

REPORT ON THE GRASMERE RANGE UNIT
- MANAGEMENT ALTERNATIVES

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REFERENCES

This report identifies the problem facing those charged with managing the range resource on the Grasmere range unit and examines possible solutions. The existing information on soils and climate, on the range unit file, and the D.A.T.E. project #2 report on Grasmere were reviewed. The ecological classification group, range and forestry personnel and Ministry of Agriculture representatives contributed material. Field orientation and limited sampling completed the survey. The dominant problem is a lack of forage to support the number of permitted animals. Forest ingrowth appears to contribute more than any other single factor to the decline in forage productivity. For completeness, other management options are discussed. However, an active program to ameliorate the deleterious effects of past forest management may best optimize range values. This program would be consistent with the multiple use policy of the Ministry and should draw a concordant reaction from other resource managers.

II History, Climate and Soils

The area has been logged in the past and has a history of periodic fires. Due to the virtual exclusion of fire through Forest Service protection measures, the former fire climax plant community is being replaced. Overgrazing has caused much of the open rangeland areas to degrade to less preferred species and weeds. Since a grazing system was initiated by the Forest Service in 1972 most areas have shown improvement in plant vigour.

The unit is presently managed under three separate rotations. A.R.D.A. and G.R.I. funds have provided primary livestock management tools such as fencing and stockwater developments. While fencing, stockwater developments and pasture rotation can do much to limit the period of use and improve the animal distribution, the permittee must do his part in order to optimize the use of the area. It takes time for new ideas to become accepted. The Grasmere permittees still seem loathe to commit themselves to the management goals set but with time their management is expected to improve.

Precipitation is limited and constrains timber and forage production. The annual amount varies from 250-450 mm/year but wide fluctuations occur. Due to the moisture constraint most of the forest sites are classified as poor or medium on the Forest Cover maps. Conversely, range capability is high, but productivity in any one year is still greatly dependent on the quantity of effective moisture received.

The soils are derived from strongly calcareous glacial tills. A silt loam or sandy loam texture is common. The coarse fragment fraction varies among the different types of deposits. Soil analysis indicates that total phosphorus levels are low. It is thought that under dry conditions, the high soil pH may render phosphorus unavailable to plants.

III The Problem

At the present time, four Grasmere permittees have cattle at the Steeples Ranch. Table 1 shows all the permittees and the animal unit months (A.U.M.'s) allocated. Periods of use vary somewhat. Nearly sixty-seven percent of the permitted grazing was transferred off the unit this year. Grasmere cattle have been using the Steeples Ranch for the past four years. The use of the Steeples facility has created flexibility in the rotations allowing some pastures to be deferred or rested and prescribed burns to be carried out. When all the cattle return to the range unit, there will be no flexibility in the rotations and very possibly the range will be overstocked. Therefore, it is imperative to explore opportunities which will increase the amount of forage available.

III Options

The available forage could be increased in many ways. Such means as irrigation and/or fertilization were dismissed as impractical, too costly, or unacceptable to other resource agencies. The D.A.T.E. project report concluded that crested wheat grass seedings would provide the greatest increase in productivity:

The A.I. pasture seemed the good possibility considering topography, soils, and amount of existing tree cover. C.R. Mills estimated that roughly the eastern half or between 120-200 hectares may be suitable. While, in theory, crested wheat grass seeding can provide much more forage per hectare than native species, in this case, there are serious disadvantages. Firstly, cattle water at Lake Kooconusa and there is no easily developable water on the eastern portion of the A.I. pasture. Therefore, the seeding could not be fenced out and the cattle would ignore the thick immature stands containing pinegrass on the western side. These values are not insignificant but to protect the seeding from over-use the pasture would have to be managed for the A.U.M.'s produced on the seeded area alone. This measure would reduce if not negate the seeding's effectiveness in mitigating against the shortage of forage.

Permittee	Total A.U.M.'s Permitted	Crown Range Use (A.U.M.'s)	Steeple's Ranch Use (A.U.M.'s)
McIntyre	594	21	573
MacDonald Ranch	664	499	165
R. Sinclair	131		131
Triple Tree Ranch	241		241
B. Phillips	144	144	
C. Lancaster	424	424	
L. Lancaster	38	38	
C. Phillips (B. Jones)	136	136	
R. McLaughlin	132	132	
D. Gorrie	98	98	
A. Hark	196	196	
Total A.U.M.'s	<u>2798</u>	<u>1688</u>	<u>1110</u>

Table 1. Grasmere permittees and number of A.U.M.'s allocated.

