Figures and tables

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## 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). After initial data cleaning was complete, we analysed GPS data from 109 individuals, totaling 633 weekly home ranges. Home ranges were composed of an average of 273 fixes. Within our sample, 24 individuals were male, 85 were female. Of the females, 32 were food supplemented while collared. A total of 234 home ranges occurred in early winter and 230 in late winter; 169 occurred outside our seasonal limits (i.e., November). The mean areas of 90%, 75%, and 50% weekly home ranges (MCPs) were 2.83 ha, 1.91 ha, and 1.08 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 1). We found no effect of sex on home range size excluding food add females (p = 0.57, t = 0.32, df = 433), so we did not include sex in our models.

Our control-only model (all years; only control individuals; n = 435) found that hare home ranges did not change with hare density (-0.45 +/- 0.29 ha per hare/ha increase in density; Figure 2).

Our seasonal model (all years; only control home ranges within seasons; n = 324), which interacted hare density with season (early versus late winter) found a negative relationship between home range size and density (-2.75 +/- 0.56). In both cases, early winter and late winter, home ranges decreased in size with hare density (Figure 3).

Our food treatment model (years with food-add experiments; all individuals; n = 612), found that as hare density increased from 0 to 1.4 hares/ha, controls slightly increased their home ranges from 3.35 ha to 2.8 ha, while food-adds substantially decreased their home ranges from 4.14 ha to 1.52 ha (Figure 3).

The model that interacted food treatment, season, and hare density (all years with food-add experiments; home ranges within seasons; n = 443) found a negative relationship between home range size and density in all four scenarios (Figure 3)

