POPULATION REGULATION

1. INTRODUCTION

population growth - limited by environment

density dependent factors
- not constant, proportional to density
- pred, comp, stress, disease, behavior
- esp. vertebrates

density independent factors
- not related to pop density
- physical envi, weather, temperature
- esp. insects

2. INTRASPECIFIC COMPETITION

intraspecific
- between individuals in same species

competition - for resources in short supply
& critical for survival
- usually food, water, space, mating
- less if low density, abundant resources

scramble - population shares resources equally
- allows pop to fluctuate chaotically
- pop density lower than possible

contest - better-adapted obtains more
- others not survive or reproduce
- adjust pop to match resources

3. SOCIAL STRESS

hormones - retards body growth
- curtails reproduction
- delays sex activity

aggression - fighting behavior
- from crowding & excess contact
- increases offspring mortality

disease & parasitism
- reduces immunity & resistance
- facilitates infection

4. DISPERSAL

dispersal - permanent relocation to vacant
or marginal habitats
- allow escape comp or stress

distance - limited to closest suitable areas

pre-saturation - before reach K
- genetic predisposition to travel
- reasonable chance of survival
- expands range, prevents overpop

saturation - after exceed K
- usually juveniles or sub-adults
- poor chance of survival

5. DOMINANCE HIERARCHY

dominance - social org. based on indiv. distance
- establishes power with aggression
- maintained with displays

displays - dominant threatens
- subordinate defers or submits

sexes - often males (+ mate/offsprings)
- sometimes different for females

ranks - alpha, beta, subordinate, omega

types - peck–order (linear)
- peck–dominance (pyramid)

evolution - allows dominant to survive & repro
- helps regulate pop size

6. TERRITORIALITY

home range - total area, not defended

territory - based on spatial separateion
- area defended for exclusive use
- establish boundaries with aggression
- maintain with displays, scent, singing

defense - only vs. conspecific males
- owner always wins, intruders retreat
- ignore if outside or diff species

types - general, mating/nesting, feeding

size - enough resources for surv & repro

‘floaters’ - reserve of non-owners
- wait for vacancy, disperse to marginal

evolution - allows owner to surv / repro
- helps regulate pop size