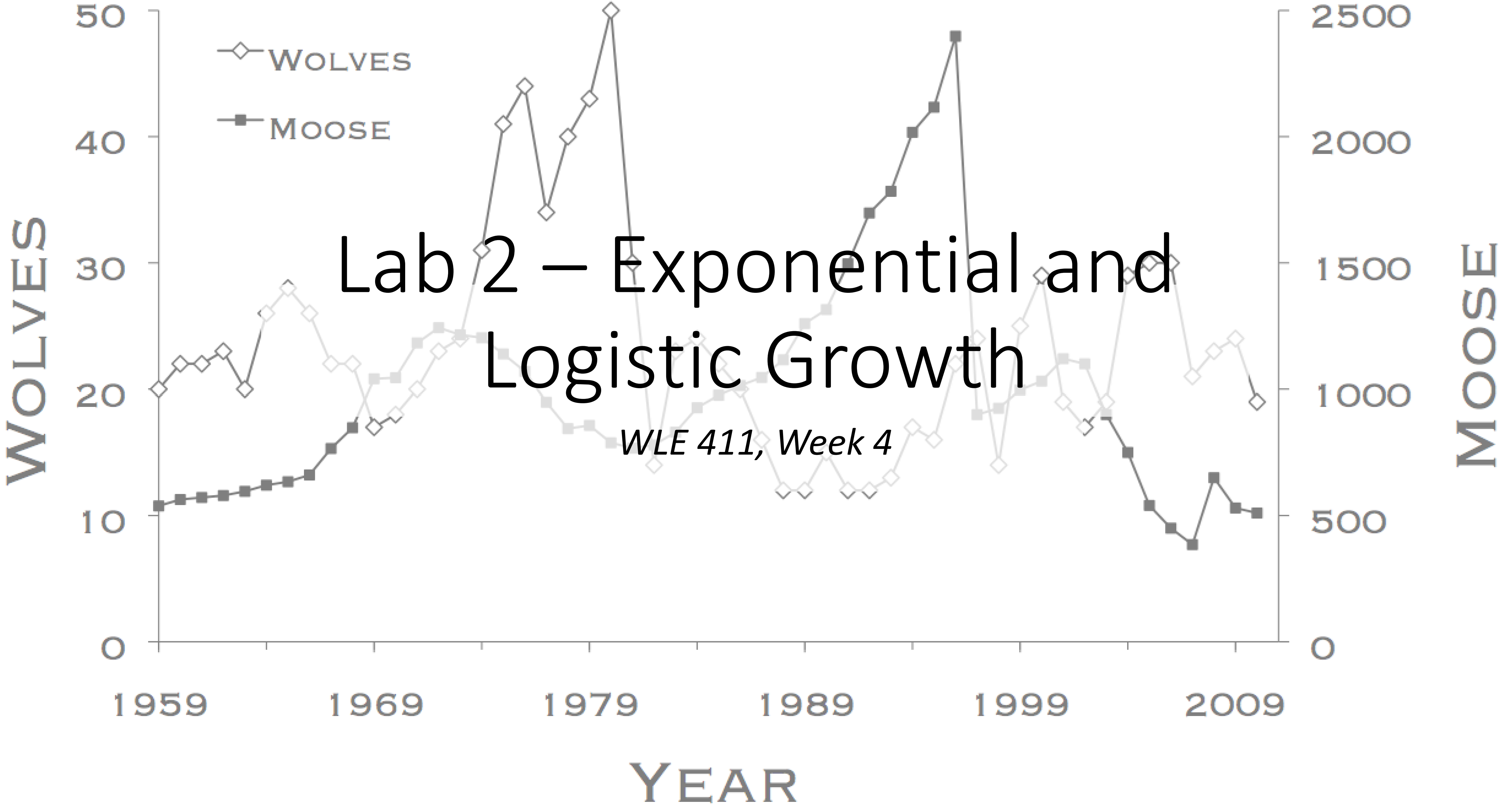
Lab 2 – Exponential and Logistic Growth

WLE 411, Week 4



Readings and deadlines

- Lab 1 assignment due at the start of class
- Readings for this lab:
  - Chapter 2- Context and Inference

