POPULATION ECOLOGY

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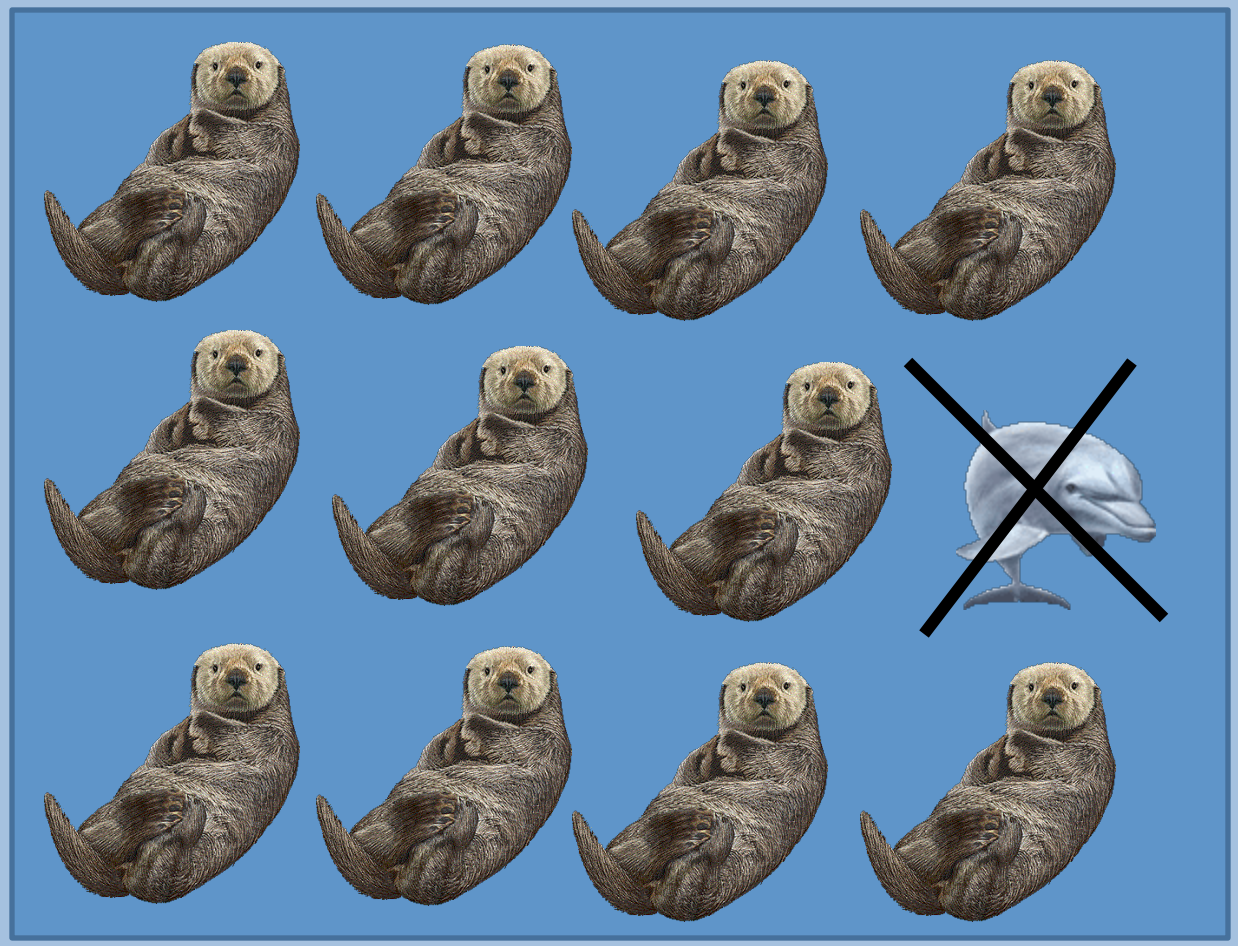
LEVELS OF ECOLOGY

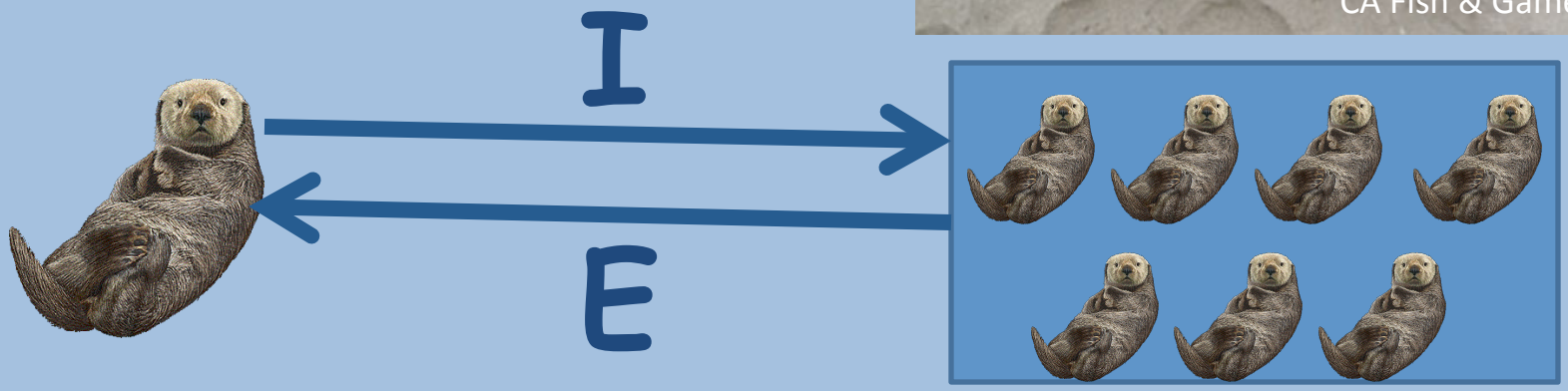
- Population = all the individuals of a species that live in the same area



POPULATION SIZE

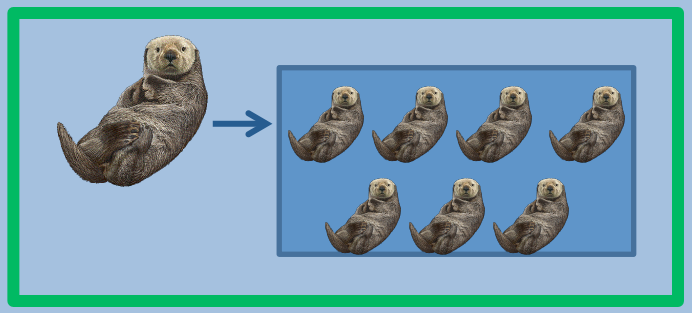
How does population size change?

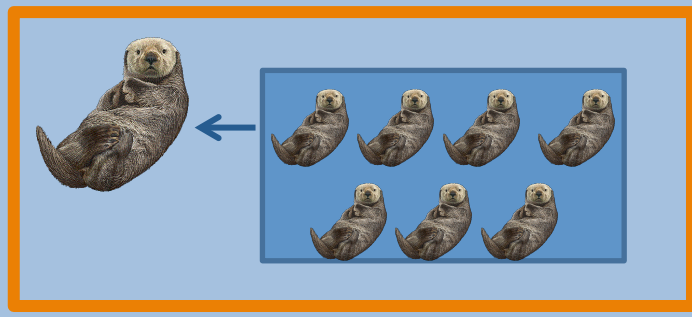
- Births
- Deaths
- Immigration
- Emigration



POPULATION SIZE

$$N_{t+1} = N_t + B - D + I - E$$





POPULATION SIZE

Scientists observed 2,813 sea otters along the Central Coast in 2009. 430 otters died and 328 pups were born. If there is no immigration or emigration, how many sea otters were there in 2010?

