



Indicator 5.1.5 Livestock Carrying Capacity

[1] Foothills Model Forest value

Multiple benefits to society.

[2] Objective

To provide benefits to society through sustainable forest grazing.

[3] Statement of indicator

Livestock carrying capacity (maximum supportable limit) in relation to grazing.

[4] Indicator measure

The measure for this indicator is the carrying capacity of a disposition, expressed in Animal Unit Months (AUMs).

An AUM is the amount of forage required by one animal unit for 30 days. One animal unit is equal to a 1000 lb (455 kg) cow with an unweaned calf up to 6 months of age. It is often expressed as a stocking rate (AUM/ha or acre). Generally, one AUM will require 1000 lbs (455 kg) of dry matter per month, which includes a 25% forage loss due to trampling. When the animal unit is larger than the standard size, an adjustment is made. For example, a 1300 lb. cow is equivalent to 1.3 animal units.

[5] Rationale for indicator

a. Significance of indicator to landscape-level management

Forest grazing has been a longstanding use of forested ecosystems dating back to the early 1900s. In Alberta, forest grazing is carefully managed and regulated, ensuring that riparian areas, wildlife habitat, and timber production are managed for sustainable use.

b. Meaning of indicator

Grazing is approved on public land through the issuance of a variety of dispositions. In the Foothills Model Forest landbase, these include grazing leases, grazing licenses and head tax permits. Carrying capacities are set by Alberta Sustainable Resource Development (ASRD) for each disposition type.

As well, for each plant community described in its Range Plant Community Type Guides, ASRD suggests an ecologically sustainable stocking rate (ESSR). This represents a balance between plant production, the ecology of the site, and livestock's monthly forage requirements. The ESSR reflects the maximum number of livestock (AUM/ha or acre) that

can be supported by the plant community, given inherent biophysical constraints and the ecological goals of sustainable health and proper functioning of the plant community.

When the ESSR is expressed for the area of a plant community polygon (for example, per hectare), the result is termed carrying capacity (CC), and is written in AUMs. Total AUMs represent the carrying capacity or the long-term average grazing available in an average year, on a disposition with good management. Carrying capacities are determined using data from range surveys, ecological classification, mapping, grazing, and plant community clipping studies. Carrying capacity calculations include consideration of livestock and wildlife forage needs, as well as the need for adequate protection of the plants and soil. Long-term carrying capacity is established at a level that will maintain forage vigour and productivity, and rangeland health.

c. Relation of indicator to Foothills Model Forest and to sustainability

It is important to manage and monitor grazing to ensure long-term rangeland ecosystem health within the Foothills Model Forest. When not properly managed, grazing can negatively affect rangeland health



Active and flexible grazing management helps maintain plant species diversity and reduce the potential for weed invasion

and ecosystem sustainability through soil erosion, loss of plant species diversity, and the depletion of nutrients. Active and flexible management of forest grazing helps ensure a sustainable level of forage for livestock grazing while balancing other values within this landbase such as timber, wildlife, and recreational and tourism resources.

[6] Current status of indicator

Figure 1 illustrates the total animal unit months (AUMs) from 2000 to 2006 in the Foothills Model Forest landbase.

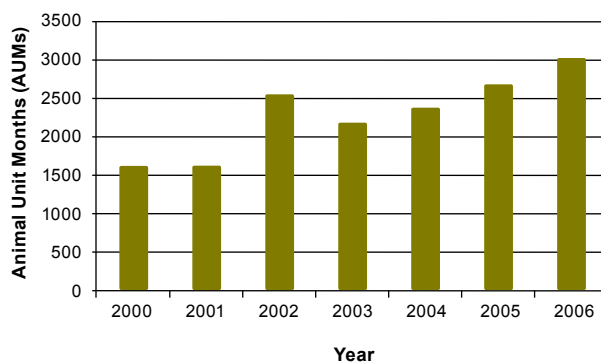


Figure 1 – Total Animal Unit Months (AUMs) from 2000 to 2006 in the Foothills Model Forest landbase

[7] Interpretation

Depending on climatic conditions, forage production can vary considerably from year to year. Figure 1 shows an increase in total AUMs from 2001 through 2006 (carrying capacity is based on average production over a period of time). In Figure 1, the AUMs used per year from 2000 to 2006 have been less than the total carrying capacity (~3,250 AUMs). In addition, if range health declines, the actual use will be adjusted through changing practices to maintain health and carrying capacity.

