

Intensive Grazing

- Several types: high-intensity-low-frequency grazing, short-duration grazing, time-controlled grazing and holistic resource management.
- All based on very high stocking rates and utilization followed by relatively long periods of rest.
- Best suited for seeded pastures in a humid climate.
- Forces animals to eat less desirable plant species that may be ignored in other grazing systems.
- Enables strict control of animal distribution when smaller pastures are used.
- Good for controlling weed problems in a targeted area.
- On fescue grasslands, high stocking rates decrease range condition.
- Heavy grazing may reduce infiltration rate and increase erosion.
- Mixedgrass prairie soils are fragile and heavy grazing can cause a decrease in organic matter, lower root mass, lower vegetation densities and a decline in range condition.
- Requires constant monitoring and adjustment based on growing conditions.

Rotational Grazing Systems

- Designed to reduce selective grazing and overgrazing.
- More livestock are grazed on a small area for a shorter period of time.
- Promotes even use of fields.
- Useful where animal distribution is a problem.
- Litter cover will increase in rested field.

There are 4 types of rotational grazing systems:

Switchback

- Involves only 2 pastures.
- Similar to deferred grazing.
- Allowed to rest every other year in the spring to maintain vigour and range condition.

Deferred-Rotation Grazing

- Similar to switchback grazing but grazing in spring is rotated among 3 or more pastures instead of 2.
- May provide management flexibility, extra grazing days, optimum stocking rate and a productive rangeland for other resources.
- Helps maintain vigour of the most productive plant species that decrease under grazing pressure.
- Optimizes use by grazing at times when plants are most palatable.
- Allows longer rest period for plants to recover.
- Allows native grasses to be grazed only once, as is desirable.
- Requires more management, fencing and water development.

Example of a deferred-rotational grazing system

Field	Year 1	Year 2	Year 3
A	Graze 1st *	Graze 3rd	Graze 2nd
B	Graze 2nd **	Graze 1st	Graze 3rd
C	Graze 3rd ***	Graze 2nd	Graze 1st

* Vegetation will be actively growing ** Vegetation will be flowering *** Vegetation will be setting seed

Merril Rotational Grazing

- Involves multiple herds and short deferment periods.
- Each pasture is grazed at a different time each year (early, mid or late season) - will repeat every 4 years.

Rest-Rotation Grazing

- Where one field is rested for an entire year.
- Requires a minimum of 4 pastures.
- Pastures are grazed in a rotation. A 4 field system would mean any given field goes through 1 year of early grazing, 1 year of mid season grazing, 1 year of late grazing and 1 year of rest.
- Moderate stocking rates are recommended and an appropriate safe use factor.
- Based on improving forage quality and minimizing selectivity.
- Improves plant vigour, animal distribution and forage use.
- Requires fencing and water in multiple fields.

Riparian Area Grazing

- Riparian areas are extremely important for wildlife habitat, aquatic life and for maintaining water quality.
- Riparian areas require diverse, multilayered vegetation to function. Plants with deep, fibrous roots provide stability and woody species provide roots and woody debris.
- Recommended utilization rates are between 25 - 50%. Enough vegetation must remain to provide cover for stream banks during runoff events, to filter and trap sediments and to lessen stream energy.
- Access to water can be improved by providing an access point with a hard surface. Livestock will prefer it, the riparian area as a whole will be impacted less and it would be easier to monitor for damage (weeds, erosion).
- Off-stream watering sites are also highly recommended because cattle prefer them, gain weight faster and damage is reduced to water bodies and riparian areas.
- Salt, shelter and off stream water placement may be enough to distribute cattle away from riparian areas. Another option is temporary and/or permanent fencing.
- Livestock access should be restricted in spring when stream banks are soft or when wildlife are breeding and nesting.
- Periods of rest will allow time for bank rebuilding, tree seedlings will be able to grow and reach a grazing resistant stage and plant vigour will increase.
- Because livestock congregate in wet areas they will overgraze them despite low or moderate stocking rates.
- Desirable native species may decrease in grazed areas without adequate rest after grazing.
- In autumn riparian vegetation is more palatable than upland vegetation, making it susceptible to damage.
- In high risk or chronic problem areas fencing may be the only option for mitigating damage.
- Overgrazed riparian areas will develop wider channels, shallower and warmer water and will lose their deep rooted plants. Instead shallow or tap rooted plants will take over and do not provide bank stability.

There are 4 types of riparian area management:

Rest Rotation Grazing

- Amount and sequence of rest periods depends on the types of vegetation the riparian area can support.
- Fields with rugged terrain and riparian areas can support 20-30% higher utilization on upland areas compared to other systems. Rest for the riparian zone during the growing season will allow it to recover.
- Preferred shrubs like willows generally thrive under this grazing strategy.
- A full year of rest may be necessary to restore degraded riparian areas.
- To regenerate large trees like cottonwoods several years of rest may be necessary.

