Campbell Creek
Timber - Grazing Demonstration

Cattle Use of Regenerating Deciduous Cutblocks

Alberta

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Cattle Use of Regenerating Deciduous Cutblocks

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Abstract

This project involved the use of ten Global Positioning System (GPS) collars to monitor cattle grazing behaviour and habitat use across a diverse mosaic of forested and non-forested range plant community types including regenerating aspen forest. Cattle use of all native plant community types was secondary to tame forages, including aspen cutblocks. If there are other community types available that are preferred above regenerating deciduous communities cattle are unlikely to use cutblock areas until forage is depleted in the preferred community types, unless cutblocks are in close proximity to preferred communities and/or unless prompted to do so with livestock distribution tools.

When planning the integration of livestock grazing and timber harvest it is important to have information on livestock range use preferences (e.g. as indicated by range health scores) prior to determining cutblock location, access, and harvest design.

Acknowledgements

Thanks to the Campbell Creek Grazing Association for their cooperation with the project and the participation of their cows. To Craig DeMaere, ASRD, for all his work with the data analysis and to Todd Bondaroff, BC Ministry of Agriculture & Lands, for his support in the acquisition and use of the GPS collars.

Objectives

This demonstration was used to improve the integration of timber harvest and reforestation activities on lands under grazing disposition by examining the effects of deciduous timber harvest on the grazing behaviour of cattle. It was also used as a pilot study to test data collection and analysis techniques and to refine hypotheses for future scientific research.

Results of this demonstration will enable:

- a better understanding of cattle use of range plant community types (habitat use versus habitat availability);
- constructive communication between livestock producers and timber operators based on documented results as opposed to perceptions; and
- the refinement of hypotheses to be thoroughly tested in future research initiatives.

Specific objectives include:

1. Do cattle avoid regenerating deciduous cutblocks when alternative plant communities (mature deciduous forest, tame pasture, wetlands, etc.) are available within the same management unit?
2. Is there a density (stems/ha) of regenerating deciduous trees that acts as a barrier to livestock distribution?
3. Is forage production a limiting factor for livestock use of deciduous cutblocks?

Introduction

Alberta's public lands are managed by the Department of Sustainable Resource Development (SRD). The first goal listed in the 2007-10 Departmental Business Plan is as follows:

"Alberta's public lands, including rangelands and shore lands, are healthy, productive, and sustainable."

What it means:

> *"Alberta's public lands are managed to optimize and sustain their current and long-term economic, environmental and social values. They are managed through sound decisions that balance multiple uses including: energy development, forest operations, grazing, recreation and other."*
>
> SRD Business Plan 2007-10

SRD is responsible for managing Alberta's public lands for a number of values including livestock grazing and timber production. Often the most productive forested rangelands are also desirable timber harvest areas and, therefore, timber and grazing dispositions tend to overlap. Integrating a variety of activities on the same landbase can be challenging. Recently a number of knowledge gaps were identified pertaining to sustainable timber harvest on grazing dispositions including:

- livestock use of range plant communities within a mosaic of different forested and non-forested types;
- livestock use of regenerating deciduous cutblocks; and
- the effect of timber harvest on livestock grazing behaviour.

A pilot project was undertaken at Campbell Creek in 2004/2005 to further explore the relationship between timber harvest and livestock grazing. The demonstration at Campbell Creek built upon our current knowledge of the effects of deciduous timber harvest on livestock grazing behaviour, enabling better management decisions on public lands with overlapping tenures.

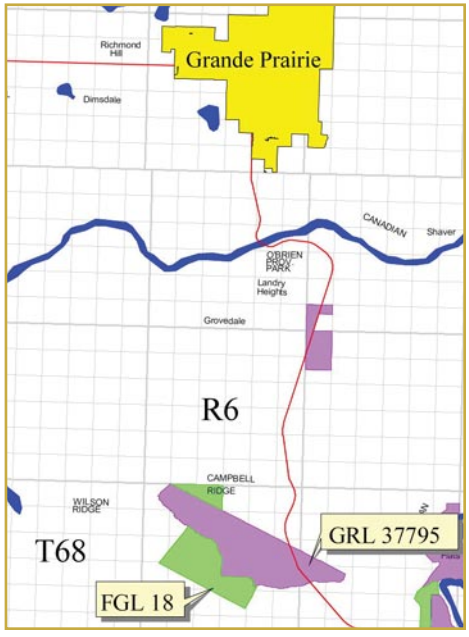


Figure 1. Project Location: Grazing Lease (GRL 37795) & Forest Grazing License (FGL 18)

Methods

This project involved the use of ten Global Positioning System (GPS) collars to monitor cattle grazing behaviour and habitat use across a diverse mosaic of forested and non-forested range plant community types (tame pasture, mature aspen forest, black spruce lowland, willow-sedge meadow, mature white spruce/aspen mixedwood forest, regenerating aspen forest and others).

Range plant community types in the grazing lease and license were classified using the 'Guide to Range Plant Community Types and Carrying Capacity for the Lower Foothills Subregion' 3rd Approximation and mapped (Fig. 2) according to the procedures outlined in the document 'Methodology for Calculating Carrying and Grazing Capacity on Public Rangelands' RRMP, 2004.

Location: Lower Foothills Natural Subregion
~ 30 km south of Grande Prairie, Alberta

Grazing Dispositions: Campbell Creek Grazing Association
GRL 37795 = 2670 ha, 2500 AUMs
FGL 18 = 1240 ha, 515 AUMs

Timber Dispositions: Weyerhaeuser: FMA 6900016
Ainsworth: DTAG910001, DTLG910003E and DTLG910001

Table 1. Range Plant Community Type Descriptions

Map Label	Range Plant Community Type
a1	Creeping Red Fescue - Timothy/Clover
a2	Timothy-Kentucky Bluegrass/Clover
a4	Creeping Red Fescue-Slender Wheatgrass/Clover
a8	Kentucky Bluegrass/Clover - Dandelion
a13	Meadow Foxtail - Creeping Red Fescue/Clover
b8	Wet Sedge Meadow
c10	Willow-Bog Birch/Water Sedge
e7	Aspen/Rose-Low-bush Cranberry/Tall Forbs
e8	Aspen/Rose-Twinflower
g2	Aspen/Rose/Strawberry
g3	Aspen/Rose/Clover
h9	Aspen-White Spruce/Rose/Forb
l5	Aspen/Rose/Fireweed/Marsh Reed Grass
l7	Beaked Hazelnut/Aspen/Wild Sarsaparilla
j18	Black Spruce/Labrador Tea/Horsetail/Moss
IN	Oil/Gas/Industrial
OW	Open Water
RI	River
RW	Rural Infrastructure
RZ	Road

