Figures and tables

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2023-03-28

## Results

General summary

The hare cycle was increasing in 2015, peaked during the 2016-2017 winter, declined from 2017 to 2019, after which it remained in the low until 2021 (Figure 1). Mortality rates changed with the population cycle; hare mortality was lowest in 2016-2017 (cycle peak; 0.14 and highest in 2019-2020 (cycle low; 0.29 ; Figure 1). After initial data cleaning was complete, we analysed gps data from 108 individuals, totaling 627 weekly home ranges. Home ranges were composed of an average of 276 fixes. Of the collared individuals, 25 were male, 83 were female. Of the females, 31 were food supplemented while collared. The mean areas of 90%, 75%, and 50% weekly home ranges (MCPs) were 2.98 ha, 1.95 ha, and 1.1 ha respectively. Results from 90%, 75%, and 50% MCPs were highly correlated (r > 0.78), and we completed subsequent home range size analyses with the 90% MCP results.

Home range size predictors

Snowshoe hare home ranges were largest in the low of the cycle (2019-2020) and smallest in the peak of the cycle (2016-2017; Figure 2). We found no effect of sex on home range size excluding food add females (p = 0.24, t = 1.38, df = 428), so we did not include sex in our models. Our control-only model (all years; no food-add individuals) found that hare home ranges showed no response to density (-0.01 +/- 0.36 ha per hare/ha increase in density). This model did find a significant effect of predation risk on home range size; as the risk of mortality risk from 0 to 0.6, hare home ranges increased from 2.06 ha to 6.02 ha (se = 1.71).

Our treatment-included model (years with food-add experiments; all individuals), found that as hare density increased from 0 to 1.4 hares/ha, controls slightly increased their home ranges from 2.73 ha to 3.28 ha, while food-adds substantially decreased their home ranges from 4.84 ha to 1.6 ha. Both groups increased their home ranges as mortality rates increased from 0.078 (unit) to 0.31 (unit), but that increase was much greater for controls (2.22 ha increase) than food-adds (0.45 ha increase).

