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The avoidance of visually feeding fish has long been considered as the primary driver of diel vertical migration of zooplankton. The diurnal vertical distribution of Cyclops gr. abyssorum, Arctodiaptomus alpinus, and Daphnia gr. longispina from 13 alpine lakes with fish (Salvelinus fontinalis) and without, was compared in order to understand whether fish in transparent lakes reduce the presence of large zooplankton from the irradiated zone. We used the light level at each sampling depth and the size of each specimen as proxies of predation risk, and we tested two predictions: (P1) the relative abundance of zooplankton in the well-lit surface waters vs. the darker waters will be greater in fishless lakes; (P2) the size of zooplankton in the well-lit surface waters vs. the deeper, darker waters will be greater in fishless lakes. We did not find any evidence of the validity of P1, but we confirmed P2 for Arctodiaptomus alpinus. These results support with new field data the Transparency Regulator Hypothesis, which argues that in transparent lakes, fish predation is less important for the vertical distribution of zooplankton than ultraviolet radiation, and further suggest that zooplankton size rather than vertical distribution may be more effective against visual predators in transparent lakes.