**Methods**

*Experimental design*

*Time periods*

We used data from 1988-2020. This allowed for the greatest possible number of plots with stable rodent treatments from 1988 until the treatment changes implemented in 2015 (Heske; data paper). We broke the time series into four eras corresponding to major transitions in the rodent community. The first spans from 1988 until 1996, when *C. baileyii* first colonized the site (Ernest and Brown 2001; Thibault et al 2010). From 1996 until 2010 *C. baileyii* was dominant on exclosure plots and abundant on control plots. Around 2010, following a multiyear drought and community-wide period of very low abundance, rodent community composition reorganized and *C. baileyii* became relatively scarce (Thibault on drought, Christensen on change points). We therefore designated the second era as 1996-2010, and explored the sensitivity of our results to selecting different endpoints. The third era runs from 2010 until March 2015, when the experimental treatments on eight of the plots in our analysis were changed (Ernest 2018?data paper, Christensen et al 2019?procb). The fourth runs from March 2015 until January 2020, the last complete census period prior to the interruption in data collection caused by the COVID-19 pandemic.

*Use of treatment-level means*

For each treatment in each census period, we calculated the mean quantities of interest and used these to make comparisons between treatments. This is necessary for the calculation of quantities such as energetic compensation and the ratio of total energy use on treatment relative to control plots. However, we acknowledge that this fails to account for potential variability between plots within a treatment. For analyses where it is possible to perform both a plot-level and a treatment-level analysis, we explored the effect of including plots. We also used generalized additive models to incorporate between plot variability into the estimates of treatment-level means and explored the impact on results.

*Treatment-level total energy use*

To assess the net effects of kangaroo rat removal on community-level energy use over time, we compared the total energy use on treatment relative to control plots over time. Because sitewide productivity fluctuates over time, we used the ratio of treatment-level mean energy use to the mean energy use on control plots in each census period to measure how the net effect of removing kangaroo rats has changed over time. We used a generalized least squares (nlme) to compare the ratio of treatment:control total energy between different treatment types and across the four eras, accounting for temporal autocorrelation.

*Energetic compensation*

Following Ernest and Brown (2001), we calculated energetic compensation as the increase in energy use from small granivores on treatment plots relative to control plots, divided by the energy used by kangaroo rats on control plots. We used a generalized least squares model, accounting for autocorrelation, to compare the degree of compensation in each era for each treatment type.

*C. baileyii abundance*

We calculated the proportion of treatment energy use accounted for by *C. baileyii* for each treatment type. Because, unlike the above ratios and compensation effects, this proportion is strictly bounded from 0-1, we used a generalized linear model with a quasibinomial link function to compare the proportion of *C. baileyii* energy use between treatments and eras.

**Results**

*Total energy use*

The ratio of exclosure energy use to control energy use from 2010-2020 declined

*Energetic compensation*

*C. baileyii*