Deferred Rotation Grazing

- Allows desirable plant species to pass a critical stage so their population will not decline.
- Defer use of riparian area during the early growing season.
- Shorter grazing periods, longer rest periods and limiting regrazing will maintain plant vigour and provide rest.
- Dividing fields into smaller pastures will provide better control over livestock movement and encourages even use of fields.

Riparian Pasture

- When riparian areas are fenced off separately and managed as a separate grazing unit.
- Fences are constructed along the boundaries of natural vegetation divisions in the riparian zone because livestock distribution is easier to control when the vegetation is similar throughout the pasture.
- Optimum period for grazing riparian zones is after spring runoff and after stream banks are no longer soft but before the dormant season in the fall. If cottonwoods are present grazing should be before peak flow occurs.
- Easy to control livestock movements in and out of the riparian zone.
- Grazing after the growing season is over sets back woody species that stabilize stream banks and provide shelter for livestock. Livestock will target vegetation that is important for stream health and stability because they remain greener in autumn.

Corridor Fencing

- When the entire riparian area is fenced off from any grazing.
- A measure of last resort used only on severely degraded areas.
- Riparian zones will quickly advance to their climax vegetation community.
- Other grazing regimes can be just as effective at allowing rest, regeneration of plant species and stream health.



Grazing Systems

Managing rangelands requires a lot of time and effort. There are many different approaches and there is no silver bullet that will meet every need or suit every ranch. Each pasture is unique and every rancher has different perspectives and goals for their operation. This factsheet is not intended to recommend any one grazing system but simply lays out the options and suggests what you may find to be the pros and cons of each for integrating wildlife management. Species at risk do not require any one particular grazing system but as you have read in other MULTISAR documents, there are many characteristics of a pasture that species at risk prefer. Utilization of grazing systems can result in habitat for species at risk if managed with them in mind. You will have to find the combination of traits from each grazing system that is right for you.

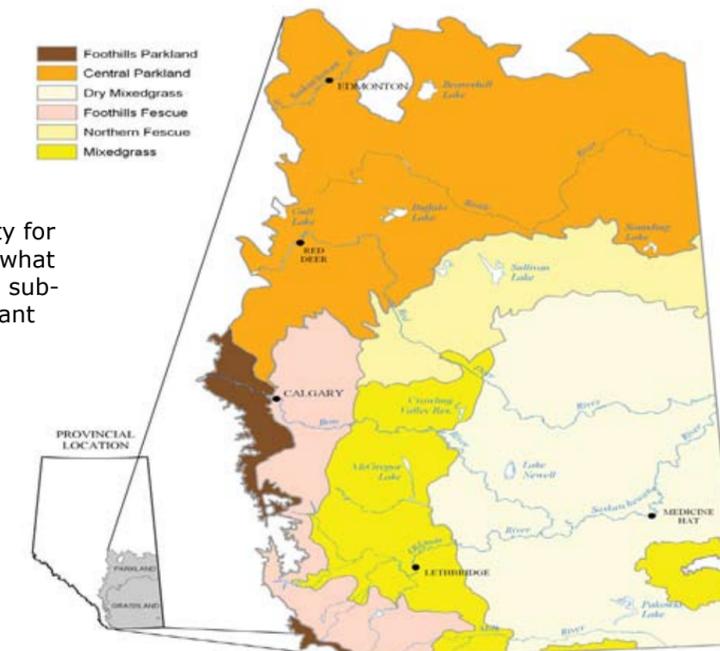
Range Management Principles

Good range management practices imitate the natural system and foster healthy native plant communities. The four key principles of good range management are:

1. Balance livestock demand with the available forage supply. This means leaving carryover and adjusting stocking rates annually based on available forage.
2. Distribute the impact of livestock grazing. Use salt, water, fencing, trails and feed to spread the impact of grazing over the range and don't allow livestock to linger in one area.
3. Avoid grazing during vulnerable periods, such as in spring when root reserves are building up and wildlife are nesting, when streambanks are wet and in the dormant season.
4. Provide effective rest after grazing. Rest must be given during the growing season when conditions are favourable to allow root and shoot growth.

(Adapted from *Grazing Lease Stewardship Code of Practice*, Alberta Sustainable Resource Development, 2007)

Alberta's grassland and parkland subregions



The native plant community for your ranch will depend on what subregion you are in. Each subregion has different dominant vegetation.



