

Population ecology

[Science](#), [Biology](#)



Population ecology is the branch of ecology that studies the structure and dynamics of populations. In population ecology a population is a group of individuals of the same species inhabiting the same area. In contrast to genetics, where the population is a group of interbreeding individuals of the same species, which is isolated from other groups and in human demography, the population is the set of humans in a given area. Population density is a common biological measurement and is often used by conservationists as a more appropriate measure than absolute numbers. If there are low population densities, extinction may be in the future of the species life, but is unlikely to occur and a reduced reproduction rate can also be a result. Low population densities result in reproduction to decline due to the increased problems with locating mates, increased interbreeding, and increased susceptibility to catastrophic events. Different species will have different population densities. Populations can be considered at a scale of regions, islands, continents or seas. Even the entire species can be viewed as a population. In populations, the numbers of individuals in each age group from newborns to post reproductive adults comprises the age distribution. Age distribution is dependent on factors such as birth and death rates, which may depend on whether or not conditions were favorable for reproduction during particular times in the past. Populations have the potential for exponential growth because the number born exceeds the number that mature and reproduce. This is referred to as population growth. Spatial distribution is another factor that affects a population. There are three types of spatial distribution which are: regular, aggregated, and random. Regular spatial distribution occurs when there is about equal distance between each

organism of the same species that is being measured. Random spatial distribution is defined as being scattered with no regularity. Aggregated spatial distribution is seen when individuals of the species are found clumped together in some areas and absent in others. New individuals are added to a population by birth and emigration and an existing species can be removed from a population by emigration out of the area or by death which is the mortality rate. The rate at which a population may grow is dependent on the sex ratio in the population; the fewer females, the slower the rate of the population's growth. There are eight ways in which population densities can be estimated. The techniques are: guess, quadrants, transects, mark and recapture, removal trapping, point quarter, and the random pairs method. The guess method is the cheapest and least time consuming method. A guess is made based on one's own observations as to how many individuals there are of the species. The quadrant method uses the complete area of which the complete population is being measured for and is divided into areas that are squares. Transect method take takes the quadrat that are located in a straight line and are counted. Mark and recapture entails capturing the organisms alive, marking them with tags, dye or fin clipping and then returning the organisms back into the area of they were removed from. Another sample is then taken after the organisms are allowed to redistribute. Removal trapping is also known as " catch per unit effort." This method is useful for animal populations that are difficult to mark. Point quarter is used by randomly selecting a point where a quadrat line crosses or forms an intersection. Dirrectes are used to assign the locations using: northeast, northwest, southeast and southwest. Random Pairs methods is

similar to the point quarter method, using an intersection of a quadrat and measuring the distance from the closest organism to the intersection to the first organism that can be measured crossing an imaginary line that passes through the intersection at a ninety degree angle.