



Hot Springs River Studies

Introduction

Our ecology class of only 12 students went into this study to analyze how humans impact the health of the river. In this study we traveled throughout town collecting data from three different sites. The data we collected included samples of the temperature, oxygen levels, nitrates, pH and phosphates of the river. We took pictures and observed the vegetation around each site. We expected the river to decrease throughout the sites because of the human interaction and how populated each location was.

Fall River History

- Minnekahta was established in 1879
- Renamed Hot Springs in 1882
- The famous Evans Plunge was created in 1890
- As of 2019 the population was 3,509
- The age of Hot Springs is about 131 years old
- In 2019 1,467,153 people visited Hot Springs

Human Interactions With Fall River

- ❖ Site 1 had low human interaction resulting in more biodiversity
- ❖ Site 2 had high human impact
 - Chemical runoff (fertilizer spray, herbicides)
 - Road runoff (car waste)
 - Garbage on banks
- ❖ Site 3 also had high human impact
 - Road runoff (car waste)
 - Human Chemicals (lotion, sunscreen)
 - Broken glass in the river

Area 1- location behind the Evans Plunge.

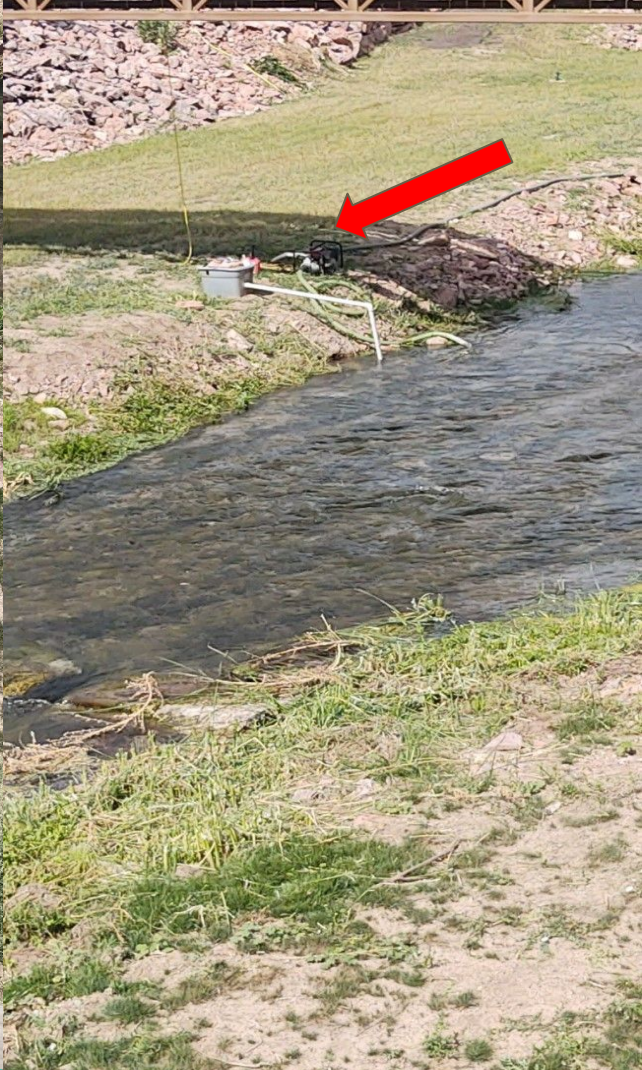
- Area one is plentiful in non-aquatic vegetation. Many trees and other types of grass are growing in the nearby flood plain. The species were diverse. The different trees included cedar, pine and russian olive were all present.
- The river in this area is narrow and rapidly moving. It kept this speed for a good length but then started to slow down as it grew wider.
- The riverbed in this area was composed of a dirt mixture. The mixture consists of dirt, bits of larger rocks, aquatic plant roots, and several invertebrate species, including fresh water shrimp.
- The area was also densely populated by many different species of aquatic vegetation. They cover an estimated 25% of the water's surface in area one. Some of the different species are water lettuce and cattails.

- In conclusion, this site has high diversity, and it is a healthy river. This location may be healthy because not many people disturb the area.



