

Supplementary materials

Table S1. Number of pixels and percentages (in brackets) of each structural type by province with balanced classes. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

Province		Badajoz	Murcia	Madrid	La Rioja	Total pixels
FOREST STRUCTURAL TYPE	SCS	8764 (0.29)	1255 (0.10)	34896 (3.16)	32176 (4.01)	77091 (1.23)
	AOW	1221209 (39.64)	183256 (14.43)	267916 (24.18)	233101 (28.93)	1905482 (30.3)
	COP	1868027 (60.18)	1082661 (85.28)	750738 (67.76)	332828 (41.30)	4034254 (64.17)
	HMS	5878 (0.19)	2417 (0.19)	54357 (4.90)	207601 (25.76)	270253 (4.3)
Total pixels		3103878	1269589	1107907	805706	6287080
% Pixels		49.37	20.19	17.62	12.82	100

Table S2. Number of pixels and percentages (in brackets) of each structural type by province with no balanced classes. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

Province		Badajoz	Murcia	Madrid	La Rioja	Total pixels
FOREST STRUCTURAL TYPE	SCS	2793 (0.09)	128 (0.01)	11853 (1.06)	15873 (1.97)	30647 (0.49)
	AOW	1087288 (35.03)	147145 (11.59)	341678 (30.84)	198606 (24.65)	1774717 (28.22)
	COP	2011934 (64.82)	1121047 (88.3)	692720 (62.48)	436370 (54.16)	4262071 (67.79)
	HMS	1863 (0.06)	1269 (0.10)	61656 (5.52)	154857 (19.22)	219645 (3.49)
Total pixels		3103878	1269589	1107907	805706	6287080
% Pixels		49.37	20.19	17.62	12.82	100

Table S3. LiDAR metrics and abbreviations.

LiDAR	Abbreviations	LiDAR	Abbreviations	LiDAR	Abbreviations
Maximum height	H max	Percentile 25	P25	% First return above the mode	%FR/Md
Mean height	Hmean	Percentile 30	P30	(All return above the mean/Total first returns)*100	AMn/FR

Mode height	Hmode	Percentile 40	P40	(All return above the mode/Total first returns)*100	AMd
Variance height	Hvar	Percentile 50	P50	Height range	HR
Interquartile range height	Hiq	Percentile 60	P60	Canopy length	C
Standard deviation height	Hsd	Percentile 75	P75	Difference between Percentile 99 and 50	Dif 99_50
Coefficient of variation height	Hcv	Percentile 90	P90	Difference between Percentile 99 and 25	Dif 99_25
Skewness height	Hsk	Percentile 95	P95	Difference between Percentile 90 and 50	Dif 90_50
Kurtosis height	Hkur	Percentile 99	P99	Difference between Percentile 90 and 25	Dif 90_25
L - Coefficient of variation	L-cv	Canopy Relief Ratio	CRR	Fractional Cover	FC
L - Skewness height	L-sk	% First return above 2 meters	%2M	Mean Height of the Canopy Profile	MCPH
L - Kurtosis height	L-kur	% All return above 2 meters	%A2	Quadratic Mean Canopy Height	QMCH
Plant Area Index	PAI	(All return above 2 meters/Total first returns) *100	CCM2	Area under the canopy curve	AC
Percentile 5	P05	% First return above the mean	%FR		

Table S4. Kruskal-Wallis rank sum test.

Martonne aridity gradient by Forest structural types	
chi-squared	1149.9
df	3
p-value	< 2.2e-16

Table S5. Pairwise comparisons using Wilcoxon rank sum test with continuity correction. P-value adjustment method: holm. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

Martonne aridity gradient by Forest structural types			
	SCS	AOW	COP
AOW	<2e-16	-	-
COP	<2e-16	<2e-16	-
HMS	<2e-16	<2e-16	<2e-16

Table S6. Contingency table for the training dataset. T3: Forest structural type 1; T2: Forest structural type 2; T3: Forest structural type 3; T4: Forest structural type 4.

CONTINGENCY TABLE (Training set: 70% of total observations)							
Predicted	Observed					USER'S ACCURACY (%)	COMMISSION ERROR (%)
	SCS	AOW	COP	HMS	TOTAL		
SCS	661	209	125	61	1056	62,59	37,41
AOW	75	136	16	37	264	51,51	48,49
COP	24	15	107	67	213	50,23	49,77
HMS	28	47	81	240	396	60,60	39,40
TOTAL	788	407	329	405	1929		
PRODUCER'S ACCURACY (%)	83,88	33,41	32,52	59,25	TOTAL ACCURACY (%)		59,30
OMISSION ERROR (%)	16,12	66,59	67,48	40,75	TOTAL ERROR (%)		40,70

Table S7. Contingency table for the training dataset. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

CONTINGENCY TABLE (Validation set: 70% of total observations)							
Predicted	Observed					USER'S ACCURACY (%)	COMISSION ERROR (%)
	SCS	AOW	COP	HMS	TOTAL		
SCS	283	90	62	35	470	60,21	39,79
AOW	20	67	2	10	99	67,67	32,33
COP	17	9	55	30	111	49,54	50,46
HMS	19	13	18	97	147	65,98	34,02
TOTAL	339	179	137	172	827		
PRODUCER'S ACCURACY (%)	83,48	37,43	40,14	56,39	TOTAL ACCURACY (%)		60,70
OMISSION ERROR (%)	16,52	62,57	59,86	43,61	TOTAL ERROR (%)		39,30

Table S8. LiDAR flight and sensor characteristics.

Province	Sensor	Point density	Pulse frequency	Scan frequency	Radiometric resolution	Sensor calibration
Badajoz	Leica AL80	1	>45kHz	>70Hz	>8bits	<12months
Murcia	Leica AL60	0,5	>45kHz	>70Hz	>8bits	<12months
Madrid	Leica AL70	1	>45kHz	>70Hz	>8bits	<12months
La Rioja	Leica AL80	2	>45kHz	>70Hz	>8bits	<12months

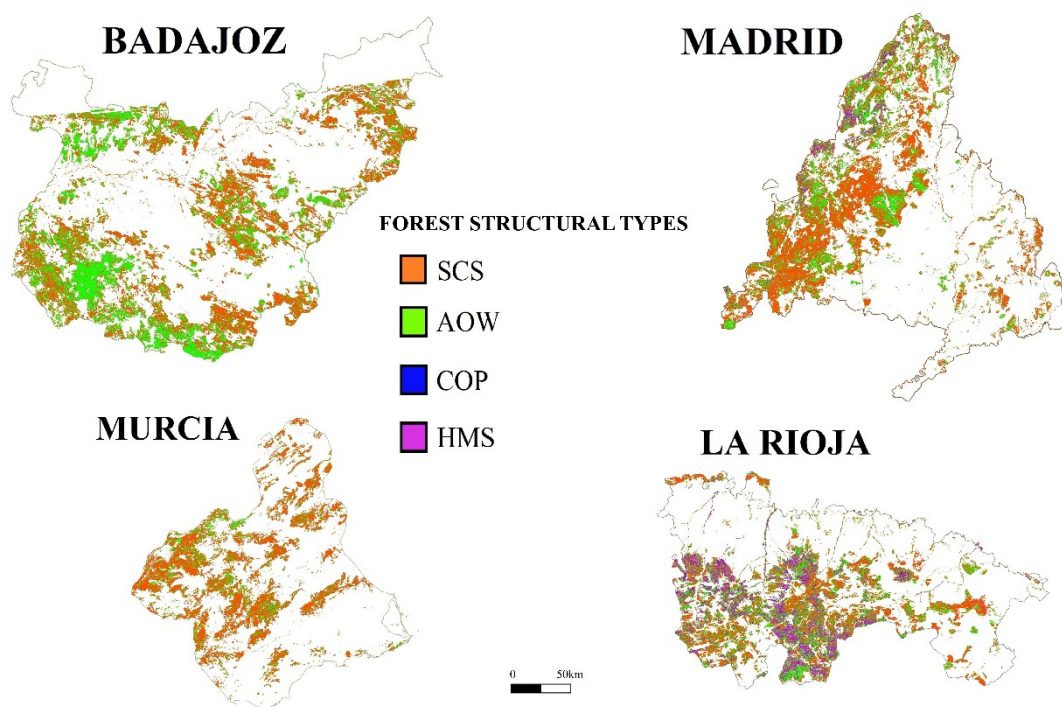


Figure S1. Distribution of forest structural type per province with no balanced classes. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

