

**COMBINING LINE AND POINT TRANSECT ADAPTIVELY**

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Several mountain ungulates species present an important degree of aggregation in animals spatial distribution. Mountain topography often makes it difficult to traverse transects, and visibility problems frequently arise due to rocks and trees. We argue that distance sampling could be a useful method to sample this species; however, assumptions can be easily violated and adjustments to the conventional distance sampling methodology need to be done. Also density estimators will not be so precise as expected. Pollard and Buckland (2004) presented a fixed-effort adaptive line transect sampling with a zigzag design that proves to be useful for patchy populations. However, this kind of design would be impractical for mountain terrains.

We proposed a new distance sampling protocol where lines and points are combined using an adaptive approach. This design can be useful to sample rare or evasive populations in difficult habitats or terrains. Under this protocol point transects are allocated according to a trigger condition. For instance, distances between detections along the line could indicate high or low density of animals in the neighbouring area. To evaluate the performance of the new method, we use a simulation study under several patchy population scenarios and compare to conventional transect designs,