ABSTRACT

The North Rainier Elk Herd (NREH) is one of ten designated herds in Washington State, all managed by the Washington Department of Fish and Wildlife (WDFW). To aid in the management of the herd, the WDFW has decided to implement a spatial ecosystem analysis. This thesis partially undertakes this analysis through the use of a suite of software tools, the Westside Elk Nutrition and Habitat Use Models (WENHUM). This model analyzes four covariates that have a strong correlation to elk habitat selection: dietary digestible energy {ODE); distance to roads open to the public; mean slope; and distance to cover-forage edge and returns areas of likely elk habitation or use. This thesis includes an update of the base vegetation layer from 2006 data to 2011, a series of clear cuts were identified as areas of change and fed into the WENHUM models. The addition of these clear cuts created improvements in the higher quality DOE levels and when the updated data is compared to the original, predictions of elk use are higher. The presence of open or closed roads was simulated by creating an area of possible closures, selecting candidate roads within that area and then modeling them as either "all open" or "all closed". The simulation of the road closures produced increases in the higher levels of predicted use.