Can we use natural selection to help managed forests keep track of climate change?

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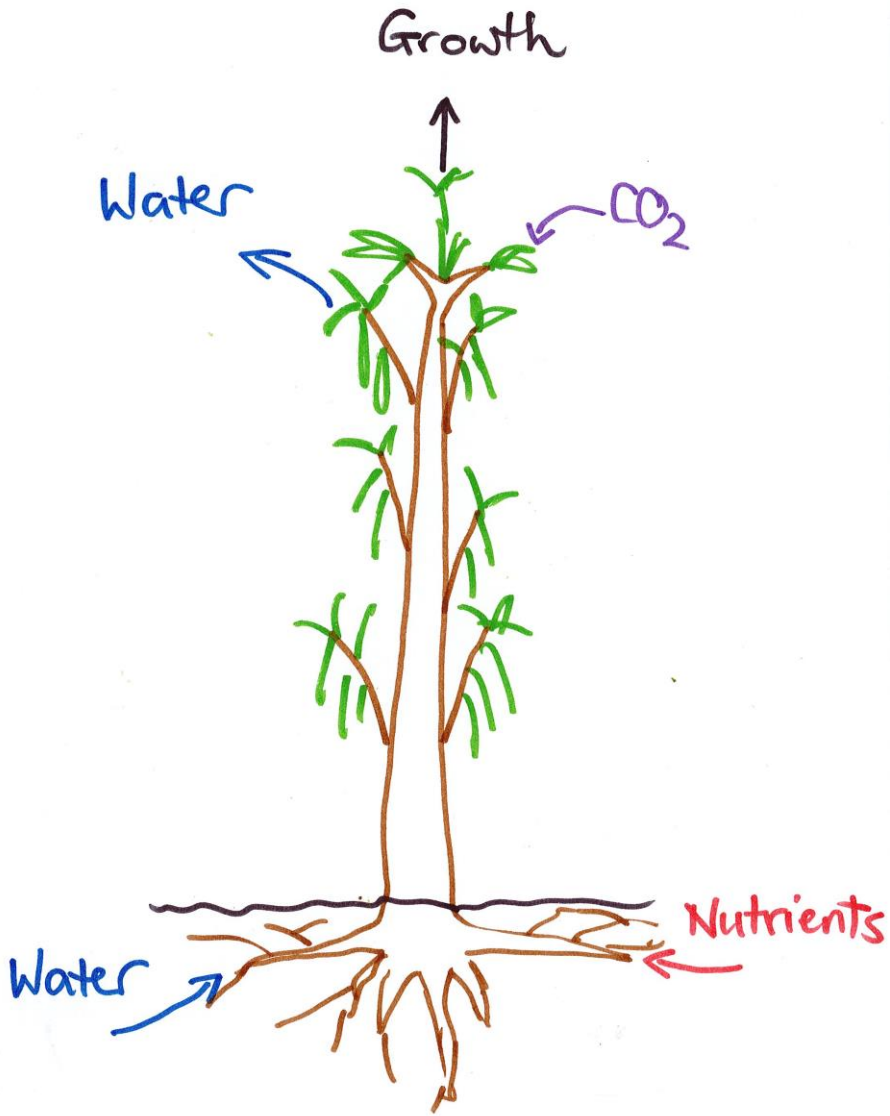
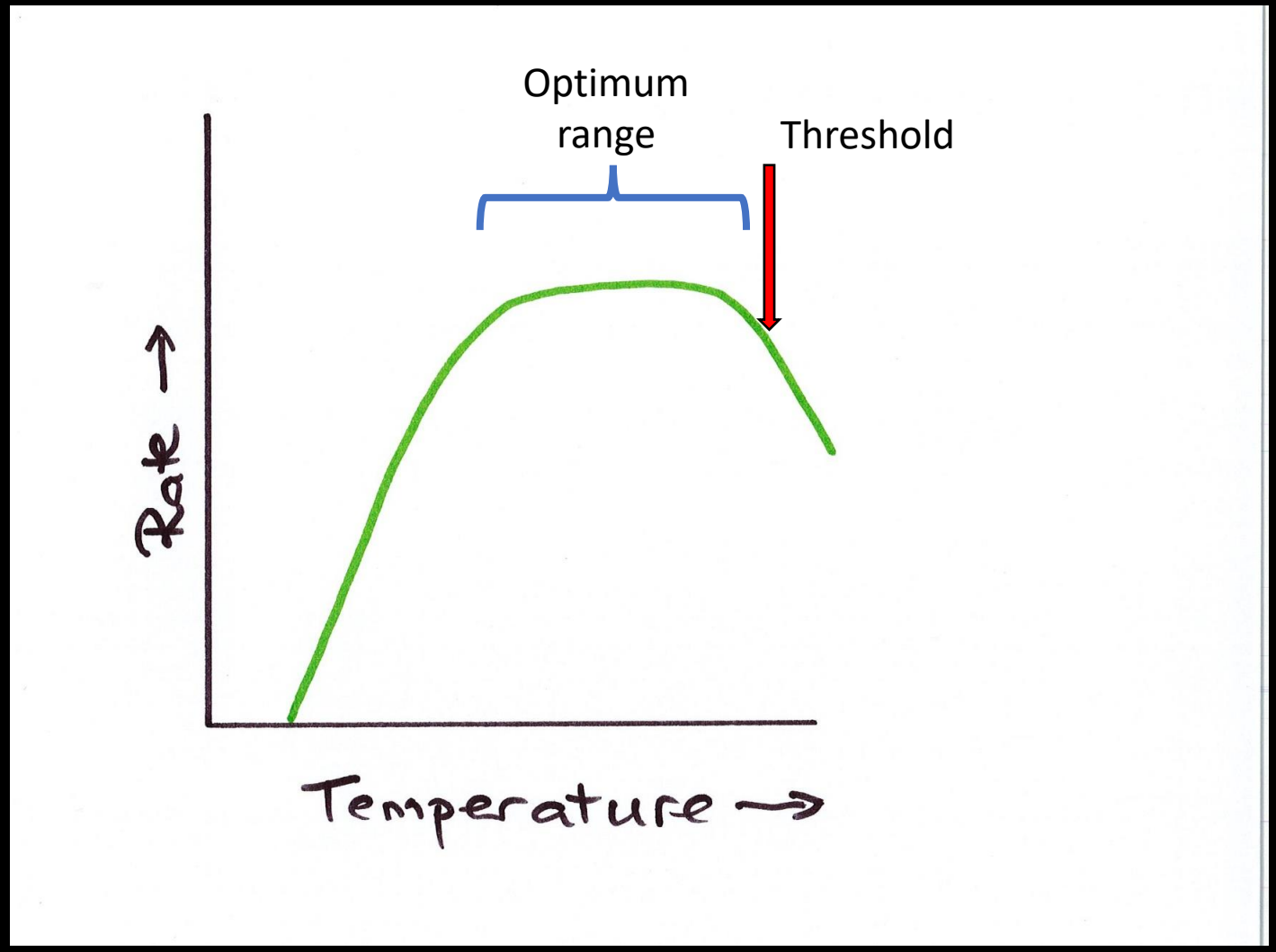
