

Equations

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Ailanthus altissima

Mostly from Crandall & Knight 2017, but with fire effects left out and notation changed slightly for consistency's sake

$$n(y, t + 1) = vgf_d(y)B(t) + \int_L^U [P(y, x) + vgF(y, x) + C(y, x)]n(x, t)dx$$

$$P(y, x) = s(x)g(y, x)$$

$$F(y, x) = f_p(x)f_s(x)f_d(y)$$

$$C(y, x) = c_d(y)h_n(x)$$

$$B(t + 1) = v_s s_b B(T) + v_g b \int_L^U [f_p(x)f_s(x)]n(x, t)dx$$

Control Treatment Parameters

$$\text{Logit}(s(x)) = 0.944 + 0.063x$$

$$g(y, x) = 1.05x$$

$$sd(g(y, x)) = 13.46257$$

$$\log(f_s(x)) = 6.86 + 0.019y$$

$$\text{logit}(f_p(x)) = -27.85 + 0.25y$$

$$f_d = \text{Normal}(\mu = 0.7, \sigma = 0.245)$$

$$h_n(x) = 0.62$$

$$c_d(y) = \text{Normal}(\mu = 2.97, \sigma = 1.63)$$

$$L = 0.45$$

$$U = 231$$

Competitor Removal Treatment Parameters

$$\text{Logit}(s(x)) = 0.093 + 0.31x$$

$$g(y, x) = 1.04x$$

$$sd(g(y, x)) = 9.772983$$

$$\begin{aligned}
\log(f_s(x)) &= 6.86 + 0.019y \\
\text{logit}(f_p(x)) &= -27.85 + 0.25y \\
f_d &= \text{Normal}(\mu = 1.5, \sigma = 0.88) \\
h_n(x) &= 1.81 \\
c_d(y) &= \text{Normal}(\mu = 2.96, \sigma = 1.65)
\end{aligned}$$

$$L = 0.27$$

$$U = 231$$

Constants

$$v = 0.025$$

$$g = 0.14583$$

Discretization Rules

Quadrature routine: midpoint rule

Number of Meshpoints: 50

Euonymus alatus

Eqs 1-4 adapted from Kuss et al. 2008

$$\begin{aligned}
n(y, t + 1) &= \int_L^U [P(y, x)]n(x, t)dx + \int_L^U [F(y, x)]n(x, t - 1)dx + \int_L^U [F(y, x)]n(x, t - 2)dx \\
P(y, x) &= s(x)g(y, x) \\
F(y, x)n(x, t - 1) &= E_{p_1}f_p(x, t - 1)f_s(x, t - 1)f_d(y, t + 1)n(x, t - 1) \\
F(y, x)n(x, t - 2) &= E_{p_2}f_p(x, t - 2)f_s(x, t - 2)f_d(y, t + 1)n(x, t - 2)
\end{aligned}$$

Control Treatment Parameters

$$\begin{aligned}
\text{Logit}(s(x)) &= -1.3459 + 0.31055x + -0.00013x^2 \\
g(y, x) &= 82.295 + f_g(x) \text{ where } f_g(x) \text{ is a standard smooth function of } x \\
sd(g(y, x)) &= 37.34628 \\
\text{Log}(f_s(x)) &= 1.178 + 0.0157y \\
\text{Logit}(f_p(x)) &= -7.5401 + 0.03225y \\
f_d(y) &= \text{Normal}(\mu = 7.545, \sigma = 2.7695)
\end{aligned}$$

Competitor Removal Treatment Parameters

$$\begin{aligned}
\text{Logit}(s(x)) &= 1.5086 + 0.03314x + 0.00117x^2 \\
g(y, x) &= 82.551 + f_g(x) \text{ where } f_g(x) \text{ is a standard smooth function of } x \\
sd(g(y, x)) &= 37.61039 \\
\text{Log}(f_s(x)) &= 1.178 + 0.0157y \\
\text{Logit}(f_p(x)) &= -7.5401 + 0.03225y
\end{aligned}$$

$$f_d(y) = Normal(\mu = 7.545, \sigma = 2.7695)$$

Constants

$$E_{p_1} = 0.1588 \text{ (Brand et al. 2012)}$$

$$E_{p_2} = 0.00224 \text{ (Brand et al. 2012)}$$

$$L = 2.96$$

$$U = 405.6$$

Discretization Rules

Quadrature Routine: midpoint rule

Number of Meshpoints: 500

Ligustrum obtusifolium

$$n(y, t + 1) = \int_L^U [P(y, x)]n(x, t)dx + \int_L^U [F(y, x)]n(x, t - 1)dx$$

$$P(y, x) = s(x)g(y, x)$$

$$F(y, x) = E_p g_i f_p(x, t - 1) f_s(x, t - 1) f_d(y, t + 1)$$

Control Treatment Parameters

$$Logit(s(x)) = -0.352 + 0.122x + -0.000213x^2$$

$$g(y, x) = 5.781 + 0.988x$$

$$sd(g(y, x)) = 20.55699$$

$$Logit(f_p(x)) = -11.489 + 0.08368x$$

$$Log(f_s(x)) = 2.6204 + 0.01256x$$

$$f_d(y) = Normal(\mu = 5.6655, \sigma = 2.0734)$$

Competitor Removal Treatment Parameters

$$Logit(s(x)) = 0.0209 + 0.0831x + -0.00012999x^2$$

$$g(y, x) = 7.229 + 0.988x$$

$$sd(g(y, x)) = 21.72262$$

$$Logit(f_p(x)) = -11.489 + 0.08368x$$

$$Log(f_s(x)) = 2.6204 + 0.01256x$$

$$f_d(y) = Normal(\mu = 5.6655, \sigma = 2.0734)$$

Constants

$$L = 1.2$$

$$U = 624$$

$$E_p = 0.15, \text{ but see Figure 8B}$$

$$g_i = 0.5067$$

Discretization Rules

Quadrature routine: midpoint rule

Number of Meshpoints: 500

Lonicera maackii

$$n(y, t + 1) = \int_L^U [P(y, x) + F(y, x)]n(x, t)dx$$

$$P(y, x) = s(x)g(y, x)$$

$$F(y, x) = E_p f_p(x) f_s(x) f_d(y)$$

Control Treatment Parameters

$$\text{Logit}(s(x)) = -2.830987 + 0.403509x + -0.000421x^2$$

$$g(y, x) = 16.884 + 0.9972x$$

$$sd(g(y, x)) = 32.74774$$

$$\text{Logit}(f_p(x)) = -10.4478 + 0.0485x$$

$$\text{Log}(f_s(x)) = 3.391 + 0.0105x$$

$$f_d(y) = \text{Normal}(\mu = 3.118, \sigma = 1.215)$$

Competitor Removal Treatment Parameters

$$\text{Logit}(s(x)) = -2.784776 + .272694x + -0.000175x^2$$

$$g(y, x) = 14.6068 + 0.9964x$$

$$sd(g(y, x)) = 28.01974$$

$$\text{Logit}(f_p(x)) = -10.4478 + 0.0485x$$

$$\text{Log}(f_s(x)) = 3.391 + 0.0105x$$

$$f_d(y) = \text{Normal}(\mu = 3.118, \sigma = 1.215)$$

Constants

$$E_p = 0.003563$$

$$L = 1.26$$

$$U = 482.9$$

Discretization rules

Quadrature routine: midpoint rule

Number of Meshpoints: 500