

CORRECT NOMENCLATURE FOR SIERRA NEVADA BIGHORN SHEEP

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Based on four specimens, Grinnell (1912) recognized bighorn sheep from the Sierra Nevada of California as a distinct subspecies, *Ovis cervina* (= *canadensis*) *sierrae*, and designated a 5 year-old male as the type specimen. In his revision of the taxonomy of North American sheep, Cowan (1940:556) did not recognize *sierrae* as a valid subspecies. While he acknowledged uncertainties about the taxonomic position of bighorn sheep inhabiting the Sierra Nevada, he listed and mapped them as belonging to *O. c. californiana*. Subsequent authors (Jones 1950, Hall and Kelson 1959, Manville 1980, Shackleton 1985) similarly have included bighorn sheep from the Sierra Nevada as *O. c. californiana*.

Recent analyses (Wehausen and Ramey 1993, 2000) have resulted in changes to Cowan's (1940) taxonomy. On the basis of genetic and morphometric data, Wehausen and Ramey (2000) reassigned specimens from north of the central Sierra Nevada, formerly designated as *O. c. californiana*, to *O. c. nelsoni* and *O. c. canadensis*, but retained the name *O. c. californiana* for bighorn sheep in the southern and central Sierra Nevada. That action raised the question of the correct subspecific name for bighorn sheep occupying the Sierra Nevada.

Douglas (1829) first applied the name California to bighorn sheep when he defined *Ovis californianus* based on a specimen from near Mount Adams, Washington that he obtained from natives, and designated the type specimen for this taxon (Shackleton 1985). His discussion of its range was, "... it appears to inhabit the subalpine regions of Mounts Wood [= Hood], St. Helens, and Vancouver, but is more numerous in the mountainous districts in the interior of California." How far south he considered this animal to range is not clear, and subsequent authors (Blyth 1840, Biddulph 1885, Bailey

1936) questioned the validity of his description and associated information. Douglas actually saw no sheep in the area he visited and based his description in part on a skin possessed by a native (Douglas 1829). Among the measurements he provided was a tail length of 18 inches, which Blyth (1840) and Biddulph (1885) noted to greatly exceed the tail length of any bighorn sheep. As a result, Biddulph (1885) questioned the legitimacy of *O. californianus*. Similarly, Bailey (1936) criticized the use of second-hand information, and questioned whether native sheep ever occupied the specific mountains in Washington that Douglas (1829) included in his description, given the high snowfall typical of those areas.

Although some early authors (Allen 1912, Lydekker 1913) recognized the subspecies *O. c. californiana*, Cowan (1940) was the first to assign specimens south of northeastern California to that subspecies. With the reassignment of specimens from north of the central Sierra Nevada to *O. c. nelsoni* and *O. c. canadensis* (Wehausen and Ramey 2000), Douglas' (1829) type specimen of *O. c. californiana* from Washington is no longer valid. By the Principle of Typification (International Commission on Zoological Nomenclature 1999), the type specimen designated by Grinnell (1912) replaces it, and the correct name for native sheep in the southern and central Sierra Nevada is *O. c. sierrae* Grinnell. We suggest the most appropriate common name for this subspecies to be Sierra Nevada bighorn sheep.

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LITERATURE CITED

- Allen, J. A. 1912. Historical and nomenclatural notes on North American sheep. American Museum of Natural History Bulletin 31:1-29.
- Bailey, V. 1936. The mammals and life zones of Oregon. United States Department of Agriculture, Bureau of Biological Survey, North American Fauna 55:1-416.
- Biddulph, J. 1885. On the geographic races of the Rocky-Mountain bighorn. Proceedings of the Zoological Society of London 1885:678-684.
- Blyth, Mr. 1840. An amended list of the species of the genus *Ovis*. Proceedings of the Zoological Society of London 86:62-81.
- Cowan, I. McT. 1940. Distribution and variation in the native sheep of North America. American Midland Naturalist 24:505-580.
- Douglas, D. 1829. Observations on two undescribed species of North American mammalia. Zoological Journal 4:332.
- Grinnell, J. 1912. The bighorn of the Sierra Nevada. University of California, Publications in Zoology 10:143-153.
- Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Ronald Press, New York, USA.
- International Commission on Zoological Nomenclature. 1999. International code of zoological nomenclature, fourth edition. International Trust for Zoological Nomenclature, London, United Kingdom.
- Jones, F. L. 1950. A survey of the Sierra Nevada bighorn. Sierra Club Bulletin 35(6):29-76.

- Lydekker, R. 1913. Catalogue of the ungulate mammals in the British Museum (Natural History). British Museum (Natural History), London 1:1-249.
- Manville, R. H. 1980. The origin and relationships of American wild sheep. Pages 1-6, in: G. Monson and L. Sumner, editors. The Desert Bighorn. University of Arizona Press, Tucson, USA.
- Shackleton, D. M. 1985. *Ovis canadensis*. Mammalian Species 230:1-9.
- Wehausen, J. D., and R. R. Ramey II. 1993. A morphometric reevaluation of the peninsular bighorn subspecies. Desert Bighorn Council Transactions 37:1-10.
- Wehausen, J. D., and R. R. Ramey II. 2000. Cranial morphometric and evolutionary relationships in the northern range of *Ovis canadensis*. Journal of Mammalogy 81:145-161.

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