Area 2-

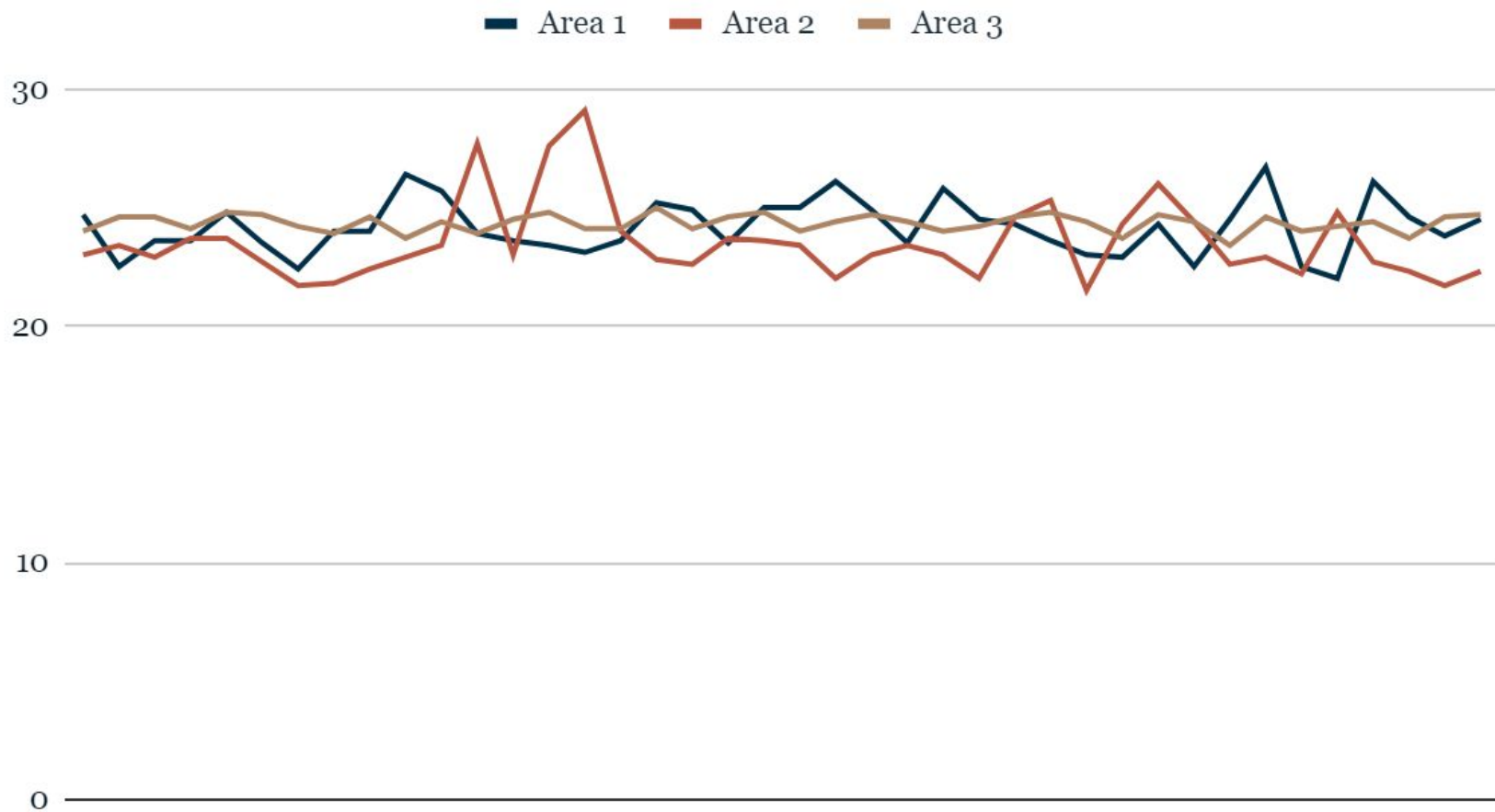
- This was the most unhealthy of the three sites we visited, with very little vegetation. Most of the plant life in the area was mowed down along with the cat tails.
- There was a pump that could be pumping out water for the waterfall, so the area could be more for commercial use.
- Above the area is a main road where runoff like trash, oil and gases from vehicles can pollute the water and little vegetation.
- It appeared that some of the vegetation up by the rocks was sprayed with chemicals to remove it.