Exponential growth

<u>Continuous</u>

$$N_t = N_0 e^{rt}$$

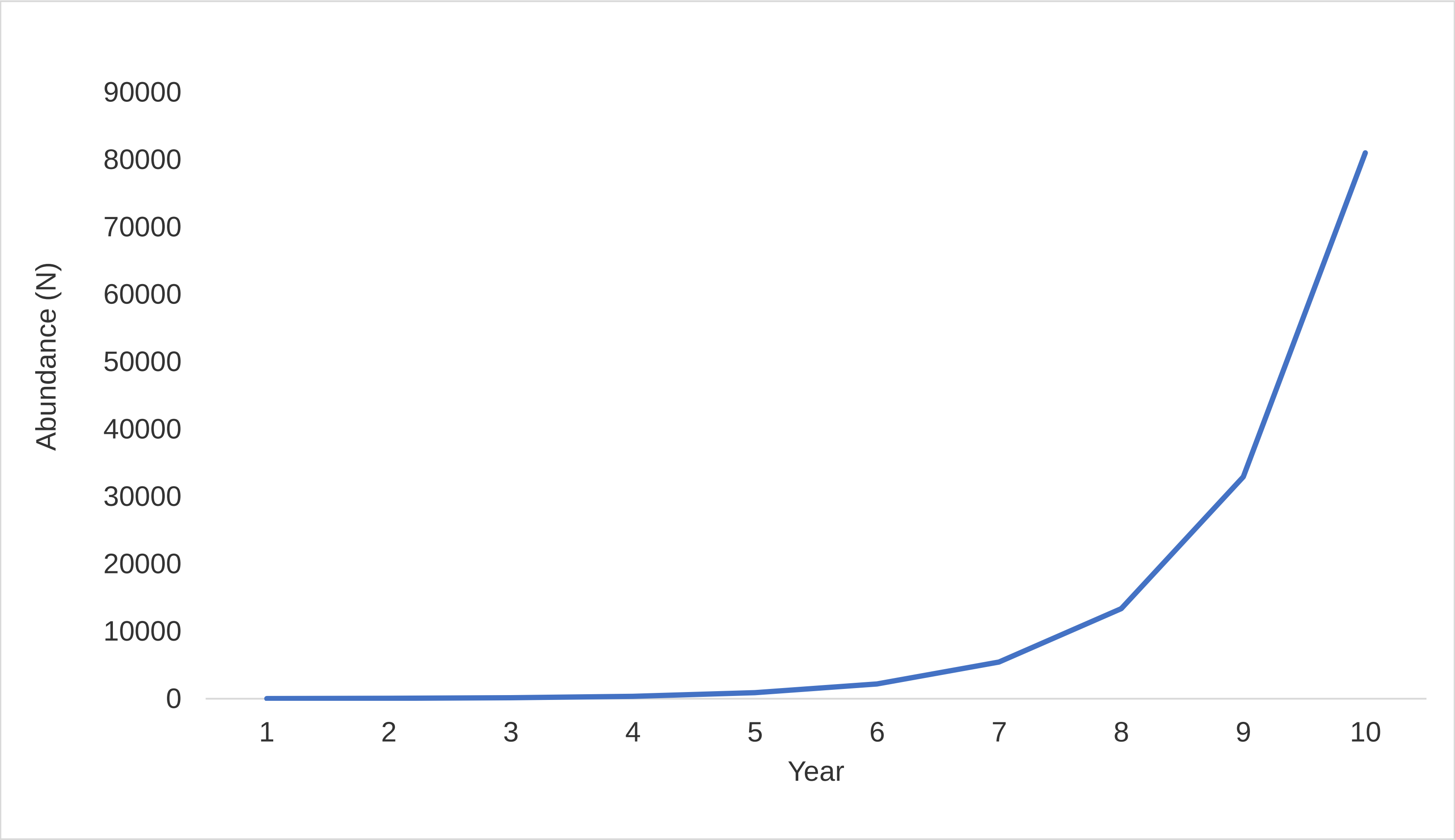
or

<u>Discrete</u>

$$N_{t+1} = N_t \lambda$$

- In what circumstances do we expect exponential growth to occur?
  - Abundant resources
  - Examples:
    - Bacteria in a petri dish
    - Invasive species (ex. rabbits in Australia)

What does exponential growth look like?



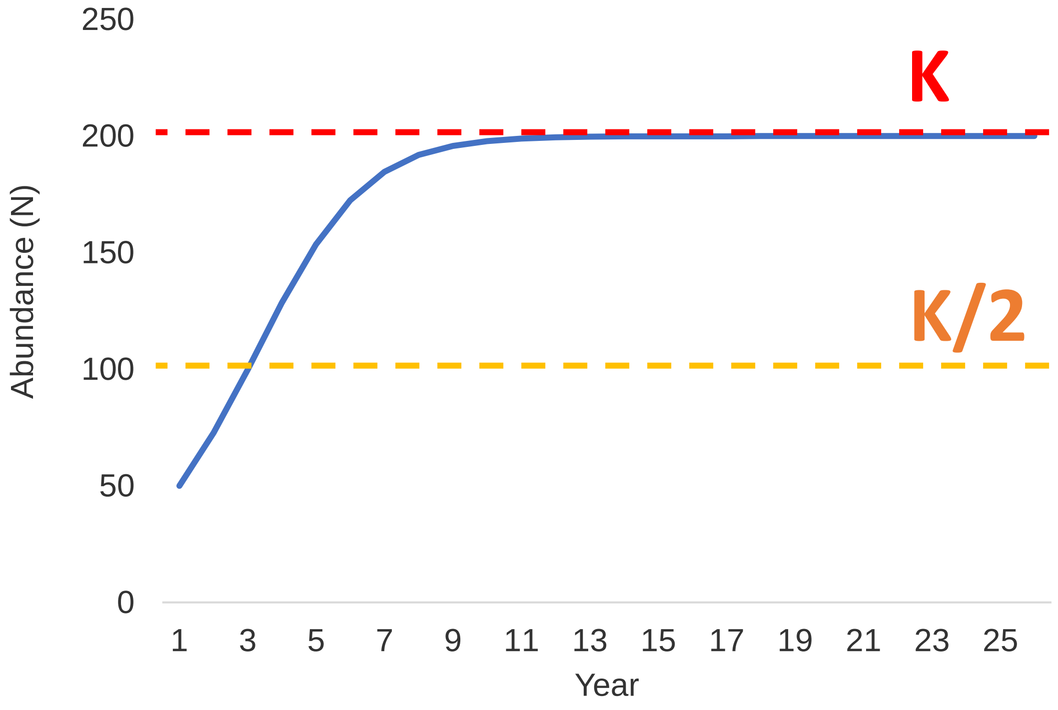
Logistic growth

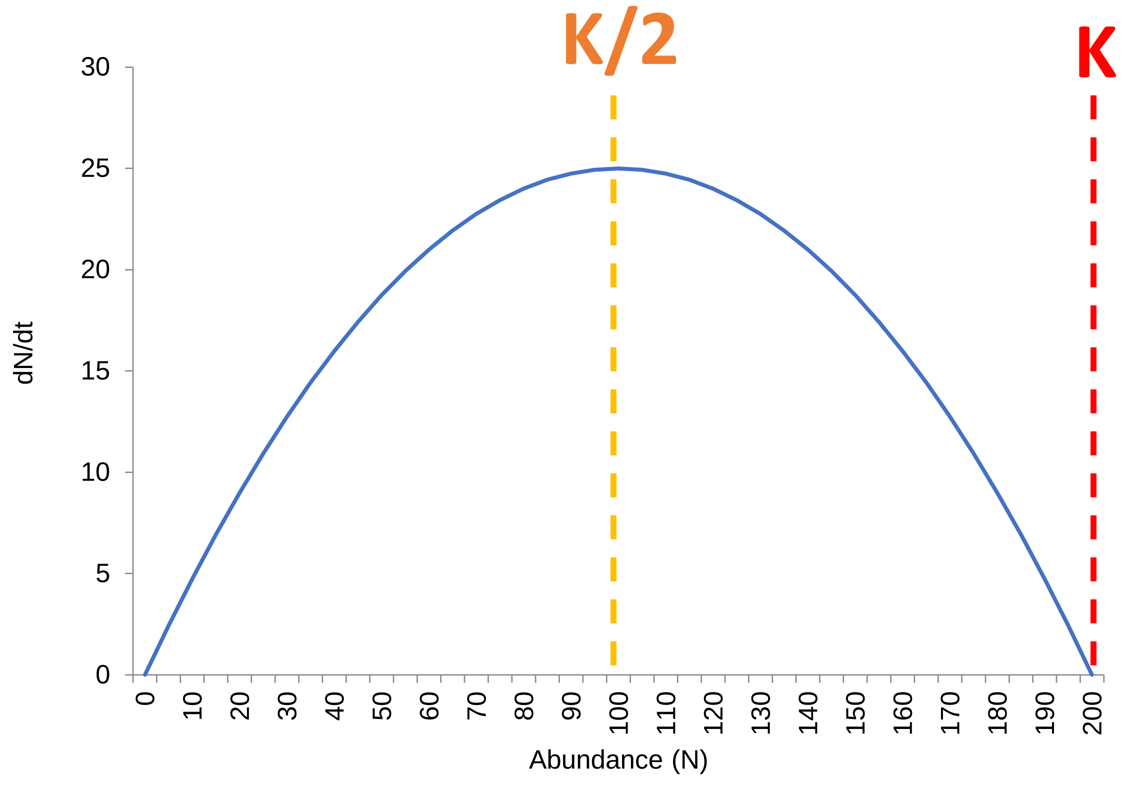
$$\frac{dN}{dt} = rN(1 - \frac{N}{K})$$

$$N_t = {K}\Big/{1 + \frac{K - N_0}{N_0} e^{-rt}}$$

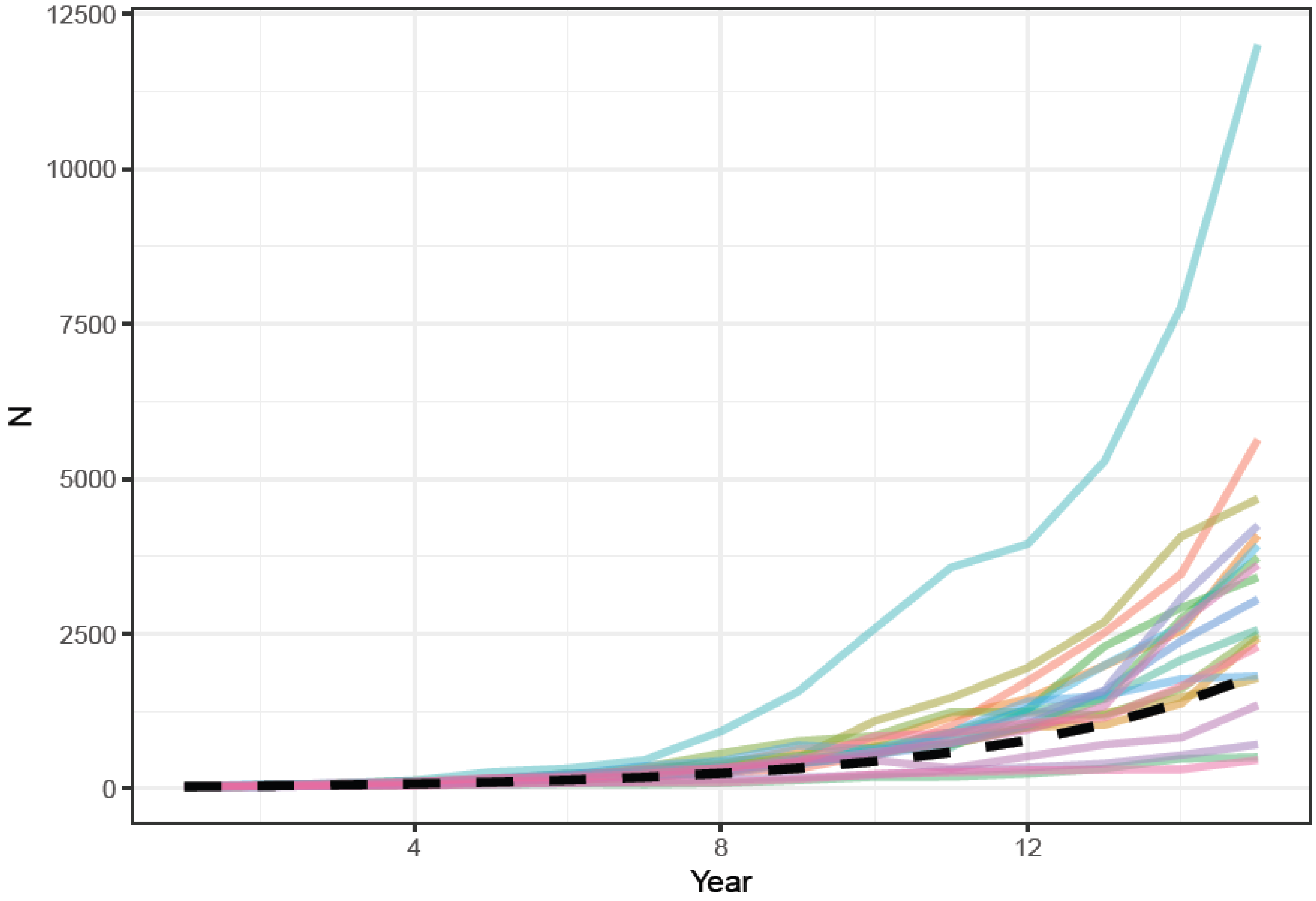
- In what circumstances do we expect logistic growth to occur?
  - Limited resources
  - Examples:
    - Large herbivores
    - Marine predators (e.g. harbor seals)

What does logistic growth look like?





Stochasticity



Strategy for this lab

- We have 2 weeks to do the lab
- Pace yourself- try and get sections 1 and 2 done today, and 3 done next week

Lab 2 - Projecting Population Growth Using Exponential and Logistic Growth Models

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Contents