Subseq limits

Given $\{a_n\}$, let

$L = \{$ subsequential limits $\}$

Can we upper bound L?

Let

$b_1 = \sup\{a_1, a_2, \dots\}$

$b_2 = \sup\{a_2, a_3, \dots\}$

$b_n = \sup\{a_n, a_{n+1} \dots\}$

$b_1 \geq b_2 \geq \dots$