$$N_{t+1} = N_t + B - D + I - E$$

2,813 +328 – 430 + 0 - 0 = 2,711

Information from Otter Project & USGS

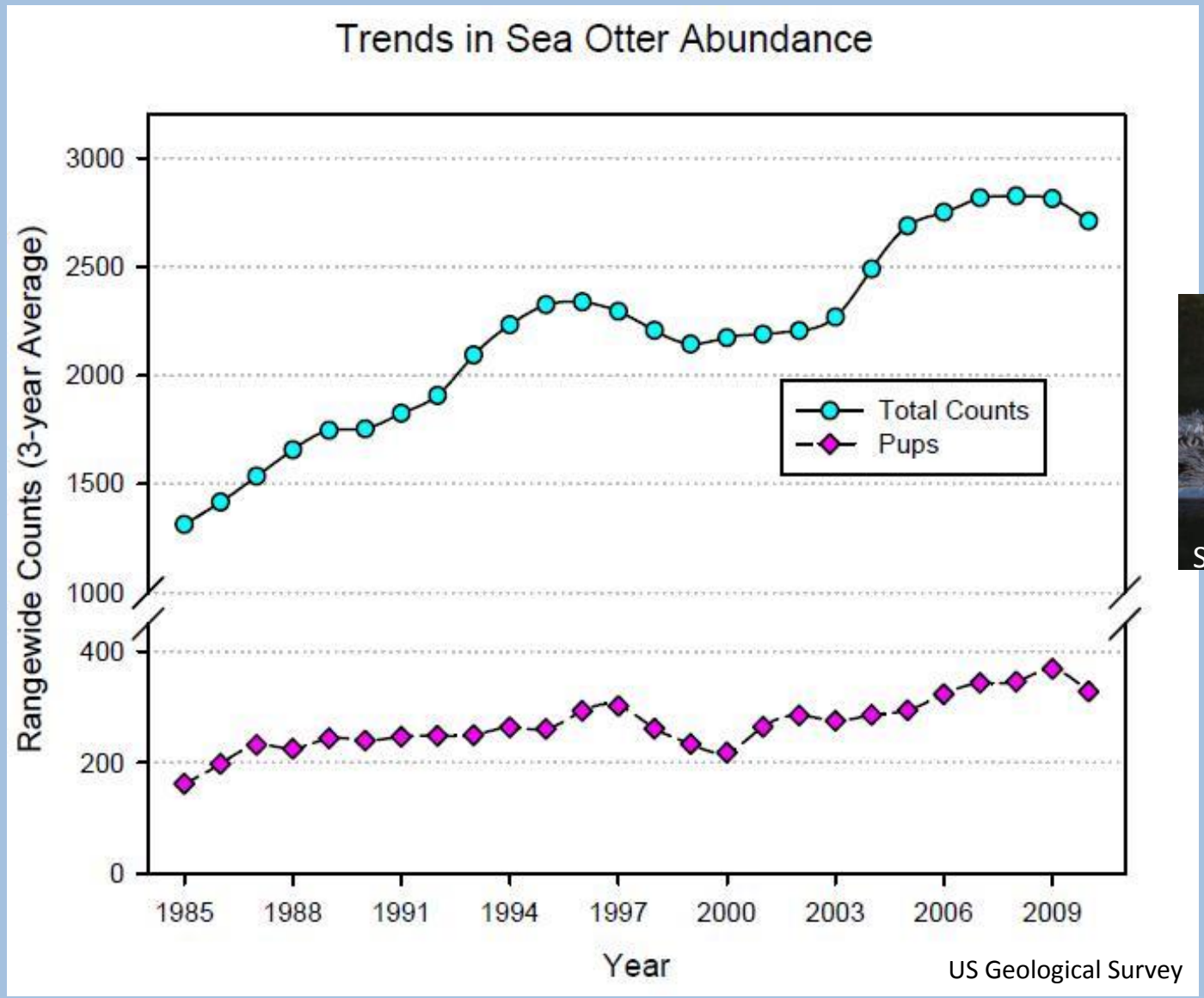
POPULATION SIZE

If 10 sea otters leave the Central Coast population and 2 enter, what would the 2010 population be?

