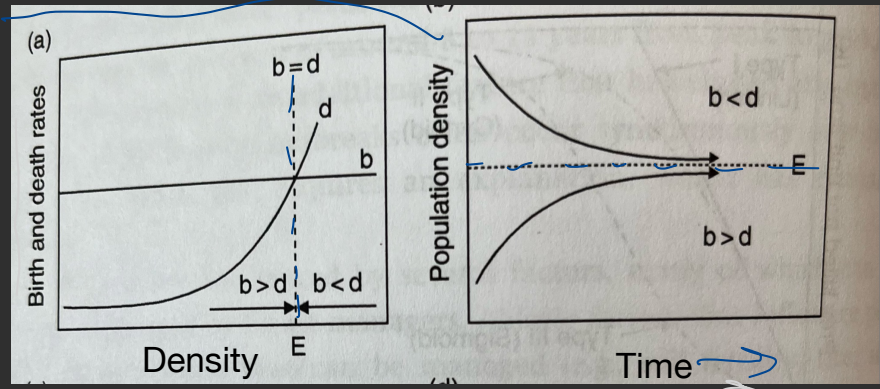
Negative density dependent growth.



Stable equilibrium density

Insect population density

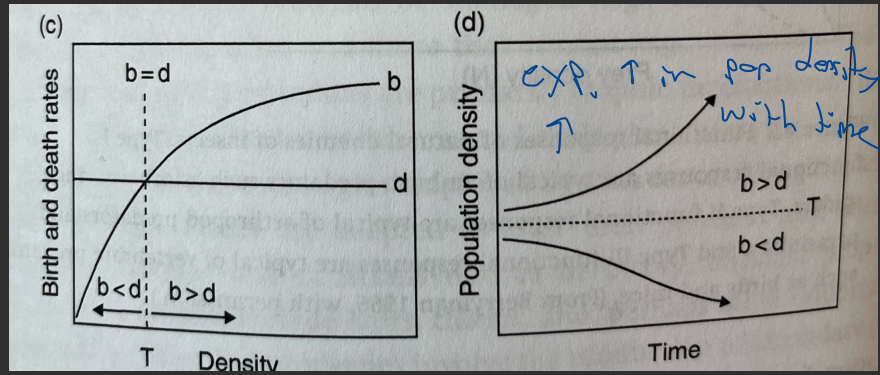
Birth rate = stable ; population increases w/ density

Death Rate = Increase in death rate ↑ rate of spread decrease

because . . . depletion of food resources

excessive predation

Positive density dependence



→ common in populations that produce many offspring in a generation

→ Unstable equilibrium

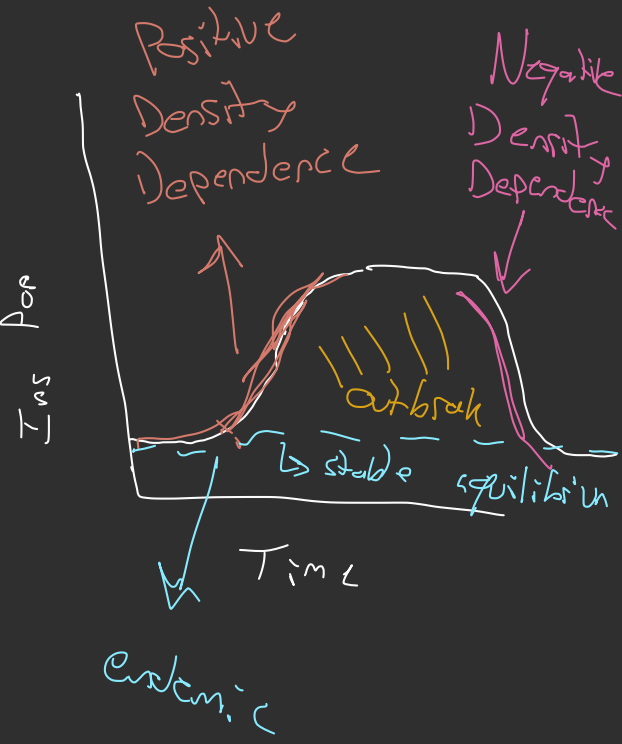
Insect/Disease outbreaks.

1. Population density remains high for extended time.

→ Abundant food.

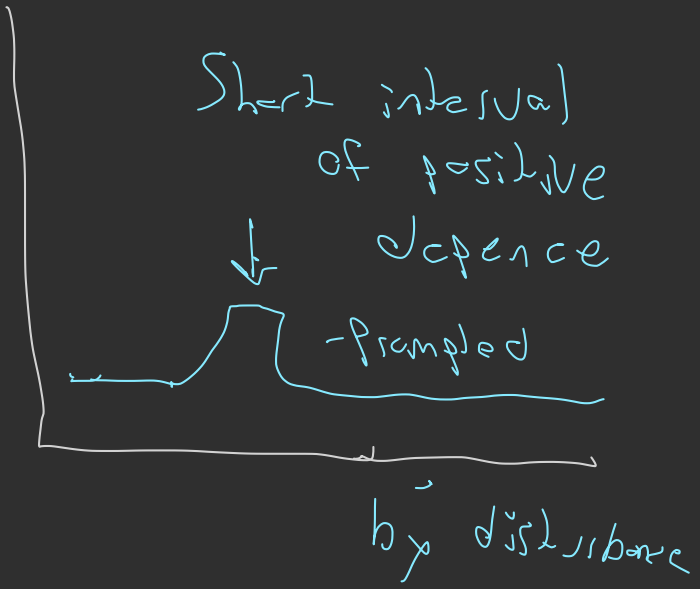
→ Favorable reproduction

→ Lack of predators



Bark beetle populations

A disturbance can change the density of food... or predators



Douglas - fir beetle and fire...

