

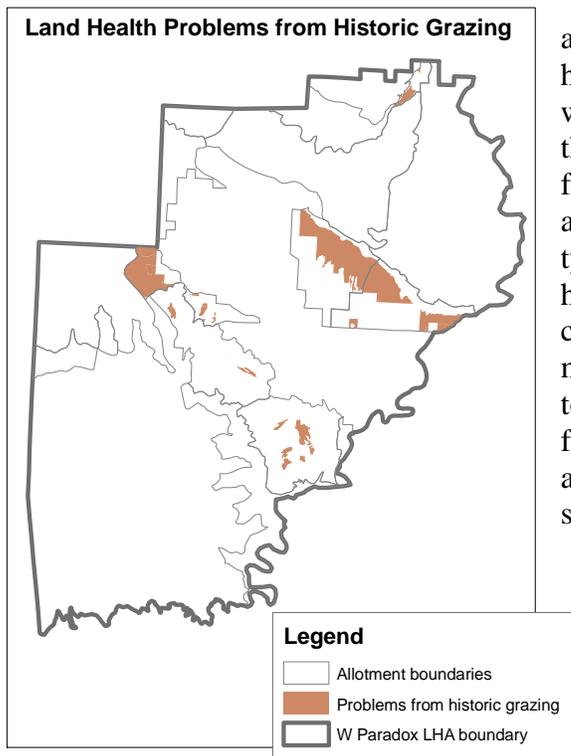
## West Paradox Landscape Health Assessment

### CAUSATIVE FACTOR DETERMINATION

Causative factors behind land health problems are addressed here for all standards taken together. The reason behind this is that one cause may impact several indicators and health standards at once. In addition, most of the land health problems observed in the landscape unit are not clearly linked to one causative factor, nor are they always related to a cause that is presently occurring. Often, causes were indirectly suggested, using the condition of indicators as evidence. In many areas, problems are occurring as a result of several causative factors which overlap spatially. As a result, acreage figures reported below may overlap for various causes.

**Historic Grazing:** Settlement of the area in the late 1880s opened the way for large unregulated livestock operations to graze much of the area. Ranchers had free and unlimited use of unreserved, unappropriated public lands until the Taylor grazing act of 1934. The primary purpose of this act was “to stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range, and for other purposes.”

Regional accounts of settlement in this part of Colorado indicate that livestock numbers grazing the public rangelands were once many times what they are now (accounts vary widely ranging from 10-100 times the current number), and that the vegetation changed dramatically following the introduction of cattle, sheep, horses and other domestic grazers. It was not until the passage of the Taylor Grazing Act that the current system of individual grazing allotments was established and implemented.



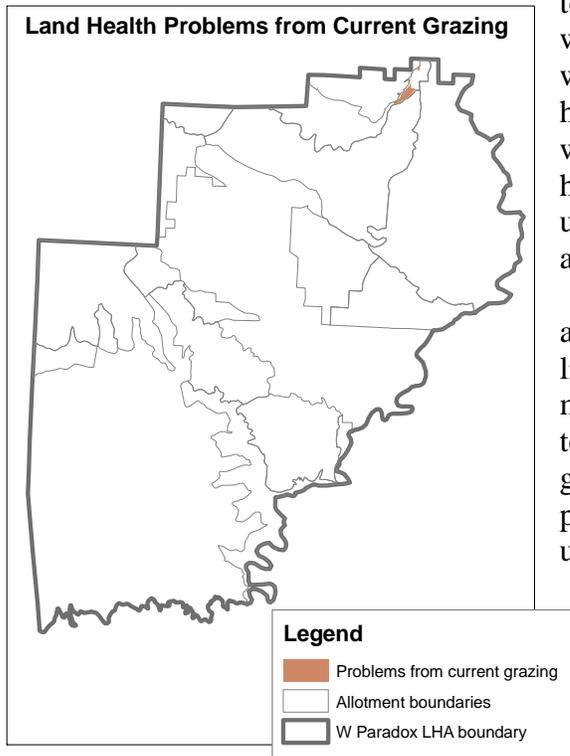
Prior to the Taylor Grazing Act, areas close to the town of Paradox would have had heavy spring and fall, and even winter use by livestock until the middle of the 20<sup>th</sup> century, mostly by small ‘farm flocks and herds’. In the highest elevation areas, season long summer use was typically practiced at stocking levels that has been reported to have changed plant communities. In lower elevation areas, the milder climate allowed wintering livestock to exist with very limited or no additional feeding required, so these areas were among the most affected, with degradation still persisting today.