(Lane et al. 2000)

Campbell Creek Grazing Association GRL 37795 & FGL 18

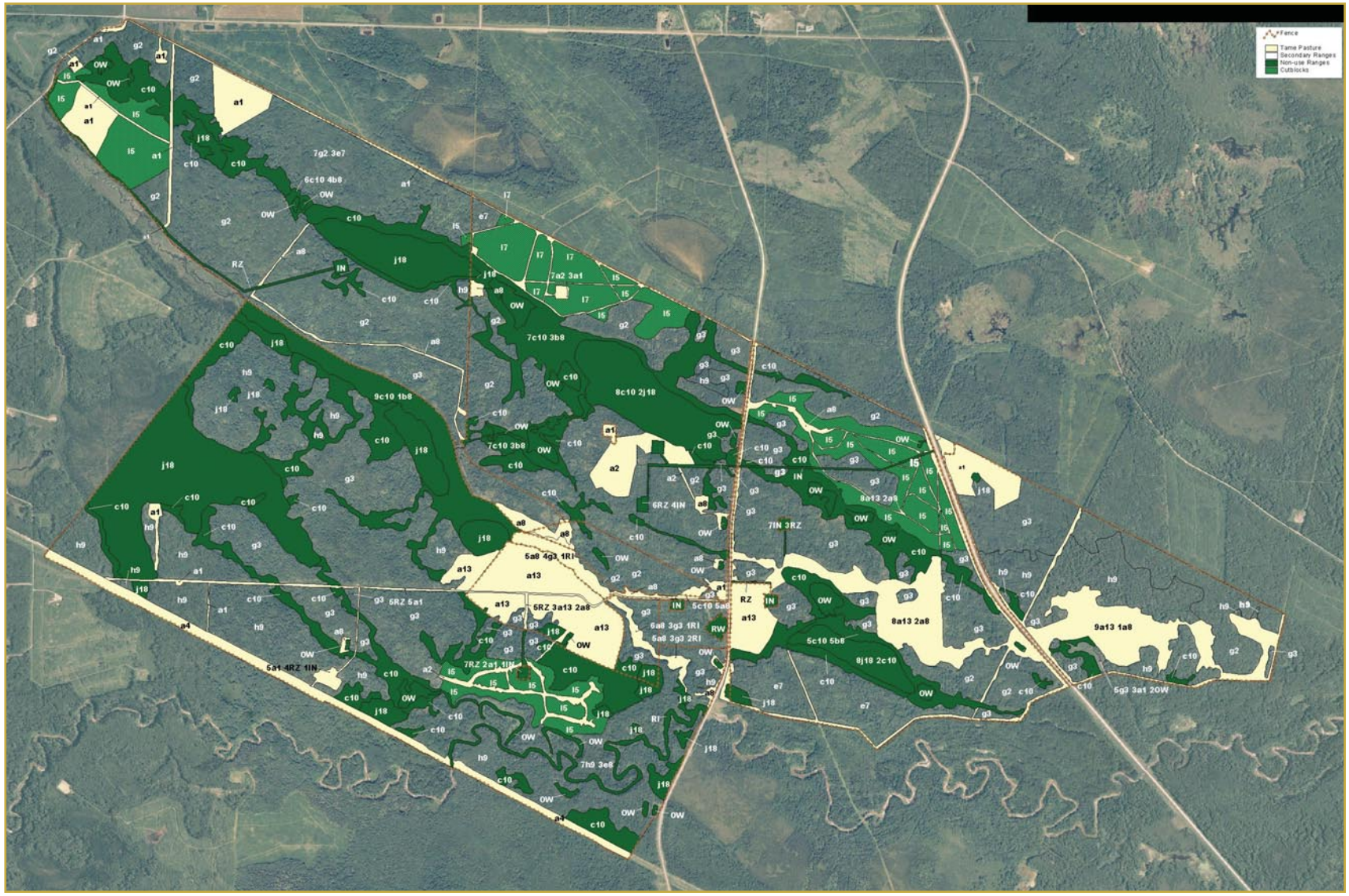


Figure 2. Campbell Creek GRL & FGL – Range Plant Community Types

The lease and license areas held by the Campbell Creek Grazing Association are divided into seven different distribution units (DUs), six of which are rotationally grazed by three separate herds (two cow/calf and one yearling) from June 1 to October 31 every year. The DUs 2, 5 and 6 contain regenerating cutblocks in which the in-block roading has been disced and seeded to tame forages. The DUs 1, 6 and 7 contain cutblocks that were wholly converted to tame pasture and DU7 contains a cutblock that has been partially converted to tame pasture but it was not well established until 2005 (second year of the project).