$$N_{t+1} = N_t + B - D + I - E$$

2,711+2-10=2,703

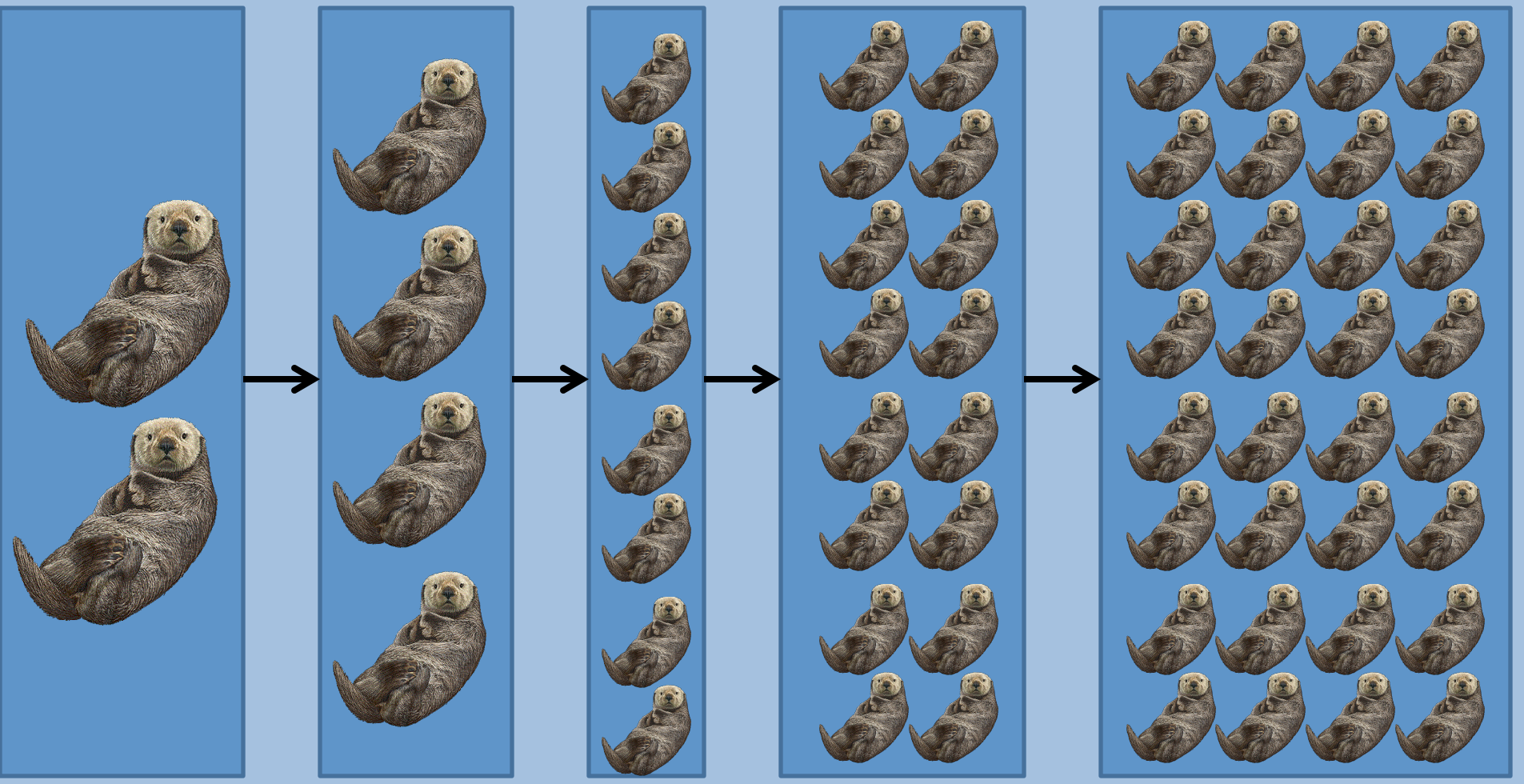
POPULATION SIZE



