

Wildlife Simulation Package

WiSP

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Concepts in animal abundance estimation

State model

Describes the spatial distribution and characteristics of animals in a region

Who lives here and where are they?

Population: group size, composition (gender, type), position, exposure

Survey design

Describes the covered region, survey units, effort (observers/traps)

Where, how, and how hard we look.

Survey design: plot sampling, removal methods, mark-recapture, distance sampling, etc.

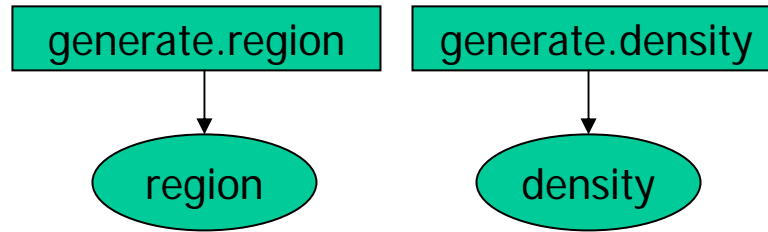
Observation model

Describes the probability that animals with given characteristics are detected.

What we assume we are likely to see.

Detection probability: certain, constant, distance dependent, covariate-dependent

Abundance estimation process in WiSP



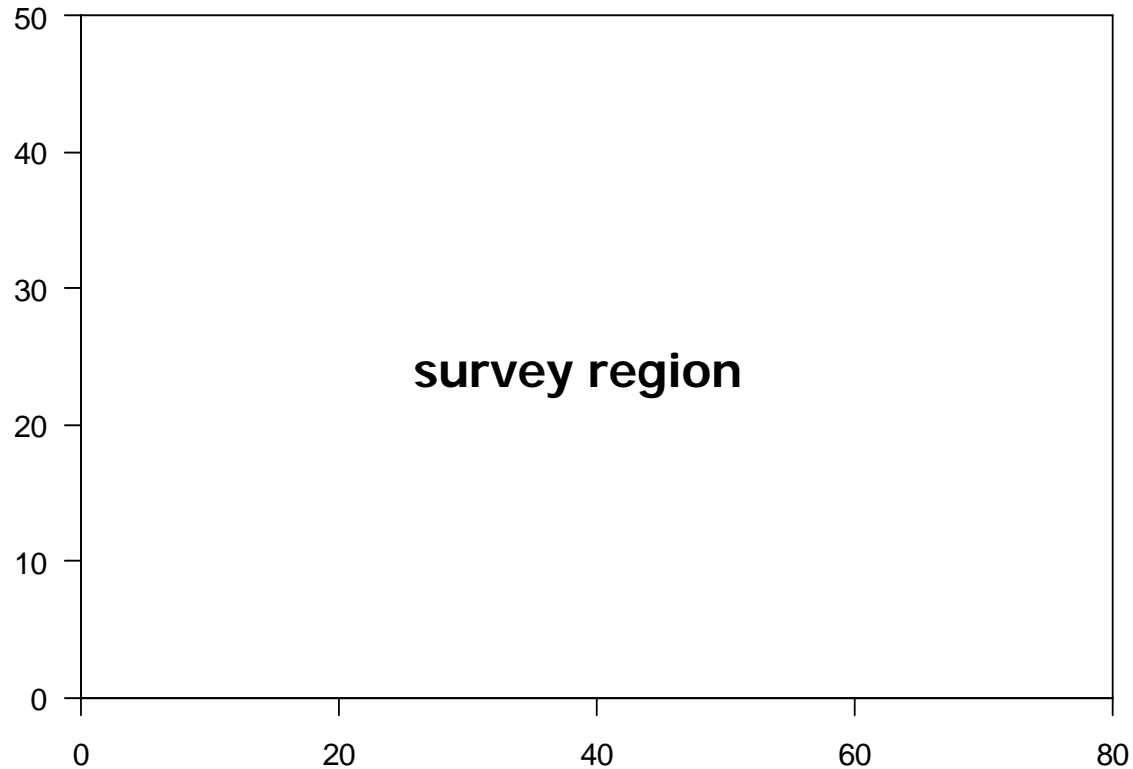
1.) Define survey region & population density

functions

objects

Generating a survey region

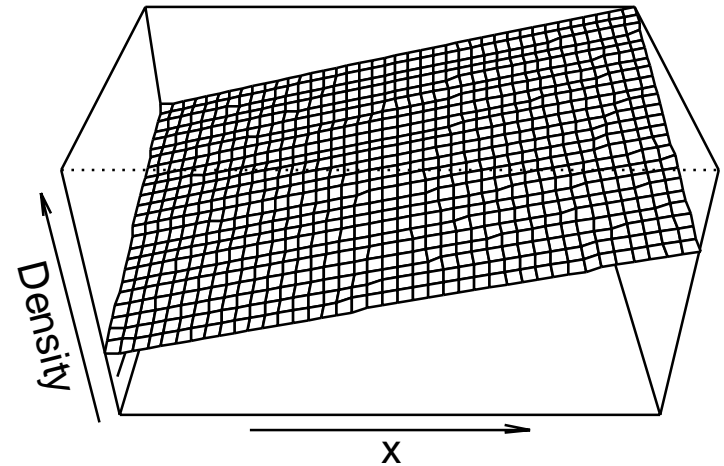
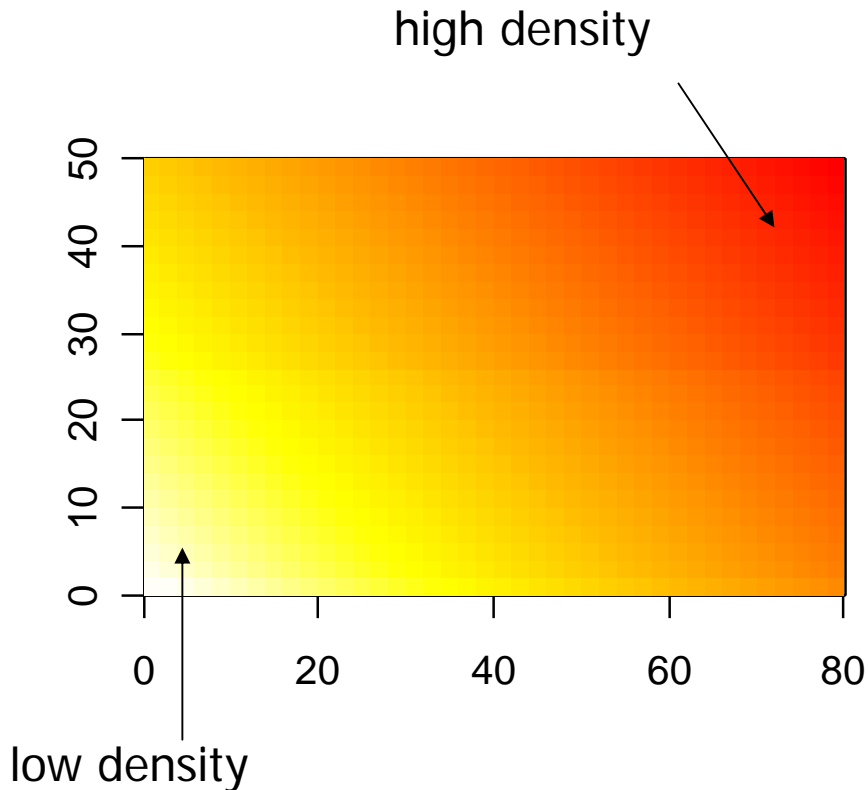
Survey region = An area of given height and width



Generating a population density (1)

The population density defines the spatial distribution of animals in the survey region.

Simple density with linear trend:



Generating a population density (2)

Increase complexity by adding hotspots and coldspots:

