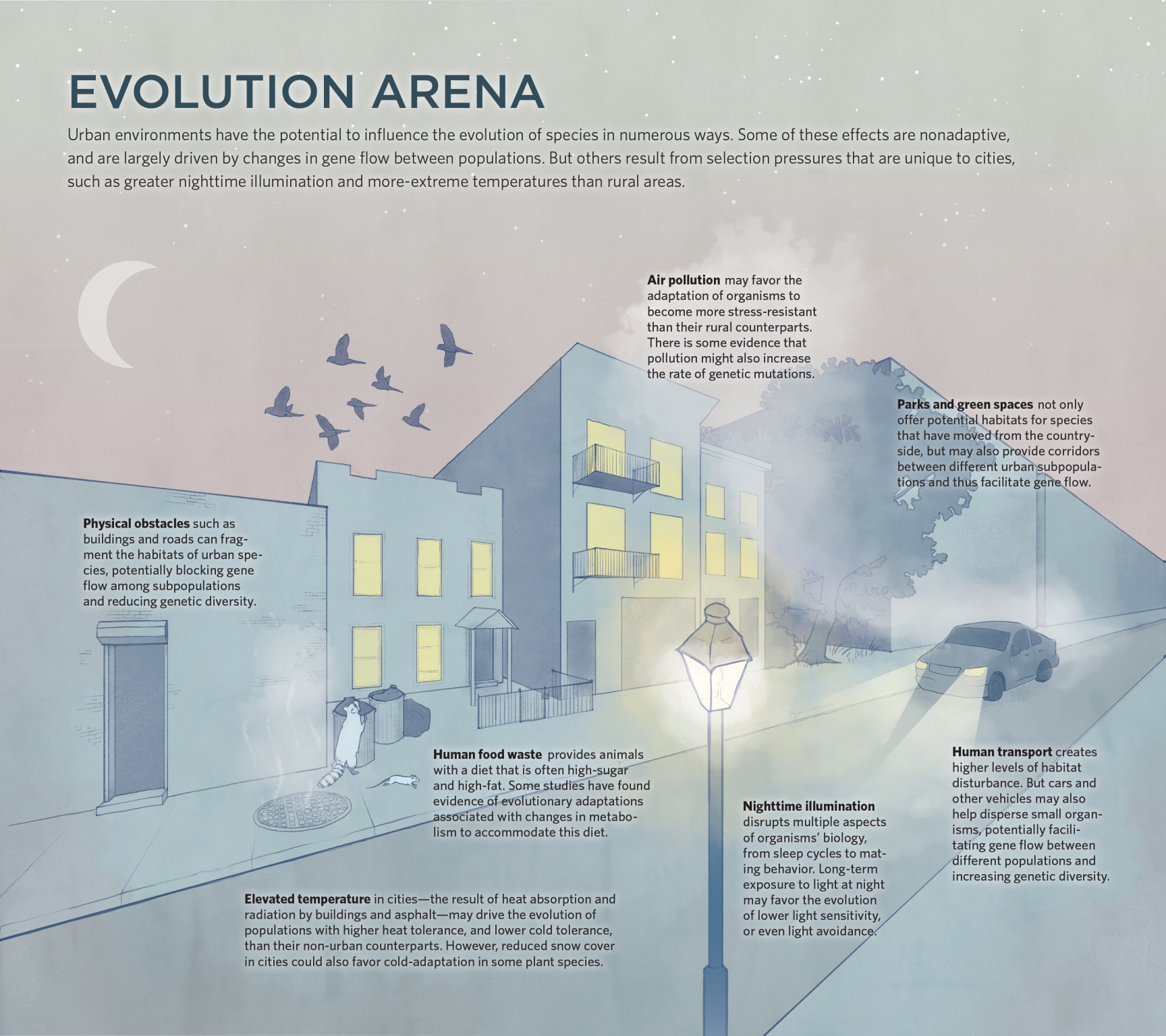


EVOLUTION ARENA

Urban environments have the potential to influence the evolution of species in numerous ways. Some of these effects are nonadaptive, and are largely driven by changes in gene flow between populations. But others result from selection pressures that are unique to cities, such as greater nighttime illumination and more-extreme temperatures than rural areas.



Physical obstacles such as buildings and roads can fragment the habitats of urban species, potentially blocking gene flow among subpopulations and reducing genetic diversity.

Human food waste provides animals with a diet that is often high-sugar and high-fat. Some studies have found evidence of evolutionary adaptations associated with changes in metabolism to accommodate this diet.

Elevated temperature in cities—the result of heat absorption and radiation by buildings and asphalt—may drive the evolution of populations with higher heat tolerance, and lower cold tolerance, than their non-urban counterparts. However, reduced snow cover in cities could also favor cold-adaptation in some plant species.

Air pollution may favor the adaptation of organisms to become more stress-resistant than their rural counterparts. There is some evidence that pollution might also increase the rate of genetic mutations.

Parks and green spaces not only offer potential habitats for species that have moved from the countryside, but may also provide corridors between different urban subpopulations and thus facilitate gene flow.

Nighttime illumination disrupts multiple aspects of organisms' biology, from sleep cycles to mating behavior. Long-term exposure to light at night may favor the evolution of lower light sensitivity, or even light avoidance.

Human transport creates higher levels of habitat disturbance. But cars and other vehicles may also help disperse small organisms, potentially facilitating gene flow between different populations and increasing genetic diversity.