Contact:
 MULTISAR
 2nd Floor, YPM Place
 530 - 8th Street South
 Lethbridge, Alberta
 T1J 2J8
 www.multisar.ca

Brandy Downey - Program Coordinator
 403-381-5526
 Jenn Carlson - Area Range Management Specialist
 403-382-4297
 Craig DeMaere - MULTISAR Rangeland Agrologist
 403-381-5112

Rangelands & Species at Risk

Range Health Assessment

Grazing Systems & Wildlife

General beneficial management practices (BMPs) for rangelands and species at risk:

- Avoid grazing native grasslands from April to June 15. This is the breeding and rearing season when prairie animals are most sensitive to disturbance and nests and young could be trampled.
- Create variability in your pastures. A range of grass heights and litter cover is desirable with shorter grass heights near burrows. Strategic placement of salt and water can achieve this.
- Maintain your shelterbelts and leave your natural trees and shrubs undisturbed. Trees with nests should be re-enforced if falling down.
- Diversify your shelterbelts with shrubs planted in an irregular manner. Thorny buffaloberry is a good choice.
- Leave a minimum 30m buffer of natural vegetation along wetlands to trap sediments, provide soil stability and filter water.
- Do not graze near known frog and toad breeding wetlands from late April to July 15.
- Tolerate Richardson’s ground squirrels if they are not causing excessive damage. They are a main food source for raptors and snakes and their burrows are used by owls, snakes and foxes.
- Provide off-stream watering sites to promote cattle movement away from wetlands and streams.
- Defer haying until July 15 whenever possible.
- Minimize pesticide use, especially near nests, leks and water bodies.
- Remove marginal cropland from production and seed to native or tame grasses to provide permanent cover.
- Ask industrial developers to conduct predevelopment wildlife surveys and follow Alberta Sustainable Resource Development’s Species at Risk Guidelines when they are on your land.



April to mid June is a critical time when wildlife breed and raise their young. Minimize disturbance at this time, including oil and gas activity and grazing.

Gord Court

Key Terms in Range Management

Grazing System - A plan for making productive use of the available pasture resources in a manner that allows livestock production goals to be met while maintaining and improving the range.

Rangelands - Land used for grazing, such as native grasslands, forests and tame pasture.

AUM - Animal Unit Month. The amount of forage required to support a 1000lb cow including a calf up to 6 months of age for one month. Adjustments are made for animal weight and class.

Carrying capacity - The maximum stocking rate a parcel of rangeland can achieve and still maintain or improve the ecological health of the plant community. This is measured in AUMs.

Grazing capacity - Same as the carrying capacity but corrected for seasonal variability, animal distribution, health trends and other management factors. This is measured in AUMs.

Safe use factor - The percentage of utilization (grazing) for a plant species or range deemed acceptable to allow improvement or maintenance of range health.

Riparian area - The green zone surrounding a stream, river, wetland or lake where increased moisture supports a unique diversity of life.

Litter - Dead plant material on the ground, also called plant residue. This does not include the current year’s production. The distribution and abundance of litter is important to the soil. Litter increases moisture retention and nutrient recycling, and reduces erosion and evaporation.

Carryover - The plant material left ungrazed to conserve moisture and provide soil protection, wildlife habitat and seeds for next year’s range.

Range Health is a measure of the ability of rangeland to properly function. These functions include net primary production (vegetation growth), maintenance of soil/site stability, capture and beneficial release of water, nutrient and energy cycling and functional diversity of plant species. The importance of these functions is outlined below. To evaluate these functions a Range Health Assessment looks at what plant species are present, what layers of vegetation are present, amount of litter, amount of bare ground or erosion and amount of noxious weeds. The assessment results in a Range Health Score. Methods for assessing rangeland health were standardized in Alberta in 2003 with the publishing of a workbook (see below to obtain a copy). Healthy rangelands provide grazing opportunities to producers and provide many other services that benefit the land, wildlife and people.

Table 1: Functions of healthy rangelands and why they are important.

Rangeland Functions	Why is the function important?
Productivity	<ul style="list-style-type: none"> • Healthy range plant communities are very efficient in utilizing available energy and water resources in the production of maximum biomass • Forage production for livestock and wildlife • Consumable products for all life forms (ex. insects, decomposers, etc.)
Site stability	<ul style="list-style-type: none"> • Maintain the potential productivity of rangelands • Protect soils that have taken centuries to form • Supports stable long-term biomass production
Capture and beneficial release of water	<ul style="list-style-type: none"> • Storage, retention and slow release of water • More moisture available for plant growth and other organisms • Less runoff and potential for soil erosion • More stable ecosystem during drought
Nutrient Cycling	<ul style="list-style-type: none"> • Conservation and recycling of nutrients available for plant growth • Rangelands are thrifty systems not requiring input of fertilizer
Plant species diversity	<ul style="list-style-type: none"> • Maintains a diversity of grasses, forbs, shrubs and trees • Supports high quality forage plants for livestock and wildlife • Maintains biodiversity, the complex web of life

Reprinted with permission from *Field Workbook for Rangeland Health Assessment for Grassland, Forest and Tame Pasture*. Adams et al. ASRD Pub. No. T/044.

