Recovery of Wolverines in the Western United States: Recent Extirpation and Re-Colonization or Range Retraction and Expansion?

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Wolverines (*Gulo gulo*) were greatly reduced in number and possibly extirpated from the contiguous U.S. by the early 1900s. Wolverines currently occupy much of their historical range in Washington, Idaho, Montana, and Wyoming, but are absent from California, Utah, and Colorado. In response, the reintroduction of wolverines to California and Colorado is being considered. If wolverines are to be reintroduced, it will be necessary to determine the genetic affinities of historical and modern wolverine populations, and identify appropriate source populations. We amplified the mitochondrial control region of 13 museum specimens dating from the late 1800s to early 1900s and 202 wolverines from modern populations in the contiguous U.S. and Canada, and combined resulting data with previously published haplotypes. Collectively, these data indicated that historical wolverine populations in the contiguous U.S. were likely extirpated by the early 20th century. The "Cali1" haplotype previously identified in California museum specimens was also common in the southern Rocky Mountains, and likely evolved in isolation in the southern ice-free refugium that encompassed most of the contiguous U.S. during the last glaciation. Modern wolverines in the contiguous U.S. are primarily haplotype "A" which is the most common and widespread haplotype in Canada and Alaska. For the reintroduction of wolverines to California, Colorado, and other areas in the western U.S., potential source populations in the Canadian Rocky Mountains may provide the best mix of genetic diversity and appropriate learned behavior.