Significance of landscape structure on moose population dynamics

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Moose population in Finland

Moose is the most important game animal in Finland

- 2003: the winter population size was ~115 000 and the annual harvest 84 450 animals

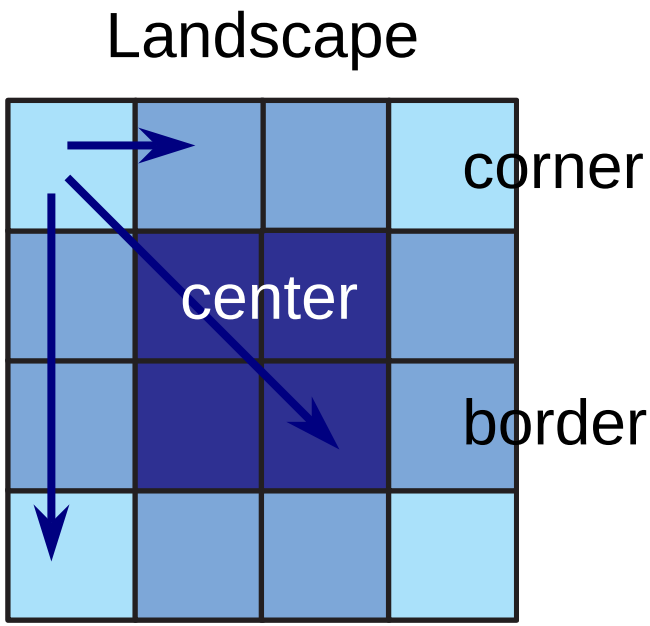
Moose management in Finland

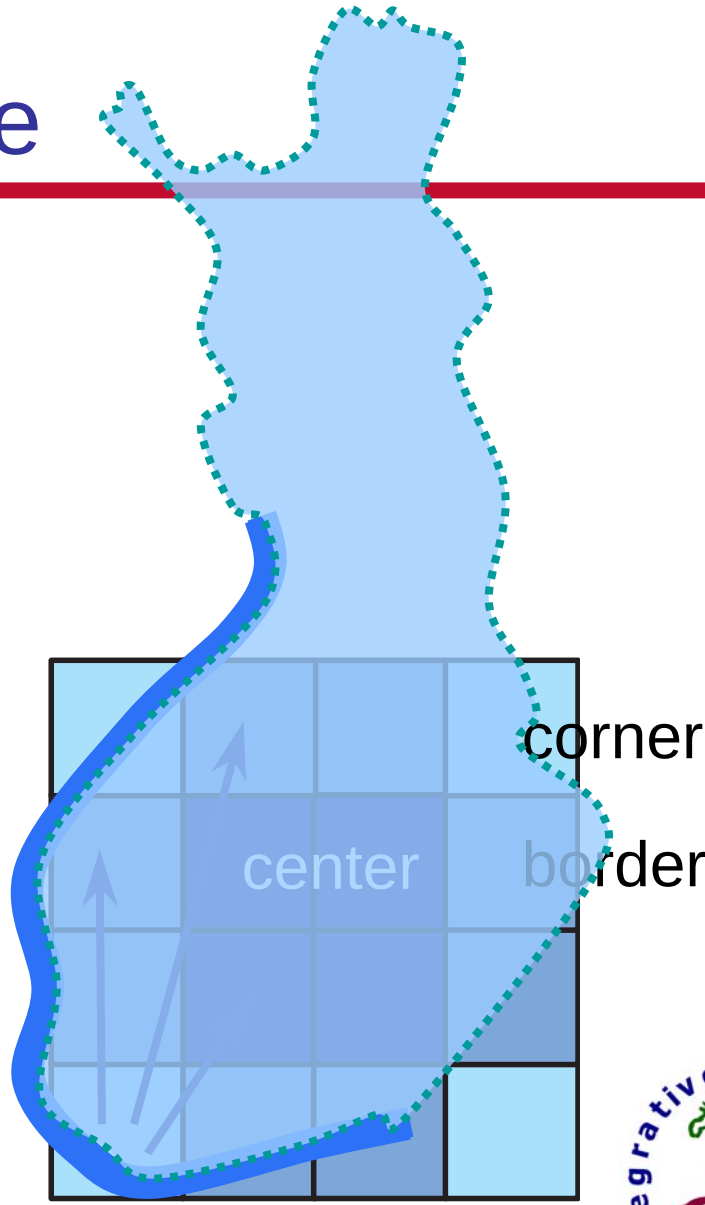
- started in the beginning of the 1970's
- annual censuses
- hunters' observation -cards
- annual harvest rates