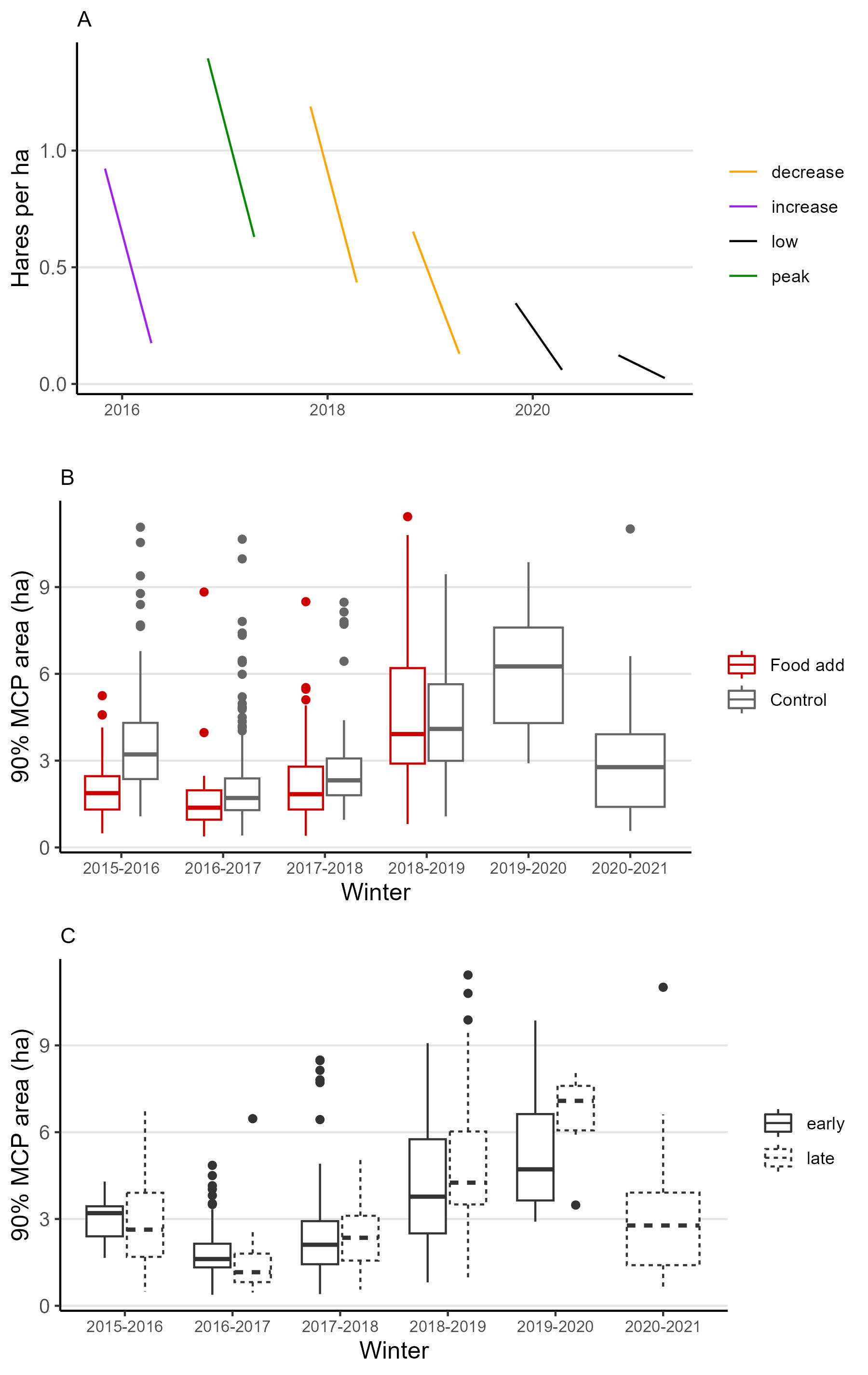


Figure 1. Summary of data

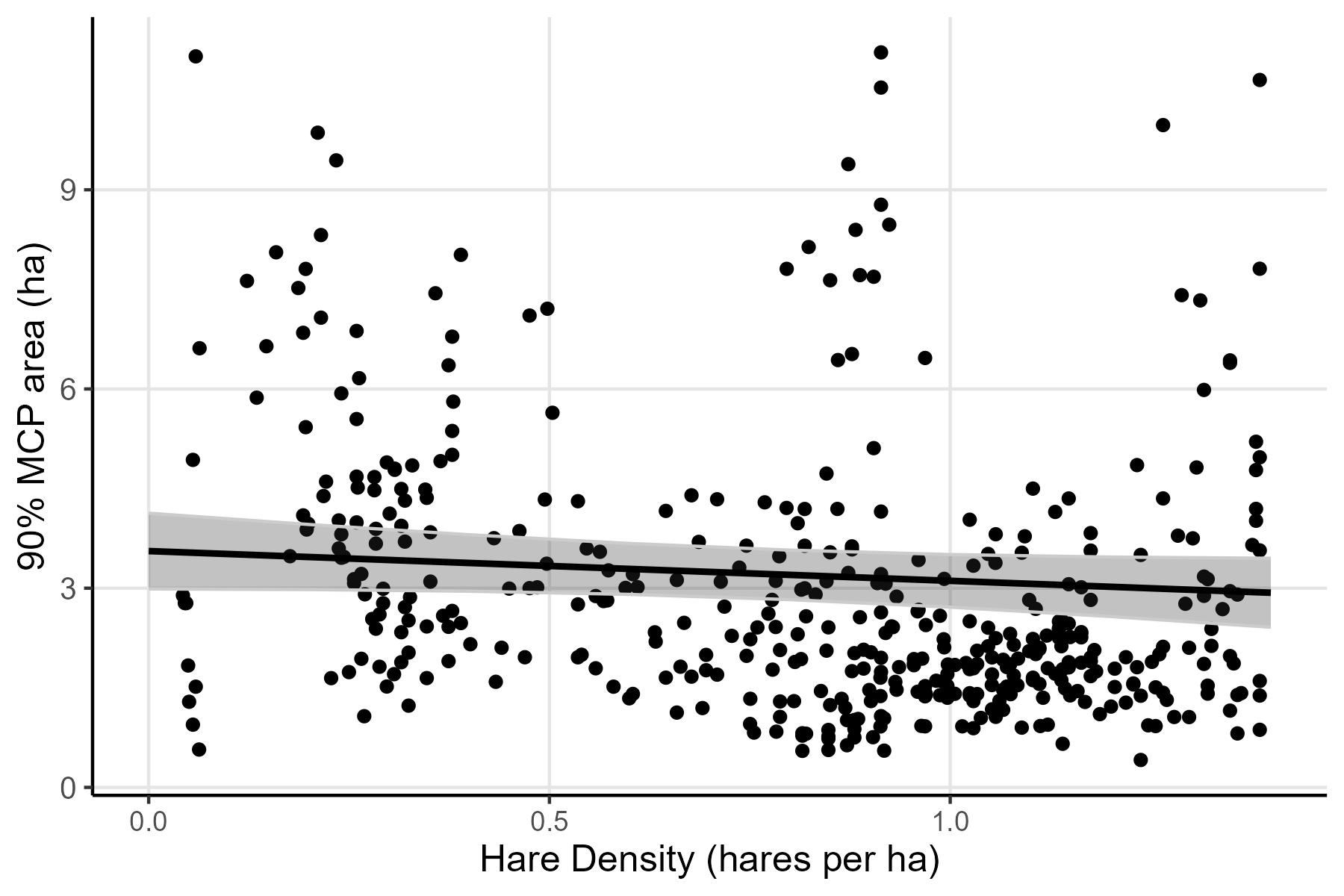


Figure 2. Home range size in response to density using control data only.

