**Using a Network Model to Assess Risk of Forest Pest Spread via Recreational Travel -** Frank H. Koch, Denys Yemshanov, Robert A. Haack, Roger D. Magarey

**Appendix S1. Estimating geographically variable start and end dates for the late spring-early summer period.**

In this study, we focused on the late spring-early summer season under the assumption that this time period would represent the best opportunity for wood- and bark-boring insects to emerge from firewood and become established in the vicinity of the campground where the firewood was transported, or if campers brought infested firewood back with them, near their homes. Effectively, we also assumed that any infested firewood brought to a campground at an earlier date (i.e., prior to late spring) was burned before insect emergence. We believe this is a reasonable assumption since most campers can be expected to use all of their firewood or (perhaps to avoid the future expense of procuring firewood of sufficient quality) take home any leftover wood [1,2]. It also seems likely that any wood that they did choose to leave behind at a campground would be quickly used by subsequent campers. In initial tests with the network model, we found that camper travel patterns based only on late spring-early summer reservations were fairly well correlated with patterns based on all reservations, downplaying the significance of this assumption; see Figure 1 in Koch et al. [3] for example model outputs generated using the full set of reservation records.

To depict geographic variation in the start and end dates defining the late spring-early summer period, we began with a map of the 30-year (1961-1990) mean annual (Julian) date of the last spring frost [4]. However, the date of last frost is an imperfect marker of the beginning of spring, especially since some locations in our study area (e.g., the extreme southeastern US) commonly have years with no spring frost. We transformed the mean last-frost map into a simple phenological map of late spring using a linear function that, based on latitude, incrementally added a number of days to the mean last-frost date. This yielded a map where the start of late spring ranged from a low of 46 Julian days (in southern portions of Florida, Texas, and Arizona) to a high of 225 Julian days (in portions of the northern Rocky Mountains); these date estimates are generally consistent with existing research on plant and insect phenological patterns in North America [5-10]. In turn, we estimated the late spring-early summer period as lasting 70 days from this modified start date. We then used this map to identify a seasonal subset of NRRS reservation records.

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