Development Of A Regional Fence Model With Implications For Wildlife Management

Andrew F. Jakes*, Faculty of Environmental Design, University of Calgary, Calgary, Alberta T2N 1N4 Canada

Erin E. Poor, Conservation Science Program, World Wildlife Fund, Washington D.C. 20037

Colby Loucks, Conservation Science Program, World Wildlife Fund, Washington D.C. 20037

Michael J. Suitor, Faculty of Environmental Design, University of Calgary, Calgary, Alberta T2N 1N4 Canada

Barbed and woven wire fence are ubiquitous features across much of western North America, yet their effects on wildlife have received less attention than those of other anthropogenic features. At this time, no geospatial fencing data is available at broad level scales; potentially making wildlife modeling of vagile species less accurate and conservation planning less reliable at various scales. Here, we model fence density across 13 counties in Montana's Hi-Line region, based on publicly available GIS data and assumptions created from local, expert knowledge. The resulting fence location and density GIS layers are based on assumptions about where fence locations occur in association to different types of land tenure, land cover and roads. Locations of fences were collected via GPS along random 3.2 km long road transects ($n = 738$) to assess overall model accuracy. Using a confusion matrix to determine variation between field and modeled fence locations, the total accuracy of the

model was 73% and Kappa was .40. Although we found inaccuracies associated with large parcels (>3 contiguous sections) of cultivated agriculture, our model is a promising step towards delineating fencing across the west. These general rules may be used and refined in the other areas based on the regional historical context. This new data may advance both wildlife research and management/mitigation activities. Using the relative density of fences across a region can prioritize conservation efforts at this broad scale. In addition, modeled fence locations provide useful and accurate information at a local scale.