady St. Clair, and Mark S. Boyce
University of Alberta, Edmonton, AB, Canada
E-mail: cbc2@ualberta.ca

Corridors are commonly used to maintain connectivity for wildlife populations, but often neglect processes of habitat selection and movement of animals.

Process-based approaches are needed if corridors are to fulfill their conservation promise.

New technologies and analytical tools make it possible to better integrate landscape patterns with behavioural processes to improve corridor design, implementation and study.

Corridor designs based on patterns of habitat and non-habitat neglect the continuum of habitats in which animals really occur.

Resource selection functions (RSF) characterize habitats in a gradient-based, multivariate way.

Location data from Global Positioning System (GPS) radiotelemetry on grizzly bears (Ursus arctos) and cougars (Puma concolor), were used to develop seasonal RSFs for two landscapes in the Canadian Rocky Mountains.

Mapping RSFs in a Geographic Information System (GIS) represents areas with high probability of occurrence (green) relative to areas of low probability of occurrence (red).

Movement processes are seldom explicitly included in corridor designs. GPS radiotelemetry provides detailed spatial and temporal information about movement, particularly for large, wide-ranging species.

GPS locations of 9 grizzly bears and 16 cougars were quantified into movement pathways (a), step lengths (b), and turning angles (c). Areas of high movement and straight pathways can indicate potential corridor locations.

Movement patterns (i.e., deflecting or channeling) at habitat edges can support corridor locations and designs.

Too often corridor planning ignores key behavioural processes of habitat selection and movement. Process-based approaches to corridor design are needed.

Key processes of habitat selection and movement can be quantified using GPS and GIS technologies and RSF analyses.

Key processes can be integrated with landscape patterns using several tractable techniques such as LCP analyses and SSFs.

Using these tools and techniques can overcome current limitations of identifying and designing corridors for functional connectivity.

Acknowledgements

Literature Cited