

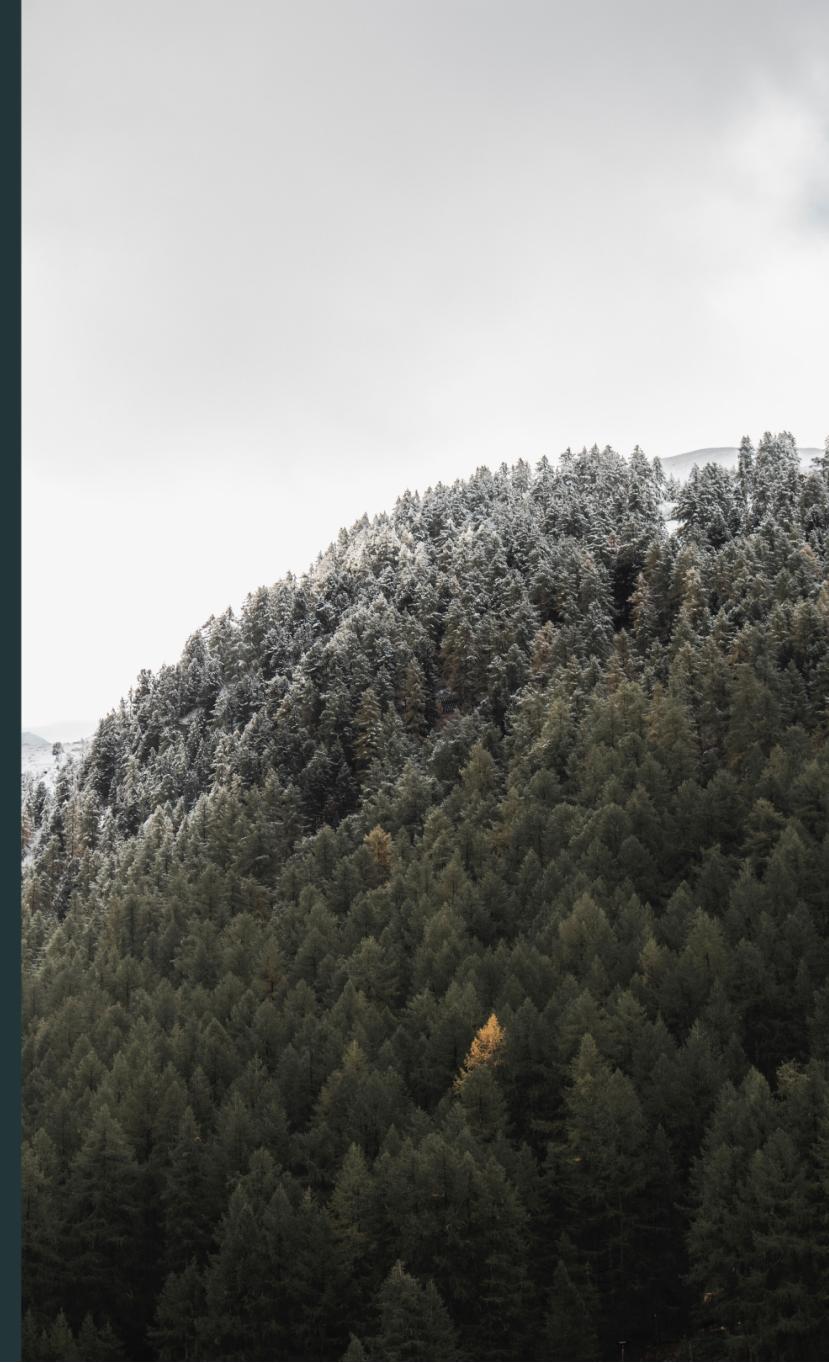
# Distributions are more than habitat amount

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The metapopulation structure is a vital element to distribution change

Victor Cameron

June 2022

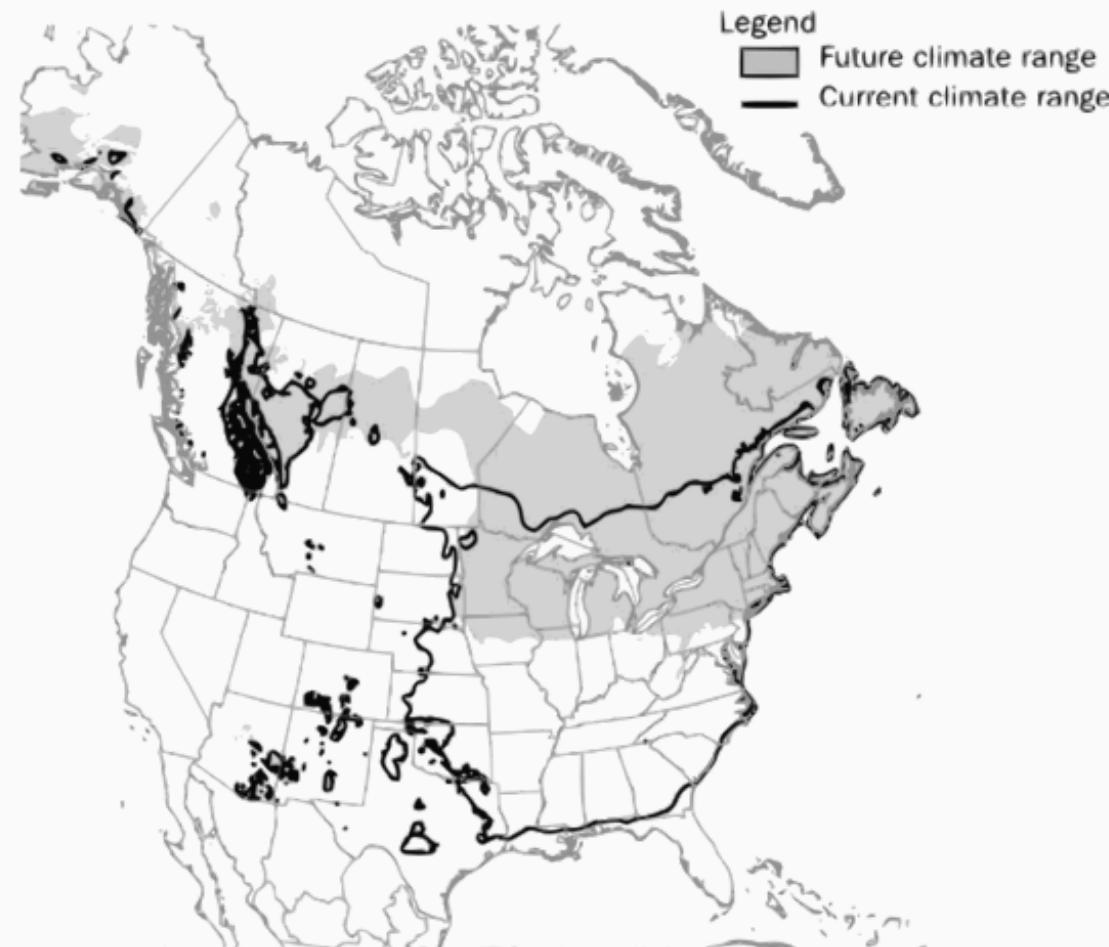




Corridor Appalachien

# Non-equilibrium dynamics

## Sugar maple



McKinney et al. 2007 BioScience.

# Complexity of bottom-up systems

## The Bicknell's thrush (*Catharus Bicknelli*)

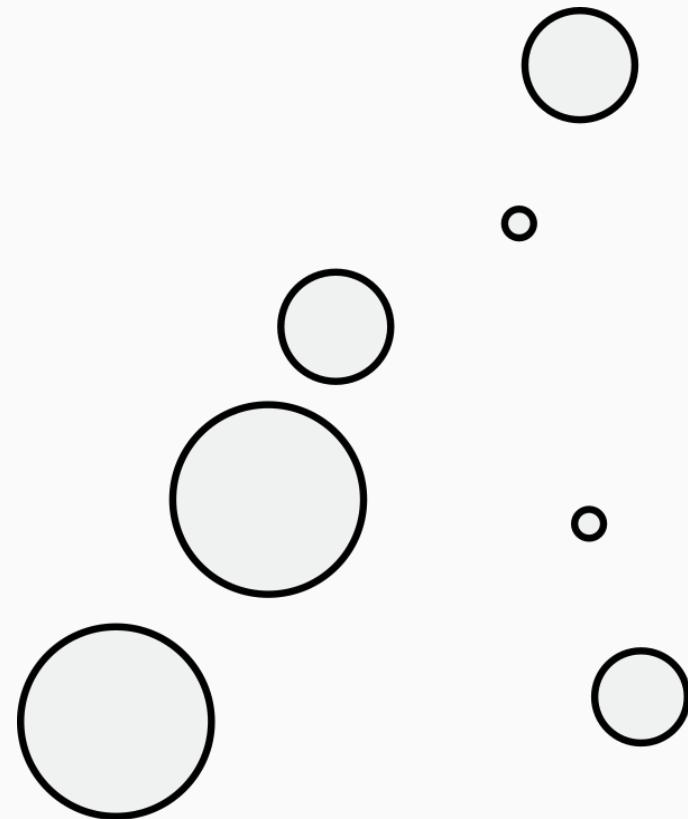


Threatened in Canada

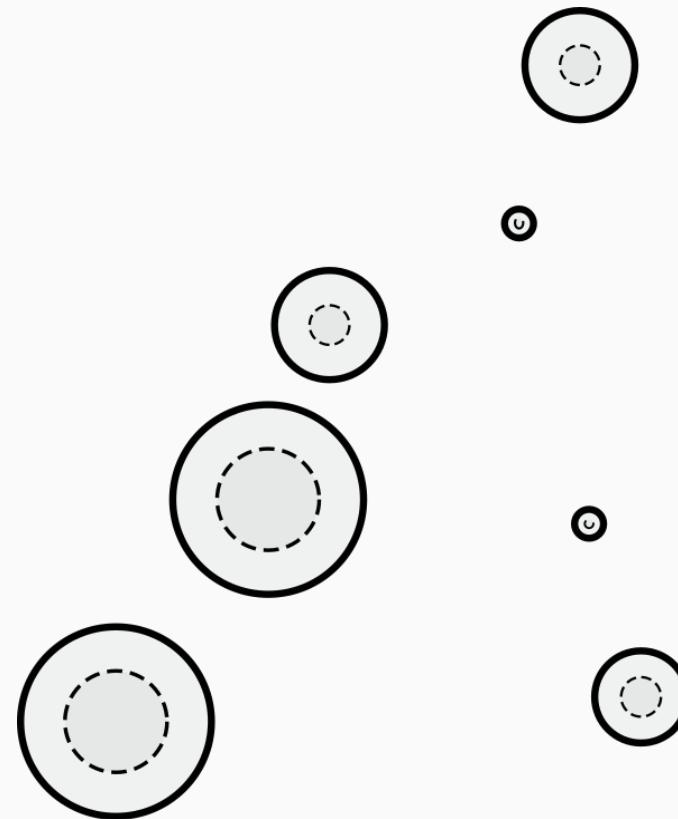
Specialist of cold, high elevation Balsam fir forests

Patchy distribution

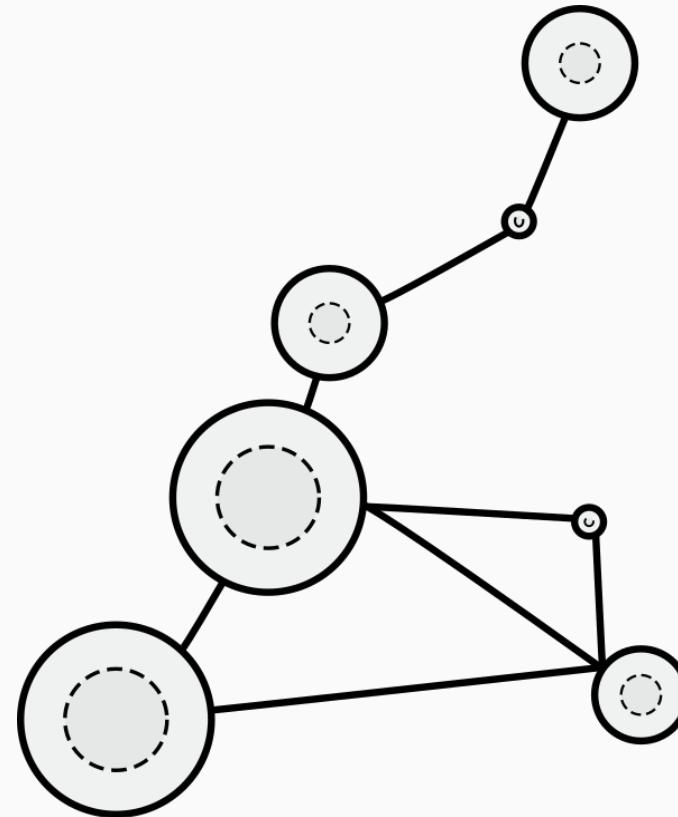
# Regional distribution and metapopulation dynamics



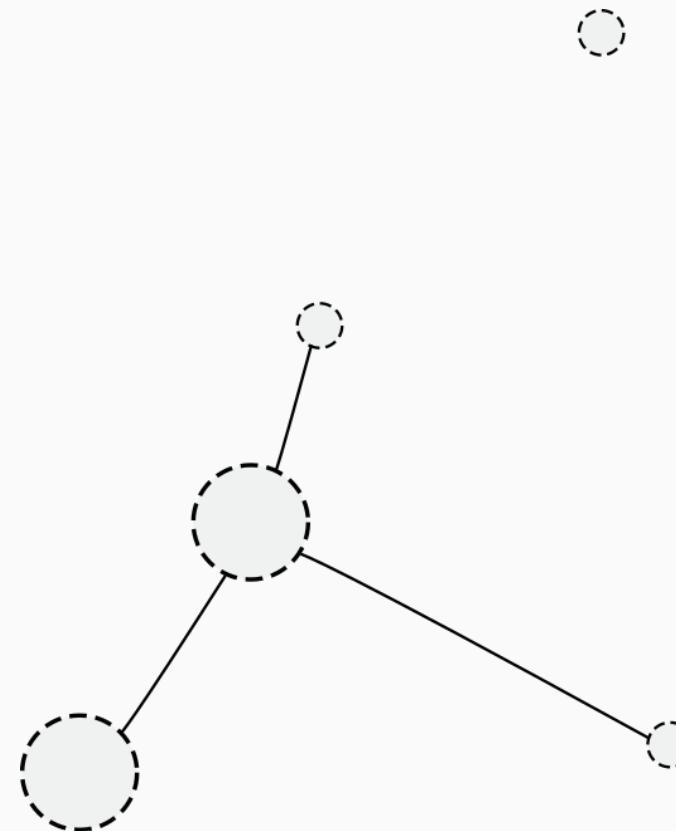
# Regional distribution and metapopulation dynamics



# Regional distribution and metapopulation dynamics



# Regional distribution and metapopulation dynamics

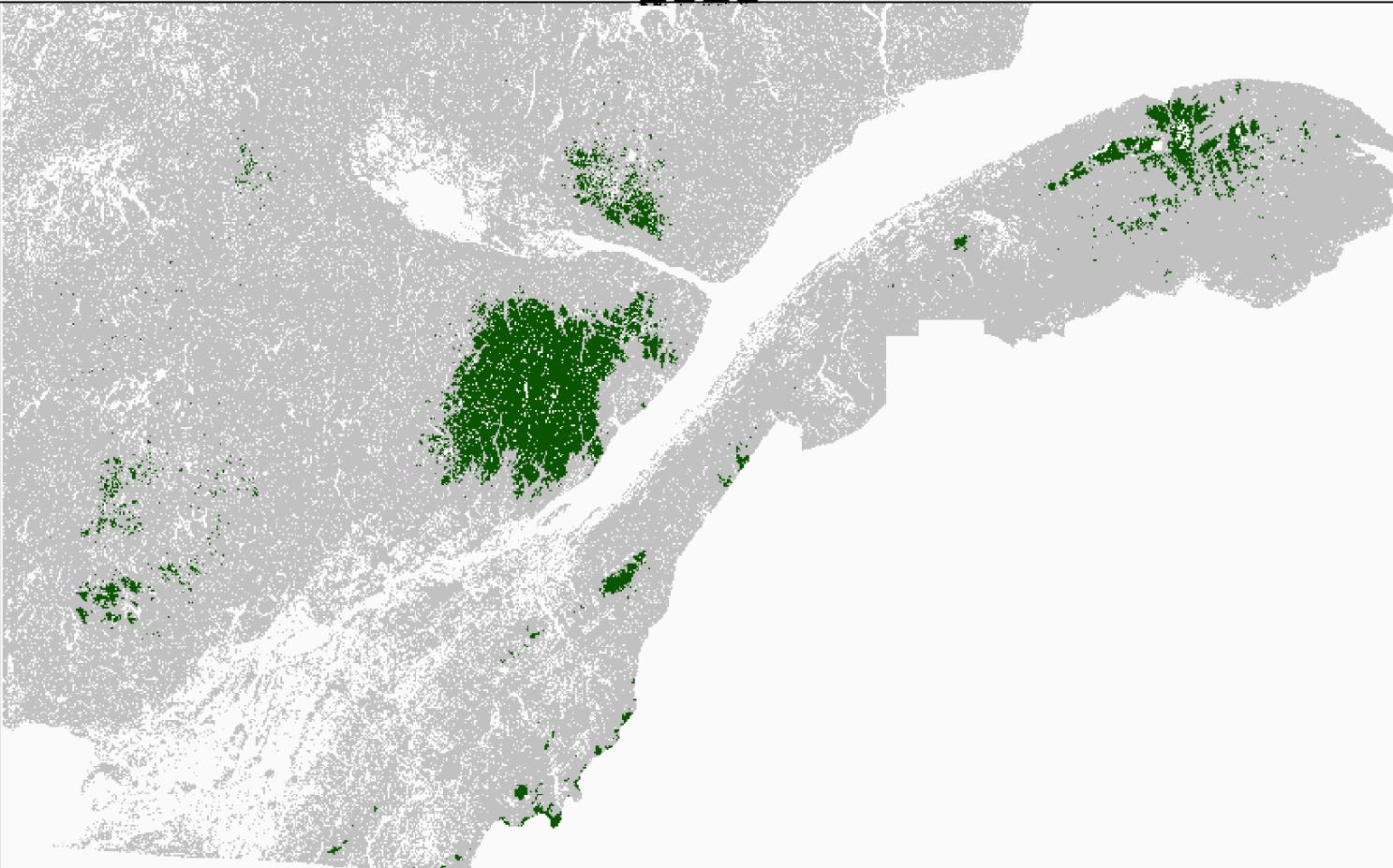


## Metapopulation dynamics

The landscape's **spatial structure** and species **dispersal** abilities affect **connectivity** and **occupancy**

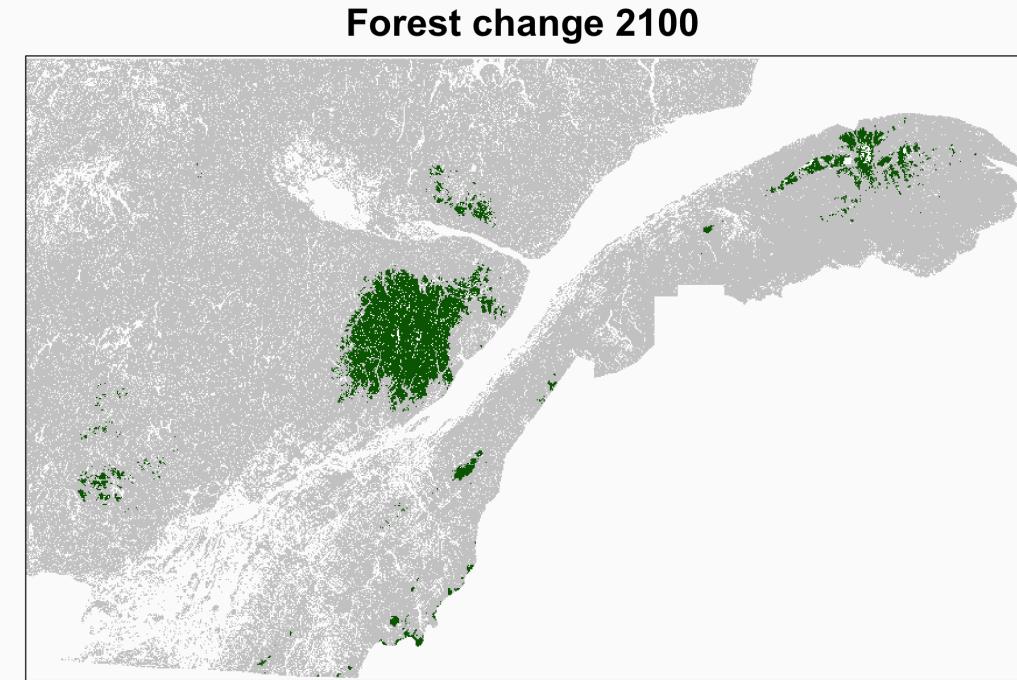
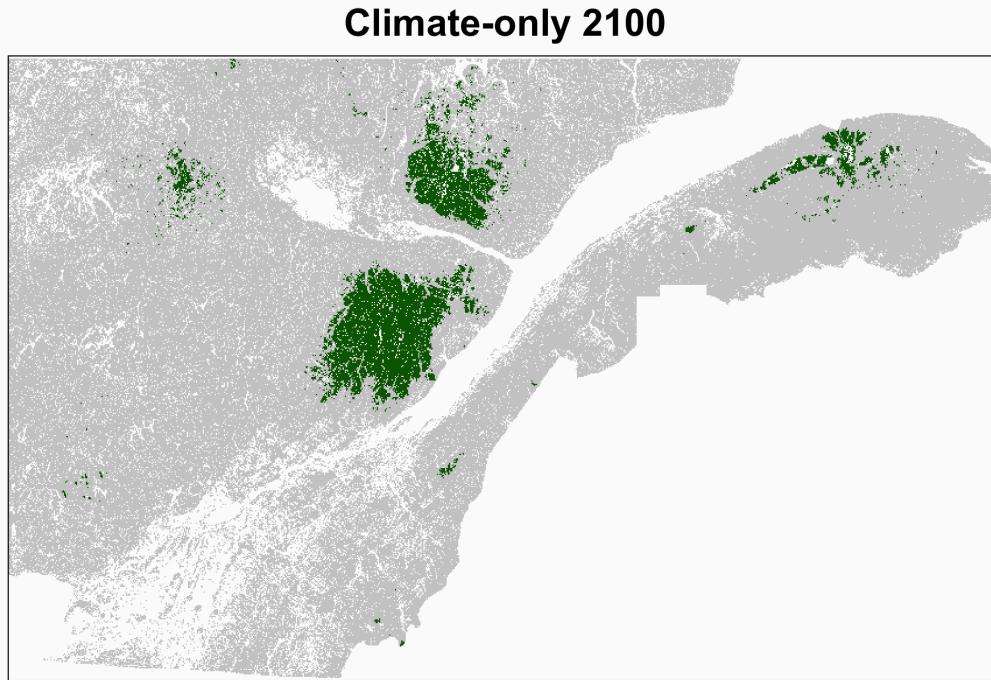
# Distribution dynamics

2020



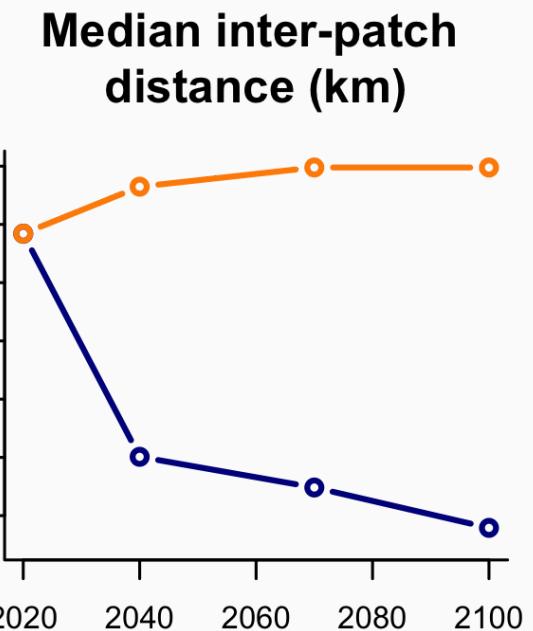
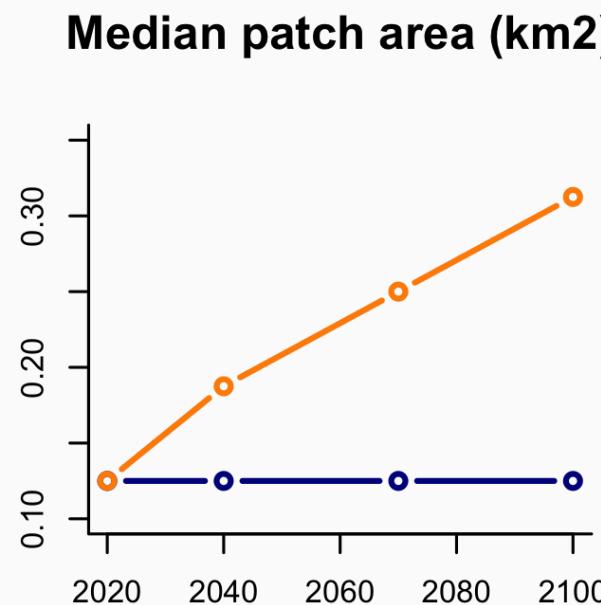
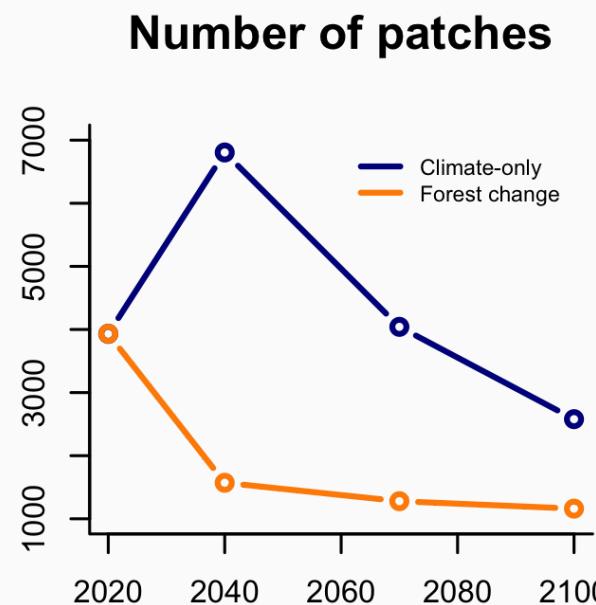
# Distribution dynamics

Favorable landscape shifts predict non-equilibrium dynamics



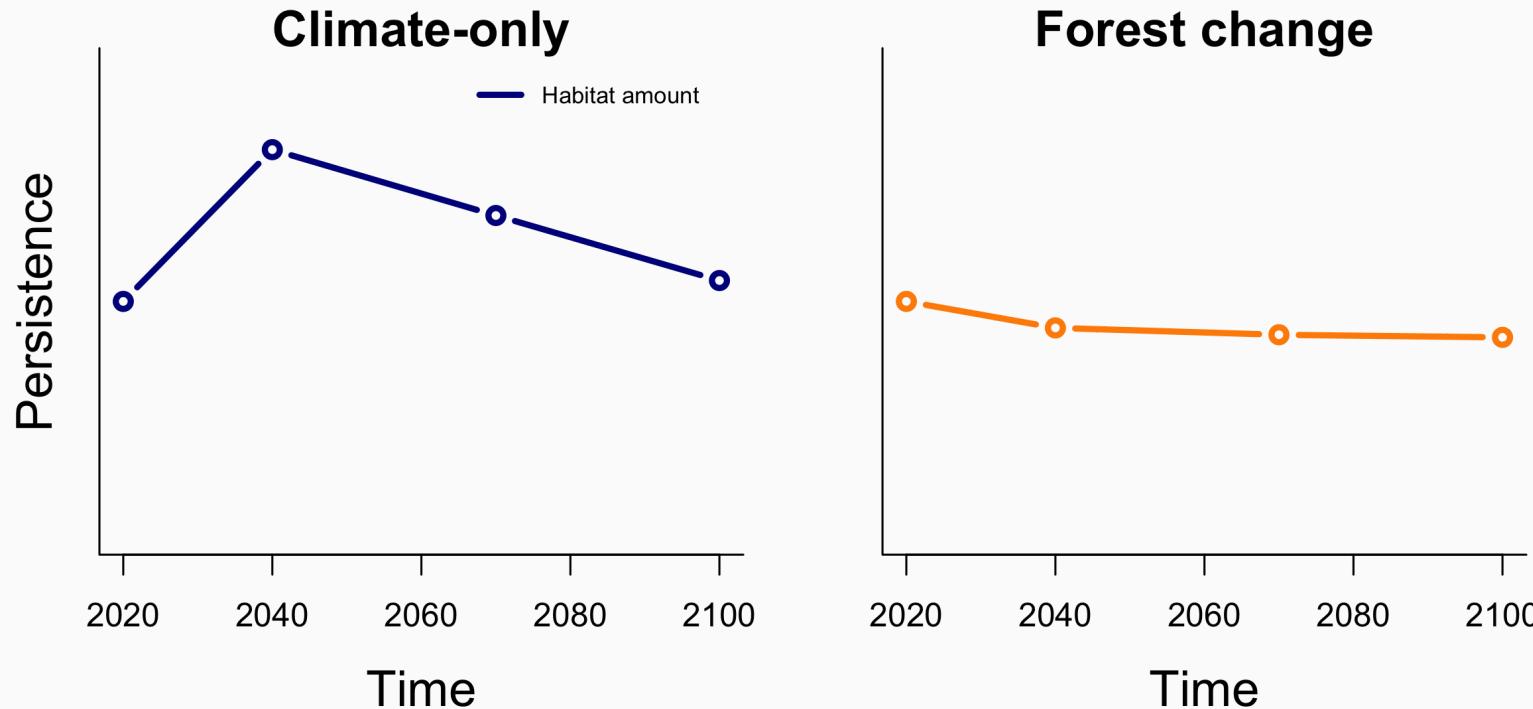
# Distribution dynamics

Spatial structure is affected by climate change



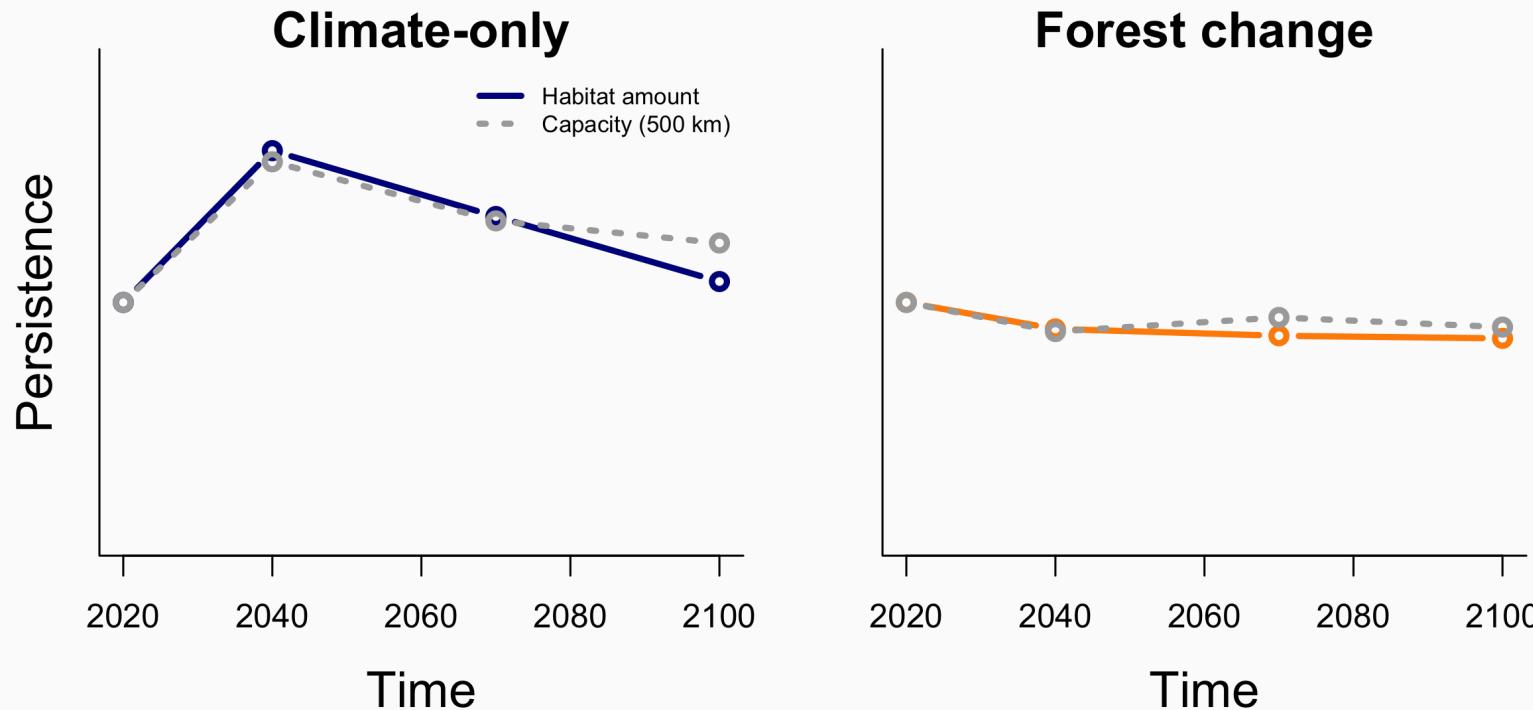
# Distribution dynamics

Persistence is impacted by the ability to use available habitat



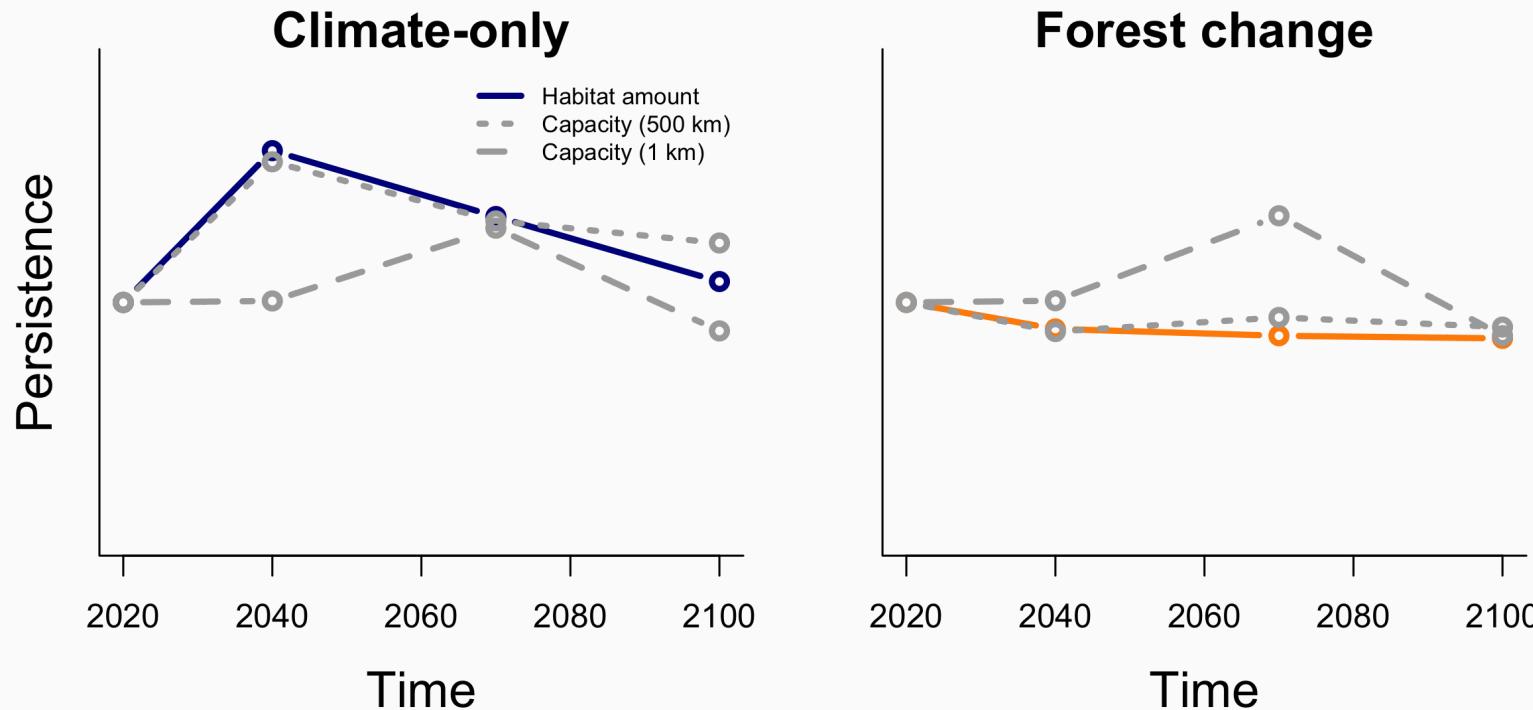
# Distribution dynamics

Persistence is impacted by the ability to use available habitat



# Distribution dynamics

Persistence is impacted by the ability to use available habitat



# Take home messages

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1. Habitat mismatch affects species distribution shifts
2. Metapopulation dynamics may precipitate species decline

**THE METAPOPULATION STRUCTURE IS A VITAL ELEMENT TO DISTRIBUTION CHANGE**

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