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We study global uniqueness in an inverse problem for the fractional semilinear Schrödinger equation $(-\Delta)^s u + q(x, u) = 0$ with $s \in (0, 1)$. We show that an unknown function $q(x, u)$ can be uniquely determined by the Cauchy data set. In particular, this result holds for any space dimension greater than or equal to 2. Moreover, we demonstrate the comparison principle and provide a L^∞ estimate for this nonlocal equation under appropriate regularity assumptions. (Received August 19, 2018)