The interdisciplinary team used a number of factors to infer that historic grazing had contributing to problems in an area. Types of problems included a lack of cool season grasses in otherwise grassy communities, lack of forbs, or

dominance by annuals, unpalatable plants, exotic species like Kentucky bluegrass, or woody species.

Historic grazing caused problems in a few areas across the LHA unit. The interdisciplinary team identified 2,069 acres where historic grazing impacts had contributed to a polygon failing to meet one or more of Standards 1, 3 and 4. An additional 956 acres were rated as meeting Standard 1, 3 or 4 with problems, and historic grazing was cited as a factor. Historic grazing was not considered to be a factor behind any stream or water problems.

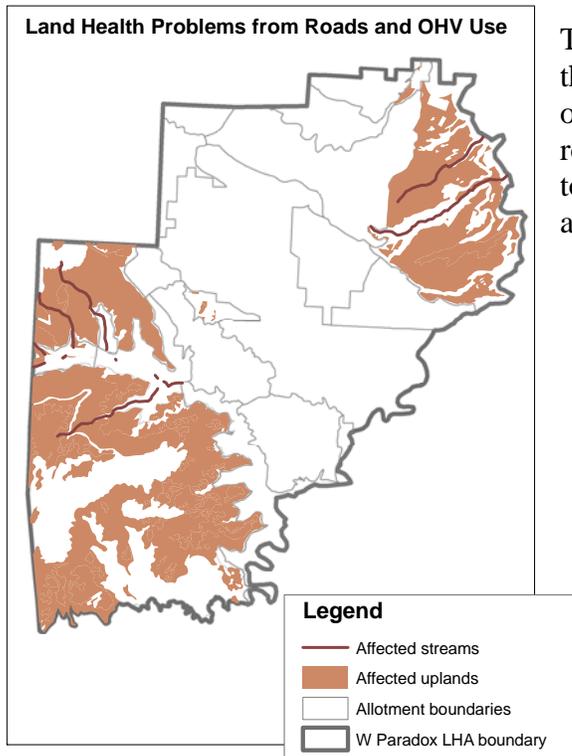
**Current Grazing:** Evidence of livestock grazing was searched for at each site to determine whether livestock grazing was causing problems with soil or vegetation. The following evidence was searched for: poor condition areas with abundant livestock droppings, crowned grass plants, terracing of slopes from livestock paths, and heavy use on four-wing saltbush or other palatable shrub species. Livestock grazing was considered



to be causing problems in riparian areas when abundant cattle sign was coupled with heavy utilization on woody and herbaceous species. Utilization information would be stronger evidence, however this has not been gathered very consistently or uniformly across the West Paradox LHA area in the past.

The ID team found only one upland area where there was evidence that current livestock grazing was causing problems meeting upland standards 1, 3 and 4. The team identified 69 acres where current grazing impacts had contributed to a polygon failing to meet one or more of the upland Standards. There were no upland acres where livestock grazing contributed to lands meeting health standards with problems. Current grazing was not considered to be a factor behind any stream or water problems.

