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INTRODUCTION

This article presents preliminary findings of a temporal analysis of the East Texas Archaic based upon the examination of radiocarbon ^{14}C dates from sites that have deposits that date to the period. All assays employed in this effort were collected from research and cultural resource management reports and publications, synthesized, then recalibrated in version 4.1.7 of OxCal (Bronk Ramsey 2013) using IntCal09 (Reimer et al. 2009).

The date combination process is used herein to refine site-specific summed probability distributions, illustrating—for the first time—the temporal position of each dated archaeological site with an assay that falls within the Archaic. Seventy-three radiocarbon dates from 34 sites serve as the foundation for this analysis of the East Texas Archaic period (ca. 8000-500 B.C.) (Table 1). All dates used in this analysis come directly from the East Texas Radiocarbon Database (ETRD) (Perttula and Selden 2011). Within the sample, there are 19 sites with a single radiocarbon sample that dates to the Archaic, eight sites with two dated samples, one site with three dated samples, three sites with four dated samples, one site with five dated samples, and one site with 14 dated samples (Table 1). Of the 73 ^{14}C dates from the ETRD used in this analysis, one dates to the Early Archaic period (ca. 8000-5000 B.C.), eight date to the Middle Archaic period (ca. 5000-3000 B.C.), and the remaining 64 date to the Late Archaic period (ca. 3000-500 B.C.) (temporal divisions follow Perttula and Young [2012]).

METHODS

The date combination (R_Combine) process assumes that if all assays collected at a particular site draw carbon from the same reservoir, then they should have the same underlying $F^{14}C$ value and can be combined prior to calibration (Bronk Ramsey 2008). The measurements have Gaussian uncertainty distributions, and X^2 was used to test the assumption that all ratios are the same to reveal whether compelling evidence exists—at the 95% confidence level—that dates cannot be related to the same event (Bronk Ramsey 2008). Each site-specific figure provides the summed probability distributions (SPDs), calibrated age range for combined assays, and all dates utilized to determine these results.

Although ^{14}C determinations are most often represented in the form $A \pm E$ where A is the radiocarbon estimate (B.P.) and E represents the standard deviation, the method of date combination can be used to create a new ^{14}C determination from multiple assays, often with the ancillary benefit of a decrease in the standard deviation (Ward and Wilson 1978). To test whether a series of ^{14}C determinations are consistent, the pooled mean is calculated by way of Ap, where:

$$A_p = \left(\sum_1^n A_i/E_i^2\right) / \left(\sum_1^n 1/E_i^2\right) \quad (1)$$

Table 1. Catalog of ^{14}C dates for the East Texas Archaic period.

Trinomial	*Assay No.*	*Raw Age*	±	*δ ^{13}C (‰)*	*Conv ^{14}C Age*	±	*1σ Age Range**	*2σ Age Range**	*Median*
41AN38	Beta-236791	--	--	-23.9	2800	40	1004-907 BC (0.68)	1051-839 BC (0.95)	954 BC
41AN115	Beta-166266	3840	50	-27.1	3810	50	2340-2195 BC (0.58), 2175-2145 BC (0.10)	2461-2134 BC (0.94), 2076-2064 BC (0.01)	2258 BC
41BW692	UGA-13422	3450	40	-24.5	3450	40	1874-1843 BC (0.17), 1816-1799 BC (0.08), 1779-1731 BC (0.29), 1719-1692 BC (0.14)	1886-1666 BC (0.95)	1768 BC
41BW692	UGA-13423	2760	40	-25.1	2760	40	970-962 BC (0.05), 1002-826 BC (0.95)	1002-826 BC (0.95)	904 BC
41BW692	UGA-13421	2690	40	-24.6	2630	40	831-787 BC (0.68)	896-765 BC (0.95), 678-675 BC (0.01)	806 BC
41CP220	Beta-204253	4450	40	-24.9	4450	40	3324-3234 BC (0.31), 3223-3220 BC (0.01), 3173-3161 BC (0.03), 3118-3078 BC (0.14), 3072-3024 BC (0.19)	3339-3206 BC (0.39), 3195-3008 BC (0.51), 2986-2932 BC (0.06)	3153 BC
41CS151	Beta-81674	5300	60	-25.4	5300	60	4231-4193 BC (0.15), 4177-4046 BC (0.53)	4317-4289 BC (0.03), 4262-3985 BC (0.93)	4135 BC
41CS151	Beta-76608	2400	60	-25.0	2400	60	729-693 BC (0.11), 659-653 BC (0.02), 543-398 BC (0.56)	756-684 BC (0.17), 670-390 BC (0.78)	513 BC
41DT59	Beta-81670	2660	50	-26.2	2640	50	889-881 BC (0.04), 843-781 BC (0.65)	917-756 BC (0.93), 685-669 BC (0.02), 607-601 BC (0.00)	815 BC
41FN66	Beta-205705	4110	80	-16.5	4250	90	3009-2983 BC (0.05), 2935-2836 BC (0.28), 2816-2671 BC (0.35)	3097-2574 BC (0.95)	2840 BC
41FN130	Beta-304937	3530	40	-6.5	3830	40	2391-2385 BC (0.02), 2346-2202 BC (0.66)	2460-2196 BC (0.91), 2170-2147 BC (0.04)	2286 BC
41FN130	Beta-304936	3450	40	-5.7	3770	40	2282-2249 BC (0.16), 2232-2137 BC (0.52)	2335-2324 BC (0.01), 2307-2113 BC (0.82), 2101-2037 BC (0.13)	2190 BC
41HE139	UGA-12890	4050	40	-23.85	4070	40	2836-2816 BC (0.08), 2668-2566 BC (0.49), 2523-2497 BC (0.11)	2859-2810 BC (0.14), 2752-2722 BC (0.05), 2701-2486 BC (0.77)	2616 BC
41HE139	UGA-12889	2590	40	-25.9	2580	40	809-756 BC (0.58), 685-669 BC (0.10)	821-742 BC (0.64), 690-663 BC (0.12), 647-549 BC (0.20)	773 BC
41HE245	SMU-660	2853	57	--	2853	70	1122-923 BC (0.68)	1258-1233 BC (0.02), 1217-843 BC (0.93)	1033 BC
41HE245	SMU-684	2821	59	--	2821	71	1112-1101 BC (0.03), 1086-1064 BC (0.05), 1058-898 BC (0.60)	1208-1140 BC (0.06), 1135-823 BC (0.89)	990 BC
41HE245	SMU-657	2669	50	--	2669	64	896-797 BC (0.68)	999-759 BC (0.94), 683-670 BC (0.01)	842 BC
41HE245	SMU-656	2635	49	--	2635	63	896-868 BC (0.11), 859-769 BC (0.58)	969-963 BC (0.00), 931-736 (0.82), 690-662 BC (0.04)	810 BC
41HP106	Beta-83089	2830	70	-27.2	2800	70	1041-892 BC (0.59), 878-846 BC (0.10)	1189-1181 BC (0.01), 1156-1145 BC (0.01), 1130-810 BC (0.94)	964 BC

Table 1. Catalog of ^{14}C dates for the East Texas Archaic period, cont.

Trinomial	*Assay No.*	*Raw Age*	±	*δ ^{13}C (‰)*	*Conv ^{14}C Age*	±	*1σ Age Range**	*2σ Age Range**	*Median*
41HP118	SMU-1970	--	--	-21.5	2980	30	1266-1190 BC (0.50), 1179-1158 BC (0.10), 1145-1131 BC (0.08)	1371-1346 BC (0.02), 1316-1117 BC (0.93)	1218 BC
41HP118	SMU-1883	--	--	-25.0	2860	70	1127-926 BC (0.68)	1260-892 BC (0.93), 878-846 BC (0.03)	1043 BC
41HP159	GX-15881	--	--	-25.5	5540	70	4452-4339 BC (0.68)	4527-4259 BC (0.95)	4394 BC
41HP159	GX-15880	--	--	-26.0	4990	70	3933-3875 BC (0.20), 3807-3696 BC (0.48)	3946-3656 BC (0.95)	3783 BC
41HP159	SMU-2222	--	--	-25.8	4800	90	3692-3686 BC (0.01), 3661-3511 BC (0.56), 3425-3382 BC (0.11)	3765-3723 BC (0.03), 3716-3370 BC (0.92)	3571 BC
41HP159	GX-15878	--	--	-24.1	4490	70	3340-3204 BC (0.39), 3198-3095 BC (0.29)	3367-3007 BC (0.90), 2989-2931 BC (0.05)	3190 BC
41HS524	Beta-92922	2570	50	-29.1	2510	50	776-731 BC (0.16), 691-660 BC (0.12), 651-544 BC (0.41)	796-501 BC (0.90), 495-486 BC (0.01), 463-449 BC (0.01), 442-417 BC (0.02)	634 BC
41HS846	Beta-210250	3560	40	-25.6	3550	40	1950-1876 BC (0.49), 1843-1819 BC (0.11), 1798-1780 BC (0.08)	2016-1997 BC (0.03), 1980-1756 BC (0.92)	1893 BC
41LR152	Beta-153589	--	--	-24.8	2490	40	763-725 BC (0.14), 694-681 BC (0.05), 673-541 BC (0.50)	781-486 BC (0.90), 463-448 BC (0.02), 443-417 BC (0.03)	626 BC
41LR187	Beta-153595	--	--	-25.6	3650	40	2123-2093 BC (0.16), 2042-1954 BC (0.52)	2140-1914 BC (0.95)	2021 BC
41LR297	Beta-237679	2470	50	-24.6	2480	50	760-683 BC (0.23), 670-523 BC (0.45)	772-479 BC (0.85), 470-414 BC (0.11)	614 BC
41NA231	Beta-204779	3100	40	-24.9	3100	40	1426-1370 BC (0.45), 1349-1316 BC (0.24)	1447-1266 BC (0.95)	1375 BC
41NA236	Beta-204781	4290	40	-25.1	4290	40	2927-2879 BC (0.68)	3023-2871 BC (0.94), 2802-2779 BC (0.02)	2907 BC
41NA240	Beta-151100	2720	40	-24.7	2720	40	902-827 BC (0.68)	971-960 BC (0.02), 935-804 BC (0.93)	868 BC
41NA240	Beta-151099	2380	40	-23.8	2400	40	522-401 BC (0.68)	749-687 BC (0.14), 666-643 BC (0.04), 592-577 BC (0.01), 568-393 BC (0.77)	487 BC
41NA264	Beta-151106	3130	80	-27.0	3090	80	1447-1261 BC (0.68)	1523-1122 BC (0.95)	1346 BC
41NA285	Beta-151111	3770	40	-24.2	3780	40	2284-2248 BC (0.19), 2234-2141 BC (0.49)	2343-2121 BC (0.88), 2095-2041 BC (0.08)	2207 BC
41NA285	Beta-203672	2860	40	-25.0	2860	40	1112-1101 BC (0.05), 1087-1064 BC (0.11), 1058-976 BC (0.50), 952-946 BC (0.03)	1191-1177 BC (0.01), 1160-1144 BC (0.02), 1131-914 BC (0.92)	1032 BC
41NA290	Beta-151114	3220	70	-26.8	3190	70	1600-1594 BC (0.01), 1531-1394 BC (0.67)	1630-1305 BC (0.95)	1469 BC
41NA290	Beta-151117	3030	40	-25.5	3020	40	1377-1338 BC (0.18), 1321-1252 BC (0.38), 1242-1213 BC (0.13)	1396-1153 BC (0.92), 1146-1129 BC (0.03)	1283 BC

Table 1. Catalog of ^{14}C dates for the East Texas Archaic period, cont.

Trinomial	*Assay No.*	*Raw Age*	±	*δ ^{13}C (‰)*	*Conv ^{14}C Age*	±	*1σ Age Range**	*2σ Age Range**	*Median*
41NA290	Beta-151118	2930	40	-24.1	2940	40	1256-1237 BC (0.08), 1215-1111 BC (0.50), 1103-1081 BC (0.08), 1065-1056 BC (0.03)	1291-1280 BC (0.01), 1270-1014 BC (0.94)	1156 BC
41NA290	Beta-151115	2960	110	-26.9	2930	110	1301-1000 BC (0.68)	1415-895 BC (0.95), 869-853 BC (0.01)	1145 BC
41PN175	Beta-163092	2990	40	-25.4	2980	40	1291-1280 BC (0.04), 1270-1129 BC (0.64)	1375-1340 BC (0.05), 1320-1110 BC (0.86), 1103-1073 BC (0.03), 1066-1056 BC (0.01)	1217 BC
41RK215	Beta-60090	3560	90	-25.3	3560	90	2025-1860 BC (0.47), 1853-1771 BC (0.22)	2194-2178 BC (0.01), 2144-1684 BC (0.95)	1907 BC
41RK215	Beta-60089	3100	90	-26.0	3090	90	1489-1482 BC (0.01), 1455-1257 BC (0.63), 1235-1216 BC (0.04)	1598-1595 BC (0.00), 1531-1109 BC (0.93), 1104-1056 BC (0.02)	1343 BC
41RK222	Beta-72779	3170	120	-24.1	3180	130	1620-1301 BC (0.68)	1767-1112 BC (0.95), 1101-1085 BC (0.00), 1064-1058 BC (0.00)	1454 BC
41RK222	Beta-72780	2970	60	-29.6	2890	60	1194-1142 BC (0.14), 1133-996 BC (0.53), 985-981 BC (0.01)	1265-914 BC (0.95)	1083 BC
41RK222	Beta-72777	2480	70	-27.6	2440	70	748-688 BC (0.17), 665-644 BC (0.06), 589-580 BC, (0.02), 556-409 BC (0.43)	766-401 BC (0.95)	571 BC
41RK222	Beta-81715	2460	60	-26.3	2440	60	746-689 BC (0.18), 664-646 BC (0.05), 552-410 BC (0.45)	762-682 BC (0.22), 672-403 BC (0.74)	566 BC
41RK222	Beta-72774	2420	90	-26.7	2390	90	748-688 BC (0.14), 666-644 BC (0.05), 590-579 BC (0.02), 558-389 BC (0.47)	784-356 BC (0.92), 286-234 BC (0.04)	521 BC
41RK468	Beta-239707	3220	40	-27.2	3180	40	1495-1425 BC (0.68)	1530-1386 BC (0.95)	1456 BC
41RK468	Beta-239709	2560	40	-27.7	2520	40	781-746 BC (0.16), 688-665 BC (0.12), 646-552 BC (0.41)	797-517 BC (0.95)	643 BC
41TT392	Beta-64978	3440	60	-32.2	3320	60	1668-1526 BC (0.68)	1745-1491 BC (0.93), 1480-1456 BC (0.02)	1602 BC
41TT396	Beta-64979	3690	70	-29.4	3620	70	2125-2091 BC (0.10), 2044-1890 BC (0.58)	2198-2165 BC (0.03), 2151-1863 BC (0.85), 1851-1772 BC (0.08)	1988 BC
41TT550	Beta-70992	2620	60	-26.5	2600	60	835-751 BC (0.50), 687-667 BC (0.08), 638-594 BC (0.10)	901-716 BC (0.62), 695-539 BC (0.33)	773 BC
41TT550	Beta-71230	2650	60	-28.5	2590	60	827-750 BC (0.45), 687-666 BC (0.09), 641-592 BC (0.14)	896-537 BC (0.95), 529-537 BC (0.00)	756 BC
41TT550	Beta-70991	2570	60	-27.3	2530	60	794-731 BC (0.22), 691-662 BC (0.11), 650-546 BC (0.36)	805-486 BC (0.91), 463-449 BC (0.01), 442-417 BC (0.03)	643 BC
41TT550	Beta-70990	2470	70	-26.0	2450	70	749-688 BC (0.17), 666-643 BC (0.06), 591-578 BC (0.03), 566-413 BC (0.41)	767-404 BC (0.95)	582 BC

Table 1. Catalog of ^{14}C dates for the East Texas Archaic period, cont.

Trinomial	*Assay No.*	*Raw Age*	±	*δ ^{13}C (‰)*	*Conv ^{14}C Age*	±	*1σ Age Range**	*2σ Age Range**	*Median*
41TT852	Beta-300058	2580	30	-25.0	2580	30	802-768 BC (0.68)	814-750 BC (0.80), 688-666 BC (0.10), 640-592 BC (0.06)	782 BC
41TT853	Beta-300108	4240	40	-24.7	4240	40	2907-2866 BC (0.45), 2805-2762 BC (0.24)	2920-2848 BC (0.53), 2814-2738 BC (0.33), 2731-2678 BC (0.10)	2867 BC
41UR77	Beta-166912	7030	40	-25.4	7020	40	5982-5942 BC (0.29), 5928-5877 BC (0.36), 5856-5850 BC (0.03)	5997-5808 BC (0.95)	5913 BC
41UR77	UGA-12975	5220	50	-25.3	5220	50	4220-4213 BC (0.02), 4150-4135 BC (0.05), 4055-3965 BC (0.61)	4230-4197 BC (0.08), 4174-3955 BC (0.88)	4031 BC
41UR77	UGA-12979	4650	40	-26.1	4630	40	3499-3433 BC (0.54), 3379-3361 BC (0.15)	3621-3610 BC (0.01), 3522-3342 BC (0.94)	3454 BC
41UR77	UGA-12977	4400	40	-27.2	4360	40	3016-2916 BC (0.68)	3091-2900 BC (0.95)	2979 BC
41UR77	UGA-12976	4230	50	-25.6	4220	50	2901-2858 BC (0.26), 2810-2752 BC (0.33), 2722-2701 BC (0.10)	2915-2833 BC (0.34), 2820-2660 BC (0.59), 2652-2634 BC (0.02)	2790 BC
41UR77	UGA-12978	4120	50	-24.4	4180	50	2881-2848 BC (0.14), 2813-2739 BC (0.34), 2732-2679 BC (0.20)	2896-2621 BC (0.95)	2764 BC
41UR77	Beta-166911	4130	60	-24.7	4130	60	2866-2805 BC (0.21), 2761-2620 BC (0.48)	2884-2570 BC (0.94), 2515-2501 BC (0.02)	2719 BC
41UR77	UGA- 12973	3500	40	-25.8	3490	40	1880-1838 BC (0.25), 1832-1757 BC (0.43)	1919-1734 BC (0.92), 1716-1693 BC (0.04)	1816 BC
41UR77	UGA-12981	3220	40	-25.8	3210	40	1509-1436 BC (0.68)	1606-1574 BC (0.05), 1558-1551 BC (0.01), 1538-1411 BC (0.89)	1478 BC
41UR77	UGA-12982	3180	40	-27.3	3140	40	1491-1480 BC (0.05), 1456-1386 BC (0.63)	1499-1368 BC (0.84), 1359-1315 BC (0.12)	1420 BC
41UR77	UGA-12980	3130	40	-25.2	3130	40	1450-1378 BC (0.60), 1337-1322 BC (0.08)	1496-1311 BC (0.95)	1410 BC
41UR77	UGA-12972	2980	40	-27.0	2950	40	1260-1115 BC (0.68)	1299-1026 BC (0.95)	1171 BC
41UR77	UGA-12985	2850	40	-24.7	2860	40	1112-1101 BC (0.05), 1087-1064 BC (0.11), 1058-976 BC (0.50), 952-946 BC (0.03)	1191-1177 BC (0.01), 1160-1144 BC (0.02), 1131-914 BC (0.92)	1032 BC
41UR77	UGA-12974	2600	40	-26.4	2580	40	809-756 BC (0.58), 685-669 BC (0.10)	821-742 BC (0.64), 690-663 BC (0.12), 647-549 BC (0.20)	773 BC

*All probabilities rounded to the nearest hundredth.

followed by the test statistic, *T*, where:

$$T = \sum_{1}^{n} \left(A_i - A_p\right)^2 / E_i^2 \tag{2}$$

the latter of which illustrates a chi-square distribution on $n - 1$ degrees of freedom under the null hypothesis (see Clark 1975:252; Ward and Wilson 1978:21).

Provided that the ^{14}C determinations are found not to be significantly different, they can then be combined with the pooled age as *Ap* given by (I), and the variance given by:

$$V\left(A_p\right) = \left(\sum_{1}^{n} 1/E_i^2\right)^{-1} \tag{3}$$

(Ward and Wilson 1978:21), which is a process accessible in OxCal by way of the R_Combine function. Once combined with R_Combine, a new date range, standard deviation, and median age is provided for the combined samples (Figure 1). Within the framework of this study, the new date range replaces the combined dates and this new date range is employed within the revised summed probability distribution, while the new median date is used for statistical analyses (see also Selden 2012, 2013).

Conventional radiocarbon dates employed were recalibrated using IntCal09 (Figure 2). The radiocarbon curve serves as the basis for date calibration and can aid the process of archaeological interpretation by highlighting temporal zones with reversals and plateaus. Within the span of time of the East Texas Archaic (ca. 8000-500 B.C.), the curve possesses a number of reversals and plateaus that warrant further consideration. These nuances help to clarify why some radiocarbon dates have longer spans of probability than others.

