



## **Silvicultural Regimes for Range Management - Guidance**

### **Scope**

This guidance covers silviculture activities by Forests For Tomorrow (FFT) within areas that the province has both range and forestry objectives.

The main focus of the FFT funded silviculture activities within these areas will be on future timber production, however, modification of treatment prescriptions may be employed to reduce negative impacts on both range and timber productivity. Sites where FFT should consider range values should be defined locally with the help of district range staff

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### **1. Introduction**

Silvicultural treatments can be used to influence stand structure which, in turn, can influence forage quality and livestock distribution. There is a potential to use stocking standards (including species choice), site preparation, thinning, and pruning (*not yet eligible under FFT*) as tools to maintain forage quality and influence livestock distribution.

### **2. Purpose and Objectives**

The purpose of this Ministry of Forests, Lands, and Natural Resource Operations (FLNR) *Silvicultural Regimes for Range Management guidance* is to provide direction on modifying silviculture regimes when opportunities and direction exist to influence livestock distribution and maintain forage quality and quantity while still maintaining the primary silviculture objective of future timber production.

### **3. General Principle**

Just as the forest resource varies by ecosystem so does the range resource. When one is working in an area with both range and forest resources on a site consideration should be given to how each responds to the differing Biogeoclimatic classification of the site.

Treatment practitioners need to work with local range operators and district range staff in order to plan and carry-out silviculture treatments to manage both the range and timber resource values on these sites.

Successful implementation will require reasonable planning and implementation windows, adequate input from knowledgeable and experienced practitioners (silviculturists, ranchers, and range staff), and having fair and reasonable expectations on what the outcomes should be.



#### **4. General Guidance**

*All silviculture activities that occur within areas with range tenures should be undertaken in timely consultation with your local range management specialists.*

Altering tree species composition and density coupled with management of post-treatment residual material can have a significant impact on forage quality and quantity. As well, tree species composition and density coupled with management of post-treatment residual material can be used to manipulate natural or man-made range barriers.

Natural barriers to livestock movement can take the form of dense shrub thickets, standing timber and downed woody debris. In some cases, debris can be placed strategically while harvesting equipment is still working on a cutblock to protect a resource feature or prevent livestock movement off the tenured area.

When prescribing activities in areas with range tenures consideration of livestock, topography (aspect and slope), riparian values, water access, trees, and understory plant species in relation to:

##### **❖ Site Preparation**

- Concentrations and retention of post harvest material can have both positive and negative effects livestock movement. Post harvest material can be strategically retained as a range barrier, but excessive material left across a block may limit access to forage. Excessive post harvest material may need to be mechanically piled in preparation for burning
- If site preparation is needed to encourage crop establishment, then discussions around the best type of site preparation with knowledge of livestock movement and behaviour is critical.
  - Site preparation techniques that result in treatment of a large portion of the soil surface can destroy forage value and may increase the potential for invasion of non-palatable or toxic invasive plant species
  - Broadcast burning of slash can create a seedbed for forage
  - Orientation of linear trenches or providing breaks in the linear trenches can alter livestock movement and modify the impact of livestock on a block. .
  - Concentrations and retention of slash an also be used to control livestock movement.

##### **❖ Stocking Standards/Planting:**

- **Species selection**
  - Broadleaf species such as aspen, poplars, maple, and birch are more susceptible to damage from browsing and trampling than coniferous species..