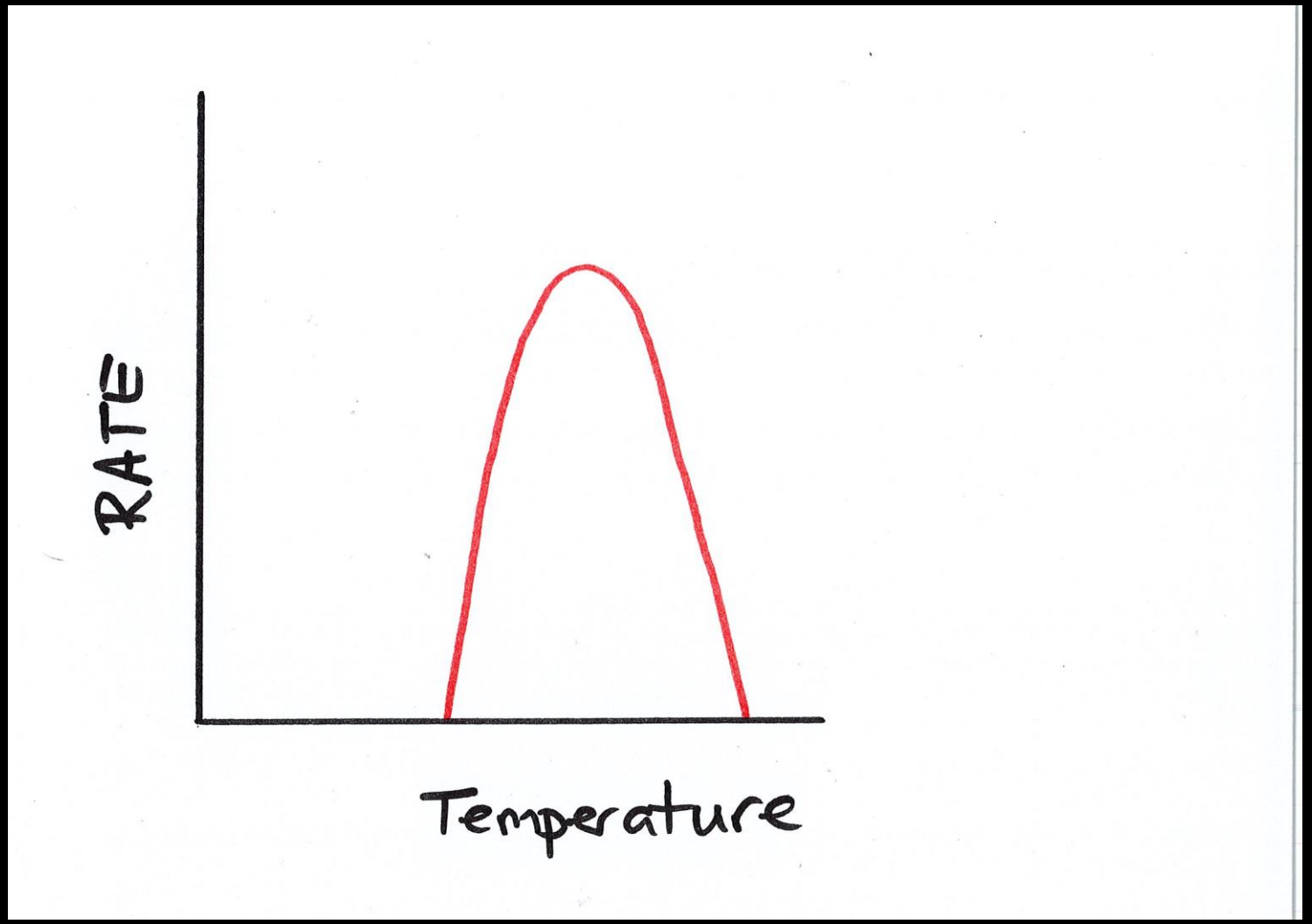
Biological processes are very responsive to climatic conditions



