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The Importance of Local Species in Cedar Falls

Cedar falls have many invasive species whether because of external or internal factors. Some species that are invasive include Eastern Red Cedar, European Buckthorn, and Japanese beetles. The introduction of these species causes harm to the environment and threatens biodiversity, which can harm natural resources. Some of these issues arise from trade and travel which can introduce invasive species, while weather events and human intervention can worsen the effect of invasive species.

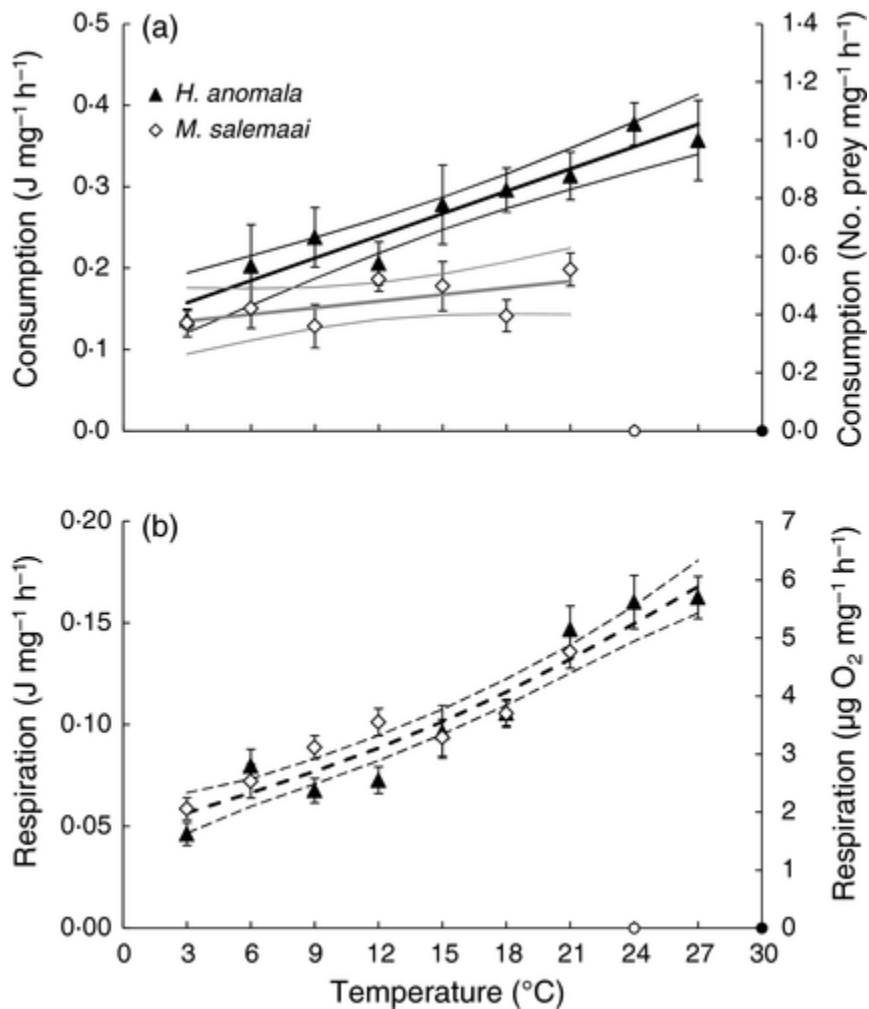
There are solutions that can help these issues and ways that we as a community can help. This is somewhat of a wicked problem as talked about in class because the solution may be unique and hard to discover while also having a possible one way to solve the problem. If this is a wicked problem then the best way to solve it is to understand the problem and specify how to measure success. Invasive species are defined as a non native species brought over a significant geographical barrier by us. A species can be invasive without knowing the measured effects of their presence. These species are transported mainly through trade whether on accident or on purpose. The goal is to be able to recognize invasive species local to Cedar Falls. As well as report invasive species so that they may be handled, they can be reported to the Iowa department of natural resources. An app would be accessible and easy to use through the University of Northern Iowa portal where invasive species can be reported and recognized.

Native species are very important to their local environment and ecosystem. Plants and animals had to adapt to their current habitat, which means they also became integrated into it.

When they are taken away from their environment it harms the ecosystem. Biodiversity within an ecosystem protects it from being vulnerable to disease, weather changes and more. Invasive species also take up natural resources needed by animals and us, as a lot of them alter water sources, damage forests, and more. This is why it is important to help maintain the local ecosystems, being able to recognize and report the threat to that ecosystem would make a difference.

Unfortunately it may not be that easy, as it can be easy to improperly report invasive species. It isn't too much of a task to recognize invasive insects or animals as they have more unique and differing characteristics, however with plants it can be easy to mix up with other native plants. That is why it is important to be able to recognize them appropriately and why an app for identifying them with pictures would help reduce invasive species. As we are in a digital age, it makes more sense to take advantage of that to solve issues like this, using an app that would be accessible to students at UNI; would help report and reduce invasive species. The need for this is because of the increasing invasive species from climate change. According to the book "Invasive and Introduced Plants and Animals" by (Rotherham and Lambert 197), there are "increased risks of invasions as exacerbated by climate change". This source also points out how other countries prioritize environmental problems, 86% in Greece, 65% in Italy, and 56% in Spain all said that the protection of the environment is to be prioritized over the competitiveness of the economy. However, they are only thinking of pollution and climate change and underestimating the dangers of invasive species. In America we don't even prioritize climate change. This reflects the high importance of awareness of this problem as environmental problems increase the invasive species issues. It makes sense to want to consider finding solutions for combating climate change and pollution before handling the invasive species issue, however each of these issues around the world affect each other. A journal of animal ecology explains how climate change assists invasive species, this Journal was written by Penk, Jeschke, Minchin, and Donohue. According to this journal, climate change can enhance the

effect of invasive species. They used species *H. anomala* and *M. salemaai* to compare how fast they grew in accordance with the temp (Penk). *H. anomala* acted as a native and *M. salemaai* as an invader, they found that this species increased feeding rate with temperature as needed for growth. Here is a graph that shows this relationship.



