1096-90-1441 **Bistra Dilkina*** (bistra@cs.cornell.edu) and **Claire A Montgomery** (claire.montgomery@oregonstate.edu). *Applications of graph theory to optimize wildlife corridor systems for multiple species: Grizzly bear and wolverines in the northern Rockies.* Preliminary report.

Maintaining connectivity between habitat core areas is important for combating the effects of habitat loss and fragmentation facing species of concern. However, conservation efforts are implemented under very limited economic resources. Therefore designing cost-efficient approaches for landscape connectivity is an important and challenging computational task. This paper reports ongoing research in the application of graph theory approaches to the problem of optimally designing wildlife corridors to connect established reserves for multiple species. To obtain conservation strategies that minimize cost while achieving connectivity for multiple species, we introduce the Steiner Multigraph Problem. Going beyond least cost solutions, we propose the Minimum Delay Generalized Steiner Network problem for finding the corridors with minimum landscape resistance to movement subject to a budget constraint. This model also addresses the need for robust conservation plans by supporting multiple disjoint corridors between pairs of reserves. We apply our approach in western Montana to demonstrate how the solutions may be used to study trade-offs in connectivity for two species with different habitat requirements and differently located core areas – the grizzly bear and the wolverine. (Received September 15, 2013)