Dust from BLM Lands in Utah Melting Snow in Colorado

Please help protect redrock wilderness as well as the Rocky Mountains' snowpack by supporting the Southern Utah Wilderness Alliance's Greater Canyonlands Petition. This petitions asks that the Bureau of Land Management improve its current management plans for the area, plans that favor oil and gas development and off-road vehicle use. These activities destabilize soils and make them susceptible to windborne erosion. The resulting dust can be carried eastward by winds to the mountains of Colorado where it causes the snowpack to melt early, creating drought and regional temperature increases.

How It Works

Dust on snow has a much greater effect on early snowmelt than increased temperatures do.[1] Snow stained by dust melts faster because it absorbs more solar energy than a pristine white snowpack, similar to a dark colored t-shirt on a hot, sunny day.

For example, in 2005 and 2006, disturbed desert dust melted snow cover 18 to 35 days earlier in the San Juan Mountains of western Colorado.[2] In 2009, disturbed desert dust melted snow cover 48 days earlier in that same mountain range.[3] Astonishingly, scientists estimate that dust on snow results in the loss of enough water every year from the upper Colorado River Basin to satisfy the water needs of Los Angeles for 18 months![4]

The Colorado Plateau, which includes all of southeastern Utah, is one of the primary sources of airborne dust emissions in the United States.[5] It is likely that soil destabilizing activities on the Colorado Plateau in Utah result in windborne dust in the mountains of Colorado which melts snow early.

Desert dust leaves a visible layer on Colorado peaks. Photo courtesy of Center for Snow and Avalanche Studies.

Off-road vehicles destabilize desert soils. Photo © Ray Bloxham/SUWA

Exacerbating the Problem

The BLM recently approved 20,000 miles of off-road vehicles routes in Utah's Colorado Plateau, including over 1,000 miles in inventoried roadless lands. These routes will expose large areas to wind erosion as disturbance from off-road vehicles can drastically increase windborne erosion rates on desert soils. Additionally, the BLM made 80% of its lands on Utah's Colorado Plateau available for oil and gas leasing and development. Oil and gas development is a surface disturbing activity that destabilizes soil and exposes land to wind erosion.

Mitigation

The best way to reduce windborne soil erosion is to prevent surface disturbing activities, such as off-road vehicle use and oil and gas development, on fragile desert soils. Protecting BLM wild lands on Utah's Colorado Plateau would limit these activities, consequently alleviating the amount of dust traveling to the mountains of Colorado and the resulting early snowmelt.

Protecting the Greater Canyonlands region (see map on flip side), is one possible step for beginning to address the dust on snow problem. The Southern Utah Wilderness Alliance's petition would substantially reduce surface disturbance from off-road vehicles. It would thus help to stabilize soils and limit dust, thereby reducing early snowmelt in Colorado and counteracting the effects of global climate change.

