Supplementary Material

**Methods**

We built linear mixed models using the R package lme4 (Bates et al., 2015), in association with the R package blme (Chung et al., 2013) when singularity was detected, to investigate the relationships between timing of spring migration and breeding site availability (explanatory variable: average snow-free date from 2001 to 2015 at nesting location). Our response variable representing timing of spring migration was the departure date from the last shared stopover area. Year was included as a random factor.

Although sample size was too low to fully investigate annual variation in the relationships, we reran the analysis using only the three years with more than five data points (2013, 2014, 2015). We also built a model with YEAR as random slope to examine if the fit was better. We compared models based on their AIC.

**Results**

The departure date from the last shared stopover area was positively related to the average snow-free date at the nesting location (*B*: 0.25, CI: [0.11, 0.40], n = 23; R2m=0.31, R2c=0.57, Figure 3). The relationship remained strong after removing the same individual again identified as an outlier (B: 0.22, CI: [0.11, 0.34], n = 22, R2m=0.37, R2c=0.59, Figure 4).

By keeping only years with more than 5 individuals (2013, 2014, 2015), we found a similar positive relationships (B: 0.20, CI: [0.11, 0.36], n = 19, R2m=0.21, R2c=0.70, AIC: 48.27, Figure 4). The model with YEAR as a random slope showed similar positive slopes. However, this was not the best model (AIC of 52.27; ΔAIC: 4.00). Overall, it suggests that slopes and intercepts were similar across years.



**Supplementary Figure 1.** Relationships between timing of breeding site availability (mean snow-free date at individual nesting location between 2001 and 2015) and individual departure date from the last shared stopover site in the nearctic temperate grasslands of the Midwestern USA in tundra nesting American Golden-plover (*Pluvialis dominica*). Black dashed line represents the fit of the mixed effect model for all individuals (n=19). Relationship obtained for each year separately (random intercept) are also illustrated (2013: n=7; in green, 2014: n=6; in dark blue, 2015: n=6; in light blue). To help visualize geographical relationships, axes have been transposed. A slight neutral offset was added to overlapping points to facilitate interpretation. Day 1 = January 1st.

**Supplementary Table 1.** Intercept (± SE) of the relationships between timing of breeding site availability (mean snow-free date at individual nesting location between 2001 and 2015) and individual departure date from the last shared stopover site in the nearctic temperate grasslands of the Midwestern USA in tundra nesting American Golden-plover (*Pluvialis dominica*) for years with more than 5 individuals represented. Intercept coefficient (B1) extracted from the mixed effect model illustrated in Figure S1.

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| Year | B1 ± SE |
| 2012 | 104.6 ±1.08 |
| 2013 | 104.8 ±1.16 |
| 2014 | 104.4 ±1.16 |