

The Ohio State University
Campus as a Living Laboratory

Olentangy River Amphitheater Proposal

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I. EXECUTIVE SUMMARY

The Olentangy River is a largely unused tributary of the Scioto River that runs through Ohio State's campus. After the restoration of the Olentangy River and the relocation of the College of Food, Agriculture, and Environmental Science (CFAES) across it, the riverfront can become "the new Oval for the next one hundred years" (Sasaki, 2014). To help realize this vision, we suggest building an amphitheater slightly north of Woody Hayes Bridge. The amphitheater will hold outdoor classes, host guest speakers and festivals, and be a gateway to the University on game days. These uses will make the amphitheater a powerful incentive for people to gather near the river.

The amphitheater will be a powerful draw to the CFAES. Its sustainable design will physically represent the college's values and provide benefits to the ecological condition of the Olentangy River corridor, including reduction of thermal pollution and sediment deposition. It will also offset the expenses of maintaining surface water for the University. The overall cost for the project will total approximately \$145,000 to \$270,000. Funds will come from various sources, including the Clean Ohio Fund, the sale of seat plaques, the OSU Alumni Association, the CFAES, and various student organizations.

The amphitheater will require regular maintenance to ensure long-term use. The soil near the river is oversaturated with water, which can lead to the destruction of grass. Fertilizer will not be necessary since ryegrass will be used for the amphitheater's terraces. An amphitheater by the Olentangy River is important for providing an incentive for people to gather at the riverfront. The multifaceted potential of an amphitheater will help the riverfront become the new Oval.

II. INTRODUCTION

With good landscaping, a river can be the highlight of an area. However, the Olentangy River is a far cry from a highlight on Ohio State's Columbus Campus. It is clogged with sediment and lined with parking lots, producing a very dismal look. It is currently viewed only as a barrier between Central and West Campus. However, as Sasaki stated, "[It] can be the new Oval for the next one hundred years." To realize this vision, the University needs to build attractions on the riverfront. The College of Food, Agriculture and Environmental Sciences (CFAES) has the unique opportunity to advertise its values by making the stretch of the Olentangy River near its new campus a landscaping masterpiece. This gives the CFAES the opportunity to turn the riverfront into a place that highlights Ohio State's already admirable campus.

The project's design will physically represent the institution's commitment to sustainable development. The entire University will benefit through its multifaceted uses. The sense of community between students and alumni with the Olentangy River corridor will be enhanced.

The following sections will describe what the amphitheater can be used for, how it will be designed and built, how it will be maintained, what environmental impacts it will have, and why it will overall be a worthwhile investment for the CFAES.

III. USES

There are infinite possible uses for an amphitheater; these include education, entertainment, recreation, and relaxation. The combined draw of an amphitheater and a riverfront means that the amphitheater can be used year round. Unlike the landlocked Browning Amphitheater, the new riverside amphitheater will be a prominent part of the new CFAES campus and of the University.

Outdoor Classroom

The amphitheater can serve as an outdoor classroom. Though the main role of the amphitheater will be a social gathering place, its location right next to the CFAES campus makes it ideal as an outdoor classroom as well. Seating up to 500 people, the amphitheater can host large-scale lectures, small interactive classes, and even certain types of labs. An outdoor

classroom on the new CFAES campus next to the river will attract students and benefit those who use it.

The idea of holding classes at an amphitheater has been in place for decades. Elementary schools as well as surgical schools have used amphitheatres as classrooms (Bell et al, 2009). People come to Ohio State's College of Food, Agriculture, and Environmental Sciences because of their love for and involvement in the outdoors. They have chosen careers that will almost always be linked to the environment and the outdoors and therefore should have the opportunity to learn and work in an outdoor environment.

