

Appendix D- Livestock Grazing Tools Available to Improve Resource Conditions

As was mentioned in the Western Montana Standard Number 1, Upland portion of the Assessment Report on page 8, Uplands and Riparian standards were assessed on 17 distinct watersheds from 2001 to 2011. Within these watersheds, there were 860 miles of streams and 854 separate stream reaches identified by BLM in the DFO. Of these 854 reaches, 429 met BLM standards for a healthy riparian system while 425 failed to meet this standard. It has already been stated that nearly all (less than 90%) uplands meet BLM standards and that livestock stocking densities are appropriate for most allotments across the field office. However, nearly 50 percent of all riparian reaches failed to meet Riparian Health standards when the BLM IDT first conducted their assessment. This failure to meet BLM riparian standards is typically due to the grazing period or length of time livestock are allowed access to the riparian area (Marlow 1991). Generally, livestock stocking density or AUMs authorized by BLM on an allotment is **not** the most important parameter leading to a failed or properly functioning riparian system.

Upland health standards on BLM allotments are highly dependent on the stocking density or stocking rate for the allotment. A stocking density or rate that is not in concert with the carrying capacity of the allotment will not result in not meeting the Upland Health Standard. This is true for all allotments across the DFO. However, riparian systems are usually much more dynamic than uplands (USDI, 1998). Riparian health is dependent on a variety of key grazing attributes including Duration, Timing, Intensity and Frequency. These four terms have corresponding terms that the Society for Range Management calls: **Grazing Period** (the length of time that livestock are grazed on a specific area), **Seasonal Grazing** (Grazing restricted to a specific season or time of year), **Stocking Density** (Number of animals per unit area expressed as AUM/ac), and **Frequency** (Number of repeat grazing events in a pasture). Three other important grazing factors are: **Palatability of Forage**, **Availability of Off-Stream Watering Sources** and **Class of Animal** (Age and/or sex-group of a kind of animal).

Grazing Period or Duration - The most critical aspect in any grazing plan for the protection of riparian areas is the Grazing Period or length of time cattle have access to a particular stream reach (Marlow 1991). Myers (1989) after reviewing 34 allotments in southwestern Montana, concluded, “Duration in grazing treatments becomes a key factor in determining the severity of damage.” He added that cattle have a tendency to gather at riparian areas and spend a considerable amount of time in the riparian area even when they are not feeding. Cattle spend a disproportionate amount of time in the riparian area and tend to over-utilize the forage that grows there (Clary and Webster 1989). This attrition to riparian areas by a small herd or a large herd of cattle has an important bearing on riparian management and its connection to Grazing Period duration and Stocking Density. Due to social factors associated with cattle dominance around a riparian area and the limited availability of space in the riparian area, it is understood that doubling the number of livestock in a pasture with a riparian area does not equate to doubling the

grazing use in the riparian area. A relatively smaller number of livestock will usually graze the riparian area close to the same degree as a large number of livestock during the same period of use. Therefore, decreasing the **Grazing Period** and increasing the **Stocking Density** in a pasture with riparian will generally benefit riparian conditions by reducing the use in the riparian area even when the same number of AUMs is grazed. This strategy of a reduced duration in a riparian pasture and an increased stocking density will improve the riparian system.

Frequency or Number of Grazing Events- Frequency is simply the number of occurrences of a grazing event during a specified period of time or incorporation of non-grazing (rest) of an area of grazing land ranging from a few days to a full year or more. To fully understand frequency, there must be a time frame associated with the frequency of the given event. Historically, the term “rest” referred to non-grazing for a full year along with foregoing grazing on that year’s complete forage crop, but the term now is commonly used to include any period of non-grazing. Thus, rest must be carefully described and interpreted in order to be meaningful. The length of time of prescribed rest will be highly dependent on site specific conditions and objectives for each riparian system. Repeat grazing events during the year are important when dealing with plant health. Plants must have time to recover from a grazing event to properly replenish lost photosynthetic material and recharge energy reserves. The time it takes for this recovery is highly dependent on the growth stage the cool-season plant is in when defoliated and the season of defoliation. Defoliation during the early stages of plant growth in the spring was formerly presumed to be the most detrimental time to graze a cool-season plant (Stoddart 1946). Later research has shown that late growing season grazing is the most critical period to negatively impact perennial forage plants, and adequate time away from grazing during this period is necessary to replenish energy reserves and for bud development (Vallentine 1990). Furthermore, grazing during any time of the plants growing season and then repeat grazing during the same growing season without allowing adequate plant recovery away from grazing will reduce plant health. The greater the frequency of grazing events, the more damage to plants that will occur. Even more detrimental to riparian plant health is when frequency increases during a specific calendar year and this scenario is continued for multiple consecutive years. Recovery of channel morphology or browse species in a riparian system will generally require longer periods of rest within a specified timeframe than recovery of herbaceous riparian vegetation.

