31. Predation, Competition, and Spacing *(Chapters 52, 53)*

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### I. Predation *(1242-1243, 1252-1255)*

-Consumption of one species by another

A. Rationale and Form of the Model

-Based on exponential growth model

-Predator prey cycles

B. Graphical Representation

1. The interaction

2. Production of population cycles

# C. Predator Regulation of Prey Populations

1. Prey population size

2. Prey population composition

D. Applications for Pest Control

1. Examples

2. Population consequences of pesticide use

-Pests have a higher r than predators

-Pests may develop resistance

II. Competition *(1255-1257)*

1. Definitions

-Demand by two or more organisms for the same limited resources

1. Competition

2. Limiting resources

3. Exploitative competition

4. Interference competition

-Intraspecific competition is competition within one species

-Interspecific completion is completion between species

-Competitive exclusion principle: no two populations can rely on the same recourse in nature and continue to coexist

-If species are sympatric (living in the same place) they must use different resources

B. Intraspecific Competition

1. Population density and logistic growth

2. Data from single‑species lab cultures

C. Interspecific Competition

1. Lab experiments on interspecific competition

2. The competitive exclusion principle

3. Indirect field evidence: resource partitioning and character displacement

4. Direct field evidence: addition and removal experiments

-Bird examples is first example of this type of competition

III. Spacing in Animals *(1224-1225)*

1. Intensity of Intraspecific Competition

-Very Strong

-Dispersion Pattern: special distribution of individuals in a population

B. Patterns of Dispersion

C. Individual Distance

-Move but maintain distance

# D. Territories of Animals

1. Definition of territory

2. Environmental requisites for territoriality

3. Functions of territoriality

4. Consequences of territoriality

5. Seasonality of territory ownership

-We see territoriality when resources are limited (not enough to support the needs of every individual), when resources are fixed in one place

-Territoriality creates dispersion and some individuals that do not hold a territory can not reproduce

-Territoriality is usually seasonal

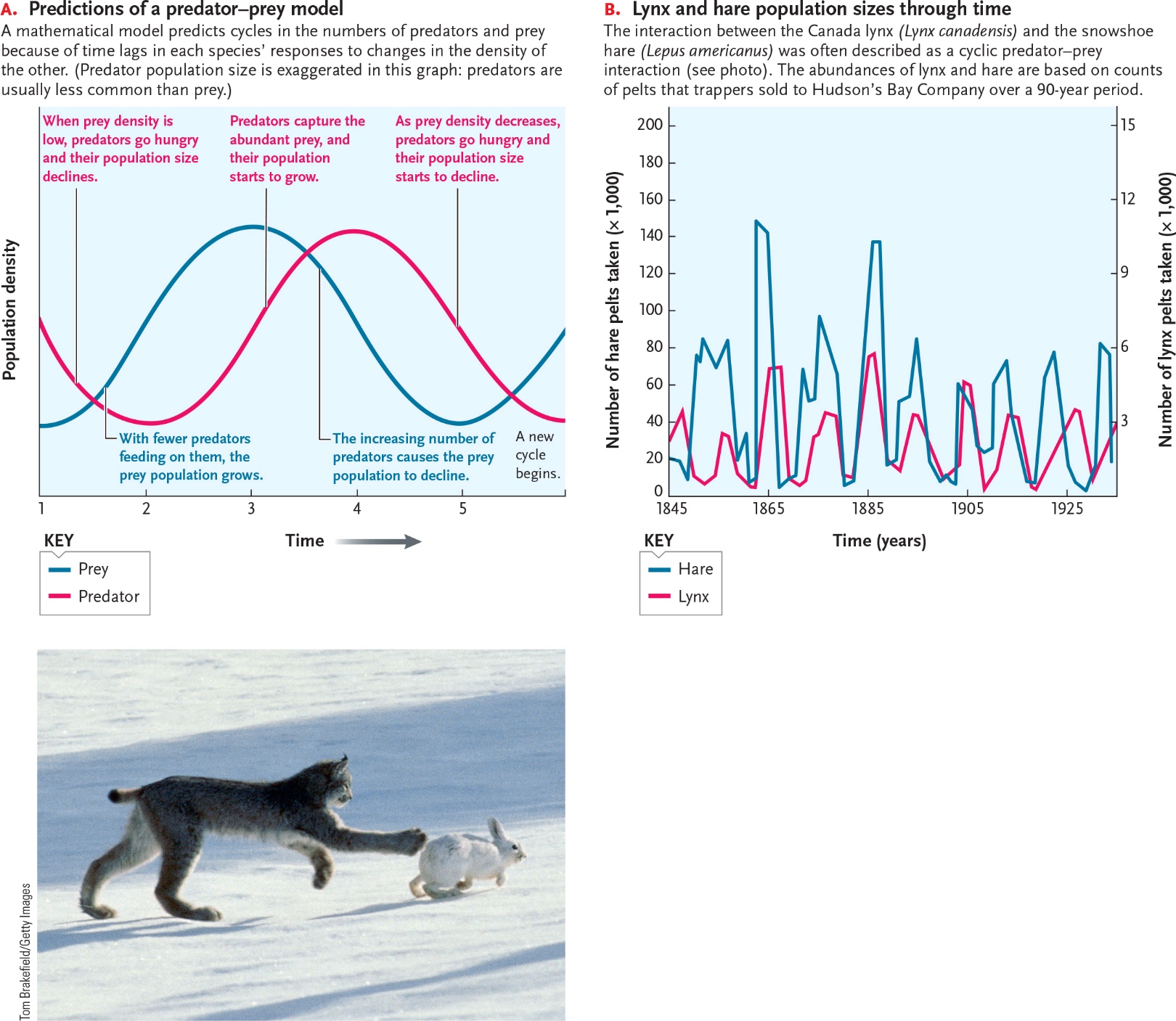
-Ecological character displacement 🡪 differences in sympatric population and similarities in allopatric populations

