* Selective forces that maintain genetic variation
* Connectivity is relevant to the genetic variation – important for conservation biologist
* Mutation is rare – depending on the part of the genome sampled – most mutation is deleterious or lethal – impact on fitness so deleted by selection
* If the population is big enough – beneficial allele will get selected for
* If the population is small – genetic drift – the beneficial allele won’t have time to be selected for
* Genetic load – proportion of deleterious allele in population level – mostly masked in heterozygous form
* Neutral and near neutral mutation maintained by selection
* Genetic variation enhanced by gene flow (migration)
* Can be enhanced by mutation if drift isn’t fast enough
* Selection – balancing selection maintains genetic variation in population
* Heterozygote advantage – malaria resistance – help maintain sickle-cell anaemia causing allele in the population
* Rare allele advantage – frequency depending survival or mating – rare colouration will benefit – maintain rare allele in the population
* Rare allele advantage – human shirt experiment – the smell response corresponds to maximising heterozygosity in that part of the genome
* Gene environment interaction – selection along the altitudinal gradient
* Gene environment interaction – frequency of allele in Harlequin frog shift across environmental gradient – another example – poison frogs with diversity bright colour – bright colour is warning signal – need consistent marketing – those colours are quite close together – make wax frogs and translocate them and identify bite mark – no difference in predation according to colour – blue frogs in red frogs don’t get eaten – look at the mitochondrial genome and make population tree – different colours on the tip refer to different colours – got the same colour that evolved independently multiple times – confirmed in nuclear analysis – so mutation has got fixed and maintained in the population – no evidence of strong directional selection for colour type and predation
  + Different colour mutation in different population – single mechanism/mutation that can change colour