Seasonal Grazing – Another key attribute in meeting riparian health standards is **Seasonal Grazing** or grazing during a specific time of year. Clipping studies have indicated that timing can greatly affect plant productivity and vigor (Miller and Donart 1981). Seasonal Grazing is simply changing the time or season of the year when the riparian pasture is grazed. During periods of hotter temperatures, July to September, livestock will congregate considerably more around riparian areas to decrease body temperatures and to forage on green vegetation that is only available near the water. This could result in an over-used riparian. Continual grazing during the plant’s growth period will eventually cause roots to die and the plant to lose vigor and reproductive capacity (USDI, BLM 1998). By simply changing nothing but the seasonal grazing period from

summer to fall, spring or winter grazing, the riparian area can improve and may meet BLM standards for riparian areas. The grazing seasons are generally divided into three seasons (USDI, BLM 1998).

Early Season (spring) Use - Early Spring grazing (April 1 to July 15) in riparian areas may improve a riparian system for a variety of reasons as listed below.

- 1) Livestock may be attracted to succulent vegetation in the uplands and will not loiter in the riparian areas as much compared to other seasons of the year.
- 2) Cool temperatures may discourage cows from staying in the riparian or weather is not as harsh in the uplands. Hot temperatures experienced during the hottest months may force cattle into the riparian areas
- 3) Soil in the riparian area may be wet as to discourage cows from entering
- 4) Well drained soils reduce the possibility of compaction

Late Season (fall) Grazing Use- Late Season (July 15 to October 31) grazing in riparian areas may improve a riparian system but livestock affinity for browse species later in fall may be a concern. Benefits of late season grazing are listed below.

Soils are drying during this period which reduces the probability of compaction and bank trampling

- 1) Most plants have completed their life cycle and removing plant material by grazing will not adversely affect plant development and health compared to Grazing during April to July.
- 2) Ground nesting birds that nest in riparian areas are not negatively impacted

Winter Use – Winter use (November 1 to March 31) usually has the least impact to the health of riparian systems.

- 1) Soil compaction is typically not an issue due to frozen soils
- 2) Most plants have completed their life cycle and removing plant material by grazing will not adversely affect plant development and health compared to Grazing during April to July.
- 3) Livestock distribution should improve due animals need for water is lessened

Palatability- Livestock palatability is simply an animal's desire or ability to consume a particular plant species or plant part (Kothmann 2008). Palatability is tied closely with the life cycle of a particular grass plant species (Raleigh and Wallace 1965). Palatability becomes important to riparian and upland management when producers are determining a livestock rotation that will benefit a riparian or upland system. In general, livestock palatability or the closely tied digestibility of a cool-season perennial rangeland grass is high from growth initiation in spring (April/May) and continues being relatively high until the grass sets its seeds in mid to late summer (Raleigh and Wallace 1965). Palatability decreases after seed set and continues to decline into the dormancy period in

late summer and into fall. This low palatability continues until the following spring when growth initiation begins.

In a similar timing scenario, negative impacts to cool-season rangeland plants caused by a grazing herbivore removing photosynthetic material are much more pronounced during a period when palatability is high. However, herbivory by livestock has little impact to plants when palatability is low. When determining a grazing plan that improves conditions in riparian or upland pastures, management should focus on grazing cattle in pastures that need improvement during periods when the plant growth cycle is completed and palatability is low.

The dates and terms used in the Seasonal Grazing heading listed above generally correspond to both palatability and the life cycle of a cool-season rangeland plant. Early spring grazing (April 1 to July 15) is when the plant is completing its life cycle and it is most palatable to livestock. During this period, plants are most vulnerable to excessive grazing by livestock (Laycock 1970). Late season grazing (July 16 to November 1) is after rangeland plant's life cycle is completed and when palatability is low. Grazing during this period has little impact on rangeland plant health if grazing is not extreme (Cook 1971, Laycock 1970). Winter grazing is also after the plant's life cycle is completed and when palatability is lowest. Grazing during this period has little impact on plant health but excessive grazing may lead to increased erosion and a loss of topsoil (Heady 1984).

