Tables S1 and S2 detail the procedure of how we estimated the risk of mistiming based on phenological shifts and assumptions of environmental information used for migratory progression. We first categorized the directions of the changes in vegetation phenology, into "no shift", "delay" or "advancement". If also the magnitude of changes is considered, delays and advancements were additionally categorized as "severe" or "slight" (see Table S1). For every combination of sites within the three flyways, the risk of mistiming was estimated for all sets of assumptions D1 to M3 by counting how often there was a change between categories.

Table S1: Visualisation of the process to estimate risk of mistiming for one example of each set of assumptions.

		non-breeding site	stop-over site	breeding site
delay	severe	+ +	+ +	+ +
	slight	+	+	+
no linear shift		0	0	0
advancement	slight	−	−	−
	severe	− −	− −	− −

Exemplarily for the migration from non-breeding site nw3, via stop-over site sw1 to breeding site bw, Table S1 should be read as follows:

For the assumption 1, when only the shift at the breeding site is considered, the arrow ❶ (from the initial state to the shifted state) crosses one line (the solid line) when only the direction of change is considered (D1), but two lines (one solid and one dashed line) when direction and magnitude of change is considered (M1). This results in a risk of mistiming of 1 or 2, depending on whether only direction or also magnitude of change is included (the results of this example are marked with * and ** in Table S2).

For the assumption 2, when both non-breeding and breeding site shifts are taken into account (assumption 2, indicated by arrow ❷), this crosses 2 or 4 categories, depending on whether only direction (D2) or also magnitude (M2) of change is included. Consequently, the risk of mistiming is 2 or 4 (the results are marked with § and ¶ in Table S2).

Including shifts at all three sites in the risk estimation (assumption 3, indicated by arrow ❸) would also cross 2 or 4 categories depending on whether only direction (D3) or also magnitude (M3) of change is included (the results are marked with # and ‖ in Table S2).

Table S2: Number of categories crossed as an estimation of risk of mistiming as the underlying data visualized in Fig. 3.

→	direction only (D)			direction & magnitude (M)		
assumptions	west	central	east	west	central	east
↓	n=4	n=1	n=4	n=4	n=1	n=4
breeding site only (1)	1*	0	0	2**	0	0
non-breeding & breeding site (2)	0	0	0	1	0	0
	1		0	2		0
	2§		0	4¶		0
	1		0	2		0
all stationary sites (3)	2 2 2 2	2	2 0 2 2	3 3 3 3	4	4 0 4 4
	1 1 1 1		2 0 2 2	2 2 2 2		4 0 4 4
	2# 2 2 2		2 0 2 2	4 4 4 4		4‖ 0 4 4
	1 1 1 1		2 0 2 2	2 2 2 2		4 0 4 4

Please note that the maximum risk of mistiming depends on the set of assumptions. For instance, when only including direction of change at the breeding site (D1), the maximum risk level is 1; when the magnitude of change is considered as well (M1), the risk of mistiming can range from 0 to 2. For Figure 3 of the main manuscript the color gradient is always related to the range within a set of assumptions (from green = minimum to red = maximum of the set-internal range).