

Impact of human pressure and forest fragmentation on the Endangered Barbary macaque *Macaca sylvanus* in the Middle Atlas of Morocco

NELLY MÉNARD, YANN RANTIER, ADRIEN FOULQUIER, MOHAMED QARRO LAHCEN CHILLASSE, DOMINIQUE VALLET, JEAN-SÉBASTIEN PIERRE and ALAIN BUTET

TABLE S1 Values of the six environmental factors for each of the 11 forest patches (Fig. 1) included in the analyses of environmental influence on the estimated density of the Barbary macaque *Macaca sylvanus* in the Middle Atlas of Morocco. Three of the 14 forest patches (Bekrit, Senoual and Ras El Ma) were not included in these analyses because they were pooled for estimating density. For details of the calculation of the shape index and the two measures of patch connectivity (distance and connectivity), see the main text.

Forest patch	Index of human pressure* (no. of parcels)	Altitude (m)	Area (km ²)	Shape index	Distance (km)	Connectivity (km ²)
Azrou	2.9 (68)	1,669	83.29	3.318	0.385	74.8
Seheb	2.4 (13)	1,793	19.49	1.423	0.385	121.8
Sidi M'Guild North	1.8 (43)	1,792	142.28	5.047	0.028	89.8
Aït Youssi	3.6 (29)	1,866	47.75	3.545	1.265	64.4
Aïn Leuh	3.3 (15)	1,455	28.53	3.569	0.284	138.7
Sidi M'Guild South	2.5 (13)	1,831	30.71	2.954	0.028	155.6
Nokra	4.0 (7)	2,067	6.8	1.512	0.828	14.6
Jbel Ben IJ	4.0 (14)	2,062	14.85	3.013	0.275	11.3
Feldi	4.0 (4)	2,225	4.97	1.839	0.275	18.4
Mouyougou	2.2 (5)	1,776	12.94	2.252	0.284	140.3
Affenourir	3.0 (2)	1,826	5.43	1.394	1.762	114.5

*From Sogreah-Ttoba (2004); each parcel of a forest fragment was characterized by a value ranging from 0 (minimum pressure) to 2 (maximum pressure) for the intensity of overgrazing by sheep and goats, and the intensity of cedar pruning. We evaluated a level of disturbance (on a scale of 0–4) for each parcel by adding together the two values. The mean level of disturbance (the index of human pressure) was then calculated for each forest patch.

TABLE S2 Area and vegetation composition of the 14 forest patches in the Middle Atlas of Morocco (Fig. 1).

Forest patch	Area (km ²)	Cedar, cedar–oak or pine forest (%)	Mature oak forest (%)	Oak coppice (%)	Open grassland or shrubby formation (%)
Azrou	83.29	57.00	9.12	14.39	19.49
Seheb	19.49	84.44	0.00	2.60	12.96
Sidi M’Guild North	142.28	77.66	3.55	9.63	9.16
Ras el Ma	26.53	62.15	11.83	6.94	19.08
Bekrit	16.42	82.84	0.00	6.05	10.94
Senoual	61.71	75.38	0.00	1.21	23.40
Aït Youssi	47.75	76.63	0.92	6.18	16.27
Aïn Leuh	28.53	6.38	44.27	45.36	3.99
Sidi M’Guild South	30.71	69.17	2.89	6.49	21.44
Nokra	6.80	92.17	0.00	0.04	7.79
Jbel Ben IJ	14.85	46.56	15.45	18.89	19.10
Feldi	4.97	84.52	0.00	6.38	9.10
Mouyougou	12.94	28.42	60.72	3.93	6.92
Affenourir	5.43	60.05	30.51	7.33	2.10

FIG. S1 The 14 forest patches where we surveyed (Fig. 1) for the Barbary macaque *Macaca sylvanus*, showing the estimated density (Table 1) in each patch (see main text for further details). The red shading on the inset indicates the location of the main map in the Middle Atlas of Morocco.