This journal of this experiment shows how climate change and the warming of the planet can affect how well invaders inhabit other ecosystems. It is important to try and fix the problems we can, this is especially important in small areas like Cedar Falls. Jared Diamond, as discussed in class, says that subtle environmental factors can build up and cause collapse of societies. We often make the same mistakes over and over just as ancient civilizations did, we too are making the same mistakes.

Another obstacle in this solution for preventing the spread of invasive species is being able to convince UNI that this is something worth investing in. It could be a challenge to try and propose an app just for keeping track of invasive species and native species, they may not see a reason. The goal is to raise awareness and try to reduce invasive species, it could be helpful to try and propose this to UNI through a presentation and have people from the botanist center, such as professors, help bring more importance to the issue because they would most definitely understand local invasive species to the UNI area. The Issues that would be brought up would be the impact that invasive species in Cedar Falls have on the environment, native species, and us. It is first important to define how invasive species cause harm to the ecosystem. According to the article, "Yale Experts Explain Invasive Species", Invasive species can kill other species which interrupts to ecosystem, as well as use up space and resources ("Yale Experts Explain Invasive Species | Yale Sustainability"). This article also explains how invasive species harm human health. Diseases can be introduced by invasive species, there can be indirect problems caused by them as well. For example a grass that was introduced could cause more wildfires. Invasive species can disrupt the natural ecosystem and drain natural resources that we need, just like in the Elymian Survival Challenge in class where natural resources were an important part of a civilization. Natural resources also played a part in the kinds of decisions that were made, just like today where we have to think about the abundance of resources.

Additionally, it would be beneficial to lay out some specific invasive species in Cedar falls that are an issue. One example of an invasive species that resides in Cedar Falls is the Marmorated Stink Bug. According to the USDA National Invasive species information center, this bug was native to East Asia, and came here likely due to shipping (Ellis). This invasive species causes damage by sucking out juice of crops, which harms and discolors them. They also contaminate crops like grapes. This causes economic loss as a lot of these crops can't be used since they are damaged. Another example that is local to Cedar Falls is Garlic Mustard. According to the Iowa DNR Forestry Invasive Species Guide, this plant species came from

Europe, it was brought for medicinal reasons but soon turned to be an aggressive invasive species (Iowa Department of Natural Resources). There are no natural predators for this plant so it can grow freely. This plant smells like garlic when crushed which brought up the name. This species is harmful because it takes up resources from other native plants like water, light, and nutrients. This plant's roots also release chemicals that harm nearby plants. Another key species is Japanese Knot Weed, according to Dr. Tom Rosburg in one of his recorded lectures, he describes this species as a very "aggressive invasive species" (Rosburg). This plant came from East Asia as an ornamental plant which controlled erosion but it quickly became out of control. This plant can quickly take over native species, clog waterways, and can even damage infrastructure. People will often avoid living places if this plant is present on the property. In class there has been a constant importance on communication, in solving problems, the building of civilizations and more. This also applies to invasive species and dealing with them. It is important to communicate about the importance of invasive species and spread awareness as well as recognize them and report them, only together can problems like this be solved. Xavier Le Pichon would also agree as he makes a point about communities being able to evolve only when we work together, he adds the variable of empathy because that is a reason people come together. These introduced species from many other places are studied by scientists and looked at, they can be looked at as a variable or data point, but without empathy then we can't solve the issue just as Xavier Le Pichon says empathy and science coincide.

Addressing this issue will help improve the quality of UNI because being able to recognize environmental issues that may be more invisible will help solve other problems as well. In class we often talked about the importance of recognizing problems early, and specifically how some can be avoided. The dead zone in the gulf of Mexico is an example, runoff from N2 from farming caused the issue however if it was caught earlier then it probably could have been avoided. This same thinking can be applied to trying to stop the spread of invasive species locally in Cedar Falls. It makes a big difference to report the invasive species

so that professionals can remove them safely. Another reason to address this issue is to try to have more empathy for things we don't normally have empathy for, such as plants, animals and more. R.W.K explains this well with grammar of animacy, it is when you refer to plants, water, and more as relatives instead of an object. In America we are accustomed to dismissing plants and animals as objects. If this thinking is changed and we see the importance of trying to solve invisible problems like invasive species, then we can be more thoughtful when thinking about the creatures around us. A lot of students already care about this issue, but getting more support would be beneficial. Some students may not see the importance of environmental issues, it can be easy to only worry about the present. Addressing invasive species will also bring more light to the importance of local species and why they need to be protected since invasive species often kill or take up resources from them. Not to mention being able to see this as an issue can make it easier to recognize climate change and then try to combat it. We have the power to change, even just a little, just as talked about in class; the way we use water changed the planet. If we can help local species around UNI then it can be easier to try and go further. The tools and weapons podcast put this well when using nature to explain the importance of combating the growing technology. He said that we were uncoordinated in dealing with COVID-19, in order to make change people have to change their lifestyles and be proactive. This can be helpful in this situation too since many people in the UNI community may still doubt the importance of combating invasive species and environmental problems since it seems like it doesn't affect them. The thriving of an ecosystem is very much our responsibility because we caused many of the issues that are happening now. It is our responsibility to fix it and return it back to the natural state, as R.W.K would agree. A sustainable environment equals a smaller trace on the world.

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