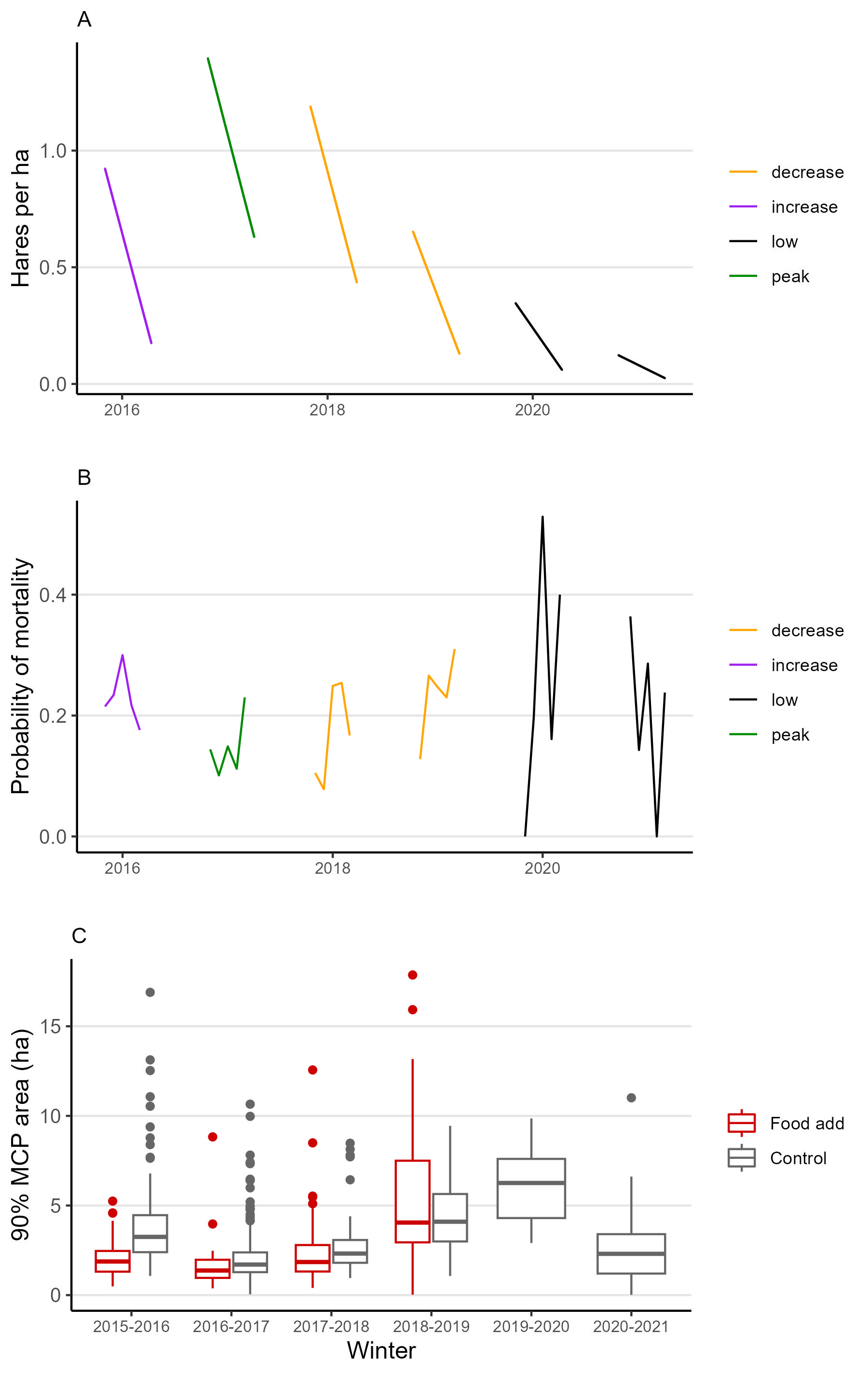


Figure 1.

