The effects of artificial light at night on urban ecosystems

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Urbanisation has resulted in a proliferation of artificial light at night (ALAN). ALAN disrupts the natural cycles of light and dark and has a wide range of impacts, including altering behavioural and physiological processes across multiple taxa. One of the primary contributors to ALAN in urban areas is street lighting. Older street light technologies such as golden high-pressure sodium (HPS) lamps are increasingly being replaced with more energy-efficient lights, predominantly consisting of white light-emitting diodes (LEDs). Given the changes in intensity and spectrum, and subsequent alteration of visual perception under LED light, we expect the large scale change in lighting to impact biodiversity and behaviour of urban wildlife. We utilised an ongoing city-wide retrofit of Auckland street lights to assess the impacts of the change from HPS to LED on urban wildlife and the night sky. We report initial results of the large-scale BACI field experiment that assesses changes in avian and insect community composition, small mammal presence, and timing of dawn and dusk bird song during the retrofit. We discuss the implications of our results for managing and enhancing urban ecosystems in light of the recent and rapid global shift to LED lighting.