

Short Communication

Density of the Vulnerable Sunda clouded leopard *Neofelis diardi* in two commercial forest reserves in Sabah, Malaysian Borneo

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APPENDIX 1 Detection data for four Sunda clouded leopards *Neofelis diardi*.

Camera-trap station	Individual Sunda clouded leopards				
	1	2	3	4	5
Tangkulap-Pinangah Forest Reserve					
St 1	0	0	0	0	0
St 2	0	1	0	0	0
St 3	0	0	0	0	0
St 4	0	0	0	0	0
St 5	0	0	0	0	0
St 6	0	0	0	0	0
St 7	0	0	0	0	0
St 8	0	0	0	0	0
St 9	0	0	0	0	0
St 10	0	0	0	0	0
St 11	0	0	0	0	0
St 12	3	0	0	0	0
St 13	2	1	0	0	0
St 14	0	0	0	0	0
St 15	0	0	0	0	0
St 16	1	1	0	0	0
St 17	1	0	0	0	0
St 18	0	0	0	0	0
St 19	0	0	0	0	0
St 20	0	0	0	0	0
St 21	0	0	0	0	0
St 22	0	0	0	0	0
St 23	0	0	0	0	0
St 24	0	1	0	0	0
St 25	0	0	0	0	0
St 26	0	0	0	0	0
St 27	0	0	0	0	0
St 28	1	1	1	0	0
St 29	0	0	0	0	0
St 30	0	1	1	0	0
St 31	0	0	0	0	0
St 32	0	0	0	0	0
St 33	0	1	0	0	0
St 34	0	2	0	0	0
St 35	0	0	0	0	0
St 36	0	1	0	0	0
St 37	0	0	0	0	0
St 38	0	0	0	0	0
St 39	0	0	0	0	0
St 40	0	0	0	0	0
St 41	0	0	0	0	0

APPENDIX 1 (Continued)

Camera-trap station	Individual Sunda clouded leopards				
	1	2	3	4	5
St 42	0	0	0	1	0
St 43	0	1	0	0	0
St 44	0	0	0	0	0
St 45	0	0	0	0	0
St 46	0	0	0	0	0
St 47	0	1	0	0	0
St 48	0	0	0	0	0
St 49	0	1	0	0	0
St 50	0	1	0	0	0
St 51	0	1	0	0	0
St 52	0	0	0	0	0
St 53	0	0	0	0	0
St 54	0	1	0	0	0
St 55	0	0	0	0	0
St 56	0	0	0	0	0
St 57	0	0	0	0	0
St 58	0	1	0	0	0
St 59	0	0	0	0	1
St 60	0	0	0	0	0
St 61	0	0	0	0	0
St 62	0	0	0	0	0
St 63	0	0	0	0	0
St 64	0	0	0	0	0
Segaliud Lokan Forest Reserve					
St 1	1	0	0	0	0
St 2	0	0	0	0	0
St 3	0	0	0	0	0
St 4	0	0	0	0	0
St 5	0	0	0	0	0
St 6	0	0	0	0	0
St 7	0	0	0	0	0
St 8	0	1	0	0	0
St 9	0	0	0	0	0
St 10	0	0	0	0	0
St 11	0	0	0	0	0
St 12	0	0	1	0	0
St 13	0	0	0	0	0
St 14	0	0	0	0	0
St 15	0	0	0	0	0
St 16	0	0	0	0	0
St 17	0	0	0	0	0
St 18	0	0	0	0	0
St 19	0	0	0	0	0

APPENDIX 1 (Continued)

Camera-trap station	Individual Sunda clouded leopards				
	1	2	3	4	5
St 20	0	1	0	0	0
St 21	0	0	0	0	0
St 22	0	0	0	0	0
St 23	0	0	0	1	0
St 24	0	0	0	0	0
St 25	0	0	0	0	0
St 26	0	0	0	0	0
St 27	0	0	0	0	0
St 28	0	0	0	0	0
St 29	0	0	0	0	0
St 30	0	0	0	0	0
St 31	0	0	0	0	0
St 32	0	0	0	0	1
St 33	0	0	0	0	0
St 34	0	0	0	0	0
St 35	0	0	0	0	0
St 36	0	0	0	0	0
St 37	0	0	0	0	0
St 38	0	0	0	1	1
St 39	0	0	0	0	0
St 40	0	0	0	0	0
St 41	0	0	0	2	0
St 42	0	0	0	2	0
St 43	0	0	0	0	0
St 44	0	0	0	0	0
St 45	0	0	0	0	0
St 46	0	0	0	0	0
St 47	0	0	0	0	0
St 48	0	0	0	1	0
St 49	0	0	0	0	0
St 50	0	0	0	0	0
St 51	0	0	0	1	0
St 52	0	0	0	0	0
St 53	0	0	0	0	0
St 54	0	0	0	1	0
St 55	0	0	0	0	0

APPENDIX 2 WinBUGS model code to estimate density of two Sunda clouded leopard populations in Sabah, Malaysian Borneo (Fig. 1). Populations are assumed to have a common movement parameter (sigma).

```

model {

#priors

lam0[1] ~ dgamma(.1,.1) #baseline trap encounter rate site 1
lam0[2] ~ dgamma(.1,.1) #baseline trap encounter rate site 2

psi[1] ~ dunif(0, 1) #probability of an individual being part of the population - site 1
psi[2] ~ dunif(0, 1) #probability of an individual being part of the population - site 2

sigma ~ dunif(0, 15) #movement parameter
sigma2 <- sigma*sigma

#model site 1

for (i in 1:M){ #loop over 0-augmented data set (see Royle et al. 2007)

z1[i] ~ dbern(psi[1]) #indicator whether individual i is part of population
SX1[i] ~ dunif(xl1, xu1) #x-coordinate of activity center
SY1[i] ~ dunif(yl1, yu1) #y-coordinate of activity center

for(j in 1:J1) {
  D21[i,j] <- pow(SX1[i]-trapmat1[j,1], 2) + pow(SY1[i]-trapmat1[j,2],2)
  #distance between activity center and traps
  Eo1[i,j] <- lam0[1]*exp(-D21[i,j]/sigma2) #trap-specific encounter rate
  log(pmean1[i,j]) <- -log(T1) + log(Eo1[i,j]) #adjustment for T1 sampling occasions
  tmp1[i,j] <- pmean1[i,j]*z1[i]
  #adjustment for whether or not individual is part of population
  y1[i,j] ~ dpois(tmp1[i,j])
  #observation model (y1 = matrix with number of photos per individual and trap)
}
}

#model site 2; parameters analogous to site 1

for (k in 1:M){
  z2[k] ~ dbern(psi[2])
  SX2[k] ~ dunif(xl2, xu2)
  SY2[k] ~ dunif(yl2, yu2)

for (l in 1:J2){
  D22[k,l] <- pow(SX2[k]-trapmat2[l,1], 2) + pow(SY2[k]-trapmat2[l,2],2)
  Eo2[k,l] <- lam0[2]*exp(-D22[k,l]/sigma2)
  log(pmean2[k,l]) <- -log(T2) + log(Eo2[k,l])
  tmp2[k,l] <- pmean2[k,l]*z2[k]
  y2[k,l] ~ dpois(tmp2[k,l])
}
}

N1 <- sum(z1[1:M]) #number of activity centers (= abundance) in state space of site 1
N2 <- sum(z2[1:M]) #number of activity centers (= abundance) in state space of site 2

}

```