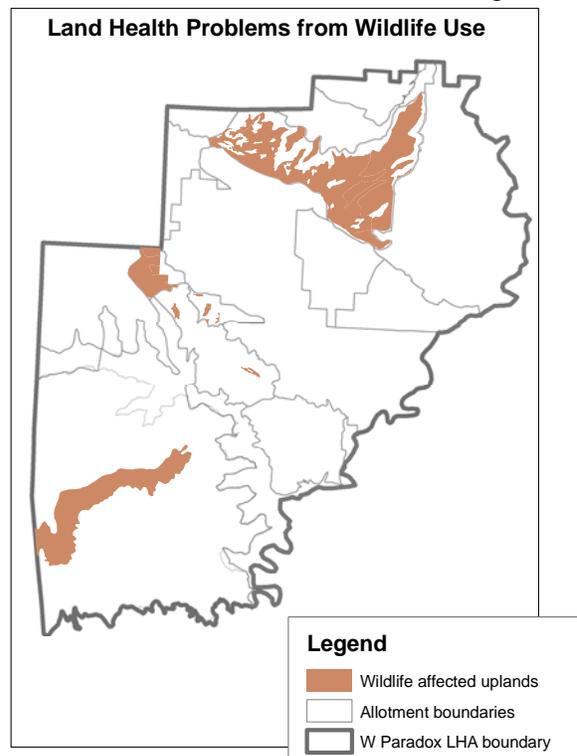
**Roads:** Poor road placement, road maintenance, and weeds associated with road maintenance cause problems with soil and vegetation indicators. These include increased levels of bare soil, runoff drainage problems, gullying, noxious weed infestations and exotic plant dominance. Roads associated with mining and off-road use by off-highway vehicles, whether recreational or associated with woodcutting, rock collecting or other pursuits can also contribute to similar problems. Roads and OHV use were a contributing factor for 122 acres failing to meet upland Standards 1, 3 or 4; and 26,707 acres to meet the upland Standards with problems. Presently, road placement and OHV use appears to be contributing to 7.0 miles of stream channels to not meet standards in the West Paradox LHA area, and another 9.7 miles to meet these standards with problems.



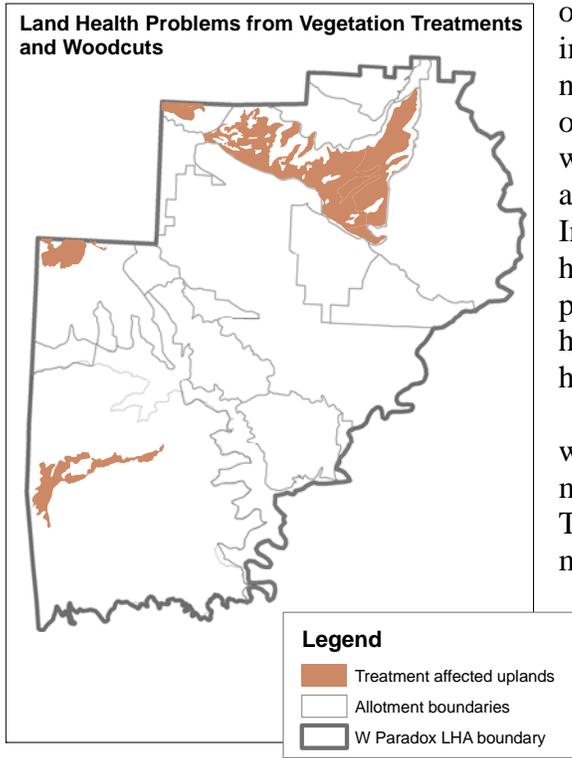
The majority of road related problems in this LHA area involve the dense networks of old mining and uranium exploration roads. These roads did not include features to mitigate erosion or resource damage, and are not being maintained or retired.

**Heavy Wildlife Use:** Heavy browse utilization caused by grazing wildlife (primarily deer and elk) causes shrubs to have a compact growth form, and often reduces shrub vigor. This is a chronic problem in heavily used winter range, which often falls on BLM land. Use levels on shrubs and forbs are frequently heightened in pinyon-juniper woodlands which border farm fields. Mule deer will typically feed in concentrated numbers in the fields in the mornings and evenings, and take shelter and browse the vegetation in the wooded area during the day. Heavy browsing can be an indication that deer and elk populations are too high for available habitat, or that habitat use and carrying capacity have been altered by agriculture.

This situation was occasionally encountered in the West Paradox area. Heavy browsing contributed to 53 acres not meeting Standard 3 or 4. An additional 7,993 acres met Standard 3 or 4 with problems, due in part to heavy wildlife use. Presently, heavy wildlife use is not contributing to water quality or riparian area problems in the West Paradox Area.



**Past Vegetation Treatments and Woodcuts:** Many vegetation treatments carried out

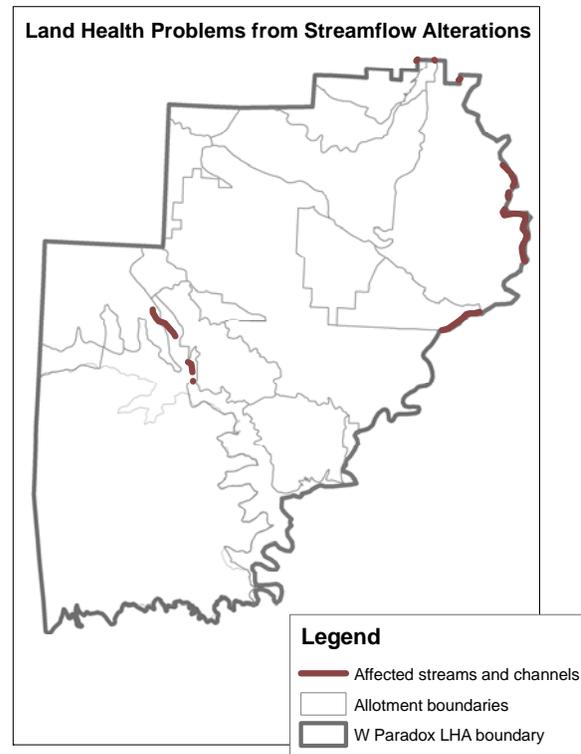


over the past 50 years were either poorly implemented, not seeded, seeded with nonnative species like crested wheatgrass, or poorly managed after treatment. Some woodcuts suffer from similar problems, and are also likely to be weed-infested. Indicators including diversity, exotic plants, herbaceous species cover, bare soil and pedestalling sometimes reflected poor health for soils, vegetation, and wildlife habitat as a result.

Vegetation treatments and woodcuts contributed to 6,674 acres meeting Standard 1, 3 or 4 with problems. There were no upland areas which did not meet standards as a result of past vegetation treatments or woodcuts. There was also no evidence that vegetation treatments were affecting streams or channels.

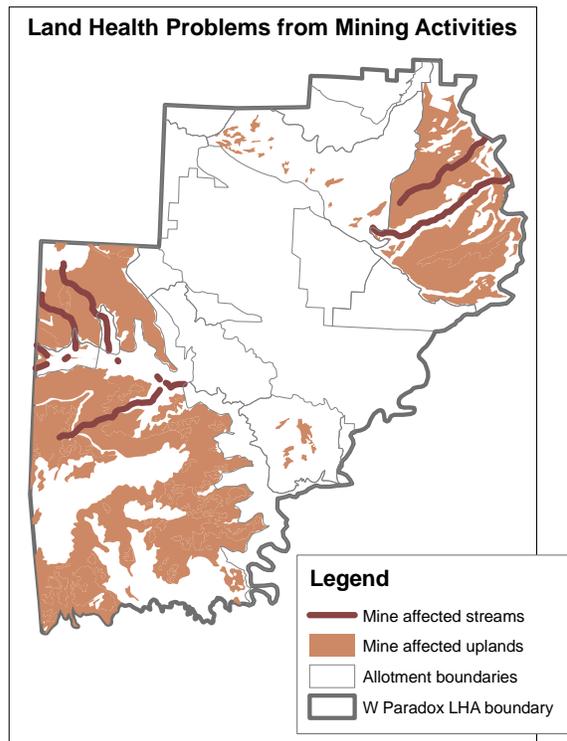
**Streamflow Alterations:** Water diversions, dam-regulated flows, and flow augmentation (either using natural channels to convey additional irrigation water or to drain irrigation tailwater) have contributed to channel morphology and riparian vegetation changes along many streams in Colorado. McPhee reservoir which controls and diverts streamflow from the Dolores River, and other stream diversions which provide irrigation water to the Paradox Valley have greatly altered historic streamflows in the West Paradox Area.

As a result, water diversions or other flow alterations contributed to 4.5 stream miles meeting Standard 2 with problems. There were no streams which did not meet Standard 2 because of flow alterations. No uplands were found to be affected by flow alterations.



