

Urban Rewilding: Do the Benefits Outweigh the Costs?

Mackenzie Snyder

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Humans threaten the existence of many species in urban areas, including college campuses, through habitat loss, fragmentation or division, and pollution. A solution for these problems is urban rewilding, which incorporates native plants and animals into urban infrastructure rather than creating infrastructure with only humans in mind. It is proven that rewilding has many benefits for wildlife, but some people, including many politicians, believe that these measures are too economically taxing. These people say that the economic costs of creating more green space is not worth the benefits to the environment. However, these people are unaware that there are benefits to humans, as well as wildlife. Urban rewilding measures benefit populations by creating physical, social, and economic benefits.

Scientists have explored the impact of surroundings on human health for many years, beginning with a study in 1854 by John Snow that identified a contaminated water well responsible for a cholera outbreak in London. This study inspired an entire field of research based around the health effects of environmental problems. One of these problems, pollution, has very direct impacts to health. An accepted solution to the pollution problem is to increase vegetation overall and in urban areas. Trees and other plants absorb air pollutants and trap them within while their roots filter groundwater, creating many health benefits. Dr. Giana Lovasi from Columbia University found that increase in about 350 trees per km² is related to a decrease in childhood asthma by 29% in New York City because pollution is correlated with asthma onset(Lovasi, 2008). Not only can pollution cause the development of asthma, but it can exacerbate symptoms. A study by Dr. Paul Delamater in 2012 found that as carbon monoxide and nitrogen dioxide levels increased, two gases associated with traffic sources, the number of

asthma related hospitalizations drastically increased (Delamater, 2012). Considering this research, it is not surprising that 12.4% of Maryland adults have asthma, a frequency which is higher than the national average of 7.4% (Bankosiki, 2012). Vegetation not only improves asthma hospitalization rates, but has other impacts in hospitals through decreasing the “stay” duration and pain levels of recovering patients after surgery (Ulrich, 1984). In a statement in the original article, Dr. Beatly from the University of Virginia asserts that the shorter recovery time support the hypothesis that being near a green space boosts the immune system (Berg, 2016).

An increase in nature not only promotes physical health, but it has a positive effect on mental and emotional health. Researchers have found that working in the presence of plants yields a lower blood pressure than an environment without plants, showing that the surroundings help reduce stress (Lohr, 1996). Vegetation benefits everyone overall through reduction of stress, however it has also been shown to prevent and aid in the recovery of mental illness. A study by Dr. Hannah Cohen-Cline at the University of Washington in 2015 found that green space is a protective factor in the development of depression (Cohen-Cline, 2015). However, nature seems to often offer protection or recovery for many other mental disorders. This can be explained by a theory by Robert Ulrich, one of the founders in this area of study. Ulrich believes that the restorative effects of nature are most potent when someone is experiencing a high level of stress (Ulrich, 1999). This theory is supported by studies that have found that people who experience nature more frequently are less affected by crises that they experienced (Ottosson, 2008). In a more extreme example of this theory, research has found that veterans with PTSD have improved functioning and fewer symptoms after engaging in a one year excursion through natural areas in a therapy called Nature Adventure Rehabilitation

(Gelkopf, 2013). Although lengthy excursions in nature have shown to have a positive impact on mental health, overall natural surroundings can also protect from conditions such as depression.

A key aspect of social health is the ability to feel safe and secure in an environment, and therefore violence greatly affects community social health. Attention Restoration theory states that which says that nature can help heal mental fatigue. Reducing mental fatigue means that people will be overall happier and more satisfied, but it also has a impact on the manifestation of violence. Mental fatigue makes people more vulnerable to outbursts of angry and violent behavior (Kuo, 2001). When mental fatigue increases in a population, the domestic violence rates subsequently increase in an area. Attention Restoration Theory has been supported in studies where the amount of vegetation increasing in environments is correlated with a decrease domestic violence independent of factors such as income(Kuo, 2001). As for crime overall, a study in Chicago found that as the vegetation around a building increased, property crime and violent crime decreased in the area. A medium amount of vegetation had 42% less crime than a low amount of vegetation, and a high amount of vegetation had 17% less crime than a medium amount (Kuo, 2011). This shows that even environments with an adequate amount of natural surroundings can benefit from even more vegetation. Spaces that incorporate nature also have lower rates of small crime such as littering, vandalism, and graffiti, creating overall a cleaner community (Brunson, 2001). Finally, natural spaces not only prevent crime, but promote community bonding. In communities with natural spaces that include trees and other plants, not only grass, social contact between neighbors improved(Sullivan, 2004).

Increasing vegetation to high levels and using a variety of vegetation improves community relations and crime rates.

One of the criticisms of expanding the presence of natural areas is the cost. However, many rewilding projects undertaken have paid for themselves over time. For example, urban forests save money through reduced energy use for cooling and heating, improving air quality, improving water, noise abatement, increasing real estate prices, and more. The 3.8 billion trees currently in urban forests in the U.S. are valued at 2.4 Trillion dollars in benefits (Nowak, 2010). Urban forests are areas with dense vegetation including trees, showing that urban rewilding is important rather than simply increasing green spaces. Houses surrounding the urban forests have almost a 5% increase in property values. Rather than having one large urban forest, it is most effective to have many small-mid forests to increase property values even more (Tyrväinen, 2000). For example, the trees along residential streets in Portland, Oregon, where 590,000 people reside, are valued at 1.53 Billion dollars in benefits and increase tax revenues by about 15 million dollars. Therefore, increasing vegetation and urban forests also increases the income of the city government to pay for further investment in trees or to pay off the initial investment (Donovan, 2010). Another common rewilding measure is wildlife passages above or below major roads so that wildlife can safely cross. Crashes with wildlife takes a toll not only on their population numbers, but they also have a financial toll for humans. According to The Baltimore Sun, about 1,500 crashes involving animals are reported in Maryland yearly, with an average cost of \$3,000 worth of damage per crash, not including the costs of corpse retrieval, medical bills, and government services that were used (Wheeler, 2011). Maryland installed 10 different wildlife passages with the new Intercounty Connector project because of these costly

crashes. Ultimately, urban rewilding measures increases tax revenues to pay for the investment and save cities and residents money through benefits such as a decreased number of car accidents.

These benefits are not only experienced by cities and the overall population, but an also be seen on college campuses. The University of Maryland campus seems to have many green spaces, including having the largest academic mall in the country. However, there is not a lot of wildlife on campus outside of squirrels because urban rewilding was not worked into the landscape designs. While there may be plenty of grass and individual trees spread out, there is a lack of diversity and density. For example, as stated before, buildings with high levels of vegetation around them have significantly lower levels of crime. This means that every building on campus should have vegetation worked into the design through yards, green roofs, and even green walls. It is also known that urban forests have many environmental benefits that ultimately translate to other benefits for humans, however there are no dense areas of vegetation that would classify as an urban forest. Including forests and other diverse areas of vegetation into the campus design rather than simply having areas of grass will maximize the benefits gained from green space while allowing the campus to be a place for the rehabilitation of wildlife populations.

Many of the benefits previously stated will have a positive impact on students at The University of Maryland. For example, the money saved means that more funding can go towards student services such as counseling or academics rather than energy usage or the upkeep of many grass fields. Overall, increasing vegetation levels has been proven to improve community relationships and decrease crime, creating a better and safer campus community.

This decrease in crime will also decrease the occurrence of relationship violence which is a concern on campus because young-adults are most vulnerable to this violence (Luthra, 2006). Using native vegetation specifically enhances education, which will benefit the many ecology and insect research programs on campus. This can bring field work to campus and allow undergraduate students to get a hands-on experience when taking ecology related labs. Introduction to Ecology labs go to the local river to study the organisms present, however it is so polluted that classes often come back empty-handed. Students not involved in ecology will still see academic benefits due to a decrease in mental fatigue and overall stress. A natural campus also helps to protect students from the development of depression and other disorders that can severely impact their academic career. Through community bonding, a decrease in stress, and an increase in academic success, the student population will experience vast improvements. Urban rewilding does require initial investment, but it is a small price to pay considering how much it can improve and strengthen the University of Maryland.

The world is currently in its sixth mass extinction, with 50% of all plant and animal species vanishing in the past 40 years (McLellan, 2014). It is often difficult for school officials to look past economic costs in regards to infrastructure projects, which is why it is time for students to be involved in environmental decisions at UMD. An active student body vocalizing their needs can lead to better campus planning decisions and therefore a better university. Using urban rewilding in campus design plans not only benefits the student body, but will allow the University of Maryland to actively be a solution for environmental problems facing the world today. It is time for the university to embrace fearless ideas and continue to be a leader

in environmental issues by increasing the amount, density, and diversity of vegetation and wildlife on campus.

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