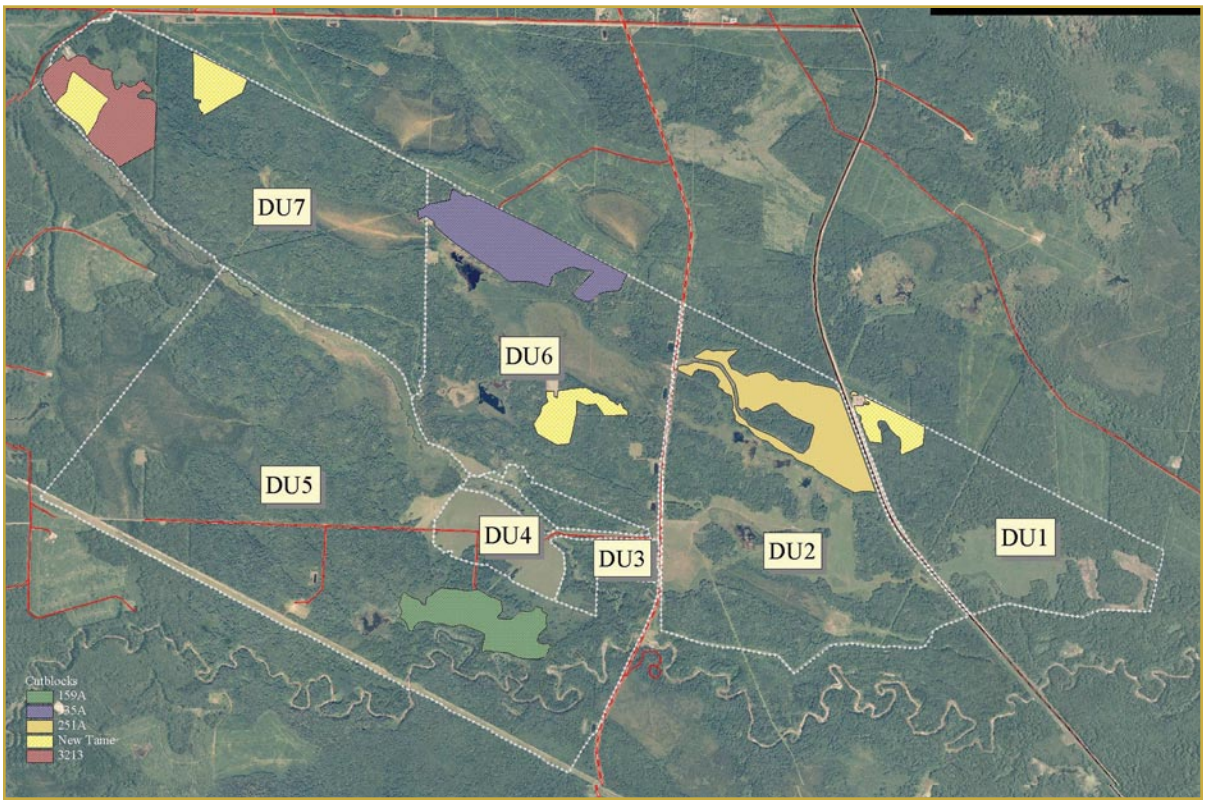


Figure 3. Campbell Creek GRL and FGL - Distribution Units

Table 2. Campbell Creek Timber Harvest History

Block #	Timber Type	Harvest Date	Treatment	Status	Company
251A	Deciduous	1983	none	L	Weyerhaeuser (P&G)
159A	Deciduous	1988	none	SR	Weyerhaeuser (P&G)
335A	Deciduous	1983-85	none	SR/L	Weyerhaeuser (P&G)
2486	Deciduous	Aug. 1999	RI	RI	Ainsworth
2297	Deciduous	Aug./Sept. '99	RI	RI	Ainsworth
3276	Deciduous	Aug./Oct. '99	RI	RI	Ainsworth
3213	Deciduous	Sept/Oct. '97	Part RI	SR/RI	Ainsworth

Note: RI = cleared and seeded to agronomic species for 'range improvement',
SR = sufficiently restocked,
L = liquidation cut,
P&G = Proctor & Gamble

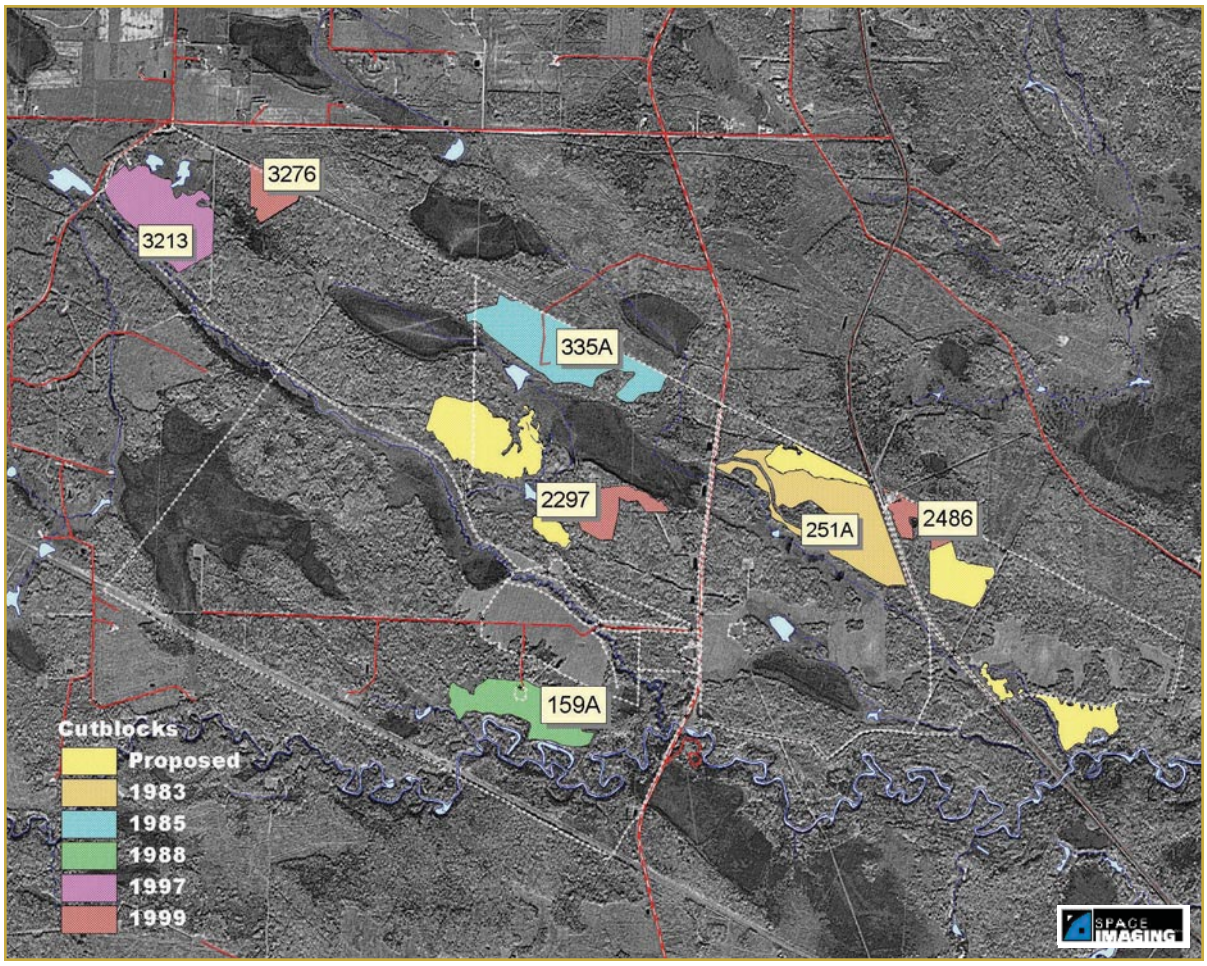


Figure 4. Campbell Creek GRL and FGL - Existing and Proposed Cutblocks

Livestock Use of Plant Community Types

Ten cows were fitted with GPS collars based on the following criteria intended to minimize variability and represent the behaviour of the herd:

- the cow had grazed the lease/license area for at least one grazing season prior to June 2004;
- the animal was expected to remain a member of the herd for the next two years; and
- the animal was not a lead cow

(Bondaroff, personal communication).

In 2004, five collared cows (747, 750, 757, 761 and 768) were members of herd A, consisting of 194 cows, 192 calves and six bulls. Four collared cows (749, 756, 766 and 769) were members of herd B, consisting of 236 cows, 230 calves and seven bulls. The final collar (762) was put on a heifer in herd C, consisting of 49 yearlings and three bulls. The herds were rotated according to the schedule in Table 3 with the following exceptions: 750 was left behind in DU1 from June 1 to October 31; 769 was left behind in DU2 from June 1 to October 30; and 762 was removed early from the grazing disposition on October 9.

Table 3. Campbell Creek Livestock Rotation 2004

Herd A		Herd B		Herd C	
June 1 - July 15	DU1	June 1 - July 12	DU2	June 3 - Oct. 11	DU6
July 15 - Sept. 17	DU7	July 12 - July 19	DU4	Oct. 11 - Oct. 31	DU1
Sept. 17 - Oct. 11	DU6	July 19 - Sept. 22	DU5		
Oct. 11 - Oct. 31	DU1	Sept. 22 - Oct. 9	DU4		
		Oct. 9 - Oct. 30	DU2		

In 2005, the same five collared cows (747, 750, 757, 761 and 768) were members of herd A, consisting of 167 cows, 166 calves and six bulls. The same four collared cows (749, 756, 766 and 769) were members of herd B, consisting of 227 cows, 219 calves and eight bulls. The final collar (762) was put on a yearling in herd C, consisting of 100 yearlings and four bulls. The herds were rotated according to the schedule in Table 4 with the following exceptions:

Herd A - Only 750 & 761 were in the north end of DU6, 757 was in a transitional unit from September 15 – October 5 then rejoined 750 & 761 in DU4. Collar 768 shut down prematurely on August 28 and collar 747 suffered the same fate on September 8.

Herd B – Only 756 & 766 were in DU2 with an additional 79 cows and 75 calves (total herd size 306 cows, 294 calves) from September 15 – October 4, during the same time 749 & 769 were in a transitional unit. The expanded herd then moved into DU1 while 749 & 769 moved into DU4 until October 28.

Herd C – grazed only the south portion of DU6 from June 1 – October 5.

Table 4. Campbell Creek Livestock Rotation 2005

Herd A		Herd B		Herd C	
June 1 - July 5	DU1	June 1 - July 5	DU2	June 1 - Oct. 5	DU6
July 11 - Sept. 15	DU7	July 6 - July 20	DU4	Oct. 5 - Oct. 23	DU4
Sept. 15 - Oct. 1	DU6	July 20 - Sept. 15	DU5		
Oct. 5 - Oct. 23	DU4	Sept. 15 - Oct. 4	DU2		
		Oct. 4 - Oct. 23	DU1		

In 2004, GPS fixes of collared cows were taken from June 1 to October 31, every half hour from 0500 to 2400 and every hour from 2400 to 0500. In 2005, the frequency of GPS fixes was increased to every 10 minutes from 0500 to 2400 in anticipation of collecting better information about travel corridors and remained at every hour from 2400 to 0500. Both years, data from activity and temperature sensors on each collar were captured every five minutes to monitor ambient temperature and grazing/resting activity (head up-head down). The GPS collars were removed during round-up at the end of October and the data was downloaded and differentially corrected using TerraPro's Hinton base station data. Two weeks (August 14 – September 1) of TerraPro's Prince George base station data was used to fill in a gap in the Hinton data set from 2004.

GPS location data was analyzed to determine whether cattle were selecting for and/or avoiding particular range plant community types by intersecting the GPS locations with the range plant community type polygons in ArcView. The number of GPS locations within a particular range plant community type were compared to the number of locations expected based on the percent availability of that area to cattle (area of range plant community type / total area of all range plant community types available to cattle at that time). Preference and/or avoidance of plant community types were measured using Ivlev's Electivity Index (Krebs, 1989). Avoidance was assessed for range plant community types that had lower than expected GPS location fixes based on availability, and selection/preference was assessed for those range plant community types that had greater than expected GPS location fixes based on availability.

Effects of Cutblock Density on Utilization

Information on deciduous stem densities in the cutblock areas were compiled and/or collected for comparison with GPS location data. Recent regeneration survey data was available for block 3213, however regeneration data for blocks 335A, 251A and 159A was either out of date (surveys completed in 1991 and 1994) or non-existent and, therefore, additional regeneration surveys were conducted on these blocks in 2004. Regeneration survey methods are outlined in the 'Alberta Regeneration Survey Manual' (FMB, 2003). Tree density data collected during the regeneration surveys completed for each block was used to compare with livestock use of the cutblock area.

Forage Production in Deciduous Cutblocks

Seventeen range cages were set up within the five cutblock areas in May 2004. These cages excluded cattle grazing for the 2004 season and allowed for an estimate of forage production within the cutblock areas. Two 0.25m frames were clipped per cage on August 17. The vegetation samples were separated into grasses, forbs, shrubs and trees (deciduous suckers) and were oven-dried at 70°C for 48 hours and weighed for dry-matter forage production estimates. Forage production estimates allow for an estimate of the carrying capacity of harvested community types and help to determine if forage availability is affecting livestock use of cutblocks.

