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Supplementary Materials for

Population collapse in Congo rainforest from 400 CE urges reassessment of the Bantu Expansion

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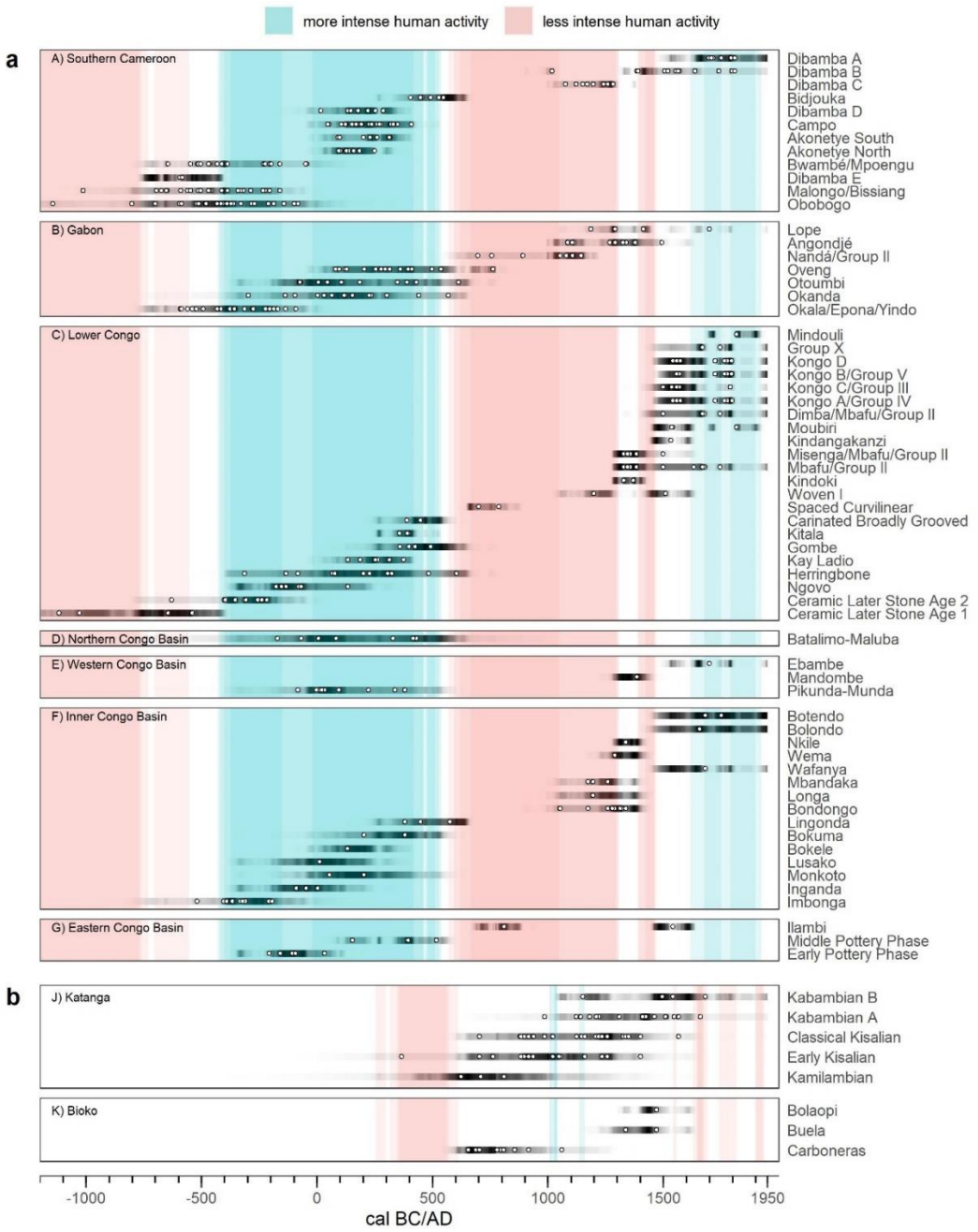

Fig. S1. Temporal distribution of 71 directly 14C-dated pottery groups from the Congo Basin over the past 3000 years. Patterns are shown separately for the Congo rainforest (**a**; regions A-H) and for the adjacent woodland areas including Bioko Island (**b**; regions I-K). Circles represent the highest-probability calendar age of each pottery-linked 14C date, and the intensity of grey shading is proportional to the summed probability of the calendar-age windows of all pottery occurrences per type. Background shading shows the periods of more (blue) and less (red) intense human activity across the Congo rainforest, as in Fig. 2. To date, no pottery groups have been described from regions H and I.

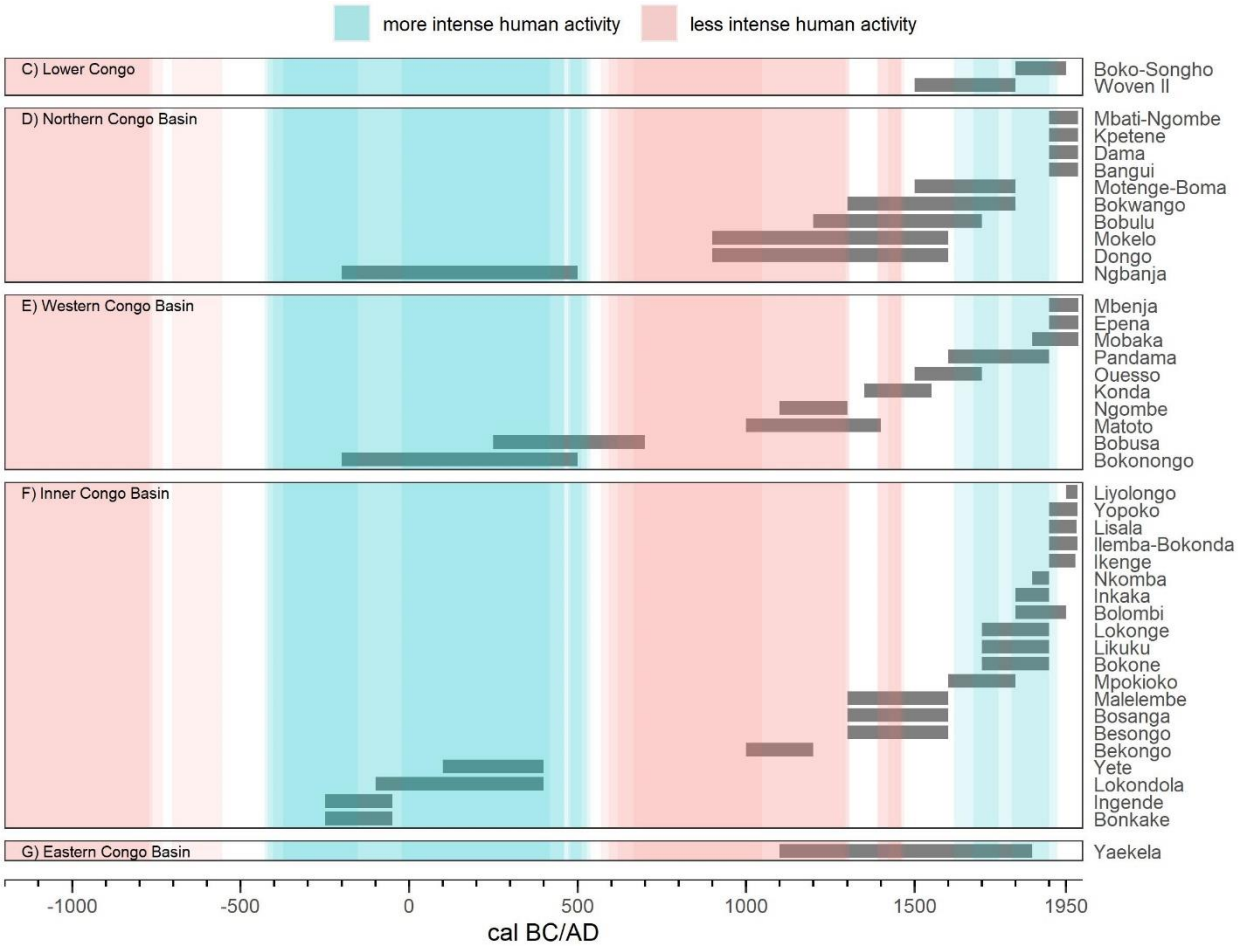

Fig. S2. Temporal distribution of 43 indirectly dated pottery groups from within the Congo rainforest over the past 3000 years. The occurrence of a pottery group in each successive 100-year bin was estimated based on stylistic resemblances with dated pottery groups (see **data S2**), and the total time window of occurrence represented as a horizontal grey bar. Background shading shows the periods of more (blue) and less (red) intense human activity across the Congo rainforest, as in **Fig. 2**.

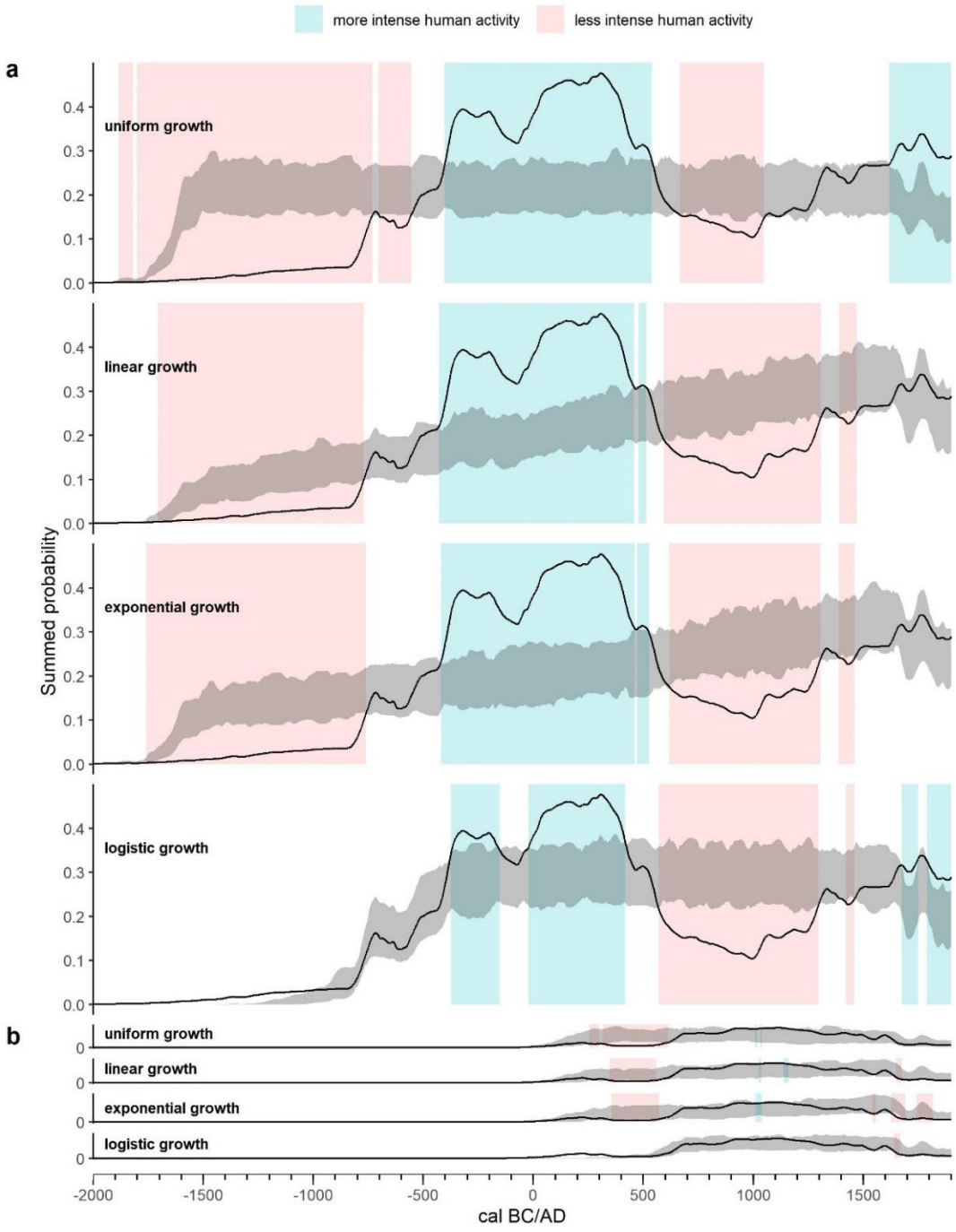

Fig. S3. Alternative models of hypothetical population growth in the Congo Basin over the past 4000 years. Patterns are shown separately for the Congo rainforest (**a**) and the adjacent woodland areas including Bioko Island (**b**). Grey background areas represent uncertainty envelopes of summed probability, as in Fig. 2 but here for all four growth models considered in this study (uniform, linear, exponential, and logistic), each compared with the observed SPD of archeological 14C dates. Background shading shows the periods of more (blue) and less (red) intense human activity.

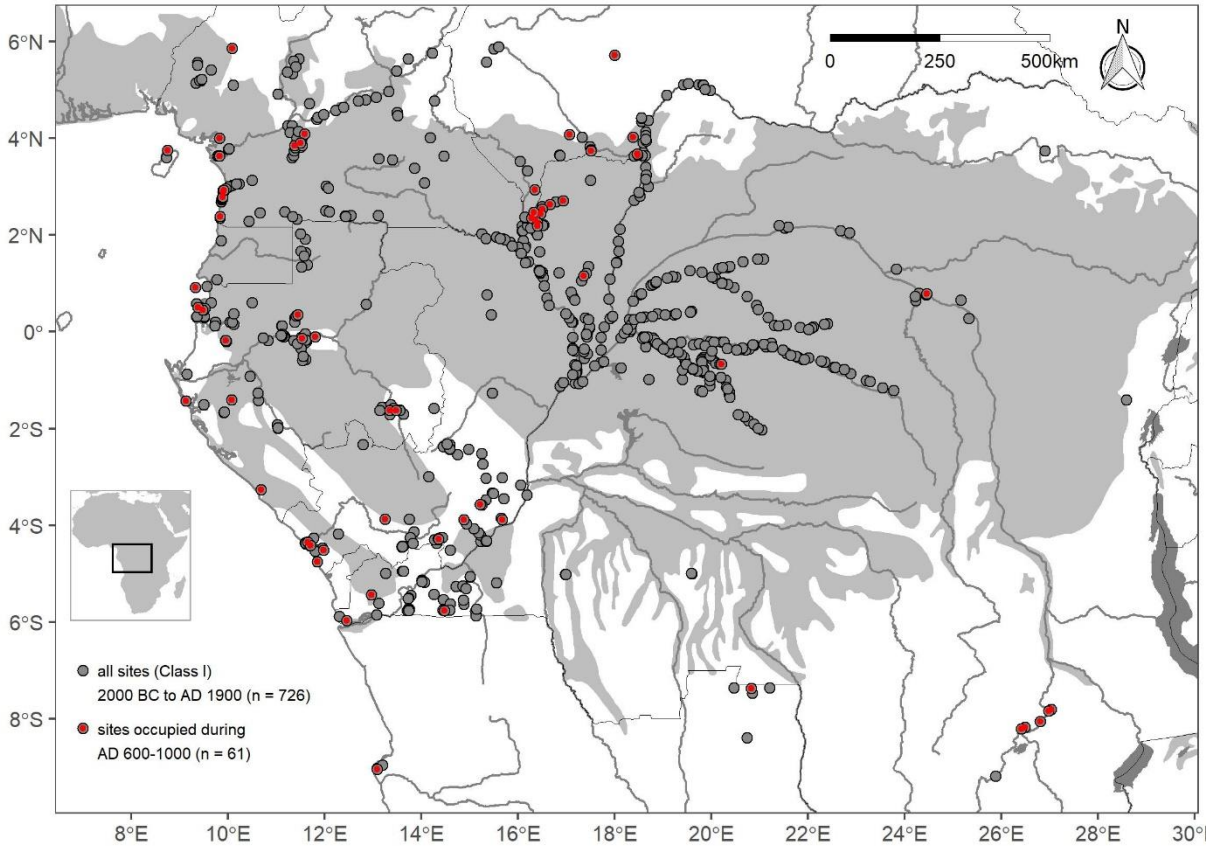

Fig. S4. Locations of analyzed archeological sites in Central Africa during the period of low human activity (AD 600-1000). Grey dots represent all archeological sites were either ^{14}C-dates (Class I) or described pottery groups have been found and that are thus related to pottery-producing communities. Red dots represent sites occupied during the period AD 600-1000 (based on the median calibrated age of archeological ^{14}C dates), highlighting the relict distribution of populations within the Congo rainforest and greater prevalence in adjacent areas.

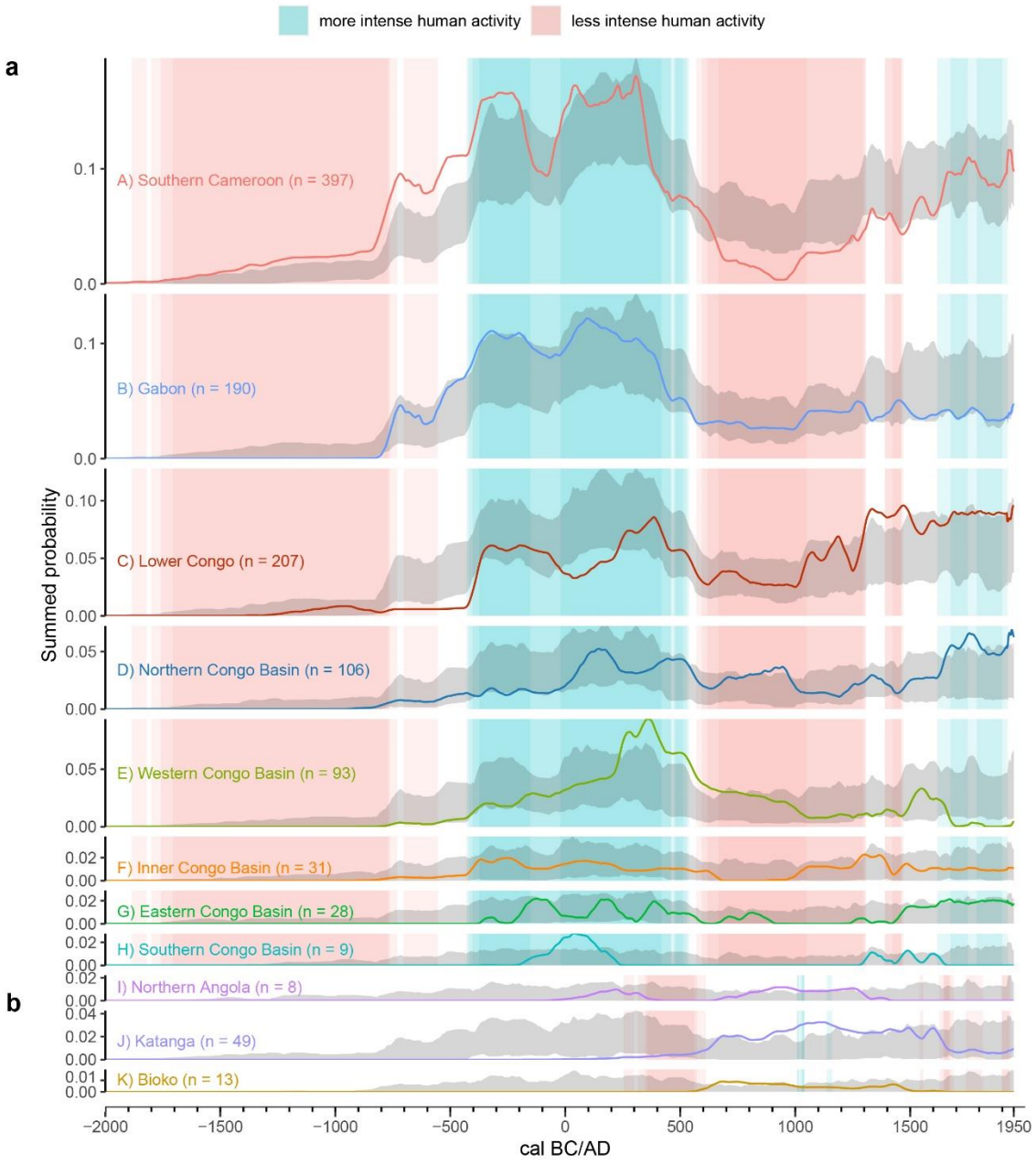

Fig. S5. Region-specific trends in human activity based on SPDs of archeological 14C dates from the Congo Basin over the past 4000 years. Patterns are shown separately for the Congo rainforest (**a**; regions A-H) and for the adjacent woodland areas including Bioko Island (**b**; regions I-K). SPDs are constructed using Class I 14C dates (table S1) and smoothed using a 60-year moving average. Background shading shows the periods of more (blue) and less (red) intense human activity, as in Fig. 2. The grey envelopes represent the 95% uncertainty envelopes of 100 simulated SPDs generated by randomly picking an equal number of 14C dates from the cross-regional dataset (Fig. 2), to highlight the region-specific trends shown by colored lines.

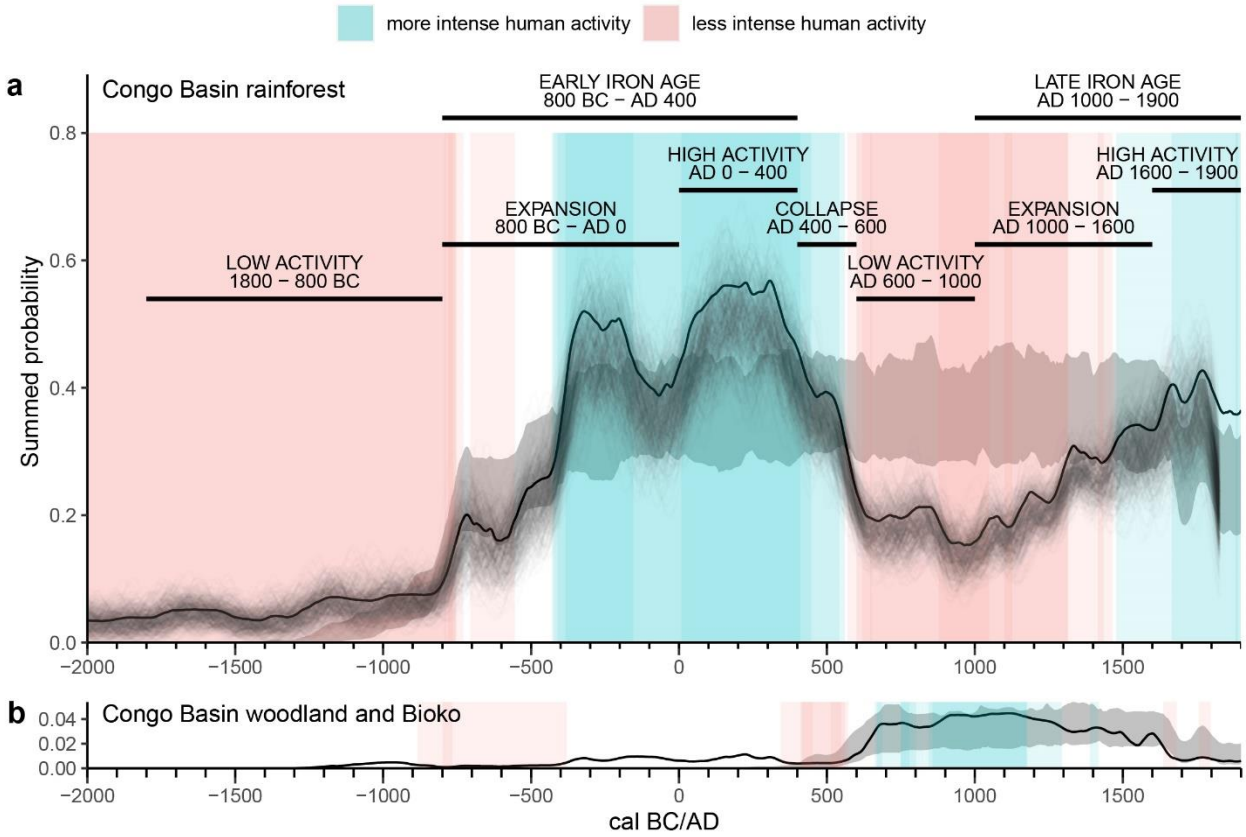

Fig. S6. Sensitivity analysis of our main result presented in Fig. 2. Alternative representation of **Fig. 2**, showing the SPD of all available ^{14}C dates (classes I, II and II, total n = 1444) and corresponding periods of inferred more (blue) and less (red) intense human activity in relation to the logistic growth model.

Table S1. Classification of ^{14}C dates based on quality screening and archeological association. Relevant dates (class I) represent activities of pottery-producing communities and were here used to construct the Summed Probability Densities (SPDs) shown in **Fig. 2** and **fig. S5**. Irrelevant (class II) and unreliable (class III) dates were excluded from our analysis for the reasons stated in the Methods section. Regions A-H comprise the Congo rainforest, regions I-K adjacent Congo Basin woodland and Bioko Island (**Fig. 1**).

Class	Archeological association	# of dates		
		all regions	regions A-H	regions I-K
I: Relevant dates		**1149**	**1075**	**74**
Ia	strong archeological context	453	391	62
Ib	moderately strong archeological context	542	533	9
Ic	weak archeological context	64	61	3
Id	proxy for human activity but no artefacts	90	90	0
II: Irrelevant dates		**239**	**233**	**6**
IIa	reference to lithic artefacts only	18	17	1
IIb	compromised archeological link (e.g. post-depositional mixing)	55	54	1
IIc	lacking archeological context	166	162	4
III: Unreliable dates		**56**	**56**	**0**
IIIa	presumed lab error	26	26	0
IIIb	based on lacustrine carbonates (potential old-carbon effect)	18	18	0
IIIc	based on sedimentary bulk organic matter (potential old-carbon effect)	12	12	0

Table S2. Overview of the 11 study regions in Central Africa, specifying the number of ^{14}C dates per class included in **table S1** and described in **data S1**, the number of pottery groups (directly dated and undated) described in **data S2,** and the number of sites per region (**data S4**).

REGION	# of radiocarbon dates per class							# of pottery groups *			# of sites **		
	Total	Ia	Ib	Ic	Id	II	III	Total	dated	undated	Total	with pottery groups	without pottery groups
Congo rainforest													
A) Southern Cameroon	502	146	247	6	1	102	0	15	12	3	136	30	106
B) Gabon	245	95	59	42	0	27	22	7	7	0	130	64	66
C) Lower Congo	261	89	111	5	5	46	5	24	22	2	164	92	72
D) Northern Congo	116	7	77	4	19	3	6	11	1	10	54	26	28
E) Western Congo	112	13	13	2	65	19	0	18	7	11	91	57	34
F) Inner Congo	59	30	1	1	0	4	23	49	19	30	190	188	2
G) Eastern Congo	55	11	17	0	0	27	0	4	3	1	10	6	4
H) Southern Congo	14	0	8	1	0	5	0	1	1	0	4	1	3
Adjacent areas													
I) Northern Angola	13	0	7	1	0	5	0	1	1	0	13	1	12
J) Katanga	54	49	2	2	0	1	0	6	6	0	6	5	1
K) Bioko	13	13	0	0	0	0	0	3	3	0	2	2	0

* 22 pottery styles occur in two regions, therefore the sum of pottery groups across all regions exceeds the number of pottery groups in **data S2**.

** Sites with both well-defined pottery groups and unclassified pottery assemblages are counted only as the former.

Table S3. Metadata for the 16 Bantu-speaking agriculturalist communities from Gabon included in the analysis of effective population size (*Ne*) through time. Specified are their geographic coordinates, number of individuals analyzed (*5*) and language affiliation code (NWB = North-Western Bantu and WWB = West-Western Bantu) (*3*, *43*, *79*).

Community	Latitude	Longitude	Sample size	Language code
Benga	0.58	9.33	51	NWB, A34
Duma	-0.82	12.70	47	WWB, B51
Fang	1.60	11.58	69	NWB, A75a
Galoa	-0.70	10.22	50	NWB, B11c
Kele	-0.70	10.22	49	NWB, B22a
Kota	0.57	12.87	56	NWB, B25
Mbamba	-0.68	13.78	46	WWB, B62
Ndumu	-1.63	13.58	38	WWB, B63
Nzebi	-1.57	13.20	62	WWB, B52
Punu	-1.87	11.02	53	WWB, B43
Shake	-0.82	12.70	52	NWB, B251
Shira	-1.22	10.60	41	WWB, B41
Shiwe (Fang-Makina)	-0.10	11.93	45	NWB, A803
Teke	-0.82	12.70	54	WWB, B71a
Tsogo	-1.03	10.67	65	NWB, B31
Viya	-1.21	10.60	38	NWB, B301

Data S1 (separate file). Overview of the 1444 ^{14}C dates included in this study. This table specifies geographic details (country, region, site, and coordinates), association with archeological remains (pottery, lithics, and iron), and the class each date was assigned to (**table S1**) after critical assessment of the original publications (as listed in the 'Source' column).

Data S2 (separate file). Overview of the 115 pottery groups distinguished in this study. This table specifies the temporal distribution of each pottery group ('From' and 'To' columns are in calendar years BC/AD); the number of dates and sites per pottery group; and the number of regions where each group has been documented.

Data S3 (separate file). Full bibliographic reference list used to compile data S1 and data S2.

Data S4 (separate file). Overview of the 800 sites covering the pottery groups and ^{14}C inventories. This table specifies the number of pottery groups per site and the number of ^{14}C dates per site, arranged per class.

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