THE ART OF A SOCIAL SUSTAINABILITY FOR URBAN WATERWAYS

by

JOANNA DUNHOLTER SCHWEVENS

(Under the Direction of Marianne Cramer)

ABSTRACT

Tanyard Creek, in Athens, GA, exemplifies the innate conflict between urban conditions and healthy watersheds causing "urban stream syndrome", which is compounded by a lack of awareness or appreciation. This thesis suggests that part of the solution could be creating a social sustainability for these waterways by using "art in the environment". This thesis begins by defining "art in the environment", its history, and relationship to social change. A baseline of motives and strategies will be compiled from accepted theories and practices in landscape architecture that will be compared with the motives and strategies found in five "art in the environment" case studies. The conclusions drawn from the comparison of motives and strategies will be applied to Tanyard Creek based on a site analysis of its physical condition and relationship to the surrounding community, culminating with an installation design of "art in the environment" specific for Tanyard Creek.

INDEX WORDS: Art in the Environment, Land Art, Social Sustainability, Cultural Sustainability, Urban Waterways, Joan Nassauer, Eco-Revelatory, Stephen Kaplan, Social Change, Tanyard Creek, Landscape Architecture, Mary Miss, Flow (Can You See the River?), Maya Lin, What is Missing?, Fresh & Salty, Matthew Geller, Open Channel Flow, Patricia Johanson, Endangered Garden

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DEDICATION

For my husband Larry. Here is to all the challenging roads we have made it down together and to all the adventurous roads we have yet to travel. Your dreamy idealistic enthusiasm is inspiring and contagious. Thank you.

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INTRODUCTION

PROBLEM

Water Crisis

Water is a nurturing and a life giving resource, yet we are currently experiencing a global water crisis. As many as seven billion people in 60 countries could face water scarcity by 2050 (How to slake a planet's thirst 2003). Currently, the water security for 80% of the world's population is highly threatened. These threats to water security are pandemic from both a human and biodiversity perspective. This is not just a third world issue. Regions, like the US, with intense agricultural practices and dense human settlements, experience the highest levels of threats to water scarcity (Gilbert 2010). Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming have participated in legal and political battles over their shared water resource, the Colorado River. Depleted lakes in this region have led to a domino effect of other ecological issues (Fuller and Harhay 2010). The southeastern United States has similar issues with severe drought (figure 1.1) and severe flooding. Georgia, Alabama, and Florida have also participated in legal battles for access to limited water supplies (Commission).

Urban Waterways

The diminishing access to potable water is a serious global and national problem. This thesis will focus on urban waters which the Environmental Protection Agency (EPA) says are being threatened as never before. The term "urban stream syndrome" has been coined to refer to the consistent degradation of streams that drain through urban conditions. Urban conditions that are characterized by impervious cover from high density development, conventional stormwater practices, and economic pressures place stress on these waterways. Contrastingly, it is exactly this dense development that is beneficial for the preservation of resources from a larger perspective and for the human population's access to social resources. A prime example is that of Tanyard Creek in Athens, Georiga. The drainage basin for the creek

has been developed since the early 1800's due to the chartering of the University of Georgia. Tanyard Creek's hydromorpholgy has been greatly altered by this extended development, through channelization, disruption of the hydrologic cycle, and piping. The creek shows signs of poor health from pollution, low flows, flooding, and decreased habitat.

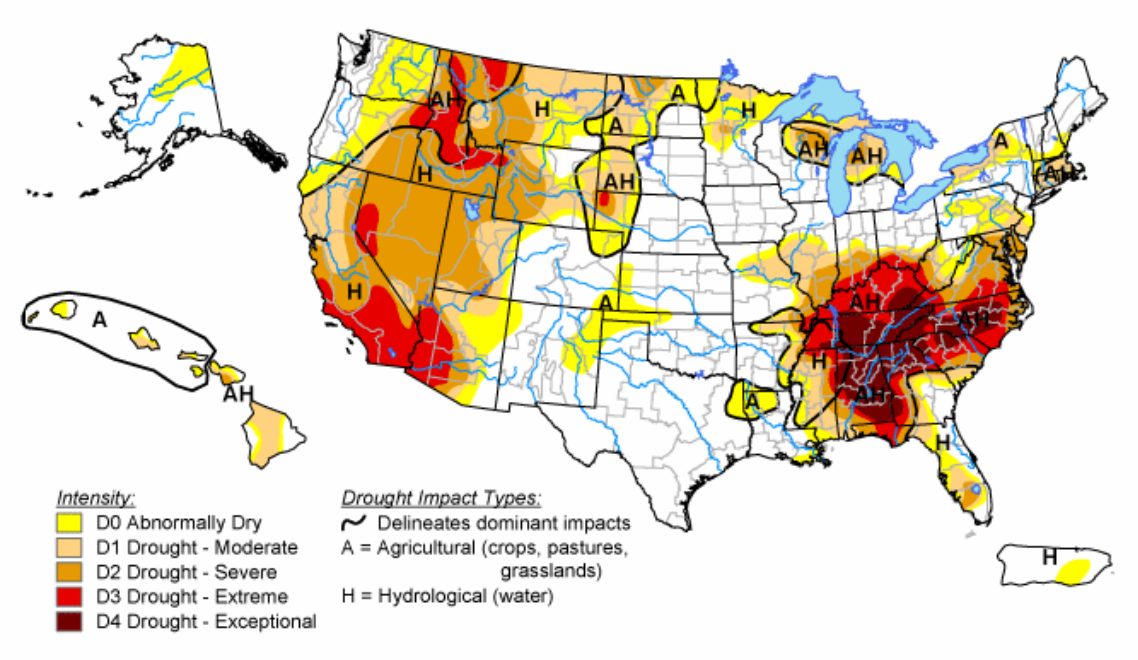


Figure 1.1 US drought levels from October 2007
Source: www.usda.gov

Lack of Awareness

According to the United Nations Population Fund, in 2008 for the first time in history, more than half of the world's population was living in towns and cities and that percentage is only projected to increase. Therefore, most people's relationship to waterways is with channels that are suffering from "urban stream syndrome". Water is a vital resource for all plant and animal life. In fact, people can live for more than a month without food, but only for a week without water (EPA 2011). Water can both help prevent disease and spread disease. Drinking a healthy amount of water, about 80 ounces a day, has been correlated to a decreased risk for certain cancers (Danielle 2010). On the other hand, water bodies polluted with infectious bacteria can quickly spread disease to those using it as a drinking source. Most

Americans don't know that eighty percent of the earth is covered with water but only one percent is the fresh water that we need for survival. Only twenty five percent of Americans know the source of their drinking water, thirty million Americans believe that the ocean is the leading source of drinking water, and less than one percent of Americans can define a watershed according to the NEETF Roper ASW annual surveys of American Environmental Knowledge, Attitudes and Behavior (Hoffman 2004). Urban dwellers usually get their water from lakes and rivers (EPA 2011), but access it through faucets and shower heads.

In addition, these urban development densities bury and degrade our waterways. Could the way we access our water and the lack of visibility and care for urban waterways be part of the reason most Americans are unaware of their dependency on this vital resource?

CONTEXT: THE URBAN PARADIGM

Technology

Throughout history humans have settled near waterways that provided transportation, irrigation, drinking water, sanitation, military defense and more. Our dependence on water has led to our desire to control it and use it to our increased benefit, leading to the manipulation of water for ages: from Egyptians using the flood cycle of the Nile to irrigate their crops to the Roman aqueducts to steam engines. Now technologies allow us to purify our drinking water and distribute it to people very efficiently. Water treatment facilities, pump stations and pipelines allow us access to clean drinking water in our homes, offices, and schools. Without much effort we can turn on a faucet and have access to this vital resource. Without much effort or thought about where it goes, we can flush a handle and our waste is transported "away". Not all communities around the world have access to technologies like these and it severely impairs the health of their population. This ease of access to clean water keeps water quality related illness and death very low in America, but it also disconnects us from the understanding that natural water systems provide us with our drinking water and that disconnection possibly diminishes our care for these systems. In addition to our ease of access to clean water, conventional stormwater management practices aim to move water away from people, streets, and buildings as fast as possible,

keeping the water cycle even more out of sight out of mind. Science writer Fred Pearce claims that "except for global warming, there has been no more drastic human alteration of the landscape in the last fifty years than the damming, regulation, and diversion of the world's rivers" (Pearce 2006).

The engineering solutions that caused damage to our urban waterways have spurred local governments to adopt new methods for dealing with stormwater. These methods collectively are known as Low Impact Development (LID). Today in many jurisdictions stormwater regulations require new developments to retain all of their associated increase in runoff on site so as not to affect their downstream neighbors. LID strategies slow, retain, and/or infiltrate water on a site.

Density

Density is good for many reasons. It reduces the per capita demand for land, therefore preserving a greater percentage of natural resources than a sprawl pattern of development would (Rees and Wackernagel 1996). Density also promotes accessibility to infrastructure, creating a "lower cost per capita for providing piped treated water, sewer systems, waste collection", and other public amenities (Rees and Wackernagel 1996). It creates the opportunity to reduce "energy consumption by motor vehicles through walking cycling, and public transit" (Rees and Wackernagel 1996).

On the other hand, increased population puts stress on waterways through increased amounts of pollutants entering the water and an increase in impervious surfaces which causes many detrimental effects on waterways. The increase in "impervious cover is highly correlated with stream degradation. As total imperviousness increases, the best attainable condition declines until only degraded streams are observed" (Wenger et al. 2009).

Urban patterns often follow a grid system which originates from Greek and Roman settlement patterns. "The grid is easy to lay out, easy to comprehend, and divides urban land into uniform rectangular lots suitable for development" (Ellis 1997). American towns founded in the latter half of the eighteenth century used the grid as an effective means to equally divide land into parcels for sale (Ellis 1997). This grid system creates a high level of access, but comes into conflict with hydrology patterns

(figures 1.7-8) This pattern conflict has previously been solved by putting streams into culverts and pipes underneath the urban fabric.

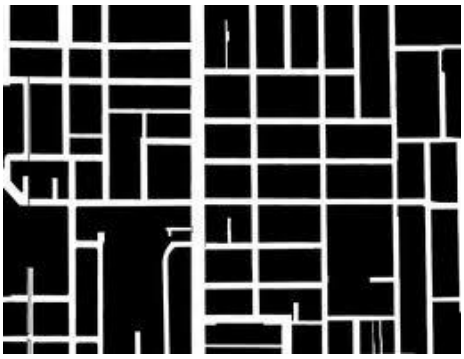


Figure 1.7 Urban Grid
Source: www.bricoleurbanism.org

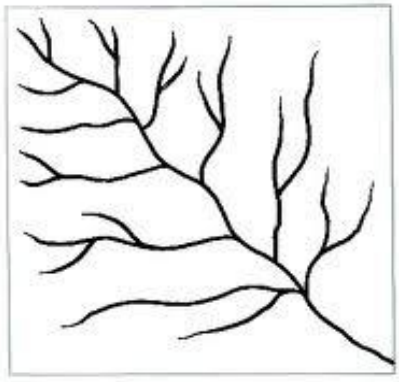


Figure 1.8 Hydrologic Pattern
Source: www.permacultureglobal.com

Economy

Economy is a strong driver of cities, which are the manifestation of the flow of people, money, and goods (Hustwit 2011). Cities provide higher wage opportunities than rural economies. Those higher incomes associated with urban employment have been linked with an increase in average personal consumption (Rees and Wackernagel 1996). In addition, the high density developments associated with urban conditions are driven by their ability to create profit. When developments come into conflict with natural resources, such as fresh water systems, financial gain is the deciding factor. With little financial profit associated with these systems, they are often not prioritized. As mentioned earlier, some local

governments are trying to enact regulations to reduce the impact of new developments on watershed systems. While this is a step in the right direction, not causing further harm is far from prioritizing their restoration.

This innate conflict between urban conditions and environmental systems has led to the pervasive "urban stream syndrome". While this is true, the author finds both environmental and social benefits to urban living. Professor Rhett Jackson, of the University of Georgia's Warnell School of Forestry, and the author believe that urban conditions can lead to situations where restoration of hydrologic connectivity to natural conditions is not the best answer (Jackson 2010). This thesis does not suggest that degraded urban waterways should be disregarded. Rather it suggests that a social sustainability should be investigated through a re-appreciation, increased awareness, and social value of water as a vital resource. The term social sustainability is used in this thesis to refer to the ability of sustained human attention and care to increase natural systems' resiliency. The term derives from, landscape architecture professor, Joan Nassauer's term, cultural sustainability, which she defines as "ecologically beneficial practices that elicit sustained human attention over time" (Nassauer 2001, 1440). The author's decision to alter the term is based on the exclusivity of the term cultural, which subdivides groups, and the inclusivity of the term social, which does not.

RESEARCH QUESTION AND PURPOSE

This thesis asks the question: how can art in the environment promote a social sustainability for urban waterways? Tanyard Creek, as mentioned earlier, shows all the signs of a degraded urban waterway. It runs through the center of the University of Georgia's campus, home to over 30,000 students. The purpose of this research is to examine art in the environment as a strategy to increase the appreciation, awareness, and value of the creek to the surrounding community, with the assumption that this social sustainability will increase the stream's resiliency.

SUB-QUESTIONS AND METHODOLOGY

In order to answer this question there are some sub-questions that must be considered. What is art in the environment? How is art in the environment related to landscape architecture? What are the current theories related to social sustainability? Is there currently art in the environment that responds to environmental issues? If so, how do these works attempt to promote a social sustainability surrounding the issue? What are the historic, current, and possible future conditions of Tanyard Creek? What is the current relationship of the community to the creek? What are the possible ways that art in the environment can promote a social sustainability for Tanyard Creek? The findings from this thesis, although applied to Tanyard Creek, will hopefully contribute to a wider conversation about the use of art in the environment as a strategy for promoting social sustainability for any degraded environmental system.

Chapter two uses interpretive historical research as an interpretive strategy to explain the history of the land art movement and define the term art in the environment for the purposes of this thesis. This chapter will also establish the role art has played over time as a motivator for social change by reviewing social movements and their parallel art movements. Art has used strategies to shift perceptions and change values in order to inspire social change. This sets the foundation for using art in the environment to shift social values around degraded urban waterways. Interpretive strategies are the best methodology for this chapter because it allows the gathering of information from a wide array of sources.

Chapter three employs descriptive strategies as well as a discourse analysis of current theories surrounding human perception, understanding, and care of surrounding environmental systems. The review will begin with Nassauer's research on landscape aesthetics and cultural sustainability. This will be followed by a review of eco-revelatory design as a strategy for making process visible and increasing people's understanding of natural systems. Finally, this chapter will look at research from Stephen Kaplan, an environmental psychologist, on motivational strategies for promoting environmentally responsible behavior (ERB). Secondary description is used because it allows the gathering of information from a wide array of sources. A discourse analysis will be used to pull out key motive and strategy terms

that will be reorganized into categories and used as a benchmark to compare art in the environment case studies. The discourse analysis is the best methodology for achieving these results because it allows the author to interpret these theories and create a new broad base from which to compare art in the environment's motives and strategies.

Chapter four will look at five case studies of art in the environment that respond to environmental issues and promote a social sustainability for the associated environmental systems. The author was unable to visit these works. The author was also unable to find information that explored the effects of these works rather than their intentions. Therefore a secondary description of the intensions of the works as well as a discourse analysis will be used as the methodology for this chapter. The discourse analysis will again be used to pull out key motive and strategy terms to compare to the benchmark categories. This chapter will show overlapping as well as additional motives and strategies that art in the environment can provide. It is imperative to use the same methodologies to review the case studies that were used to review the theories if the findings are going to be compared.

Chapter five will use four methodologies to show review the condition of Tanyard Creek as well as its relationship to the community: primary and secondary observation, behavior mapping, and a photo reveal, which are all descriptive strategies. The secondary observation employs interpretive historical research will be used to present the historic condition of the creek. A review of stream assessment literature will show the characterization of Tanyard Creek's current level of degradation. In addition, a review of proposed design documents will show possible conditions for the future of Tanyard Creek. Observation and behavior mapping will be used to quantify and qualify the interactions of passersby with the creek. A photo reveal project done by a class at the University of Georgia (UGA) will be used to further investigate how people are relating to the watershed in Athens, GA. Multiple perspectives are gained by using observation and behavior mapping tactics as well as the photo reveal for understanding the relationship of the community to Tanyard Creek. Observation mapping allows the objective compiling of data and the photo reveal is a subjective personal account directly from the community itself.

Chapter six will use the findings from the motive and strategy comparison of chapters three and four. The most often used or most powerful motives and strategies will be used to create a list of characteristics for promoting a social sustainability for urban waterways, such as Tanyard Creek, through art in the environment. The list of characteristics will be applied to Tanyard Creek based on the findings from the site analysis in the form of a designed installation as well as an organizational and financial structure.

LIMITATIONS

Limitations of this thesis include the data from the case studies, observation mapping, and photo reveal. Case studies were only reviewed by the literature from the designers or implementing organizations as mentioned before. No literature or data was available on people's reactions to the work or how effectual the work was at inspiring appreciation or an investment with the environmental issue at hand. The observation mapping was only done over a period of two months, with one hour sessions at four different times at each site. While this observation methodology was implemented with the hopes of getting representative data, it was limited. All of the observations took place during later winter and early spring and the weather during the time might have affected the use of the space. The data from the photo reveal is a convenience sample and is not representative of the diverse community that comes into contact with Tanyard Creek.

CHAPTER 2

ART IN THE ENVIRONMENT

In order to answer how art in the environment can promote a social sustainability of urban waterways, this thesis must define art in the environment. Art in the environment is a phrase that stems from the land art movement that began in the 1960's. This chapter will look at the history of this art movement and its associated social and artistic values. The phrase art in the environment will be defined by its relationship to other terms and values that are associated with this art movement. Art has a history of being used as motivational strategy for social change. This history will be explored with a few key movements. This history creates a key foundation for the use of art as part of the environmental movement. Lastly, this chapter will look at the relationship between art in the environment and landscape architecture. Do or should landscape architects consider using art in the environment in their work?

WHAT IS ART IN THE ENVIRONMENT

A History

Artists began to move out of the gallery and into the landscape as part of an anti-formalist movement in the late 1960's. These works rejected the gallery and the commodification of art by making works of monumental scale that used natural, sometimes ephemeral materials. Lucy Lippard reflects on this time as one filled with possibilities that rebelled against the current institutions: "not just a new art style or movement, but new ways of conceiving of, experiencing, and distributing art" (Boettger 2002, 28). The founding of The National Endowment for the Arts (NEA) in 1966 along with increased corporate support through grants and art purchases stimulated growth of the art community through increased funding. Simultaneously, the economic prosperity and explosion of baby boomers created a youth culture that was active in both social reform and artistic exploration (Boettger 2002). Young people

across the country were fiercely protesting the Vietnam War. The college campus was a significant platform used in these demonstrations and it was on this stage that Senator Gaylord Nelson proposed and promoted the first Earth Day which successfully took place the spring of 1970. Rachel Carson's book *Silent Spring*, published in 1962, was a catalyst for the environmental movement, but it wasn't until the success of the first Earth Day, in which hundreds of thousands of people participated, that the federal government began to act on behalf of the environment in a significant way. A number of federal laws were passed including the National Environmental Policy Act, the Occupational Safety and Health Act, the Solid Waste Disposal Act, the Endangered Species Act, and the creation of the Environmental Protection Agency (EPA).

This was the cultural context out of which the land art movement was born. Many of the early land artists were mostly concerned with the land as a material, a space outside of the gallery, and a primal method for self and societal reflection. A quintessential piece reflecting this time is the well-known *Spiral Jetty*, (figure 2.1) completed by Robert Smithson in 1970. As land art evolved into the 80's and 90's, land artists began attempting to use this medium to raise awareness and stimulate a conversation about environmental issues. The role of the artist began to shift towards connecting art, aesthetics, ecology, and culture. A well-known art work that exemplifies this shift is Mel Chin's *Revival Field*, (figure 2.2) installed in 1990. The sculpture used hyper-accumulating plant species to remove toxins from a 60 square foot section of the Pig's Eye landfill in St. Paul, Minnesota.

Today land art and its artistic predecessors continue to work in the environment, reflect on political and environmental issues through the landscape, and inspire through its formal attributes. The constant fluctuating and redefining of what is meant by environment and what is meant by art continues to push and evolve this art form in new directions.

Figure 2.1 Robert Smithson. *Spiral Jetty*. Rozel Point Utah, 1970
Source: www.mediabistro.com

Figure 2.2 Mel Chin. *Revival Field* . St. Paul, Minnesota, 1990
Source: www.greenmuseum.org

A Definition

Even though this movement began in the 60's with the term land art many subsequent terms and niche definitions have been created since then. These different terms respond to slight differences in relationship to site, materials, ecological function, and activism. The diagram (figure 2.3) on the next page attempts to show how this term relates to other terms that have been associated with or relate to the art works created out of the gallery, such as, public art, art installations, earthworks, earth art, art in nature, ecological art, eco-vention, and eco-design.

Public art has existed for many generations and is defined by art historian Knight as art works that do not simply exist in public spaces, nor is it defined by the accessibility or volume of viewers, but takes the idea of the public as the genesis and subject of analysis (Knight 2008). Art installations are works that are defined by and in response to site. Land Art, Earth Works, Earth Art, and Art in Nature are all terms associated with earlier works from this art movement that imply works that are made outdoors with natural materials. Ecological Art and Eco-vention both refer to works that begin to incorporate ecological function and restoration as part of the art work. Eco-design is a newer term that generally refers to the design of consumer products that either employ green practices or at least want consumers to believe that they employ green practices in the production of the product.

Figure 2.3 shows the relationship of the definition of art in the environment to other related terms. The phrase is more closely related to newer terms that are more concerned with environmental activism and less concerned with materiality as opposed to earlier terms that were highly defined by site and materials. The phrase was chosen because of its specific attributes. Art in the environment responds to a specific site or site issue but is not necessarily defined by site. Art in the environment is not constrained by materials. It does respond to an environmental issue but does not necessarily perform an ecological function. Art in the environment plays a role in activism and advocacy for environmental issues.