US Geological Survey

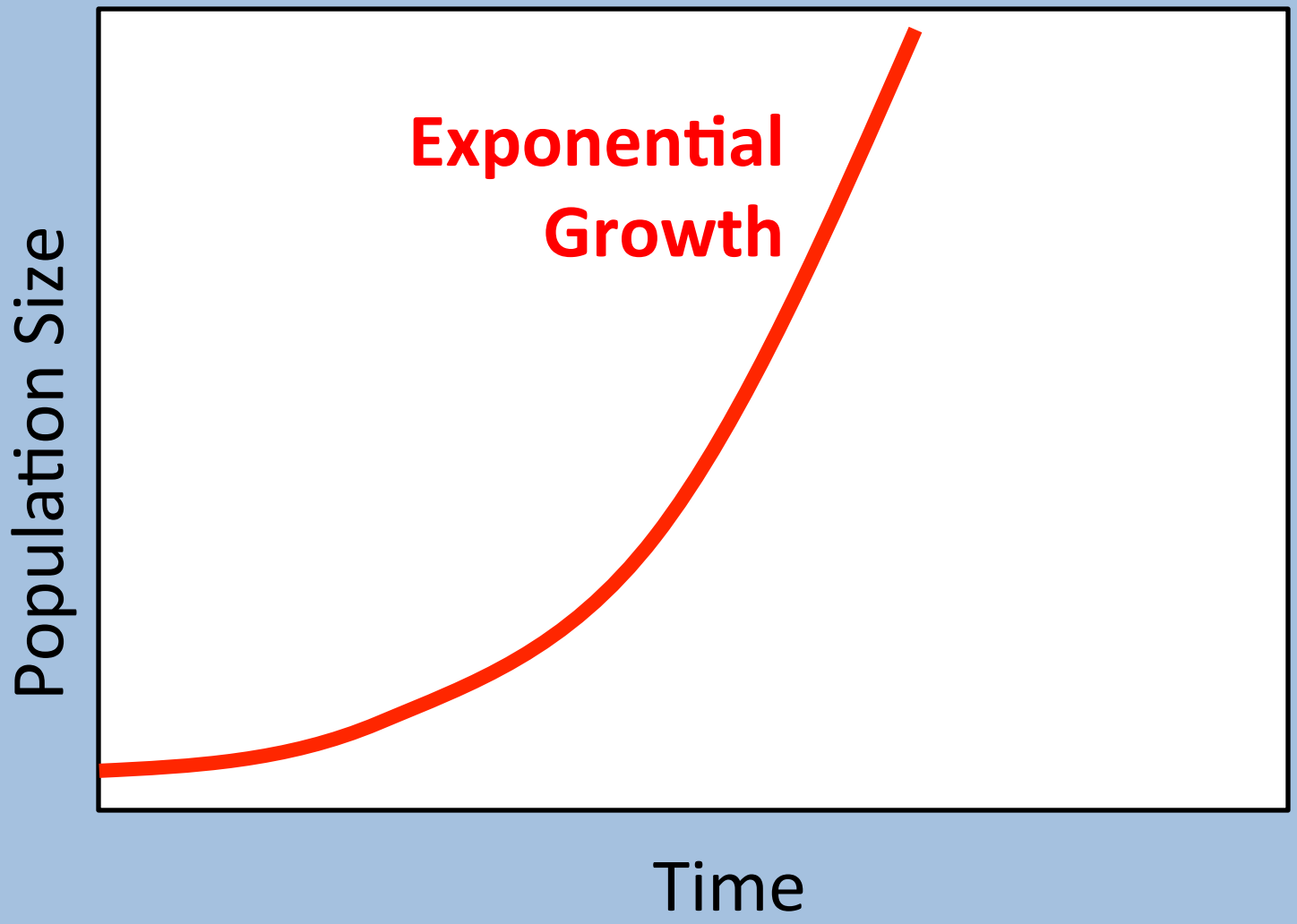
Steve Choy / NOAA MBNMS

POPULATION GROWTH



Generation	1	2	3	4	5
Population Size	2	4	8	16	32

POPULATION GROWTH

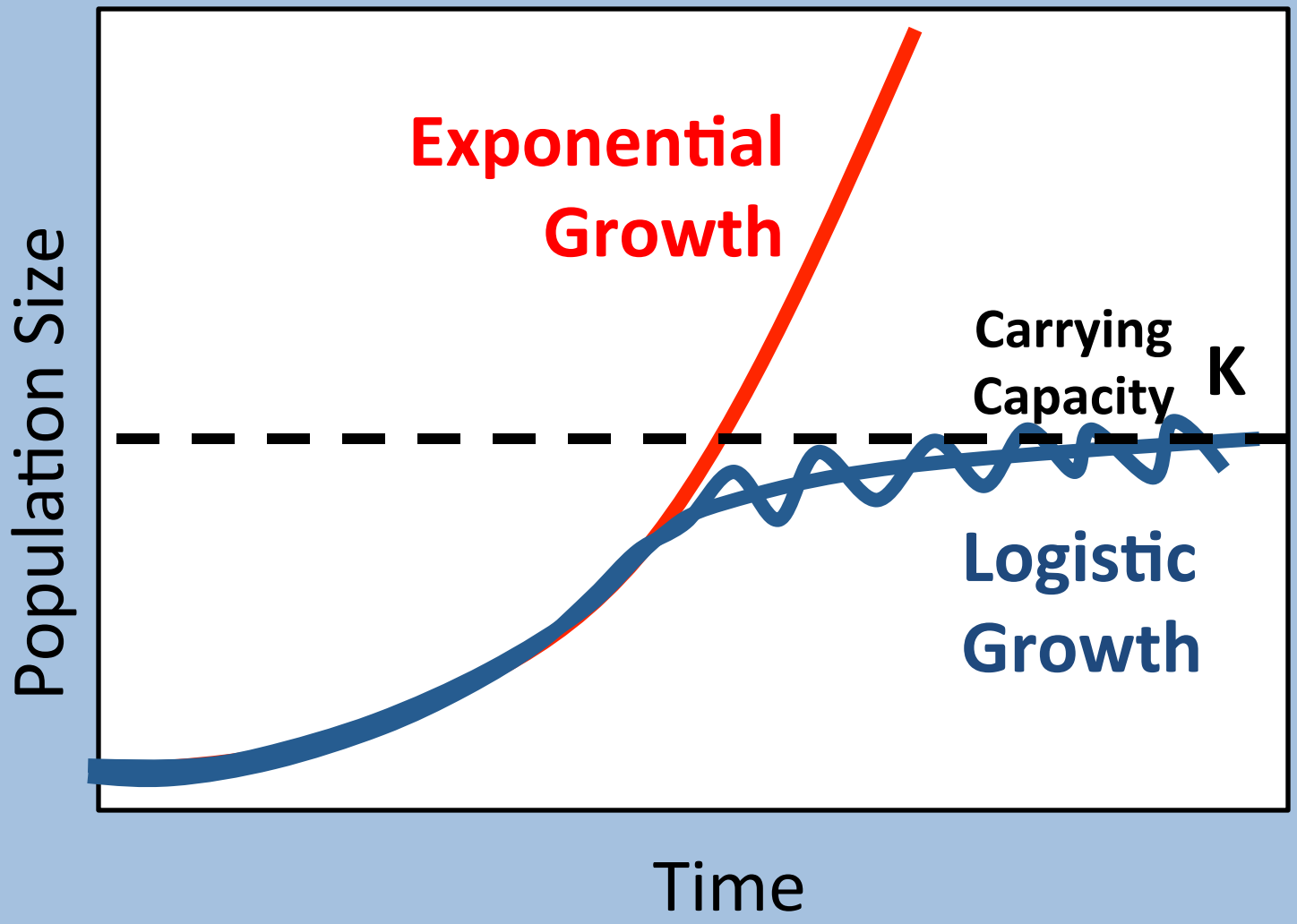


