

Monitoring Grassland Wildlife Habitat & Impacts of Livestock Grazing Using Digital Photography



FREP
Forest & Range
Evaluation Program

FREP Wildlife Objective

• Under the Forest and Range Practices Act (FRPA), Range Use Plans must be consistent with objectives set by government, which are associated with key values. One of the objectives relevant to range (and associated with the key value of wildlife) is to “Maintain or promote sustainable healthy, viable, productive and diverse wildlife populations and their associated habitat”

Grazing & Cover for Wildlife

• The physical structure of grasslands can be a critical component of wildlife habitat. The amount of cover, in terms of height, density and arrangement of grass, forb and shrub species, is important for visual screening, for nesting, to avoid detection by predators on land and from the air, and also helps to increase nesting success.

• Grazing can change the structure and composition of the vegetation of grassland ecosystems as well as reduce litter cover. Some wildlife species have been shown to be adversely impacted by grazing while others may thrive under light, moderate or even heavy levels of grazing. The scope of this project is limited to studying the response of a selection of more structurally dependant wildlife species to different grazing regimes.

• So how much grazing is ok? Are there threshold levels of use?

• How do we and range tenure holders monitor impacts of grazing on wildlife habitat?

Monitoring Methods

• Visual Screening Monitoring methods can be used to evaluate the potential of grassland ecosystems for wildlife and the level of cover left following grazing by livestock.

• Cover boards using the outline of the species is one method used in both the small mammal and the grassland nesting bird projects.

• Clipping was used to simulate grazing levels and visual screening of the cover boards was measured using digital photography.

• Small mammal trapping and surveys of nesting birds is underway to determine relationships between visual screening levels and wildlife presence and abundance in grazed and ungrazed grassland ecosystems.

• At each site, a total of 300 visual screening photos were taken, including 120 robel pole estimates over two summer sessions (June and August).

Developing Monitoring Methods - Grassland Nesting Birds

• 8 sites are located in the Thompson Region, 4 grazed and 4 ungrazed.

• 8 sites are also located in the Cariboo Region.

• Additional sites are located at the OK Ranch and at Churn Creek and the Junction PPA to survey grassland nesting birds.

Developing Monitoring Methods - Small Mammals

• Eight sites were established in 2006 (four grazed and four ungrazed) in the Thompson area.

• Six small mammal trapping sessions were conducted at each site between May and October on a grid with 50 permanent trap stations using live trap using mark and recapture methods (Jolly-Seber method) and sampling methods recommended by Sullivan et al. (2003) and Lindgren (2005). Population estimates will be generated using mark-recapture models.



FREP Monitoring - Grassland Nesting Bird Project, Vesper Sparrow Chicks. Photo credit: Pat Robinson

Figure 1. Visual Screening and Clipping Heights - 5cm Intervals - Sharp-Tailed Grouse

