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Katalin Berlow*, kberlow@andrew.cmu.edu. *Restricted Stacks as Functions.*

The stack sort algorithm has been the subject of extensive study over the years. In this paper we explore a generalized version of this algorithm where instead of avoiding a single decrease, the stack avoids a set T of permutations. We let s_T denote this map. We classify for which sets T the map s_T is bijective. A corollary to this answers a question of Baril, Khalil, and Vajnovszki about stack sort composed with $s_{\{\sigma,\tau\}}$, known as the (σ, τ) -machine. This fully classifies for which σ and τ the preimage of the identity under the (σ, τ) -machine is counted by the Catalan numbers. We also prove that the number of preimages of a permutation under the map s_T is bounded by the Catalan numbers, with a shift of indices. For T of size 1, we classify exactly when this bound is sharp. We also explore the periodic points and maximum number of preimages of various s_T for T containing two length 3 permutations. (Received August 31, 2020)