Livestock Use of Plant Community Types

An examination of the activity sensor (head up/head down) and GPS location data indicated that the livestock were essentially 'at rest' from 2400 to 0500, therefore, only daytime (0500 to 2400) GPS points were used in the analysis of plant community type preference. Preference and/or avoidance of plant community (PC) types were measured using Ivlev's Electivity Index (Krebs, 1989).

$$Electivity = \frac{(\%\ of\ GPS\ points\ in\ PC) - (\%\ of\ DU\ area\ that\ is\ PC)}{(\%\ of\ GPS\ points\ in\ PC) + (\%\ of\ DU\ area\ that\ is\ PC)}$$

Electivity varies from –1.0 to +1.0 with values between 0 and +1.0 indicating preference and values between –1.0 and 0 indicating avoidance. Results for DU1 demonstrate that where tame pasture communities (a1, a13) occur, they are highly preferred and all other plant communities are avoided while tame pasture is available (Fig. 5).

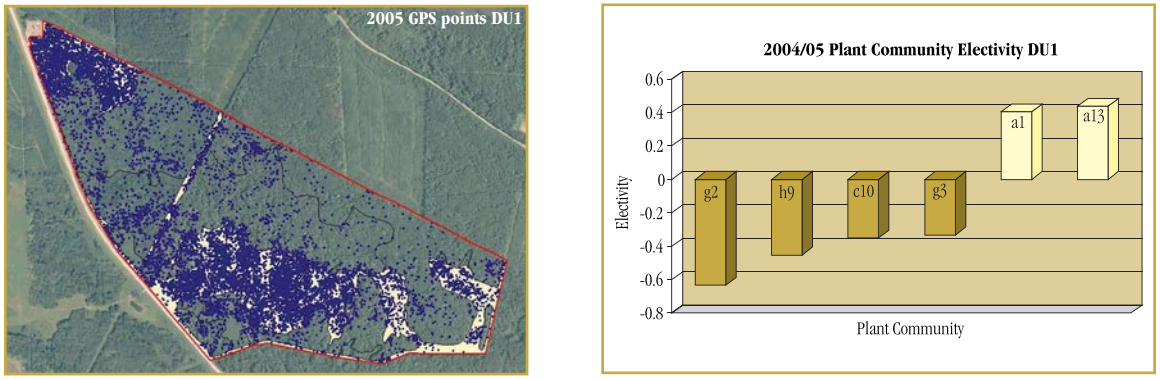


Figure 5. Distribution Unit 1 - GPS Locations and Electivities

Results from the other distribution units are comparable to the results from DU1, regardless of season, with the addition of cutblock communities. An overall ranking of preference for vegetated plant community types in this demonstration project, from most preferred to least preferred/avoided is as follows:

- tame pasture;
- regenerating aspen forest;
- mature aspen forest;
- white spruce/aspen mixedwood forest;
- willow-sedge meadows; and
- black spruce lowland.

Individual plant community polygons will rise or fall in the preference ranking based on proximity to preferred plant community types, access and/or location of livestock distribution tools (salt, water, cross-fences, etc.).

Effects of Cutblock Density on Utilization

In distribution units where both tame pasture and regenerating cutblocks occur, the cattle responded differently to cutblock communities depending on a number of factors including proximity and size of tame pasture. Density of the regenerating cutblock did not appear to be a significant factor. In both 2004 and 2005 cattle avoided the 22-year-old cutblock 251A (l5), stocked at 7751 stems/ha in DU2, preferring the tame pastures (a8, a13) to the south (Fig. 6).

Table 5. Regeneration Surveys

Block #	Survey Type	Harvest Date	Survey Date	Status	Density (stems/ha)
251A	Deciduous Performance	1983	2004	SR	7751
159A	Deciduous Performance	1988	2004	SR	8544
335A	Deciduous Performance	1983-85	2004	SR	8888
3213	Deciduous Establishment	1997	2002	SR	25,340

Note: The density of a mature (70-200 years) deciduous stand in Volume Sampling Regions 5 and 6 (Northern Foothills/Peace) averages ~ 428 stems/ha (AENR 1985).

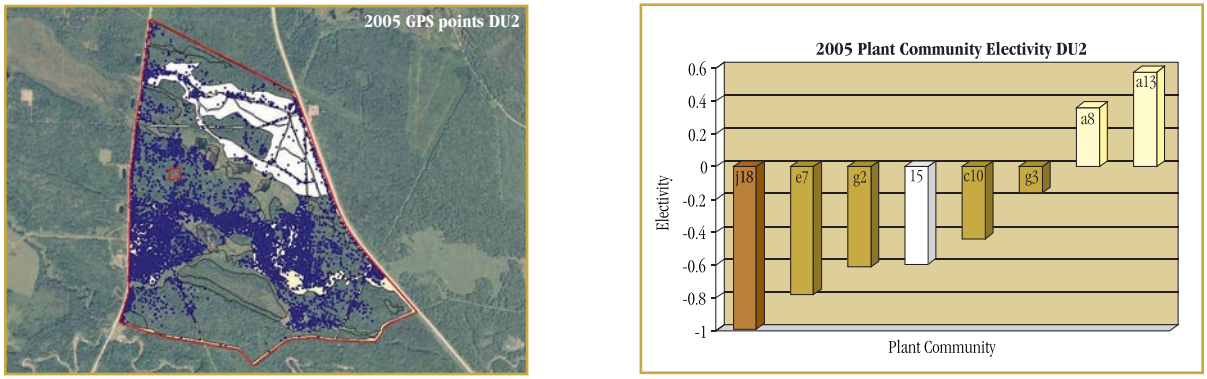


Figure 6. Distribution Unit 2 (block 251A) - GPS Locations and Electivities

In contrast, the cattle in DU7 demonstrated preference for both the tame pastures (a1, a8) and for the 7 year-old cutblock 3213 (l5) stocked at 25,340 stems/ha, which envelops a newly establishing tame pasture (Fig. 7 & 8).