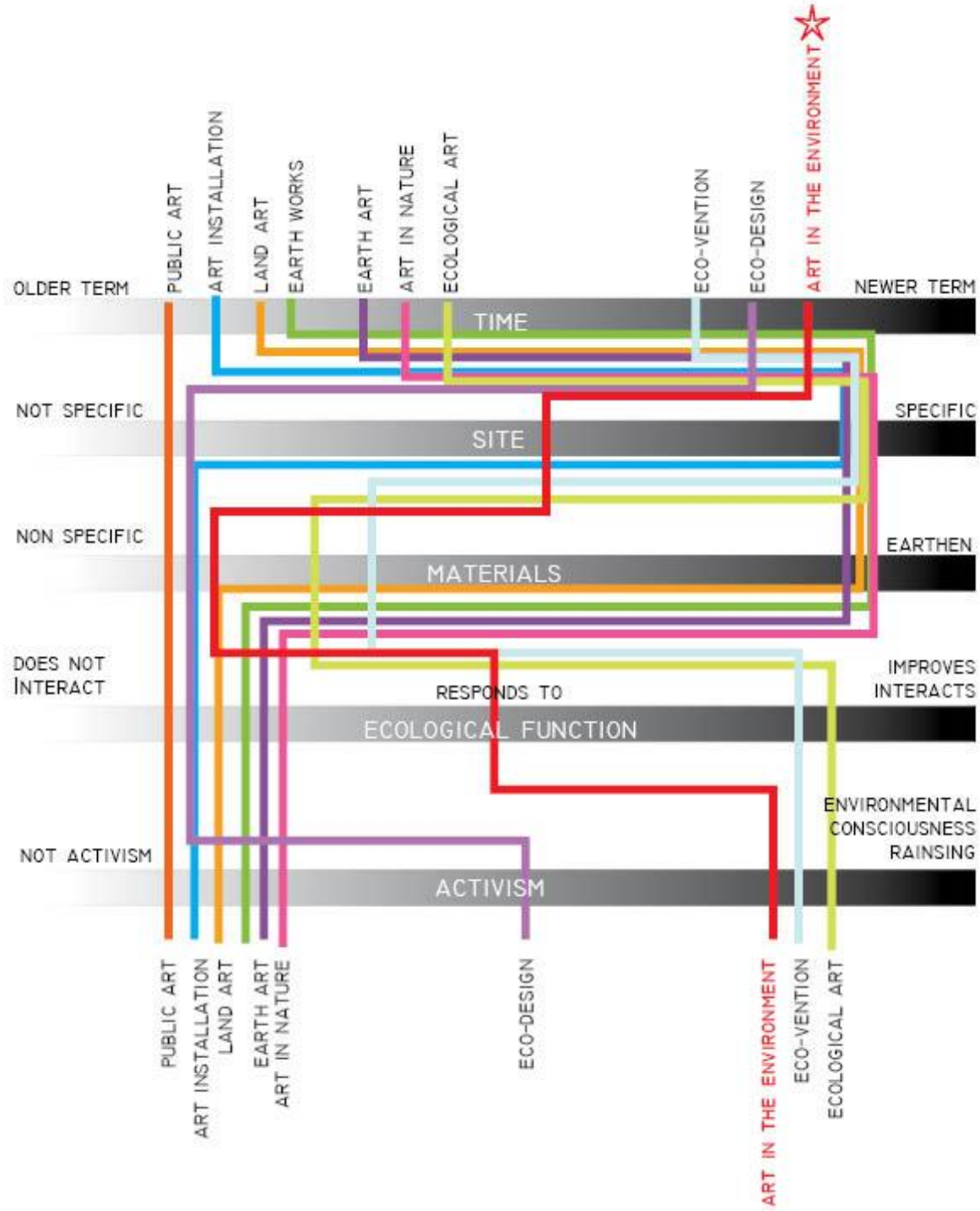
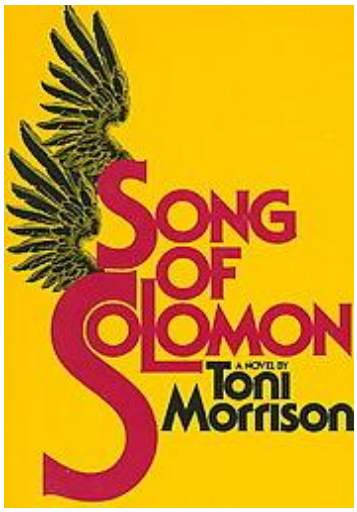


Figure 2.3 Definition diagram of Art in the Environment
Source: created by author

ART: A CATALYST FOR SOCIAL CHANGE

A work of art has the ability to produce an effect, change in perception, or meaning for the viewer (Turner 2006). Joan Nassauer (1977), whose research will be discussed in the next chapter, says that good art changes peoples' consciousness and the future by communicating something that exists now, but that people are unaware of now. It is precisely this ability that underlies its use in stimulating dialogue and creating movements of social change. Malcom Miles (Knight 2008) argues that the particular role of public art today is to initiate social criticisms, engage public dialogues, and to encourage debate on social issues ranging from homelessness to the survival of the rain forest.

As previously discussed, social activism was peaking during the inception of the land art movement. Since that time art has been used as a medium to respond to these social issues such as the civil rights movement, women's liberation, and gay rights. The black arts movement associated with the fight for civil rights was defined by theater, literature, poetry, music, and dance. A few acclaimed contributors to this movement are novelist Toni Morrison, poet Maya Angelou, jazz musician Dizzie Gillespie, and artist Wadsworth Jarrell (figure 2.4) (Smethurst 2005). Similarly, the women's liberation movement had associated artists who were supporting and stimulating dialogue for the cause. Judy Chicago, the Guerilla Girls, Gloria Steinem, and Hannah Wilke are a few of the well-known artists from this movement (figure 2.5). Keith Haring and Robert Mapplethorpe used their art to push the dialogue surrounding gay culture and an artists' collective called Gran Fury created propaganda to de-stigmatize gay culture and misconceptions about the AIDS epidemic (figure 2.6).



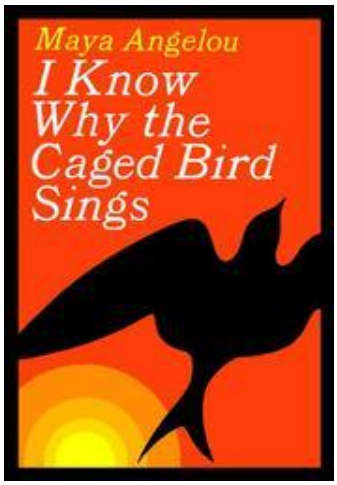


Figure 2.4 Examples from the black arts movement
Sources: (in order from left to right and top to bottom) www.libraries.uc.edu, Wadsworth Jarrell. *Wall of Respect*. Chicago, IL. 1967 www.xroads.virginia.edu, Dizzie Gillespie www.americaslibrary.gov, http://mhalphintdp4380.blogspot.com

Figure 2.5 Examples from the women's liberation art movement
Sources: (in order from left to right and top to bottom) Judy Chicago. *The Dinner Party*. The Brooklyn Museum. 1979 www.throughtheflower.org, The Guerrilla Girls http://womhist.alexanderstreet.com, www.sexualityinart.wordpress.com, Hannah Wilke. *S.O.S. Starification Object Series*. Museum of Modern Art. 1974 www.hannahwilke.com

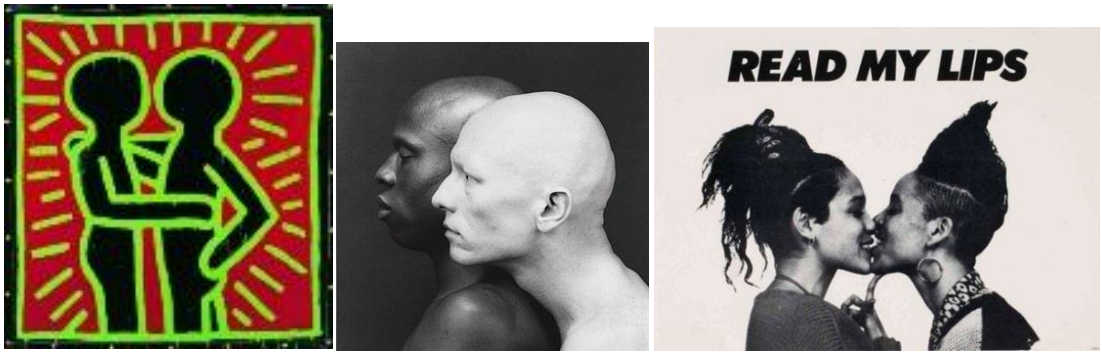


Figure 2.6 Examples from the gay rights movement
Sources: (in order from left to right) Keith Haring. *Whitney*. www.worldgallery.co.uk, Robert Mapplethorpe. *Ken Moody and Robert Sherman*. 1984 http://pastexhibitions.guggenheim.org, Gran Fury. *Read My Lips*. www.anti-thesis.tumblr.com

Unfortunately, the environmental arts movement has not created as much public awareness as these other socially charged arts movements. The film *An Inconvenient Truth*, released in 2005, by former Vice President Al Gore has been the most publicly noted work and is widely credited

with pushing climate change to the forefront of political discussion in the United States. Since its release, over 15 climate change bills have been introduced in Congress and over 2,600 people have been trained to give The Climate Project presentation which has been seen by four million people on all seven continents.

Artists continue to use their work to motivate social change. A few examples of current artists/organizations that use art work for political activism are Banksy, iO Tillett Wright, and Photo Voice. Banksy's work is highly controversial and successfully creates dialogue. Below (figure 2.7) are images of graffiti work done by Banksy in the West Bank in response to the 425 mile long wall dividing Israeli and Palestinian territories. These images use a dark humor to shift the perception of the viewer, placing domestic imagery in the middle of war imagery. A child pats down a soldier and a rebel throws a bouquet instead of a bomb. A cozy living room with a view into the distance, painted on the barrier wall, allows the viewer to let the wall metaphorically disappear. Human figures in the foreground of these images reveal the larger-than-life scale of the graffiti. The scale and dramatic imagery create a powerful effect for the viewer.

Figure 2.7 The work of Banksy in the West Bank
Sources: (in order from left to right) www.weburbanist.com, www.therealsasha.wordpress.com, www.paxmachinga.tumblr.com

The works of iO Tillett Wrights, a New York City based artist, include a photographic compilation of single portraits showing the face of the Lesbian-Gay-Bisexual-Transgender-Queer (LGBTQ) community in America today. The photographic project, called *Self Evident Truths* (figure

2.8), has travelled from city to city across America compiling these compellingly simple photographs. The project was funded by Kickstarter.com, a web site that allows smaller projects to raise money and advertise to a large public, as well as profits from selling the photographs.

Figure 2.8 iO's *Self Evident Truths*
Source: all images from selfevidentproject.com

Photo Voice is an organization that supports participatory photography for social change. Their vision is of a world where no one is denied an opportunity to speak out and be heard. Their mission is to give disadvantaged and marginalized communities the tools for advocacy and communication in order to achieve positive social change. They achieve these goals through participatory photography and digital storytelling. The organization provides disadvantaged community members with cameras in order for them to tell their own stories. A few examples of their projects include: *Eyes of Youth*, where young people in a deprived region of Albania explore and document local issues, *Street Vision*, images taken by street and working children in Vietnam, and Workshops with nomadic pastoralist children in Samli Region of Ethiopia (figure 2.9).

Figure 2.9 Albanian, Vietnamese, and Ethiopian Photo Voice projects
Source: www.photovoice.org

LESSONS

Art moved out of the gallery and into the landscape as a rebellion against the white box and the gallery system. These works were outside the realm of commodification because of their use of landscape materials, their scale, and sometimes ephemerality. This was a time of social upheaval where the arts took a large role in advocating for social change. Art has been and is still being used as a catalyst for social change by altering the perception of the viewer, through tactics such as confrontational imagery, humor, relaying information, the telling of a new narrative, and/or placing these works in the public arena. One thing that Banksy, iO, photo voice, Gran Fury, and others have done to motivate for social change is to use the confrontational imagery from the associated issue and twist it into something beautiful or humorous as a way to comment and create reflection on the situation. Is art in the environment using this type of twisted confrontational imager? What type of strategies is art in the environment using? Should art in the environment take a lesson from social art that has shown success with this strategy?

ART AND LANDSCAPE ARCHITECTURE

Why might a landscape architecture thesis be suggesting the use of art in the environment? Today art in the environment has many parallels with landscape architecture and the two are beginning to overlap in some important ways. Landscape architecture and art in the environment are both concerned with time, space, the creative process, scale, and culture (Parent 2007). The American Society of Landscape Architects (ASLA) lists landscape art and earth sculpture as projects that landscape architects pursue. In fact, an increasing number of landscape architects are bidding for and winning public art and memorial projects. The blending of the two professions is put well by artist Stacy Levy when she said that artists used to make art and put it in public spaces, landscape architects used to make spaces and plop art in them, perhaps artists are becoming gardeners and gardeners are becoming artists (Bruce and Tacha 2006). Landscape architecture has even entered the world of the gallery with the Museum of Modern

Art's (MOMA) recent exhibition "Groundswell", which displayed contemporary creative landscapes in the United States, Europe, Asia, and the Middle East (Bruce and Tacha 2006).

Art works in general are somewhat defined by how they are perceived by others and good landscape architecture also takes human perception into consideration. It is the opinion of the author and much published research that designed environments that take into consideration the values and preferences of human inhabitants are more likely to be valued, cared for, and preserved. The next chapter discusses three theories that are concerned with the social perceptions of the environment and ways of improving the social sustainability of environmental systems.

CHAPTER 3

LANDSCAPE ARCHITECTURE: THE SOCIAL SUSTAINABILITY OF ENVIRONMENTAL SYSTEMS

Art in the environment is a practice that straddles the work of both artists and landscape architects. Art's historic relationship with movements of social change used art in an attempt to shift the perspective of the viewer. Landscape architecture is also concerned with how their work relates to and effects social groups. The following three widely accepted theories were chosen to review based on their concern with landscape designs' relationship to human perception, understanding, and value which are key factors in the social sustainability of environmental systems. The three theories are organized by their incremental relationship of human perceptions and relationship to their environment, beginning with Joan Nassauer's research on aesthetics and its effects on cultural sustainability, as defined on page six. The next topic in this incremental review is eco-revelatory design. This practice is concerned with revealing the process of environmental systems through landscape design with the aim of increasing peoples' awareness and understanding of these systems, in turn increasing the systems' social sustainability. Lastly, this section will review a theory called the reasonable person model formed by Stephen Kaplan, an environmental psychologist whose work has been very influential to landscape architects. The reasonable person model is a theory that explores ways of motivating people to have environmentally responsible behavior, the psychological aspect of social sustainability.

NASSAUER: AESTHETICS AND CULTURAL SUSTAINABILITY

Nassauer (1977) argues that natural resource decisions cannot be made alone to protect resources, they must include the concern of other people. Humans have a powerful effect on

environmental phenomena; therefore it is highly meaningful to consider how humans perceive and interact with landscapes. The aesthetics of what people perceive as valuable in the landscape must be respected in order for innovative landscape designs to be successful, or have a cultural sustainability. Nassauer refers to the type of aesthetics that people perceive as valuable in the landscape as cues to care. These cues to care can vary with culture and landscape context, but may include: neatness, order, structures in good repair, visible crisp edges, trimmed vegetation, colorful flowers, decoration or ornamentation, and signage (Nassauer 2011). The aesthetics that people value specific to riparian landscapes include: curvilinear forms, banded patterns, panoramic views, water sounds, and white water or bubbling in addition to the previously listed cues to care. Nassauer's research shows that when these types of aesthetics are seen in the landscape, people view them as valuable and are more likely to care about sustaining those landscapes. Nassauer adds that part of eliciting human care includes educating the public on "ecological health or what needs to be protected to maintain ecological health" (Nassauer 2001, 1440). Therefore, environmental education along with valued aesthetic forms can be a powerful tool for improving the cultural sustainability of environmental systems, such as urban waterways.

ECO-REVELATORY: UNDERSTANDING PROCESS

The aim of eco-revelatory design is to make eco-system processes visible in the landscape. It has been said that environmental processes are considered invisible, making ecological benefits not obvious (Elmiger 2011). Eco-revelatory design is a practice that attempts to resolve this issue. It uses experiential and interpretive design to increase people's awareness and understanding of landscape systems. It is intended to reveal and interpret ecological phenomena, processes and relationships (Eco-Revelatory Design: Nature Constructed/Nature Revealed 1998). This practice assumes that if people are able to see and comprehend these

normally hidden processes, then they are "better able to appreciate, evaluate, and make wise decisions concerning them" (Eco-Revelatory Design: Nature Constructed/Nature Revealed 1998, x).

Eco-Revelatory Design: Nature Constructed/ Nature Revealed, an exhibit and catalogue featuring fifteen designed works and eight essays, was conceived in response to a perceived stagnancy and polarization between art and ecological aesthetics within landscape architecture.

> "In this exhibit landscape architects and their partners employ various strategies to reveal ecologies. *Abstraction,* so obvious in a time-based landscape *simulation* created by contemporary computer technology, is also at work in landscape design and its representations. Designers' strategies have to do with how we see and experience as well as with what we see and experience. Designers envision and plan *new uses* of landscapes, out of which arise *deeper caring*, for the interactive life and processes within them. They preserve, restore and introduce *signifying features* in landscapes that speak for natural and cultural processes that might otherwise remain invisible. They *expose infrastructure processes* customarily hidden. They *reclaim* landscapes so that the past is *remembered*, even as nature, culture and their interactions are recast and *revived* for present and future. They *change perspectives* by structuring how we interact with landscapes as well as by structuring the forms and processes of landscapes themselves" (Eco-Revelatory Design: Nature Constructed/Nature Revealed 1998, xvi).

Looking at three of the projects featured in this exhibit can give insight into some of the strategies used by eco-revelatory design. Urban Ecological Retrofit, by Joan Nassauer, is a project in a residential neighborhood of Maplewood, Minnesota. An impending street resurfacing project created the opportunity to improve water quality by creating areas for stormwater to infiltrate. Native plantings and French drains were placed in homeowners' front yards in an aesthetic that was familiar to the neighborhood. Even though many homeowners were skeptical during initial meetings, all chose to install the optional rainwater gardens once construction began. Throughout the project it was observed that homeowners recognized the attractiveness of the new landscape and had begun to take care of it (Eco-Revelatory Design: Nature Constructed/Nature Revealed 1998).

Traces: Revealing Nature through Models of Landscape Dynamics, by Douglas Johnston and Wes Reetz, uses digital technology to reveal the structure of nature. A projection-based 3-D video environment, where an image is projected onto four walls in stereo, reveals patterns of water movement through the landscape. Normally one's senses, although rich, are limiting. A person's experience with the landscape only allows them to view one perspective, or a piece of the whole. As objects or sounds move closer or farther away, a person will perceive a change in the size, shape, or sound. This project tracks the viewer through a radio signal so that the projection displayed on the walls are recomputed and gives the viewer control over shifting spatial or temporal scales. Depictions can be changed in order to view the path of water drops across surfaces, revealing how water drainage, slope, and surface materials are related.

Watermarks at the Nature Center, by Richard Hansen, is a series of sculptural systems that aim to reveal the movement and elusive character of water while improving ecological function. The series of sculptural forms refer to native hydrologic patterns. The sculptures aim to create visual delight as well as good ecological design. Each system is announced with a site marker with a unique waterflow icon that evokes the hydrological process occurring. A brochure available at the Visitor's Center links the images with written information elaborating on the process.

These three projects show a spectrum of application possibilities for eco-revelatory design from residential amenities to artistic technological installations to civic design. Although these applications range they share similar motives and strategies. The key terms describing eco-revelatory's motives and strategies include: educate, reveal, interpret, expose process, experience, perceive, improve ecological function, referential forms, increase awareness, appreciation, improved decision making, abstraction, simulation, deeper caring, expose

infrastructure, change perspectives, new interactions, patterns, sculptural, visual delight, and informative.

KAPLAN: THE PSYCHOLOGY OF MOTIVATION

Stephen Kaplan's research on what types of motivations promote an environmentally responsible behavior (ERB) questions the linkage between "good" motives and "good" behavior, on which a significant amount of scholarly literature focuses - particularly the "good" motive of altruism. Kaplan alternatively looks at the range of "bad" to "good" motives and their "bad" to "good" outcomes. His research shows that although there are many examples of "good" motives such as altruism and idealism leading to "good" behavior, parts of this assumption fail. Kaplan finds flaws with altruism as a motive because it is "defined as feeling or acting on behalf of the welfare of others in cases where self-interest could not be involved" (Kaplan 2000, 494). This definition infers that altruistic action is sacrificial and sometimes working against one's own self-interest. "The centrality of such a negative pay-off as essential to the definition of altruism creates serious motivational issues that bring into question the strategic usefulness of the concept. The requirement of receiving no benefit from one's action and the inclination to enshrine sacrifice as a paradigmatic environmental virtue communicate a powerful, if unintended message, namely that ERB inherently leads to a reduction in the quality of life" (Kaplan 2000, 494). In opposition, some "bad" motivators, such as the not in my backyard phenomenon (NIMBY) or pride, a sometimes-shunned motive, have been reported as remarkabley successful motivators. Kaplan has found that a balance between altruism and self-interest is most effective for motivating ERB.

He suggests a new model called the reasonable person model. This model is based on the ways that human information processing has been designed by evolution. Humans hate being

disoriented and confused; they desire to have the information to gain an understanding of the world around them. Humans prefer to gather information at their own pace and in answer to their own questions. Humans do not like to be incompetent or helpless; they want to participate and play a role in the world around them (Kaplan 2000, 498). Kaplan stresses that the feeling of helplessness is pivotal in the context of ERB. His studies showed that a decline in concern about environmental issues is due to a sense of futility and helplessness. Participation is a counter to helplessness and Kaplan suggests a focused task that needs problem solving. This takes advantage of the human creative cognitive capacity. Tasks should be both self-satisfying and responsibly altruistic for a maximum motivational effect.

FINDINGS

The three theories reviewed are concerned with different levels of human perception and relationship to the environmental in regards to increasing a social sustainability: from accepting aesthetics to revealing and understanding process to a psychological model for motivating responsible behavior. The terms used to describe the strategies in each of these theories are collected, sorted, and regrouped in order to create a baseline from which to relate the strategies that are used in the case studies that will be explored in the next chapter (figure 3.1). The synthesizing of terms from three well accepted theories creates a deeper breadth from which to compare how art in the environment is achieving the goal of social sustainability. The new categories developed from reorganizing the terms are motives, action strategies, form strategies, sensory strategies, and time based strategies.

Five case studies that exemplify the use of art in the environment to promote social sustainability will be described and their strategies will be compared with these baseline strategies (figure 3.1) in the next chapter.

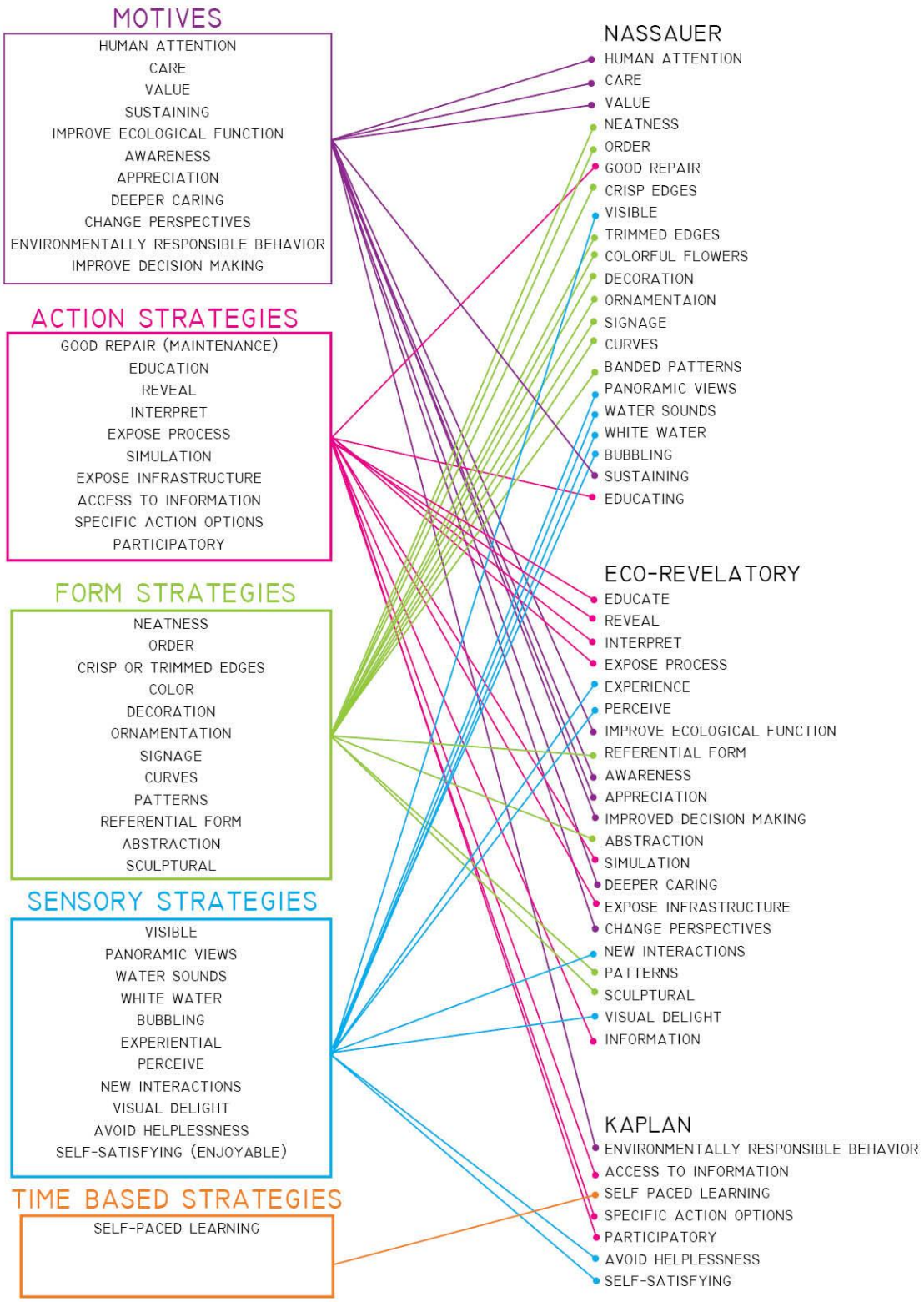


Figure 3.1 Reorganization of terms for baseline comparison with case studies
Source: created by author

CHAPTER 4

CASE STUDIES

Through an extensive literature search it has been found that all over the world art in the environment is engaging communities with environmental issues. The following five case studies are projects that exemplify how art in the environment is being used to engage the public with the environmental issues in their community. The case studies used in this research were selected because they met the following criteria. 1) The project is in response to an environmental issue or degraded or undervalued landscape system. 2) The project uses art to engage a community with the degraded or underappreciated landscape system. 3) The project must be issue specific.

The projects will be described and evaluated through a consistent lens. First, the organizational structure supporting the project will be described. Many of these projects were not created by the artist alone, but in conjunction with organizations that provide environmental expertise or financial support. Secondly, the environmental issue that the project responds to will be explained. Thirdly, the components that make up the project will be described. This section will discuss the elements that make up the project: what is it, what does it look like, and where is it. Finally, a collection and discussion of the key terms that identify the projects strategies will be collected and compared to the categories developed from the landscape architecture based theories.

Case Study No. 1: FLOW (Can You See the River?)

Indianapolis, Indiana

Figure 4.1 Lenses and markers on the White River, Indianapolis, IN (*Flow Can You See The River*) Source: www.marymiss.com

Organizational Structure

This project was the result of a major collaboration of different artists and organizations. The project was initiated by Mary Miss, an artist, and Marda Kirn, the Excecutive Director of EcoArts Connections. These two women created an initiative, that is currently applying for a 501(c)3, called City as Living Laboratory: Sustainability Made Tangible Through the Arts (CaLL). CaLL is a studio that envisions a "framework for collaboration and citizen engagement, linking the arts with long term research and policy initiatives to make sustainability personal, visceral, tangible, and actionable" (Maidhof 2012). The project was supported by the Indianapolis Museum of Art (IMA) and more than 20 Indianapolis organizations based in the arts, sciences, environment, and governance. Each organization contributed time, expertise, and resources that informed the project and its elements (*Flow Can You See The River*).

The project was commissioned for the IMA's 100 Acres: The Virginia B. Fairbanks Art& Nature Park and was supported in part by an award from the National Endowment for the Arts (NEA). 100 Acres: The Virginia B. Fairbanks Art & Nature Park is one of the largest museum art parks in the country and has a series of ongoing commissions for site-specific works that explore and respond to the varied

environments in the park (*100 Acres IMA* 2012). The research, organization and planning, and installation occurred between 2008- 2011.

Environmental Issue(s)

The focus of this project is the White River, which runs through the heart of Indianapolis, and is taken for granted by many of its citizens. Urban dwellers are unaware that the river provides them with drinking water and is a major life support system for the city's residents (Mary Miss 2011, 8). The project has four distinct goals: increase public awareness and understanding of the watershed, create a visceral experience for how one's actions effect the watershed, provide new ways for citizens to take actions to improve the health of the river, and inspire new learning and research collaborations (Mary Miss 2011). These goals can be translated into the issues of lack of awareness, a lack of understanding of how the watershed works, a lack of visceral engagement with the watershed, and a lack of collaborative projects responding to watershed health. Mary Miss also notes that 70% of Indianapolis' drinking water comes from the White River which is very polluted (artbabble.org).

Components

Miss divides the project down into six components: 1) revealing riverside sites, 2) markers, 3) a walkable map, 4) audio and web content, 5) public access points, and 6) a launch event (Mary Miss 2011).

The riverside sites are stopping points along the river that are defined by an eye level mirrored lenses (figure 4.2) that focus the viewers' attention toward a marker. These mirrored lenses create a visual connection with the landscape, highlighting the viewer and the marker within the landscape.

Figure 4.2 Riverside Site
Source: www.marymiss.com

The markers look like oversized rounded red thumb tacks (figure 4.3) or stripes of red cloth (figure 4.4) and they indicate water related infrastructure, such as rain gardens, pervious pavement, pond/wetland areas, or water quality monitoring sites (Mary Miss 2011). A series of markers at the IMA visualize the path of water through, over, and around the Museum. This reveals the movement of water in the urban condition where it is normally unseen, hidden in pipes underground or inside of buildings' infrastructure (Mary Miss 2011). Markers are also placed throughout the IMA's Art and Nature Park to reveal the relationship between the river, the lake, and flood levels (figure 4.4).

The walkable map is a large scale installation on the floor plane of the IMA that allows visitors to locate marked sites associated with the project and their relationship to the river and surrounding city of Indianapolis (figure 4.6). The map also allows visitors to plan a self-guided tour of the markers.

Optional audio and web content is available at riverside sites and can provide more detailed information about one of the following topics: watershed, circulation, wetlands, floodplains, flora of river, fauna, history, climate change, and citizen action (Mary Miss 2011). Visitors can access the information by calling a number etched on the mirrored lens to hear stories or information while experiencing the site. In addition, mobile applications such as Track a Raindrop, a web based application, allows web browsers to follow a raindrop from their location (either GPS located or keyed in) through the raindrops drainage

basin, different parts of the stormwater systems, and into the river (figure 4.5). Also, web cams relay real time imagery to an IMA installation (figure 4.7) from as far upstream as the top of the watershed and as far downstream as the Gulf of Mexico (Lgaumond 2011).

Figure 4.3 Markers
Source:www.marymiss.com

Figure 4.4 Flood Level Markers

Figure 4.5 Track a Rain Drop
Source: www.marymiss.com

Figure 4.6 Walkable Map

Figure 4.7 Live River Surveillance Display (*Flow Can You See The River*)Source: www.marymiss.com

The launch event, actually a series of events, took place between September 22, 2011 and October 1, 2011. The events included performances, discussion panels, film programs, tours, and exhibits. Performances included storytellers' works related to the river, ten minute plays written by youth playwrights and acted by adult professionals, ten minute dance performances that used choreography that refered to water, and musical performances inspired by nature/water (Mary Miss 2011). Panels enabled open public dialogue between knowledgeable individuals from diverse backgrounds, such as Native Americans, engineers, artists, public officials, and economists (Mary Miss 2011). Film programs included the debunking of Hollywood's portrayal of water as well as excerpts from orchestral concerts and ethnographic dances based on water themes (Mary Miss 2011). Tours included a guided float down the river and a progressive dinner with a river-related culinary theme using produce raised along the river (Mary Miss 2011). Exhibits included a comparison of the changing flora and fauna along river from over time, exhibits of indigenous materials related to water, and other informational displays (Mary Miss 2011).

Findings

The key motive and strategy terms taken from this project are: highlight, mark, visual connection, reveal, relationship, comprehend, scale, optional information, web applications, ongoing events, performances – theater/music, dis, films, panel discussions, exhibits, storytellers, visceral

experience, increase public awareness, provide actions, new research, collaborations, access, simulation, visualize, exhibit change over time, and self-guided. Many of these key terms parallel those of the landscape architecture theories previously discussed (figure 4.8). In figure 4.8 a list of the strategies in this project are compared with those strategies from the baseline. Strategies that are used by both the baseline and this case study are marked with an asterisk. This project uses art to reveal process and relationships of the watershed to viewers in the same way that eco-revelatory designs aspire. Educational strategies that use signage, visibility, and self-paced learning parallel all three of the previously discussed theories.

As mentioned at the beginning of this chapter, the organizational structure that supports these projects is important to their success; therefore it should also be categorized. This project was created and supported by one artist, one environmentalist, 20+ local art, science, or government organizations, one national arts non-governmental organization (NGO), and one national governmental arts org. A comparison of all the case study structures can be found at the end of this chapter (figure 4.51).

Figure 4.8 Comparison of Flow's strategies to baseline strategies
Source: created by author

Case Study No. 2: What is Missing?

Figure 4.9 What is Missing?
Source: www.whatismissing.net

Organizational Structure

The project was initiated by Maya Lin, who collaborated with scientific institutions (the California Academy of Sciences, the Cornell Lab of Ornithology and the Wildlife Conservation Society), environmental organizations : The International Union for Conservation of Nature (IUCN), The Natural Resources Defense Council (NRDC), World Wildlife Fund (WWF), Panthera, and Ocena, and others, artists, photographers, filmmakers, writers and concerned citizens. Audio and video content for "What is Missing?" was donated by the Cornell Lab of Ornithology, the National Geographic Society, ARKive, and BBC Earth, as well as other groups (Lin). The "What is Missing?" Foundation was established by Maya Lin in 2003 to fund the project. Seed funding came from Fairfield Community Foundation and the Betsy and Jesse Fink Foundation. Lead funding came from the Bloomberg Foundation, Donald R. Mullen, Li Ka Shing Foundation, and eighteen other individuals/foundations. Additional funding has come from Creative Time and Rockefeller Foundation's NYC Cultural Innovation Fund and others for specific works. In addition to funding, creative contributions, and audio and video donations, there are a

multitude of organizations on an advisory committee including but not limited to BBCEarth, National Georgaphic Society, World Wildlife Fund, the Yale School of Forestry, and IUCN (Lin). Design work was completed by the Maya Lin Studio, a ten person firm in New York. Marketing was done by a media team consisting of five individuals. The web page was created by two design studios of six people. This project was funded, designed, and marketed by an very large number of supporters from individuals to the federal government to global organizations.

Environmental Issue(s)

This project is in response to the mass extinction of plants and animals that is currently underway. This "sixth mass extinction in the planet's history is the only one to be caused not by a catastrophic event, but by the actions of a single species – mankind" (Lin). Close to every 20 minutes a plant or animal species disappears. At this rate it is possible that as many as 30 percent of the world's plants and animals could be endangered or extinct within 100 years. The project ties this issue back to its underlying issue of habitat loss and degradation (Lin).

Components

The nexus of this project is a website, whose home page exhibits a dot-based map of the world. Each dot on the map represents a species, habitats, or natural phenomenon that has disappeared or significantly diminished (Lin). A curser hovers over a black screen with the dots scattered like stars across the globe (figure 4.9). The curser appears as cross hairs floating over a circle, somewhat like a scope, with the latitude and longitude of the curser's location in the globe appearing just to the left. When the dot is clicked, an image and text or a film appears about the species, place, or natural phenomena that the dot represents (figure 4.10). The associated films use a technique the author has termed scripto-visual-audio matrix built from the terms scripto-visual matrix used by Dawkins to describe a particular well established rhetoric used in the print culture of ecological organizations. This technique successfully creates emotional resonance in the viewer (Dobrin and Morey 2009). A link called "add a memory" brings up a new window with a survey allowing the viewer to record a personal or a historical/factual memory of a species, place, or natural phenomena that has declined or is missing. The survey allows the

viewer to choose between mammal, fish, bird, habitat, or plant. A new screen allows the viewer to write 300 words or less about this memory, upload images, and record a

Figure 4.10 A Personal Memory
Source: www.whatismissing.net

year in history to place the memory. After filling out the form and clicking the disclosure agreement, anyone's story can become a part of the project. The stories become a part of the website. The information on the website and the stories that are continually added are part of a research project initiated by Maya Lin in 2010. Lin traveled around the world and asked people the question "What is Missing?" from their environment or from nature. The dot-based map can then be sorted by chronological, personal, historical, film, or subject order (figures 4.11 and 4.12). This allows the viewer maximum individualized search-ability and, what the author deems an interesting graphic reorganization of the data. A zoom tool allows the viewer to zoom in and scroll around the globe. A map key defines the graphic symbols used on the website. Another important element is the share-ability of the web page. The page allows viewers to link the web address with well over a hundrend different networking sites. This is important because getting as many people across the globe to view the site will determine its success.

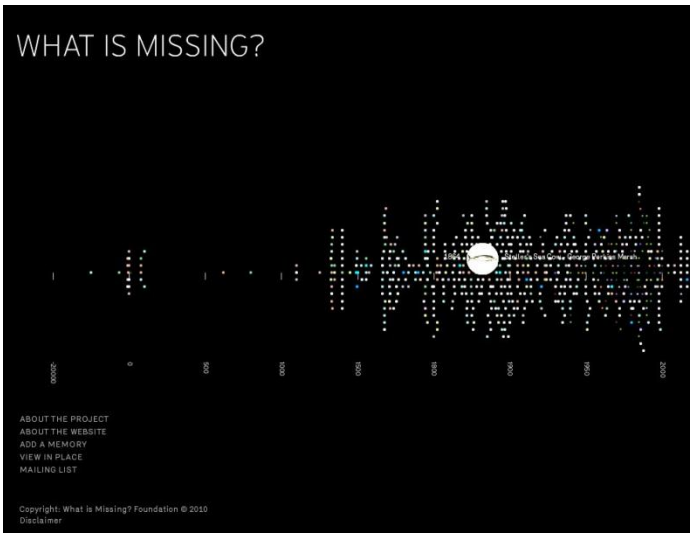


Figure 4.11 Sorted Chronologically
Source: www.whatismissing.net

Figure 4.12 Sorted By Subject
Source: www.whatismissing.net

Figure 4.13 Icon To Time Travel Through Site
Source: www.whatismissing.net

The website also enables viewers to navigate through time, revealing an ecological history of the world by virtue of maps of the past (Map of Memory), present (Conservation in Action), and future (Greenprint)" (Lin) (figure 4.13). The "past" portion of the website is the collection of memories

previously explained. The “present” portion of the website will be launching Earth Day 2012 and will focus on conservation in action, highlighting the work of environmental organizations and collaborating institutions. It will give web viewers actions they can pursue to help protect species and habitat. Over time the dots that represent each organization will be updated to reflect their changing goals and initiatives. Twinkling dots will alert viewers of environmental issues that are in need of immediate help.

The “future” portion of the website will be launched on Earth Day 2013 and will be subtitled “A Greenprint for the Future”. This map will pose plausible designed futures that balance the conflicts between human development and environmental degradation and habitat loss. “A web-based mapping mechanism will take satellite imagery of the earth and redraw the map of city lights based on user inputs on (a) what people need, (b) what nature needs, and (c) preferred technologies (e.g. diet, transportation, city size and density) for satisfying people and nature (Lin).

In addition to the website “What is Missing?” a series of permanent and temporary media and sound works are being installed throughout the world. The installations include: permanent Listening Cones placed at select science institutions, a traveling Empty Room exhibit, smaller site specific sound and media installations placed in art, science and public venues, independent video works that can be shown at events, and a physical and digital book compiling this research.

The listening cone sculpture has both permanent and temporary installations (see figures 4.14 and 4.15). The cone has an interior screen that plays films from the What is Missing? Foundation’s library of films. The library currently holds 75 films but is planning on developing 75 more. The traveling or temporary listening cone is smaller, made from recycled plastics, and has the same capability of video display as its permanent counterpart.


Figure 4.14 Permanent Listening Cone (Lin)


Figure 4.15 Traveling Temporary Listening Cone
Source: www.whatismissing.net

The Empty Room, essentially about absence, is a traveling exhibit that is a darkened space with flickering lights. The viewer can guide a thin, clear screen over a projection and see an image (figure 4.16). A sound plays that is associated with the image as they hold it in their hands. Images featuring species will appear at actual scale – whether it is a songbird, tuna, or a whale's eye. It is solely the information that gives form to the exhibit. The exhibit can be installed in any darkened environment and there are plans for both single and double screen installations (Lin).

Figure 4.16 Traveling Empty Room Exhibit
Source: www.whatismissing.net

Other traveling works include Sound Ring (figure 4.17) and Wall Portal (figure 4.18). Sound Ring is single elliptical ring with embedded speakers that emit sounds. The installation is intended to give viewers an isolated tonal experience with distinct species and habitats from around the globe. The first Sound Ring is planned for the Cornell Lab of Ornithology in Ithaca, NY (Lin). The Wall Portal is a sculptural wall with small portals a viewer is able to peek into and watch one of the films from the What is Missing? Foundation's library. The wall will emit integrated sounds with the films, giving the viewer an audiovisual experience.


Figure 4.17 Traveling Sound Ring
Source: www.whatismissing.net

Figure 4.18 Traveling Wall Portal
Source: www.whatismissing.net

A "What is Missing?" film was a part of a 2010 Earth Day celebration supported by Creative Time presented in New York City's Times Square. The film highlights the current mass extinction and natural habitat degradation issues and was played at the top of the hour, every hour for 15 days (figure 4.19). Another co-supported film initiative is *Unchopping a Tree* (figure 4.20), which can be found on the "What is Missing?" website as well as other video sharing platforms. The film communicates the importance of protecting against deforestation and working for strategic reforestation (Lin).

