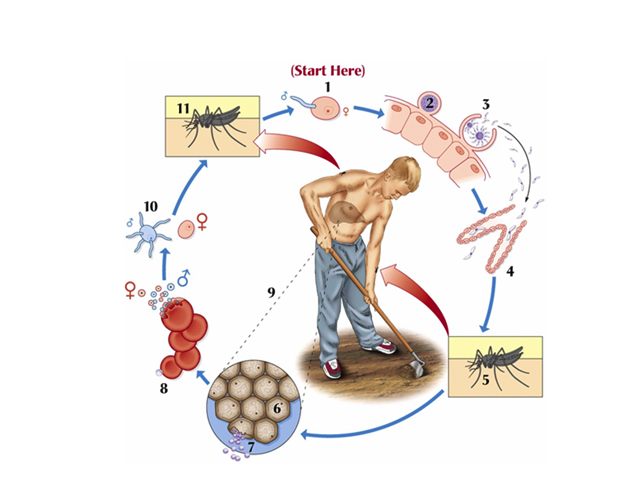
**Disease & Parasitism**

**Parasites are extremely common in natural populations/communities.**

**Parasitism +/- ecological interaction**

Parasite-host systems show evolution of virulence and resistance. History alters the effects of parasites on their hosts.

**Parasites often have complex life-cycles**

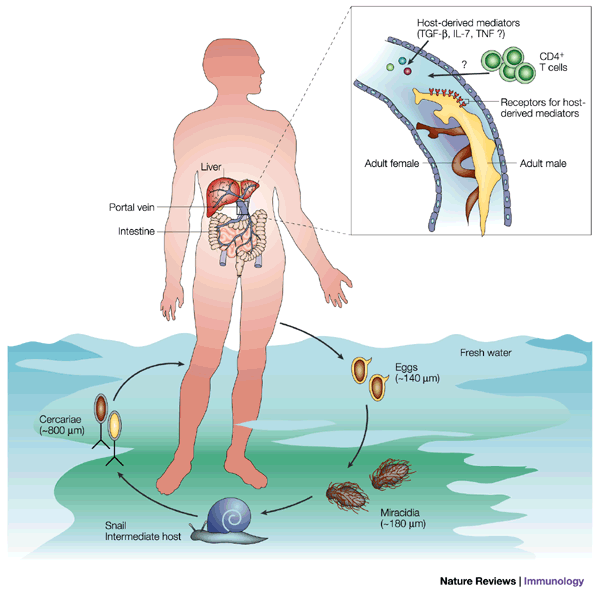
requires more than one host to complete life-cycle (each host provides a different ‘environment’)

Definitive host:

Intermediate host(s):

**Successful completion of life-cycle requires *transmission*:**

\*\*creates opportunity for strong co-evolution among hosts and parasites

 Vertical:

Horizontal:

Direct:

Indirect:

**Vectors** move pathogens between hosts

Types of Parasites

**Microparasites:**

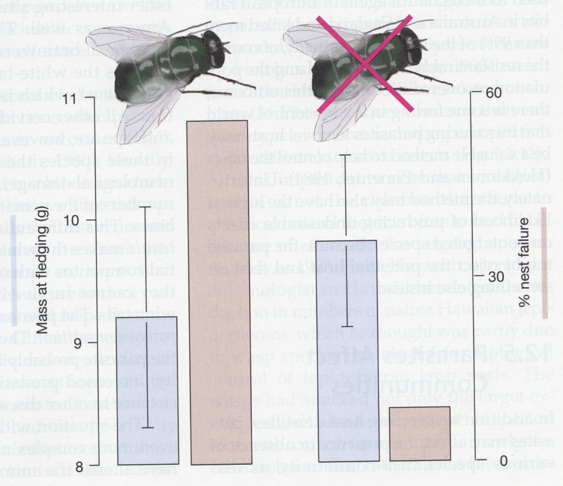
**Macroparasites:**

Ectoparasites:

examples?

Endoparasites:

examples?

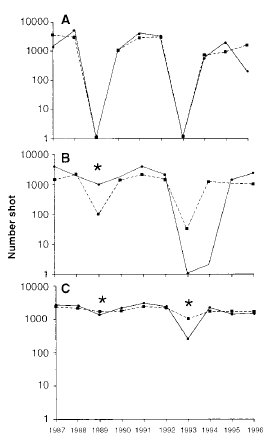


Ecological effects of parasites

**Individual-level effects:**

types:

examples: Blue tits & blow flies



**Population-level effects:**

types:

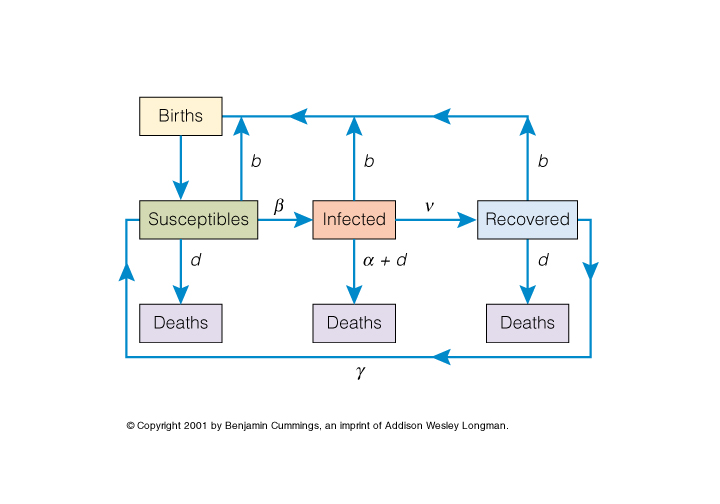
Examples: Red Grouse

**Community-level effects:**

types:

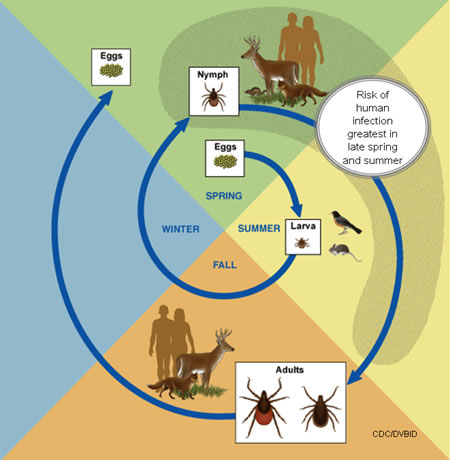
examples:

**Disease is often modeled from the perspective of the host as three sub-populations of Susceptible, Infected, and Recovered hosts**

**(S-I-R models)**

Why model the hosts?

**Lyme Disease Case Study:**



Spirochete bacterium, *Borrelia burgdorferi*

Hosts?

Why the increase in human prevalence?

What has changed in the system?