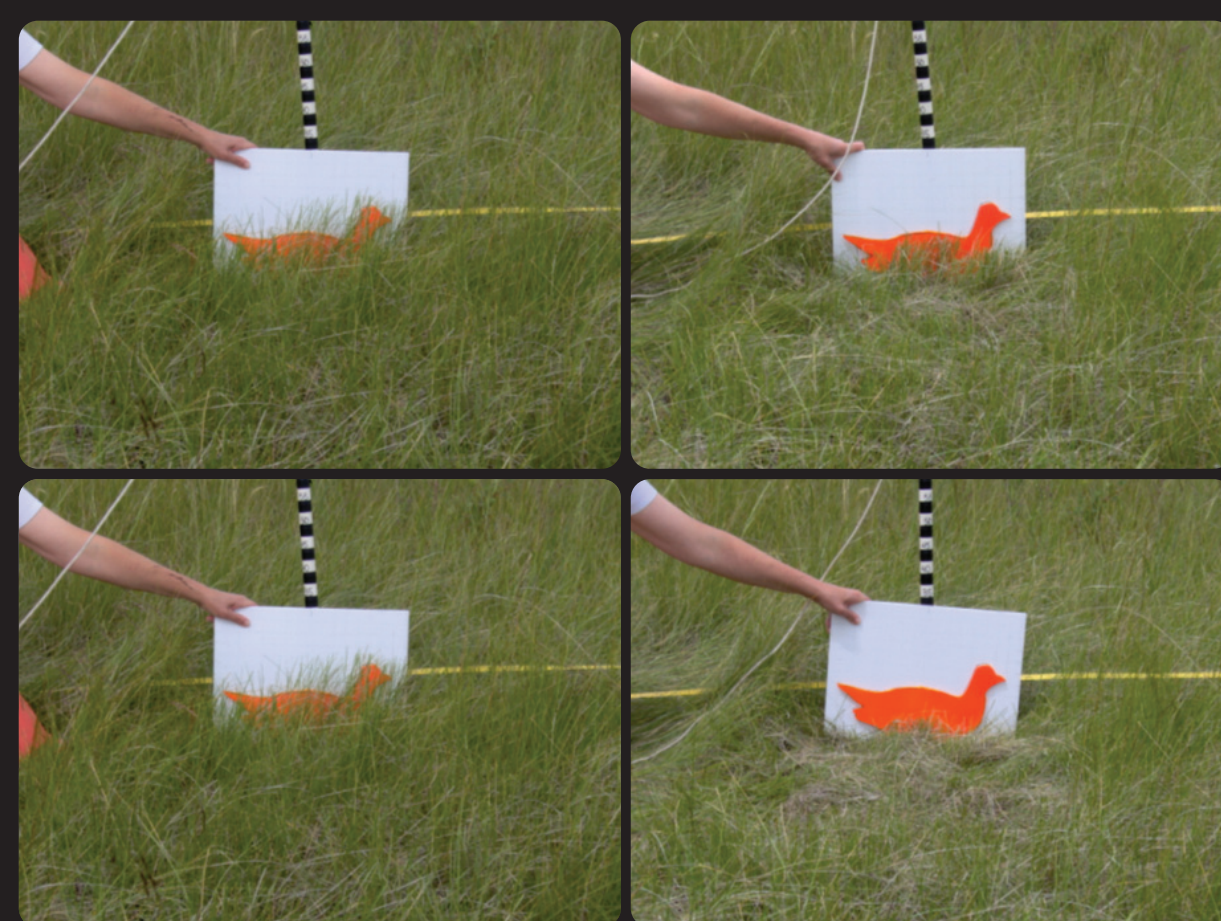


Photo credit: Becky Bings

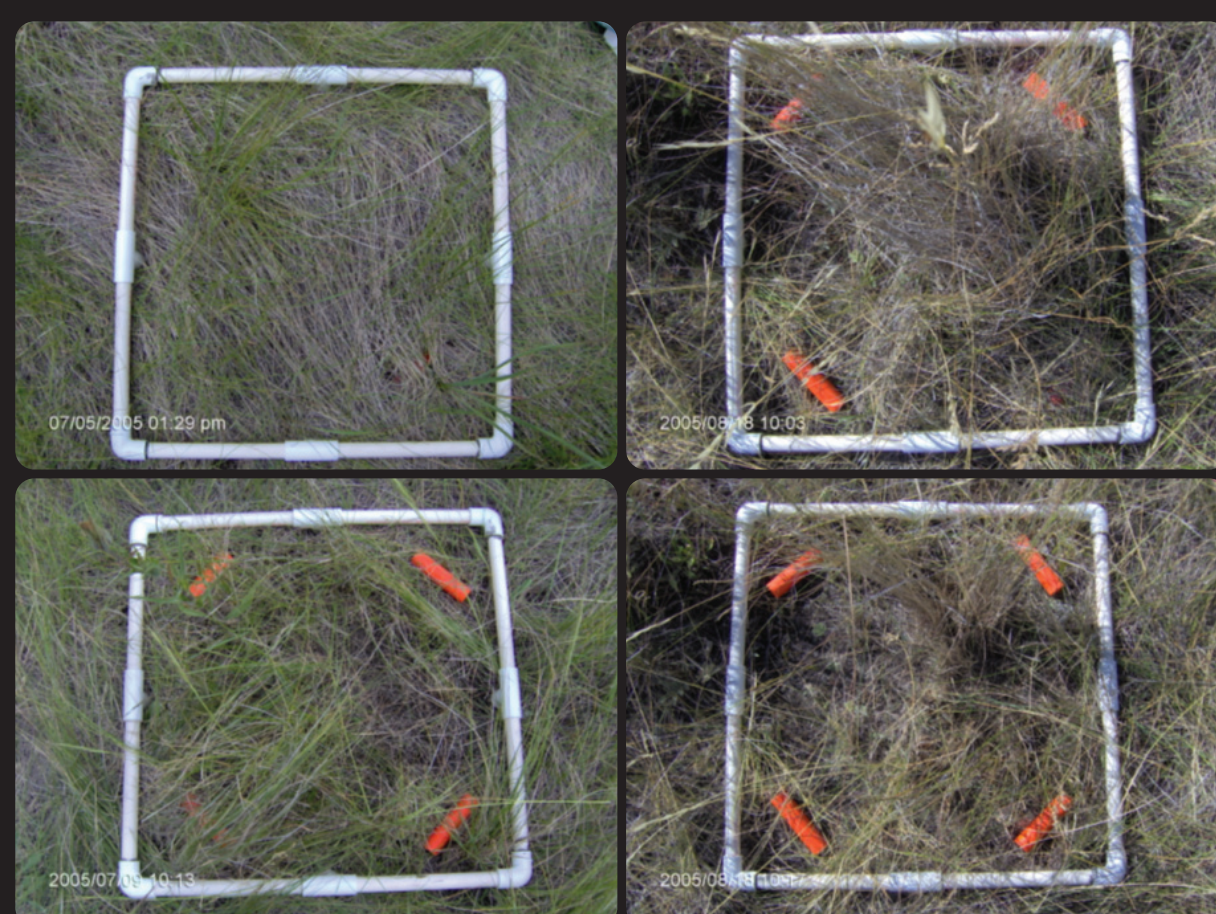


Figure 2. Paired photos - with litter, without litter - inside Loran C enclosure left-outside Snake Pitt enclosure right.

Photo credit: Becky Bings

Table 1. Linear regression used to predict stubble height (cm) required for visual cover of three bird species in four different grass types.

Data provided by: Cameron Carlyle

Grass Species	r ²	Stubble height (cm) required for the visual obstruction of birds at different percent visibility values.				
		0%	25%	50%	75%	
Grouse	Bluebunch wheatgrass	0.42	42.5	31.2	19.9	8.7
	Rough fescue	0.73	29.8	20.3	10.9	1.4
	Kentucky bluegrass	0.6	34.7	23.7	12.7	1.7
	Richardson's needlegrass	0.69	35.5	24.2	12.9	1.6
Meadowlark	Bluebunch wheatgrass	0.41	40.1	29.8	19.4	9.1
	Rough fescue	0.71	27.8	19.1	10.5	1.8
	Kentucky bluegrass	0.59	32.1	22.3	12.6	2.9
	Richardson's needlegrass	0.7	33.9	23.6	13.3	3.0
Sparrow	Bluebunch wheatgrass	0.41	33.8	23.9	14.1	4.2
	Rough fescue	0.61	24.4	15.6	6.8	-2.0
	Kentucky bluegrass	0.55	26.6	17.4	8.1	-1.2
	Richardson's needlegrass	0.66	27.4	17.9	8.5	-1.0

GIMP: GNU Image Manipulation Program

Using GIMP Program to Analyse Visual Screening of Cutouts and Dowels.

• Using a colour select tool in GIMP, the orange colour of the cutouts and dowels is selected for. The colour threshold is set to 40 and fine tuned down to 15. We are able to pick out most of the visible orange areas not screened by vegetation.

• The GIMP software counts the number of pixels of a specified colour in the photo.

Figure 3. Screen Capture of GIMP program.

Project Partners

Ministry of Environment
Ministry of Forests and Range (FREP)
Thompson Rivers University
Simon Fraser University
The Grasslands Conservation Council of BC
The Upland Bird Society
The National Science and Engineering Research Council of Canada
The Canadian Wildlife Service
The OK Ranch

