Alberta Conservation Association
2007/08 Project Summary Report

Project name: Elk Habitat Planning Tool

Project leaders: Robert Anderson and Shevenell Webb

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Partnerships:

Alberta Outfitters Association
Alberta Professional Outfitters Society
Alberta Sustainable Resource Development
Foothills Model Forest Grizzly Bear Project
National Science Foundation (USA)
National Science and Engineering Research Council (CANADA)
Rocky Mountain Elk Foundation Canada
Shell Canada Limited
Sundre Forest Products
Talisman Energy
University of Alberta (Central East Slopes Elk Study)
Weyerhaeuser Company

Key findings

- The elk habitat planning tool is a useful resource in predicting the effects of landscape change and habitat restoration on the suitability of habitat for elk in the Central East Slopes.
- Burn scenarios increased source habitat for elk by an additional 26 km^2 (winter) and 48 km^2 (summer).
- Remote cameras were found to be a poor detection method for elk, but did photograph white-tailed and mule deer, moose, coyote, and red fox.
- The elk tool, in its current state, is not suitable for use outside of the Central East Slopes.

Introduction

The Alberta Conservation Association (ACA) has been working with the Central East Slopes Elk Study (CESES) to produce habitat models that jointly account for the positive and negative responses of elk (*Cervus elaphus*) to land use changes (Frair et al. 2007). In 2006 and 2007, a geographic information system (GIS) interface was produced in collaboration with Foothills Model Forest (FMF) that allows the user to input proposed disturbances into the models, enabling the user to assess potential outcomes of either habitat restoration treatments or industrial development scenarios (Figures 1 and 2).

The primary objectives for this past year were to: 1) test the GIS tool interface and use the tool in conjunction with the ACA's Ungulate Winter Range Restoration program to assess multiple prescribed burning scenarios, 2) test the use of remote cameras as a means to validate model predictions, and 3) determine the feasibility of expanding the elk planning tool outside the original study area.

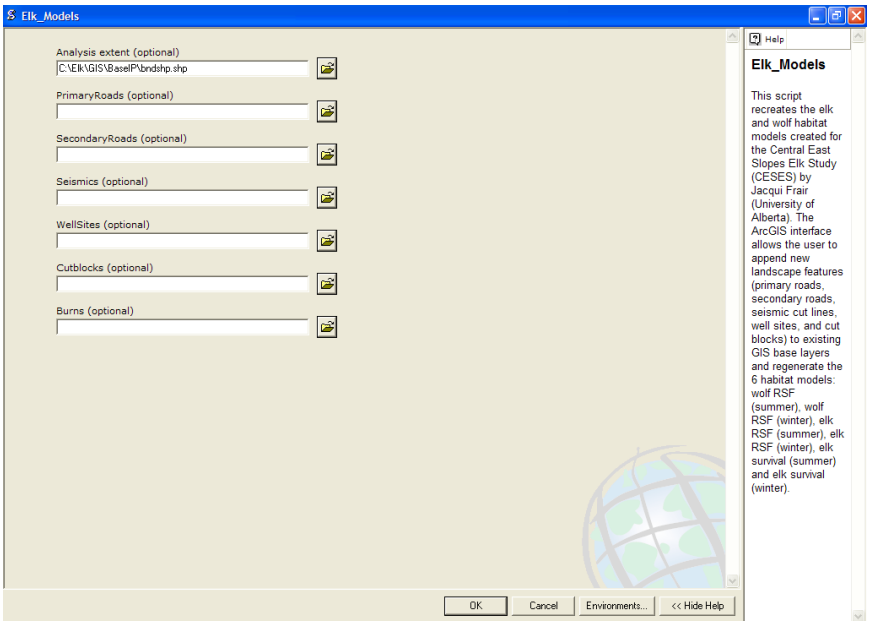

Figure 1. Elk habitat planning tool GIS interface that allows a user to define the study area and land use and burn scenarios.

