

Phylogeographic Investigation of Bighorn Sheep in California

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Abstract: Many bighorn sheep subspecies (*Ovis canadensis* spp.) differences proposed in 1940 have not stood up to recent morphometric and genetic analyses when coupled with a sound definition of subspecies. However, the suggestion that bighorn sheep in the Sierra Nevada of California were different from adjacent desert sheep has found support. Differences were found in the mtDNA control region using RLFP data and significant skull shape differences from cranial morphometric data. We assessed DNA sequence data for 515 base pairs of the mtDNA control region for about 550 different sheep from 35 populations in California. These included large samples from the Sierra Nevada and six populations to the immediate east. Samples from the Rocky Mountains, British Columbia, Stone's, Dall's, and snow sheep were included for perspective. Bighorn sheep in the Sierra Nevada have only one haplotype, and it is as different from desert bighorn as are Rocky Mountain bighorn. However, in the Sierra Nevada clade there are two additional haplotypes; one in the Inyo Mountains immediately east of the southern Sierra Nevada, and one across a series of connected ranges to the southeast of the Inyo Mountains. Both haplotypes occur at high frequency, but are mixed with haplotypes of desert bighorn. For comparison, we currently are sequencing about 1100 base pairs of a more conserved mtDNA gene (ND5) for a select subsample of sheep.

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