Supplemental Text 3. Description of Simulation Experiments and Results.

Simulations were run to determine the minimum number of new dates needed to more precisely identify the occupation boundaries of Averbuch (40DV60), Brentwood Library (40WM210), East Nashville Mounds (40DV4), Gordontown (40DV4), Rutherford-Kizer (40SU15), and Sellars (40WI1).

In the chronological model simulations, calendar years for the site occupation are "known" (for example, see Bayliss [2009]; Bayliss et al. [2007]; Griffiths [2014]). For this simulation experiment, the calendar years for the site occupations in the simulation models are the median value for posterior probabilities for the starting and ending boundaries, respectively, of the primary models described in Supplemental Text 1. Simulation models were created by adding simulated radiocarbon dates with OxCal's R\_Simulate function. The simulated radiocarbon dates were given an error of 35 years and the true calendar dates of the simulated radiocarbon dates were evenly distributed in each model between the known calendar years for the site occupation. The minimum number of simulated radiocarbon dates needed to achieve the known calendar dates in the starting and ending boundaries' posterior probabilities within confidence intervals spanning 50 years (or less) at *68%* and *95% probability* are reported in Table 3. New simulated radiocarbon dates were added in groups of five until the desired precision was obtained.

It should be noted that no primary Bayesian chronological model had been created for Gordontown because only two radiocarbon dates are available from the site. As a result, the known calendar years for the site occupation for models created for

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Gordontown in the simulation experiment are AD 1250 and AD 1450.



Figure S11. Results and structure of the primary chronological model for Averbuch with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *68% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S12. Results and structure of the primary chronological model for Averbuch with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *95% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S13. Results and structure of the primary chronological model for Brentwood Library with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *68% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S14. Results and structure of the primary chronological model for Brentwood Library with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *95% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S15. Results and structure of the primary chronological model for East Nashville Mounds with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *68% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.

| OxCal v4.3.2 Bronk Ramsey (2017); r:5 IntCal13 atmospheric ourve (Reimer et al 2013) |      |           |                |
|--|------|-----------|----------------|
| Boundary Primary Model: end East Nashville Mounds                                    |      |           |                |
| R Date Feature 24: Beta-61244 [A:100]  |      |           |                |
| R Date TX-7858 (A:109)   |      |           |                |
| R Date Beta-61245 (A:100)  |      |           |                |
| Phase Feature 59: Subrectangular pit   |      |           |                |
| P. Data Feature 37: TX 7957 (A:100)  |      |           |                |
| R_Date Pearline 57: 1X-7657 [A.100]  |      |           |                |
| K_Date Possible House Hoor (Peature 30). TX-7836 [A:62]                              |      |           |                |
| R_Date 1X-7600 [A.02]  |      |           |                |
| R_Date Beta-61250 [A:102]  |      |           |                |
| Phase Feature 57: Subrectangular pit   |      |           |                |
| R_Date ceramic grave good (Bunal 4a,4b,9): TX-7859 [A:                               | 133j |           |                |
| R_Date Posthole 15: Beta-61246 [A:102]   | -    |           |                |
| Sequence   |      |           |                |
| R_Date General midden (Level 2): TX-7860 [A:100]                                     |      |           |                |
| R_Date Feature 18: Beta-61243 [A:101]  |      |           |                |
| R_Date TX-7855 [A:102]   |      |           |                |
| R_Date Beta-61242 [A:113]  |      |           |                |
| Phase Feature 11: Large subrectangular feature                                       |      |           |                |
| R_Simulate 50 [A:128]  |      |           |                |
| R_Simulate 49 [A:128]  |      |           |                |
| R_Simulate 48 [A:113]  |      |           |                |
| R_Simulate 47 [A:89]   |      |           |                |
| R_Simulate 46 [A:131]  |      |           |                |
| R_Simulate 45 [A:81]   |      |           |                |
| R_Simulate 44 [A:115]  |      |           |                |
| R_Simulate 43 [A:125]  |      |           |                |
| R_Simulate 42 [A:128]  |      |           |                |
| R Simulate 41 [A:107]  |      |           |                |
| R Simulate 40 (A:132)  |      |           |                |
| R Simulate 39 [A:111]  |      |           |                |
| R Simulate 38 [A:100]  |      |           |                |
| R_Simulate 37 [A:103]  |      |           |                |
| P. Simulate 36 (A:101)   |      |           |                |
| P. Simulate 35 [A:101]   |      |           |                |
| R_Simulate 35 [A.99]   |      |           |                |
| R_Simulate 34 [A:99]   |      |           |                |
| R_Simulate 33 [A:99]   |      |           |                |
| R_Simulate 32 [A:99]   |      |           |                |
| R_Simulate 31 [A:99]   |      |           |                |
| R_Simulate 30 [A:100]  |      |           |                |
| R_Simulate 29 [A:99]   |      |           |                |
| R_Simulate 28 [A:100]  |      |           |                |
| R_Simulate 27 [A:99]   |      |           |                |
| R_Simulate 26 [A:100]  |      |           |                |
| R_Simulate 25 [A:100]  |      |           |                |
| R_Simulate 24 [A:99]   | _    |           |                |
| R_Simulate 23 [A:100]  |      |           |                |
| R_Simulate 22 [A:100]  |      |           |                |
| R_Simulate 21 [A:100]  |      |           |                |
| R_Simulate 20 [A:100]  |      |           |                |
| R Simulate 19 [A:100]  |      |           |                |
| R_Simulate 18 [A:100]  |      |           |                |
| R Simulate 17 [A:99]   |      |           |                |
| R Simulate 16 (A:100)  |      |           |                |
| R Simulate 15 (A:100)  |      |           |                |
| R Simulate 14 (A:99)   |      |           |                |
| R Simulate 13 (4:99)   |      |           |                |
| R Simulate 12 [A:100]  |      |           |                |
| P. Simulate 11 (A:100)   |      |           |                |
| B Simulate 10 (A:102)  |      |           |                |
| P_Simulate 0 (A:102)   |      |           | -              |
| R_Simulate 9 (A:100)   |      |           |                |
| R_Simulate 8 [A:103]   |      |           |                |
| R_Simulate 7 [A:112]   |      |           |                |
| R_Simulate 6 [A:102]   |      |           |                |
| R_Simulate 5 [A:103]   |      |           |                |
| R_Simulate 4 [A:97]  |      |           |                |
| R_Simulate 3 [A:112]   |      |           |                |
| R_Simulate 2 [A:85]  |      |           |                |
| R_Simulate 1 [A:110]   |      |           |                |
| Phase  |      |           |                |
| Boundary Primary Model: start East Nashville Mounds                                  |      |           |                |
| Sequence [Amodel:119]  | ,    |           |                |
| 700 000 1000 1000  | 1100 | 1200 1200 | 1400 1500 1000 |
| 100 000 1000   | 1100 | 1200 1300 | 1000 1000      |
|  |      |           |                |

Modelled date (AD)

Figure S16. Results and structure of the primary chronological model for East Nashville Mounds with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *95% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S17. Results and structure of the chronological model for Gordontown with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *68% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S18. Results and structure of the chronological model for Gordontown with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *95% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.

| OxCal v4.3.2 Bronk Ramsey (2017); r:5 IntCal13 atmospheric curve (Reimer et al 2013) |         |             |      |      |      |      |
|--|---------|-------------|------|------|------|------|
| Boundary Primary Model: end Rutherford-Kizer   |         |             |      |      |      |      |
| R Date Beta-70875 [A:100]  |         |             |      |      |      |      |
| R Date Beta-70874 [A:102]  |         |             |      |      |      |      |
| Phase Feature 20: large refuse pit   |         |             |      |      |      |      |
| B Date Feature 36: Beta-70877 [A:102]  |         | _           |      |      |      |      |
| Phase  |         |             |      |      |      |      |
| [] [] [] [] [] [] [] [] [] [] [] [] [] [   |         |             |      |      |      |      |
| R Date Eesture 96: Beta-70880 [A:08]   |         |             |      |      |      |      |
| R_Date Feature 90. Beta-70000 [A.90]   |         |             |      |      |      |      |
| R_Date Feature 06. Deta-70079 [A:05]   |         |             |      |      |      |      |
| First start structure 4  |         |             |      |      |      |      |
|  |         |             |      |      |      |      |
|  |         |             |      |      |      |      |
|  |         |             |      |      |      |      |
| Last end palisade  |         |             |      |      |      |      |
| R_Date Feature 867: Beta-90023 [A:87]  |         |             |      |      |      |      |
| R_Date Feature 832: Beta-90025 [A:102]   |         |             |      |      |      |      |
| R_Date Feature 733: Beta-90024 [A:102]   |         |             |      |      |      |      |
| R_Date Feature 708: Beta-90626 [A:103]   |         | _           |      |      |      |      |
| R_Date Feature 528: Beta-90625 [A:116]   |         |             |      |      |      | _    |
| First start palisade   |         |             |      |      |      |      |
| Phase palisade   |         |             |      |      |      |      |
| R_Date Feature 756. Beta-90627? [P:0]  |         |             |      |      |      |      |
| R_Date Feature 15: Beta-70876 [A:9]  |         |             |      |      |      |      |
| R_Date Beta-70872 [A:101]  |         |             |      |      |      |      |
| R_Date Beta-70873 [A:102]  |         |             |      |      |      |      |
| Phase Feature 101: large refuse pit  |         |             |      |      |      |      |
| R_Simulate 15 [A:81]   |         |             |      |      |      |      |
| R_Simulate 14 [A:100]  |         |             |      |      |      |      |
| R_Simulate 13 [A:101]  |         |             |      |      |      |      |
| R_Simulate 12 [A:100]  |         |             |      |      |      | _    |
| R_Simulate 11 [A:100]  |         |             |      |      |      | -    |
| R_Simulate 10 [A:100]  |         |             | -    |      |      |      |
| R_Simulate 9 [A:99]  |         |             |      |      |      | -    |
| R_Simulate 8 [A:100]   |         |             | -    |      |      |      |
| R Simulate 7 [A:99]  |         | _           |      |      |      |      |
| R Simulate 6 [A:102]   |         |             |      |      |      |      |
| R Simulate 5 [A:107]   |         |             |      |      |      |      |
| R Simulate 4 [A:109]   |         |             |      |      |      |      |
| R Simulate 3 [A:110]   |         |             |      |      |      |      |
| R Simulate 2 [A:92]  |         |             |      |      |      |      |
| R Simulate 1 [A:111]   |         |             |      |      |      |      |
| Phase  |         |             |      |      |      |      |
| Boundary Primary Model: start Rutherford-Kizer                                       |         |             |      | _    |      |      |
|  |         |             |      |      |      |      |
| 600 700 800 900  | 1000    | 1100        | 1200 | 1300 | 1400 | 1500 |
|  | Modelle | d date (AD) |      |      |      |      |

Figure S19. Results and structure of the primary chronological model for Rutherford-Kizer with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *68% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S20. Results and structure of the primary chronological model for Rutherford-Kizer with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *95% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S21. Results and structure of the primary chronological model for Sellars with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *68% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.



Figure S22. Results and structure of the primary chronological model for Sellars with the minimum number of simulated radiocarbon dates needed to achieve the desired precision at *95% probability* for the posterior probabilities of the starting and ending boundaries for site activity. The brackets and keywords define the model structure. The format is as described in Figure S1.