Say that a graph with maximum degree at most $d$ is $d$-bounded. For $d > k$, we prove a sharp sparseness condition for decomposability into $k$ forests and a $d$-bounded graph. Consequences are that every graph with fractional arboricity at most $k + \frac{d}{k + d + 1}$ has such a decomposition, and (for $k = 1$) every graph with maximum average degree less than $2 + \frac{2d}{d+2}$ decomposes into a forest and a $d$-bounded graph. When $d = k + 1$, and when $k = 1$ and $d \leq 6$, the $d$-bounded graph in the decomposition can also be required to be a forest. When $k = 1$ and $d \leq 2$, the $d$-bounded forest can also be required to have at most $d$ edges in each component. (Received August 20, 2010)