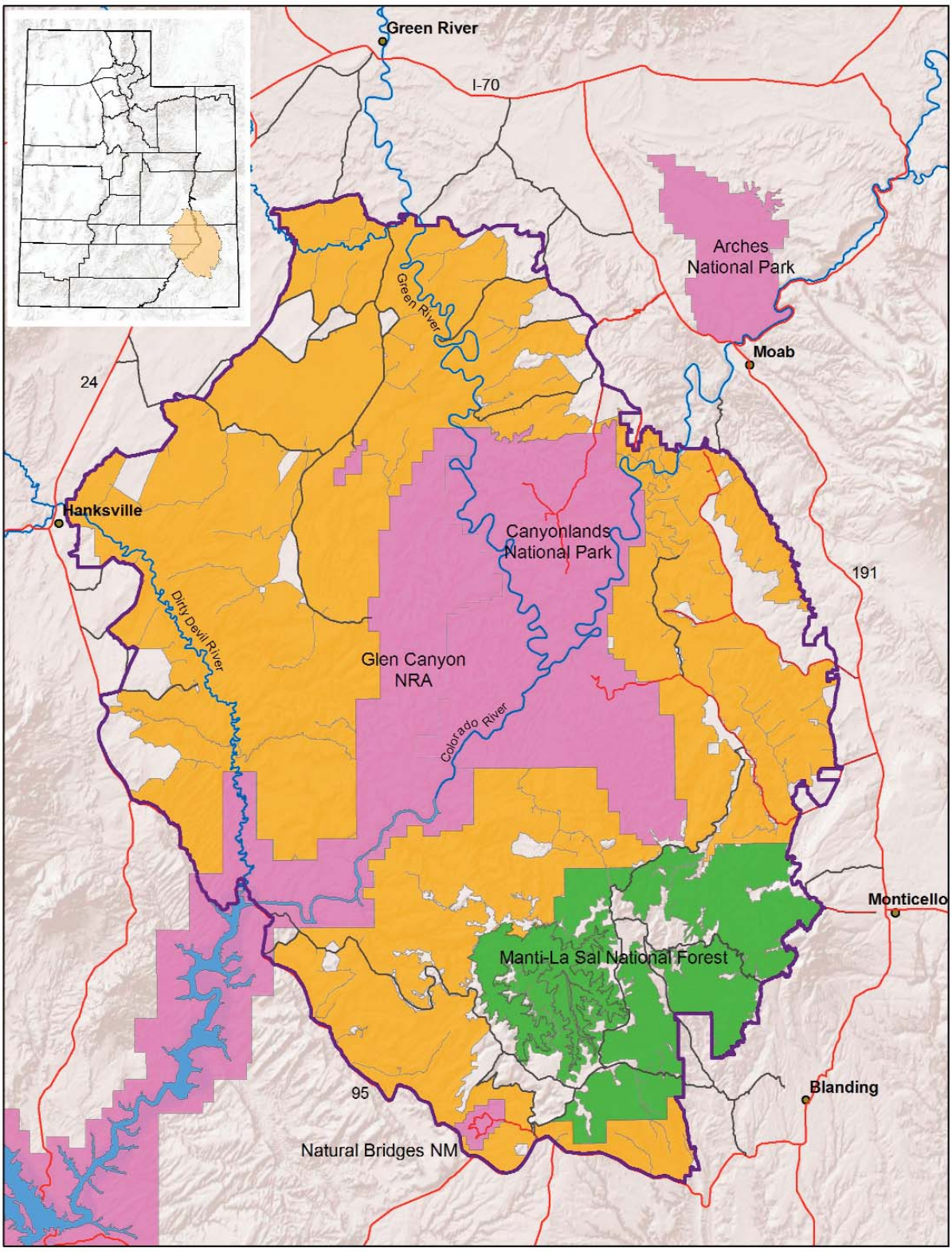
[1] Clean snow absorbs solar energy (radiative forcing) at a rate of 308 W/m^2, whereas the dusty snow of one Colorado mountain range in 2004 and 2009 added 319 W/m^2 and 430 W/m^2 of radiative forcing to the normal level of clean snow. Simply increasing the temperature by 6° C on clean snow only leads to an additional 21 W/m^2 of radiative forcing. (Painter Grand Junction Presentation). In other words, warm temperatures may only melt snow a few days earlier whereas dust can cause snow to melt over a month earlier.

[2] Thomas H. Painter et al., Impact of Disturbed Desert Soils on Duration of Mountain Snow Cover, Geophysical Research Letters, Vol. 24, L12502 (June 23, 2007).

[3] Thomas H. Painter, Presentation, Colorado River District Water Seminar, September 18, 2009, Grand Junction, Colorado (Painter Grand Junction Presentation).

[4] This is due to evapotranspiration (water transpiring from plants and soils that normally would not be exposed yet) and snow sublimation (snow turning to water vapor). Thomas H. Painter et al., Response of Colorado River Runoff to Dust Radiative Forcing in Snow, Proceedings of the National Academy of Sciences (September 20, 2010).

[5] See, e.g., J.C. Neff et al., Increasing Eolian Dust Deposition in the Western United States Linked to Human Activity, Nature Geoscience (Advanced Online Publication – February 24, 2008).



Greater Canyonlands Region

BLM Lands Proposed for Wilderness in ARRWA

National Park Service Lands

US Forest Service Roadless Lands

Highways/Paved Roads

Major Dirt/Gravel Routes

N

For more information contact David Garbett, (801) 428-3992
Southern Utah Wilderness Alliance
www.suwa.org

southern utah wilderness alliance