Abstract. Grasslands and savannas worldwide have been dramatically altered by woody plant encroachment (WPE). Maintaining remnant grasslands and restoring degraded grasslands for the people and animals that depend on them will require a new paradigm for WPE: one that views WPE as a complex social–ecological system. Here, we examine WPE as a social–ecological problem using a conceptual framework designed to bridge the biophysical and social domains. We use the Press–Pulse WPE Framework to develop a set of integrative hypotheses and to identify key knowledge gaps using the Southern Great Plains as a case study. An alternative—and potentially complementary—approach to the Press–Pulse WPE Framework is the use of classical dynamic systems modeling, which was widely adopted in ecology and economics. The explicit coupling of the Press–Pulse WPE Framework with systems modeling has the potential to yield new insights for understanding the local-to-regional scale processes that drive and constrain changes in grass–woody plant abundances and for predicting the socio-economic and ecological consequences of these changes.