

# The density of anthropogenic features explains seasonal and behaviour-based functional responses in selection of linear features by a social predator

Karine E. Pigeon\*, (kpigeon@friResearch.ca), D. MacNearney<sup>1,2</sup>, M. Hebblewhite<sup>3</sup>, M. Musiani<sup>4</sup>, L. Neufeld<sup>5</sup>, J. Cranston<sup>6</sup>, G. Stenhouse<sup>1</sup>, F. Schmiegelow<sup>7</sup>, and L. Finnegan<sup>1</sup>

*Linear features, like seismic lines, influence how wolves use the landscape. Seismic lines can also alter the potential for wolf-caribou encounters.*

## We Asked:

? How does wolf behaviour around seismic lines change throughout the year, and with varying degrees of human-caused disturbances on the landscape?

## What We Did:

- Study area: west central Alberta - Little Smoky, A La Peche, Redrock Prairie Creek, and Narraway caribou herds
- GPS collar data recorded at two-hour intervals from eight wolf packs, separated into 'resting-feeding', and 'travelling' locations
- Three seasons: denning, rendezvous, and nomadic
- Two landscapes: more industrialized and less industrialized
- LiDAR-based vegetation heights and wet areas on seismic lines, elevation and ruggedness, immature forests, densities of disturbance features at the landscape and local scales
- Examined wolf response to seismic lines in contrasting landscapes



## What We Found:

### 1 Common Key Factors

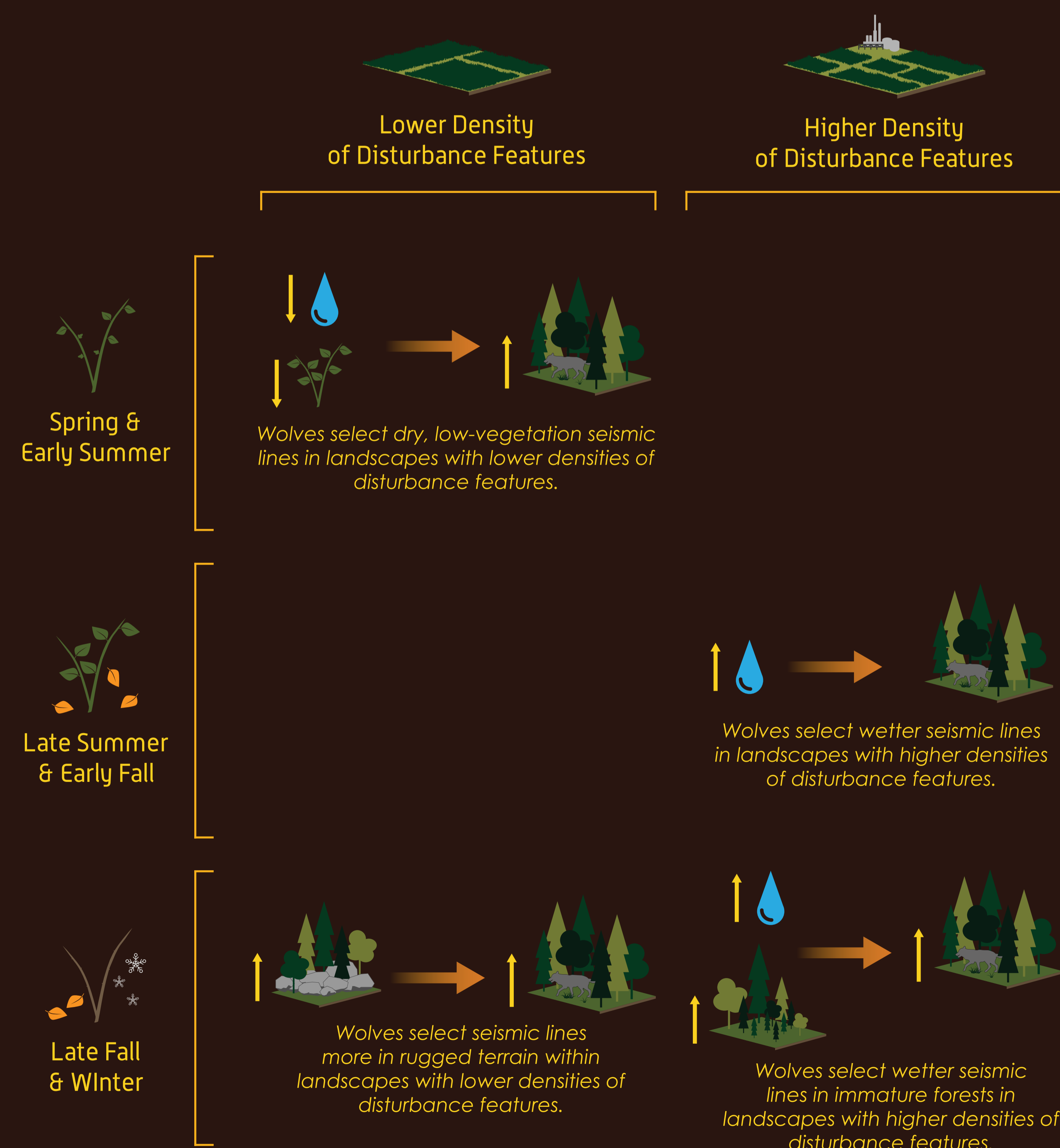
Density of disturbance features and vegetation height on seismic lines are key.

*Wolves are more likely to select low-vegetation seismic lines when there are fewer disturbances on the landscape, regardless of season.*



### 2 Variable Factors

Soil moisture, terrain ruggedness, and forest age also affect wolf behaviour around seismic lines. These factors vary by season and with density of disturbance features.



## Implications:

Densities of disturbance features influence how wolves use seismic lines, and can affect the probability of overlap between predators and threatened prey.



Low-vegetation seismic lines are more useful to wolves, especially in areas where fewer of these linear features are available on the landscape.

Land restoration in caribou ranges should ensure that ease-of-travel isn't improved for wolves; selective restoration could increase the use of remaining, unrestored seismic lines by wolves, particularly low-vegetation seismic lines.

@KEPigeon

<sup>1</sup>fRI Research, 1176 Switzer Drive, Hinton, Alberta, Canada; <sup>2</sup>Current address: Wildlife Research Division, Environment and Climate Change Canada, National Wildlife Research Centre, Ottawa, Ontario, Canada; <sup>3</sup>Department of Ecosystem and Conservation Science, W.A. Franke College of Forestry and Conservation, University of Montana, Missoula, Montana, USA; <sup>4</sup>Department of Biological Sciences, Faculty of Science, University of Calgary, Calgary, Alberta, Canada; <sup>5</sup>Parks Canada, Jasper National Park, Jasper, Alberta, Canada; <sup>6</sup>Arctos Ecological Consultants, Edmonton, Alberta, Canada; <sup>7</sup>Department of Renewable Resources, University of Alberta, Edmonton, Alberta, Canada



Illustrated by: Jennifer Hird  
@JNHird