Exceptional aggregation of Cantabrian brown bears during hyperphagia

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Introduction

Brown bears are opportunistic omnivores, and aggregations around clumped and abundant food resources have been described for bears feeding on natural or anthropogenic sources (White et al. 1998, Peirce & van Daelen 2006). Recent research has shown the importance of kin-related social structures in the spatial ecology of bears (Steen et al. 2005), particularly matrilineal assemblages caused by female phylopatry and related females tolerance (Steyaert et al. 2012).

The long-term monitoring carried out in the Cantabrian Mountains (>25 years estimating the minimum number of females with cubs of the year), has allowed us to observe events of spatial tolerance between females with cubs, multiple courtships with up to 5 adult bears involved and low-density concentrations of bears feeding on fruits. During the 2017 hyperphagia period, an exceptional aggregation of bears has been observed and has been subject to detailed monitoring.

Methods

In September 2017, we detected the first 5 bears feeding upon acorns on the trees in a small area in the Sil river valley (NW of Leon province, north of Spain), with rocky and steep slopes covered with mixed forest and oaks (Quercus petraea, Q. pyrenaica) and altitude between 800 and 1,260 m. Between September 8 and December 19 we dedicated 41 days to the visual monitoring of the bears in the area, locating and filming them. Between one and three observers each day have searched and monitored the bears with telescopes at distances between 300 and 400 m, from morning until sunset.

Results

We have located between 1 and 17 different bears each day. The analysis of videos, field data and simultaneous observations allowed us to identify at least 31 different bears feeding in an area of ca. 3 km² (with main presence and concentration in about 50 ha): 18 solitary (adult and young) bears and 5 different groups of females with cubs. Although some bears showed alert behaviour a few times, no agonistic behaviour was observed, and tolerance, temporal bonds or even play events were registered.

Discussion

Cantabrian bears base their diet during hyperphagia in the consumption of nuts (Naves et al. 2006), mainly Quercus sp., Fagus sylvatica and Castanea sativa, which suffer high inter-annual harvest variability. Food shortage has been remarkable in the fall of 2017. In May, heavy frosts for at least 3 days in a row, affected the flowering and production of all fruit trees in most of the bear range. However, the bears aggregation area kept a good production level of oak acorns, apparently due to orographic and microclimatic reasons buffering the impact of the frosts in spring.

The bears have been able to make extensive movements and feed themselves close to others for a long period of time to take advantage of the concentration of trophic resources. This situation supports bear opportunism and behavioural flexibility (Bojarska & Selva 2012, Coogan et al. 2018), and provides new insights on the social structure of bears, and the importance of the conservation of key areas of high trophic quality for bears.

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