- However, forage quality and quantity can be higher under some broadleaf canopies than under coniferous canopies.
- Conifers are more attractive to livestock when trees are flushing in spring, so planning is required in order to maintain feasible livestock rotation options.
- **Seedling stock selection**
  - Planting a larger more robust tree may avoid some damage or provide the seedling with enough resilience to survive livestock caused damage.
    - Although larger planting stock costs are higher it could result in greater tree seedling survival with fewer fill plants occurring, potentially, reducing overall establishment costs.
- **Density and Inter-tree distance**
  - Crop Tree density, inter-tree distance, and spatial arrangement can be used to influence forage quality and quantity as well as livestock movement.
  - Even where good forage is available, supply decreases dramatically once the canopy closes past 50%.
  - Adjusting the inter-tree spacing can maintain good forage for a longer period.
  - Density can be manipulated to control livestock movement. High density and spatial arrangement can be used to control livestock movement by creating range barriers.
  - Spatial pattern of tree placement on site can also affect forage. Creation of forage corridors may allow for management of forage while having minimal impact on timber production. Spatial pattern can also be manipulated to ease the maintenance of fencing.
- **Seedling placement**
  - A combination of utilizing good obstacles (scattered debris, rocks, terrain, stumps, slash piles, SOME site prep installations) and clustering around these obstacles by planting more seedlings in proximity to the obstacle (increase localized density while increasing spacing between clusters) may achieve both overall density objectives for trees and increase the time which forage is available in a planted area.
  - Livestock can cause damage by stepping on (or against) seedlings, as well as scraping off bark. Planting adjacent to obstacles such as rocks, stumps, or slash piles can provide some protection to seedlings
    - Generally, trees are most susceptible when less than 40 cm tall, and during the period of rapid growth in early spring. Trampling damage causes deformation and weakening of the stem, and may also provide an entry point for pests and disease. Once seedlings reach about 40 cm, cattle will begin to step around them.
    - Cattle also tend to avoid stepping on objects of a certain mass (10 to 15 cm wide and 15 cm high).



❖ **Vegetation management/brushing**

- Livestock can do a reasonable job of controlling certain types of vegetation, depending on the kind and class of livestock (cow-calf pairs/yearlings/sheep) you have and how palatable they find the forage.
- Consideration should be given to the impact of the various vegetation management options (e.g. manual brushing, chemical brushing, etc.) have on native forage species and livestock access.

❖ **Juvenile thinning/spacing**

- Provides an opportunity to influence density and espacement which in turn influences forage quality and quantity and livestock movement.
- The depth and orientation of slash on the ground can create conditions that limit livestock movement and prevent access to any forage that might be made available.
  - Accumulations of heavy slash should be avoided so that cattle, particularly calves, can use the area without getting trapped by slash accumulations.
  - The amount of slash resulting from thinning depends very much on the initial density and tree size as well as the pattern in which the trees are felled.
  - The impact of heavy slash can be reduced by directional falling, limbing, bucking, and cutting access trails
- Specific stump height and angle of thinned material can also create situations that injure livestock.
  - Stumps throughout the area should be cut as low as practical (i.e., 20 cm high) and as flat as practical (i.e., stump angle not exceeding 1:2 rise/run) to reduce the risk of injury to cattle and range riders.
- Fences should be cleared of slash accumulations for two metres on each side to provide access.

❖ **Fertilization**

- Three aspects should be considered with regard to livestock use when applying fertilizer: the availability, palatability, and inherent toxicity of the applied fertilizer.
  - Urea applied to forest soil as forestry-grade pellets is available to livestock for a period of a few hours to a few days, depending mainly on precipitation patterns after fertilization.
  - Domestic cattle are attracted to urea pellets. Small doses (a few handfuls) of urea are lethal to these animals.
- The prime concern is spills around the loading site.
- In range use areas, arrange with the range resource officer to have cattle off the site during treatment. It is improbable that cattle will ingest a lethal dose



from a properly spread fertilizer application within the block or from compacted surfaces such as roads or landings. However, cattle are attracted to urea and will even make holes in unopened bags. Therefore, do not leave fertilizer stores unattended on a site if cattle are expected to be in the area.

- Daily clean up is required at loading sites to prevent fertilizer from being ingested by animals.
  - Any fertilizer spills must be cleaned up on a daily basis.
- ❖ **Pruning** - *not yet eligible under FFT*
- Pruning increases the height to the base of the crown and can improve understory forage production.
  - However, pruning may also disrupt natural range barriers.

## **5. Supporting tools/Information**

- ❖ [Factors influencing livestock behaviour and performance](#)
- ❖ [Agroforestry guide](#)

## **6. Range management contacts**

- ❖ [Rangeland Management Staff Contacts](#)

## **7. Additional Information**

- ❖ [Other range information](#)