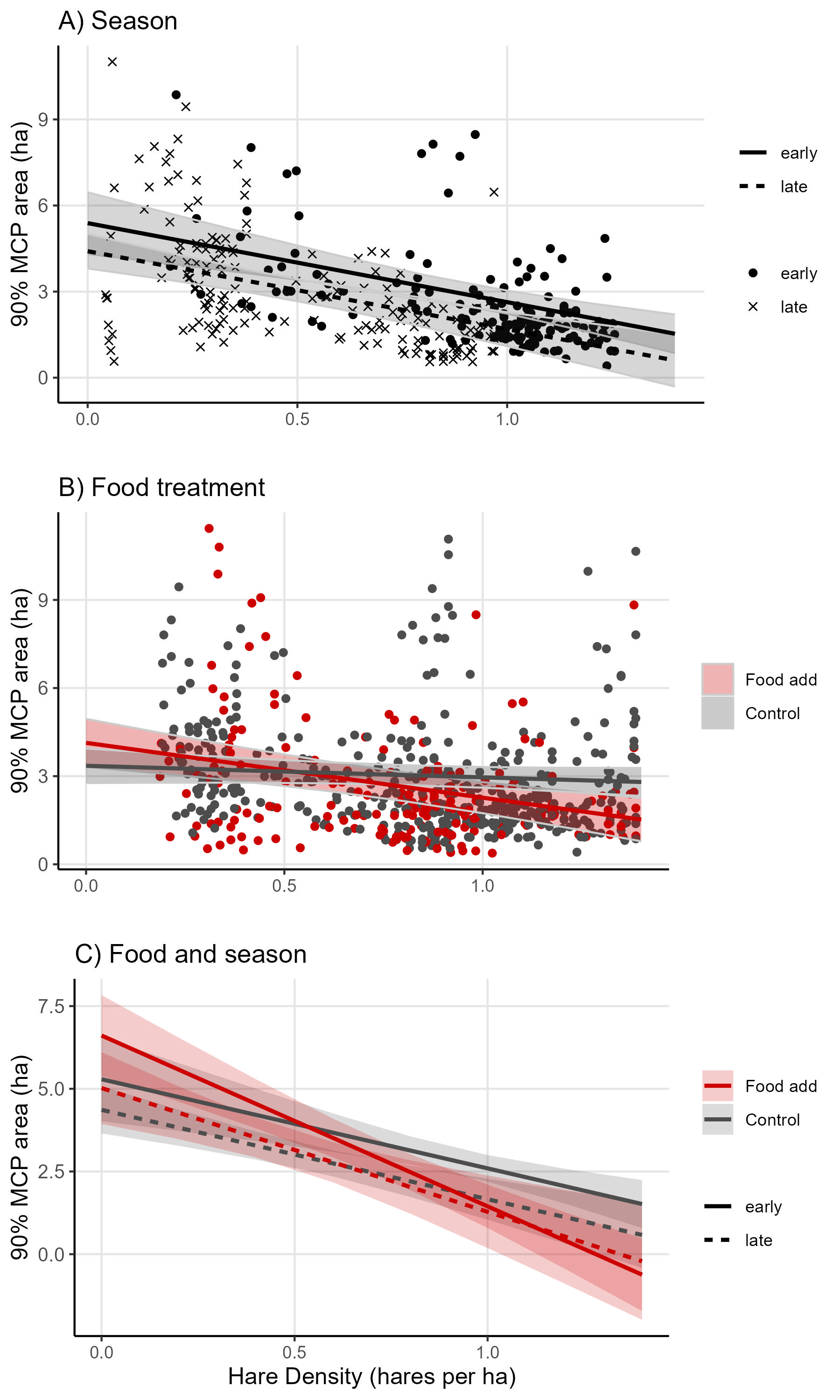


Figure 3. Home range size in response to density considering food conditions, both via season and food add treatment.