Incrementally $k$-list coloring a graph means that a graph is given by adding vertices step by step, and for each intermediate step we ask for a vertex coloring such that each vertex has one of the colors specified by its associated list containing some of in total $k$ colors. We introduce the “conservative version” of this problem by adding a further parameter $c$ specifying the maximum number of vertices to be recolored between two subsequent graphs (differing by one vertex). The “conservation parameter” $c$ models the natural quest for a modest evolution of the coloring in the course of the incremental process instead of performing radical changes. We show that even on bipartite graphs the problem is NP-hard for $k \geq 3$ and $W[1]$-hard for an unbounded number of colors when parameterized by $c$. In contrast, also on general graphs the problem becomes fixed-parameter tractable with respect to the combined parameter $(k, c)$. Furthermore, we present some results with respect to kernelization and investigate the parameterized complexity on various subclasses of perfect graphs. Finally, we provide empirical findings on the practical relevance of our approach in terms of an effective graph coloring heuristic. (Received September 24, 2012)