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ORIGINAL PAPER

Eurasian otter (*Lutra lutra*) density estimate based on radio tracking and other data sources

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Abstract Estimating animal population size is a critical task in both wildlife management and conservation biology. Precise and unbiased estimates are nonetheless mostly difficult to obtain, as estimates based on abundance over unit area are

frequently inflated due to the “edge effect” bias. This may lead to the implementation of inappropriate management and conservation decisions. In an attempt to obtain an as accurate and conservative as possible picture of Eurasian otter (*Lutra lutra*) numbers, we combined radio tracking data from a subset of tracked individuals from an extensive project on otter ecology performed in Southern Portugal with information stemming from other data sources, including trapping, carcasses, direct observation of tagged and untagged individuals, relatedness estimates among genotyped individuals, and a minor contribution from non-invasive genetic sampling. In 158 km of water network, which covers a sampling area of 161 km² and corresponds to the minimum convex polygon constructed around the locations of five radio-tracked females, 21 animals were estimated to exist. They included the five radio-tracked, reproducing females and six adult males. Density estimates varied from one otter per 3.71–7.80 km of river length (one adult otter per 7.09–14.36 km) to one otter per 7.67–7.93 km² of range, depending on the method and scale of analysis. Possible biases and implications of methods used for estimating density of otters and other organisms living in linear habitats are highlighted, providing recommendations on the issue.

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Introduction

Estimating wildlife population size is a major goal for conservation biologists, who are often called upon to provide policy makers with pertinent data regarding rare or endangered species. Inaccurate estimates, especially overestimations, represent a serious threat to wildlife conservation, in that they may lead to less conservative management practices and conservation strategies. This may result in local extirpations or reserve sizes too small to support viable populations. Estimating