

## **Supplementary Material**

Belonging to the manuscript:

Mos, J. & T.R. Hofmeester. The *Mostela*: an adjusted camera-trapping device as a promising non-invasive tool to study and monitor small mustelids.

Supplementary Table S1. Camera types used in the field trials.

| <b>Camera type</b>                  | <b>Trial</b> |
|-------------------------------------|--------------|
| Bushnell Trophy Cam HD              | 2017/2018    |
| Bushnell Trophy Cam HD Essential E3 | 2018         |
| Scout guard Full Color SG560C       | 2018         |
| Scout guard Black IR SG560K-14mHD   | 2018         |
| Browning Dark Ops Pro XD            | 2018         |
| Browning Strike Force HD Pro        | 2018         |
| Primos Proof Generation 3           | 2018         |
| Reconyx Ultrafire XR6               | 2018         |

Supplementary material S2. Model descriptions in BUGS language.

## 2017 model:

"

```
model{
# Priors and model for params

int.psi ~ dunif(0,1)      #Intercept for occupancy probability
int.p ~ dunif(0,1)        #Intercept for detection probability

# prior for random intercept per location
sigma_r ~ dunif(0,100)
tau_r <- 1/(sigma_r*sigma_r)
for(j in 1:n.loc){
r.psi[j] ~ dnorm(0,tau_r)
}

# Priors for random intercepts per month
sigma_r ~ dunif(0,100)
tau_r <- 1/(sigma_r*sigma_r)
sigma_r2 ~ dunif(0,100)
tau_r2 <- 1/(sigma_r2*sigma_r2)
for(t in 1:n.month){
r.psi[t] ~ dnorm(0,tau_r)
r.p[t] ~ dnorm(0,tau_r2)
}

#Slope of p covariate :: diameter
beta.lp ~ dnorm(0,0.001)

#Likelihood

for(i in 1:n.site){

#Occurrence in site i
z[i] ~ dbern(psi[i])
logit(psi[i]) <- logit(int.psi) + r.psi[loc[i]] + r.psi2[month[i]]

for(k in 1:n.days){

# detection probability on day k
y[i,k] ~ dbern(mu.y[i,k])
mu.y[i,k] <- z[i] * p[i,k]
logit(p[i,k]) <- logit(int.p) + r.p[month[i]] +
beta.lp * diameter[i]
}
}
}
```

```

# model for missing covariates
for(i in 1:n.site){
diameter[i] ~ dbern(q) #prior model for wheter diameter is 0 (8 cm) or 1 (10 cm)
}
# vague prior for prob of diameter being 1
q ~ dbeta(1,1)

} #End Model
"

```

```

## 2018 model:
"
model{

# Priors and model for params
int.psi ~ dunif(0,1)      #Intercept for occupancy probability

int.p ~ dunif(0,1)       #Intercept for detection probability

# prior for random intercept
sigma_r ~ dunif(0,100)
tau_r <- 1/(sigma_r*sigma_r)
for(j in 1:n.loc){
r.psi[j] ~ dnorm(0,tau_r)
}

sigma_r2 ~ dunif(0,100)
tau_r2 <- 1/(sigma_r2*sigma_r2)
sigma_r3 ~ dunif(0,100)
tau_r3 <- 1/(sigma_r3*sigma_r3)
for(j in 1:n.month){
r.psi2[j] ~ dnorm(0,tau_r2)
r.p[j] ~ dnorm(0,tau_r3)
}

#Slope of p covariate :: diameter
beta.lp ~ dnorm(0,0.001)

#Likelihood (or basic model structure)
for(i in 1:n.site){

#Occurrence in site i
z[i] ~ dbern(psi[i])
logit(psi[i]) <- logit(int.psi) + r.psi[loc[i]] + r.psi2[month[i]]

for(k in 1:n.days){

# detection probability on day k
y[i,k] ~ dbern(mu.y[i,k])
mu.y[i,k] <- z[i] * p[i,k]
logit(p[i,k]) <- logit(int.p) + r.p[month[i]] +
beta.lp * diameter[i]
}
}

} #End Model
")

```

Supplementary table S3. Estimated daily detection probability per month (as based on a random intercept) per year for both 8 and 10 cm tubes. The 95% credibility interval of the estimate is given between brackets.

| Month     | 2017             |                  | 2018             |                  |
|-----------|------------------|------------------|------------------|------------------|
|           | <i>8 cm</i>      | <i>10 cm</i>     | <i>8 cm</i>      | <i>10 cm</i>     |
| February  | -                | -                | 0.14 (0.00-0.82) | 0.19 (0.00-0.87) |
| March     | 0.18 (0.00-0.84) | 0.26 (0.00-0.91) | 0.12 (0.00-0.76) | 0.16 (0.00-0.83) |
| April     | 0.19 (0.00-0.85) | 0.27 (0.00-0.92) | 0.09 (0.04-0.16) | 0.13 (0.05-0.26) |
| May       | 0.20 (0.00-0.88) | 0.28 (0.00-0.94) | 0.10 (0.06-0.14) | 0.15 (0.09-0.22) |
| June      | 0.07 (0.02-0.17) | 0.11 (0.03-0.25) | 0.02 (0.01-0.05) | 0.04 (0.01-0.08) |
| July      | 0.20 (0.13-0.29) | 0.32 (0.21-0.45) | 0.03 (0.01-0.06) | 0.05 (0.02-0.10) |
| August    | 0.20 (0.14-0.28) | 0.32 (0.23-0.43) | 0.18 (0.12-0.24) | 0.25 (0.17-0.35) |
| September | 0.21 (0.11-0.34) | 0.33 (0.21-0.47) | 0.18 (0.13-0.24) | 0.26 (0.16-0.38) |
| October   | 0.08 (0.02-0.18) | 0.14 (0.03-0.31) | -                | -                |

Supplementary table S4. Estimated detection probability for a 14 day deployment per month (as based on a random intercept) per year for both 8 and 10 cm tubes. The 95% credibility interval of the estimate is given between brackets.

| <b>Month</b> | <b>2017</b>      |                  | <b>2018</b>      |                  |
|--------------|------------------|------------------|------------------|------------------|
|              | <i>8 cm</i>      | <i>10 cm</i>     | <i>8 cm</i>      | <i>10 cm</i>     |
| February     | -                | -                | 0.50 (0.01-1.00) | 0.58 (0.01-1.00) |
| March        | 0.70 (0.02-1.00) | 0.80 (0.04-1.00) | 0.69 (0.41-0.91) | 0.82 (0.53-0.99) |
| April        | 0.71 (0.03-1.00) | 0.81 (0.05-1.00) | 0.75 (0.60-0.88) | 0.88 (0.74-0.97) |
| May          | 0.73 (0.03-1.00) | 0.82 (0.06-1.00) | 0.27 (0.08-0.52) | 0.38 (0.12-0.70) |
| June         | 0.56 (0.20-0.92) | 0.75 (0.36-0.98) | 0.35 (0.18-0.56) | 0.49 (0.24-0.78) |
| July         | 0.95 (0.86-0.99) | 0.99 (0.96-1.00) | 0.93 (0.84-0.98) | 0.98 (0.93-1.00) |
| August       | 0.95 (0.88-0.99) | 0.99 (0.97-1.00) | 0.93 (0.86-0.98) | 0.98 (0.92-1.00) |
| September    | 0.95 (0.81-1.00) | 0.99 (0.96-1.00) | 0.50 (0.01-1.00) | 0.58 (0.01-1.00) |
| October      | 0.63 (0.20-0.94) | 0.80 (0.33-0.99) | -                | -                |