Holding classes in the amphitheater will not only enhance environmental learning and research, but it will also promote the health and wellness of staff and students. Studies show that biophilia, "a fundamental, genetically-based human need and propensity to affiliate with other living organisms" (Kahn 1997, p. 1), fosters recovery from mental fatigue in people who are exposed to the outdoors. Students and staff may use this space to get away to a natural environment setting during free periods and meals, and thus recover from the stresses of school and work. "Mental fatigue is a fact of life in a world overflowing with information [and] finding ways to recover is greatly helped by the availability of restorative settings and experiences" (Kaplan, Kaplan, and Ryan 1998, p. 22). Today, most college students are highly organized, urbanized, and technologically advanced. This means that this society has "fewer opportunities to explore the natural world than did their ancestors" (Bell et al., 2009, p. 15). Using the amphitheater as an outdoor classroom can mitigate this problem.

Outdoor classroom experiences can also lead to gains in social development. Studies show that moving away from confrontation with peers is easier in an outdoor setting. People are also less likely to display lack of cooperation, frustration, and annoyance. There are significant benefits to both students and teachers with the use of education outside the classroom. "Academic fieldwork clearly enhances the teaching of science and geography, but other subjects such as history, art and design, and citizenship can also be brought to life [with outdoor instruction]" (Dillon et al., 2005, p. 9). It also allows both students and teachers to break free from the typical monotonous day-to-day activities within a brick-and-mortar school building. Students who may not normally have the opportunity to enjoy the outdoors may do so with an outdoor classroom setting.

Though there are times in the year when the amphitheater cannot be used as a classroom, the opportunity to hold lectures outside is nevertheless a great benefit. The gains to mental health, social health, physical health, and academic performance are strong reasons to adopt this project.

College Game Day

Fall at Ohio State brings Buckeye football. The loss of St. John's Arena will cause a huge loss of tailgating. Loyal fans will need a new place to occupy before and during the games. The amphitheater and the riverfront area can hold these fans. The amphitheater will also host up-and-coming musicians or begin new traditions. For example, our band can hold a pre-game performance at our amphitheater, just as Clemson University's band performs at theirs. Places like the Varsity Club are known for their pregame activities where people can come to eat and listen to musical performances like the consistent draw created from The Danger Brothers. This atmosphere can be created along the Olentangy with the CFAES amphitheater being the focal point of it all.

In Sasaki's original master plan, there is an amphitheater that can hold a new section of tailgating. With the amphitheater already being constructed along the river, it can be used as a base attraction that will also include tents, vendors and spots to set up and tailgate. Fans will have the opportunity to enjoy themselves in preparation to the game through music, food and drink, and the intensity that is always in the air before the Bucks play. The riverfront is a great alternative to the lost St. John's parking lot as a gathering place for fans on college game day since it is close to the stadium. The move of tailgating will also encompass the possibility for new fans to create a whole new set of game day traditions. The possibilities are as far as fans take them, and Buckeye fans are more passionate than any others.

Social Draws

One of the most prominent areas at Ohio State is the Oval: an open green space for students to hang out, throw a Frisbee, or just walk around with friends. Part of Sasaki's plan is to make the riverfront into "the Oval of the next one hundred years" (Sasaki, 2014). Drawing people to the riverfront, however, may be a challenge. An amphitheater can provide the needed incentive by offering a place for people to gather, eat together, relax between classes near the

riverfront, and listen to music or a presentation. Unlike the Oval, the riverfront isn't at the center of the academic core and, therefore, needs an attraction to be kept active. While our project's proximity to the new CFAES campus will encourage food, agricultural, and environmental students to congregate to the riverfront, the true purpose of the project is to highlight the riverfront and bring all students from OSU to "the new Oval."

Besides being a general gathering place, the area can open up new opportunities for student organizations, many of which are connected with the outdoors, and the amphitheater can be a new meeting place for them. A rental schedule will be necessary to make this new space reservable. This is one way the amphitheater will be connected directly to the CFAES. A registry for signing out the amphitheater will be placed in one of the new buildings. If the area is rented out to various student organizations, professors, or entertainers, the possibilities for use goes up even more. The University or student organizations can also host small festivals during different parts of the year.

