**Supplemental Text 1**

**Radiocarbon Analysis**

To examine whether features were preferentially destroyed through time compared to scattered charcoal, we use radiocarbon dates from the Northeast to compare the frequency of dates from feature and non-feature contexts. Dates were compiled from the Canadian Archaeological Radiocarbon Database (Martindale et al. 2016) supplemented by dates from the Populating a Radiocarbon Database of North America project (NSF BCS 14-18858, 16-24061, and 18-22033). We gathered dates from all time periods and contexts, thus, our sample is not biased toward feature or non-feature dates. For many dates contextual information is available allowing a determination of whether dated material was recovered from a feature or not.

Before analysis, we cleaned the database, retaining: (1) corrected dates identified as archaeological, (2) dates with standard errors < 200, and (3) dates where the material dated, lab number, and site name or number are known. We removed those dates identified as modern, infinite, or those rejected by the original investigator. This cleaning protocol reduced the number of useable dates from 7261 to 3311 (Supplemental Table 1). We then categorized dates as originating from a feature or non-feature context. “Feature” dates included all those with the term ‘feature’ in the context, unless the feature was further identified as something other than a hearth (flake scatter, posthole, shell lens, etc.). We listed all pottery residue (5%), bone (4%), and shell (3%) dates as non-feature unless arising from a burned artifact concentration identified as a hearth. Dates specifically identified as scattered charcoal were included in the non-feature dataset. Finally, we assumed that dates with no context information were non-feature dates.

To determine if features were preferentially destroyed we used two methods employing summed probability distributions (SPD) to compare radiocarbon dates from features to dates not from features. The first method used is a now commonly employed approach to identify important features of an SPD by comparing an empirical SPD to a null model ascertaining significant differences between the two (e.g., Bevan et al. 2017; Crema et al. 2016; Shennan et al. 2013; Timpson et al. 2014). However, instead of using an exponential or logistic curve as the null model the dates from feature and non-feature contexts are compared using permutation-based testing developed by Crema and colleagues (2016). This method examines the proportion of dated materials through time and tests if samples are from the same statistical population by iteratively shuffling dates’ membership to create the null hypothesis (Crema and Bevan 2020; Crema et al. 2016). This method has been used to evaluate SPDs from different regions (e.g., Bevan et al. 2017; Crema et al. 2016) or, more similar to its use here, to compare dates derived from different materials (Bevan et al. 2017). To guard against oversampling a single site, dates from the same sites were binned in 100-year intervals before SPDs were created. For this analysis, the IntCal20 calibration curve was used (Reimer et al. 2020) and summed probability distributions and the permutation test (*permTest* function) were performed using the rcarbon package v.1.4.1 (Bevan and Crema 2020).

The second method used to compare the feature and non-feature SPDs considers the loss of sites through taphonomic processes (Bluhm and Surovell 2019). The taphonomically-corrected SPDs were created for both feature and non-feature dates using the same binning parameters described above and more easily allow direct comparison between the curves, particularly during the terminal Pleistocene when date sample sizes are small. These were then corrected using the global taphonomic correction (Bluhm and Surovell 2019:327).

**Wyoming Hearth Comparison Dataset**

Wyoming was selected for this comparison because the Wyoming State Historic Preservation Office maintains a large searchable database of site information. In addition, these data allow us to bias the comparative sample to a case where we might expect seeds to be abundant in hearths (1) because of excellent preservation due to aridity, relatively young ages of most sites, and lower post-depositional disturbance by trees and agricultural tillage, and (2) because small seeds played an important role in subsistence in southwestern Wyoming for much of the Holocene (Thompson and Pastor 1995: 63).

We used a relatively conservative strategy to select a subset of hearths for inclusion in this analysis (Supplemental Table 2). Only hearths processed via flotation were selected from sites in Lincoln, Sweetwater, and Uinta counties in southwestern Wyoming. To further increase the probability that seeds were present at each location during occupation only sites containing metates were included. No age consideration was given to the hearths investigated for this analysis, although all hearths analyzed postdate the fluted-point period. We do not assume that seeds were processed by roasting or parching within these hearths, but rather that they entered hearths accidently because of their presence in the campsite. The intent of this exercise is only to understand at what frequency we should expect seeds to accidentally carbonize in hearths when preservation is good, and seeds were included in the diet.

For each site, records were reviewed the total number of floated hearths with and without seeds recorded. Species and the number of seeds were noted for hearths with macrobotanical remains. Only charred materials were considered since uncharred seeds deteriorate rapidly in the soil except under conditions of exceptional preservation (e.g., Minnis 1981). Sites with multiple hearths generally had multiple stratigraphically separate components represented, which prevented biasing the sample toward one period or activity. Like the Northeast fluted-point period hearths, flotation sampling methods and sediment volumes varied considerably in the Wyoming sample, thus we again restrict our analysis to presence/absence data.

**Works Cited**

Bevan, Andrew, Sue Colledge, Dorian Fuller, Ralph Fyfe, Stephen Shennan and Chris Stevens

2017 Holocene Fluctuations in Human Population Demonstrate Repeated Links to Food Production and Climate. *Proceedings of the National Academy of Sciences* 114(49):E10524.

Bevan, Andrew, and Enrico R. Crema

2020 rcarbon: Methods for calibrating and analysing radiocarbon dates. https://github.com/ahb108/rcarbon.

Crema, Enrico R., Junko Habu, Kenichi Kobayashi, and Marco Madella

2016 Summed Probability Distribution of 14C Dates Suggests Regional Divergences in the Population Dynamics of the Jomon Period in Eastern Japan. PLOS ONE 11(4):e0154809.

Martindale, Andrew, Richard Morlan, Matthew Betts, Michael Blake, Konrad Gajewski, Michelle Chaput, A. Mason, and Pierre Vermeersch.

2016 Canadian Archaeological Radiocarbon Database (CARD 2.1).

Minnis, Paul E.

1981 Seeds in Archaeological Sites: Sources and Some Interpretive Problems. *American Antiquity* 46:143-152.

Shennan, Stephen, Sean S. Downey, Adrian Timpson, Kevan Edinborough, Sue Colledge, Tim Kerig, Katie Manning, and Mark G. Thomas

2013 Regional population collapse followed initial agriculture booms in mid-Holocene Europe. *Nature Communications* 4(1):2486.

Thompson, Kevin W., and Jana V. Pastor

1995 *People of the Sage: 10,000 Years of Occupation in Southwest Wyoming*. Report on file at Archaeological Services of Western Wyoming College, Rock Springs.

Timpson, Adrian, Sue Colledge, Enrico Crema, Kevan Edinborough, Tim Kerig, Katie Manning, Mark G. Thomas and Stephen Shennan

2014 Reconstructing Regional Population Fluctuations in the European Neolithic using Radiocarbon Dates: A New Case-Study Using an Improved Method*. Journal of Archaeological Science* 52:549-557.