Human Influences on Elk Movement Rates and Resource Selection in the Wildland-Urban Interface.

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Elk (*Cervus elaphus*) are known to select for refuge from hunting by humans (elk hunting). In many areas in the western U.S., elk hunting is completely excluded in the wildland-urban interface (WUI) as a result of land ownership change and subdivision, thus providing refugia for elk. Many of these WUI elk populations are increasing rapidly, and pose a significant credibility challenge to wildlife managers. The North Hills Elk Herd, in Missoula, Montana, has been growing at ~11 percent since the early 1980s, and the herd now numbers over 300 animals. Landownership is a complex matrix of public and private lands that range from partial to complete exclusion of hunting, thus elk hunting pressure is low and provides multiple refugia. Montana Fish, Wildlife and Parks used elk hunting in this setting to reduce population growth, crop depredation, and habituation. Little is known about the

efficacy of elk hunting on elk movement rates and habitat selection. We used First-Passage Time (FPT) and Resource Selection Functions (RSF) analysis based on nine GPS collared adult female elk during three hunting seasons with increasing hunting pressure (2007-2009) to test relationships between elk movement rates and resource selection in the WUI. Elk FPT decreased annually, if they were accessible, and differed by hunting mode and season. Elk selected for intermediate distances from homes, trails, and weakly avoided access. These data have been used to modify hunting season structure, acquire conservation easements, and develop lasting partnerships in a complex matrix of ownerships.