Maximum entropy model equations for probability of *Pinus banksiana* seedlings occurring based on aspect, *P. banksiana* basal area (pb.ba), other species basal area (other.ba), slope, and vegetation type (vegtyp). Forward hinge features are indicated with a dagger (†) proceeding the variable name. For forward hinge features, if variable < the hinge value (value subtracted from the variable), then the feature function is zero, else the feature function is as written. Reverse hinge features are indicated with a double dagger (‡) proceeding the variable name. For reverse hinge features, if variable < the hinge value (value from which variable is subtracted from) then the feature function is as written, else the feature function is zero. Model visualization and interpretation were based on relative output ($seedlings_p$).

$$
\begin{aligned}
seedlings_s = {} & \left(0.00\left(\frac{aspect - 0.00}{359.51 - 0.00}\right)\right) + \left(0.00\left(\frac{pb.ba - -1.71}{37.55 - -1.71}\right)\right) + \\
& \left(0.00\left(\frac{other.ba - -1.02}{27.72 - -1.02}\right)\right) + \left(-1.12\left(\frac{slope - 0.00}{55.79 - 0.00}\right)\right) + \left(0.00\left(\frac{vegtyp - 1.00}{35.00 - 1.00}\right)\right) + \\
& \left(-1.3\left(\frac{aspect^2 - 0.00}{129244.62 - 0.00}\right)\right) + \left(-0.3\left(\frac{slope^2 - 0.00}{3113.00 - 0.00}\right)\right) + \left(2.48\left(\frac{vegtyp^2 - 1.00}{1225.00 - 1.00}\right)\right) + \\
& \left(-0.37\left(\frac{aspect \times pb.ba - -415.05}{10232.81 - -415.05}\right)\right) + \left(0.96\left(\frac{aspect \times vegtyp - 0.00}{12015.32 - 0.00}\right)\right) + \\
& \left(5.51\left(\frac{pb.ba \times other.ba - -26.95}{312.82 - -26.95}\right)\right) + \left(1.54\left(\frac{pb.ba \times slope - -21.62}{862.31 - -21.62}\right)\right) + \\
& \left(-0.05\left(\frac{pb.ba \times vegtyp - -44.45}{934.85 - -44.45}\right)\right) + \left(-7.04\left(\frac{other.ba \times vegtyp - -26.41}{688.68 - -26.41}\right)\right) + \\
& \left(-1.82\left(\frac{slope \times vegtyp - 0.00}{1523.28 - 0.00}\right)\right) + \left(-3.20\left(\frac{\dagger vegtyp - 29.50}{35.00 - 29.50}\right)\right) + \\
& \left(-0.78\left(\frac{-0.54 - \ddagger other.ba}{-0.54 - -1.02}\right)\right) + \left(-0.51\left(\frac{1.69 - \ddagger slope}{1.69 - 0.00}\right)\right) + \left(-0.53\left(\frac{1.03 - \ddagger pb.ba}{1.03 - -1.71}\right)\right) + \\
& \left(-0.37\left(\frac{1.71 - \ddagger slope}{1.71 - 0.00}\right)\right) + \left(-1.03\left(\frac{\dagger other.ba - 4.18}{27.72 - 4.18}\right)\right) + \left(-1.73\left(\frac{9.50 - \ddagger vegtyp}{9.50 - 1.00}\right)\right) + \\
& \left(-0.45\left(\frac{-0.55 - \ddagger other.ba}{-0.55 - -1.02}\right)\right) + \left(-1.51\left(\frac{\dagger other.ba - 4.08}{27.72 - 4.08}\right)\right) + \\
& \left(-0.58\left(\frac{1.03 - \ddagger pb.ba}{1.03 - -1.71}\right)\right) + \left(-2.21\left(\frac{-0.45 - \ddagger other.ba}{-0.45 - -1.02}\right)\right) + \left(0.36\left(\frac{0.51 - \ddagger other.ba}{0.51 - -1.02}\right)\right) + \\
& \left(-3.62\left(\frac{\dagger other.ba - 4.06}{27.72 - 4.06}\right)\right) + \left(-4.07\left(\frac{\dagger other.ba - 4.05}{27.72 - 4.05}\right)\right) + \\
& \left(-0.51\left(\frac{-0.44 - \ddagger other.ba}{-0.44 - -1.02}\right)\right) + \left(-0.28\left(\frac{0.37 - \ddagger pb.ba}{0.37 - -1.71}\right)\right) + \left(-0.19\left(\frac{2.63 - \ddagger slope}{2.63 - 0.00}\right)\right) + \\
& \left(0.17\left(\frac{\dagger aspect - 347.33}{359.51 - 347.33}\right)\right) + \left(-0.2\left(\frac{2.65 - \ddagger slope}{2.65 - 0}\right)\right) + \left(-0.07\left(\frac{11.69 - \ddagger pb.ba}{11.69 - -1.71}\right)\right) + \\
& \left(-0.11\left(\frac{\dagger slope - 15.91}{55.79 - 15.91}\right)\right) + \left(-0.23\left(\frac{-0.45 - \ddagger other.ba}{-0.45 - -1.02}\right)\right) + \\
& \left(0.04\left(\frac{0.48 - \ddagger other.ba}{0.48 - -1.02}\right)\right) + \left(-0.08\left(\frac{\dagger pb.ba - 17.67}{37.55 - 17.67}\right)\right) + \left(-0.20\left(\frac{1.50 - \ddagger slope}{1.50 - 0.00}\right)\right) +
\end{aligned}
$$

$$\left(0.07\left(\frac{\dagger aspect - 347.15}{359.51 - 347.15}\right)\right) + \left(-0.15\left(\frac{23.46 - \ddagger aspect}{23.46 - 0.00}\right)\right) + \left(-0.04\left(\frac{1.03 - \ddagger pb.ba}{1.03 - -1.71}\right)\right) + \left(-0.02\left(\frac{2.65 - \ddagger slope}{2.65 - 0.00}\right)\right) + \left(-0.15\left(\frac{-0.55 - \ddagger other.ba}{-0.55 - -1.02}\right)\right) + \left(0.01\left(\frac{0.48 - \ddagger other.ba}{0.48 - -1.02}\right)\right) + \left(-0.02\left(\frac{2.64 - \ddagger slope}{2.64 - 0.00}\right)\right) - 2.30$$

$$seedlings_p = \frac{\frac{e^{seedlings_s}}{305.49} \times e^{6.96}}{1 + \frac{e^{seedlings_s}}{305.49} \times e^{6.96}}$$