Gateway

Since the river acts as a border between Ohio State and the rest of Columbus, a landmark on the riverfront can be a natural gateway to the University. Along the Scioto River there are various parks that combine to become what is known as the Scioto Mile (Schieber, 2013). Each park serves a purpose unique from the others. Genoa Park and Amphitheater Park, in particular, serve as a gateway to COSI, just as the amphitheater can serve as a gateway to the University. When combined, these parks create attractions for all sorts of people. The amphitheater, in combination with other riverfront projects, will also draw people of all sorts.

As a gateway to the University, the amphitheater can also act as a gateway to the Olentangy River. It will become the meeting place for river recreation due to its proximity. The large open green space provided by the amphitheater's design will allow people to be active and gain access to the river. The amphitheater can have a dock for fishing and boating, which will draw even more people. In this case, the formerly underutilized river will become part of the University's gateway and help showcase the University.

Educational Shows

A huge prospect for the amphitheater is live animal shows. Wildlife shows draw large amounts of people and are entertaining, educational events. People of all ages can enjoy the shows. The Ohio State University currently has a partnership with the Columbus Zoo and the Wilds. This partnership can help the University gain publicity by bringing animal shows to the amphitheater. CFAES students with majors related to animals will benefit from the ease of access to these shows. The Columbus Zoo's shows will be a further incentive for environmental students and professors to come to Ohio State. Hosting one of the most recognizable animal handlers in the world, Jack Hanna, right on campus will result in huge gains in publicity and popularity. The more connected with the zoo the University becomes, the more each benefits.

Education is key to the future of wildlife/habitat preservation and restoration. One amphitheater that hosts educational wildlife shows is at Hawk Mountain Sanctuary in Kempton, Pennsylvania (Reagan, 2012). The sanctuary is home to a variety of wildlife and is widely used by bird watchers. The Pennsylvania game commission decided to pair up with the sanctuary to build an amphitheater with the possibility to spread information about the species there and raise awareness of the programs in place. This partnership serves as of an example of a cooperative effort between state agencies and education. A government wildlife agency that helps sponsor and implement the project could be another avenue of funds and future uses.

Rental Space

The amphitheater is meant to be open to the public, but it is not big enough for everyone to use it at the same time. Making sure that people can use it without interference from others is a necessary aspect of the project. Currently, the Browning Amphitheater is open for public use most of the time; however,, the space can also be reserved. There is no charge to reserve the amphitheater, though users are responsible for any damages that may occur. Our project could be managed in the same way. The process to reserve the Browning Amphitheater is coordinated by the Buckeye Event Network for students and the scheduling office for others (S. Volkmann, personal communication, March 27, 2014). Keeping with the system already in place may prove to be an easy option rather than creating a new one. If the demand for the space is too high, a small fee can be charged for its reservation.

IV. BUILDING AND DESIGN

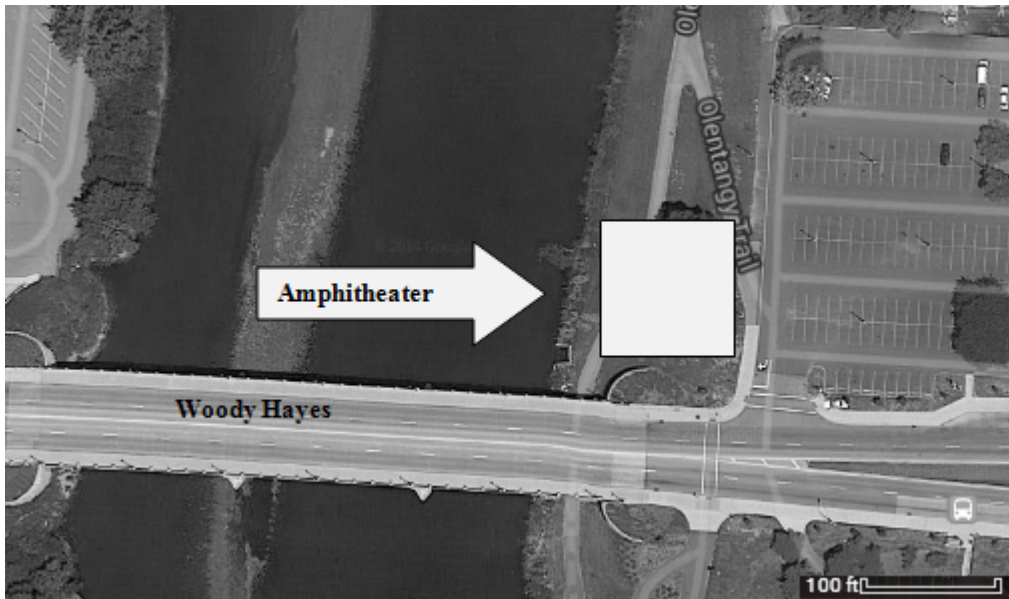


Figure 1: Proposed location of our amphitheater along the Olentangy River between Lane Avenue and Woody Hayes Bridge (Google Maps, 2014).

Overview

After the current river restoration project is completed, the Olentangy River's water level will lower (Sasaki, 2014). The stretch of the riverfront between West Lane Avenue and Woody Hayes Drive will be naturally sloped due to the receding river. In addition, the stretch of the Olentangy Trail between these two roads is curved away from the river. Both of these factors favor the construction of an amphitheater. Little to no additional dirt will be needed for terracing. The curve of the Olentangy Trail will enhance the aesthetic appeal of the amphitheater. Since the amphitheater needs to be easily accessible to pedestrians and motorists, the amphitheater should be built in close proximity to Woody Hayes Bridge and in between the river and Olentangy Trail (**Figure 1**). It will be on the eastern bank of the river, but will not cut across the trail, as it will be rerouted slightly from its current path. This location will help the amphitheater serve as a gateway to the University on game days. The amphitheater needs to be aesthetically pleasing and large enough to comfortably fit a large group both on the stage and in the audience area in order to serve such purpose. The project will use a total of 10,000 square feet: 4800 square feet for the amphitheater and 5200 square feet for trees and greenspace.

Design

The design criteria for the amphitheater are aesthetic appeal, minimal environmental impact, and ease of construction on the riverfront. We chose a semicircular design because it is the design we most commonly see in other amphitheaters.

Another aspect of the design is the total area of the amphitheater, which depends on factors such as square footage per person on the stage and sitting area per person in the audience area. Our proposed amphitheater seats 500 people and holds 100 people on the stage. Each person on the stage requires a minimum of 2.8 square feet to stand comfortably, bringing the total stage area to 280 square feet (Knibb et al, 2013). The outer arc of the amphitheater will be 120 degrees. The first row of the audience area will seat 20 people and each successive row will seat six more people, so 11 rows will seat the specified five hundred people (Knibb et al, 2013). The concrete lip on which people sit will be 2 feet across and the terrace area between concrete lips will be 4 feet across. The area per seat will be at most 9.04 square feet (Knibb et al, 2013), bringing the total area for the audience area to approximately 4520 and the total area to approximately 4800 square feet.

For construction materials, we plan to use concrete. About 20% of this concrete will be recycled (IMS Consulting Service, 2012). The recycled concrete may come from the demolition of St. John's Arena or other nearby demolitions. Using recycled concrete will reduce the cost of construction as well as the environmental impact of the amphitheater project, as explained later. The amphitheater will be terraced into the riverfront slope. Ryegrass will be planted between the terraces to reduce runoff, as explained in the next section.