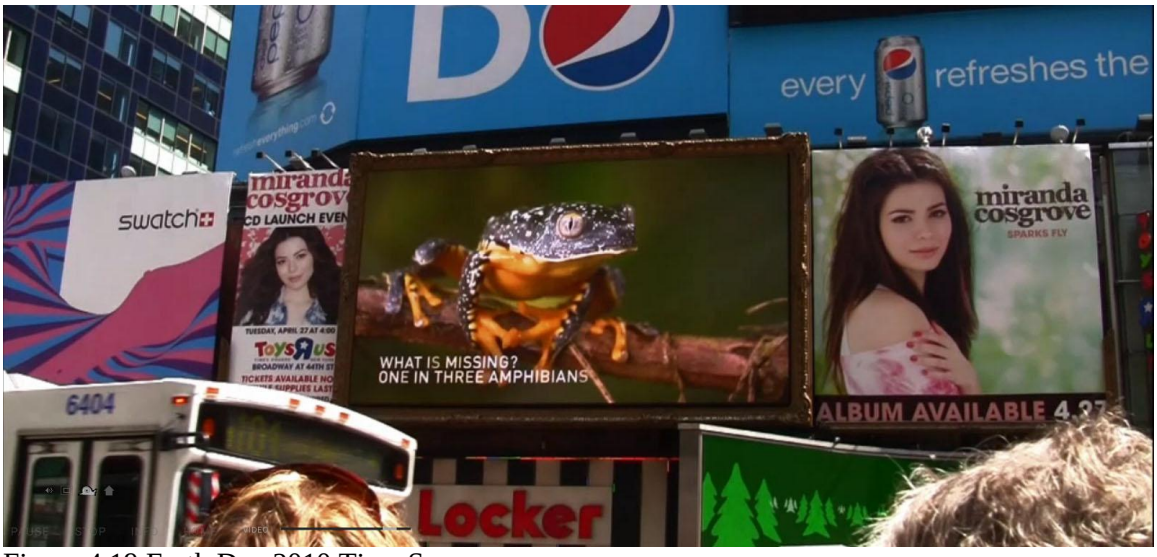


Figure 4.19 Earth Day 2010 Time Square
Source: www.whatismissing.net


Figure 4.20 Film Still from *Unchopping a Tree*
Source: www.whatismissing.net

Findings

The key motive and strategy terms taken from this project are: awareness, protect, find solutions, deeper care, connect, share, highlight, provide actions, participatory, searchability, reorganization, updatable, visible, traveling, acces to information, science based art, media, web based, catalogue, markers, film, mapping, scripto-visual-audio matrix, sculpture, sensory isolation, referential sound, scale, emotional resonance, permanent, temporary, ongoing, exhibits change over time, and self-paced information gathering. This project also shares some of the motives and strategies from the baseline list of motive and strategies for promoting social sustainability. Figure 4.21 shows the comparison of terms where shared terms have an asterisk next to them. The author feels it is especially kin to Kaplan's research in that this project is driven by information. The cataloguing of information drives the project's form and the data can be reorganized and searched in many different ways giving the viewer a self-guided, controlled sense of learning, recommended by Kaplan. In addition, the viewer is encouraged to add their own information to the project, adding a participatory element that Kaplan recommends. They are also given (or as soon as this part of the webpage is completed) specific action options, discouraging a sense of helplessness, also recommended by Kaplan. The author thinks this project brings another very important element to the table not seen in the baseline list of strategies, which is to create an emotional resonance through the scripto-visual-audio matrix. The author believes that the combination of these strategies creates a strong design for promoting social sustainability.

The list of supporting organizations for this project runs deep. No supporters could be defined as local for this project since it is a global issue. This project was designed and developed by more than sixteen artists and other individuals, three academic institutions, one national science NGO, more than twenty five other national organizations, and more than eight global science organizations.

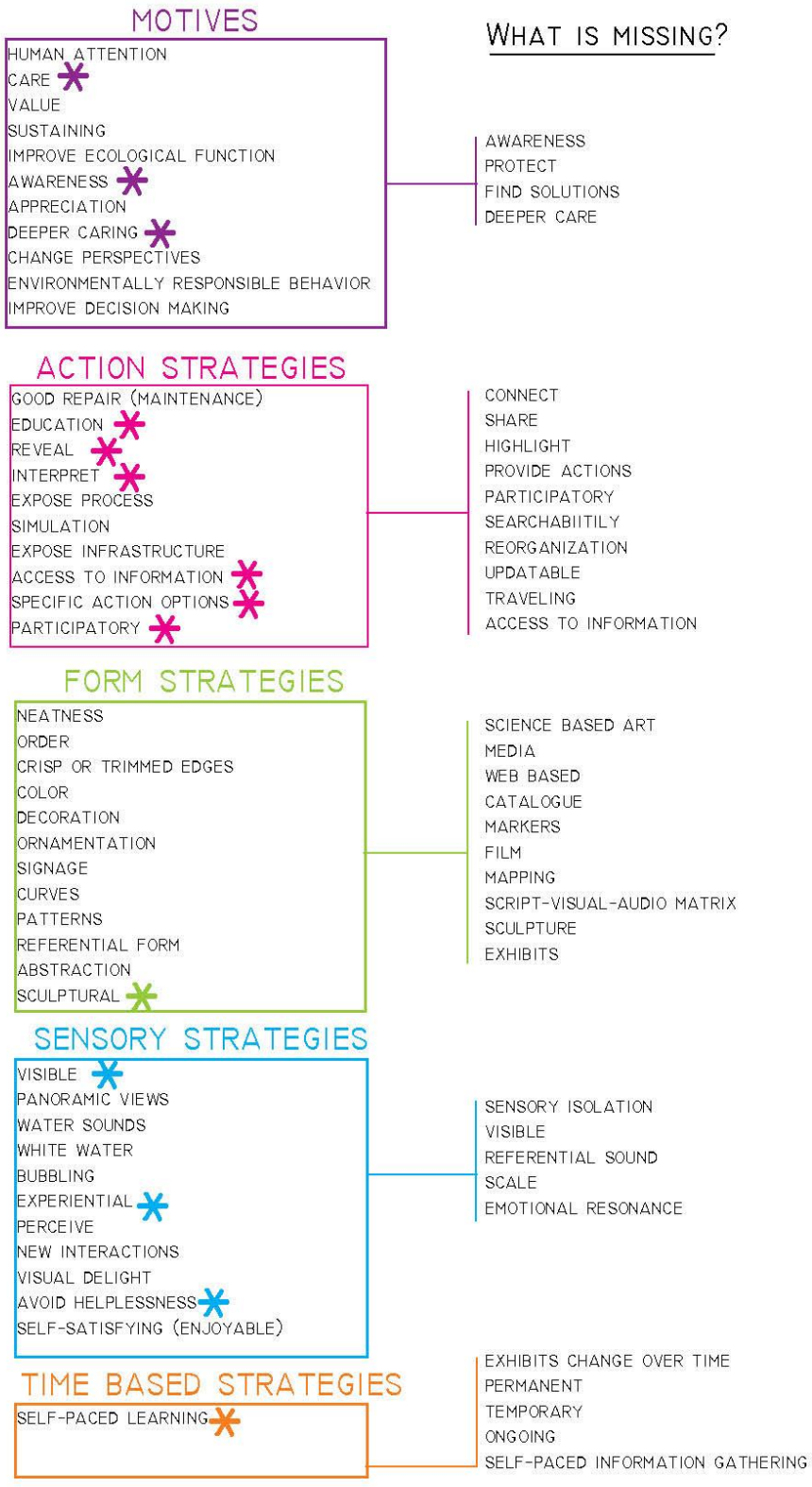


Figure 4.21 Comparison of What is Missing?'s strategies to baseline strategies
Source: created by author

Case Study No. 3: Fresh & Salty

Victoria, Australia

Figure 4.22 Film still from animation project
Source: www.rav.net .au

Organizational Structure

The project was initiated by the Regional Arts Development Officers (RADO), a subsidiary of Regional Arts Victoria in Victoria Australia. RADO made connections with local artists in each of the regions that are a part of their community. RADO reached out to hire artists early in their careers and paired them with mentoring artists established in their field. RADO also formed partnerships with eighteen different community organizations across the five projects. Seed funds were established through the Regional Arts Fund and each project sourced additional funds to enable completion (Duthie 2008).

Environmental Issue(s)

All five projects, completed in 2007, respond to water related issues in Victoria, Australia. The Wimmera River system has reached a critical point with salinity issues that stem from a historic presence of ocean waters coupled with extensive drought (Rhook). The water table in this area is rising, causing salinity to contaminate previously fresh water systems. This is partially due to disappearing vegetation

that previously held the ground water levels lower, by absorbing water through their root systems. Due to recent drought conditions, the water levels of the Wimmera River are dropping, causing a higher concentration of salt in the river. In some places the river is almost twice as salty as the ocean. In addition, the drought has caused Lake Wendouree to dry out and has harmed the delicate ecological balance of the Haddon and Heyfield wetlands (CMA 2012). The mission of this project was to provide positive opportunities for community members to express their concerns and enhance their understanding of how environmental issues have influenced and supported their way of life.

Components

Fresh & Salty is a compilation of five projects across the state: an animation about salinity for Wimmera, an ephemeral earth drawing in Lake Wendouree Ballarat, a sculpture on the Heyfield Wetlands, a living sculpture on Haddon Wetlands, and a sculpture for Kurtonitj (Indigenous Protected Area) near Tyrendarra.

The animation project was a partnership between RADO and the Wimmera Catchment Management Authority (WCMA). Artists were hired to create an animated film about the salinity issues in the Wimmera River. They developed a "7 minute DVD, narrated by a no-nonsense, bulbous nosed waterbug (figure 4. 23) explaining how salt affects, not only his part of the river, but the whole system" (Art at the Heart of Victoria 2008). Characters in the animation were created by a puppeteer. The success of the animation led local schools to hire the animators to create a resource kit for use by teachers and students to learn about water and salinity issues (Art at the Heart of Victoria 2008). The 19 page resource kit includes activities developed for different aged students accompanied with images and instructions for teachers on how to implement the projects (figure 4.24). The films have become a major part of the WCMA's ad campaign. The artists were further commissioned to create three 30 second ads to air on a local TV network that featured the voices of local people visiting the Wimmera River.

Figure 4.23 Narrating Waterbug
Source: www.rav.net.au

Figure 4.24 Page from Student Resource Kit
Source: www.rav.net.au

Environmental sculptor Michael Shiell worked with Indigenous artist Billy Blackall and students from the Ballarat and District Aboriginal Cooperative (BADAC) Youth Group to design an ephemeral artwork on the dry bed of Lake Wendouree. The lake dried out in 2006 and is a strong icon of drought and climate change in the region. (Higgins 2008, 5). Since then the waters have returned (figure 4.26) causing the ephemeral earthen drawing to exhibit change over time. The artists and members of the youth group created an indigenous style drawing of a platypus through a series of four workshops. The team of artists and youth volunteers then spent ten days turning soil, raking grasses, and moving clay to realize the design of three platypus spread over acres (Higgins 2008). The structure in figure 4.25 makes clear the scale of these earthen drawings. Figure 4.27 makes it clear that the yellower portion of the design is

created with raked seed heads of fairy grass. This thesis assumes that the darker lines are created by tilling in darker clay, but this information was not found to be clearly stated in the literature. Since the ephemeral artwork's completion 40,000 postcards with its image have been distributed to Ballarat residents and the city has incorporated the image into entryway signage. This is noteworthy because entryway signage defines a self-identity of a city and this imagery represents the indigenous people, the Wathaurong, who have been misrepresented in the past (Higgins 2008).

Figure 4.25 Aerial photograph of the ephemeral art work
Source: www.rav.net.au

Figure 4.26 The water returns to Lake Wendouree
Source:www.rav.net.au

Figure 4.27 Volunteers raking Fairy Grass
Source: (Higgins 2008)

Figure 4.28 *Sero*
Source: www.rav.net.au

Sero, the sculpture located at the Heyfield Wetlands, (figure 4.28) was created by local artist Gillian Swanson under the mentorship of Cameron Robbins. The sculpture is white and three meters tall. It is an abstraction of the Swamp Sedge seed pod. This plant is listed as rare in Victoria and there are few populations left. "It grows in the headwaters of the Macalister River in Gippsland and on the Major Mitchell Plateau in the west of the state, as well as Tasmania" (Milligan 2008, 10). The plant requires fire for germination and the sculpture is symbolic of optimism and regrowth. *Sero* sits by the edge of the wetlands and is lit by spotlights to give it a gentle golden glow after dusk (Milligan 2008). In addition to the building of this sculpture, sculpture-making workshops were given to community groups in Meerlieu, Briagolong, and Heyfield. Each community group created a sculpture of their own all related to water symbolizing optimism and regrowth.

A living sculpture, *Ship of Fools – Ship of Hope*, (figure 4.29) was created on Haddon Wetlands. The sculpture was created by Julie Collins and Derek John and "references the rewards and consequences of how we manage our water" (Art at the Heart of Victoria 2008, 7). The sculpture is maintained by 6th grade students at the Haddon Primary School. The students collect items that represent the mistreatment of wetland systems and place that in the ship of fools. Indigenous plants are potted and maintained in the ship of hope. The students learn by seeing how these different items affect the two different living sculptures, watching them change over time.

Figure 4.29 *Ship of Hope*
Source: www.rav.net.au

The fourth project is a stone wall sculpture created by Carmel Wallace and Vicki Couzens in South West Victoria. Rocks from the site were the only material used in the sculpture. The site was rich with rock from a historic lava flow and a very old European stone wall running through the property. The sculpture reference both Indigenous and European uses of water in history (Grant 2008) and is based on a traditional design for Indigenous eel traps (Art at the Heart of Victoria 2008). Throughout the literature it was never clearly stated how this sculpture reflects European uses of water. This project was mentored by stone waller, Alistair Tune. In addition, community stonewalling workshops were given to artists and community members across the region.

Figure 4.30 Aerial of Southwestern sculpture
Source: www.rav.net.au

Findings

The key motive and strategy terms taken from this project are: animation, humor, fun, storytelling, ephemeral, markers, visible, sculpture, show ecological function, indigenous, referential form, puppets, access to information, student projects, advertisements, participatory, signage, abstraction, positive, optimism, renewal, workshops, ownership, maintenance, mentorship, provide opportunity for

expression, exhibits change over time, and increase public understanding. Once again there are many terms here that parallel the baseline terms.

The Fresh & Salty projects took on cultural issues in addition to the water related issues of the region. It also greatly focused on the teaching and mentorship of art related knowledge and skills. While these side goals are extremely important within Victoria, the author believes the addition of these issues diluted the original intention of the works. The entire project was also much less accessible since there was no dedicated website related to the art works. For the author, this signifies the importance of having a dedicated website for the purposes of making the information and the art works visible and accessible to a wider audience, particularly if the work is temporary or ephemeral.

The supporting organizations for this project included three local governmental arts organizations, more than ten artists, and eighteen local NGOs.

Figure 4.31 Comparison of Fresh & Salty strategies to baseline strategies
Source: created by author

Case Study No. 4: Open Channel Flow

Figure 4.32 Open Channel Flow
Source: wwwmatthewgeller.com

Organizational Structure

The Houston Arts Alliance and the City of Houston Sabine Water Pump Station commissioned artist Matthew Geller to create the art work that became *Open Channel Flow*. After Geller created the design for the work, architects Joe Meppelink and Andrew Vrana were hired to build the sculpture. The final work was installed in the Fall of 2009.

Environmental Issue(s)

Houston's drinking water partly comes from groundwater that is pumped to one of five re-pump stations, treated, and then distributed to the citizens of Houston (Houston 2012). The Sabine Water Pump Station is one of these stations that treats and distributes drinking water to the Houston's citizens, who wouldn't be able to identify it if asked. The pump stations are vital human necessity that is taken for granted (Geller). The intent of Geller's sculpture is to acknowledge this important water delivery system

and to bring an awareness and appreciation to the ease of access the citizens have to clean water (Alliance 2012).

Components

This work is a permanent interactive sculpture at the Sabine Water Pump Station. It is 60 feet tall and made of steel pipes that extend beyond the station and into the Buffalo Bayou Park which is right next to the Lee and Joe Jamail Skatepark. The sculpture is located directly next to a running path through the park. The pipe that extends into the park is "an outdoor shower operated by an old-fashioned manual well pump. When someone pushes down the pump handle, water pours out of the shower from 25 feet above" (OPEN CHANNEL FLOW 2009, 3). The handle is intentionally difficult to press down, in an attempt to create a greater appreciation for the shower that inevitably pours down. When the pump is being activated, orange and blue beacons on top of the 60 foot-tall structure flash, "signaling people as far away as downtown that another person has doused themselves with a refreshing, albeit brief, shower" (OPEN CHANNEL FLOW 2009, 3).

Figure 4.33 Pressing the handle down
Source: www.swamplot.com

Figure 4.34 Enjoying the shower
Source: wwwmatthewgeller.com

Findings

The key terms taken from this work are: acknowledge importance, bring awareness, bring appreciation, permanent, interactive, sound, signal, visible, marker, water play, refreshing, fun, activate, participatory, referential forms, and celebratory. This work is really about the play and celebration of water while attempting to create an awareness and appreciation for the systems that provide this easy access to water.

The supportive organizations for this project are one artist, one local private design organization, one local government arts organization, and one local government utilities organization.

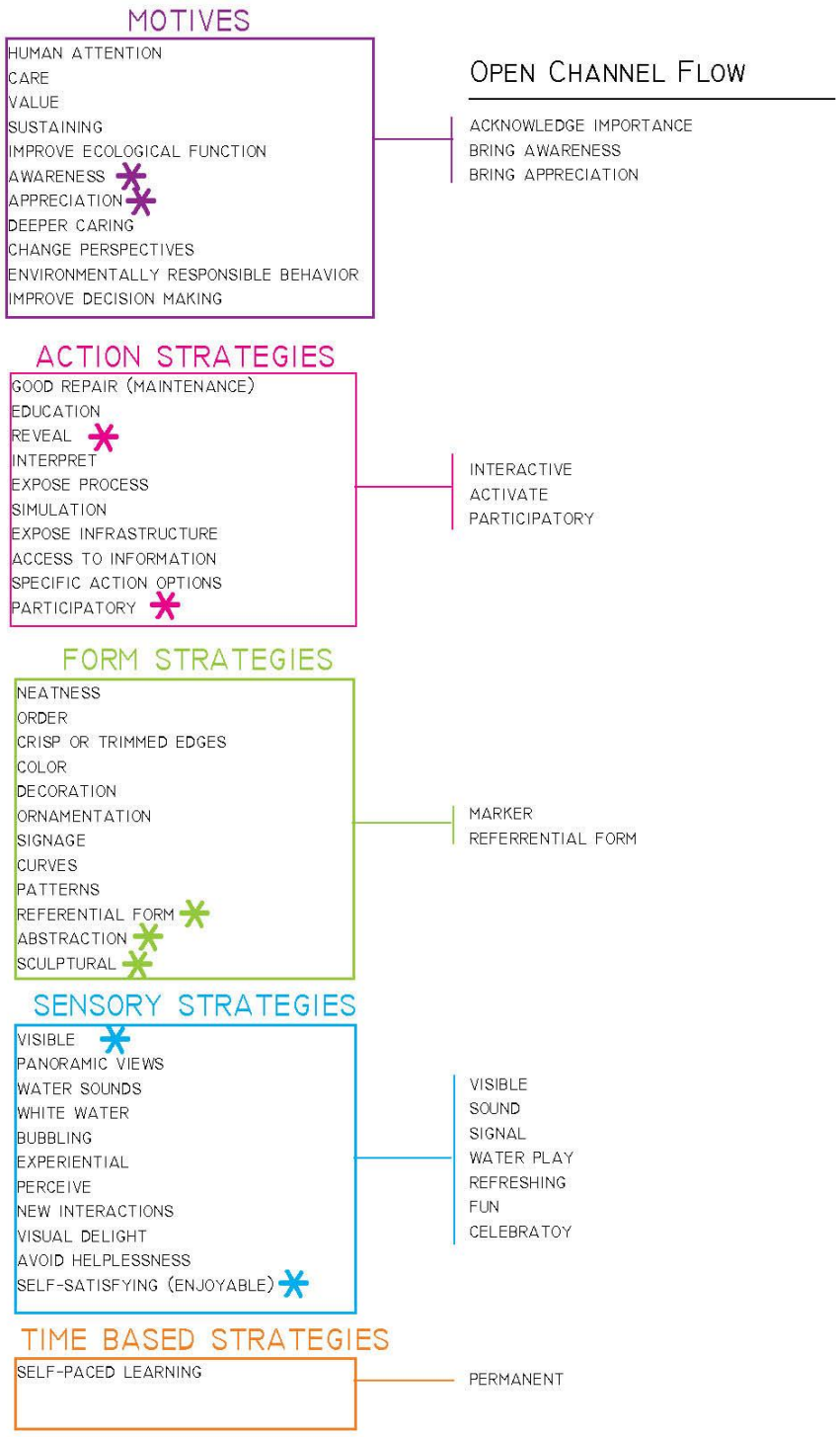


Figure 4.35 Comparison of Open Channel Flow strategies to baseline strategies
Source: created by author

Case Study No. 5: Endangered Garden

San Francisco, CA

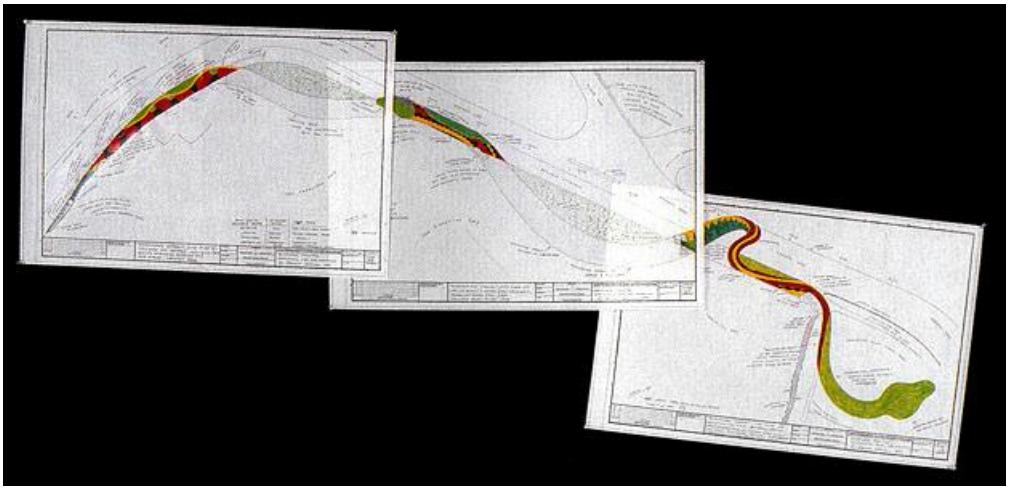


Figure 4.36 Endangered Garden Drawing
Source: http://patriciajohanson.com

Organizational Structure

The San Francisco Arts Commission hired artist Patricia Johanson to complete this work in 1987 for the Sunnydale Facilities, a pump station and holding tank for water and sewage, on the San Francisco Bay shoreline, used primarily during heavy rains. These three were the only parties involved in the conception, design, and funding for the project.