The Range Health Score for any given pasture will fall into one of three categories: healthy, healthy with problems or unhealthy. The score is determined through 5 sets of questions:

1. What kinds of plants are on the site? What is the plant community?
2. Are the expected plant layers present?
3. Does the site retain moisture? Is the expected amount of litter present?
4. Is the site subject to accelerated erosion? Is there human caused bare ground?
5. Are noxious weeds present? How dense are the weeds?

Rangeland managers are encouraged to call 310-0000 and ask Public Lands and Forests for a copy of the *Field Workbook for Rangeland Health Assessment for Grassland, Forest and Tame Pasture*. This workbook can also be downloaded off the web at <http://www.srd.alberta.ca/lands/managingpublicland/range-management/healthassessment.aspx> by clicking on Rangeland Health Field Workbook. In the grasslands range health should be assessed mid June to late July.

Small areas with unhealthy range health scores may be a good thing when considering small patches with burrows. For example, burrowing owls prefer very short grass around their burrows for visibility. MULTISAR can help you decide if an unhealthy area is good for wildlife.



Black - Description/general information Blue - Benefits/positive outcomes Green - Drawbacks/negative outcomes

Continuous Grazing and Season-long Grazing

- Cattle graze a field throughout the season, normally May to October.
- Cattle are selective grazers that favour certain plants so over time selected areas will become overgrazed while others are undergrazed.
- Patchy areas with long and short grass heights created with this system are good for wildlife because habitat is created for a variety of species.
- Native grasses evolved with heavy bison grazing making them more resistant to grazing pressures. They also provide more palatable forage in the fall and winter and are not damaged when dormant.
- In the flat Mixedgrass prairie region, livestock can be distributed more evenly with careful placement of water and salting locations.
- High stocking rates change the soil to that of a more arid climate, reducing fertility and water holding capacity.
- Patches that are grazed frequently and do not regrow tend to deteriorate even at moderate stocking rates. These plant communities shift to less desirable or invasive tame plant species.

Season-of-use Grazing

- Involves several fields, each grazed once each year, usually during the same season each year.
- Well suited to ranches that have several different dominant vegetation types available in their pastures.
- Using smaller, more concentrated areas forces livestock to graze more uniformly. This creates a similar landscape throughout the pasture, which does not provide habitat for many species. Wildlife prefer patchy habitat.
- This system provides rest for plants to recover from the stress of grazing. This rest can also be used to exclude animals from certain wildlife habitats during key times (spring).
- On native prairie, late season grazing (after July) increases the frequency of taller grasses like spear grass, wheatgrass and June grass. It also keeps good ground cover and carryover for next season.
- Pastures that have several different features on them (treed or shrubby areas, grassland, meadow or stream-sides) can be fenced and used separately at their time of best palatability and nutrition.
- The species that are most palatable when livestock are grazing will be effected the most and would likely decline in numbers while others that are not grazed will increase. Changing the season of use year to year will alleviate this pressure.

Deferred Grazing

- When grazing is delayed to allow specific desirable plant species to maintain their population when they would otherwise decrease if grazed.
- Only appropriate if alternate pastures are available that do not have the species under consideration.
- May be used to improve plant vigour, reduce harm from early season grazing, accumulate litter and ensure carryover.
- Early season grazing reduces the height of standing and fallen litter, decreases organic matter, increases bare ground and limits the nutrition in plants.
- Allowing plants to mature and set seed often makes them less palatable and less nutritious.

Complementary Grazing

- Uses both native and seeded pastures to improve their vigour, forage quality, range condition and to lengthen the grazing season.
- Seeded pastures should have 15cm (6inches) of growth before being grazed and carryover is important to facilitate new growth.
- Fencing based on plant species allows greater control over livestock distribution and better use of forage.
- Crested wheatgrass or meadow brome provides highly nutritious forage early in spring when native grasses are most vulnerable to grazing but may invade the native prairie.
- Native grasslands should never be converted to tame pasture to use this system.

Skim Grazing

- Used to control invasive species.
- Graze for a short duration mid-May when invasives are most palatable to reduce further expansion.
- Rough fescue may be preferred by livestock at this time so restriction to the weeded area may be necessary.