V. ENVIRONMENTAL IMPACT

Overview

“Architecture, at its best, embodies a society’s consciousness about itself” (Speck, 2006, pg.1). The values of past societies have been reflected through the architecture they left behind. The construction of an amphitheater near the new CFAES has the potential to be a statement for the College, a physical representation of its dedication to sustainable design and environmental

quality (CFAES Strategic Plan, 2013). By building a structure that brings OSU students and alumni to the Olentangy River Corridor in a way that preserves the quality of the University's natural resources, CFAES will set forth a legacy from which future generations will benefit and upon which they will build.

In order to successfully protect the restoration efforts of the Olentangy River, careful attention must be paid to the physical and chemical characteristics of its proposed site as well as to the design of the amphitheater itself. As stated earlier, the construction site lies adjacent to the Woody Hayes Bridge, uphill of the bike path, and just southwest of the new campus (Figure 1). Designing infrastructure close in proximity to any hydrologic feature poses problems such as flooding, water pollution, and enhanced erosion. A soil survey of the land (USDA Soil Survey, 2014) provided an estimate of feasibility of the amphitheater's construction. This data was used to suggest possible design choices that minimize these ecological impacts on the corridor's riparian ecosystem.

Design and Site Characteristics

The Columbus campus near the Olentangy River is mainly characterized by impermeable surfaces and the region receives a relatively large amount of precipitation nine months out of the year. High rainfall events pose threats to the river with chemical contamination and thermal pollution from these impermeable surfaces as well as erosion of the riverbank. The key to combatting all of these problems is to slow down and decrease the amount of runoff. The terrace serves this purpose by intercepting surface runoff, slowing its progression, and encouraging it to infiltrate (Dorren L., 2005). For this reason, we believe our amphitheater terracing design will mitigate some of these problems for the watershed.

The proposed site was found to lie on an approximate 20% slope (USDA Soil Survey, 2014). A graded terrace is most effective at intercepting runoff from high-intensity events for slopes of 8 to 20 percent, and hence will be used in our design. The specific type of terracing that will best suit the location is known as bench terracing. Level strips of earth are joined by a steep vertical face by cutting and filling practices (Dorren L., 2005). Although this practice of cutting and filling may appear to be ecologically disruptive, soil survey data has shown that the current

site has had a history of such development and so this management would not be nearly as disturbing (USDA Soil Survey, 2014).

The soil survey analysis of the region revealed that our proposed site is characterized by occasional flooding. The site was also deemed ‘limited’ in its potential to support a small commercial building (which we assumed analogous to its capacity to support an amphitheater). Despite this, the area’s soil has the potential to move water effectively if developed properly. It was found to be moderately well-drained and to have a high-saturated hydraulic conductivity (USDA Soil Survey, 2014). Minimizing the amount of impermeable surfaces incorporated into its design and maximizing vegetative cover can further reduce the issue of flooding.

The vegetation selected to anchor the soil of each step of the amphitheater must have remediation potential for runoff water and have the ability to assimilate large volumes of water at a given time. Research conducted in China experimented with twelve species of ryegrass and sampled their potential to remediate eutrophic water. Results from this analysis showed that three varieties of ryegrass, *Abundant*, *AngusII*, and *Major*, averaged a 73.82% and 84.77% removal of water-solubilized nitrogen and phosphorus, respectively (Ding, Z, 2012). As the Olentangy is a freshwater ecosystem, any elimination of excess limiting nutrients like phosphorus would result in an improvement in water quality. Floating plant-bed systems were used in the experiment, indicating that ryegrasses are well suited to saturated conditions. The grasses in the experiment tolerated temperatures from 28 to 91 °F. As a result of their hardy nature and great capacity for water absorption and purification, any of the aforementioned varieties of ryegrass will greatly assist the sustainability of both the amphitheater and the quality of the river corridor, even if it is mixed in with another species of grass.