Environmental Issue(s)

Hundreds of prehistoric shell mounds once dotted the shores of San Francisco Bay, which has been continuously occupied since 1500 B.C. by Native Americans who fished in the bay, hunted waterfowl in the marshes, and foraged for shellfish along the mudflats. When excavated in 1910, many human burials and artifacts were recovered from a shell mound on this site. Today it lies buried twenty-five feet underground (Johanson 2000). Johanson says that the bay species that are seen today are descendants of the same communities that attracted prehistoric man to this shore. This project responds to the lack of maintenance, awareness, and appreciation of the bay's history and habitat. Johanson (2000)

calls this work a new aesthetic that is as "creative, functional, and biologically productive as nature herself".

Components

The work is a half-mile-long baywalk in the form of the endangered San Francisco Garter Snake. It winds through the park connecting bird baths, a butterfly habitat garden, tide pools, and marshes (figure 4.36). The baywalk is thirty feet wide of public access that coincides with the roof of the new transport / storage sewer (Johanson 2000).

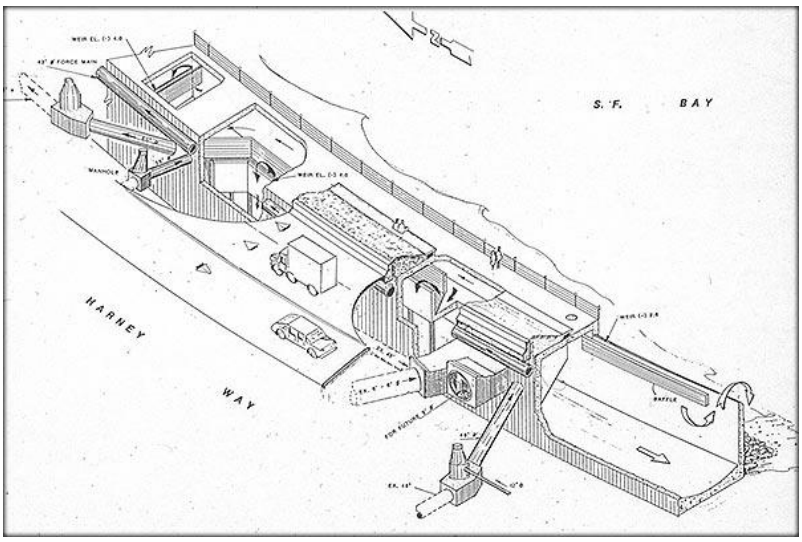


Figure 4.37 Transport and Storage Sewer below
Source: http://patriciajohanson.com

A tidal sculpture, called "Ribbon Worm-Tide Pools", breaks away from the main path and allows visitors to walk through the habitat for inter-tidal communities without damaging it. The sculpture mimics the form of the ribbon worm and "provides a path down to the marsh and mudflats of [the] San Francisco Bay" (Johanson 2000). In between the wiggling, worming, pathway are jumbled rocks that provide the tide pool habitat for vertically zoned inter-tidal communities (Johanson 2000). At high tide the wormy path gets covered with ocean water and over time the sculpture has "become encrusted with barnacles and marine growth and populated by shrimp, worms, crabs, hydrozoa, sponges, and algae. As it ages, the Ribbon Worm becomes a living sculpture – simultaneously aesthetic functional, and nurturing" (Johanson 2000).

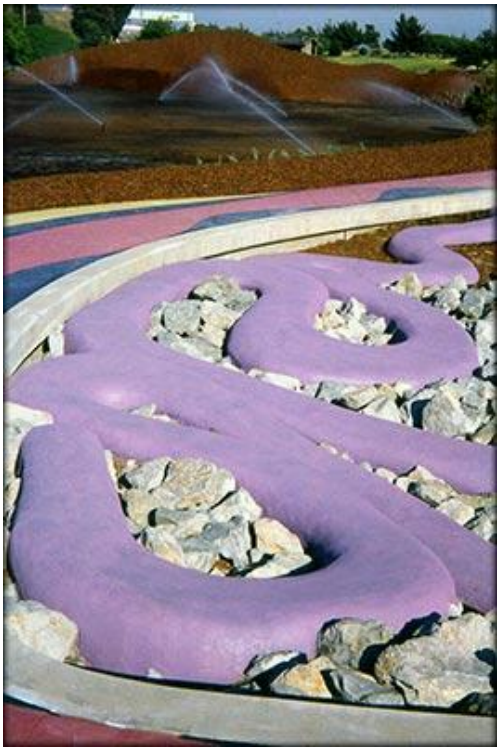


Figure 4.38 Ribbon Worm – Tide Pools
Source: http://patriciajohanson.com

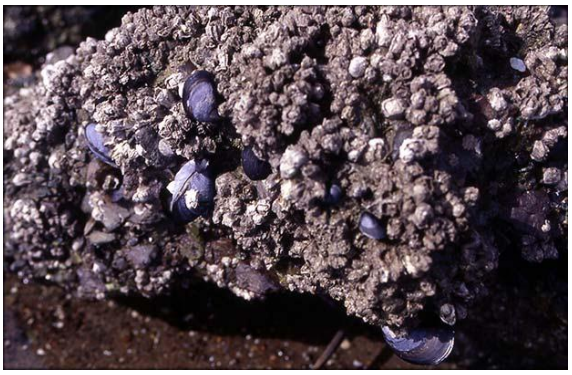


Figure 4.39 Life making its home on Ribbon Worm – Tide Pools
Source: http://patriciajohanson.com

The path that mimics the endangered garter snake culminates with a sculpture earth mound that mimics the head of the snake (figure 4.40). The mound rises twenty feet in the air creating a windbreak, sunning platform, and shelter from predators for the regional butterfly garden below (Johanson 2000). The garden consists of plants that provide nectar for grown butterflies and host plants for caterpillars (figure 4.41). The earth mound is also meant to mimic the San Bruno Mountain visible across the Bay.

Figure 4.40 Earth Mound
Source: http://patriciajohanson.com

The paving on the boardwalk mimics the pattern and colors found on the endangered San Francisco Garter Snake. The design creates “special places” and focuses the viewer’s attention on the life of the bay (figure 4.42). Depressions in the pavement are modeled after the California Indian petroglyphs and fill with rainwater for birds to drink (figure 4.43).

Figure 4.41 Plants that provide habitat for native butterflies
Source: http://patriciajohanson.com

Figure 4.42 Coil Overlook
Source: http://patriciajohanson.com

Figure 4.43 Petroglyph-esque water depressions
Source: http://patriciajohanson.com

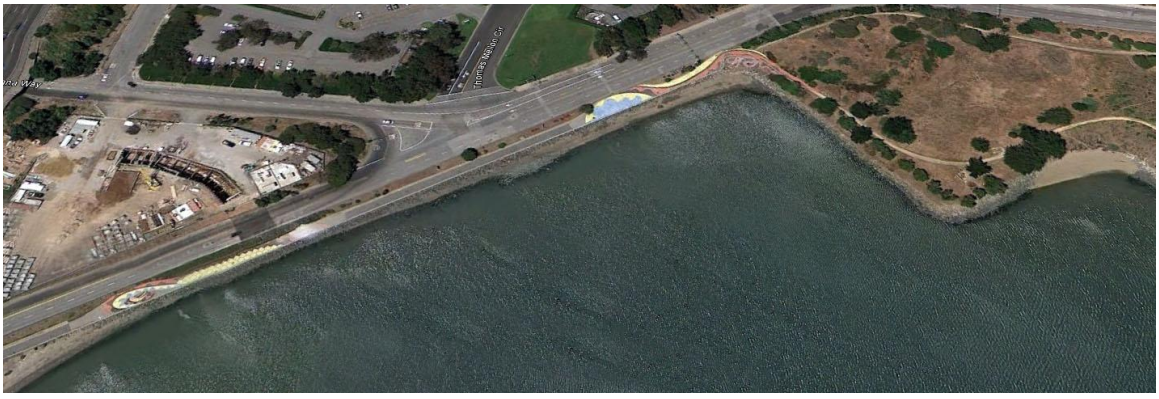


Figure 4.44 Endangered Garden as seen from Google Earth Today
Source: maps.google.com

Findings

The key terms to take away from this project are: productive, improve ecological function, increase access, sculptural, meadow, path, referential form, hide, colorful, pattern, reveal, visible, mimics, increase value, permanent, exhibits change over time, and new interaction. This project is interesting in that it both hides and reveals processes, making a judgment on what is important for people to see and know about. The ecological restoration of habitat for the butterflies and for the inter-tidal communities is beautiful and was not being valued, so the design reveals this to the view. At the same time it hides the process treatment plant below, which the author deems a lost opportunity. The visibility and knowledge of the treatment plant could help people be more aware of the fact that we make waste and it has to go somewhere to be treated. Even with this missed opportunity the project gracefully merges form with ecological restoration and visibility of process, a very eco-revelatory design.

The supportive organizations were limited to one artist, one local government arts organization, and one local government utilities organization.

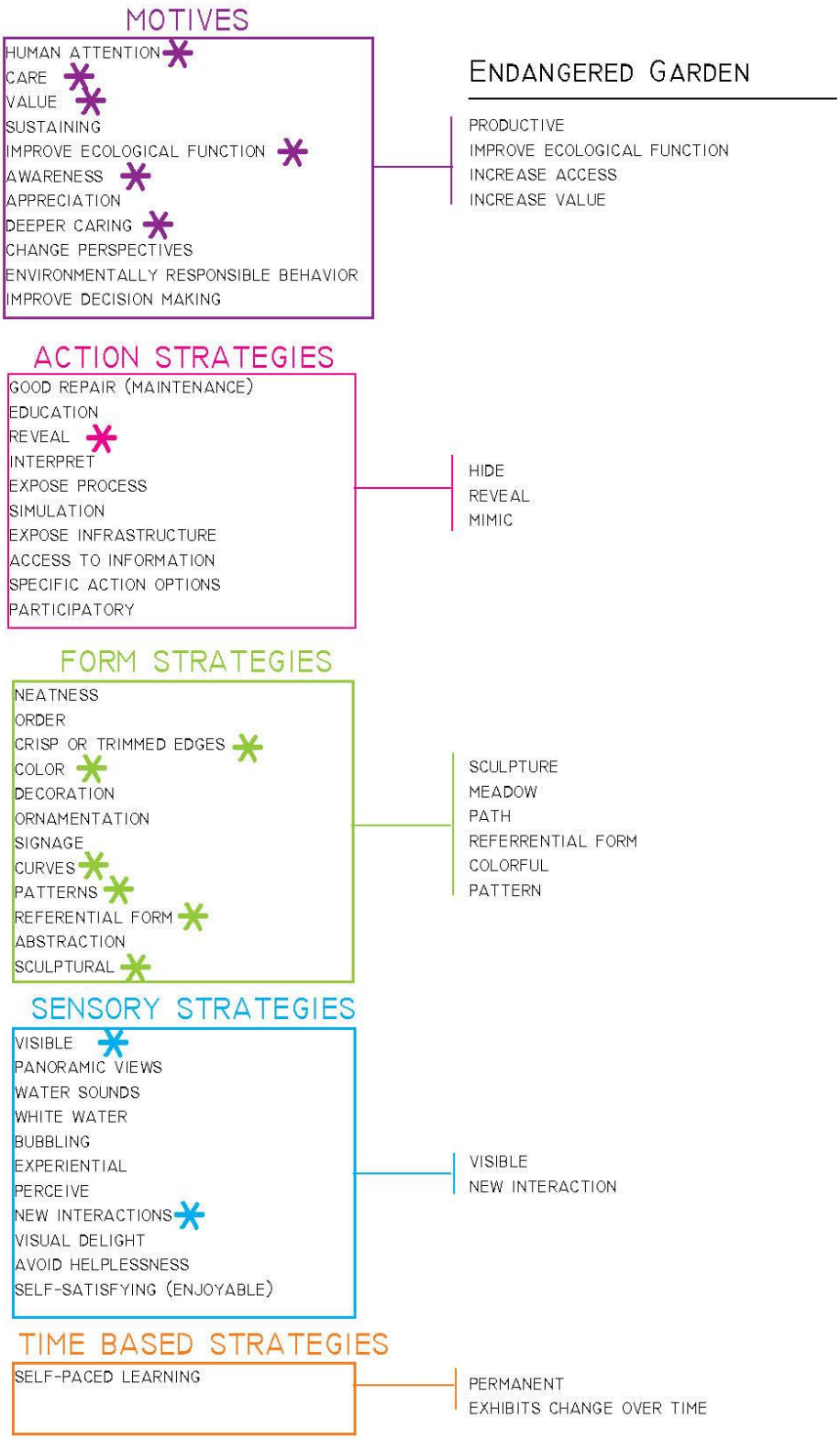


Figure 4.45 Comparison of Endangered Garden strategies and baseline strategies
Source: created by author

CUMULATIVE FINDINGS

These five projects are diverse in scale, components, locations, and issues yet share similar motives and strategies. The tables below (tables 4.1 – 5) show a comparison of the motives and strategies shared between the baseline and each case study. These projects share strong motives of increasing awareness and caring, which the author believes is an essential component for improving the social sustainability for these environmental systems. Common shared strategies are making a site or issue visible through sculptural, referential forms or simply by marking it in some way, providing access to information in a self-paced participatory manner, with works that are permanent or ongoing. The author believes that a permanent work that has ongoing qualities, such as exhibiting change over time, can renew interest and promote a sustained human care. Some motives not widely shared are still considered important for social sustainability by the author, such as increasing value, and appreciation. Awareness as a motive is important but without awareness leading to an increased value, appreciation, and caring for the landscape system, it does not contribute to the social sustainability of the system. The author, also, believes that some strategies, although not widely shared, were very powerful, such as creating an emotional resonance, the use of sound, creating an enjoyable, fun, celebratory experience, or using play. Another important note is that projects with a dedicated website allowed a much easier access to information surrounding the issues and the work. A dedicated web presence is important for allowing more than just the local present audience to discover, experience, learn from, and be affected by the projects work. Also, if a project is ongoing or has temporary or ephemeral elements the website is a way to catalogue, preserve, and share those elements long after their installation.

What this comparison shows is that art in the environment has overlapping motives and strategies with the theories reviewed in chapter three, but art in the environment has shown many additional strategies that work towards engaging people with their environments. In the following diagrams, widely shared motives or strategies are shown with a red box around them and the motives or strategies that they author deems important have a red box just around the term (tables 4.1 – 5).

