* Genetically viable populations
* Definition, how large in practice, captive populations, fallacy of small isolated populations
* Chapter 15 of textbook
* Why define the size
  + Resources are limited for conservation
  + Funding opportunitistic
  + Require decisions to be made promptly with limited knowledge – poor country and non-charismatic animals
* 50/500 – rule of thumb
* Resources limited
  + Captivity
  + Wild
* How large to retain genetic health
  + Retain fitness in short term - 50
  + Retain evolutionary potential – 500
* Short term – avoid inbreeding depression
  + Evidence been accumulating
  + Effective size of 50 inadequate
  + Domestic – more benign environment – subject to bottleneck
* Realistic simulations
  + Ne 70 to avoid 10% ID
* Short term is 5 generations
* Linear decline in fitness with inbreeding – no total avoidance
* Threatened species are too small to aboid ID
* How large to retain evolutionary potential
  + Assumptions
    - Retain quantitative genetic variation
    - Heterozygosity – not allelic
    - Characters peripheral to fitness – height vs grain yield, etc.
  + Balance between mutation and drift and stabilising selection
* Change since 1980 – Ne = 500 is unadequate – 4 studies
* Originally concerned with quantitative genetic for total fitness – not drift effect
* How large to retain single locus genetic diversity
* Indiv loci – important to maintain variation – direct effect on fitness
  + MHC – critically in fighting diseases
  + SI alleles in plants – lose them – direct effect on fitness – ID
  + Sex locus – haploid diploid control sex
* Humans Ne = 10K
* What if Ne < 1000
* Must preserve genetic diversity not
* Avoid of accumulation of harmful mutations
  + Large population – low frequent
  + Small population – effectively neutral frequency – fixation – can lead to extinction
  + Between 12 to 1000 – some mutations are very harmful – need small effective size – need high effective size for mild mutation – few loci of mutation with large effect
  + Worse in asexual – can’t separate beneficial and harmful
* Minimum viable populations size – MVP
* In captivity – retain 90% of genetic variation for 100 years
  + Early meeting on conservation genetics in 1994 – tradeoff between number of species can be conserved and genetic diversity
* Small wild isolated population overwhelming go extinct – both captivity and wild
  + Argue from few and generalise cases – can be bad science