Experimental Approaches to Determine Competition:

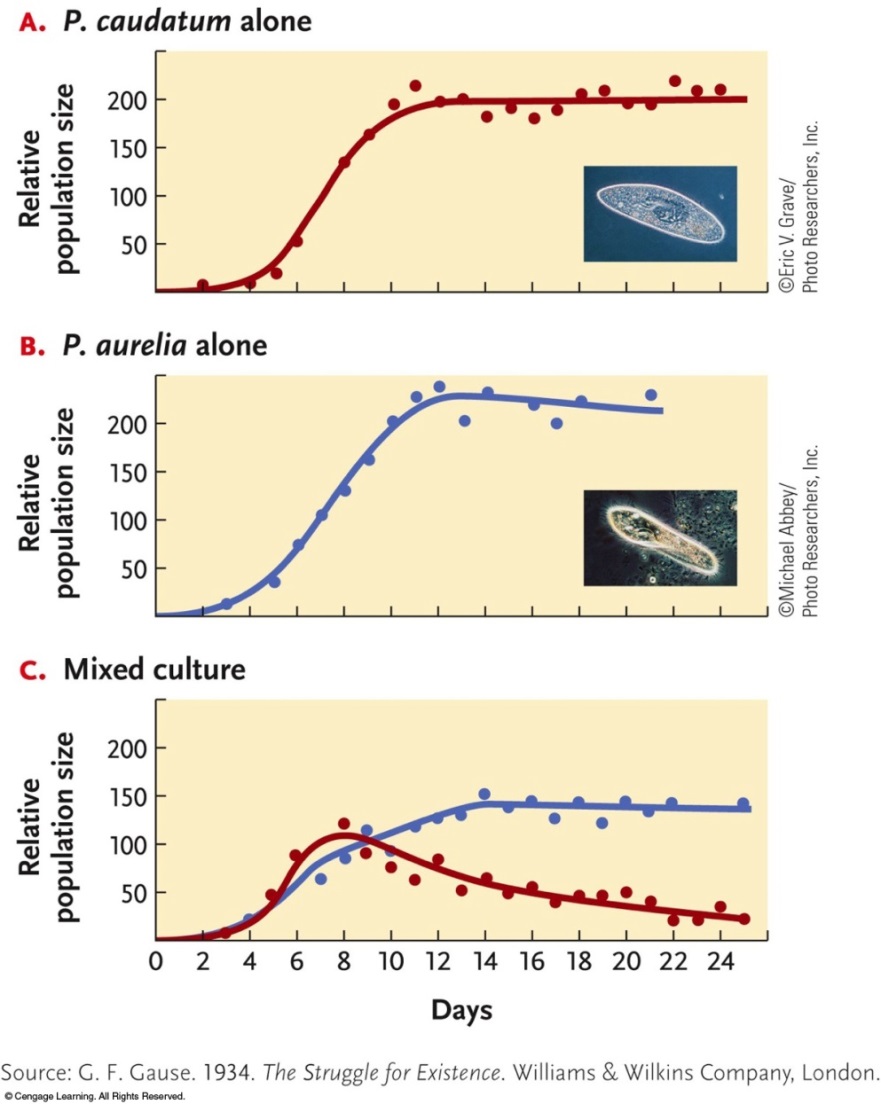
-Addition Experiment: if species A lives alone add species B to see what happens to species A

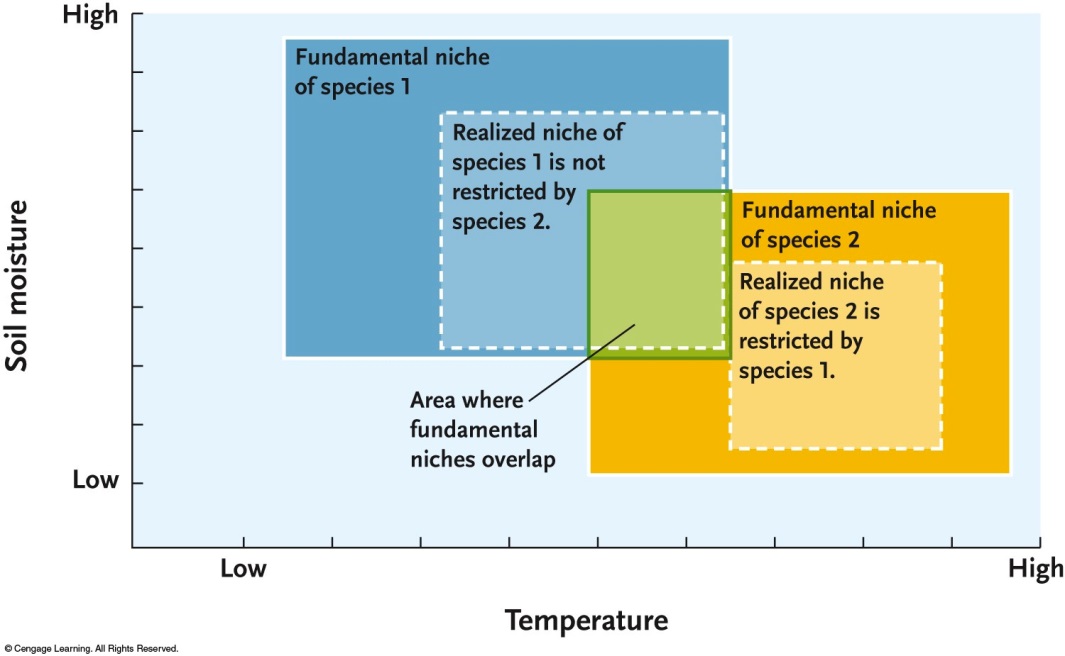
-Removal Experiment: if species A and B are sympatric you would remove A or B and see what happens to the remaining species

31-1

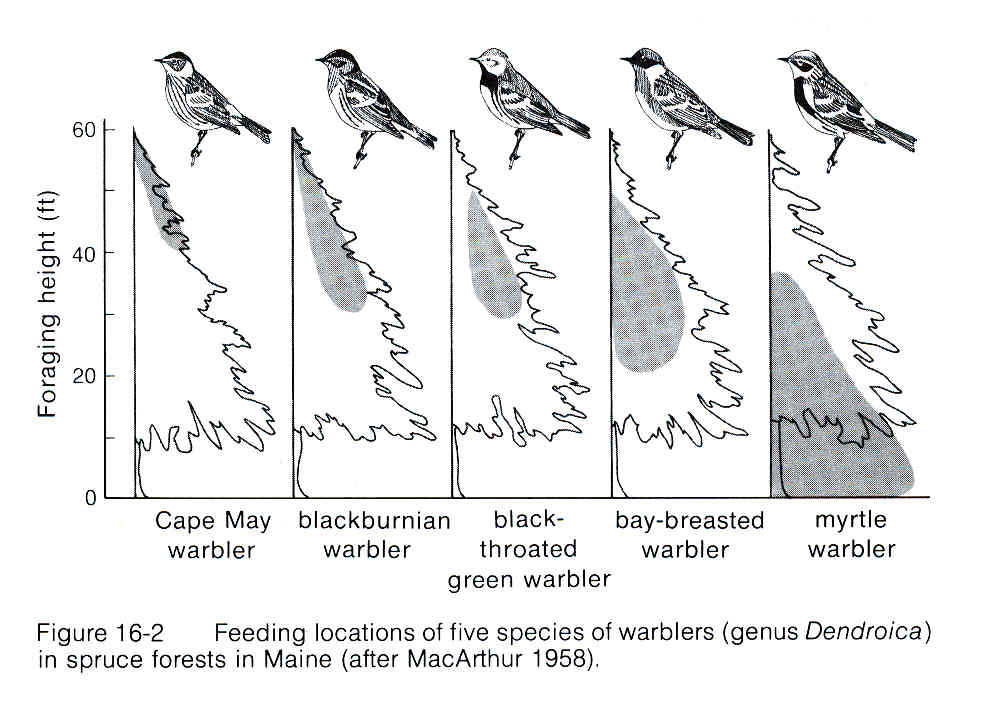


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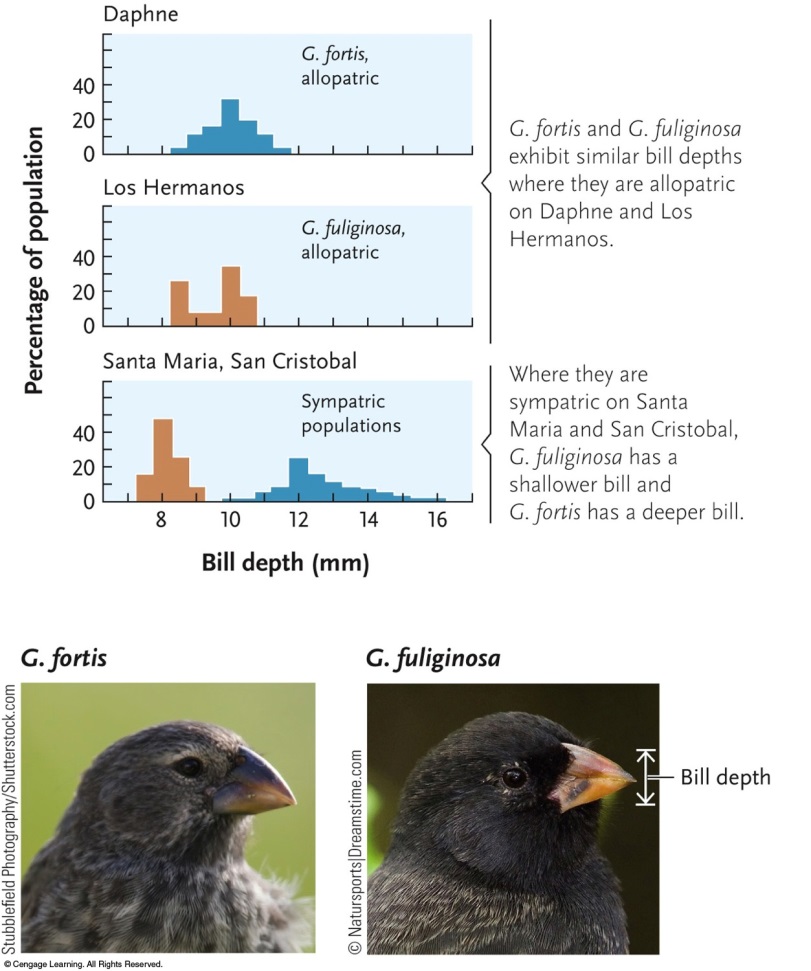




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