Table 4.1 Cumulative motive comparison
Source: created by author

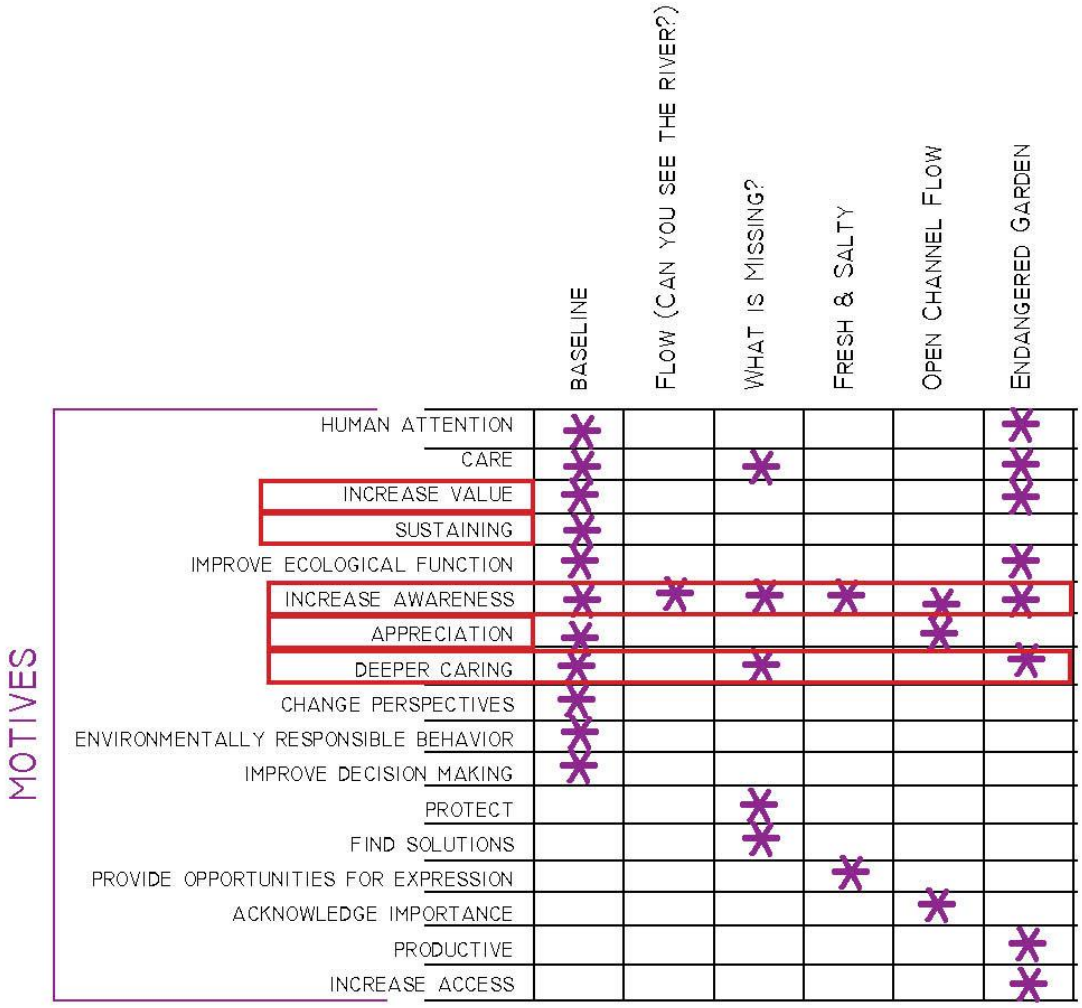


Table 4.2 Cumulative action strategies comparison
Source: created by author

Table 4.3 Cumulative form strategies comparison
Source: created by author

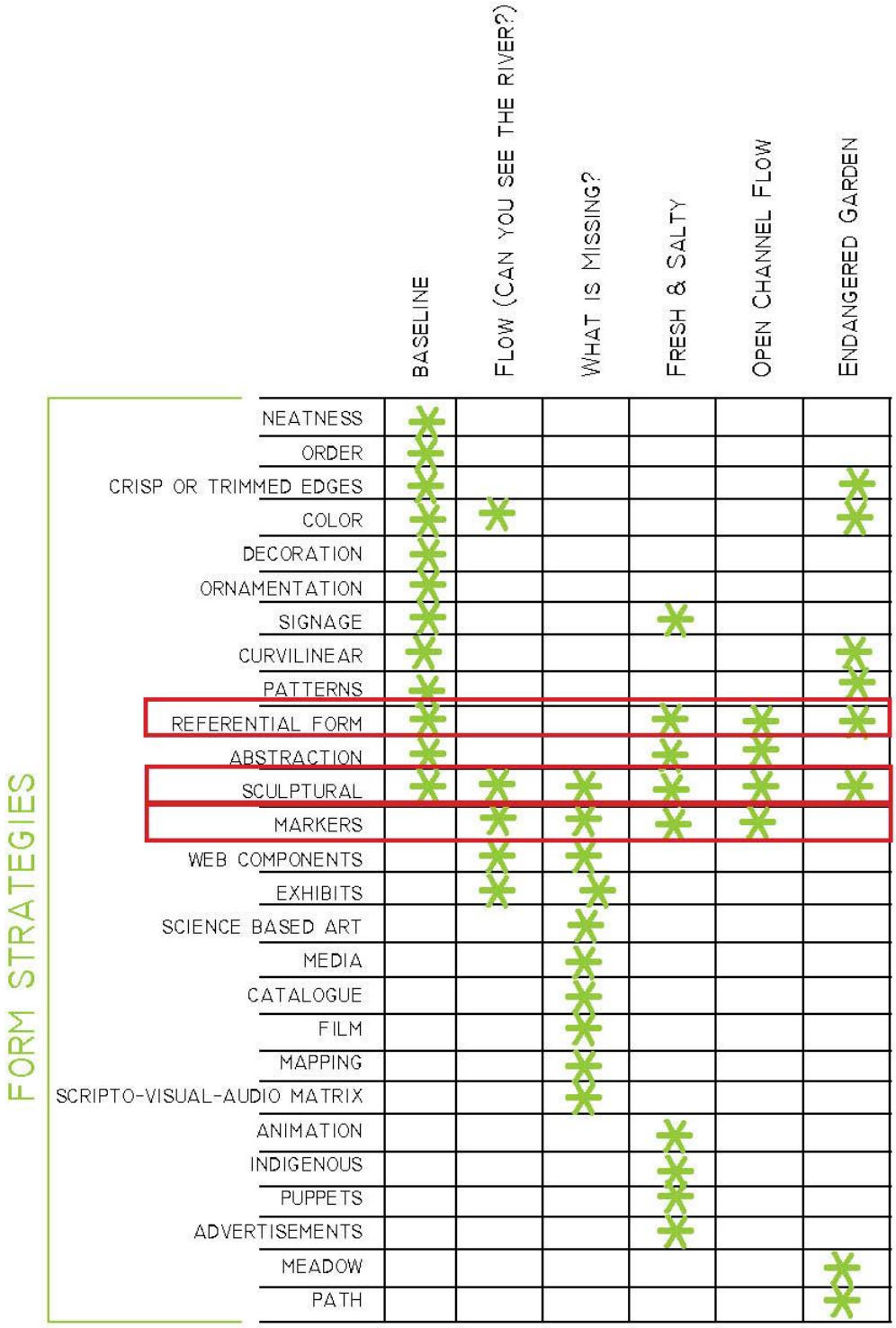


Table 4.4 Cumulative sensory strategies comparison
Source: created by author

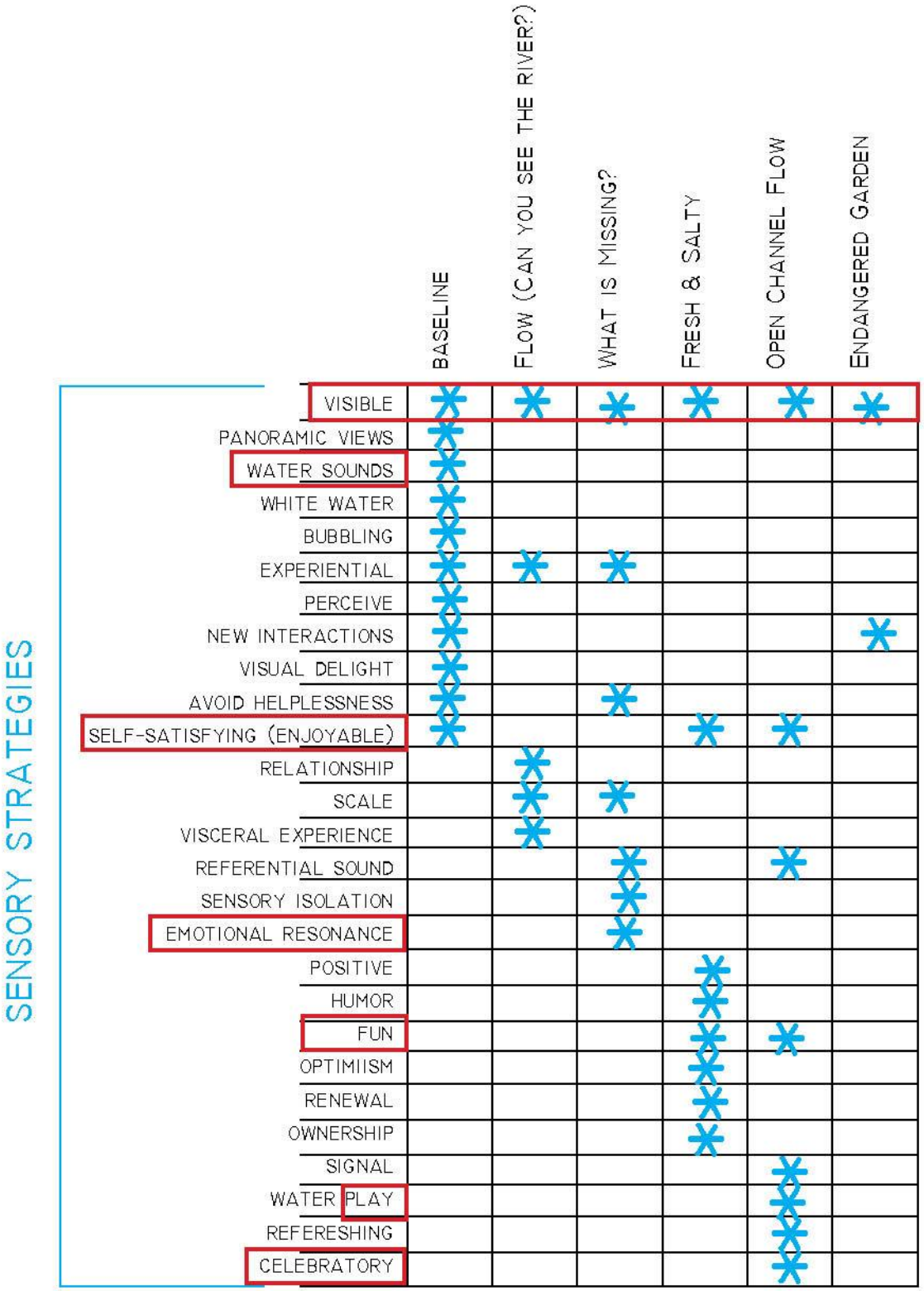


Table 4.5 Cumulative time based strategies comparison
Source: created by author

It was evident during the review of these case studies that supporting organizations were integral for creating funding, compiling scientific information relevant to the issue, connecting citizens with specific action options, engaging citizens in participatory events, and providing access to sites. The comparison chart (figure 4.51) shows a couple findings. The first three projects, Flow (Can you see the river?), What is Missing?, and Fresh & Salty, which had many more components, paired with many more organizations than the last two projects which consisted of one component. Therefore either more partnering led to the ability to create more components, or the design of more components led to the need to partner with more organizations. If bringing awareness is a strong shared motive, then the author believes that partnering with more organizations is a valuable strategy for connecting and bringing awareness to more people. The author also believes that there was strength in projects that partnered with both scientific and arts related organizations as well as academic, local, or youth organizations. Partnering

with diverse types of organizations creates a more diverse audience, which the author believes can create a richer collaborative experience and/or a richer response. Lastly, this comparison shows that projects partnered with organizations that matched the scale of the issue initiating the work. This is most evidently seen with What is Missing?, a global issue without an associated specific locale, appropriately partnered with global organizations. On the other hand, Fresh & Salty, which responds to a very local issue, only partnered with local organizations.

	Flow (Can you see the river?)	What is Missing?	Fresh & Salty	Open Channel Flow	Endangered Garden
Individual Artists	1	16+	10+	1	1
Individual Other					
Individual Enviornmentalist	1				
Academic Institution		3			
Local Art NGO	20+				
Local Science NGO					
Local Other NGO			18		
Local Art Gov			3	1	1
Local Other Gov				1	1
National Art NGO	1				
National Science NGO		1			
National Other NGO		25+			
National Art Gov	1				
Global Science		8			

Figure 4.51 Cumulative support organizations comparison

CHAPTER 5

SITE ANALYSIS OF TANYARD CREEK

It is hard to comprehend the importance of the global water crisis when clean potable water is accessible to so many citizens in Athens at the touch of a faucet. Even though about 70% of the Earth's surface is covered in water, 96.5% of that water is in the ocean and non-potable (USGS 2012). Political, economic, and environmental conditions, as well as unsustainable harvesting practices have led to an uneven distribution of water and diminishing quantity of potable water. Many of the world's rivers no longer reach the ocean, a horrifying loss of our freshwater resources (Pearce 2006), which also affects coastal marine ecosystems. All life depends on the availability of clean water on this planet. The situation becomes critical in many parts of the world as rivers dry out and aquifer levels decline and pollutants contaminate potable water sources. Even though man has manipulated water courses in attempts to control and divert access to this vital commodity, water remains a local resource; therefore acting on a local level is essential for this issue.

It is the aim of this thesis to apply the knowledge gained from the previous chapters and apply it to Tanyard Creek, a local first order stream emptying into the North Oconee River and an important source for Athens-Clarke County's drinking water. Athens gets its drinking water from three sources: the Bear Creek Reservoir, the North Oconee River, and the Middle Oconee River (ACC 2012). Tanyard Creek runs through the heart of the University of Georgia's campus and silently flows behind vegetative overgrowth, underneath traffic thoroughfares, and under the iconic Sanford Stadium, unseen. This creek has been underappreciated since modern development began in this region. The accomplishments of realigning the creek and containing the water were more highly regarded than the creek itself.

Now there is a body of quantifiable evidence of the creek's degradation from local and state government organizations and not-for-profit advocacy groups. In addition to stream health data this thesis

will use primary source data to show how the community interacts with the creek in order to infer what the current relationship of the community is to the creek. The future of Tanyard Creek depends upon the politics of development and the advocacy of the community. The following evidence will show that the creek is unhealthy and there is little to no relationship of the community to the creek.

TANYARD CREEK'S HISTORY

Evidence found near the site of the Cutwright Mill, formerly located on the banks of the Oconee River, shows signs of Indian and white settlements existing before modern settlements (this research is unclear on exactly what time frame) close to the current downtown Athens area. A review of historic aerial photographs and maps, from as far back as 1874, show that the Tanyard Creek basin has been developed since 1930. Before then it was likely that most of the surrounding land was used for agriculture, which can have impacts on local streams 50 to 100 years after agricultural practices have ceased (Watershed Management Plan Tanyard Creek 2011). As discussed previously, urban development conditions can have harmful effects on streams' health. The fact that Tanyard Creek's basin has been developed for close to 100 years indicates that the stream has suffered severe stress. See figure 5.1 for a graphic time line of the historic development of Athens and the Tanyard Creek watershed. Due to the poor quality of these historic aerials the information depicted is a rough estimate and not an exact portrayal.

The early and persistent development of the basin is partially due to the University of Georgia, chartered in 1785 and initially developed in the early 1800's in the center of Tanyard Creek's watershed. It was during this time that the stream ran along two or three tanneries, giving it the name Tanyard Creek (Brooks).

The University's development began with the purchase of 633 acres of high wooded ground on the west bank of the North Oconee River. Only 37 of those acres remain intact as what we call north campus today, while the rest was sold or leased during times of economic hardship for the University. Soon the town of Athens emerged on this vended land (figure 5.2) (Boney 1984).

By the late 1800's Athens had nearly 10,000 residents, light industry, and a considerable amount of commercial business (Boney 1984). A sudden influx of private and public money allowed the University to expand. New construction filled up the 37 acres of the original campus as well as a rapidly expanding southward "across a little creek called Tanyard Branch, which flowed southeastward from the old Botanical Garden through a little wooded valley" (Boney 1984, 96). Andrew M. Soule, president of the State College of Agriculture at the University of Georgia, led the hasty development of the new south campus, aggressively utilizing federal funding for the agricultural colleges that were housed there. Tanyard Branch was the dividing line between north and south campus, whose student populations had a light hearted competitiveness. It wasn't until 1963 that the two sides of campus were physically connected with a bridge (Sanford Drive) making the traverse from one side to the other much easier.

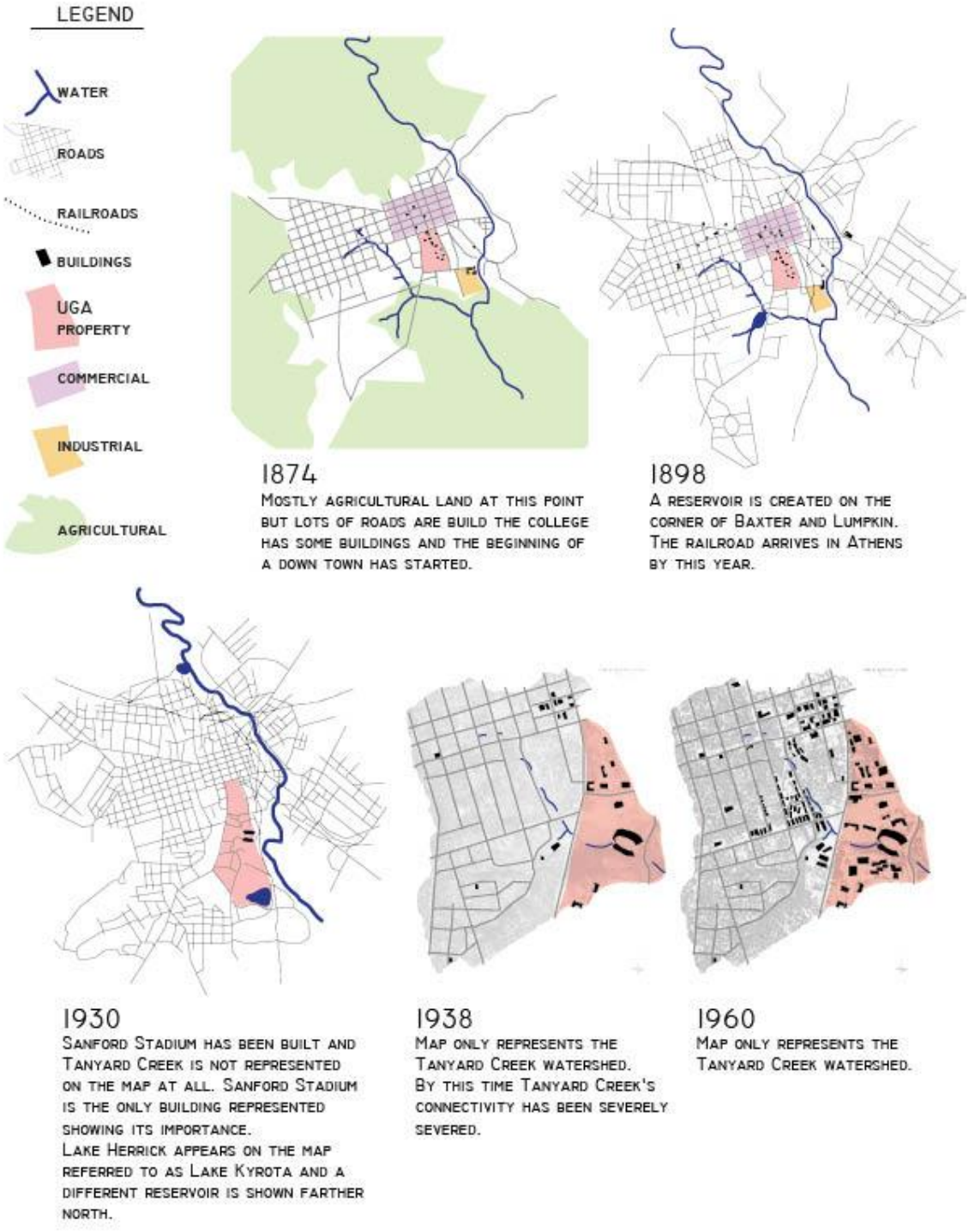


Figure 5.1 Development in Athens and the Tanyard Creek watershed from 1874 – 1960
Graphics created by author

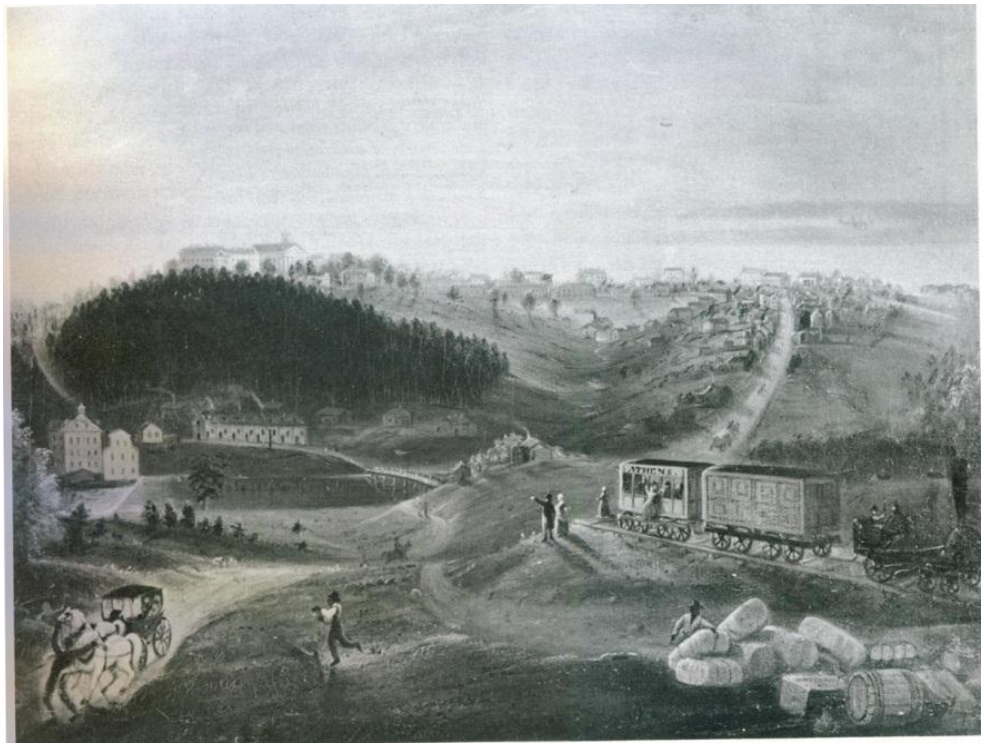
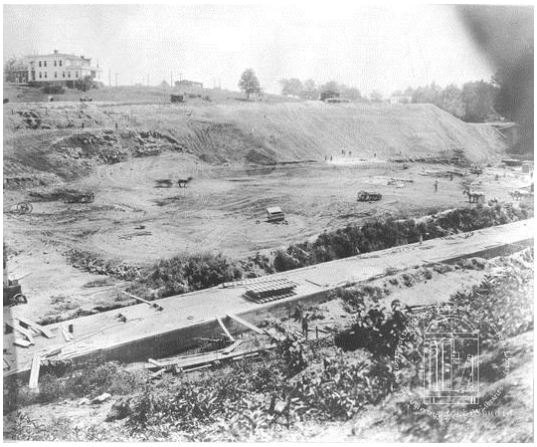


Figure 5.2 Painting by George Cooke from 1840's
Source: (Boney 1984)

In Cook's painting, UGA is shown on the hilltop horizon to the left, the Textile Mill shown in middle left, the developing town on the horizon to the right, and the North Oconee River running in the middle. The railroad shown in this picture arrived in Athens in 1841 but stopped short with no station or warehouse and didn't bridge the river until late in the nineteenth century (Boney 1984).

The historic maps and aerials leave gaps making it unclear when different parts of the creek were piped. It appears almost intact on the 1898 map, and being used directly as a water resource with the appearance of a created reservoir at the corner of Lumpkin and Baxter. This reservoir was built by a private water company in 1880, but by the early 1890's resident's complaints led to the development of a municipal water works that "had a capacity of one million gallons per day and 16 miles of water lines" (ACC 2012). In the map from 1930, a depiction of the creek is completely left out, even though parts of the creek must have been present during this time, and the only building drawn on the map is the stadium, which is telling of the priorities and values at the time. The stadium was built the year prior, in 1929. "Tanyard Branch … was diverted a little southward and sealed in a concrete tunnel, and over it gangs of

convict laborers constructed a new football stadium seating thirty-three thousand people" (Boney 1984, 118). See figures 5.3 - 5 for images of the tunnel and laborers. Figure 5.6 shows the stadium in use the first year of its construction during a game against Yale, a strong rival at the time. Figure 5.7 shows Sanford Stadium during a game in 1959, showing the increased amount of development, cars, and people inhabiting the area by this time. Today a transformed version of that stadium still exists in the heart of the campus. The football games held in the stadium draw over 90,000 visitors six times a year. It is also used for other large events like graduation. The large number of visitors that flood the stadium for these events have little knowledge or care for the creek that is hidden underneath.




Figures 5.3-4 Concrete tunnel piping Tanyard Creek during Sanford Stadium construction ca. 1929
Source: courtesy of Hargrett Rare Book and Manuscript Library / University of Georgia Libraries

Figure 5.5 Convict laborers building tunnel and stadium
Source: courtesy of Hargrett Rare Book and Manuscript Library / University of Georgia Libraries


Figure 5.6 Sanford Stadium 1929
Source: www.dawgsports.com

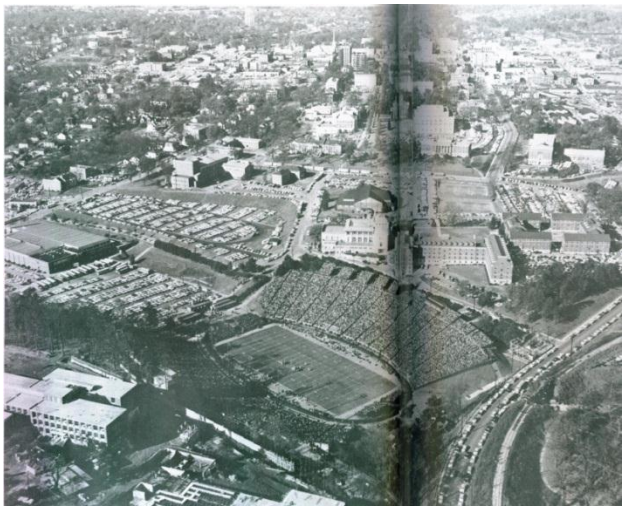


Figure 5.7 Stanford Stadium in 1959
Source: (Boney 1984)

Before the 1980s there were no government or university stormwater design requirements protecting streams, consequently the Tanyard drainage basin was manipulated in favor of new development. Because the stream was left unprotected, early and continuous development left the creek vulnerable to increased velocity and volume of runoff entering the stream, bank scouring and erosion, decreased vegetated buffer, loss of suitable habitat for macroinvertebrates, urban pollution, increased temperature, lowered ground water recharge, and increased flooding. Tanyard Branch is a quintessential degraded urban stream, suffering from all of the corresponding hydrologic issues.

PRESENT CONDITION OF TANYARD CREEK

Fortunately, regulations protecting stream health have been implemented, causing new developments to be "less bad", and in some cases even repair damage done to urban streams. Currently four different local groups are tracking Tanyard Creek's health, Athens Clarke-County (ACC) stormwater management program, a division of ACC public utilities department: Upper Oconnee Watershed Network (UOWN), a local community interest watchdog group that promotes education and collects data on the water quality in Athens; the University of Georgia Physical Plant, and an assortment of UGA students and faculty. This thesis will use data from all four stakeholder groups to create an unbiased analysis. The creeks health will be characterized using the following categories: impervious cover in the drainage basin, piping, channel quality, amount of riparian buffer, habitat, contamination and water quality assessment.

Description

Tanyard Creek is a first order stream emptying into the North Oconee River and running through the most densely developed watershed in ACC. The development in this watershed began before any other in the ACC area. The Tanyard watershed is a 45 square mile sub-drainage basin in the North Oconee River watershed, the largest in the county (Athens-Clarke County Watershed Protection Plan 2009). The Tanyard Creek drainage basin lies almost in the direct center of the County. It has a land area of approximately one square mile with its headwaters underground near the intersection of West Hancock Avenue and Church Street. The land in this drainage basin is comprised of three zoning uses: commercial, the University of Georgia, and residential (Watershed Management Plan Tanyard Creek 2011). The map in figure 5.8 shows the drainage basin, density of development within the drainage basin, and land use divisions.