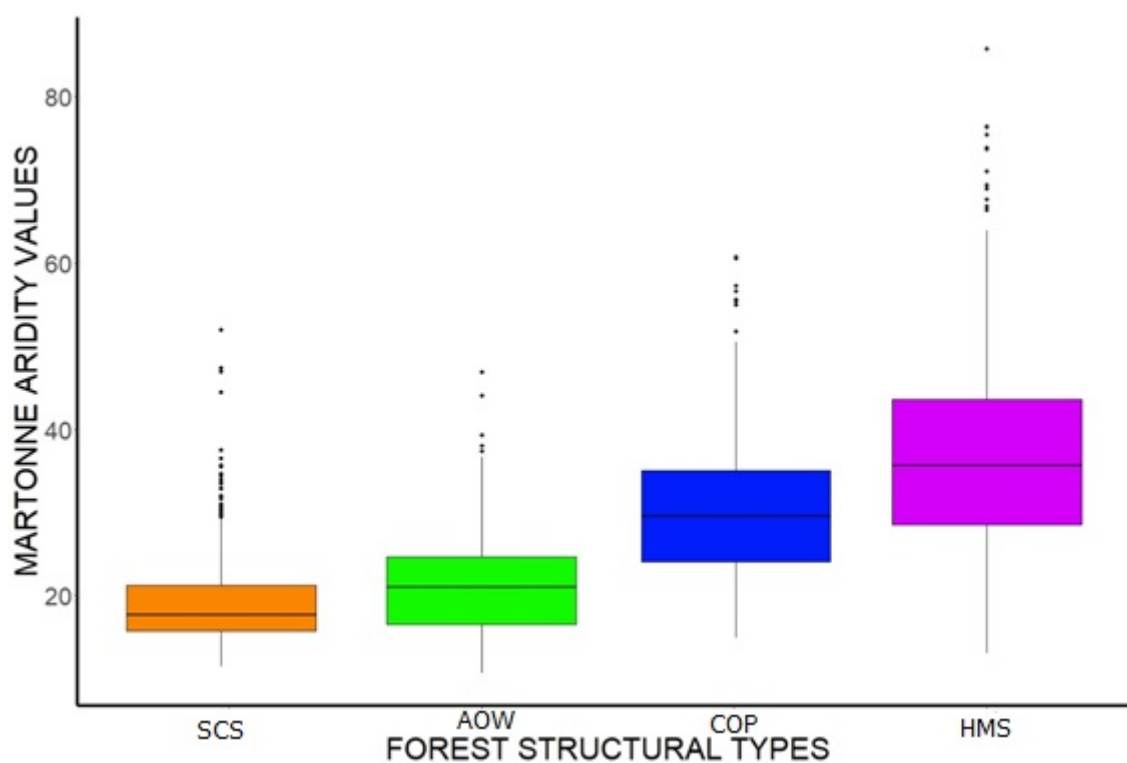


Figure S2. Martonne aridity index per forest structural type. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

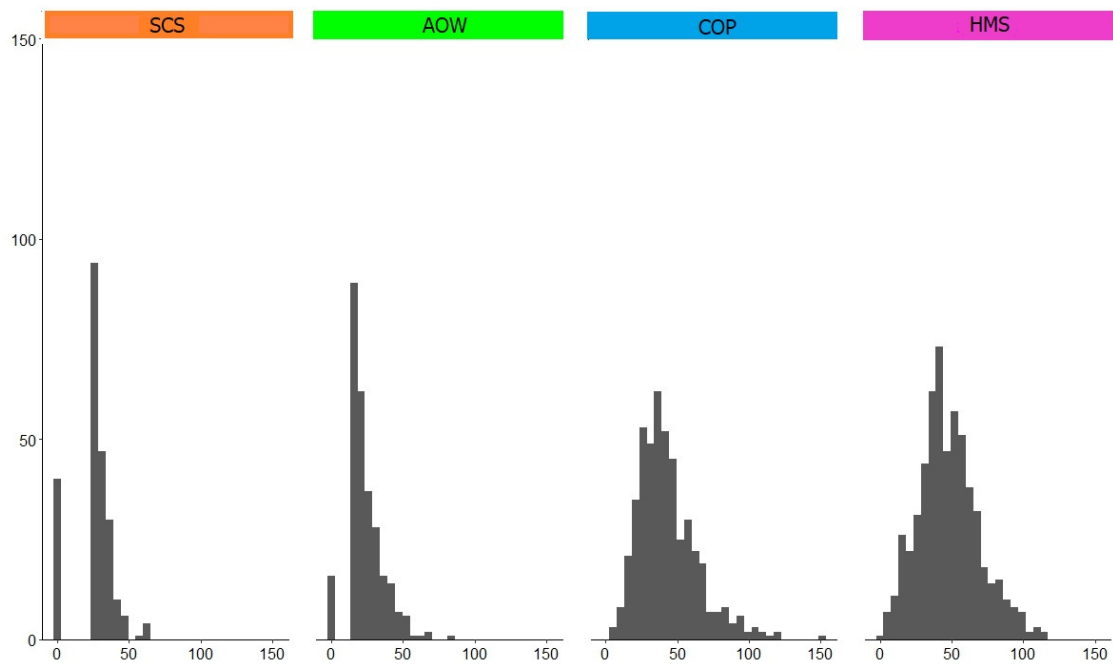


Figure S3. Plot basal area per hectare per cluster. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species.

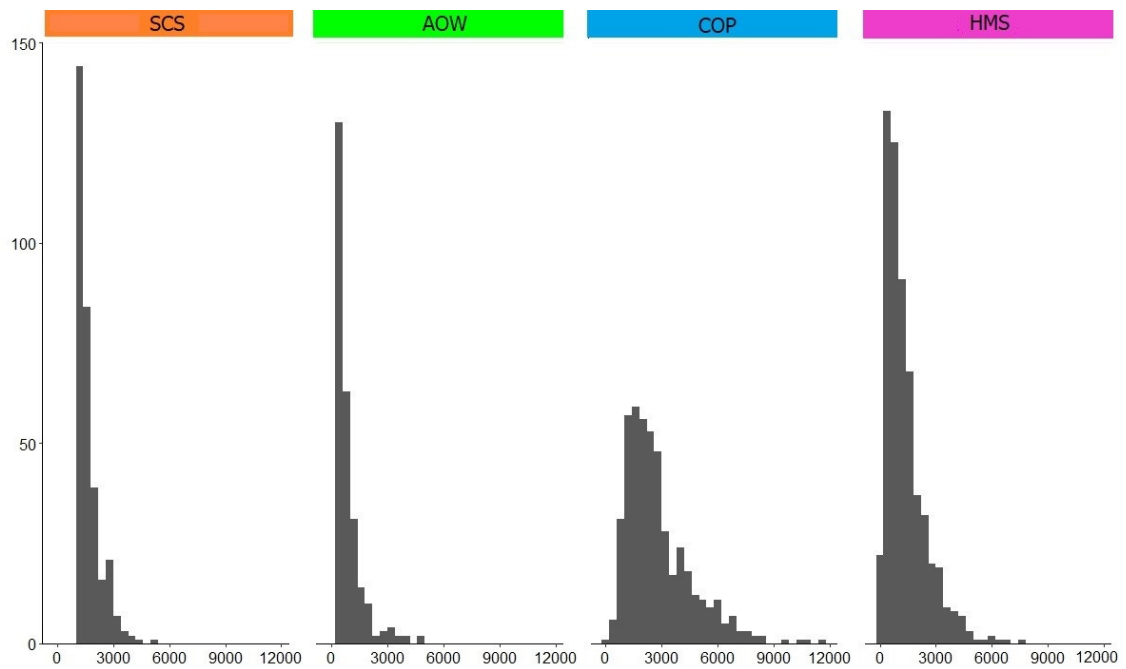


Figure S4. Number of trees per per hectare per cluster. SCS: Sclerophyllous stands; AOW: Agrosilvopastoral and/or Open Woodlands; COP: Coppices and oromediterranean pines; HMS: High mountain species