

A Comparison of Randomized and Fixed Bridge Sampling Sites for Estimating River Otter Distribution: A Case Study in Imperfect Detection Probabilities

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Abstract: Randomization of survey sites is generally preferred over using predetermined fixed sites for most sampling designs due to its unbiased approach and improved interpretation and inference of results. However, a completely randomized approach to sample site selection often leads to serious logistical complications and is often abandoned in favor of fixed sample sites. We conducted sign surveys for river otters (*Lontra canadensis*) on the Big Piney and Osage Fork rivers in southern Missouri using randomized survey points ($n = 60$) and fixed bridge crossing points ($n = 20$) in summer and winter 2001 and 2002. In each season of each year, we conducted two samplings on three 10-mile sections of each river. Otter sign was more likely to be located at random sampling sites than bridge sites on both rivers in winter and summer ($P < 0.05$). Random sampling sites had a greater mean number of scats per site than did bridge sites for both rivers, although this trend was only significant on the Osage Fork ($P < 0.05$). Our results indicate that sampling of fixed crossing sites may not be an effective method for determining river otter distribution or abundance, despite the logistical advantages that it affords. This is potentially due to the increased human activity at fixed bridge crossings, with otters being more likely to deposit scat at latrine sites that occur farther from fixed bridge crossings. More advanced techniques, such as occupancy modeling, may be required to accurately estimate river otter distribution if sampling at fixed bridge sites is to continue.

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