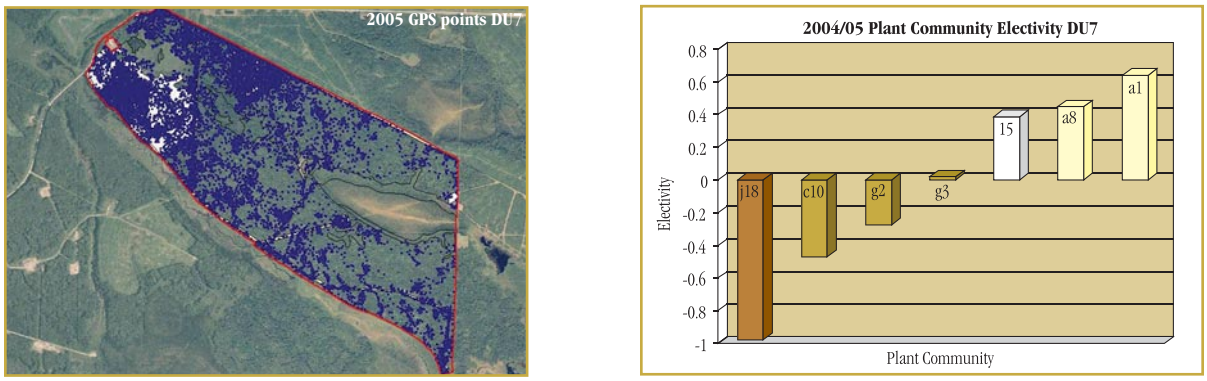


Figure 7. Distribution Unit 7 (block 3213) - GPS Locations and Electivities

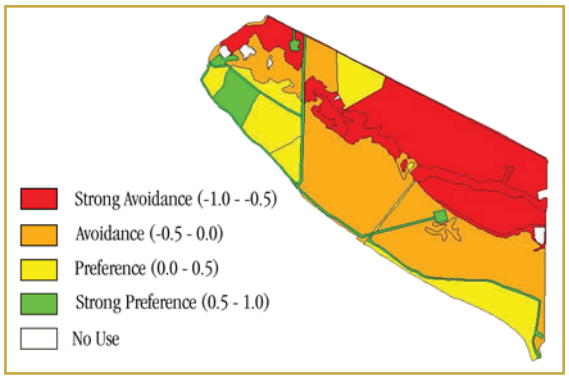


Figure 8. Distribution Unit 7 - Electivity by Plant Community Polygon 2004

Distribution Unit 5 contained a 17 year-old regenerating cutblock 159A (l5), stocked at 8544 stems/ha, but no tame pasture aside from the tame forages seeded on pipelines, wellsites and in-block roading. DU5 was to be grazed by four collared cows, two each from two different owners in a combined herd. However, although there were no physical barriers to prevent it, in both 2004 and 2005, the cows from the two different owners did not mix in DU5 (Fig. 9), essentially establishing 'territories' within the unit. Consequently, plant communities in the west (blue) cow's territory were interpreted to be unavailable to the east (red) cows and vice versa.

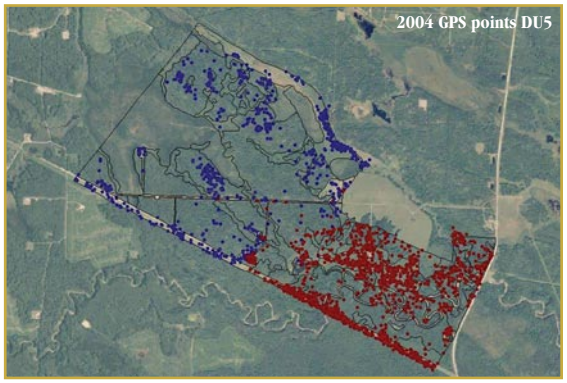
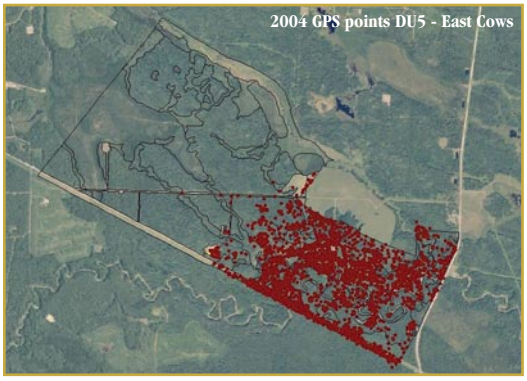


Figure 9. Distribution Unit 5 (block 159A) - GPS Locations

Therefore, the analysis of the DU5 'territory' containing cutblock 159A only included the GPS points from the two east (red) cows and only those areas determined to be in their 'territory'. The 'territories' were not identical in both years of the study and therefore prevented a multi-year combined analysis of the data. The cutblock community type (l5) was preferred by the east cows in 2004 but was still secondary to the tame forage communities (a1, a2, a4, a8) found on in-block roading, wellsites and pipelines (Fig. 10).



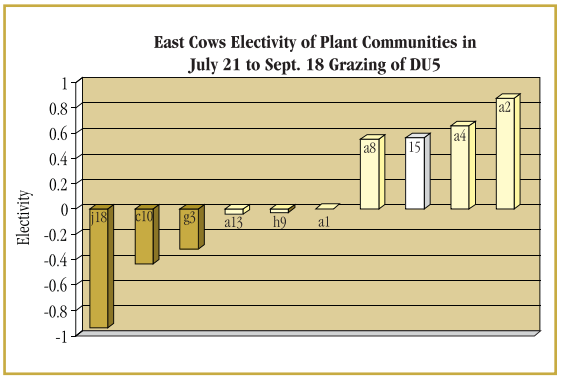


Figure 10. Distribution Unit 5 (block 159A) - GPS Locations and Electivities

Further analysis of the cutblock GPS points reveals that there may have been an 'edge effect' influencing cattle use of the cutblock caused by seeding the in-block roading to tame forage. The electivity for those areas within 25m of the edge between the tame forage and the cutblock (yellow buffer Fig. 11) was +0.12 as opposed to –0.28 for the cutblock areas >25m away from the edge (purple areas in Fig. 11). As a result, the majority of cutblock use may have been incidental to the livestock use of the tame forages on the in-block roading.

