**Mathematical representations of the dispersal and population dynamic model**

1. The initial population at time (*t*) for each location (*i*) is based on the status (*s*) of the location and a carrying capacity (*k*). Here it is assumed that the population in the native range are at maximum capacity:

Where , 0 = invasive range and 1 = native range

1. The population growth for each location follows a Beverton-Holt growth model with density dependence:

Where *r* is the growth rate

1. Dispersal between locations uses an exponential dispersal kernel and is given by:

Where Dij is the Euclidean distance between locations *i* and *j* and mean (*D*) is the average distance between all locations.