

Recommendations

Jones and Schier (1985) reported that it generally takes between two and five years for aspen stems to reach breast height (4.5 feet (1.37 m)), but dieback, browsing or competition from shrubs or herbs can mean that stems take more than five years to reach breast height. Shepperd & Fairweather (1994) determined that even though aspen stems are taller than 1.37 meters (4.5 feet) and have breast height diameters > 2.5 cm (1 inch), these stems still received enough elk damage to impact their health and vigor following removal of fencing after an area was treated five years before. They go on to recommend that stems may require ten to fifteen years of fencing to protect them from elk breaking stems while foliage browsing. Rolf (2001) and Kay (2001) also reported on the effectiveness of protectively fencing treatments from wildlife pressure.

Realizing that the Forest Service must work to manage the health of the ecosystems found within their administrative boundaries, the only management tools that are available to them are to remove cattle from affected grazing allotments for between five and ten years (the time required for aspen to mature past the sapling stage), fence treated areas with exclude-everything or cattle excluding fences, or utilize a combination of the fencing and allotment manipulations. It may also be useful to locate treatment areas away from readily available water, where cattle prefer to congregate. Negative conditioning techniques may be also be useful, such as percussion charges to frighten animals away from treatment areas.

Future Monroe Mountain aspen restoration treatments should at least be fenced with 8-foot exclosures for at least ten years. Determining elk and deer movement patterns could be useful in predicting which areas may only need cattle exclosures, since Burnt Flat is the only site

that produced enough aspen stems to potentially restore the ecosystem to properly functioning condition.

Following wildfires, it would be impossible to completely fence out wildlife, not to mention the cost involved in erecting miles of permanent tall-fencing. Keeping cattle out for as long as it takes for stems to reach size class 4 (d.b.h. > 2.5 cm (1.0")) would be the minimum. Fencing areas known to be wildlife corridors may also be necessary. Additionally, areas where elk act as disease vectors (Sheppard & Fairweather 1994, Hart & Hart 2001) may also need to be fenced, since disease can dramatically affect the vigor of regenerating aspen stems.

In contrast, Utah DWR's primary focus lies not with ecosystem health, but with managing the state's wildlife populations for its citizens. This means that they alone determine how many animals are too many, and they can set management objective populations without regard for ecosystem health. However, hunting and other recreation on the Forest are very important to the local economy through revenue generated from these activities by visitors. According to Rolf (2001), "The expense and visual impact of establishing and maintaining over 20 miles of fence along with continued damage to aspen greater than 3.0 inches d.b.h. outside the fenced areas have resulted in the Arizona Game and Fish Department increasing the elk hunting permits by 400%, in an effort to reduce the elk herd in the area of the San Francisco Peaks." Similarly, certain alternatives may not be acceptable to all stakeholders, so different strategies would need to be negotiated. It is also important to note that Utah DWR's funding comes primarily from the sale of hunting and fishing licences, and this funding source must be maximized.

Another alternative for managing the wildlife on Monroe Mountain would be to reintroduce predators, such as wolves. However, this option may not be an acceptable one for political reasons. When the U.S. Fish and Wildlife Service attempted to reintroduce the Mexican

gray wolf (*Canis lupus baileyi*) onto the Gila National Forest in eastern Arizona, local residents eventually managed to kill enough of the released wolves to force the U.S. Fish and Wildlife Service to retrieve the remaining survivors and move them across the border into a more isolated area of the Forest, in New Mexico (personal recollection).

Originally, one of the stated goals of the Monroe Mountain Common Ground Initiative (see Appendix D), was to "improve management of livestock and wildlife on all lands, regardless of ownership". Unfortunately, my study shows that the cooperative was anything but. Utah DWR managed the wildlife to increase elk herds to unprecedented levels, even though complaints were expressed regarding the condition of summer and winter ranges. Another of the expressed goals of the Initiative was to manage the existing breeding elk herd to 1000 - 1200 mature animals. As of 2001, Monroe Mountain's elk herd had exceeded that number by as many as 600 animals, and the deer population has increased from 5000 in 1993 to 7500 in 2001. Utah DWR should re-think its commitment to maintaining a large trophy elk herd in combination with a large deer population on Monroe Mountain. At the very least Utah DWR should reduce its deer populations to those found in the nearby Beaver and Plateau WMUs (< 0.2 deer / Km²), because this study shows that the summer range, previously thought to be adequate, may not be able to support the densities of deer, elk and cattle currently present without changing the existing habitats and losing potentially ancient aspen clones.

Presently, the two goals of maintaining wildlife densities noted and aspen ecosystem restoration may not be compatible, since more elk need more forage, and aspen regeneration projects offer that forage to the detriment of the restoration treatments. The Initiative had hoped to "contribute to an economically viable livestock grazing program". Additionally, the Forest Service must abide by the Multiple-Use, Sustained-Yield Act, which states that lands "shall be

administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes".

Thus, removing cattle from the mountain may not be a legally viable alternative, and was counter to the Initiatives stated goal. However, a more liberal interpretation of the mandate would allow short-term cattle removal or manipulation of allotments, which would still allow for managing the Forest for long-term sustainability, thereby balancing multiple interests.

I still believe that cooperatively managing ecosystems on Forest Service land is possible, but stated goals can only be reached if the steps towards reaching those goals are clearly defined and measurable. In the case of reversing processes that took 100 years to create, time scales must be realistic and included in the planning process. The Monroe Mountain Initiative failed to reach many of its goals, because its objectives were actually subsets of goals with no clear pathways or sets of steps needed to reach those goals or objectives. Forest Service and Utah DWR personnel needed to work more closely to monitor and feedback information that would be useful to the other, so that adjustments could have been made when and where needed. The cooperative concept will only work if all involved parties are willing to respect all needs and viewpoints, put forward the effort needed, and to plan the processes needed to attain those goals, but more importantly to trust one another. Only when the parties trust each other can the other three be achieved.

As a final closing note, this study sampled a large number of treatment types and locations, which made analysis challenging. However, the treatment areas sampled were ones that the Forest had completed prior to my arrival, so study design was outside of my control. That said, I would have preferred to control some of the many variables. For example, I would have liked to conduct a single study of same-aged burned areas in which thirty, 1-acre or larger side-by-side wildlife and cattle exclosures that had been erected within a month after the fire.

This type of study would have produced more easily interpreted data sets that could be used for long-term monitoring purposes. Additionally, during my literature review, I found many references to elk's impact on aspen suckers, saplings and trees, but only one reference to deer's impact and no studies of strictly cattle impacts. These are issues that if studied, could be useful to both wildlife and land managers.