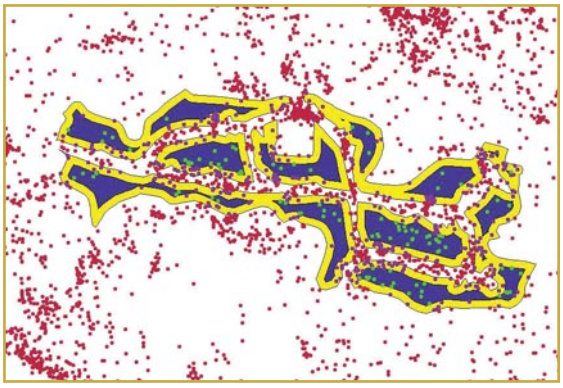
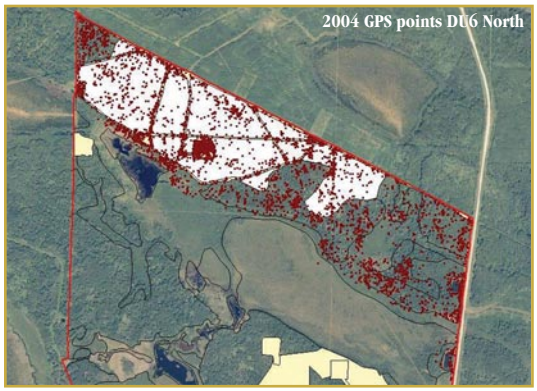


Figure 11. Distribution Unit 5 - Edge Effect (block 159A)

In Distribution Unit 6, the unit with the smallest percentage of tame pasture (3.8%) and the largest percentage of cutblock (23%), the GPS points indicated preference for the 22-year-old regenerating cutblock 335A stocked at 8888 stems/ha, in addition to all other available plant community types [with the exception of the willow-sedge wetland (c10)] under a season-long grazing regime in 2004.



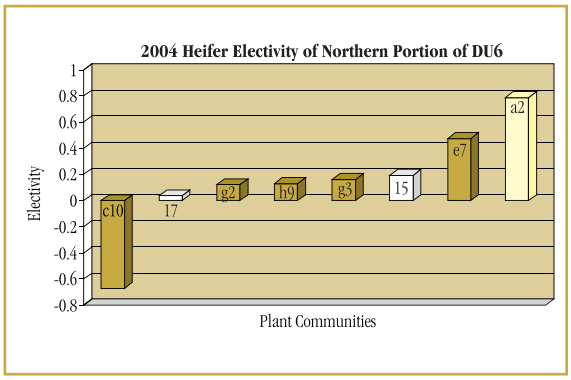


Figure 12. Distribution Unit 6 (block 335A) - GPS Locations and Electivities

Note: The wetland complex in the middle of DU6 acted as a natural barrier and, therefore, the analysis of DU6 only included those areas available to the heifer (areas north of the wetland complex).

The 'edge effect' seen in DU5 also appeared to be a factor in the 2004 use of cutblock 335A in DU6, as the electivity for those areas within the 25m buffer was +0.2 as opposed to –0.15 for the cutblock areas >25m away from the edge. In 2005, DU6 was only grazed for two weeks in the fall and, as a result, the plant community preferences were noticeably different (Fig. 13). The heifer focused only on the tame pasture community types and those plant communities in close proximity to them. Therefore, as in DU5, much of the livestock use of block 335A may have been incidental to the use of tame forages within the cutblock.

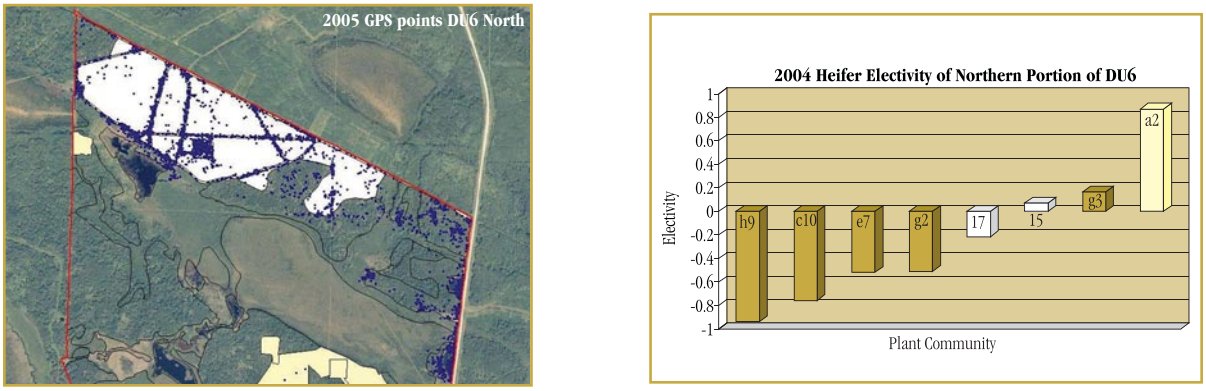


Figure 13. Distribution Unit 6 (block 335A) - GPS Locations and Electivities

The shift in preferences from 2004 to 2005 in DU6 is somewhat explained by the following figure that indicates a linear relationship between time spent in cutblocks and grazing pressure on tame communities in the same DU (i.e. as the forage in the tame pasture is depleted, the amount of time cattle spend in cutblocks increases).

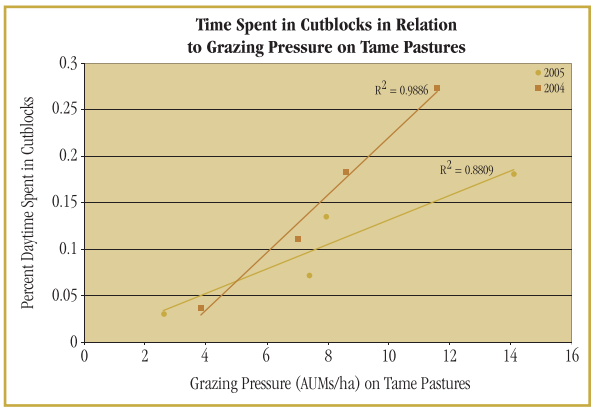


Figure 14. Percent (%) Time in Cutblocks vs. Tame Grazing Pressure (AUM/ha)

