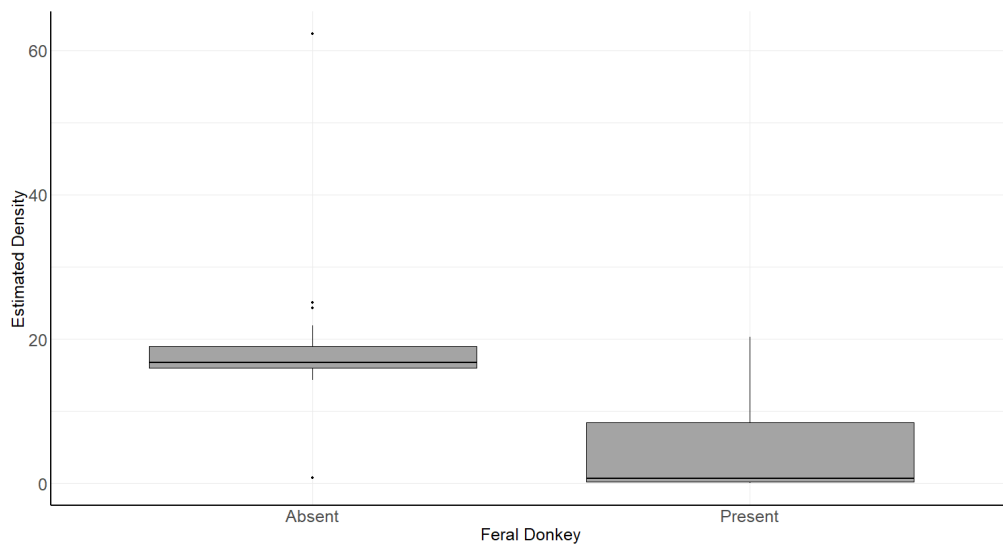


Supplementary Table S1. A list of all converged models ranked according to their AIC. The model formula is a double right-hand formula describing detection covariates followed by density covariates. ~1 ~1 would be a null model. Δ AIC is the difference in AIC compared to the lowest AIC (the best model).

#	Model formula	Key function	Δ AIC
1	~ Covey size + Vegetation cover + Observer ~ Wadi Width + I(Wadi Width ^2) + Disturbance * Distance to hillside + Tree cover	half-normal	0.00
2	~ Covey size + Vegetation cover + Observer ~ Wadi Width + I(Wadi Width ^2) + Disturbance * Distance to hillside + Tree cover + Season	half-normal	1.80
3	~1 ~ Distance to hillside + Disturbance	hazard rate	4.18
4	~1 ~ Distance to hillside + Disturbance + Season	hazard rate	5.93
5	~ Covey size + Observer ~ Vegetation cover + Tree cover + Disturbance + Distance to hillside	half-normal	6.04
6	~ Covey size + Observer ~ Vegetation cover + Tree cover + Disturbance	hazard rate	6.33
7	~ Covey size + Tree cover + Observer ~ Disturbance + Wadi Width + Tree cover + Distance to hillside	hazard rate	7.42
8	~ Covey size + Observer ~ Vegetation cover + Distance to hillside + Tree cover + Disturbance	hazard rate	7.67
9	~ Covey size + Observer ~ Vegetation cover + Tree cover + Disturbance + Distance to hillside + Season	half-normal	8.01
10	~ Observer + Tree cover ~ Disturbance + Distance to hillside	hazard rate	8.27
11	~1 ~1	hazard rate	38.12
12	~1 ~1	half-normal	39.28



Supplementary Figure S1. Boxplot showing the estimated density of the Arabian Partridge in sites where feral donkeys were not recorded (absent) and in sites where feral recorded (present) in Harrat Uwayrid Biosphere Reserve, Saudi Arabia. Black lines in boxes represent median values of the estimated density, while the lower and upper box edges represent the 25th and 75th percentile of the density, respectively.