

# Global Warming Impacts on Western U.S. Rangelands/Livestock

## U.S.D.A. Assessment

The final U.S. Department of Agriculture report released in May 2008 finds climate change has negatively impacted western U.S. rangelands and livestock populations and predicts severe losses in the future<sup>1</sup>. The full report is available on line at:

<http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>

The report finds it is “very likely” that climate change and historic land management practices will cause major disruptions to western rangelands and the livestock industry that relies on them. *“The evidence... over the past two centuries provide indisputable evidence that warming, altered precipitation patterns, and rising atmospheric CO<sub>2</sub> are virtually certain to have profound impacts on the ecology and agricultural utility of rangelands.”*<sup>2</sup>

*“Climate changes... could impact the economic viability of livestock production systems worldwide.”*<sup>3</sup> The report predicts increased heat waves, which will cause major livestock die-offs, and in addition, *“economic losses from reduced cattle performance (morbidity) likely exceed those associated with cattle death losses by several-fold.”*<sup>4</sup>

Rangelands are large-scale landscapes in the western United States, comprised of grasslands, chaparral, widely spaced woodlands and deserts. They make up more than half the overall land area of 17 Western states (ND, SD, NB, KS, OK, TX, MT, WY, CO, NM, UT, AZ, NV, ID, WA, OR, and CA). Rangelands are a cornerstone of the region’s livestock industry, which relies on these lands for forage and habitat.

The report estimates that in the next 30 years, CO<sub>2</sub> concentrations are expected to have increased about 60 ppm, from today’s 380 ppm to about 440 ppm, and temperatures over the contiguous United States are expected to have increased by an average of 2.2 degrees Fahrenheit.<sup>5</sup>

Impacts on Western rangelands and the livestock industry include:

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<sup>1</sup> : U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;” final report, May 2008

<sup>2</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;” final report, May 2008, p. 72, <http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>

<sup>3</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;” final report, May 2008, p. 64, <http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>

<sup>4</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;” final report, May 2008; p. 64, <http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>

<sup>5</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;” final report, May 2008; p. 25, <http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>

- **Heat Waves:** According to Intergovernmental Panel on Climate Change estimates, intense heat events will by 2030 increase an average of 14 to 21 days per year over current levels,<sup>6</sup> which can devastate livestock herds, both from die-offs and stress-induced reductions in growth and vitality. For example, a three-day heat wave in August 1992 in central and eastern Nebraska caused several hundred feedlot cattle deaths, while a July 1995 heat wave killed more than 4,000 head of feedlot cattle across the central United States.
- **Economic Losses:** The economic losses to the livestock industry from the combined impacts of climate change and historic land management practices, in terms of cattle growth, reproductive health and ability to survive other stressors will exceed those of cattle deaths “by several-fold.” For example, a separate USDA farm income report found that between 2001 and 2002, net income from livestock production in New Mexico fell \$279 million.<sup>7</sup>
- **Disappearing Rangelands:** *“There is already some evidence that climate change-induced species changes are underway in rangelands. The worldwide encroachment of woody plants into grasslands remains one of the best examples of the combined effects of climate change and management in driving a species change that has had a tremendous negative impact on the range livestock industry. In the southwestern arid and semi-arid grasslands of the United States, mesquite and creosote bushes have replaced most of the former warm season, perennial grasses, whereas in... the central Great Plains, trees and large shrubs are supplanting grasslands.”*<sup>8</sup>

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<sup>6</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity,” final report, May 2008, p. 17; <http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>

<sup>7</sup> U.S. Dept. of Agriculture, National Agricultural Statistics Service, New Mexico Annual Statistics Bulletin 2002, [http://www.nass.usda.gov/Statistics\\_by\\_State/New\\_Mexico/index.asp](http://www.nass.usda.gov/Statistics_by_State/New_Mexico/index.asp).

<sup>8</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity,” final report, May 2008, pp. 61; <http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm>