The application of basic ecological concepts to fields of conservation biology and applied environmental sciences is a healthy sign, but before these concepts are widely used, ecology must provide operational definitions and quantifiable methods.Our results support the idea that in keystone–dominated systems, species other than the keystone species have only minor, if any, effects on the rest of the community, and thus might be cited by some as "redundant species." However, our results also indicate that, after the loss of a keystone species, previously "redundant" species can partially compensate for the reduced predation and adopt a major role in the altered system.We studied the strength of predation on mussels (Mytilus trossulus) by the keystone seastar Pisaster ochraceus and the whelks Nucella emarginata and N. canaliculata under different environmental conditions in the Oregon intertidal zone.We attempted to determine: (1) the sensitivity of keystone predation to the presence of other predators in the system; (2) the role of other predators in the presence and absence of a keystone species; and (3) the per capita and population–level variability in interaction strengths of strong (keystone) vs. weak interactors.Each combination of seastar and whelk treatment was replicated four times in both wave–exposed and wave–protected habitats of two sites that differed in predator densities, primary productivity, and recruitment and growth rates of prey species.Predation intensity on mussels was measured by recording the survival of mussels transplanted to areas from which seastars, whelks, or both, had been either manually removed or left undisturbed at natural densities.Negative effects of seastars on whelk density were observed $