## DISPERSAL LIMITATION D<u>OES NOT CONTROL HIGH ELEVATIONAL PATTERNS OF</u> ALIEN PLANT SPECIES (5C)

Philip W. Rundel<sup>1</sup> and Jon E. Keeley<sup>2</sup>

<sup>1</sup>Department of Ecology and Evolutionary Biology, University of California (UCLA),

<sup>2</sup>U.S. Geological Survey, Western Ecological Research Center, Sequoia-Kings Canyon Field Station

Our aim was to test the hypothesis that most alien plant species invading high elevations around the world are climate-generalists capable of growing across a wide elevational range, and that their limited presence at higher elevations largely limited by dispersal rather than ecophysiological tolerances. This study was conducted in Sequoia and Kings Canyon National Parks in the southern Sierra Nevada of California. To minimize issues of phylogenetic bias, we analyzed the comparative elevational patterns of distribution and growth form in native and alien plant species in the four families (Asteraceae, Brassicaceae, Fabaceae, and Poaceae) that contribute the majority of naturalized aliens in the study area. The distribution of realized climatic niche breadth, as measured by elevational range of occurrence, was virtually identical for alien and native species, with both groups showing a roughly Gaussian distribution peaking with species whose range covers a span of 1,500-1,999 m. In contrast to alien species which only rarely occurred at higher elevations, native species showed a distribution of upper elevation limits peaking at 3,000-3,499 m, an elevation which corresponds to the zone of upper montane and subalpine forests. In conclusion, these data do not support the hypothesis that aliens in mountains are climategeneralists whose elevational range is determined by directional ecological filtering along elevational gradients, with dispersal limitations as the controlling factor. Alien species distribution is much more complex in causality, with life history traits and abiotic stress as primary limiting factors influencing alien species occurrence at high elevations.

Key words: Elevational gradient, invasive plants, alpine, subalpine