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The coolest and most numerous stars in the Galaxy harbor a vast population of planetary systems. The compact architectures of this newly discovered population presents a challenge to our understanding of how they may have formed. Clues to the dominant mechanisms responsible for forming this population of planets are imprinted in the observed planet radius function—the occurrence rate of planets as a function of their radii. We present a non-parametric reconstruction of the planet radius function for planets with periods < 90 days around stars cooler than 4000 K, based on the Kepler exoplanet survey. We demonstrate that careful completeness correction, precise stellar radius measurements, and avoidance of histogram binning are necessary in order to identify robust features of this distribution. We find that Earth-size planets are most common and that atmospheric evolution has played an important role in forming this extensive planetary population as observed today.