



Value of University of Arizona Cooperative Extension's Involvement in Immediate Post-Wallow Fire Grazing Recovery

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Summary

The University of Arizona Cooperative Extension participated in cooperative efforts to monitor rangeland recovery and assess forage availability after the Wallow Fire that provided critical information supporting the Forest Service's decision to allow grazing to resume on allotments earlier than originally anticipated. Enhancement and use of the University of Arizona Cooperative Extension Vegetation GIS Data System software allowed Forest Service and University personnel to quickly record and analyze ecological data. This ecological data was important to determining the response of vegetation to provide forage for livestock and wildlife. Estimates of benefits to ranchers from earlier resumption of grazing on their allotments range from \$12,241 to \$52,835 per allotment. Estimates of total rancher benefits range from \$477,410 to \$2,060,577.

Background

In late May of 2011, the Wallow Fire broke out in the Apache-Sitgreaves National Forest in Eastern Arizona. The fire would prove to be one of the most destructive in the history of the state, burning 538,000 acres.¹ In response to the fire, all livestock were removed from public grazing allotments in the Alpine District of the National Forest and most livestock were removed from the Springerville District. Of the livestock removed, some were relocated to nearby grazing allotments. Most, however, had to be transported to other areas of the state, primarily to private grazing land. Amongst other potential plans under consideration was an anticipated 2- to 5-year no-grazing constraint on the Forest Service grazing allotments.

Rangeland monitoring efforts by the University of Arizona Cooperative Extension, the Springerville and Alpine Districts of the US Forest Service (USFS), private ranchers, and other organizations, however, suggested that ranchers could return cattle to Forest Service allotments sooner than is often recommended. In August of 2011, Cooperative Extension and USFS personnel began monitoring grasslands burned by the fire. By the 2012 grazing season, it was determined that the grasslands had ample forage and that affected plant communities were recovering quickly enough to allow grazing on 39 allotments, accounting for roughly 30,000 animal unit months (AUMs) of forage. These 30,000 AUMs represented about 90% of the pre-fire grazing level and by 2013, grazing essentially returned to pre-fire levels on the affected allotments. The collaborative efforts between the Forest Service, Cooperative Extension, and other partners were largely responsible for the return of livestock to their original allotments in 2012. Furthermore, the collaborative work following the Wallow Fire, as well as other large fires in the Apache-Sitgreaves and Coronado National Forests, provided the basis for the Forest Service Southwestern Region's (R3) revision of their Grazing Permit Administration Handbook in 2015. This revision incorporated monitoring and evaluation considerations for restocking and management of grazing allotments post wildfire and other disturbances, establishing a staged approach to incrementally restock allotments based on continuing assessment of fire-affected areas. This approach provides the ability to adapt management in response to changing environmental conditions, a critical factor to the sustainability of rangelands and agricultural livestock production.²

¹ Impacts of Arizona's Wildfires on Wildlife & Outdoor Recreation. Arizona Game and Fish. Accessed at http://www.azgfd.gov/w_c/fire_impacts_on_wildlife.shtml

² Dyess, Judith, et al (2017). Re-stocking and Management of Grazing Allotments Post Wildfire and Other Disturbances. Presentation to the National Society for Range Management, February 2017.

Study Methods

This study estimates the impact to ranchers of the Forest Service's decision on when and how much to restore grazing on the 39 allotments affected by the Wallow Fire. The University of Arizona Cooperative Extension was a partner that contributed to the field monitoring efforts that supported the Forest Service's decision to restore near-full grazing in 2012 versus; 1) full grazing in 2013, 2) incremental grazing through 2016; or 3) full grazing in 2016. The impact to ranchers can be measured in terms of avoided grazing costs. By shifting grazing to alternative allotments consisting primarily of private land, ranchers would have incurred greater grazing costs compared to grazing their livestock on public lands. Excluding the initial permit cost for the right to graze public lands, their monthly grazing fees are generally much lower than private grazing due to a federal formula taking into account a variety of factors including higher costs of operating on public land, as well as the added services often associated with private land grazing fees.³

Avoided costs are measured as the difference in grazing costs between private and public lands over the immediate 2- to 5- year period for the permitted herd size. The avoided costs are presented in terms of a high, medium, and low scenario – the high scenario measures the avoidance of a 5-year no-grazing approach; the medium scenario incrementally returns grazing to the region; and the low scenario values reflect the avoidance of a 2 year no-grazing approach. Any

change in costs in 2011 must be excluded from the avoided cost calculation as livestock had to be shifted that year due to the fire regardless of the Forest Service's post-fire authorizations. Similarly, transportation costs are not considered part of the avoided costs because the herds had to be transported to alternative allotments in 2011 irrespective of subsequent grazing authorizations. Return transportation costs are likewise excluded.⁴

Private grazing fee estimates were obtained from NASS-USDA and represent grazing fees for privately-owned, non-irrigated land in 11 western states.⁵ Federal grazing fees are annual grazing fees published by the US Forest Service and Bureau of Land Management. Both fees were converted into 2015 dollars⁶ and avoided costs are presented in terms of 2015 dollars.

Results

Figure 1 depicts grazing levels on the 39 allotments measured in AUMs that would have resulted from 1) the 2-year no-grazing approach (green dashed line), 2) incremental return to grazing (yellow dashed line); and 3) the 5-year no-grazing approach (red dashed line). Also depicted are actual grazing levels implemented from the collaborative rangeland monitoring and Forest Service decision, returning to roughly 90% of previous levels in 2012 and 100% of previous levels in 2013 (blue line).

