Dear editorial team, dear Lina Polvi Sjölberg,

We adjusted expended and adjusted the discussion part and calculated uncertainties regarding our usage of annual rate (Lines 597 – 624):

We have found that rainfall plays a key role in triggering burrowing activity, which means that wet seasons experience higher sediment redistribution rates than dry seasons. In the year of investigation (2019), the dry season lasted from January until April, and from September until December (8 months), and the wet season lasted from May until August (4 months). The monitoring period lasted from March until October which covered 3 dry and 4 wet months (7 months in total). A yearly rate of sediment redistribution can be calculated by simply averaging the redistribution rate of the 7 monitored months and multiplying this result by 12 months, which results in an average redistribution rate of 0.4 m^2 ha^{-1} $year^{-1}$ for LC and 0.1 m^2 ha^{-1} $year^{-1}$ for PdA. However, because burrowing activity and rain-driven sediment redistribution is mainly determined by rainfall, this method might have led to an overestimation of the annual redistribution rate based on averaging, because the unmonitored part of the year 2019 was predominantly dry (Übernickel et al. 2021a). This can be accounted for by adding five times the dry month redistribution rate to the monitored 7 months, which leads to a lower annual redistribution rates for LC of 0.3 m^2 ha^{-1} $year^{-1}$ and for PdA of 0.1 m^2 ha^{-1} $year^{-1}$. This difference between both values (0.1 m^2 ha^{-1} $year^{-1}$ for LC and under 0.1 m^2 ha^{-1} $year^{-1}$ for PdA) can be interpreted as the uncertainty range for the year of observation. However, decadal rainfall variability indicates that the year of monitoring (2019) was among the drier years of the last 30 years (Yáñez et al. 2001) which means our results might underestimate sediment redistribution on a longer time perspective.

Furthermore, the phenology of the burrowing animals is an additional source for uncertainty when calculating annual rates. The most common burrowing animal families in the area are active from March until October (refer to section earlier), and hence their burrowing activity is fully covered during the monitoring period. None of the most common burrowing animal families were reported to be active from November until February. This is also in line with our observations, because burrowing intensity increased from March until May, reached its peak between May and June and declined until September (Figure 6). By extrapolating from 7 months to one-year period, our estimated excavation was 0.7 m^2 ha^{-1} $year^{-1}$ in LC and 0.8 m^2 ha^{-1} $year^{-1}$ in PdA. By adding five times the low active months to the 7 months of observation, the estimated excavation would be 0.6 m^2 ha^{-1} $year^{-1}$ in LC and 0.6 m^2 ha^{-1} $year^{-1}$ in PdA. The excavation uncertainty range is thus 0.1 m^2 ha^{-1} $year^{-1}$ for LC and 0.2 m^2 ha^{-1} $year^{-1}$ for PdA. In summary, the discussion on the uncertainties of extrapolating single or sub-annual observations to annual rates clearly underpins the importance of high resolution, longer-term monitoring, which can be warranted with the here developed technology.

Kind regards

Paulina Grigusova