Forage Production in Deciduous Cutblocks

Prior to timber harvest, the mature deciduous forest in all four cutblock areas was either the modal Aspen/Rose-Low Bush Cranberry/Tall Forbs (e7) community type or more likely, some grazing modified variant [Aspen/Rose/Strawberry (g2) or Aspen/Rose/Clover (g3) depending on historical grazing pressure]. The average forage production and ranges in these community types are as follows:

e7 – 957 kg/ha (202-2776) n=52
g2 – 898 kg/ha (220-2522) n=65
g3 – 720 kg/ha (210-1674) n=21

(Lane et. al., 2000)

Table 6. Cutblock Forage Production 2004

Kg/ha	251A	159A	335A	3213
Grasses	762	76	160	276
Forbs	260	212	294	2144
Shrubs	378	134	168	200
Trees	0	0	0	0
Total	**1400**	**422**	**622**	**2620**

Forage production was greatest in the youngest cutblock (3213, seven years old). This cutblock was broadcast seeded with agronomic species by the Grazing Association the year following harvest. However, studies have shown that seeding agronomic species in deciduous cutblocks has no significant effect on total forage production [and may even result in an overall decrease in foliar nutrients] (Hays-Byl et. al., 2001). Note that the forage production of native species found in a typical cutblock [Aspen/Marsh Reedgrass/Rose/Fireweed (l5)] formed after harvesting a modal (e7) Aspen community averages 2154 kg/ha two to eight years after harvest (Lane et. al., 2000).

When compared with the average forage production of the mature stand prior to harvest (957 kg/ha), both cutblocks 3213 and 251A provided greater than average forage production, whereas cutblocks 159A and 335A, while within the range of the pre-harvest forested community type, provided lower than average forage production. Cutblock forage production does not appear to have exerted a strong influence on livestock preference as the two blocks with the lowest forage production (159A and 335A) were preferred by livestock, as was the cutblock with the highest forage production (3213), whereas the cutblock with the second-highest forage production (251A) was avoided. Therefore, no relationship between cutblock forage production and livestock preference could be determined.

The results of this demonstration project support range practitioner's observations of the strong influence of tame pasture on livestock distribution and subsequent use of 'secondary' plant community types, including regenerating cutblocks. In this project, any areas of tame forage were grazed first and other plant communities were essentially avoided until the tame forage was depleted. Cattle didn't appear to avoid regenerating cutblocks any more than any other native plant community type. Regeneration densities observed in this project didn't appear to be a physical barrier to livestock distribution as the cutblock with the highest stem densities was actually preferred by livestock (likely due to its close proximity to a tame pasture). Forage production also did not appear to be a limiting factor. Livestock use of regenerating deciduous cutblocks boils down to a question of availability of preferred community types. If there are other community types available that are preferred above regenerating deciduous communities the cattle are unlikely to use the cutblock areas until the forage is depleted in their preferred community types, unless the cutblocks are in close proximity to the preferred communities and/or unless prompted to do so with livestock distribution tools.

Future Research

Suggestions for future research arising from this project include:

- documenting livestock grazing behaviour in a native forested landscape (without tame pasture) before and after timber harvesting;
- documenting the effectiveness of various livestock management tools (salt, water, cross-fencing, herding, trail development, etc.) on livestock distribution; and
- documenting livestock grazing behaviour under different fenceline widths and species composition [progressing from a narrow (<10m), native fenceline to a 30m line seeded to agronomic species].

Integration - Best Management Practices

SRD promotes the integrated use of Alberta's public land for a number of resource uses and values including timber harvest and livestock grazing. Sustained, deciduous timber-yield cutblocks can be productive rangeland for both livestock and wildlife, however, careful management of these areas is required to ensure that both forest regeneration is successful and that livestock pre-harvest stocking levels are maintained. Implementation of sound range management and timber harvesting practices allow cutblocks to be grazed without negatively impacting regeneration while maintaining pre-harvest Animal Unit Months (AUMs). Recently, in consultation with stakeholders, SRD published guidelines (Grazing and Timber Integration Manual, ASRD 2006) intended to facilitate the integration of overlapping timber and grazing dispositions. As directed by the manual, it is strongly recommended that the grazing and timber stakeholders discuss the potential impacts of their land management activities on each other's operations and reach a written agreement [e.g. Grazing Timber Agreement (GTA)] prior to any new integrated timber harvesting or grazing activities. In addition to meeting the

requirements of the manual, consider the following list of 'Best Management Practices' when contemplating the integration of sustained, deciduous timber yield and grazing.

1. Stakeholders should discuss the potential impacts of timber harvest on grazing operations and grazing on timber operations and agree to mitigative solutions in writing (GTA) prior to any integrated timber harvest or grazing activity occurring on overlapping dispositions.
2. A collective goal of maintaining pre-harvest stocking levels and pre-grazing timber production at sustainable levels should be established.
3. Prior to any integrated activity taking place inventories of the range and timber resources including the conditions of any pre-existing developments and/or improvements (e.g. fencelines, natural barriers, gates, corrals, wind breaks, water supplies, trails, tame pastures, etc.) should be documented to establish a baseline for maintenance of the range and timber resource.
4. Evaluation and documentation of existing management practices and site conditions should be conducted prior to integrated operations including; range health and range management practices; status of existing cutblocks; pre-harvest assessments; and the species, location and extent of any noxious and/or restricted weeds.
5. A risk assessment based on livestock range use preferences (as indicated by range health scores), grazing history and proposed cutblock access and locations should be conducted to determine any areas where it is highly probable that a negative impact may occur to either industry. Where risks are identified the implementation of proactive mitigative solutions as outlined in the GTA may be required.
6. Communication between stakeholders should occur prior to initiation of integrated activities and on a regular basis during operations to quickly address any emerging issues.
7. Stakeholders should monitor the forage and timber resource on a regular basis after operations to ensure maintenance of stocking levels and regeneration success. Any indications of potential impacts should be quickly communicated and addressed as per the written agreement (GTA) between stakeholders.
8. Depending on the nature of the impact (i.e. under or overutilization of the cutblock area) the management tools agreed to in the GTA should be implemented to mitigate impacts by either improving livestock access to forage in the cutblock or reducing livestock use of the cutblock area.

Additional Information

For additional information on integrating livestock grazing and timber harvest please contact your local SRD office toll free at 310-0000, or visit our website at:
www.srd.gov.ab.ca/lands/managingpublicland/grazingtimberintegration.aspx

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