Supporting Information. Aikens, E.O., S.P.H. Dwinnell, T.N. LaSharr, R.P. Jakopak, G.L. Fralick, J. Randall, R. Kaiser, M. Thonhoff, M.J. Kauffman, and K.L. Monteith. 2021. Migration distance and maternal resource allocation determine timing of birth in a large herbivore. Ecology.

Appendix S3 – Quantifying IRG and Days-From-Peak

We used bands 1 and 2 from the MOD09Q1 surface reflectance imagery (v006, spatial resolution = 250m, temporal resolution = 8-day composite) to calculate NDVI (Merkle et al. 2016), which is a proxy for plant biomass. To determine when plants at the landscape-scale reached intermediate biomass, which should represent the stage of phenological development that provides the highest-quality forage (hereafter peak green-up; Fryxell 1991), we first fit a double logistic curve to an annual time series of NDVI data for each pixel on the landscape (Bischof et al. 2012, Merkle et al. 2016). Next, we took the first derivative of the double logistic curve, which resulted in a curve called the Instantaneous Rate of Green-up (IRG), which peaks when plants are at their intermediate growth stage (Bischof et al. 2012).

To calculate exposure to IRG and green-wave surfing, we first defined a customized date range for each individual which started 60 days before birth and concluded on the date of birth (Aikens et al. 2020). During that 60-day period, we extracted the IRG value for each location to estimate exposure to spring green-up (Bischof et al. 2012). Additionally, to quantify green-wave surfing behavior, we took the absolute difference in days between the date of peak green-up and the date the animal used a location, which results in a metric called Days-From-Peak. We used the absolute value to avoid bias introduced by early surfing canceling out late surfing across the 60-day period (Aikens et al. 2017). To account for uneven sample size caused by different fix rates across collars, we first took a daily average of the Days-From-Peak and IRG values, before averaging over the 60-day period before birth for each animal-year.

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