Wellston High School
2016-2017 AP Environmental Science
Trails Project Proposal

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Introduction:

In order to bring a better environment to our school and improve the type of impact we have on our environment, we, the AP Environmental Science class of 2016-2017, would like to propose a plan to improve upon the existing trail system (Figure 1) on the school's property. We have hiked these trails on numerous occasions with many students growing an emotional attachment to making the trails and the immediate environment better. Rather than leaving the trails muddy, overgrown, and littered with trash, we would like to transform them into an ideal nature trail. The trails project will create new learning opportunities for the students and promote environmental stewardship in the school as well as the community.

Figure 1. Aerial photograph of location of the Trails Project. Site location is the wooded area to the east and southeast of the Wellston High School building. (Google Earth 2017)

When working on the trail improvement project, we hope to incorporate nearly every course/class in the high school. To do this, the project will not only be carried out by the us, the AP Environmental students, but also by the other classes at Wellston High School. We invite the entirety of our school to collaborate on this project and invest their time into making the school grounds a more desirable place for both education and recreation.

After the project is completed, the trails can be utilized in a variety of ways. For example, the gym class can benefit by adding an additional environment for exercise other than the standard gymnasium. The cross country team at Wellston High School will also be able to compete in a safe and scenic environment. Other classes that can benefit from the trails are the construction technology and art classes. These students will be able to display their
craftsmanship skills, DIY projects, and art created throughout the year on the trail systems. Various classes can use the trails as an outdoor classroom. English classes could read outside, or science classes could be taken outside to see the native species and invasive species. If we can incorporate multiple classes in the project we can finish in a timely manner. As the AP Environmental Science Class, we also plan to create memorials for students/staff that have passed away, as well as successful alumni. The rehabilitation of these trails will create a bond between the school and community that will give everyone a special appreciation for the trails.

The trails project at Wellston High School will not only benefit the student body but also the members of our community. Many students and community members may not be aware of the environmental issues the city of Wellston has, such as invasive species, acid mine drainage, and the dumping of various construction wastes. By creating informative signs, we can inform the public of these issues, along with the history of the land. These signs will help motivate the public to care for their immediate environment and establish partnerships between the school and community. With public awareness we can work to make these trails safe and enjoyable for all.

**Present Site Conditions:**

The trails are currently in very poor condition. Many parts are excessively muddy due to motor vehicles accessing the trail. The lack of waste disposal has resulted in the dumping of trash and an excess of littering. Drug paraphernalia (ex: used needles) can be found throughout the area as well. Additionally, abandoned on the trails are leftover construction materials, old exercise equipment, tires, and several other types of debris. There are also hazards on trail, such a broken pedestrian bridge and exposed sewer access points; the aforementioned bridges foundation is seemingly stable but the boards on top are decomposing and falling off, making the bridge itself dangerous. Underneath the bridge, the water is polluted; there is a large collection of trash in the connected body of water.

Figures 2 & 3: The damaged pedestrian bridge and uncapped sewer.
The trails run through an area of wetlands. Wetlands are some of the most important ecosystems in the world. They are slowly being degraded due to litter, dumping, and invasion by non-native plants and animals. Wetlands help reduce the impacts from storm damage and flooding, maintain good water quality in rivers, and store carbon along with other benefits. Since they are already so rare we must protect any wetlands we can find.

Another major issue with the trails is non-native plant species, which cause problems such as displacing the native species or harming their populations. They can also cause problems like allergies. Some of these non-native species adapt so well to their new environment that they are recategorized into what is known as an “invasive species,” able to compete with native species for room and sunlight, often smothering the local plant. An example of an invasive species are typha, which are not native to Ohio. Another example of an invasive species on the trails is the Autumn Olive (Elaeagnus umbellata), which can survive and thrive in poor soil making them excellent invaders. Autumn Olive fruit are easily spread and due to its fast growing nature it is outgrowing native species. Which tends to choke out competing plants and leads to the Autumn Olive spreading even more. There are however certain native species that can take Autumn Olive’s place such as (Amelanchier arborea) or serviceberry (Amelanchier). Also, a common invasive species is garlic mustard, which outcompetes native species, and can disrupt other populations like white-tailed deer, because they rarely eat it.