Stocking Density – Stocking density is simply the number of animals in a given area. As Myers (1989) and Marlow (1991) stated, length of time is the most important factor when determining the amount of use a riparian area will receive. However, stocking density is important. It is fundamentally understood that if a given number of AUMs are to be grazed in a riparian pasture, it is most beneficial for the riparian area to graze the largest number of animals for the shortest period of time to harvest the given number of AUMs. This assumption is valid only when strictly dealing with riparian resource health and does not factor important economic and logistical factors such as livestock performance, breeding performance, health of the livestock, logistics of moving livestock, etc.

Class of animal – Class of animal is an important consideration when trying to improve a riparian area that has failed standards. A livestock operation that grazes cows and their calves will typically have a livestock herd that travels less and has poorer grazing distribution in the pasture compared to a yearling cattle operation. Yearling or younger cattle will usually spend less time in the riparian area and more time exploring the entire pasture which has the potential to improve riparian conditions and get better use of your upland vegetation.

Off-Stream Watering Locations- Developing ways to influence the amount of time livestock spend in the riparian area is a critical part of proper riparian management (USDI, BLM 1998). The development of alternative clean water sources may lure livestock out of the riparian areas. Livestock usually prefer clean water provided in a livestock trough rather than a riparian area, especially during periods outside the hot summer months (July to September). By developing an alternative water system,

livestock can improve distribution in the pastures with riparian present and lessen the impact of livestock in the riparian areas.

Other Tools to Improve Riparian Areas- There are other options that may be effective in improving a riparian system, yet each one by itself will not change a non-function riparian system into a health riparian.

Hardened crossings – Hardened crossings are graveled or rocked areas that allow cattle to cross creeks or streams without adding excessive sediment to the stream or compacting soils in this area. Cattle often prefer to use these areas if constructed properly and will travel less on the riparian area that isn't hardened.

Watering Access Point- Sometimes, riparian streams are fenced off from livestock use for protection. However, providing a watering location from the stream is still needed to water the remainder of the pasture. Creating a watering access point off the creek using rock or gravel can allow livestock to water without negatively impacting riparian condition or increasing sediment in the stream. The goal is to construct an access point that allows livestock to water but encourages them to leave quickly and to avoid creating an area where livestock are able to loiter.

Riding Cattle Out of Riparian Areas- Riding is increasingly being used as a method to move livestock out of riparian areas (Storch 1979). Proper riding can be an effective tool to improve riparian areas but the quality and quantity of the riding will correspond to the benefits that area derived in improving the riparian area.

Drift Fences- In hilly topography, livestock are likely to use the riparian area and sometimes the stream bed itself as a corridor to travel to and from lower and higher elevations. A strategically placed drift fence can interrupt this habitual corridor and reduce pressure on the riparian area.

Riparian Pasture- As stated by Marlow and Myers above, length of time is the most critical factor when determining whether or not a riparian will meet BLM standards. Increasing the number of pastures by constructing a grazed riparian pasture may give an operator more flexibility to graze pastures with higher stocking densities but for shorter durations.

Pasture Divisions- In a similar fashion to Riparian pastures, dividing an existing pasture may provide more flexibility in the producers operation and result in grazing a pasture with riparian for a shorter period of time which will likely improve riparian condition.

Salt and Mineral Placement- Although these alone may not solve a riparian problem, they can improve livestock distribution and reduce the time cattle spend in the riparian area.

In conclusion, the length of time livestock are allowed access to a riparian area is the paramount grazing parameter that determines the health of the system. However, many other tools mentioned above may help to reach the goals for the livestock operation and to meet the desired natural resource condition. In summary, there is no single, let alone simple solution for how to graze livestock in riparian areas where both ecologic and economic goals are desired. Ultimately, what is required is an on-the-ground review of

the site specific circumstances by resource professionals (livestock producers and land managers) and a carefully considered prescription developed to address the unique conditions and desired objectives of the parties involved (Anderson 1993, Buchhouse and Elmore 1993).

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