The use of concrete as the material for the seating of the amphitheater has sustainability benefits that work well with other aspects of the amphitheater’s design. Preliminary soil data shows that the chemical composition of the site is suitable for concrete, and the risk of corrosion is low (USDA Soil Survey, 2014). Compared to other construction materials, concrete has a relatively high albedo (IMS Consulting Service, 2012). Since it reflects more light than other materials, it also absorbs less heat and transfers less heat to substances that may come in contact with it like runoff water. This property works synergistically with the terracing design to cut down on thermal pollution of the water that passes down through the amphitheater. Terracing

increases the amount of time it takes water to reach the river and the amount of runoff that is absorbed by the grasses. This increase in discharge time and percolation allows the water to cool down slightly before reaching the river. In urban areas of North Carolina, a study was conducted on the effectiveness of level spreader-vegetative filter strips, gently sloping variants of riparian buffers composed primarily of grasses. Researchers found that these strips significantly reduced the thermal load of water passing through them due to contact with a cool substrate and increased infiltration of the earliest, and warmest, runoff (Winston, R. J. 2011).

One potential way to improve the benefit concrete provides to the amphitheater structure would be to incorporate superabsorbent polymers (SAPs) into its mix, which are characterized by their ability to absorb large quantities of water (as much as 5000x their weight). Concrete infused with these polymers will effectively have an increased porosity. The absorption of water will improve the tensile strength of the material, increase its resistance to thermal contraction and expansion, and help absorb standing water and contribute to reducing the amount of contaminated runoff reaching the river (Mejhede, J, 2013).

Supporting Elements of Amphitheater Design

There are several long-term benefits to successfully designing the amphitheater, such as reducing thermal pollution, bank erosion, and sedimentation in the Olentangy River bed. The Ohio State University is obligated by law to perform a number of maintenance measures on its premises for storm water management purposes including the ‘Maintenance of Aquatic Environments’ and ‘Sediment Removal and Disposal.’ The former mandates that surface waters be cleaned of algae blooms and other unwanted water vegetation and the latter mandates the periodic excavation of accumulated sediments and other solids (OSU Storm Water Management Plan, 2009, 3-5). The 12 percent increase in soil water retention provided by terracing (Li, Juan 2012), the nutrient removal provided by the ryegrass strips, and the erosion control provided by both will act to reduce these effects on campus. The ecological benefits of the amphitheater design could potentially make a sizable reduction in costs to the University for these types of maintenance initiatives in the long run.

In addition to these maintenance measures, the Storm Water Management Plan urges the University to engage in Best Management Practices (BMP) for managing storm water when

possible. The function of one of these BMP types, in particular, bears extraordinary resemblance to the physical functioning of our amphitheater. The ‘Enhanced Water Quality Swale’ is described as being “designed to treat and attenuate storm water runoff through vegetation which slows the runoff allowing for sedimentation and infiltration into the underlying soils” (OSU Storm Water Management Plan, 2009, 4-2). This is almost verbatim the stated purpose of the amphitheater’s design. By agreeing to construct this new amphitheater on behalf of the CFAES, OSU will be fulfilling its commitment to pursue Best Management Practices wherever possible.

Although more research into site characteristics, zoning laws, and the impact of a vegetative-terrace design specific to small urban rivers is needed, we believe this analysis of sustainable design options for a riverside amphitheater bordering the new CFAES campus validates the choice of design and supports its implementation. The few physical characteristics of the proposed site that are not supportive of such construction can be mitigated through proper terracing practices, vegetative filter strips, and polymerized concrete. All of these factors work to preserve the environmental quality of the river corridor while providing symbolic value to CFAES, maintenance offset to the University, and ecosystem services for the entire Olentangy River.

VI. COST AND MANAGEMENT

There are three parts to cost and management: the cost of designing and building, the cost of maintenance after the amphitheater is built, and the methods of obtaining funding.

Cost of Building

Since the proposed amphitheater does not have a rear wall, it will be about \$3,000-\$10,000 less expensive than similar-sized amphitheaters (Table 1). Most of our reference costs come from an amphitheater built in Camp Woodhaven. Since our building seats about as many people as the Camp Woodhaven amphitheater but lacks a rear wall, we expect to use a slightly smaller amount of materials.