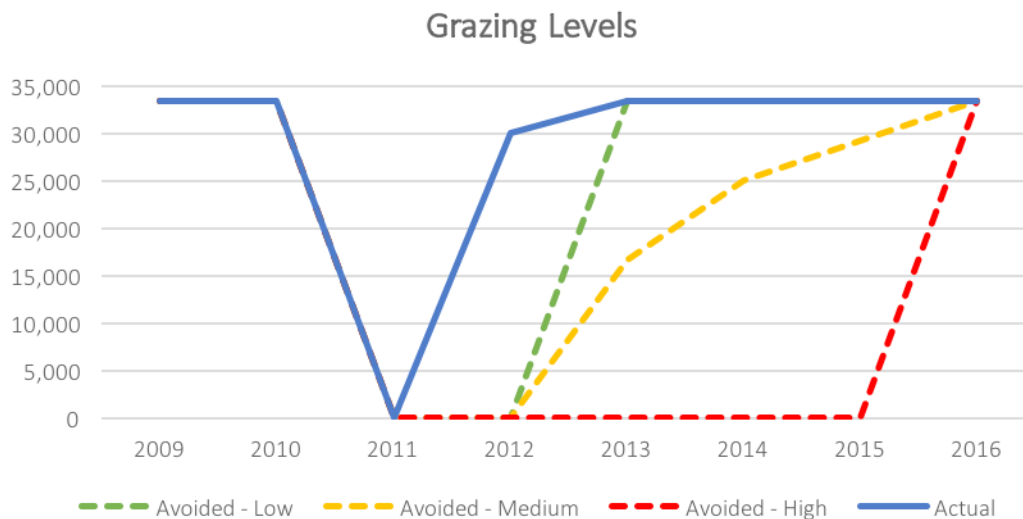


Figure 1: Grazing Levels

³ While in many areas private grazing fees cover improvements and services not included in public grazing fees, in this region the private grazing fee cited would represent a relatively minimal level of improvements and services covered. Additionally, cost sharing of repair expenses between ranchers and the Forest Service, as well as the need to repair improvements, varied considerably from one allotment to another. As a result, avoided costs are conservatively estimated as the difference between the two grazing fees, recognizing the potential for some variation from one allotment to another.

⁴ Inflation rates were low over this period, while gasoline prices were falling. It was assumed that there would be no additional inflation-adjusted costs to transporting animals in earlier rather than later years.

⁵ USDA NASS, Arizona Field Office 2011 Annual Statistics Bulletin. Accessed at http://www.nass.usda.gov/Statistics_by_State/Arizona/Publications/Annual_Statistical_Bulletin/11bul/pdfs/42-grazing%20fees.pdf

⁶ Bureau of Labor Statistics CPI Inflation Calculator. Accessed at http://www.bls.gov/data/inflation_calculator.htm

Table 1: Grazing Fees, Reduction in AUMs, and Avoided Costs

Year	Federal Grazing Fees		Private Grazing Fee	Reduction in AUMs	Avoided Reduction in AUMs			Avoided Cost to Ranchers - \$2015		
	Nomin al / AUM	\$2015/ AUM (HM)**	\$2015/ AUM	(ACTUAL)	LOW	MED	HIGH	LOW	MED	HIGH
2010	\$1.35	\$1.47	\$17.22	0	0	0	0	\$0	\$0	\$0
2012	\$1.35	\$1.39	\$17.30	3,333	33,333	33,333	33,333	\$477,410	\$477,410	\$477,410
2014	\$1.35	\$1.35	*\$17.30	0	0	8,333	33,333	\$0	\$32,950	\$531,800
2016	N/A	N/A	N/A	0	0	0	0	\$0	\$0	\$0
TOTAL								\$477,410	\$940,868	\$2,060,577

* Private land grazing rate data available through 2012, analysis assumes rate holds constant from 2012 onward

** HMs (head months) are treated as equivalent to AUMs (animal unit months) by the federal government for purposes of fee calculation

The net decrease in AUMs of forage avoided on the allotments can be seen in the vertical distance between the lines. These avoided decreases in AUMs of grazing are included in Table 1, along with the public and private grazing fees and corresponding avoided costs of the high and low scenarios.

In the case of an avoided 2-year no-grazing policy, savings to ranchers would have totaled an estimated \$477,410. In the case that the no-grazing policy had been in effect for 5 years, those savings would have climbed to \$2,060,577, all else held constant. This equates to avoided costs of \$12,241, \$24,125, and \$52,835 per grazing allotment, respectively.

Conclusions

The collaborative efforts between the University of Arizona Cooperative Extension and the US Forest Service in rangeland monitoring aim to promote rangeland health while also enhancing the productivity, profitability, and sustainability of ranching enterprises, applying best available science to enhance the state’s economy and environment. Cooperative efforts to monitor rangeland recovery and forage response after the Wallow Fire helped provide critical information supporting the Forest Service’s decision to allow grazing to resume on affected allotments earlier than had originally been contemplated. This translated into stewardship of the natural resources and avoided private grazing costs for ranchers that were able to resume grazing earlier on their permitted public land grazing allotments.



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