**Mining:** There has been a long history of vanadium and uranium mining in the West Paradox area. Much of this activity took place prior to many of the environmental laws which regulate mining today. As a result, there are very dense networks of mines, and other mining related disturbances ranging from waste rock piles to exploration roads to mining excavations. These have greatly reduced native vegetation cover in some areas of the West Paradox unit, increased bare soil, and altered hydrologic patterns.

In the West Paradox LHA area, 27,208 acres met the upland health standards with problems that are in part attributable to past mining. Mining had not caused any acres to fail to meet the upland standards. There were 7 stream miles that failed to meet Standard 5 as a result of past mining, while 9.7 miles met the Standard 5 with problems caused from past mining activities.



**Other Causes:** A variety of other causes were also cited as contributing factors for some polygons failing to meet a standard, or meeting with problems. These problems are listed below.

Cause	Acres Not Meeting	Acres Meeting w/ Problems	Miles Not Meeting	Miles Meeting w/ Problems
Vegetation Seral Stage	1,129	21,519	0	0
Unusually Difficult Site for Growth	1,946	12,227	0	0
Watershed Condition	0	0	7	3.9
Noxious/Invasive Weeds	0	0	0	3.1
Interspersed w/ Private Lands, Weedy Region	940	664	0	0
Drought	0	5,676	0	0
Pinyon-Juniper Invasion	818	2,821	0	0
Recent Fire	0	7,262	0	0
Fire Suppression	0	258	0	0
Pinyon Decline	0	3,188	0	0
Reservoir	0	2,284	0	0
Rights of Way	53	0	0	0

**Causes of Large Scale Problems:** The long term trend for the west-central Colorado landscape is one in which vegetation seral stage is advancing, the average patch size is getting larger, the amount of “edge” is decreasing, and the size and quality of browse stands are declining. Much of this is thought to be due to fire suppression. This trend is not so pronounced in the West Paradox area. Wildfires and controlled burns have begun to increase vegetation diversity and the amount of edge habitat. Vegetation mosaic objectives are contained in the Uncompahgre Field Office Fire Management Plan. There are still some problems with attaining these objectives, which should be addressed through development of vegetation management strategies across the West Paradox unit.

Concerns about tree invasion causing major land health problems are lessening in light of the recent drought and research on pinyon dendrochronology and stand structure on the Uncompahgre Plateau and adjacent landscapes. This research indicates that many woodland stands have experienced density increases followed by density declines over the past several centuries, and these appear to be linked to climate fluctuations (Eisenhart 2004). Two prolonged wet periods over the past century are likely contributing to the increases in tree density, both within woodlands and invasion into new communities. Land management practices are probably also contributing, as livestock grazing may enhance tree establishment, and young trees have reappeared in the woodland chainings from the mid 20<sup>th</sup> century. However, the drought has recently killed some of these “invading” trees in some parts of the landscape. As yet there is no evidence that frequent fire in the shrub communities repelled tree invasions, so fire suppression does not yet seem to have dramatically affected the West Paradox landscape over the large scale.

Other, more difficult landscape level issues include climate change, trends in private land use, mining and impacts of historic land use practices. Climate change threatens land health by changing precipitation levels, timing of precipitation, and temperature ranges—all environmental parameters upon which the native community depends. Human land uses which result in disturbance to native vegetation and soils threaten land health by increasing the amount of land supporting exotic and noxious species, and decreasing the amount of the native community. People and equipment often unknowingly bring in plant, animal or disease propagules from other regions, further increasing threats to the integrity of the native community. Because of these, this area, as well as much of the adjacent landscape, is probably declining in overall quality for many species, and is becoming more favorable for weedy, invasive, typically nonnative species, with cheatgrass being the principle species of concern.

## DECISION RECORD

DECISION: It is my decision to accept this determination of cause for problems associated with the Standards for Rangeland Health found during the West Paradox Landscape Health Assessment.

RATIONALE: The determination was based on extensive data collection coupled with review by an interdisciplinary team familiar with the landscape unit and the history of land uses that have occurred there.

SIGNATURE OF AUTHORIZED OFFICIAL:

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Barbara Sharrow, Field Office Manager  
Uncompahgre Field Office

DATE SIGNED: