Elephant rewilding affects landscape openness and fauna habitat across a 92-year period

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Appendix S2

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Appendix S2. Method used to select detection functions for Distance sampling of tree density.

Section S1: Description of the method used to select detection functions for Distance sampling.

To identify the most parsimonious method to tree estimate density, three models with different detection functions were compared using Akaike Information Criterion (AIC) values: half-normal key function and cosine adjustment, a uniform key function and cosine adjustment and a hazard-rate key function and simple polynomial adjustment. To account for differences in detectability between reserves with different elephant reintroduction times (and subsequent differences in vegetation density / cover), model selection was conducted separately for the reserve without elephants and the reserves with a younger elephant reintroduction time (i.e. “thick” vegetation; 1995, 2003) and the reserves with an older elephant reintroduction time (i.e. sparse vegetation;1972, 1927). The function with the lowest AIC score was used to estimate density. All models falling within two AIC points of the “best” model were deemed equivalent. Where this occurred, we attempted to use the same detection function between transects (Table SI.3).

Table S1: Akaike Information Criterion (AIC) values for Distance sampling models used to estimate the density of trees bearing small- (a), medium- (b) and large-sized (c) tree hollows (HBT) and the density of all trees (d), *Senegalia nigrescens* (e) and *Sclerocarya birrea* (f) trees. Different detection functions were fit for sites occurring at three reserves with “thick” vegetation (maximum transect width 20 m) and two reserves with “sparse” vegetation (maximum transect 40 m). * indicates the detection function used to estimate density.

Detection function	**Transect width**	
	20 m	**40 m**
a) Small HBT		
Uniform cosine	592.31	210.36

Half-normal cosine	_591.45*_	_210.79*_
Hazard-rate simple polynomial	592.73	210.64
b) Medium HBT		
Uniform cosine	363.31	294.26
Half-normal cosine	362.46	293.90
Hazard-rate simple polynomial	_358.99*_	_291.68*_
c) Large HBT		
Uniform cosine	_63.10*_	_130.14*_
Half-normal cosine	63.47	130.77
Hazard-rate simple polynomial	65.18	131.18
d) All trees		
Uniform cosine	_3601.41*_	_935.17*_
Half-normal cosine	3606.32	934.88
Hazard-rate simple polynomial	3621.14	934.92
e) Senegalia nigrescens		
Uniform cosine	2202.66	326.19
Half-normal cosine	_2200.63*_	_326.67*_
Hazard-rate simple polynomial	2209.97	327.21
f) Sclerocarya birrea		
Uniform cosine	1114.27	373.12
Half-normal cosine	_1114.04*_	_373.96*_
Hazard-rate simple polynomial	1117.84	373.82