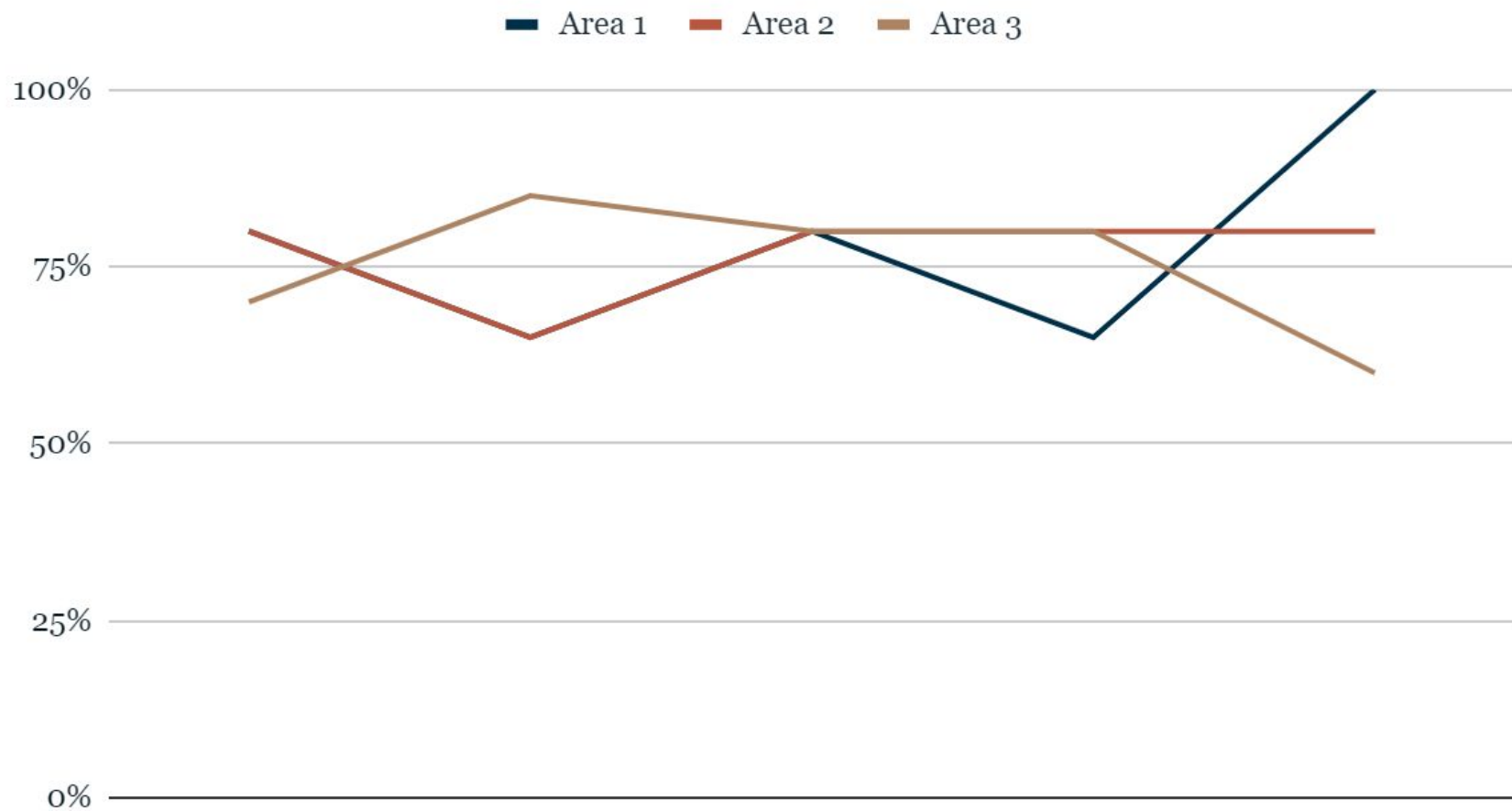
Area 3-

The river was wider and slower moving than Area 1 and 2. There was more water life, such as crustaceans and molluscs. Shells of molluscs past covered the floor of the river. There were also some small fish in the stream. There was less aquatic vegetation in the water than at area 1. The floor of the river at area 3 is sandy.

