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Lights Harming Natural Lands

The lights in St. Olaf's Skoglund parking lot sit high in the air, approximately fifteen meters or so, and they beam down with intense white light. Sadly, a lot of the light they emit at night makes its way into the surrounding natural lands. Excessive light is known to have detrimental effects on the health of ecosystems. The bright white light that shines into the natural lands from the parking lot at night is negatively impacting the health of the ecosystem that resides there.



Figure 1. Both photos are of St. Olaf's Skoglund parking lot. The left photo shows the lights shining into the surrounding natural lands. The right photo shows how many parking lights there are in the parking lot. Photographed by author in 2019.

The light that St. Olaf's skoglund parking lot emits at night is white light, which is known to have a particularly bad impact on the health of ecosystems. In the article titled, "Ecological Effects of Light Pollution: How Can We Improve Our Understanding Using Light Loggers on Individual Animals?," Davide M. Dominoni states that "different wavelengths have the capacity to impact different biological functions and ecological processes to different extent." This shows

that white light, such as that emitted by the parking lot, has a significantly worse effect on ecosystems because it has multiple wavelengths. The lights are incredibly bright, but this is made much worse by the fact that that light produced is white light

The bright white light produced by the parking lot lights at night is disrupting the circadian rhythm of the organisms in the natural lands. According to the paper titled “Light pollution as a biodiversity threat” by Franz Hölker et. al, many organisms have developed sensitive circadian rhythms that play important roles in metabolism, growth, and behavior. Circadian rhythm is defined as, “The natural cycle of physical, mental, and behavior changes that the body goes through in a 24-hour cycle” (National Cancer Institute). Artificial lightning is known to disrupt this circadian rhythm of organisms and cause them harm. For instance, when discussing the health effects of light on rats, in their paper titled “The impact of light, noise, cage cleaning and in-house transport on welfare and stress of laboratory rats,” M J Castelhana-Carlos and V Baumann state:

Continuous exposure to bright light has been shown to strongly suppress circadian rhythms of the sleep –wake cycle, drinking, locomotion, blood pressure, heart rate (HR) and body temperature (BT), which are regulated by the SCN. Constant light (LL) housing has been shown to increase corticosterone levels in both male and female rats, and is used as an experimental model of chronic stress.

Importantly, their statement highlights that in animals, excessive artificial lighting can disrupt the circadian rhythm to the extent that it causes physiological effects that mimic chronic stress. This is a testament to the impact that artificial lighting, like that in the parking lot, can affect the

health of animals. Although circadian rhythm disruptions are one way that artificial lighting can harm the health of an ecosystem, it's not the only way.

The bright white light emitted from the parking lot is also negatively impacting the health of the natural land's ecosystem by killing bugs. When talking about the negative effects that light pollution has on the biodiversity of ecosystems, Hölker states:

many insects actively congregate around light sources until they die of exhaustion. Light pollution can therefore harm insects by reducing total biomass and population size, and by changing the relative composition of populations, all of which can have effects further up the food chain.

This statement highlights the fact that light pollution can indirectly harm ecosystems through propagations in the food chain, from bugs up to larger animals. This is particularly disturbing because artificial lighting can harm a larger creature in the ecosystem by affecting the population size of a smaller one.

The information presented strongly suggests that the lights in the St Olaf Skoglund parking lot are harming the ecosystem of the surrounding natural lands. Although the lights do comply with dark sky approved lighting, as the lights are faced downward to the ground, they are still producing a lot of light that is making its way into the natural lands. This could be due to the brightness of each individual light or the quantity of lights installed. Either way, the light produced by the parking lot is having a detrimental impact on the health of the ecosystem in the natural lands.

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