Table 1. Reference and estimated costs of the riverfront amphitheater.

Component	Reference Cost	Estimated Cost
Concrete (unit cost)	\$2 / block or cap (Knibb et al, 2013)	\$2 / block or cap
Concrete (total cost)	\$8780 (Knibb et al, 2013)	\$5600
Stage	\$14,000 (Knibb et al, 2013)	\$14,000
Total material cost	\$34,780	\$19,600
Labor	\$125,000-\$250,000	\$125,000-\$250,000
Total cost	\$150,000-\$268,000 (Sea Turtle, 2014) (UCA News, 2012)	\$145,000-\$270,000

Maintenance

The proposed amphitheater will require maintenance, whether it is routine or post-game day. The terrace grass will require regular mowing and replacement to keep the amphitheater looking new and inviting. OSU Facilities Operations and Development will provide the maintenance labor since it maintains the Browning Amphitheater (S. Volkmann, personal communication, March 27, 2014).

The terraced section of the amphitheater will need to be mowed on a weekly basis, with grass being replanted as needed. Most of the users of the amphitheater will be sitting on the concrete lips, but the grass will see moderate to heavy foot traffic. Regular foot traffic in combination with the heavy use during major events (such as football games) will ruin the grass. This means that new grass will have to be planted on an annual or biannual basis to keep the

terrace from turning to mud. After planting the new grass, the amphitheater will be closed for a minimum of three weeks to allow the grass to grow (The Toro Company, 2014).

Concrete is touted as one of the most durable construction materials that is readily available, yet will still have to undergo routine maintenance as it will begin to break apart at the molecular level. Snow removal during winter will be conducted with shovels because deicing chemicals degrade concrete (Evenson Concrete Systems, 2014). Different chemicals, like strong acids, will erode and crack the concrete. It is important to “never apply deicers containing ammonium sulfate or ammonium nitrate... [these] aggressively attack and deteriorate concrete surfaces” (Evenson Concrete Systems, 2014).

In order to protect the concrete from cracking due to water entering cracks and beginning freezing/melting cycles, the concrete surface needs to be sealed every 2 to 3 years (Evenson Concrete Systems, 2014). However, with sustainability and the proximity of the Olentangy River in mind, an environmentally safe sealer needs to be used so that the sealer does not contaminate groundwater if it leaches into the soil. If visible cracks form in the concrete, they need to be filled.

Funding

The project needs outside funding in order to succeed. Funding can come from a number of places, including the Clean Ohio Fund, student and alumni organizations, the sale of seat plaques, and the CFAES itself.

The Clean Ohio Fund devotes itself to funding projects that enhance recreational trails, preserve green space, or reclaim brownfields. Typical grants range anywhere from fifty thousand to more than a million dollars. The parties doing the projects are required to contribute 25% of the funds (Clean Ohio Fund, 2014). The Clean Ohio Fund has funded amphitheaters with construction costs totaling as much as \$3 million (City of Hamilton, 2014). Since our amphitheater enhances the Olentangy Trail and adds green space to Ohio State’s campus, the University has good cause to solicit funding for this project from the Clean Ohio Fund. Roughly 75% of the \$145,000-\$270,000 (or \$108,750-\$202,500) necessary for this project can be obtained from this organization.

Another potential source of funding is the alumni association and alumni outreach. Tradition is a huge part of what it means to be a Buckeye. The memories that students take with them when they graduate tie them to the University and give them a sense of pride. The amphitheater project gives alumni the chance to be remembered for helping create the next Oval on the riverfront. Because of this, alumni could be one of the largest investors in the project. In 2013, Ohio State alumni and friends donated \$374 million to the University, \$35.2 million of which was for facilities and renovation. During that year, OSU built or renovated several residence halls on South Campus. The average residence hall costs more than \$4 million, or more than 15 times as much as our project (Reed Construction Data, 2013). This means that the amphitheater could potentially be built on just alumni donations.

