

Public Abstract

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Title:A genetic approach to determine river otter abundance in Missouri

Extirpated from Missouri by the 1930s, river otters (*Lontra canadensis*) were reintroduced by the Missouri Department of Conservation (MDC) between 1982 and 1992. Since the reintroductions, concerns over the legitimacy of otter trapping and the predator's effects on sport fish populations have sparked controversy. The MDC responded by increasing efforts to monitor river otter populations, using latrine site counts to measure relative abundance across several rivers in Missouri. However, the actual number of otters represented by these counts was unknown. To address this question, I extracted DNA present on the surface of scat samples collected along 8 rivers in southern Missouri in the winter and spring of 2009. I used a panel of 10 microsatellite markers (segments of DNA containing repeated base pairs, the number of which varies between individuals) plus sexing markers to genotype (or fingerprint) and sex individual otters to determine the population size and sex ratio. I identified 63 otters (41 males, 22 females) across the 8 rivers, with population sizes ranging from 2 in the Niangua River (density 0.069 otters/km) to 14 in the Big Piney River (density 0.511 otters/km). I then developed a model to estimate population size from latrine site index variables, observing that the number of scats per latrine and the density of active latrines across the river best predicted population size. I then used the genotypes to calculate the genetic diversity of the otter populations, evaluate the distribution of genotype clusters across the landscape, and track individual otter movements between latrines. Unexpected genetic similarities in geographically distant rivers indicated that otters translocated to different areas may have come from the same source populations, and have not yet developed population substructure related to their current Missouri environments. Overall, this project has demonstrated the utility of genetic methods for estimating otter abundance, provided insight into the genetic diversity of the populations, and presented a model for inexpensive monitoring of river otter populations in the future.