Secondly, the unit has no shortage of spring/fall range. The physiological characteristics of crested wheat grass dictate early use. Range managers can best design rotations to meet livestock needs when a balance exists between summer ranges and spring/fall ranges.

Thirdly, for whatever reasons (and many have been advanced) Bagley's Seeding, immediately north of A.I. pasture, does not look very healthy. To establish another seeding, without fully understanding what went wrong in Bagley's seems irresponsible. Should climatic or edaphic conditions be contributing to its decline rather than inappropriate management alone, then a new seeding would also show less than the expected productivity.

Fourthly, the timber managers of the Forest Service may object to very widely spaced trees on the seeded hectarage with a concomitant loss of some growing stock.

Finally, the more ecologically-minded personnel in the Range Section, and Fish and Wildlife Branch prefer to minimize the use of seedings on Crown Range. They feel that productivity enhancement of natural grass communities better facilitates range management over the long-term. In view of the serious disadvantages, no economic evaluation was attempted.

Another way in which productivity can be enhanced is through forest stand tending. As crown closure percent increases the productivity of ground vegetation decreases in response to less sunlight received at the forest floor. Tree thinning would increase the amount of sunlight at the forest floor and hence productivity. Much of the Grasmere unit is covered with stands of over-dense immature trees. Some of these stands are within active Christmas Tree Permits and any plan to thin would have to exclude these areas. Other stands have a mature overstorey which should be removed prior to thinning consistent with the Forest Service's objective of attaining uneven-aged stands of three to five age groups.

The very dense immature stands of yellow pine (Pinus ponderosa Laws.) are particularly troublesome. These stands which occur on very dry sites have arisen in the past thirty to forty years primarily as a result of the Forest Services fire protection policy. Areas that were classified as open rangeland in 1951 are now covered with "doghair" stands of stagnating yellow pine. Frequent wildfires in the past prevented the formation of these stands. The "ingrowth" will be expensive to treat initially but the judicious and directed

use of fire in the future should prevent recurrence of the problem. Discussion has taken place at the Regional level in the Forest Service to identify and progressively treat these areas throughout the East Kootenays. This report recommends that the Grasmere unit receive priority.

V Proposed Solution

Additional foreage should be created on the unit through the planned removal of the mature volume and through a thinning program to treat overdense immature stands.

Some of the stands with a mature overstorey have active cutting permits over them already. However, little cutting has taken place in the recent past for two main reasons (1) the mountain pine beetle salvage program and (2) low snowfalls which have allowed operations to continue in higher elevations throughout the winter. Over the next few years, it will be necessary to urge operators to continue cutting in lodgepole pine stands in order to recover some of the volume. Many remaining stands are suitable for the Small Business Program and these could be set up and offered on a priority basis in accordance with the quota set for the Small Business Program. Four areas have already been chosen as suitable by the Forest Service and are being prepared for sale. It is in the best interests of both range and timber managers to follow up the logging with thinning of thickets and grass seeding of disturbed areas.

L. Fitchett estimated 310 hectares in selectively logged areas still need spacing work. Another 80 hectares could be spaced without a preceding logging operation. Approximately 400 hectares require logging prior to juvenile spacing.

The Pacific Northwest Forest and Range Experiment Station, Portland, Oregon, has published numerous papers on ponderosa pine responses to various management regimes. In general, the literature indicates that trees should be spaced nineteen to thirty feet apart depending on the capability of the site and management objectives. New restocking standards being developed at the Regional level may indicate around 200 seedlings or advanced regeneration per hectare as representing a fully stocked condition in the Southern Trench Dry Cordilleran Interior Douglas-fir Biogeoclimatic Variant (IDF g2).

It is unlikely that intensive forestry monies will be spent on these poorer forest sites in the future. The return to forestry alone simply does

not warrant the expenditure. However, with allowable cut effect operating and with the values accruing to the range resource counted as well as those to timber Sassaman et al. (1973) demonstrated a positive rate of return for a variety of management regimes.

