FOREST INGROWTH AND ENCROACHMENT

ON THE

GRASMERE RANGE UNIT

BETWEEN 1958 AND 1994

prepared for:

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by

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Executive Summary

There has been a recent resurgence in interest on the effects of fire suppression on dry forest types throughout western North America. Major problems have been identified such as declines in forest health, loss of merchantable volume in overstocked stands, increased risk of catastrophic wildfire and reduced forage production. The principal cause of these problems has been identified as forest encroachment and forest ingrowth. Although interest is high in parts of British Columbia where the Ponderosa pine and Interior Douglas-fir forest types exist, little work has been done to characterize the problem. On the Grasmere Range Unit the carrying capacity of the range is believed to have decreased, with an attendant loss of AUM's. Other concerns include; altered plant communities, decreasing range condition, and a possible loss of biodiversity.

Objectives were: 1) Determine the distribution of forest canopy cover classes in the Grasmere Range Unit in 1958 and 1994, 2) Estimate the area of forest encroachment in open grassland and, forest ingrowth in treed grassland and open forest, 3) Identify the locations where ingrowth and encroachment have occurred, and, 4) Estimate the AUM losses due to forest encroachment and forest ingrowth.

In the Grasmere Range Unit a total of 11,778 ha was classified. The area of the open grassland class, treed grassland and open forest decreased by 40-60% between 1958 and 1994, totaling nearly 2,600 ha. Conversely, the closed forest class increased from approximately 3,600 ha. in 1958 to nearly 5,900 ha. in 1994. The open grassland class has experienced a decrease of 32 ha./year since 1958. The treed grassland and open forest classes have decreased at an average of 24 ha./year and 18 ha./year, respectively. The recent logging class was similar between dates.

Douglas-fir is the primary ingrowth/encroachment tree species on the Grasmere Range Unit although ponderosa pine is also important.

Some generalizations about the nature of the problem:
1) Both forest ingrowth and forest encroachment are prevalent. There is a continuous forest edge in many places. Ingrowth may have already occurred on most sites.
2) North and east exposures are more susceptible than south or west exposures,
3) Encroachment into small grassland openings in the forest, and narrow "necks" of open grassland extending into areas of open or closed forest,
4) Encroachment from contiguous areas of closed forest,
5) Gullies and microtopography,
6) Litter and grazing - the relationship between these factors and forest ingrowth and encroachment is not definitive,
7) The effect of prevailing winds on tree seed dispersal and soil moisture levels,
8) Logging practices of the 1920's and 30's left the forest in a state where it was susceptible to ingrowth, and

9) Forest ingrowth has concentrated grazing on the open grassland, treed grassland and openings in the open forest resulting in excessive forage use and decreased range condition.

On most ground-truthing sites forest ingrowth and encroachment had occurred with 2 or more generations of trees so several age classes were represented on one site. The absence of fire as a functional ecosystem force since the 1920's has likely allowed forest ingrowth to proceed such that the treed grassland and open forest classes represent a small percentage of these range units.

It is not known to what extent historical levels of grazing have contributed to the problem of forest encroachment and ingrowth in the Grasmere Range Unit. In most locations where sufficient fine fuels were available to carry a fire, tree establishment can be observed on sites with and without good litter cover. The grassland/forest ecotone is the location of forest encroachment and forest ingrowth. Complex units of soil topography have led to the establishment of trees in topographically favourable sites.

At current stocking rates, 722 AUM's are lost annually in the Grasmere Range Unit solely due to forest ingrowth and encroachment in the open grassland, treed grassland and open forest classes since 1958.

Historical photos should be obtained where possible and re-photographed. Permanent photo-points and witness trees could be established at survey corners for future monitoring. Vegetation transects should be established at these sites. Link site series information to determine historical grassland/forest boundaries. Use weather records to predict successful tree seedling establishment years. Forest ingrowth and encroachment should be addressed by amending forest harvest practices in the grassland/forest ecotone to complement livestock needs and wildlife habitat requirements and also benefit the timber resource. Operational trials with prescribed fire should be conducted toward improved success in eliminating tree seedlings and juveniles while enhancing the forage base. Integrated resource planning should focus on the grassland/forest ecotone. Research is needed on fire behavior, fire-plant-animal interactions and economic factors.