

Study reveals impact of historical domestic cattle hybridization with American bison

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Plains bison are an iconic symbol of America on everything from coins to state flags. Now scientists writing in *Conservation Biology* are exploring how the cross-breeding of bison with domestic cattle in the late 1800s may still have unwanted effects on modern populations of the species.

"The plains bison are an iconic symbol of rugged individualism and the will to survive," said Professor James Derr from Texas A&M University. "The population crash and the spectacular recovery over the last 125 years is a classic example of the resilience of this species and the success of science based wildlife conservation."

Plains bison (*Bison bison bison*) once numbered in the tens of millions, but they were driven to the brink of extinction in the late 1880's during America's westward expansion. A small [population](#) of wild bison survived in Yellowstone National Park, while 5 herds remained in the hands of private ranchers. It is estimated that less than 100 surviving bison became the common ancestors of today's herds.

In some of these privately held herds, bison were crossed with domesticated cattle in an attempt to introduce the hardy bison traits into beef producing animals. While this effort failed to produce new and improved beef breeds, some hybrids were created, and with the use of molecular technologies, these scientists have discovered there remains a legacy of small amount of cattle genetic contamination in most bison herds in North America.

"Looking at the long-term recovery of the bison it is important to find out if this small amount of cattle genetics in an otherwise normal bison can really have a biological effect," said Derr. "We brought together researchers from Arizona, California, Montana and Texas to find out."

The team recorded size measurements for over 900 bison from a nutritionally harsh environment for bison on Santa Catalina Island in California and a nutritionally rich environment on a ranch in Montana.

The results revealed that bison with a particular [domestic cattle](#) genetic trait, mitochondrial DNA, were consistently smaller and lighter than animals with true bison mitochondrial DNA in both environments.

"We have found that this cattle ancestry affects phenotypic traits and most likely fitness of bison in herds which are maintained for both production and species conservation," concluded Derr. "Long term management efforts with [bison](#), and possibly other species with a history of hybridization, must carefully consider the importance of genome integrity in order to preserve what is the foundation and essence of these species, their genomes."

More information: Derr. J, Hendrick. P, Halbert. N, Plough. L, Dobson. L, King, J , Calvin. D, Hunter. D, Cohen. N, Hedgecock. D, 'Phenotypic Effects of Cattle Mitochondrial DNA in American Bison,' *Conservation Biology*, 2012, [DOI: 10.1111/j.1523-1739.2012.01905.x](https://doi.org/10.1111/j.1523-1739.2012.01905.x)

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