The medium sites stands have a larger Douglas-fir (Pseudotsuga menziesii (Mirb.) Franco) component. Reukema (1979) remarks that maximum production on low site quality land is often attained through much wider than normal spacing of trees. The same paper indicates that 750 stems/ha would be a suitable initial stocking (3.6 m x 3.6 m spacing). Particularly interesting to note is the precipitation in his study area of 250 cm annually - at least 5½ times greater than for the Grasmere area.

Yet post-spacing surveys indicate 688-1275 stem/ha. remain on area which have been thinned under the intensive forestry program guidelines. This report recommends that pertinent recent literature be reviewed before spacing criteria are finalized on future thinning projects.

To gain a very rough idea of productivity variations, ten 0.5 m² plots were clipped within the boundaries of two pastures. Enclosures were not used so areas not obviously grazed were chosen. These areas may not provide an accurate estimate of productivity for the type. The figures are also not reliable in any statistical sense.

Plots 8 and 9 are in the same range type. Plot 8 is located in cutting permit on a skid trail. The pinegrass has shown tremendous response to the change in light conditions. While the area as a whole does not have this productivity (thickets have not been thinned), the difference between Plot 8 and Plot 9 is still remarkable. (Plot 9 is located just outside the logged area.) In general, Table 2 shows how much more productive the open areas are compared with densely covered areas.

These figures represent total production and not safe use. If 50% of available forage used as safe, then Plot 9 indicates a carrying capacity of roughly 10 hectares per A.U.M. For Plot 8, the carrying capacity is 0.8 hectares per A.U.M. Recalculated average productivities published in the D.A.T.E. report of 1975 (based on the 1973 and 1974 growing seasons) tend to confirm the improving trend established on the open areas. However, data are not strictly comparable. For the five range types identified, the following productivities were found:

- | | |
|-------------------|------------|
| 1. open grassland | 460 kg/ha. |
| 2. open forest | 319 kg/ha. |
| 3. intermediate | 279 hg/ha. |
| 4. dense | 110 kg/ha. |
| 5. bluegrass sod | 476 kg/ha. |

Plot Number	Pasture	Date Clipped	total green wt. kg/ha	Productivity air-dry wt. kg/ha	grass wt.	rangeland type
1	A.I. → Western pine →	Sept. 24/80 →	800	440	400	open, Py
2			600	440	360	open, Py
3			1200	760	600	open, Py
4			500	260	120	Py, F
5			400	300	160	dense, immature Py, F
6			1100	760	160	dense, older, immature
7			1000	700	600	open, Py
8			1300	760	760	open, Py
9			300	140	60	logged opening seed trees plus dense immature
10					1300	760

Table 2. Clipped plots on the Grasmere Range Unit

Cost estimates for hand thinning using power saws are available. The areas already thinned on the unit cost between \$110 to \$289 per hectare. However, in the future, slash disposal is expected to be an integral part of the thinning program. Foresters are concerned about the high fuel loading and beetle breeding grounds which results, while range managers view the area as lost to grazing until the material no longer acts as ground cover and an impediment to cattle movement. In the dry climate, the fire hazard becomes dangerous and the material will take many years to decompose.

Treatment trials will be needed to determine the method which achieves the thinning objectives for the least cost. Plans are being made for such trials as a joint project between Range Section and Silviculture Section.

VI Conclusions

The Grasmere unit could become one of the most productive rangeland units in the East Kootenays. There is no shortage of spring/fall range which frequently acts as the limiting factor to increased use on other range units. The dryness of the area favours range values over timber values. A logging and thinning program would greatly enhance range productivity and concurrently increase timber production. More forage would be available for wildlife and the aesthetics of the area would improve.

The essential range management tools are already in place. Without a continuing longterm logging and thinning program the initial impetus and enthusiasm for range management will be lost. The ranches realize uncontrolled tree regeneration means reduced grazing opportunities. The Steeples Ranch has afforded range relief and may yet provide more as the logging and thinning get underway. Unlike a domestic grass seeding, which produces results within three years, the program to log and thin will be carried over many years and show results more slowly. However, any measure which increases the homogeneity of a pasture improves livestock distribution. Presently, it is difficult to persuade cattle to use the forage available in the thicker areas. Thinning some thick areas may encourage cattle to better use areas not included in the treatment program.

If a program is initiated immediately it should be possible to avoid reductions when all cattle return to the unit and be possible to maintain rotations with built-in flexibility to permit prescribed burning, deferment or additional grazing of pastures in good years, and yet have sufficient forage for the poor years.

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