Initiation and recession of the knickpoints are significant boundary condition for processes of fluvial system. In the Yalu River–Wangtian’e volcanic region of northeastern China, broadly distributed flat lava terrain provides an ideal site to study the recession of fluvial knickpoints because knickpoints and waterfalls are well preserved here. Here we describe the distribution of knickpoints in the Yalu River–Wangtian’e volcanic region by combining DEM analysis and numerical modeling. Furthermore, we present a knickpoint celerity model, derived from stream–power incision model, to relate knickpoint recession rate to drainage area. We calibrate important empirical coefficients with our knickpoint celerity model; the best fit erosion coefficient (K) is $1.32 \times 10^{-8}$, and the best fit drainage area exponent (m) is 0.69. Error analysis indicates a close correspondence between synthetic and real knickpoints. Finally, we show that knickpoint recession rates in the Yalu River–Wangtian’e volcanic region between ~1 – 10 mm/a during the early stages of transient incision, and that the present rates are ~1 – 6 mm/a. Our results are in good agreement with previous findings from the Aso Volcano and volcanoes near Boso Peninsula (Japan), providing new insight into landscape evolution in the Yalu River–Wangtian’e volcanic region in northeastern China.