Dispersal and landscape

- Dispersal (in general) has very strong effect on population dynamics
- Not much is known about dispersal patterns of Finnish moose
- Landscape affects the dispersal
- Dispersal barriers

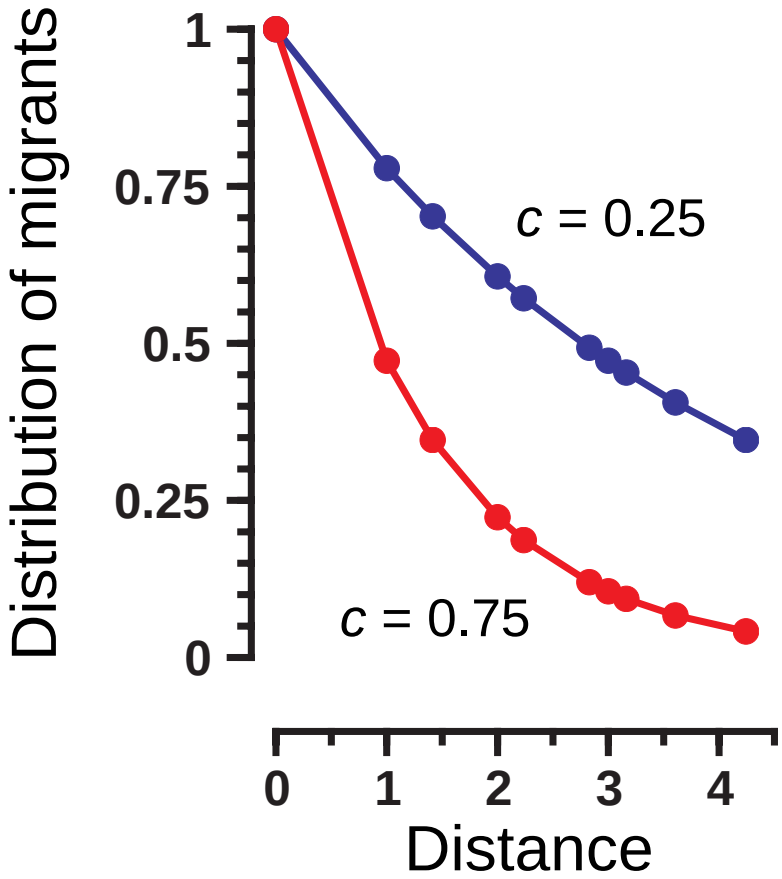
Model landscape





With different values of *c*, animals can reach some/all subregions

Dispersal in the model



c = parameter scaling the dispersal

(when *c* = 1, the dispersal range is very short, when *c* = 0, they are free to move anywhere)

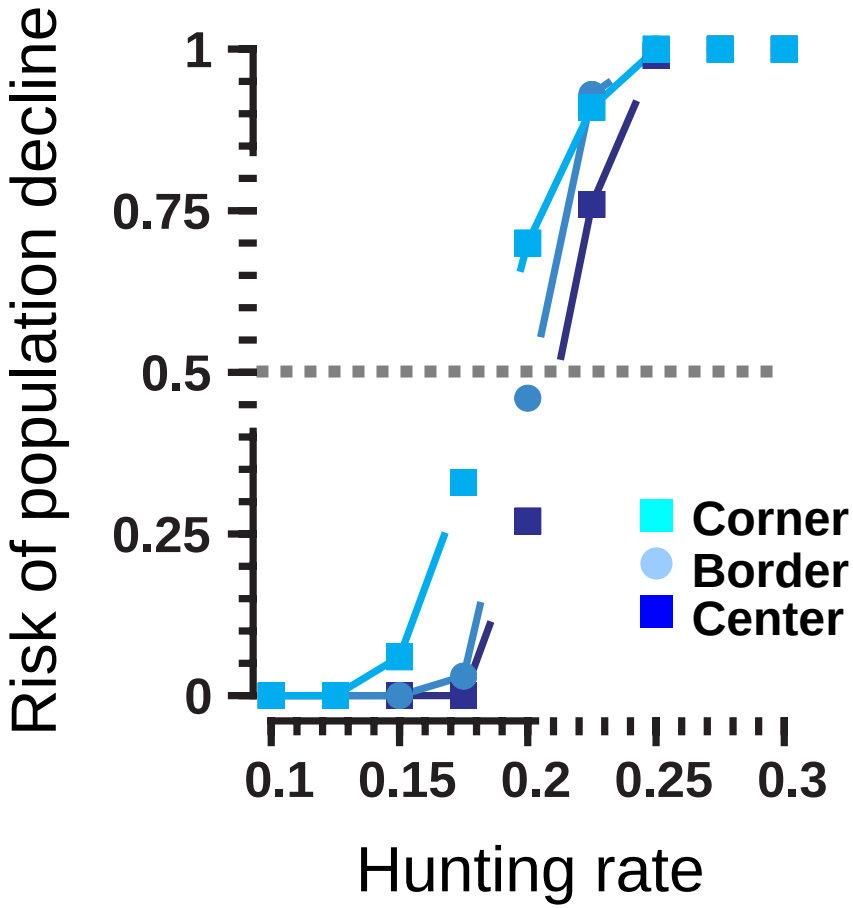
m = migrating or dispersing part of population

Questions

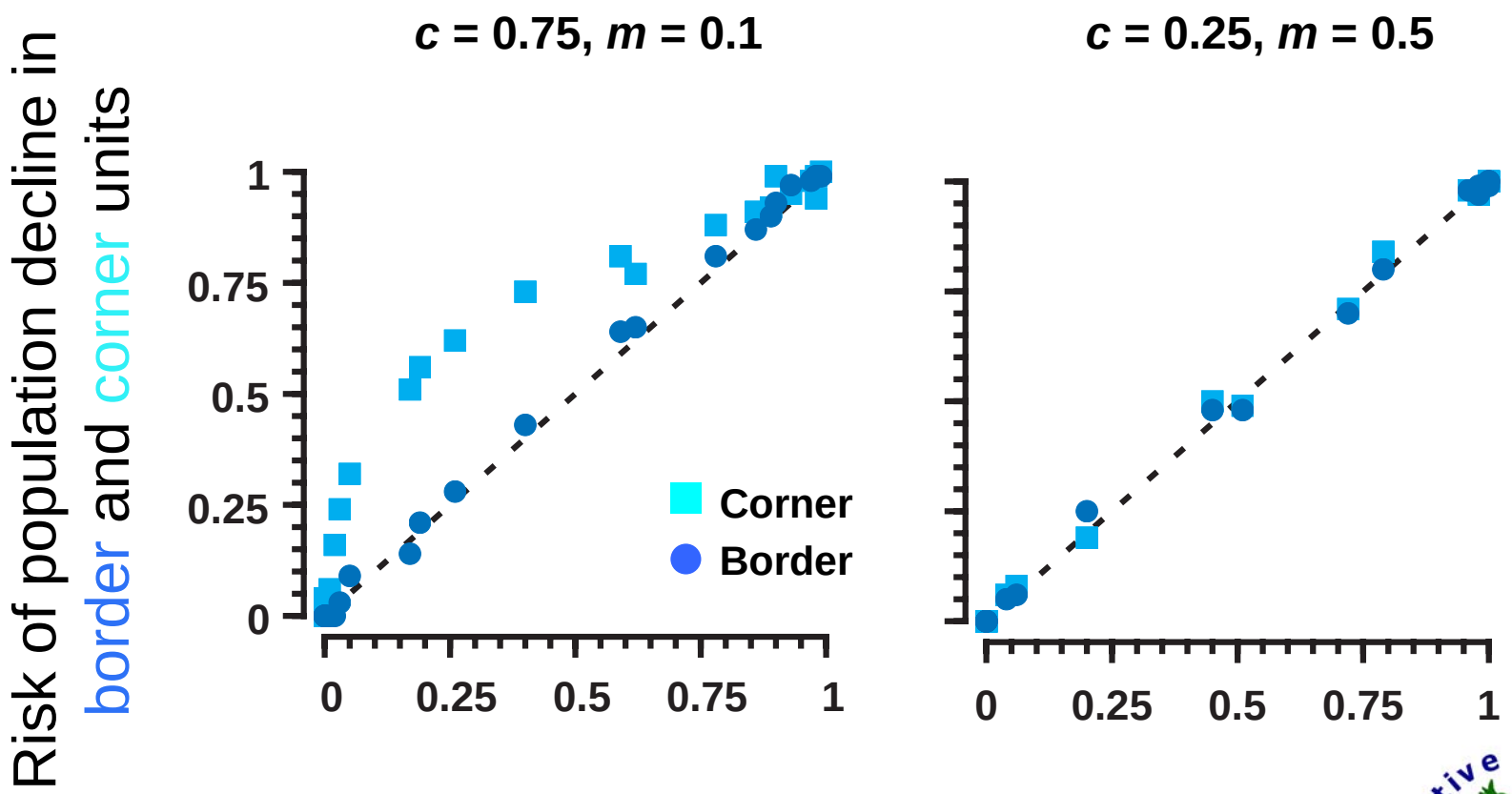
- How much do the populations in corner, border and center regions differ (conserning harvesting)?

- How much does this depend on the extent of dispersal?

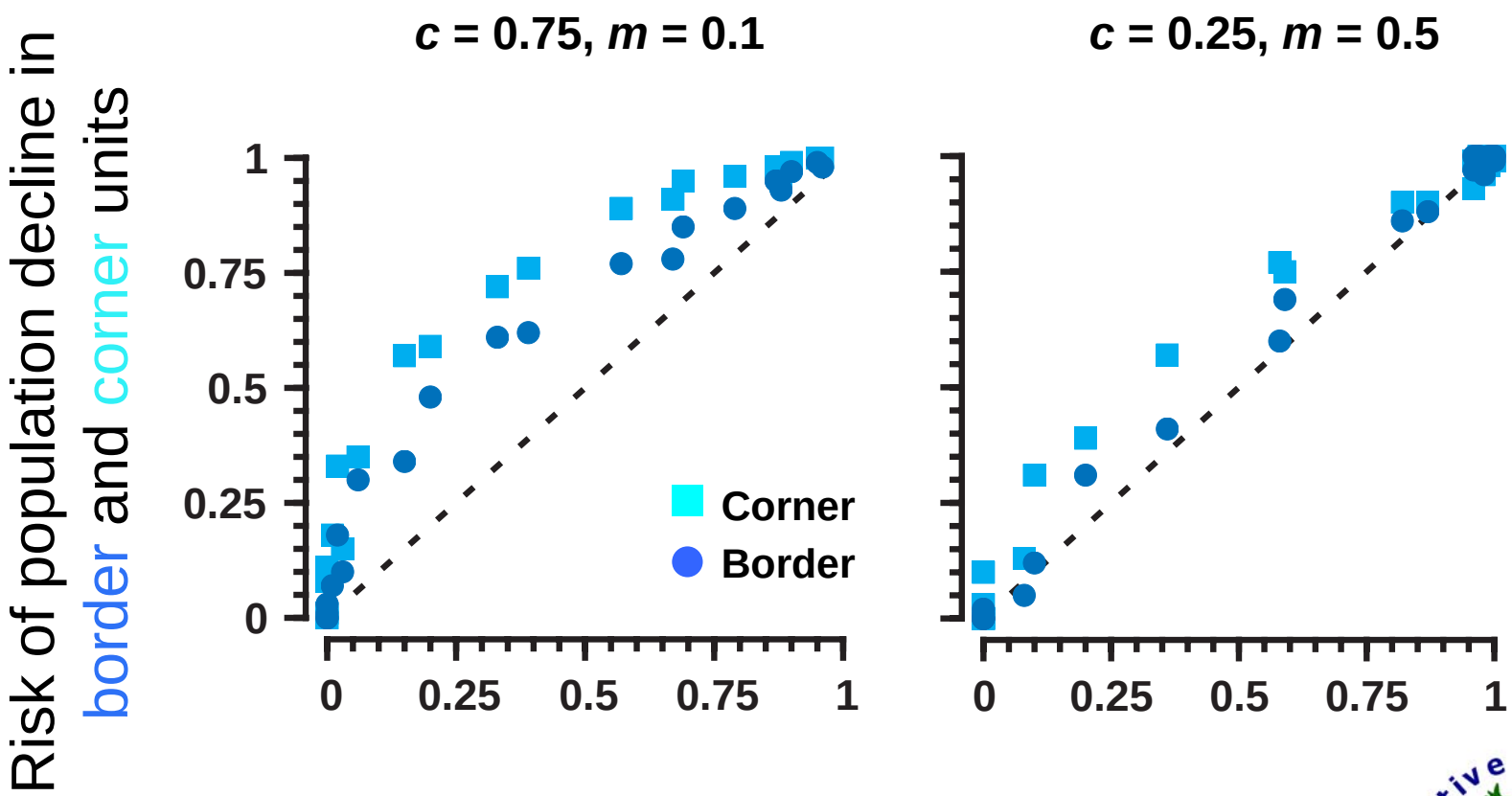
Harvest rates



All individuals (may) disperse



Only young (<2.5 years) disperse



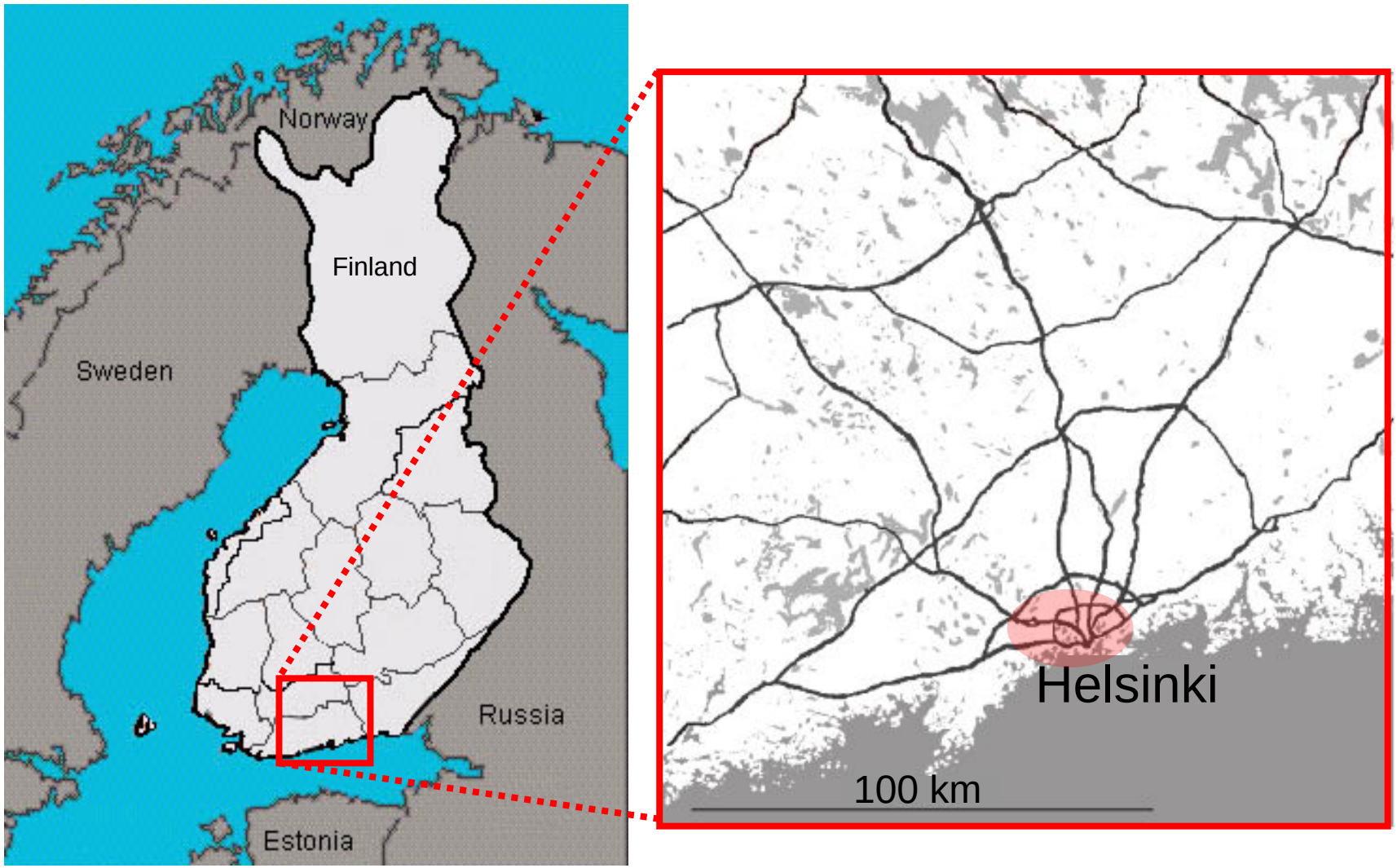
Results

- When dispersal distances are limited and *m* is small, the risk increases in corner (and border) sub-populations
- If *c* and *m* increase, differences even out
- When only young animals are dispersing, areas differ (the risk of population decline is higher in corner and border areas)

Conclusions

- Dispersal do effect on local moose populations
- In areas where immigration is limited, hunting rates should be lower
- More information about dispersal is needed
- There might be many kind of corner, border, or center areas (in different scales)

Moose fences

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