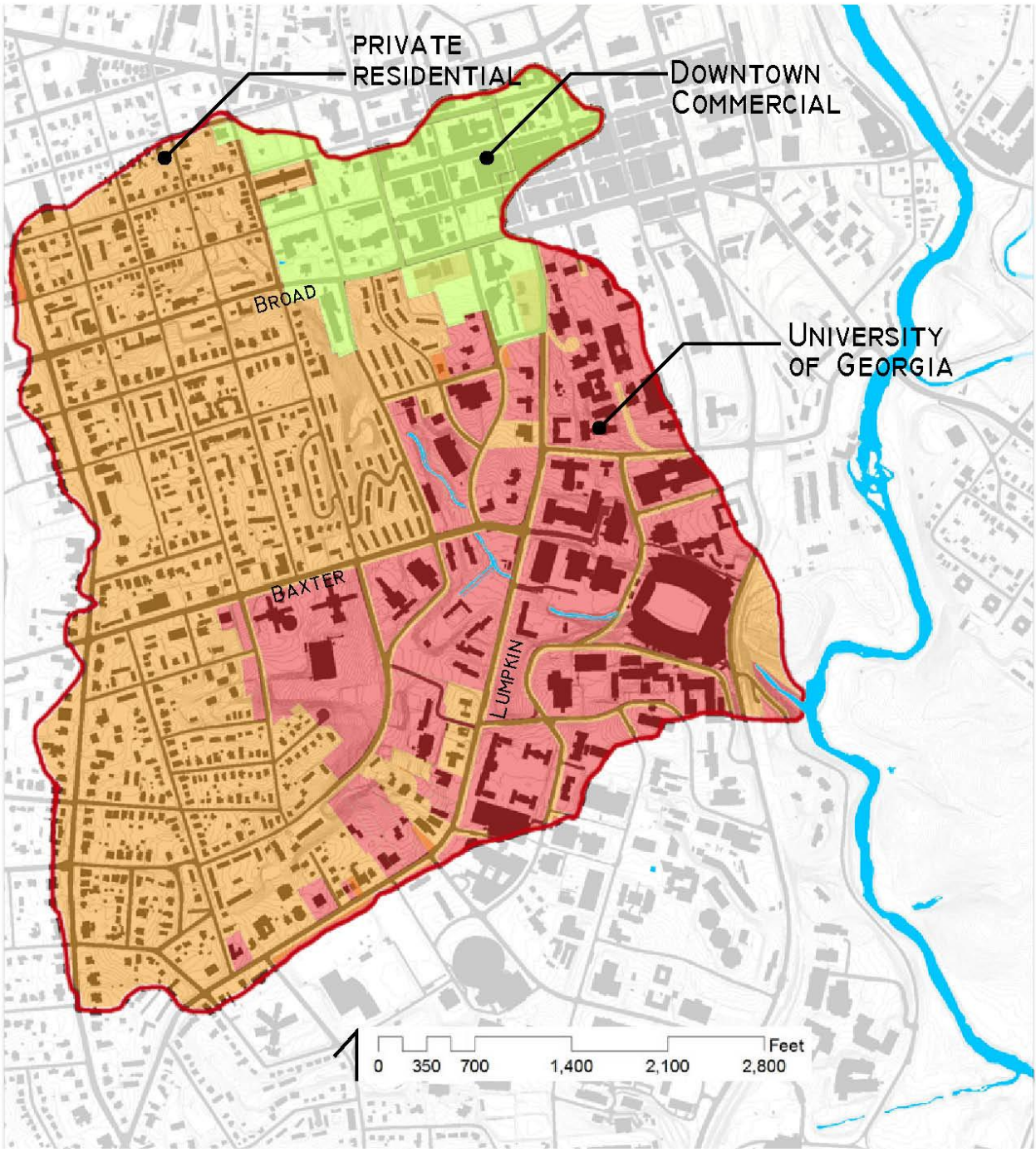


Figure 5.8 Tanyard Creek drainage basin and land use
Source: created by the author

Impervious Cover

This density shown above in figure 5.8 compared to the historic density mapping shown in figure 5.1 illustrates a massive increase in development and associated impervious cover. While stakeholder

group reports have given slightly different data on impervious cover in the drainage basin from 60% imperious recorded by students (Tanyard Creek Landscape Management Project 2002) to 90% of the drainage basin at 40% impervious or greater from ACC (Watershed Management Plan Tanyard Creek 2011), the author's calculations show over 28% of the watershed at 99% impervious. 99% impervious refers to roads, buildings, and parking lots in the area. Some data for parking lots and sidewalks were clearly missing; therefore it is clear that the basin contains over 28% impervious surfaces but the extent is unclear.

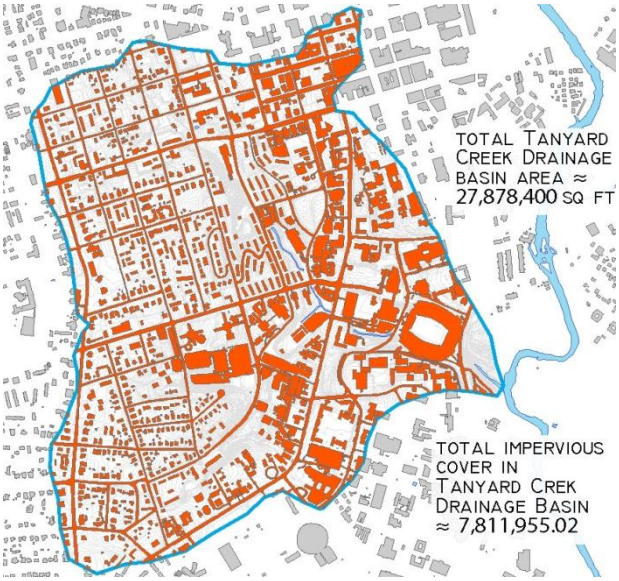


Figure 5.9 Impervious cover in the Tanyard Creek drainage basin
Source: created by the author

Impervious cover is a dominant cause of stream degradation in urban areas. UOWN's analysis of their sampling data confirms the correlation between development in the watershed and the water quality impairment (Little 2007).

Piping

"Piping of streams is another highly detrimental factor to stream ecosystem health. Piping prevents lateral connectivity with groundwater, eliminates terrestrial inputs (e.g.leaf litter and woody debris), blocks sunlight needed for algal growth, and often results in hypoxic or anoxic conditions in streams" (Tanyard Creek Landscape Management Project 2002). Tanyard Creek, approximately 6,410

feet in length, is piped for more than half of its course, from its source near Broad Street to its confluence with the North Oconee River. The length of piped sections of Tanyard Creek is depicted in figure 5.10. The cumulative distance the creek undergoes piping is around 3,651 feet, which is 57% of its total distance.

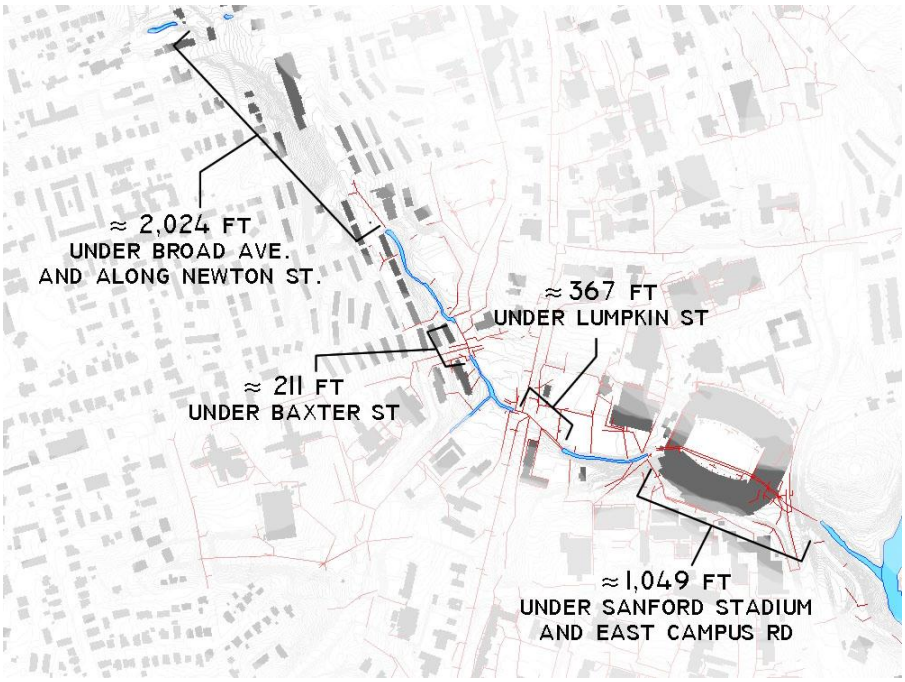


Figure 5.10 Distances that creek is piped
Source: created by the author

Channel Quality

Healthy streams have a riffle pool sequence and a lateral sinuosity that causes its edges to flux in a healthy flood plain zone of varying widths depending on local soils and geomorphology. If the channel of a stream is straightened and\or heavily armored with concrete or rip rap, the stream is not able to maintain a healthy fluctuating edge. When a channel has been straightened and\or armored, its normal hydrology is altered and water velocity increases, causing degradation in its downstream banks. Below are some images showing examples of armorization of Tanyard Creek. Scoured edges are proof of the increased water velocity caused by surrounding impervious surfaces, channel armorization, and piping.

Culvert at Baxter and Hull Channel in the Legion Pool section Culvert at Lumpkin Street

Figure 5.11 Armorization of the channel

Source: photos taken by the author

Just down stream of the culvert on Baxter (the Legion Pool side)

Figure 5.12 Stream bank erosion

Source: photo taken by the author

Riparian Buffers

A riparian buffer is a vegetated area around a waterway that helps protect stream water quality and habitat by slowing runoff, filtering contaminants, and providing shade (Tanyard Creek Landscape Management Project 2002). Athens-Clarke County ordinance requires a 75 foot buffer for all mapped and un-mapped streams. Georgia state regulations only require a 25 foot buffer, which is the overriding regulation for the University of Georgia. This regulation is overriding because UGA property is state property causing state regulations to be overriding. Student work below shows the encroachment of

buildings, driveways, and parking lots within the 75 foot buffer. Athens-Clarke County conducted an assessment of the vegetative buffer around Tanyard Creek and found no "intact 75 foot buffer; only small portions have much more than 10 feet" (Watershed Management Plan Tanyard Creek 2011).

Figure 5.13 Development encroachment in the riparian buffer
Source: (Tanyard Creek Landscape Management Project 2002)

In the ACC assessment of buffer width it is suggested that repair of a proper riparian buffer "may be nearly impossible in such an urbanized [area]" and proposes that other "solutions will be needed" (Watershed Management Plan Tanyard Creek 2011).

Habitat

Macroinvertebrates are small insects, some of which live in stream ecosystems. Some of these water-loving macroinvertebrates are sensitive to pollution and other stream impairments. The number and

diversity of macroinvertebrates found in a stream can indicate stream health and water quality. Since many macroinvertebrates live in sandy pools and Tanyard Creek's channel bed is mostly made of manmade materials like concrete or rip rap, there are not many suitable places for these indicator species to inhabit. (Watershed Management Plan Tanyard Creek 2011).

Figure 5.14 Example of a macroinvertebrate
Source: (Watershed Management Plan Tanyard Creek 2011)

The lack of shading by a vegetative buffer leads to high stream temperatures which can cause death for some taxa. This is not a likely cause for a decrease in macroinvertebrate populations in Tanyard Creek. It is more likely that the lack of vegetation creates a lack of leaf and wood debris entering the stream. This debris is an important source of food and habitat for them. Other data shows that high flows could be washing away the wood and leaves. Furthermore, the high non-point source pollution in the creek could be another cause of missing macroinvertebrates (Watershed Management Plan Tanyard Creek 2011).

One student's research found a total of 24 taxa from 4 orders in samples taken from the stream. All the species found were extremely tolerant of disturbed ecosystems and therefore gave the stream a water quality rating of poor (Greenawalt 2000). Another student's research only found 3 taxa of macroinvertebrates and says that Tanyard Creek "scored consistently lower on biotic indices than nearby reference streams" (Dreelin 2000, 6).

Water Quality Assessment Data

Tanyard Creek is designated a recreational use stream by the Georgia Environmental Protection Division (EPD) and the United States. The designated use has associated total maximum daily loads

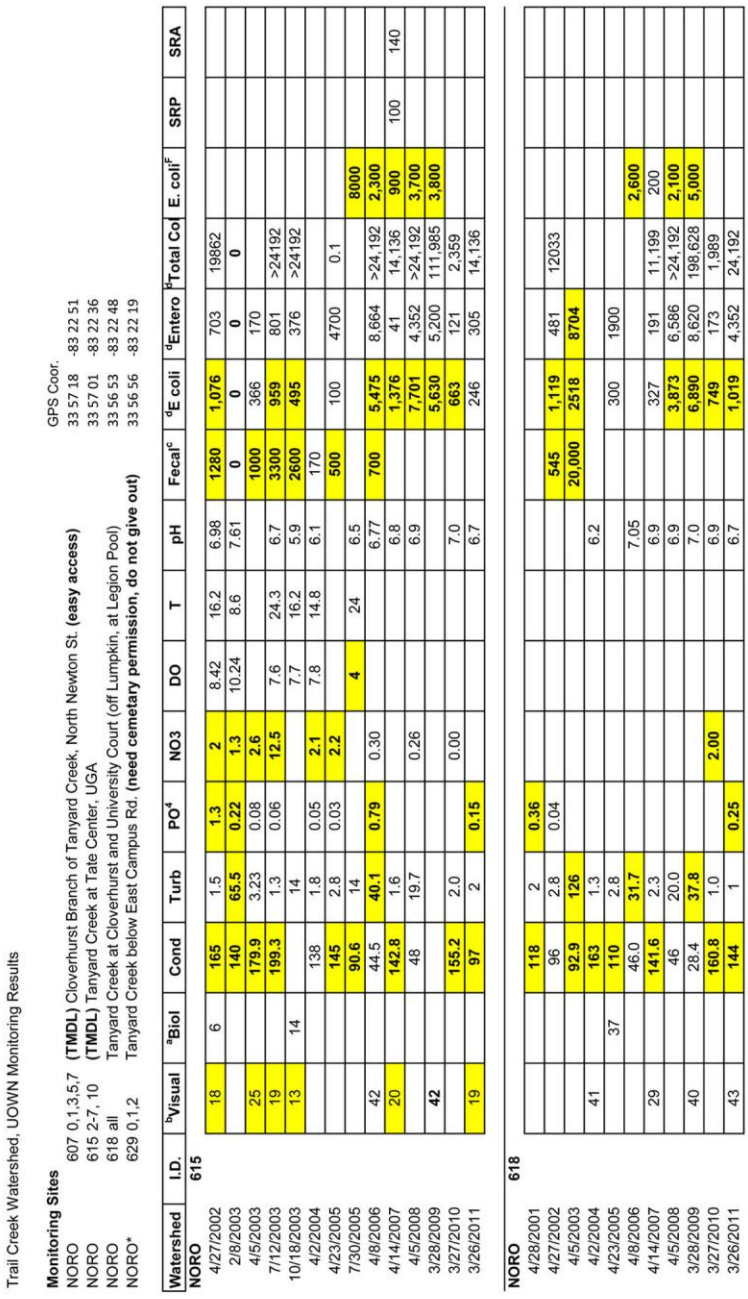
(TMDLs) which defines the maximum amount of a substance that a water body can receive and still safely meet water quality standards of its designated use. Tanyard Creek has been listed on the Georgia Environmental Protection Division's (GA EPD) 303(d) list of impaired waterways for having fecal coliform beyond TMDL limits.

The ACC Department of Transportation and Public Works uses three types of water quality sampling techniques: monthly, in-situ, and wet weather monitoring (Watershed Management Plan Tanyard Creek 2011). Their samples from Tanyard Creek show a violation in water quality standards for fecal coliform. Possible sources of the fecal coliform could be leaking septic systems, sewer lines, or domestic animal waste. Another possible source of fecal coliform could be a concentration of wildlife species' feces that enter the stream through run off or feces from water fowl. "Given the level of development within the watershed, the buffers along the stream appear to provide the most desirable habitat for wildlife, potentially concentrating wildlife sources of fecal coliform in the stream corridor"(Watershed Management Plan Tanyard Creek 2011).

Other nutrients or signifiers can indicate poor stream health even though they don't violate EPD's regulations. Nutrients sampled show a level above benchmark standards for nitrogen but low levels of phosphate and total phosphorus. "The impacts of elevated nutrient loading can result in increased algae growth. Excessive growth of attached algae can cause low dissolved oxygen levels, unsightly conditions, odors, and poor habitat conditions for aquatic organisms" (Watershed Management Plan Tanyard Creek 2011). "Conductivity, a measure of dissolved ions in the water and a good indicator of pollution from non-specific sources was high at all three sampling sites on many sampling dates" (ACC WMP, 2011). From the collective data ACC found high levels of fecal coliform, escherichia coli, and nitrogen.

The organization UOWN has been collecting water quality data quarterly since 2001. A summary for the findings of Tanyard Creek are shown in Table 5.1. The cells that are highlighted yellow are findings that indicate poor stream health.

Table 5.1 UOWN's Tayard Creek Monitoring Results
Source: (UOWN 2011)



Trail Creek Watershed, UOWN Monitoring Results

Monitoring Sites GPS Coor.

NORO	607	0,1,3,5,7	**(TMDL)** Cloverhurst Branch of Tanyard Creek, North Newton St. **(easy access)**	33 57 18 -83 22 51
NORO	615	2-7, 10	**(TMDL)** Tanyard Creek at Tate Center, UGA	33 57 01 -83 22 36
NORO	618	all	Tanyard Creek at Cloverhurst and University Court (off Lumpkin, at Legion Pool)	33 56 53 -83 22 48
NORO*	629	0,1,2	Tanyard Creek below East Campus Rd. **(need cemetary permission, do not give out)**	33 56 56 -83 22 19

Watershed	I.D.	[b]Visual	[a]Biol	Cond	Turb	PO[4]	NO3	DO	T	pH	Fecal[c]	[d]E coli	[d]Entero	[d]Total Col	E. coli[f]	SRP	SRA
NORO	**615**																
4/27/2002		18	6	**165**	1.5	**1.3**	**2**	8.42	16.2	6.98	**1280**	**1,076**	703	19862			
2/8/2003				**140**	**65.5**	**0.22**	**1.3**	10.24	8.6	7.61	0	0	0	0			
4/5/2003		25		**179.9**	3.23	0.08	**2.6**				**1000**	366	170				
7/12/2003		19		**199.3**	1.3	0.06	**12.5**	7.6	24.3	6.7	**3300**	**959**	801	>24192			
10/18/2003		13	14		14			7.7	16.2	5.9	**2600**	**495**	376	>24192			
4/2/2004				138	1.8	0.05	**2.1**	7.8	14.8	6.1	170						
4/23/2005				**145**	2.8	0.03	**2.2**				**500**	100	4700	0.1			
7/30/2005				**90.6**	14			**4**	24	6.5					**8000**		
4/8/2006		42		44.5	**40.1**	**0.79**	0.30			6.77	**700**	**5,475**	8,664	>24,192	**2,300**		
4/14/2007		20		**142.8**	1.6					6.8		**1,376**	41	14,136	**900**	100	140
4/5/2008				48	19.7		0.26			6.9		**7,701**	4,352	>24,192	**3,700**		
3/28/2009		**42**										**5,630**	5,200	111,985	**3,800**		
3/27/2010				**155.2**	2.0		0.00			7.0		**663**	121	2,359			
3/26/2011		19		**97**	2	**0.15**				6.7		246	305	14,136			
NORO	**618**																
4/28/2001				**118**	2	**0.36**											
4/27/2002				96	2.8	0.04					**545**	**1,119**	481	12033			
4/5/2003				**92.9**	**126**						**20,000**	**2518**	**8704**				
4/2/2004		41		**163**	1.3					6.2							
4/23/2005			37	**110**	2.8							300	1900				
4/8/2006				46.0	**31.7**					7.05					**2,600**		
4/14/2007		29		**141.6**	2.3					6.9		327	191	11,199	200		
4/5/2008				46	20.0					6.9		**3,873**	6,586	>24,192	**2,100**		
3/28/2009		40		28.4	**37.8**					7.0		**6,890**	8,620	198,628	**5,000**		
3/27/2010				**160.8**	1.0		**2.00**			6.9		**749**	173	1,989			
3/26/2011		43		**144**	1	**0.25**				6.7		**1,019**	4,352	24,192			

[a]Biological Score: Excellent = >22, Good = 17-22, Fair = 11-16, Poor = <11
[b]Visual Score out of a possible 56
[c]Test conducted by Dwight Fisher, IDEXX, MPN/100ml
Fecal coliform test conducted by Deanna Conners, cfu/100ml, membrane filtration
[f]Test conducted by Rick Meinersmann, MPN/100ml, membrane method
SRP=Soluble Reactive Phosphorus; SRA=Soluble Reactive Ammonium, tests performed by Todd Rasmussen

"healthy" Thresholds

Conductivity	<80mS/cm	
Turbidity	<25 NTU	
Phosphate	<0.1mg/L	
Nitrate	<1.0 mg/L	
DO	>4 mg/L	temperature adjusted
Fecal	400 cfu/100ml	
E. coli	400 mpn/100 ml	This number can vary according to rain and season
pH	6-8.5	

This data shows high levels of conductivity, turbidity, phosphorous, nitrogen, fecal coliform, and two other forms of coliform. Since this data was collected over the series of 10 years it gives a clearer

picture of the stream's health than data that was collected over a shorter period of time. This data shows that Tanyard Creek is in poor health.

The University of Georgia outsources their water quality sampling to Brown and Caldwell, a national environmental engineering company. Brown and Caldwell has been monitoring the campus watershed since 2003-4. Tanyard Creek is sampled in three locations: in the middle of the Newton St. reach, just upstream of the culvert going under the stadium, and the culvert on the east side of East Campus Road. They collect samples for four quarterly dry and four quarterly wet events. Their findings also show high levels of bacteria, phosphorous, nitrogen, and conductivity. In addition fecal coliform numbers exceed EPA water quality standards.