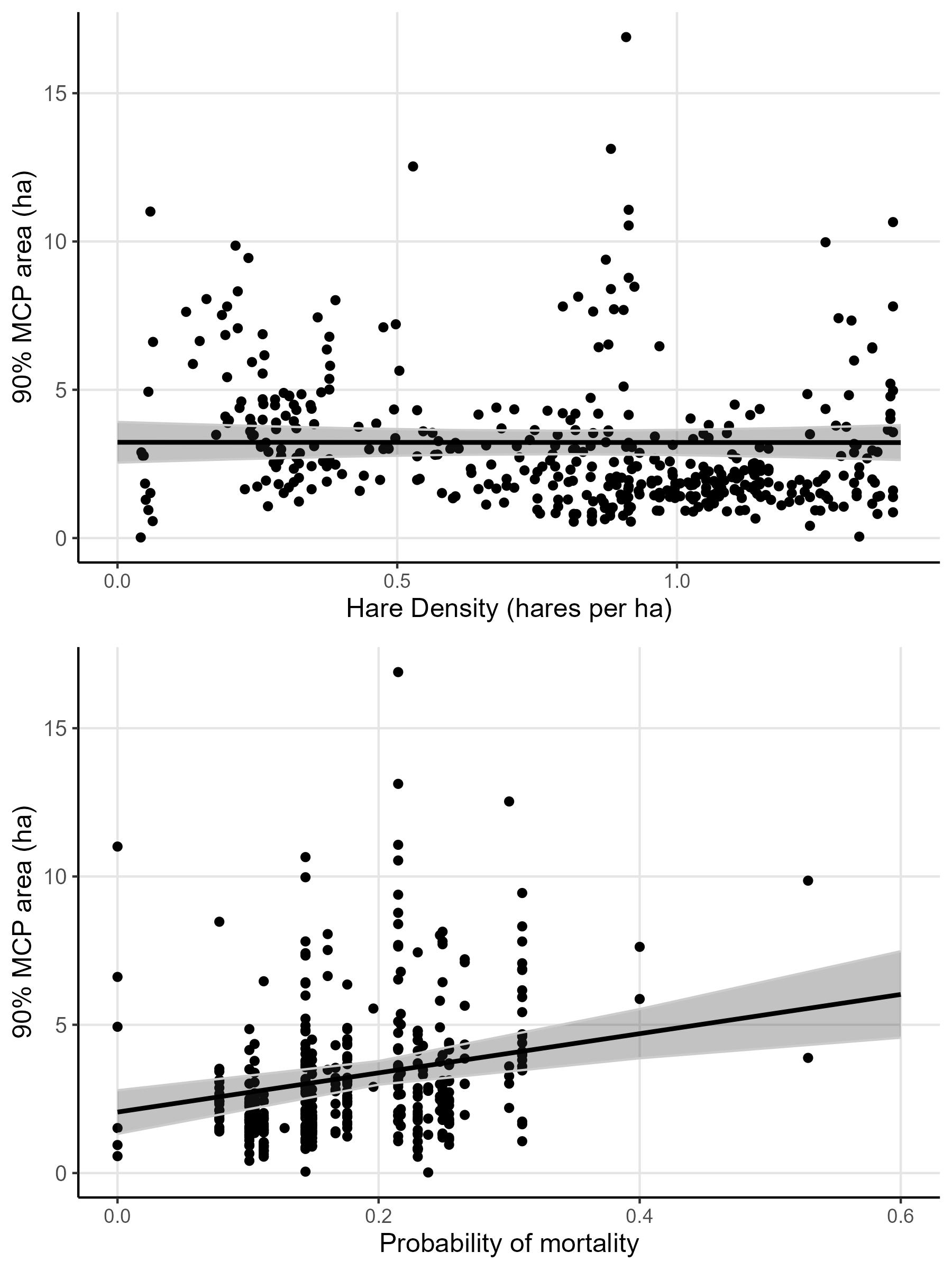


Figure 2

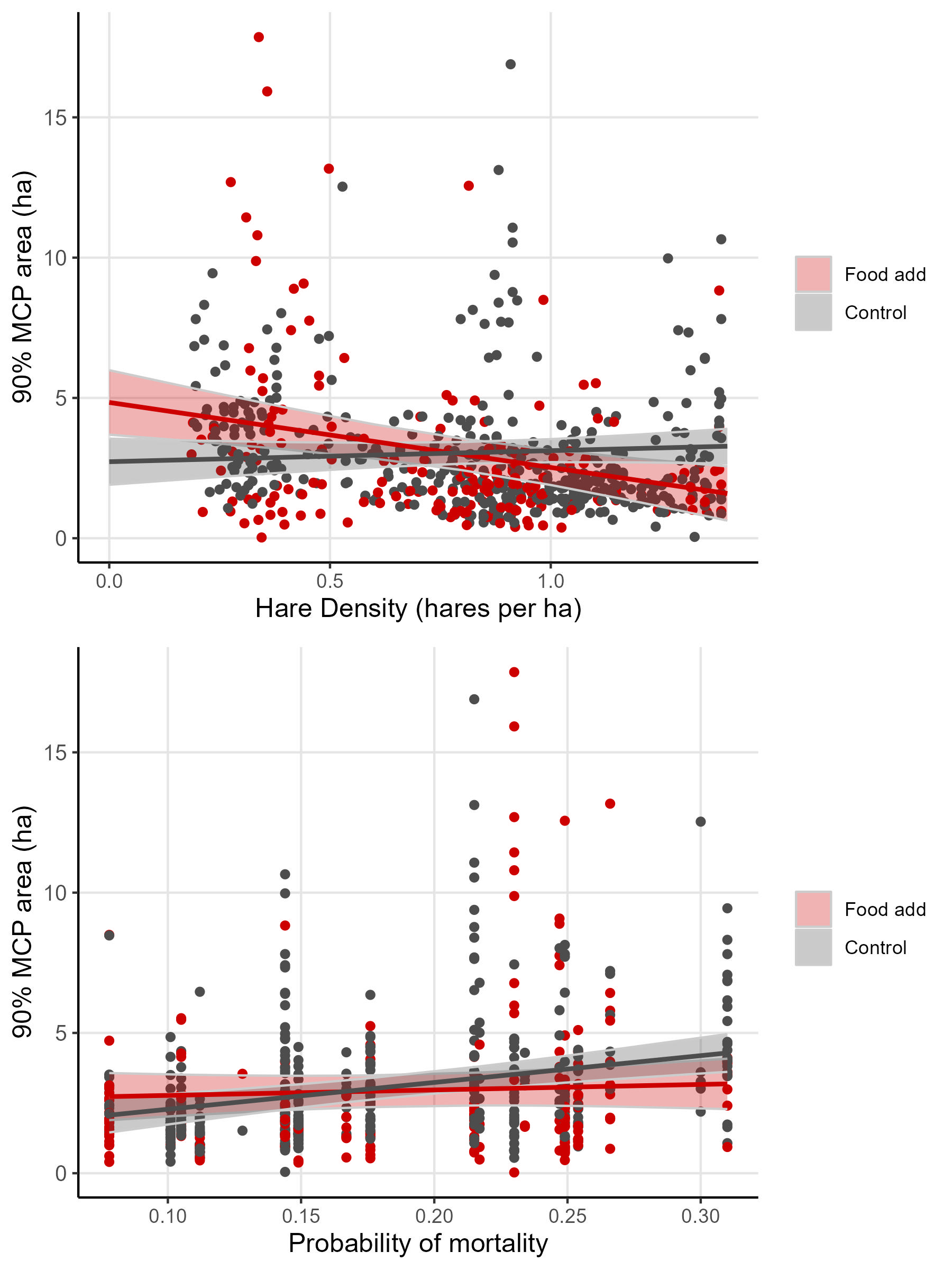


Figure 3