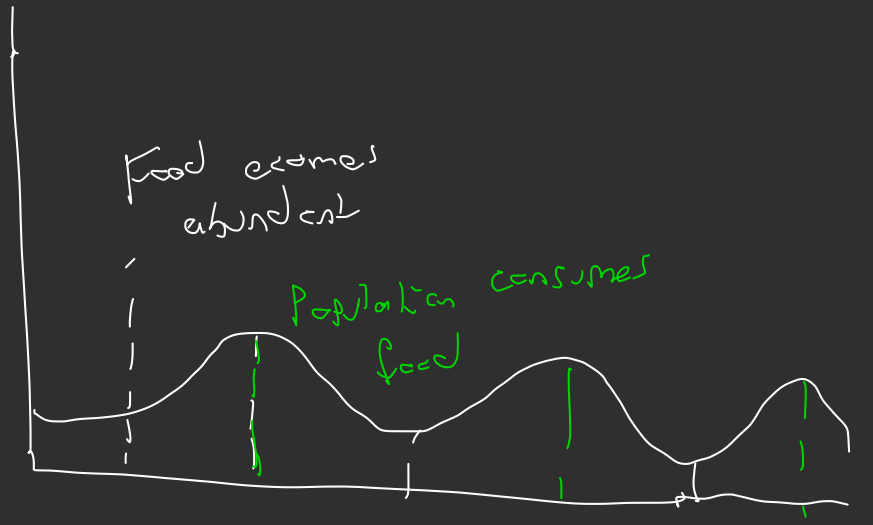
↳ fire weakens trees = more food

= spike in beetle population

→ Population density that peaks in regular cycles. (Delayed negative density dependent)

Snowshoe hare / Lynx

Elk / wolves

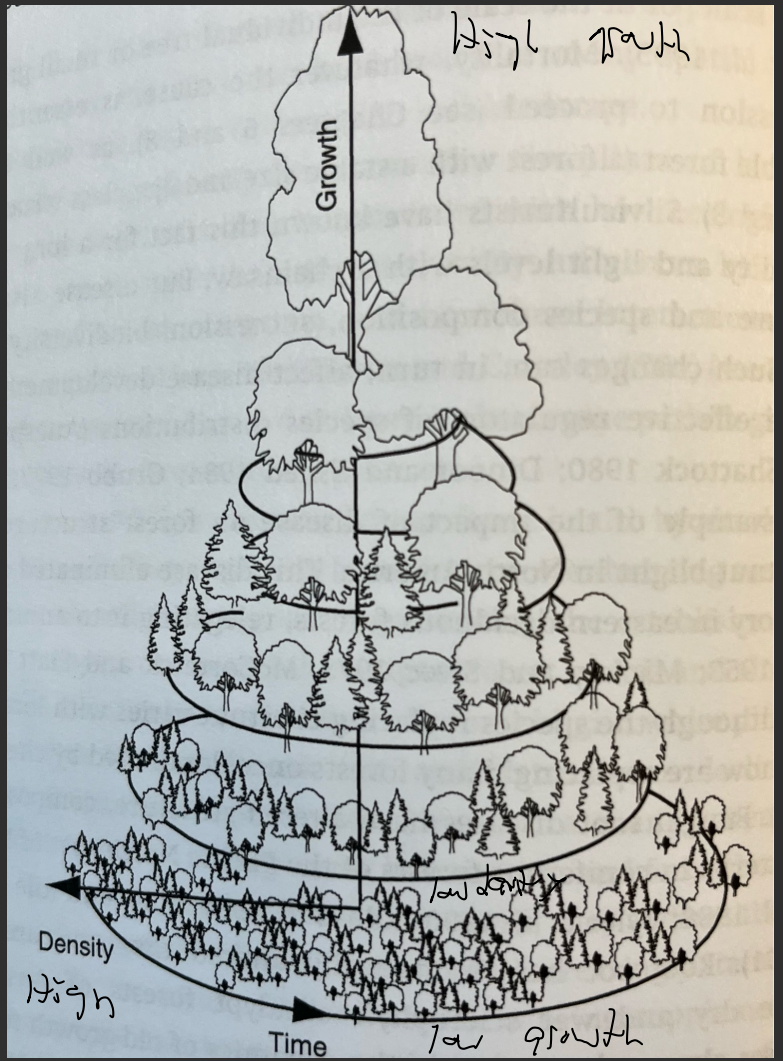


Insects that defoliate or have common natural predators

Spruce Bud Worm

Warblers + song bird predators

The tree density spiral.



Forest Health examples

Gain Names!

→ Bark beetle →

→ Drought → mortality

→ Gypsy moth

→ Rust fungi (Blister Rust)

→ Stem rot / root rot

→ Dwarf mistletoe