**The Mission:**

As the AP Environmental Science class, our mission is to make the informative trails a better place for the student body. We are in the process of cleaning up the trails by the high school. First, we the AP Environmental class envision the cleaning process, to try and clear out all waste and overgrown areas throughout the trail. Secondly, we feel it would be important to properly map the trails out and begin the process of defining the trails and installing proper drainage systems.

The point of this project is to inform the school and the community around us. To do this, we will have informational signs. The signs we want will have the trail name, length and destination. These signs will be in the ground to prevent damage to them. These signs will also explain the immediate environment around them. Additionally, the trails will give the community a nice place to get out and enjoy the beauty of nature on the trails here at WHS. By removing all the waste that people have dumped in the area and adding trashcans, people can properly dispose their waste and keep the area clean. The trail will be maintained by seniors of Wellston High School and the AP Environmental classes for years to come, in hopes to better the environment in the area.
This project was started in hopes that the trails can be turned from barren to beautiful and that people in the community would want to come enjoy the nature scene. These trails will add many more native plants such as, silver maples (*Acer Saccharinum*), and sweetgum (*Liquidambar styraciflua*), as well as information about these plants. There are high hopes for using these trails to educate the community of Wellston about the environmental concerns in juxtaposition with what can be done to combat said problems. As students in the AP Environmental Class, we hope that the trails will become an active part in the school community as well the Wellston community.

*Proposed Improvements:*

In order for the trails to be usable by the community, we, the AP Environmental Class, will need to take charge and work to improve them. Before anything “decorative” can be placed, we will need to improve the environment surrounding the trails. We will then put drainage in the trails before mulching them. Mulch will then need to be placed and spread across the trail to prevent water from pooling and creating giant mud puddles. Small ditches will need to be dug next to the trail for the water to run off into, to prevent flooding of other areas after the mulch is placed. Much of the trails are overgrown with thorns and invasive plant species, and will need to cut back to allow more space to walk. To keep the trails from once again being over run with waste and tire tracks, two or three wooden beams will be placed in the center of each entrance to the trails to prevent large vehicles from tearing the trails up once again. The class would also focus on picking up the things that had been dumped including things such as the treadmill, the asphalt, and pipes. Figure 4 shows what we plan to be our trail head. Here the class plans to
put a large sign with the trail’s name on it and also a sign to show the different trails. This will also be one of the places where we add poles to limit car access to the trails, and we are also considering adding picnic tables and trash and recycling receptacles.

Figure 4: Proposed main trailhead.

After the essential parts are added to the trail the we look to add trash cans and recycling bins so that we can limit the amount of litter on our trails, and we hope that we can reduce the amount of litter on our trails. The class would then add in signs to name the trails, and help people hiking the trails recognize certain elements that we want to draw attention to, some of these elements being the invasive species of plant that are located near these trails. The next thing we would look into adding would be benches and picnic tables, so that hikers would have places to rest. The class has considered adding in memorial benches or gardens for the loved ones lost by the community. The benches we have considered are made out of recycled plastic that will be sturdy enough to withstand weathering, and any other possible incidents. The class will then work to repair the current pedestrian bridge on the trails that leads to the baseball fields so that it can be utilized as well, since it currently cannot be crossed.

After the major restorations of the trails and adding mulch and the drainage pipe we want to start with poles that will limit things like cars and fourwheelers from entering the area. A lot of the current damage to the trails was done by mud running, and we look to prohibit that by adding the bars like you see on the bike path in town. We would then focus on adding informational signs to the trails starting with trails at the mouths telling people where they are like a directory to make sure no one is to get lost. Other signs would include ones that give information about the certain areas, an example of this being where the wetland is currently we would identify it with a sign and give some facts about it. There would be multiple signs like this. For the informational signs we have a large scale printer available in one of the computer labs.