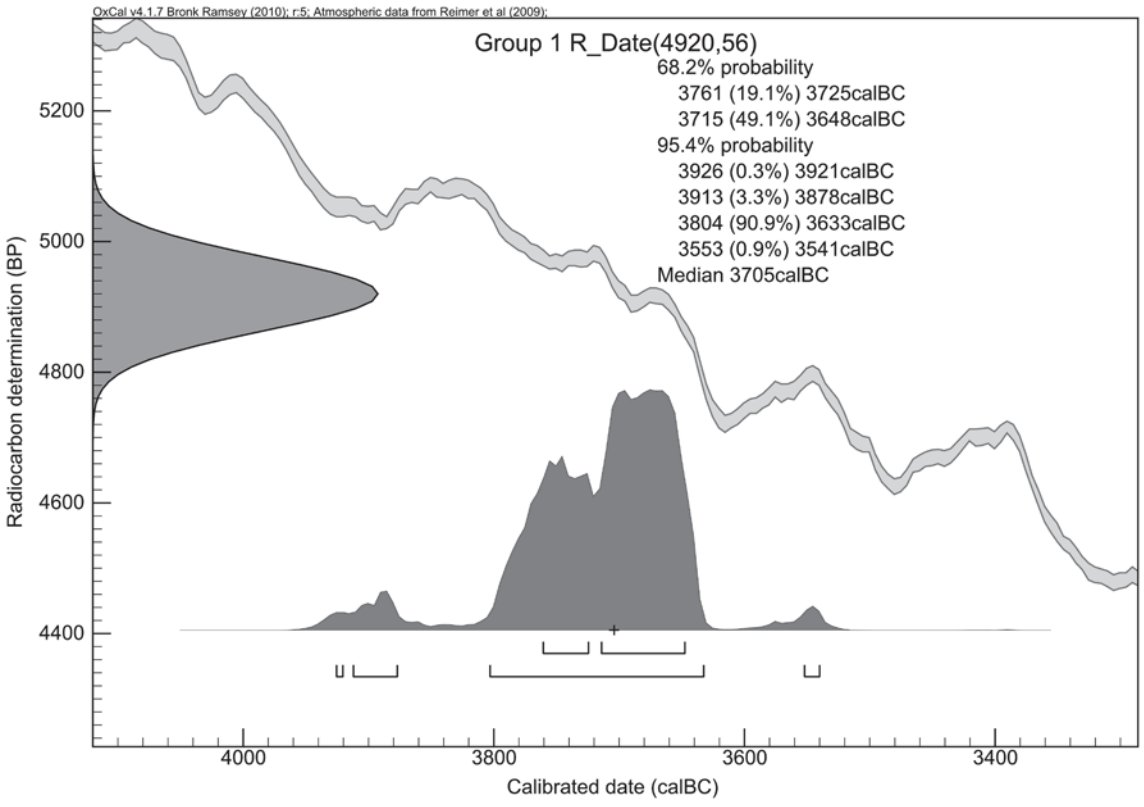

Figure 1. Calibrated results from the R_Combine function for the Finley Fan site (41HP159), Group 1.

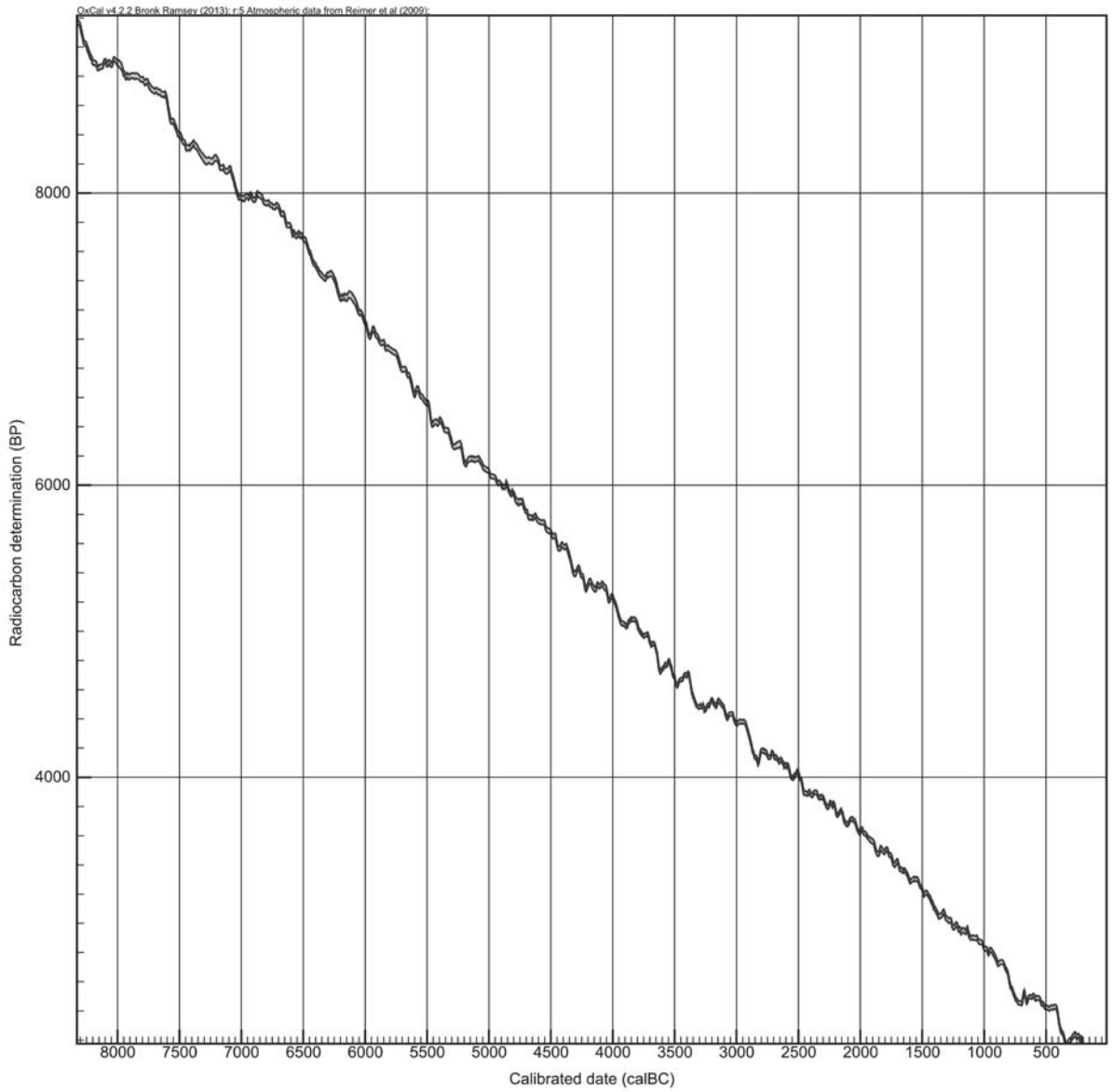

Figure 2. IntCal09 Radiocarbon calibration curve for the Archaic period.

The 1248 corrected dates in the ETRD were calibrated utilizing OxCal 4.1.7 (Bronk Ramsey 2013) and IntCal09 (Reimer et al. 2009). With few exceptions, older assays found to lack δ13C value estimates for fractionation correction used -25‰ for nutshells and charcoal (C3 plants) (Stuiver and Reimer 1993:Table 1).

Upon completion of the date combination process, a summed probability distribution (SPD) was produced for each of the sites with Archaic dates to illustrate the temporal position of each within the period. The dates were plotted in a manner where the SPDs, the combined groups, and the individual assays that inform them can be viewed together. These efforts permit the uncombined SPD for each site to be contrasted with the combined SPD and the combined groups that comprise it. This comparison demonstrates the impact that each site has upon the whole of the Archaic sample, and allows for a discussion of regional trends within the temporal sample.

COMBINING THE SAMPLE

Archaic sites with combined ^{14}C dates include: Shell Lens (41FN130), Winston (41HE245), Finley Fan (41HP159), J. Simms (41NA290), Herman Ballew (41RK222), Mockingbird (41TT550), and 41UR77. The number of dates garnered through research at each of these sites is biased by variable research designs, mitigation strategies, and access to funding. In the following section, the ^{14}C assays from these seven sites are refined through date combination, and the subsequent results (combined dates) replace the original assays within the analysis of all Archaic sites.

Shell Lens (41FN130)

The Archaic period dates from the Shell Lens site (Beta-304937 and Beta-304936) were combined into one group (Figure 3). The conventional age for Group 1 is 3800 ± 29 B.P., which has a calibrated 1σ age range of 2287-2201 B.C. (0.68), a 2σ age range of 2339-2315 B.C. (0.03) and 2310-2139 B.C. (0.93), with a median age of 2238 B.C.

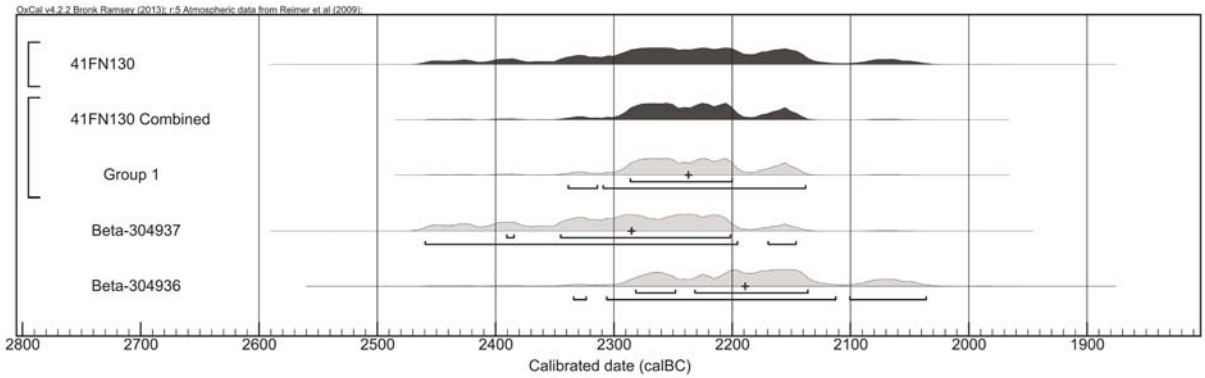

Figure 3. All and combined summed probability distributions for Archaic period dates from the Shell Lens site (41FN130) with 1σ and 2σ ranges, median ages, and number of samples.

Winston (41HE245)

The Archaic period dates from the Winston site were combined into two groups (Figure 4). The conventional ^{14}C age for Group 1 (SMU-660 and SMU-684) is 2837 ± 50 B.P., which has a calibrated 1σ age range of 1056-916 B.C. (0.68), a 2σ age range of 1191-1178 B.C. (0.01), 1160-1144 B.C. (0.01), 1131-892

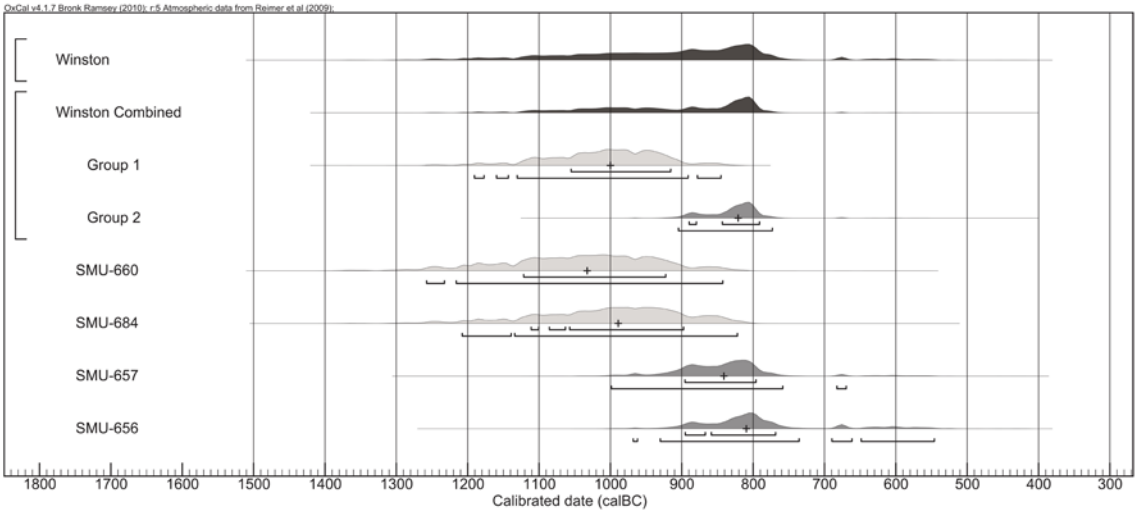

Figure 4. All and combined summed probability distributions for Archaic period dates from the Winston site (41HE245) with 1σ and 2σ ranges, median ages, and number of samples.

B.C. (0.91), and 879-846 B.C. (0.03), with a median age of 1001 B.C. The conventional age for Group 2 (SMU-657 and SMU-656) is 2652 ± 45 B.P., which has a calibrated 1σ age range of 890-880 B.C. (0.06) and 844-792 B.C. (0.63), and a 2σ age range of 905-774 B.C. (0.95), with a median age of 822 B.C.

41HP118

The Archaic period dates from 41HP118 are represented by one group (SMU-1970 and SMU-1883) (Figure 5). The conventional ^{14}C age for Group 1 is 2962 ± 28 B.P., which has a calibrated 1σ age range of 1257-1234 B.C. (0.15) and 1217-1130 B.C. (0.54), a 2σ age range of 1295-1111 B.C. (0.91), 1103-1074 B.C. (0.03), and 1066-1056 B.C. (0.01), with a median age of 1190 B.C.

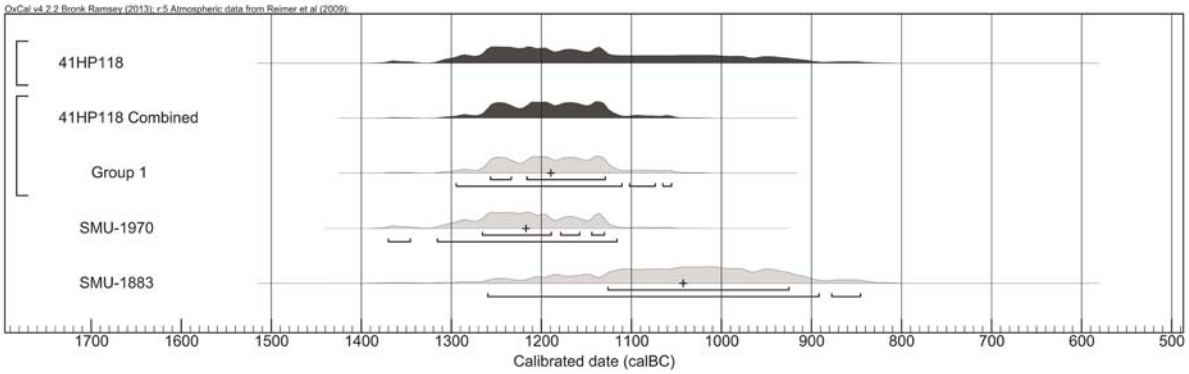

Figure 5. All and combined summed probability distributions for Archaic period dates from 41HP118 with 1σ and 2σ ranges, median ages, and number of samples.

Finley Fan (41HP159)

The Archaic period dates from the Finley Fan site are represented by two individual assays (GX-15881 and GX-15878) and one group (GX-15880 and SMU-2222) (Figure 6). The conventional age for Group 1 is 4920 ± 56 B.P., which has a calibrated 1σ age range of 3761-3725 B.C. (0.19) and 3715-3648 B.C. (0.49), a 2σ age range of 3926-3921 B.C. (0.00), 3913-3878 B.C. (0.03), 3804-3633 B.C. (0.91), and 3553-3541 B.C. (0.01), with a median age of 3705 B.C.

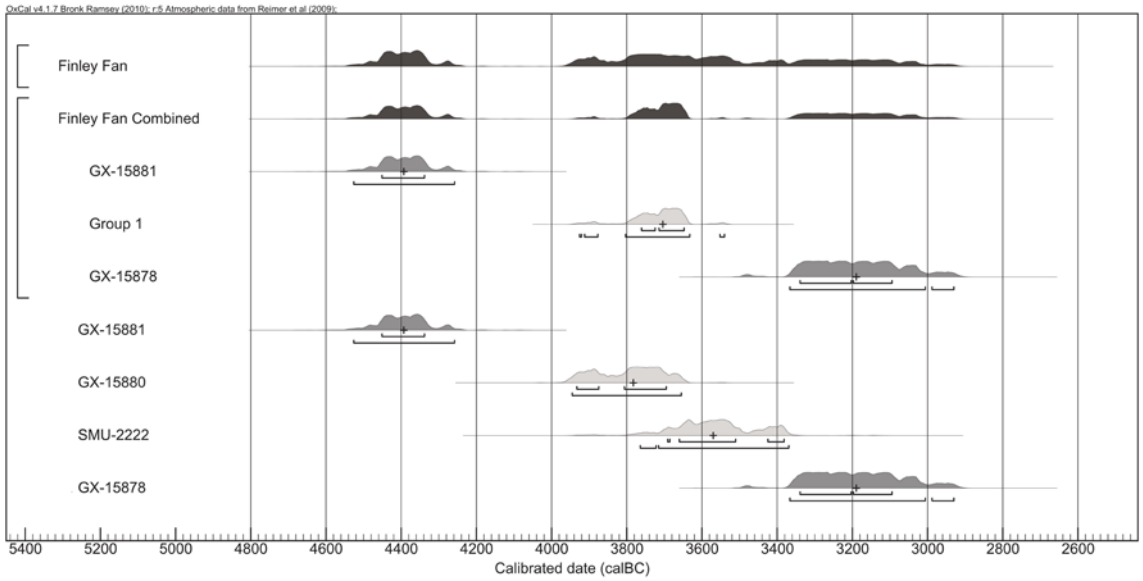

Figure 6. All and combined summed probability distributions for Archaic period dates from the Finley Fan site (41HP159) with 1σ and 2σ ranges, median ages, and number of samples.

J. Simms (41NA290)

The Archaic period dates from the J. Simms site are represented by a single individual assay (Beta-151114) and one group (Beta-151117, Beta-151118, and Beta-151115) (Figure 7). The conventional age for Group 1 is 2977 ± 28 B.P., which has a calibrated 1σ age range of 1264-1191 B.C. (0.50), 1178-1160 B.C. (0.10), and 1144-1131 B.C. (0.08), and a 2σ age range of 1368-1361 B.C. (0.01) and 1314-1116 B.C. (0.95), with a median age of 1214 B.C.

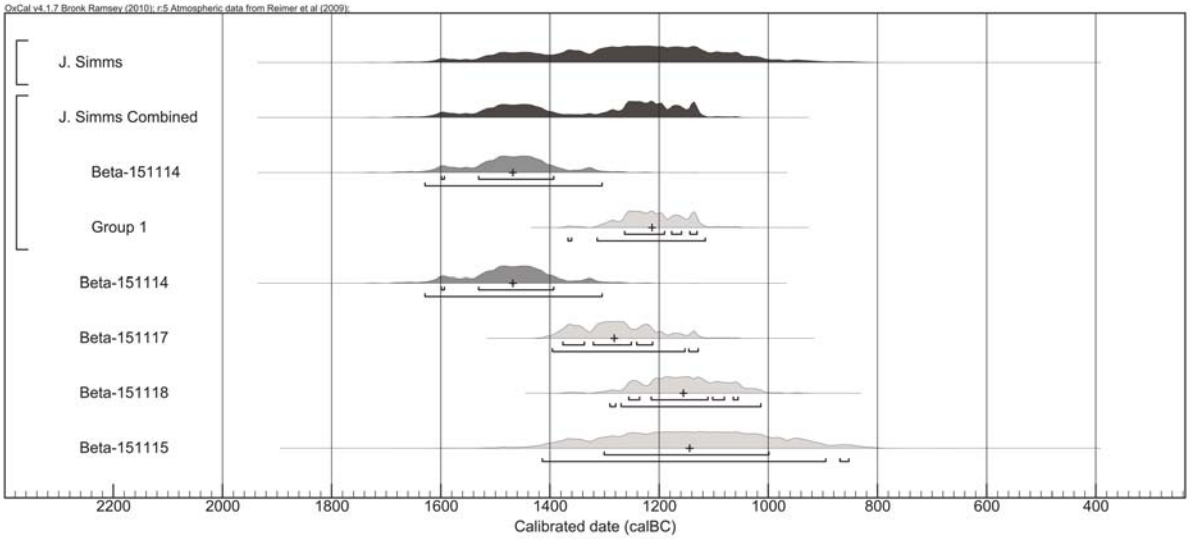

Figure 7. All and combined summed probability distributions for Archaic period dates from the J. Simms site (41NA290) with 1σ and 2σ ranges, median ages, and number of samples.

Herman Ballew (41RK222)

Five Archaic period dates from the Herman Ballew site are represented by two individual assays (Beta-72779 and Beta-72780) and one group (Beta-72777, Beta-81715, and Beta-72774) (Figure 8). The conventional age for Group 1 is 2430 ± 41 B.P., which has a calibrated 1σ age range of 728-693 B.C. (0.13), 658-654 B.C. (0.01), and 542-410 B.C. (0.55), a 2σ age range of 753-685 B.C. (0.20), 668-632 B.C. (0.08), 626-611 B.C. (0.02), and 597-402 B.C. (0.66), with a median age of 527 B.C.

Mockingbird (41TT550)

Four Archaic period dates from the Mockingbird site (Beta-70992, Beta-71230, Beta-70991 and Beta-70990) were combined into one group (Figure 9). The conventional age for Group 1 is 2550 ± 32 B.P., which has a calibrated 1σ age range of 797-752 B.C. (0.43), 686-667 B.C. (0.15), 633-625 B.C. (0.03), and 612-596 B.C. (0.08), a 2σ age range of 802-737 B.C. (0.47), 691-662 B.C. (0.17), and 649-547 B.C. (0.32), with a median age of 687 B.C.

41UR77

The Archaic period radiocarbon dates from 41UR77 are represented by six individual assays (Beta-166912, UGA-12975, UGA-12979, UGA-12977, UGA-12973 and UGA-12974) and three groups (Figure 10). The conventional age for Group 1 (UGA-12976, UGA-12978, and Beta-166911) is 4182 ± 31 B.P., which has a calibrated 1σ age range of 2880-2857 B.C. (0.14), 2811-2748 B.C. (0.40), and 2724-2699 B.C. (0.14); a 2σ age range of 2888-2835 B.C. (0.22) and 2817-2667 B.C. (0.73); with a median age of 2774 B.C. The conventional age for Group 2 (UGA-12981, UGA-12982, and UGA-12980) is 3160 ± 24 B.P., which has a calibrated 1σ age range of 1488-1484 B.C. (0.04) and 1454-1412 B.C. (0.65), a 2σ age range of 1496-1401 B.C. (0.95), and a median age of 1437 B.C. The conventional age for Group 3 (UGA-12972

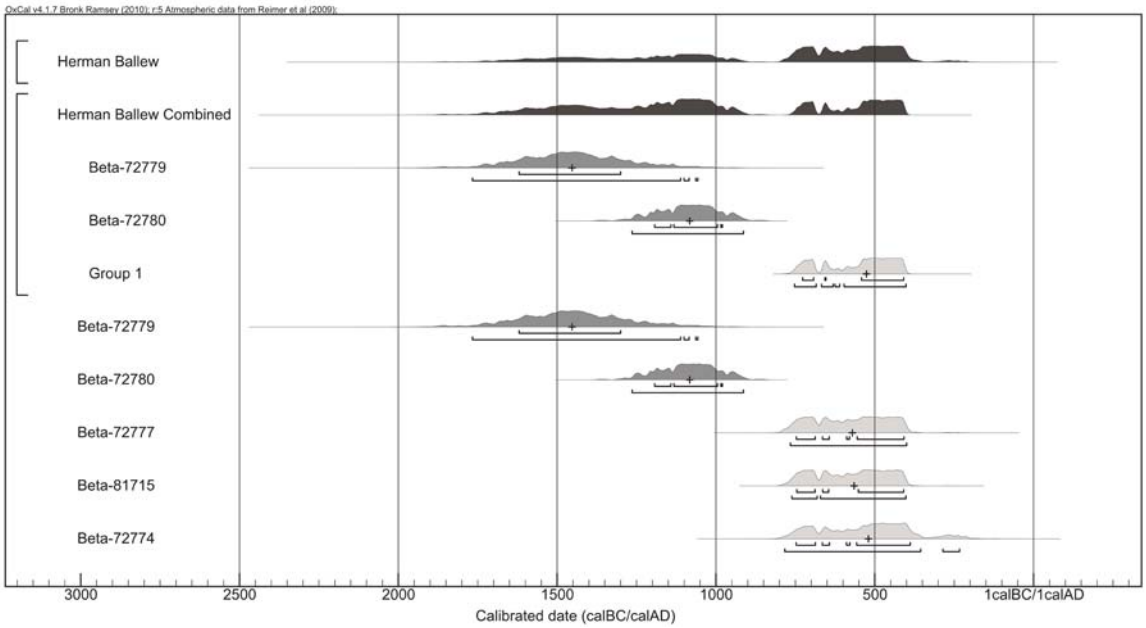

Figure 8. All and combined summed probability distributions for Archaic period dates from the Herman Ballew site (41RK222) with 1σ and 2σ ranges, median ages, and number of samples.

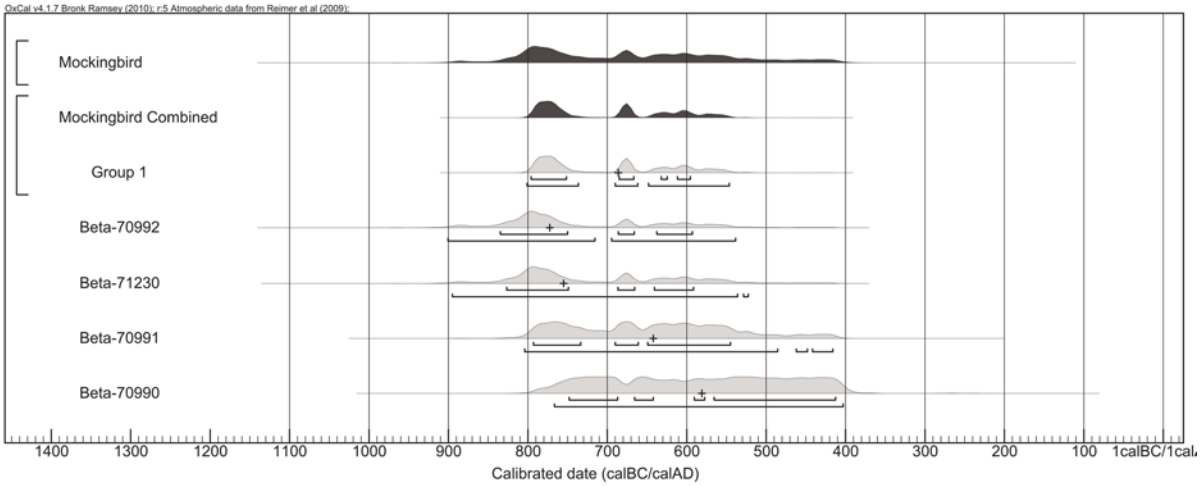

Figure 9. All and combined summed probability distributions for Archaic period dates from the Mockingbird site (41TT550) with 1σ and 2σ ranges, median ages, and number of samples.

and UGA-12985) is 2905 ± 29 B.P., which has a calibrated 1σ age range of 1129-1024 B.C. (0.68), a 2σ age range of 1211-1006 B.C. (0.95), and a median age of 1094 B.C.

RESULTS

In every case where date combination was applied, the new combined age replaced the assays used to calculate it. Upon completion of the date combination process, the summed probability distributions for all East Texas sites with Archaic-era radiocarbon assays were plotted chronologically (Figure 11). This allows us—for the first time—to view all of the Archaic-era assays at the regional scale.

In the future, it would be useful to apply some manner of chronometric hygiene (e.g. Reith et al. 2011; Wilmshurst 2011) to the Archaic radiocarbon samples, whether following a conventional method or by vetting

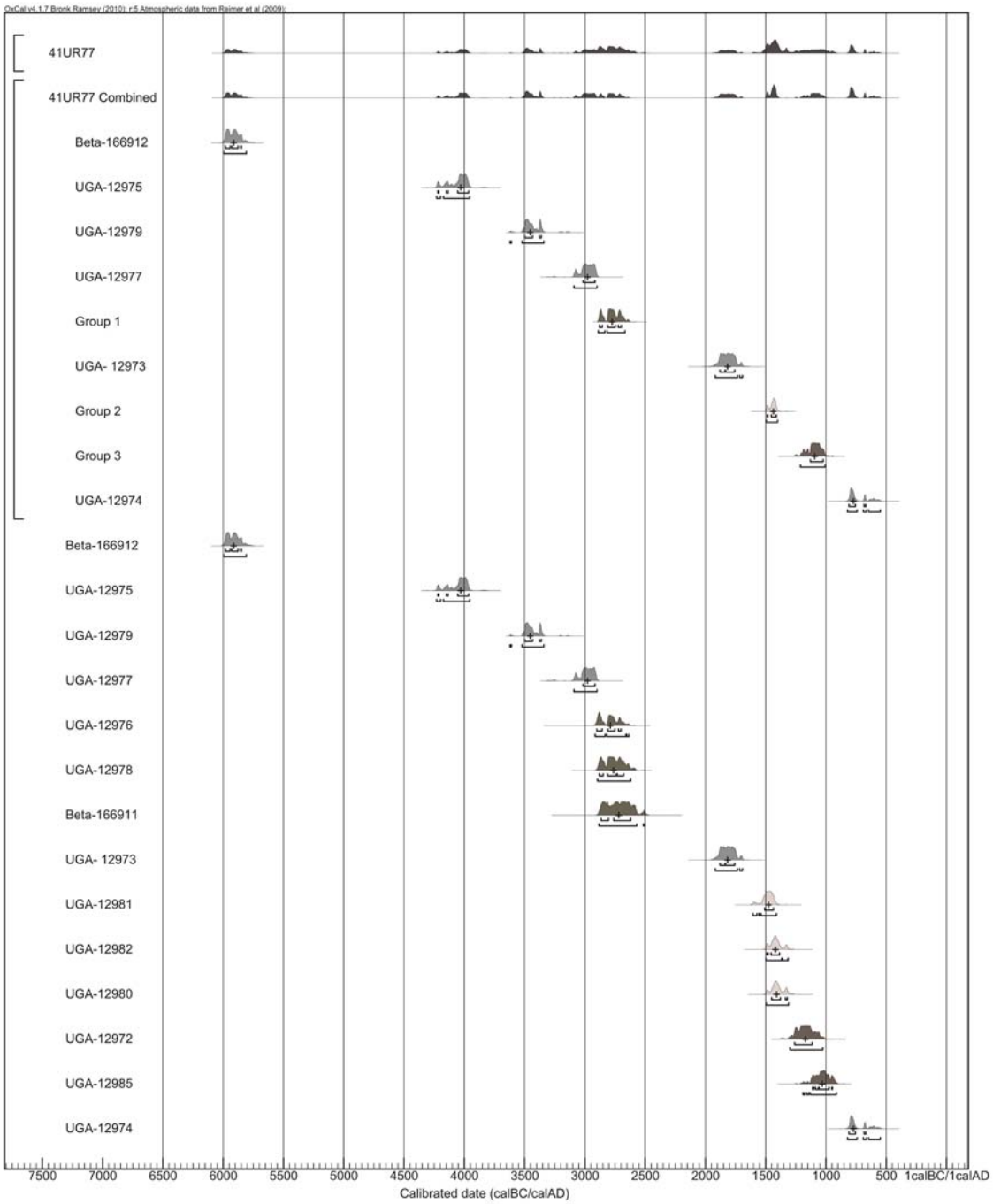

Figure 10. All and combined summed probability distributions for Archaic period dates from 41UR77 with 1σ and 2σ ranges, median ages, and number of samples.

each date to ensure that the assays represent an Archaic component associated with some manner of human occupation (i.e., artifact manufacture or feature use). At this point it is unknown how many of these dates can actually be attributed to the Archaic occupation of the East Texas landscape, but this preliminary analysis does illustrate a fairly remarkable increase in the number of dates during the Late Archaic (ca. 3000-500 B.C.) period following a sparse dated record for the Early and Middle Archaic. The fact that the number of assays from each period increase through time is a familiar trend (Selden 2012, 2013; Selden and Perttula 2013; Surovell and Brantingham 2007; Surovell et al. 2009), and one that is often attributed to an increase in population size (see Peros et al. 2010).

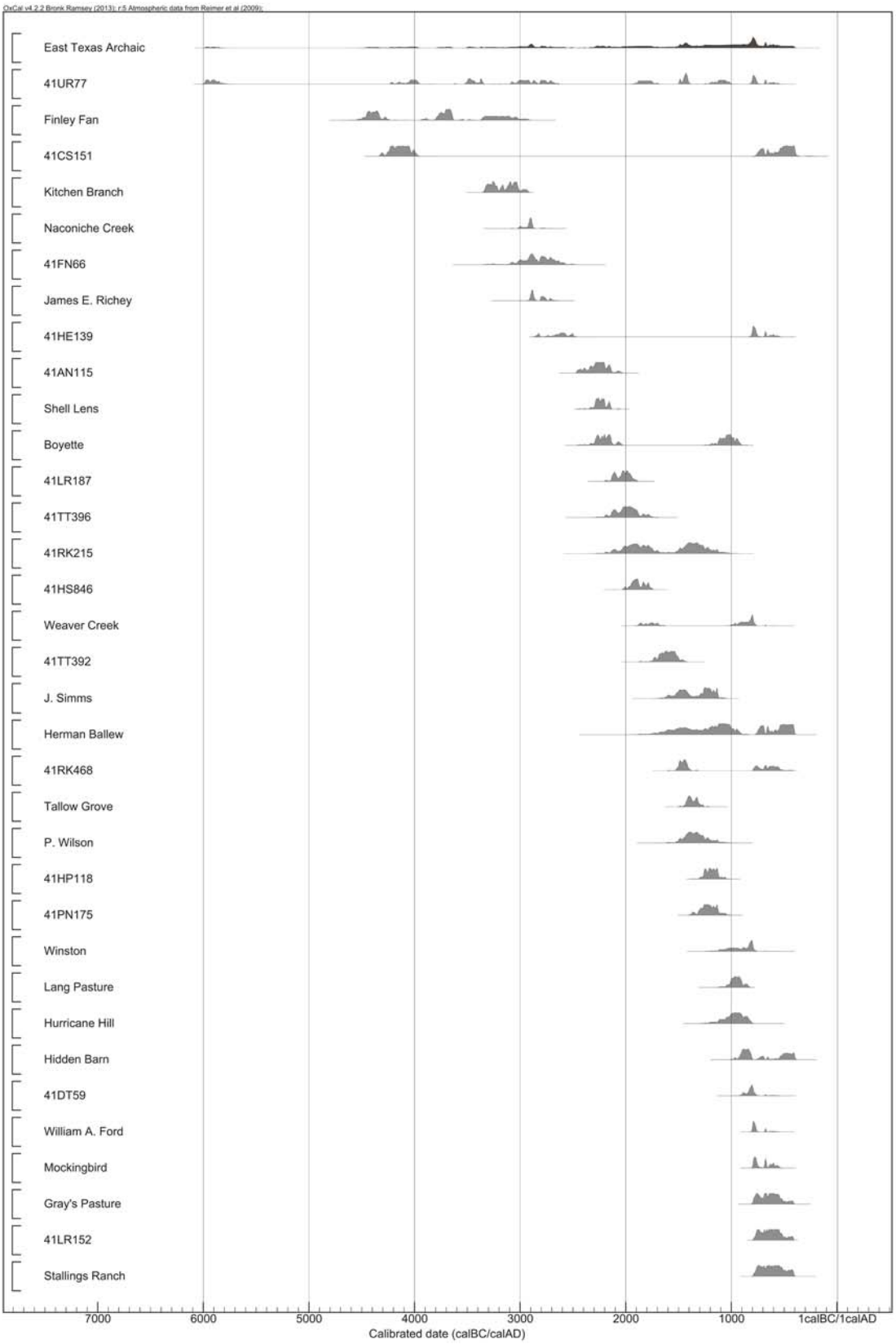

Figure 11. East Texas sites with Archaic-era assays in chronological order.

CONCLUSIONS

Although biases likely exist in the radiocarbon sample from sites in the region, it is evident that the most extensive Archaic occupation of East Texas occurred during the Late Archaic period. Certainly more dates are needed from Early and Middle Archaic horizons that may exist at sites, but given the often ill-formed stratigraphy in archaeological deposits that occurs throughout East Texas, finding suitable samples can be a challenge. Also, some measure of chronometric hygiene needs to be applied to this sample of dates to increase their resolution and temporal accuracy. While large steps have been taken to explore East Texas archaeology, the Archaic period remains ill-defined with respect to its material culture as well as our understanding of the chronology. The fact that only 73 dates from the East Texas Radiocarbon Database—which is currently composed of 1248 radiocarbon dates from East Texas—speaks to the need for further research.

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