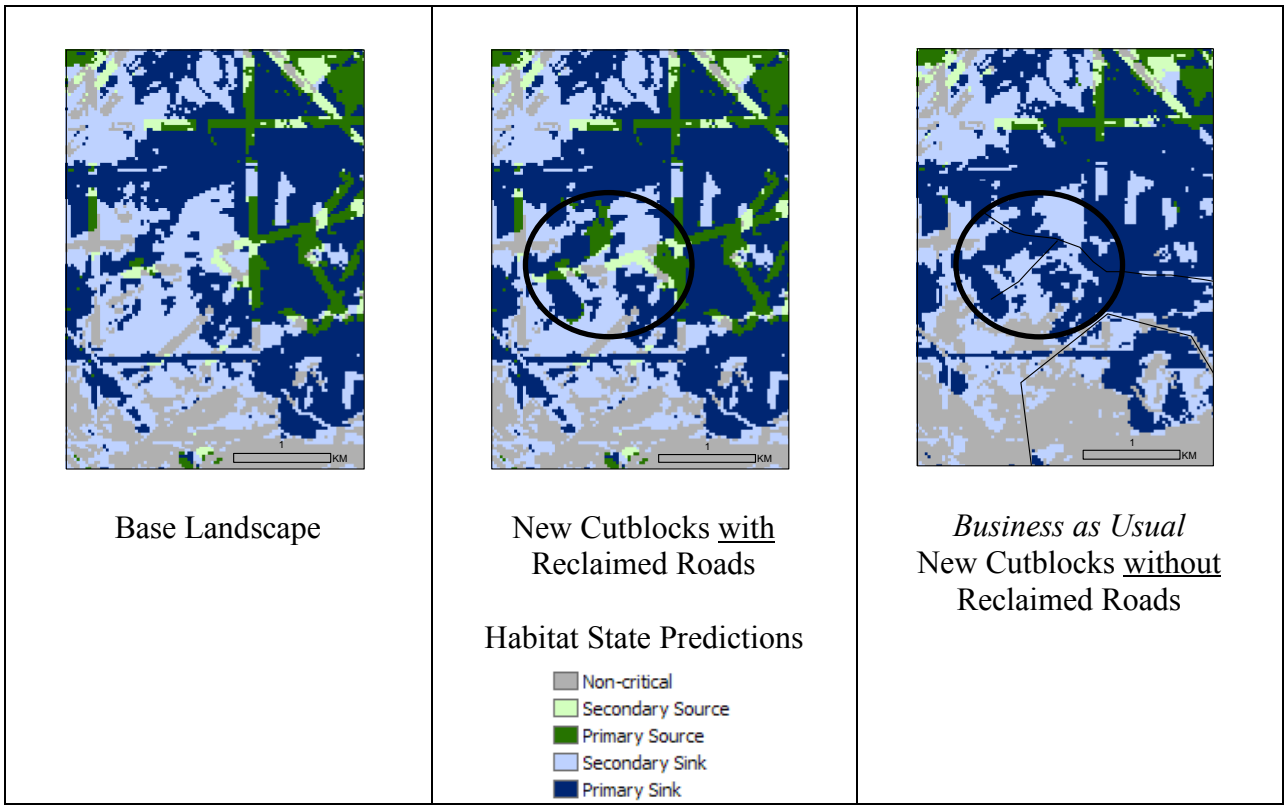

Figure 2. An example of the elk tool habitat predictions with cutblock/road scenarios. The cutblocks created more attractive habitat, but without the reclamation of roads the focal area becomes sink (risky) habitat because of the elevated mortality risk associated with roads.

Methods

To test the tool, we assessed ten years worth of proposed prescribed burns in the R11 Forest Management Area for their potential impact on elk habitat. These burns were arranged in different patterns, based on varying the importance of addressing issues related to forest health, wildfire threat, and natural disturbance emulation. We compared the amount of predicted source habitat created by the different burn pattern scenarios and assessed the potential implications of these results for elk in the study area.

We tested the use of Reconyx Silent Image remote cameras in quantifying elk occurrence in the Central East Slopes. We put the cameras at "elk height" on trees facing obvious game trails in a variety of predicted elk habitat types and counted the number of positive identifications after various time frames.

We also assessed the feasibility of expanding the elk planning tool outside of the original study area. The Foothills Model Forest Grizzly Bear Project has developed extensive landcover layers that overlap the proposed expanded area and we hoped to use this information source to apply the model throughout the Foothills Natural Region. To validate this, we compared landcover

differences and elk tool predictions between FMF and CESES layers in the original study area extent.

Results

Burn scenarios increased source habitat for elk by an additional 26 km^2 (winter) and 48 km^2 (summer). These sum to increases of 1 to 5% of the source area available for elk within the project's range depending on season. There was little variation between the different burn pattern strategies on predicted habitats, but burns positively affected habitat potential for elk because burns create meadow-like conditions with high quality forage. We would expect greater benefits if more area was burned, burns were strategically planned on the landscape in areas of secondary source habitats, and roads were removed near the burns to reduce mortality risk.

We deployed remote cameras between 23 October 2007 and 3 March 2008 at 16 different sites across a variety of habitat states predicted by the elk tool. On average, cameras were out for 29.94 ± 0.96 nights and collected a total of 1,501 photos. The proportion of photos taken of various species were: deer = 0.91, humans = 0.04, coyote = 0.02, red fox = 0.01, moose = 0.004, and elk = 0. Less than 5% of the photos were from an unknown trigger. Four sites had elk tracks present at the time the cameras were set, but no elk were photographed.

We generated 1,000 random points in the original study area extent and intersected the point layer with the FMF and CESES landcover. We found that some layers (e.g., cutblock, closed conifer, burn, and wet herbaceous) had high agreement (> 60%), while most layers had low agreement when comparing landcover categories. We also determined that the elk tool habitat state predictions differed for winter and summer seasons. A kappa statistic computes the degree of agreement between categories and ranges between 0 - 1 (1 = perfect agreement); in summer kappa = 0.66, SE = 0.02 and in winter kappa = 0.67, SE = 0.02.

Conclusion

The elk habitat planning tool is a valuable resource that allows users to evaluate alternative land use and restoration scenarios on elk habitat states and is being used in the ACA's Ungulate Winter Range Restoration Program to plan prescribed burns in the Central East Slopes.

Remote cameras were not effective at detecting elk because of variability in elk movements and restricted placement of cameras due to false triggers caused by movement of vegetation and human-related theft. Increasing the number of cameras, sites, and camera-nights and using bait would likely improve the detection of elk but probably would not be cost-effective.

We conclude that the FMF and CESES landcover layers are statistically different and do not recommend expanding the elk tool to areas outside of the original study area at this time.

Communications

- Results of the work completed by our project partners at the University of Alberta were summarized in a report to ACA in fiscal year 2007.
- We produced a draft scientific manuscript from this work in 2007, and plan to submit it to the Journal of Wildlife Management for review in fiscal year 2008

Literature cited

Frair, J., E.H. Merrill, and M.S. Boyce. 2007. Modeling the cumulative effects of wolves and industrial activities on habitat effectiveness for elk in the Rocky Mountains of Alberta, Canada. Final report submitted to the Alberta Conservation Association. 29 pp.

Example of pictures taken by Reconyx Silent Image digital cameras. (Photos: ACA)