POPULATION GROWTH

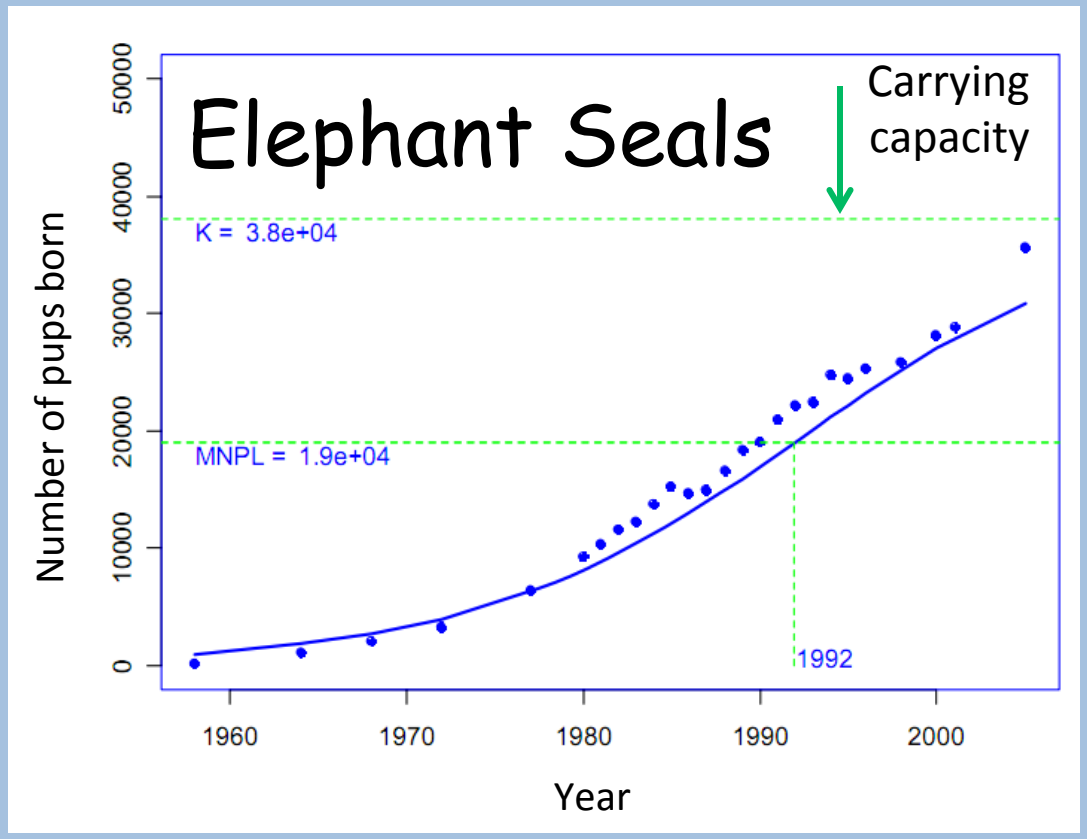
Why don't populations usually grow exponentially?

