

APPENDIX

Appendix S1: WinBUGS model for analysis of *Clidemia hirta* abundance and disturbance by wild pigs at Pasoh Forest Reserve, Peninsular Malaysia

model {

```
for (i in 1:N.section) {                                     †1
  CLIDEMIA[i] ~ dpois(lambda[i])                             †2
  lambda[i] <- exp(
    a[1, Tr[i]] + d[1] * DISTANCE[i] + ENVIRONMENT[1, i])   †3, 4, 5
  DISTURBANCE[i] ~ dbin(p[i], N.dist)                         †6, 7
  disturbance[i] ~ dbin(p[i], N.dist)                         †6, 8
  logit(p[i]) <- a[2, Tr[i]] + d[2] * DISTANCE[i] + ENVIRONMENT [2, i]

  for (j in 1:2) {                                          †9
    ENVIRONMENT [j, i] ~ dnorm(m[j, i], tau[j])
  }

  m[1, i] <- (                                              †10
    (ENVIRONMENT [1, LeftRight[i, 1]]
    + ENVIRONMENT [1, LeftRight[i, 2]]) * (c[1] - 0.5)       †11, 12
    + b[1] * (disturbance[i] - Mean.dist)                    †13
    + b[2] * GAP[i] + b[3] * SWAMP[i]                         †14, 15
  )

  m[2, i] <- (                                              †16
    (ENVIRONMENT[2, LeftRight[i, 1]]
    + ENVIRONMENT [2, LeftRight[i, 2]]) * (c[2] - 0.5)
    + b[4] * GAP[i] + b[5] * SWAMP[i])
```

```

    }

Tau.noninformative <- 1.0E - 4
P.beta <- 1.0E + 1
P.gamma <- 1.0E - 2

for (k in 1:N.transect) {
    for (j in 1:2) {a[j, k] ~ dnorm(0, Tau.noninformative)}
}
for (j in 1:N.b) {b[j] ~ dnorm(0, Tau.noninformative)}
for (j in 1:N.c) {c[j] ~ dbeta(P.beta, P.beta)}
for (j in 1:N.d) {d[j] ~ dnorm(0, Tau.noninformative)}
for (j in 1:2) {tau[j] ~ dgamma(P.gamma, P.gamma)}
}

```

- †1: "N.Section" = total number of 5 m survey sections (3 transects x 1000 m = 600)
- †2: Clidemia abundance
- †3: "DISTANCE" = centered distance from forest to Oil Plam edge (unit = 1 km)
- †4: "a" = intercept estimated at each transect which is expressed by "Tr[i]"
- †5: ENVIRONMENT = virtual variable produced at each section as an assemblage of environmental factors
- †6: Disturbance by Wild Pigs
- †7: "DISTURBANCE" = observed value. "N.dist" = number of levels of disturbance
- †8: "disturbance" = predicted value which is used in model of abundance.
- †9: j for model of abundance and of disturbance
- †10: Linear predictor for "ENVIRONMENT" in the abundance model
- †11: "LeftRight[i, j]" gives the order of neighboring two sections
- †12: "c" gives the intensity of spatial auto-correlation as determining the weight of

“ENVIRONMENT” to be shared by neighboring section (smoothing process)

- †13: Centered “disturbance” predicted by †8
- †14: "GAP" = presence of canopy gap
- †15: "SWAMP" = presence of swamp
- †16: Linear predictor for “ENVIRONMENT” in the disturbance model
- †17: “N.transect” = the number of transects
- †18: Prior distribution for intercept
- †19: Prior distribution of coefficients
- †20: Hyperprior distribution of the precision of “ENVIRONMENT”