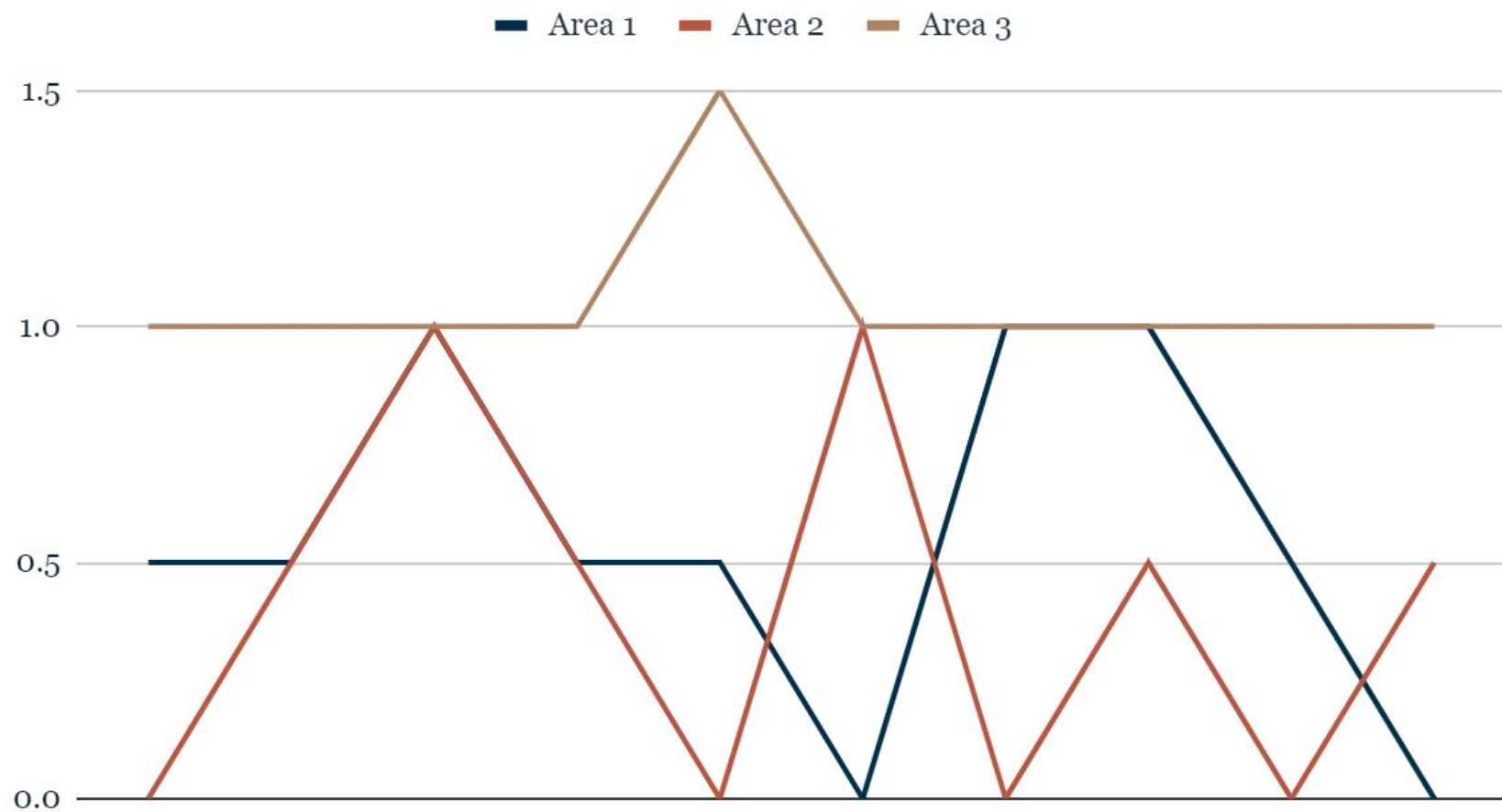
Temp. Area 1, 2, and 3



Oxygen Area 1, 2, and 3



Nitrates Area 1, 2, and 3



In conclusion

- Our Ecology class started with the **hypothesis** that the busier an area was the more unhealthy the environment was
- Area one proved the hypothesis right when it was the healthiest.
- **Site one** was undisturbed, contained a wide variety of vegetation, water vegetation, greater diversity, the water samples that our class tested were higher quality, and overall water quality was higher.
- **Site 2** was a heavily populated and distrubed area due to past construction
- Vegetation was severely damaged and no water vegetation was found
- The water samples had a low temperature and a low pH

- **Site 3-** Site 3 was a common middle ground between between being damaged and being healthy
- The area is highly populated during the summer as many people swim in the river
- **What we learned-**

Our class learned about about the habitats located in different bodies of water, how to identify healthy bodies of water, and how to practice safe lab experiments. Furthermore, throughout the course of this semester team building exercises were prevalent inside and out of the science classroom.