After the class has the poles and signs done the we would then work towards putting in benches for those walking the trails a place to rest, we are currently thinking about making the
benches ourselves to lower costs, but if it comes to it then we can invest money into buying the benches premade. We would then consider adding things like picnic tables for people who would like to enjoy lunch out on the trails. After adding benches and picnic tables to the trails we would start to consider adding things like bird feeders, bird houses, and bat houses to increase the population of the native species. We will also be adding a water crossing to the space in the area in Figure 5, because when there is flooding this space is hard to cross due to the excess of water. We also plan on adding stepping stones to make it easier to cross.

![Figure 5: Location of frequent high water and proposed area to add stepping stones.](image)

There is currently a unsealed sewer access drain on the trail and the class looks to cover this, but since it was improperly installed, then the city will need to cover it properly. There is also currently a bridge between the baseball fields and the trail, and the metal frame is fine, but there are missing and broken boards that we look to replace so that the bridge can once again be utilized by students walking from the school to the fields for practice and games.

This project isn't just to benefit the community in places to walk. It will also give the town a learning experience. This project will promote learning about the environment, and the effects and impacts that we have on it. This project will also incorporate other schools such as the Buckeye Hills Career Center, and other classes from the high school.

**Proposed Cost**

In order to achieve the goal of improving the trails, the AP Environmental class will have to buy, build, and transport materials and objects such as benches and signs. At the beginning of the main trail, a trailhead message board should be placed and could cost between $599-$100. Multiple other signs need to be place such as, seven informational signs, seven directional signs, and three extra entrance signs which will cost(Including the main trail message
board) approximately $3,523, but to buy a X-carve would only cost around $1820 plus the cost of materials to make signs. In order to clean up the trails the proposed plan is to place a total of five trash cans throughout the trail for a total cost of $850 plus shipping. Along with the trash cans, drainage needs to be put in place which is cost about $114 for five pipes. Things such as gravel and mulch we are hoping to get free of charge. To make the trail more aesthetically pleasing we have ideas to put extras in such as memorial benches which prices range $300-$400, three picnic tables for $160 each, bird baths and bird houses. To help lower the cost it is planned to buy planks of wood with a size of 1 in by 4 in by 8 ft costing $7 a board in order to build benches and tables. In order to make most of this happen, we will have to rent heavy machinery which will cost between, $690-$895.

Costs: $5900 (\* = in paragraph, rounded to the nearest hundred)

➢ The Mini Kiosk
   ○ Kit for $1,000, $900 for 2-4, $850 for 5 or more

➢ Message center with post \*
   ○ $599 for 1, $569 for 3+

➢ 7 informational signs, 7 directional signs, 3 entrance signs, 1 main trail head sign \*

➢ Plastic sign \*

➢ X-Carve \*
   ○ $1822.98

Lumber

Wood boards 1 in. x 4 in. x 8 ft. $7 (not including shipping)

Clean up/Drainage

➢ Wire mesh trash can(45 gallons) \*
   ○ $180 per trash can & $170 for +3

➢ Drainage pipe(4in x 50ft.) \*
   ○ $22.94
Extras

➢ Benches
➢ Bird baths
➢ Picnic Tables

Picnic table: $179 per. +3:159. Bird bath: $26.37*

Conclusions:

Wellston High School’s AP Environmental science class has started what we have decided to call “The Trails Project”. The project looks to improve the current trails system through adding things like drainage pipes and mulch. The class would then focus on the more decorative things starting with signs at the head of the trail to name the different trails, show how the trails are laid out, and also provide information on the invasive species of plants, and other things to learn from. The AP Environmental class looks to improve this site and make it useable for the community.

To incorporate other students into this project we look to bring in art students to paint some of the pipes that were dumped so that we can help beautify the area, and we also look to bring in students from Buckeye Hills Career Center to build the things like the picnic tables. We would provide the materials to make these things happen. This isn't just about the AP Environmental Science class, but about getting the whole school and community involved and to promote science and environmental stewardship.
Citations


Aerial Photo courtesy of Google Earth: