Zeeman-driven Lifshitz transition: A scenario for the Fermi-surface reconstruction in YbRh$_2$Si$_2$ MATTHIAS VOJTA, Technische Universitaet Dresden, ANDREAS HACKL, California Institute of Technology — The heavy-fermion metal YbRh$_2$Si$_2$ displays a field-driven quantum phase transition where signatures of a Fermi-surface reconstruction have been identified, often interpreted as breakdown of the Kondo effect. We argue that instead many properties of the material can be consistently described assuming a Zeeman-driven Lifshitz transition of heavy-fermion bands. Using a suitable quasiparticle model, we find a smeared jump in the Hall constant and maxima in susceptibility and specific heat, very similar to experimental data. An intermediate non-Fermi liquid regime emerges due to the small effective Fermi energy near the transition. Further experiments to discriminate the different scenarios are proposed.