Selling plaques to be attached to the amphitheater seats can be another source of funding. People in Columbus love Ohio State football. They love watching the band play before each game. They feel close to the football team, as if they were participating themselves. Why not let them feel even closer by giving them the chance to donate and be acknowledged for their contributions to Ohio State's marching band? The chance to become part of Ohio State's history should not be restricted to alumni. Ohio State fans are willing to pay hundreds of dollars for football tickets. They are likely willing to pay even more to be remembered for their contributions to the University. The amphitheater project gives fans such an opportunity. For example, seat plaques at Sea Turtles, Inc. are sold for \$200 per seat (Sea Turtles Inc., 2014). If the University sold seat plaques at this price, the entire amphitheater project can be funded twice over.

The CFAES may also help fund the project. The CFAES has always stressed the One Health philosophy. The amphitheater helps make this philosophy a reality by encouraging people to be outside. In addition, what better way to recruit environmental students than to have a source of outdoor entertainment right on one's doorstep? The CFAES can gain a lot from helping the amphitheater be brought into existence.

VII. DISCUSSION

The establishment of an outdoor amphitheater on the eastern bank of the Olentangy River will benefit the new CFAES campus, the Ohio State University, and the Columbus community.

Its close proximity to the new CFAES campus will attract the attention of prospective students and staff, and its sustainable terraced design will make a public statement of the College's commitment to environmental quality and sustainable design. The University will offset costs related to storm water management and add to the aesthetic qualities that set it apart from other institutions. Students, staff, and the general Columbus community will be able to enjoy pre-game events, outdoor education, entertainment opportunities, and the peaceful sights of a restored river corridor.

Due to its close proximity to the Woody Hayes Bridge, noise interference is a concern with our proposal. We will address this through the planting of trees and shrubbery to act as a sound buffer for the amphitheater. It should be mentioned, however, that such vegetation will take time to grow to the point where it will be effective. An additional concern for the amphitheater is that flood potential or highly saturated conditions will result in damage to the grass terraces or make it difficult for the site to be utilized in the spring. The proposed site for the amphitheater has adequate conditions for the infiltration of water. This combined with the use of ryegrass, a hardy and water-loving species, for the terraces will greatly reduce these concerns.

The construction of the new CFAES campus presents great opportunity for an amphitheater to compliment other improvement projects for the Sasaki proposal. Established greenways surrounding the amphitheater site will provide even more opportunity for social interaction and mental recovery. Just downstream, the Riverfront Recreation and Educational Facility (RREF) complex's water monitoring data and classroom space will enrich outdoor educational opportunities provided by the amphitheater, while also presenting the option of enjoying recreational activity on the Olentangy. For all of these reasons, we believe that a riverfront amphitheater is a chance to highlight the Olentangy River and provide another cornerstone to the Ohio State University's already stunning campus.

VII. CONCLUSION

The construction of an amphitheater along the Olentangy River near the new CFAES campus presents limitless potential for use by students and staff of the entire University. From outdoor education to musical performances to a place of relaxing communion with nature, our project promises the enrichment of every person's experience at the Ohio State University.

Through its ecologically sensitive design and close proximity to the new College, our amphitheater gives CFAES a chance to publicly display its commitment to its environmental values and raise awareness within the Columbus community of the strong academic tradition it shares with OSU. Cost-effective construction and ecosystem services provided by the structure make this project a win-win for the University administration and for the environment. Our proposal also holds exciting opportunities for integration with other proposals for the new CFAES campus. In combination with newly established greenways and a nearby activity center (i.e. the Riverfront Recreation and Educational Facility), our amphitheater will easily surpass expectations. Our project will bring with it the hope of continued growth of the OSU tradition, and will be a simple yet powerful symbol of the bright future to come.

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