- Limited resources – light, water, nutrients, food, space
- Disease
- Predation

POPULATION GROWTH



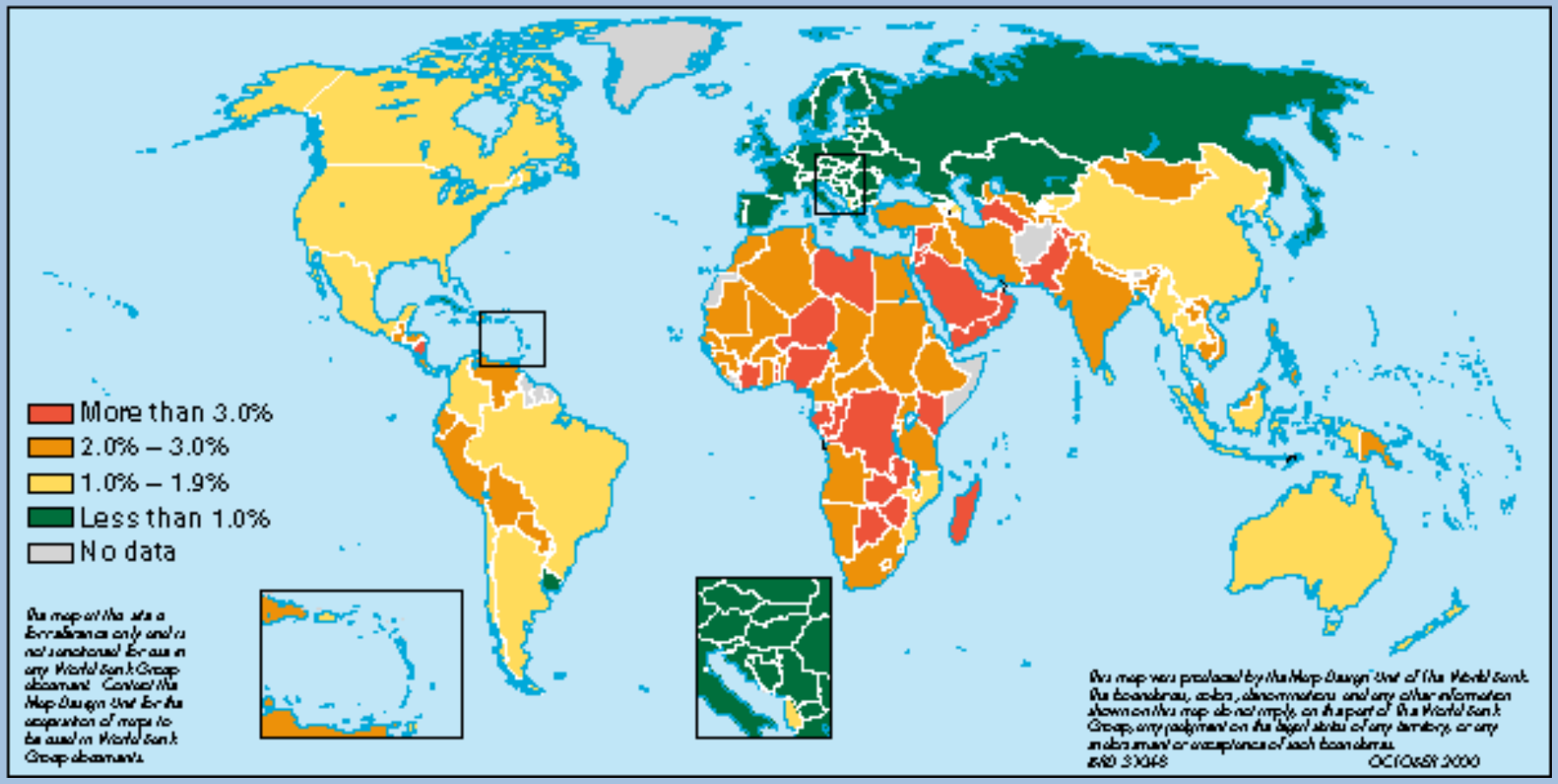
POPULATION GROWTH



Photos by Kristin McCully

http://www.nmfs.noaa.gov/pr/pdfs/sars/po2007sene-ca.pdf

ACTIVITY



Map of Average Annual Population Growth Rate, 1980-1998

(http://www.worldbank.org/depweb/english/modules/social/pgr/)