

CHAPTER 6

Incorporating Livestock and Aspen Management

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Aspen stands throughout Oregon are in an ongoing state of decline (Cobb and Vavra 2003; Shirley and Erickson 2001). Reasons for this decline are many, but key factors are lack of fire, encroachment by conifers, and excessive herbivory by livestock and large native ungulates—deer and elk (Shirley and Erickson 2001; DeByle 1985; Messmer 1999; Bates et al. 2006).

Kay (1994) speculated that increased herbivory may be due in part to a dramatic increase in herd size from pre-European settlement to present. The combination of domestic livestock and wildlife browsing has contributed to a higher level of browse pressure than that experienced by aspen stands in the past.

European settlers entering northeast Oregon in the mid-1800s reported that game was plentiful (Hug 1961). By the turn of the century, elk numbers were so low that the Oregon Legislature banned hunting of elk. That ban lasted until 1932. On the Umatilla National Forest, elk numbers in 1933 were estimated to be 3,080. Meanwhile, sheep, cattle, and horse numbers grew from the late 1800s to the early 1900s, reaching hundreds of thousands.

Today there has been a significant reduction in livestock numbers. However, elk and deer populations have grown and are now relatively stable. In the spring of 2000, elk numbers on the Umatilla National Forest were between 12,000



Figure 60. Grazing in aspen stands should be carefully planned and implemented. (Photo: Nicole Strong)

and 15,000 head (Shirley and Erickson 2001). Reported complaints about elk and livestock forage competition have risen.

Herbivory in aspen

Herbivory, the consumption of plants, is done by many species of animals and insects. Herbivores that utilize aspen include cattle, sheep, elk, deer, moose, beavers, gophers, wood borers, leafminers, etc. Utilization of aspen and terminal buds tends to be greater when sites are used by multiple species: cattle and sheep, cattle and deer, cattle and elk, or deer and elk.

Animals select areas to graze based on forage quality and quantity, comfort, and security. As a result, aspen stands cannot be viewed as discrete types when dealing with impacts of grazing and browsing (DeByle 1985).

Aspen stands in Oregon are small, particularly when compared to the aspen forests of the Rocky Mountains and Canadian provinces. In addition, these stands are small in comparison to the surrounding area available for grazing/browsing. However, aspen communities are known for their forage productivity. Cobb and Vavra (2003) reported that aspen communities can produce more than 1,750 lb of forage/acre. Jones et al. (2009) report that aspen communities at times produce more forage than neighboring meadow communities. Aspen stands can contain up to

10 times more forage than conifer stands, and the diverse grasses, forbs, and shrubs that grow in these areas are a valuable resource for livestock and wildlife (Salmon et al. 2007). Young aspen sprouts are nutritious and, when available, can make up a substantial portion of livestock and big game diets (Mueggler 1985). Thus, these sites are especially attractive to livestock and wildlife.

Cattle utilize aspen primarily early in the season. As the growing season progresses, cattle diets consist primarily of herbaceous species (grasses). However, following fire, use of aspen suckers by cattle has been shown to be significant in August. Sheep will browse aspen regardless of season.

The season of use by elk and deer is primarily fall and winter. Deer diets can be made up of as much as 74 percent trees and shrubs. Snow depths generally force deer out of aspen stands during the winter, but elk, being larger, are able to remain throughout most of the winter months.

Any of these herbivores, when out of balance, can have a pronounced negative impact on restoration success. Understanding the impact of herbivory by livestock and wildlife is necessary as management and restoration activities are planned. When implementing aspen restoration activities, one must plan to deal with grazing pressures on aspen sprouts and saplings.

Effects of livestock herbivory on aspen

Cobb and Vavra (2003) summarize the effects of livestock herbivory on aspen. Cattle stocking rates resulting in utilization levels of 50–60 percent of the palatable forage have negligible effects on aspen stands, regardless of whether stands are comprised of mature or young suckers. The greatest impact by cattle is trampling of the suckers while seeking shade. Repeated sucker damage progressively deteriorates the grove, opening it up for disease and ultimately leaving a few decadent trees and eventual grove loss.

Similar levels of grazing by sheep will directly damage and kill aspen suckers. Sheep browsing in the early sapling stage reduces growth, vigor, and numbers. Repeated overbrowsing will eliminate aspen regeneration and eventually the grove.

Shepperd and Fairweather (1994) reported on elk damage on a site in Arizona that had been fenced for 5 years after clearcutting. When the fence was removed, the grove stem density averaged 20,240 stems/acre, with dominant stems over 9.8 feet in height. By the end of the first year following fence removal, elk had caused severe damage to the grove by breaking the stems to reach the terminal foliage.

Elk also tend to “bark” mature trees during winter. Barking is the process of gnawing or stripping off the bark for food. Smaller mammals such as rabbits, mice, and porcupines also bark trees. Excessive barking can girdle trees, directly killing them or providing opportunities for fungi to infect the tree.

Grazing management principles

Livestock owners and land managers can control livestock impacts on aspen restoration activities and aspen grove health by controlling animal numbers (density), animal type and/or class (sheep vs. cattle, yearlings vs. cow/calf), timing (season), frequency of use, and length of the grazing period. Grazing systems, management tools (such as location of water and salt), and control of animals (through fences or herding) address these factors.

Rules of thumb established as far back as 1919 state that aspen suckers need to be greater than 3.9 feet tall for terminal leaders to escape sheep utilization; suckers need to be greater than 4.9 feet tall for terminal leaders to escape browsing by cattle. Terminal leader height for elk exceeds 6.6 feet (Sampson 1919; Jones et al. 2009).

When rehabilitating an aspen grove, it may take 4 or 5 years for trees to exceed browse height for sheep and cattle. For elk and deer, it may take 6 to 8 years for saplings to exceed browse height. As a result, if animal exclusion is necessary, temporary fences need to last long enough to protect the restoration treatment.

Designing a grazing system

A well-defined and implemented grazing plan will alleviate environmental concerns with respect to livestock grazing and help to maintain pasture and range health. A well-designed plan can also

improve or maintain forage production while optimizing plant and animal performance.

Grazing plans should strive to achieve livestock performance objectives and be based on the physiological and reproductive requirements of plants. Most forages are adapted to grazing but can be stressed by grazing. Individual plant response to grazing depends on:

- Whether the species is native or domesticated
- Number of times the plant is grazed (frequency)
- Amount of plant material left after grazing (stubble height, a function of grazing intensity)
- Amount of rest the plant is given following grazing, coupled with the amount of moisture and nutrients available

Elements of a beneficial grazing plan include:

- Site-specific grazing strategies
- Grazing schedules based on the physical and biological characteristics of the site
- Grazing schedules that provide periodic rest from grazing during periods of critical growth. Rest promotes plant vigor, reproduction, and productivity.
- Grazing schedules that prevent the increase and spread of invasive plants, while promoting conditions that facilitate the establishment and maintenance of desirable plants

One approach is “prescription grazing.” Arthur Bailey, professor emeritus from Edmonton, Alberta and now a private consultant, defines prescription grazing as a process that involves planning, implementation, monitoring, and revisions where necessary.

In short, prescription grazing is a site-specific, well-developed grazing management plan. Just as a doctor would prescribe medicine or a treatment plan for an ailment, range managers prescribe or design a grazing plan to meet landowner/land objectives while addressing resource issues or problems (ailments). Prescribed management scenarios differ from one another because of differing objectives and site characteristics. Bailey sums it up this way: “The cardinal rule in developing objectives for prescribed grazing is to realize what grazing can and cannot accomplish.”

A variety of grazing systems are available (see sidebar, page 64). Continuous grazing works well for managers who do not wish to invest much and do not expect much in return from grazing livestock. However, continuous grazing may result in resource degradation over time. If you wish to optimize forage and livestock performance, more sophisticated grazing systems are required.

When determining the timing, frequency, duration, and intensity of livestock grazing, consider the following:

- Maintain adequate plant cover and leaf material in order to promote photosynthesis, water infiltration, soil moisture conservation, and soil stability.
- Optimize energy and nutrient cycles by using sunlight, water, and nutrients from different zones in the canopy and soil. Plant structure provides habitat for numerous wildlife species, including browse and nesting sites.
- Dormant-season grazing makes use of the previous year’s production. Remove livestock before current-year grass growth begins. Spring grazing should be initiated after grass growth has begun (green-up).
- Reduce the length of grazing periods (number of days per pasture) to encourage leaf regrowth and replenishment of carbohydrate reserves before the next grazing season.

Specific to grazing livestock in the presence of aspen, consider the following points:

- Prescription grazing of aspen by livestock is an effective and relatively inexpensive best management practice for aspen in a number of resource-management scenarios.
- Cattle and sheep often graze aspen and other brush species as part of their diet. Carefully planned and executed grazing systems can either enhance aspen regeneration or suppress aspen and enhance grass production.
- In spring, new growth of aspen stems is easily sheared by cattle, but by August the young stems have hardened and cattle rarely eat them. By late summer, cattle use is generally limited to aspen leaves.
- Deferral of cattle grazing is appropriate in the first year of a new, regenerating aspen cut.

- Aspen regeneration (sprouts) should be protected from all large herbivore browsing until trees are taller than browse height.
- Spring cattle grazing can be accommodated in 4- or 5-year old aspen cuts that have well-established aspen saplings (above browse height).

Case Study 4 (page 55) looks at the effectiveness of several types of fences at reducing browse damage by both livestock and wildlife.

Conclusions

In eastern Oregon, aspen do not exist in the large, extensive stands (several hundred acres) common to the Rocky Mountains, Great Basin, or Canadian provinces. Aspen are typically found in isolated upland stands where soil and moisture conditions are favorable (perched water tables) or as stringers along stream corridors (Cobb and Vavra 2003). Managing herbivory on scattered small stands dispersed across the landscape is challenging. Before implementing an aspen-recovery project, be sure to understand post-treatment concerns about livestock and wildlife utilization of new sprouts. Grove protection will probably be necessary for the first 4 or 5 years if elk are not present and for up to 10 years if elk are anticipated to be in the area.

Grazing management systems can be developed to meet the needs of healthy aspen and productive ranches. Grazing should be limited during the early spring and late summer. Grazing systems that utilize some form of pasture rotation and rest periods will result in healthy range, sustained or improved site productivity, and better animal performance.

TYPES OF GRAZING SYSTEMS

Continuous grazing: A method of grazing livestock on a unit of land that permits unrestricted and uninterrupted grazing throughout the time period when grazing is allowed. Generally, this means that livestock are in a single pasture through more than one plant-growth period.

Deferred-rotational grazing: Grazing management of more than one pasture that involves delaying grazing in one pasture until seed maturity, then deferring other pastures in subsequent years.

Rest-rotational grazing: A grazing system in which one pasture receives a year of non-use. Most rest-rotation systems use three or four pastures.

Intensive grazing management: Grazing management that attempts to control the duration and timing of grazing. Management capital (labor, time, and other resources) is increased to optimize the production of both the land and the livestock.