[8] Rationale for allowable variance (threshold)

Livestock use can be reduced when forage production for a given year is below the long-term average. Grazing at CC during times of drought and other disturbances can create range health problems and may require serious destocking if continued. Adjusting the CC for weather and other factors will maintain range health and carrying capacity.

[9] Analytical considerations

a. Calculation of indicator

Many years of research have resulted in

the creation of detailed guides on carrying capacity and range plant communities for several sub-regions within the province. These include the lower foothills, upper foothills, montane, and subalpine regions. These guides are available through Alberta Sustainable Resource Development (see <http://srd.alberta.ca:80/lands/managingpublicland/rangemanagement/classificationecology.aspx>).

The concept is to ecologically classify the landbase along with plant community classifications to determine ecologically sustainable stocking rates. These guides outline the species composition, forage production and suggested stocking rate of each range plant community within a given subregion. Additionally, ASRD carries out long-term monitoring of the range resource at over 180 reference area sites in the province. The primary objective of this monitoring is to determine range health and long-term range trends for species composition and forage productivity in the presence and absence of grazing disturbance. This monitoring allows us to detect changes in rangeland diversity that exceed the range of natural variation.

b. Special considerations

When ASRD assigns dispositions, there is normally a delay of a year or two before the new disposition holder uses the disposition. When grazing dispositions are to be renewed, ASRD inspects them at or before the renewal date.

Range health is one of the criteria used to determine the good standing of the disposition and renewal for another term. If the disposition is not in good standing, ASRD will work with the disposition holder to make the necessary changes. Failure to make the changes may result in compliance and enforcement actions, including decisions to reduce the term or not to renew the disposition. Regional forage availability fluctuates each year depending on many factors, including the number of dispositions.

It should be noted that incidental grazing occurs through commercial trail riding permits within Willmore Wilderness Park and Jasper National Park. These are administered by Alberta Tourism, Parks, and Recreation and Parks Canada, respectively.

[10] Responsibility

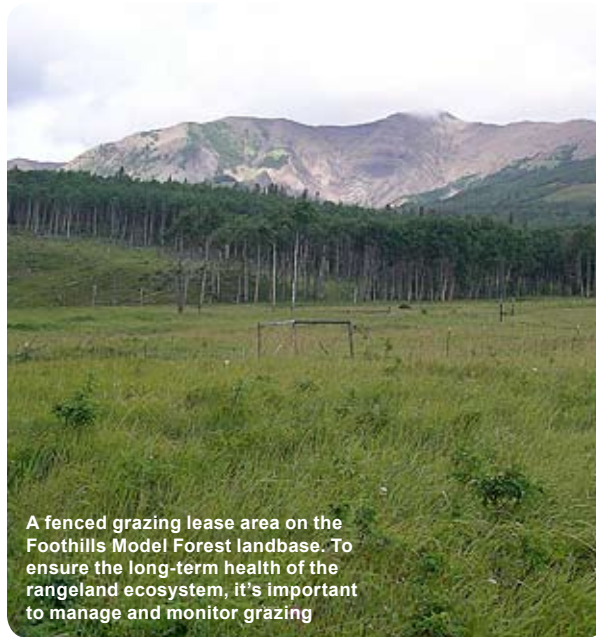
Alberta Sustainable Resource Development was responsible for providing all the data for the calculation of this indicator.

[11] Monitoring

Carrying capacities are determined at the time of disposition issuance and at times of renewal. Yearly monitoring is done when disposition holders submit annual stock return forms. Monitoring is an important component of rangeland management, as it lets us track whether goals are being achieved and maintained and if management adjustments are necessary.

[12] General discussion

Since the last report, grazing has been maintained in sustainable limits in the Foothills Model Forest landbase. Climatic and environmental conditions may cause variances from year to year in the amount of forage produced. Drought and insects can also negatively affect the quantity of forage. The disposition holder has a responsibility not to overstock the disposition, and must adjust usage to reflect yearly forage production. In essence, when properly managed to protect the rangeland resource and to sustain economic, social and environmental values, grazing is a sustainable and acceptable use of rangeland resources within the Foothills Model Forest landbase.



A fenced grazing lease area on the Foothills Model Forest landbase. To ensure the long-term health of the rangeland ecosystem, it's important to manage and monitor grazing