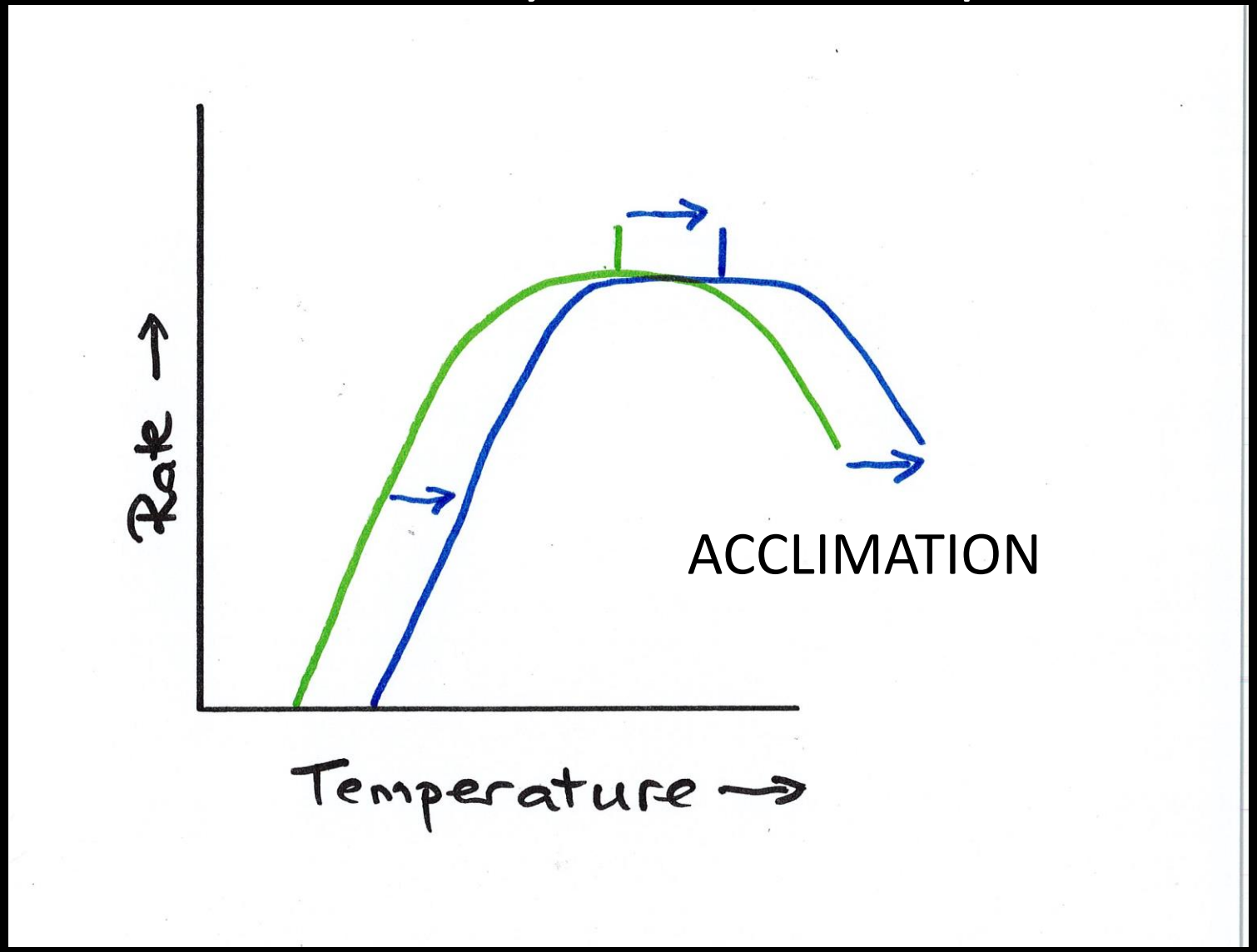
Climate change and biological processes



Climate change and biological processes



Flexibility of the response

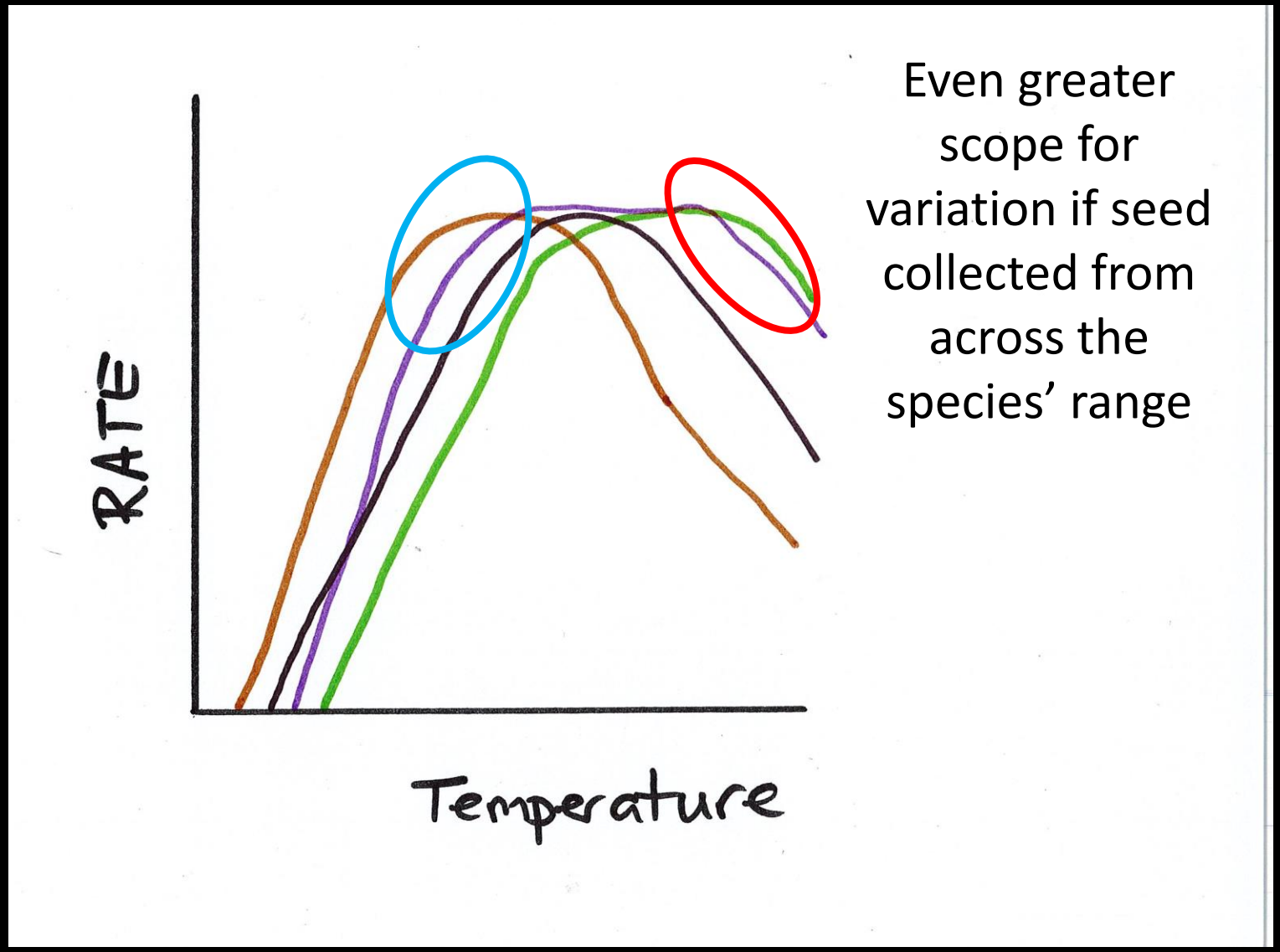


Acclimation to prevailing conditions

- Mostly seasonal
- Quite limited

- INSUFFICIENT TO TRACK CURRENT CLIMATE CHANGE

Natural variation within a population

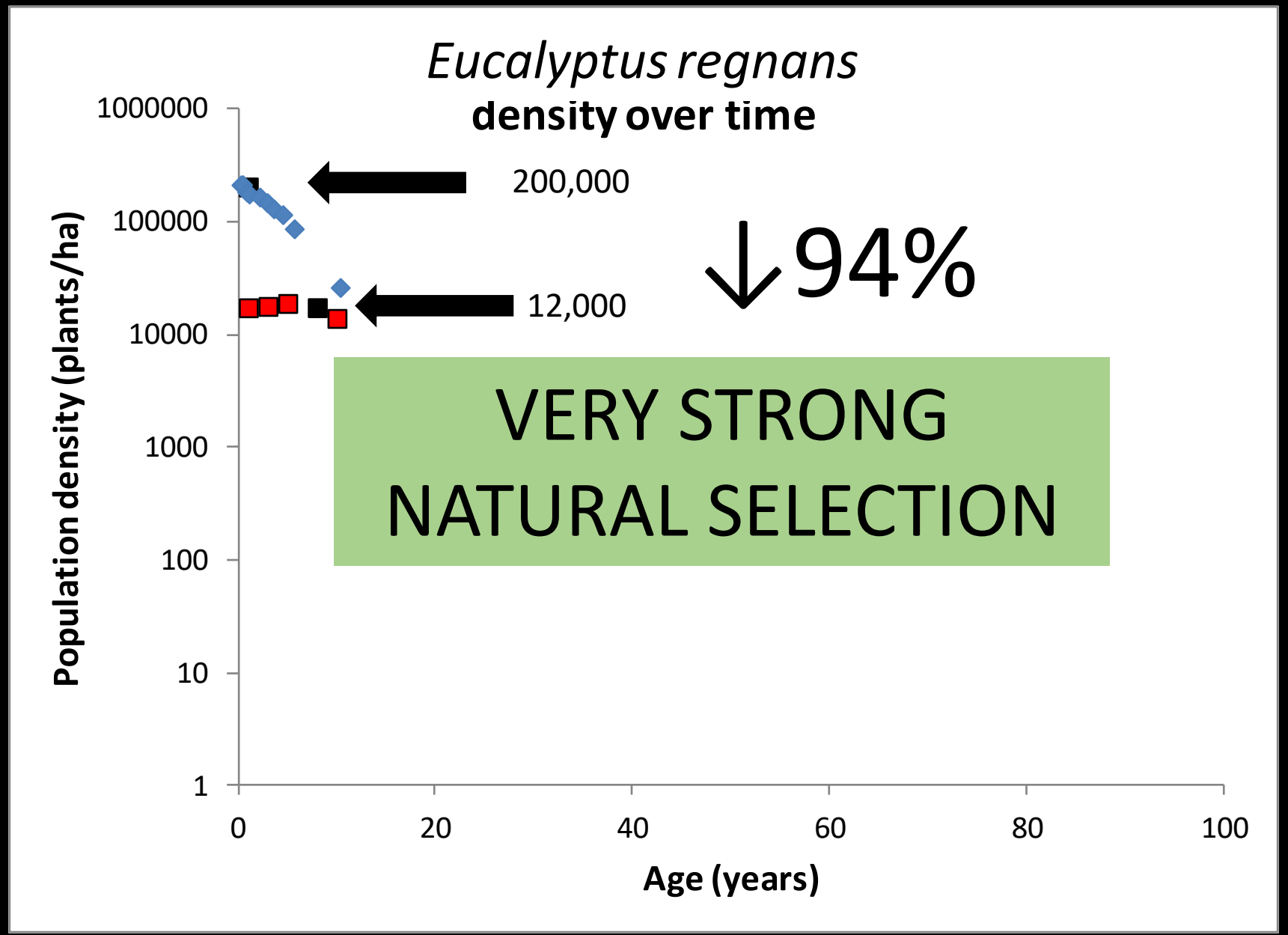


Even greater scope for variation if seed collected from across the species' range

Can natural processes deliver these “best” adapted trees?

- There is evidence that YES, this IS possible
  - Annual plants – many weeds – are actually tracking the changing climate
  - New crop varieties are also tracking the climate without having been bred for this purpose
  - Can this happen in a forest?

Strong natural selection is the key

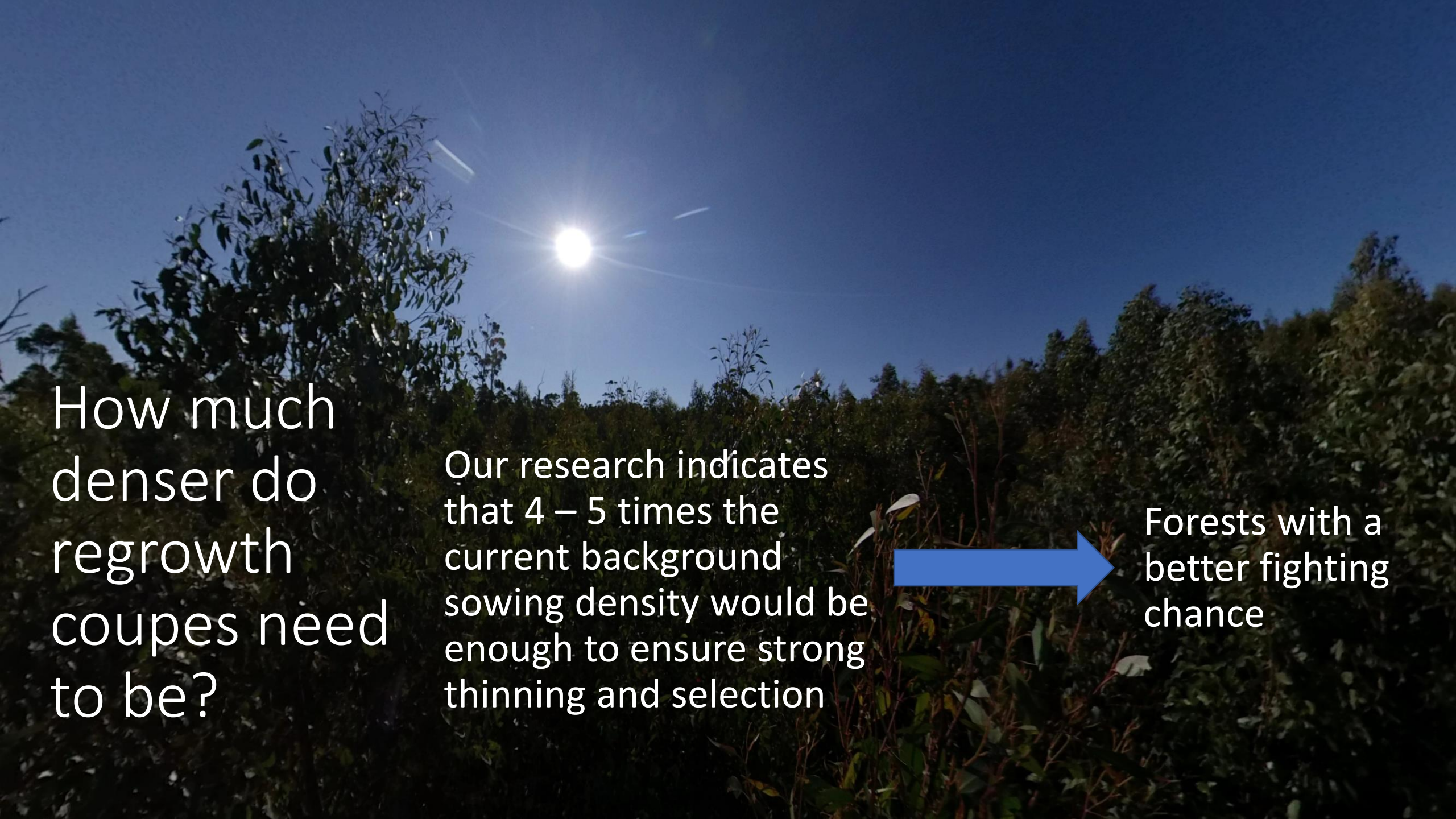


Current resowing practices don't impose strong natural selection

- Relatively little competition
- Forest retains many poorly adapted individuals

Would ensuring strong natural selection occurs ensure a solution?

- Would ensure forest is best adapted to the prevailing conditions
  - Prevailing conditions are NOT the same as future conditions
- Mixing seed sources from across a species' range (or > 1 species) would help broaden the base of responses



How much denser do regrowth coupes need to be?

Our research indicates that 4 – 5 times the current background sowing density would be enough to ensure strong thinning and selection

Forests with a better fighting chance