Students' research concurs with the poor water quality assessments of Tanyard Creek. One student summarizes their research by calling Tanyard Creek "a desolate wasteland … highly contaminated with pollutants" (Martin 1999, 11). Another student's work found high numbers of fecal coliform and through a "Save our Streams" quality survey found Tanyard to have poor water quality (Brooks). One student's report shows that pollution levels are not unhealthy during base flow but rise to unhealthy levels during a storm event (Greenawalt 2000). Figure 5.16 below shows one classes' assessment of the stream quality in sections for both Tanyard and Cloverhurst Branches. It characterizes the Broad St. section as degraded, the Newton St. section as highly degraded and the Legion Pool and Tate Center sections as moderately degraded. The list goes on, one after another student reports' elucidate the poor water quality of Tanyard Creek.

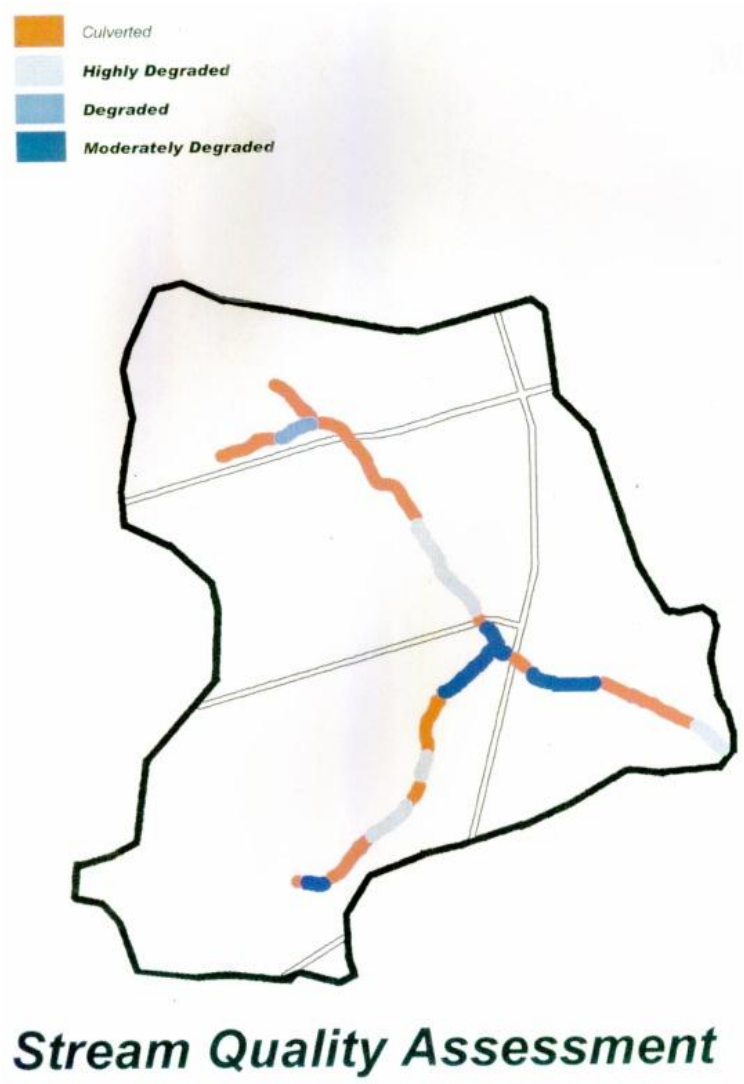


Figure 5.15 One UGA management class's stream quality assessment
Source: (Tanyard Creek Landscape Management Project 2002)

FUTURE PLANS

"From a watershed management standpoint, development occurring within a previously developed watershed is more desirable than when it occurs in a lightly developed one. Redevelopment tends to concentrate density and impervious cover in existing watersheds, thereby reducing sprawl pressures from encroaching on more distant and lightly developed watersheds. Yet, while redevelopment and infill are desirable on a regional basis, they can contribute to already serious water quality problems in highly urban watersheds" (Tanyard Creek Landscape Management Project 2002, 45). Redevelopment

within the University of Georgia campus is a real opportunity for improvement because a large percentage of the campus is covered with impervious surfaces. Because of the University's new commitment to environmental health, the new development will likely have an improved relationship with the creek.

The two conceptual masterplans below (figures 5.16-17) show an intention to create green corridors along Tanyard Creek. Figure 5.17 shows restoration efforts along Newton Street, Legion Pool, and Tate Center. Figure 5.18 denotes restoration efforts for the section along Legion Pool and a pond amenity that references the historic reservoir located at this point in the late 1800's. The University Architects Office (UAO) says that a new dining hall will most likely be built in the place of the current parking lot on the corner of Lumpkin and Baxter even though it's not shown on these plans. The new dining hall, proposed for the very landscape intended for restoration efforts to Tanyard Creek seen in figure 5.17, would replace Bolton, an older facility that would need a major financial investment to serve future needs. The UAO has chosen to place the building on this prominent corner because of its visibility and its location in between student residential halls and classrooms. Therefore, the urban needs of services and accessibility have taken precedence once again over the environmental needs of an extended riparian buffer for Tanyard Creek.

Figure 5.18 shows three insets from the current UGA master plan depicting future intentions for the sections of Tanyard Creek at Newton Street, Legion Pool, and the Tate Center. The image farthest to the left shows the Newton Street section with the addition of academic support buildings. The central images shows the Legion Pool section with a rearrangement of the dorms and a green corridor along the Cloverhurst reach meeting up with Tanyard Creek. The image all the way to the right show the Tate Center section of the Creek with a proposed bridge extension crossing over the creek and connecting with new student housing.

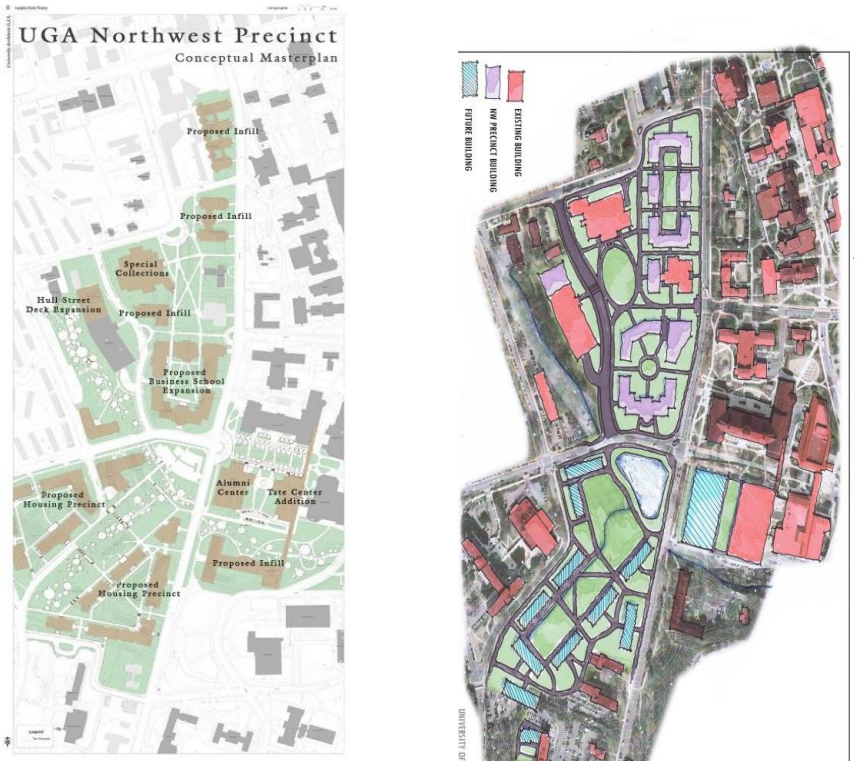


Figure 5.16-17 Northwest Precinct masterplans
Source: courtesy of the University Architects Office

Figure 5.18 Insets from the current UGA master plan of the Newton St, Legion Pool, and Tate Center sections of Tanyard Creek, where red indicates proposed academic and support buildings and blue indicates proposed student housing
Source: www.architects.uga.edu

Figure 5.19 Fall 2010 student's proposed Tanyard Branch restoration
Source: courtesy of Stuart Jones

Figure 5.20 Design Studio Summer 2002 proposed Tanyard Branch restoration
Source: (S.E.E.D.S.)

The students' work above (figure 5.19-20) shows two proposed plans for restoring the section of the creek near the Tate Parking lot. Figure 5.19 shows the removal of the surface lot in exchange for a fuller riparian buffer. Figure 5.20 shows the same as well as a re-routing of Lumpkin to create a pedestrian zone.

Even though the University and CED students have proposed efforts to restore Tanyard Creek, development decisions often come down to the value engineering of the client, which at the university is the college or department. For example, some departments have the ability to raise more funds for their

developments through alumni or other capital campaigns and therefore have the capability to spend more on landscape restoration efforts. An excellent example is the landscape surrounding the new Lamar Dodd School of Art. Departments with smaller budgets have to cut what they might deem "unessential", which are often landscape amenities. Other clients have their own budgets, yet prioritize land in terms of income value and when the income generated by green space is compared to the income generated by parking lots, parking lots generally win.

Findings

Tanyard Creek has had a long history of abuse because of surrounding land use and traditional stormwater practices that didn't take environmental health and long term sustainability into consideration. The various assessments of the health of the creek verify that it is currently severely degraded. Environmental restoration plans for the creek have been proposed by both students and the University. The implementation of these plans is subject to the previously discussed conflict between development and environmental priorities.

Now that the physical health and condition of the creek has been established, this thesis will explore the relationship of the community to the creek. Is the creek underappreciated? How does the community interact with the creek if they do at all?

WHAT IS THE RELATIONSHIP OF THE COMMUNITY TO TANYARD CREEK?

OBSERVATION AND BEHAVIOR MAPPING

The author observed four sections of Tanyard Creek that are not piped. The following map in figure 5.22 shows the location of sections observed and the names this research uses to refer to them. The part of Tanyard Creek that exits a culvert from under East Campus Road and empties into the Oconee River was not observed because its location was difficult to access. Accessing the section of the creek through the Oconee Hill Cemetery was problematic because it is a semi-private property and the author was repeatedly told to leave. The note associated with the water quality data taken by UOWN for this section reads that it is not to be released without the Oconee Hill Cemetery's permission, signifying the

level of privacy this property owner prefers. Accessing the section from River Road was somewhat dangerous due to the traffic on the road, no sidewalk, and the bushwhacking necessary to get to the creek. Because of these conditions an assumption has been made that there are few to no people interacting with this section of the creek.

The other four chosen sections were observed for one hour at four different times during the spring semester for a total of sixteen hours. Data collected during the observation included the section being observed, date, time, weather, smells, sounds, visual access, visual appeal, animal species, people and whether they were walking by or using the space and whether they were youth, meaning teenagers or younger, or adults. Each section was given a visual appeal rating of high, medium, or low, which is based on the author's opinion of the aesthetic quality of the landscape surrounding the creek channel but also supported by Joan Nassauer's theory on preferred aesthetic qualities. Each of the four observation visits was recorded from a different vantage point to develop a greater understanding of the relationship to the creek, except for the Broad Street section. The Broad Street section was only recorded from one vantage point because it was the only spot available. The data collected from these sixteen observation visits is located in appendix A. The information given here is a summary for each section. This information will help give a depiction of the current ways people are interacting with and around Tanyard Creek.

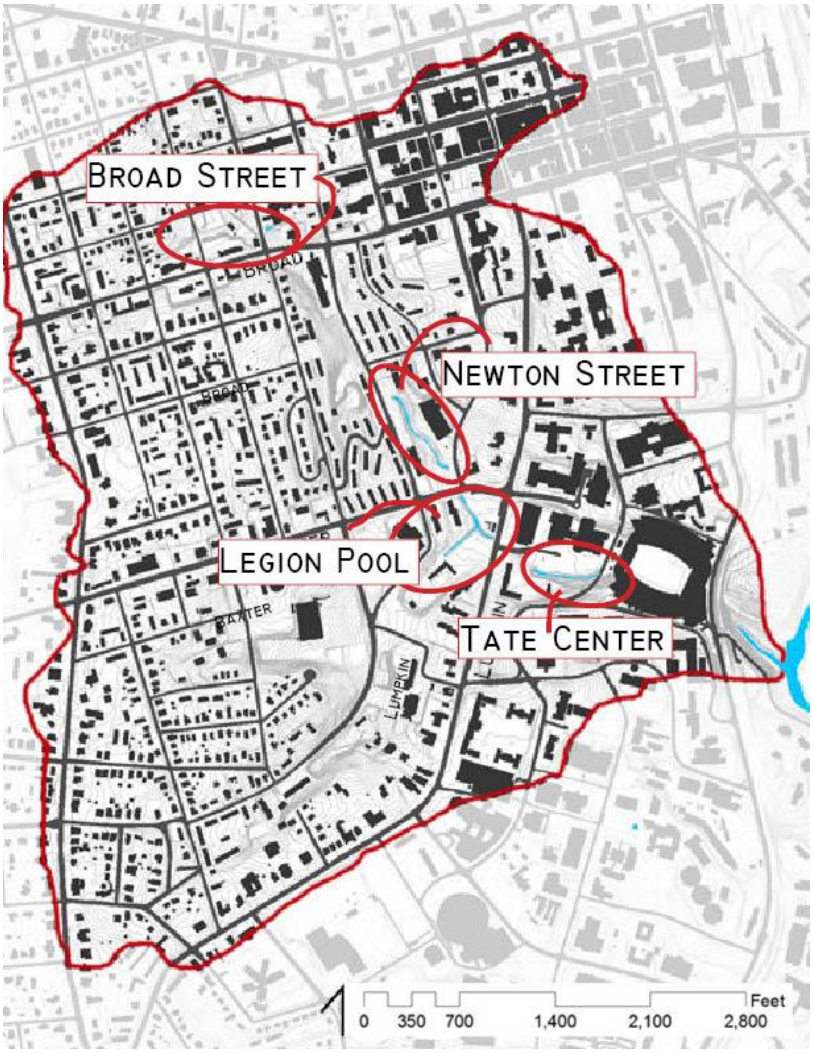


Figure 5.21 Sections of Tanyard Creek observed
Source: created by author

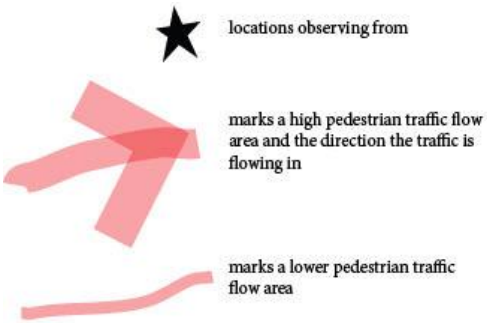


Figure 5.22 Legend for observation map summaries
Source: created by author

Broad Street Observation Summary

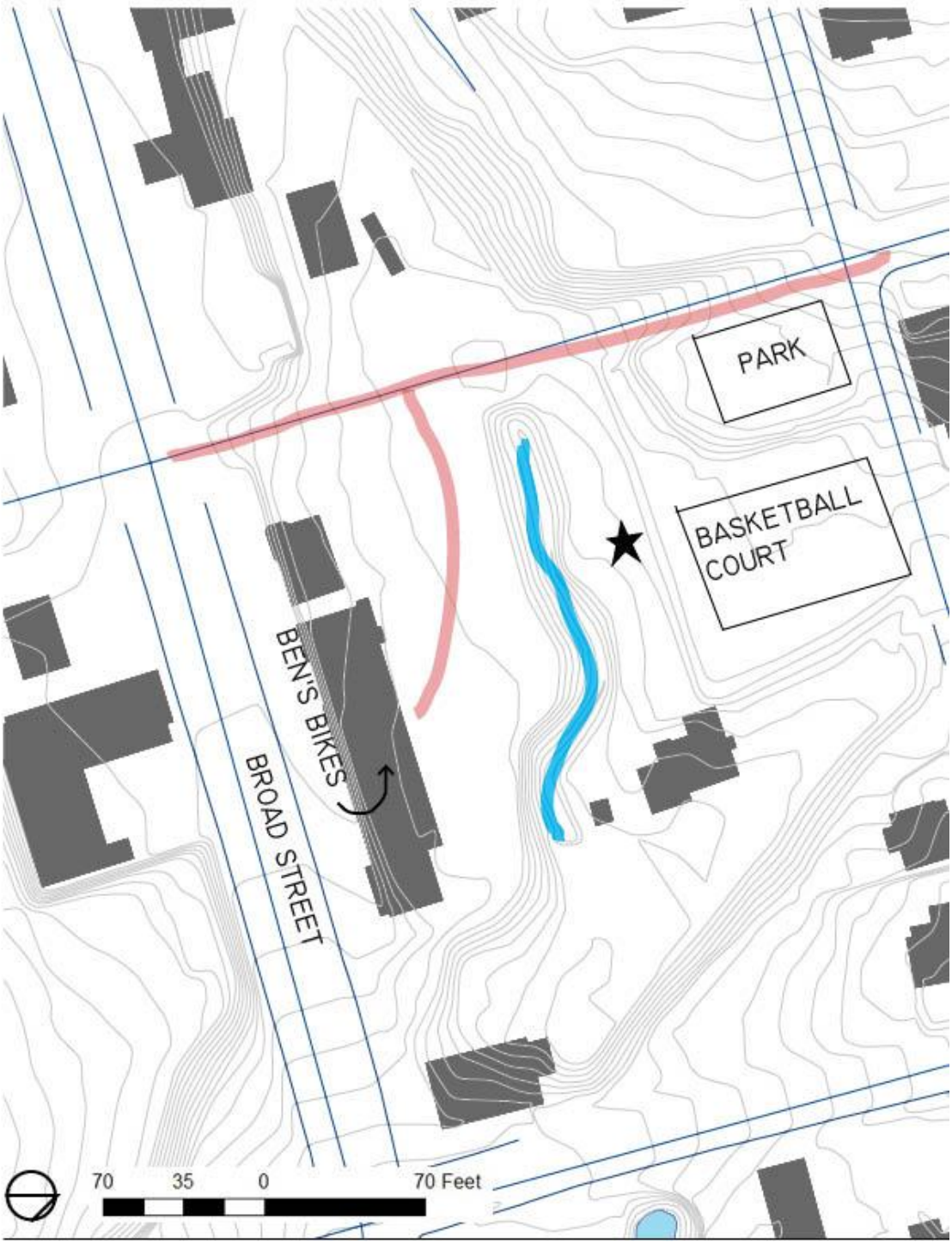


Figure 5.23 Summary of Observations at Tanyard Creek Broad Street Section
Source: created by author

Table 5.2 Broad Street observation and behavior mapping data summary
Source: created by author

VISIT	1	2	3	4
DATE	1.13.12	1.26.12	2.6.12	2.17.12
TIME	10:50AM-11:50AM	3:00-4:00	12:00-1:00	4:30-5:30
WEATHER	SUNNY, COLD 40°, OCCASIONAL GUSTS OF WIND	FOGGY 60°	GREY SORT OF CHILLY	SUNNY 65°
# OF PEOPLE	10	14	8	25
INTERACTIONS WITH CREEK	NONE	NONE	NONE	NONE
USING THE SPACE	NONE	PEOPLE HANGING OUT AT PARK, PEOPLE HANGING OUT IN FRONT OF BEN'S BIKES	NONE	PEOPLE PLAYING BASKETBALL AND SITTING IN THE PARK
OBSERVATION POINT	NORTH SIDE OF RIVER UNDER PECAN TREE	NORTH SIDE OF RIVER UNDER PECAN TREE	NORTH SIDE OF RIVER UNDER PECAN TREE	NORTH SIDE OF RIVER UNDER PECAN TREE
VISUAL ACCESS	CREEK EDGE IS VISIBLE BUT NO WATER IS VISIBLE	CREEK EDGE IS VISIBLE BUT NO WATER IS VISIBLE	CREEK EDGE IS VISIBLE BUT NO WATER IS VISIBLE	CREEK EDGE IS VISIBLE BUT NO WATER IS VISIBLE
VISUAL APPEAL	MED - CARE AND HUMAN ATTENTION CAN BE SEEN	MED - CARE AND HUMAN ATTENTION CAN BE SEEN	MED - CARE AND HUMAN ATTENTION CAN BE SEEN	MED - CARE AND HUMAN ATTENTION CAN BE SEEN
SOUNDS	CARS, LEAVES RUSTLING, TRAFFIC, DOGS, BIRDS	TRAFFIC	BIRDS, CARS, MOTORCYCLES	CARS, BASKETBALL, YELLING, TALKING, BIRDS
SMELLS	NONE	NONE	NONE	NONE

Few people were observed using this space during the four observation days. The most people observed in one visit was 25 and the smallest was 8 and the average was 14. Most people were coming and going from Ben's Bikes which is the building located in between the creek and Broad Street. The park is frequented by a group of local men who hang out and socialize there. There was no interaction with the creek seen while observing, but some manipulation of the creek to try and slow run-off was noted. Also, kudzu, an invasive plant species, as well as some other advantageous/invasive species, had been cut back. A garden of herbs and edibles has been planted along the side near Ben's Bikes (figure 5.25). Further interaction with the creek was noted where stairs had been built into the bank down to the

creek and a tree trunk placed to make a bridge providing access to and across the creek (figure 5.24). Even though there were not a lot of people seen in this section or people seen interacting with the creek these markings indicate a fairly strong relationship of ownership and interaction with the creek.

Figure 5.24 Stairs and Bridge
Source: photo taken by author

Figure 5.25 Edge Plantings of Herbs and Edibles
Source: photo taken by author

The sound of traffic was the most noticeable noise and the sound of water in the creek was inaudible. This section of the creek was given a visual appeal rating of medium due to the noticeable care of the creek, its openness and accessibility, in conjunction with the noticeably unhealthy channel of steep edge, lack of visibility to water, and a fair amount of overgrowth.

Newton Street Observation Summar

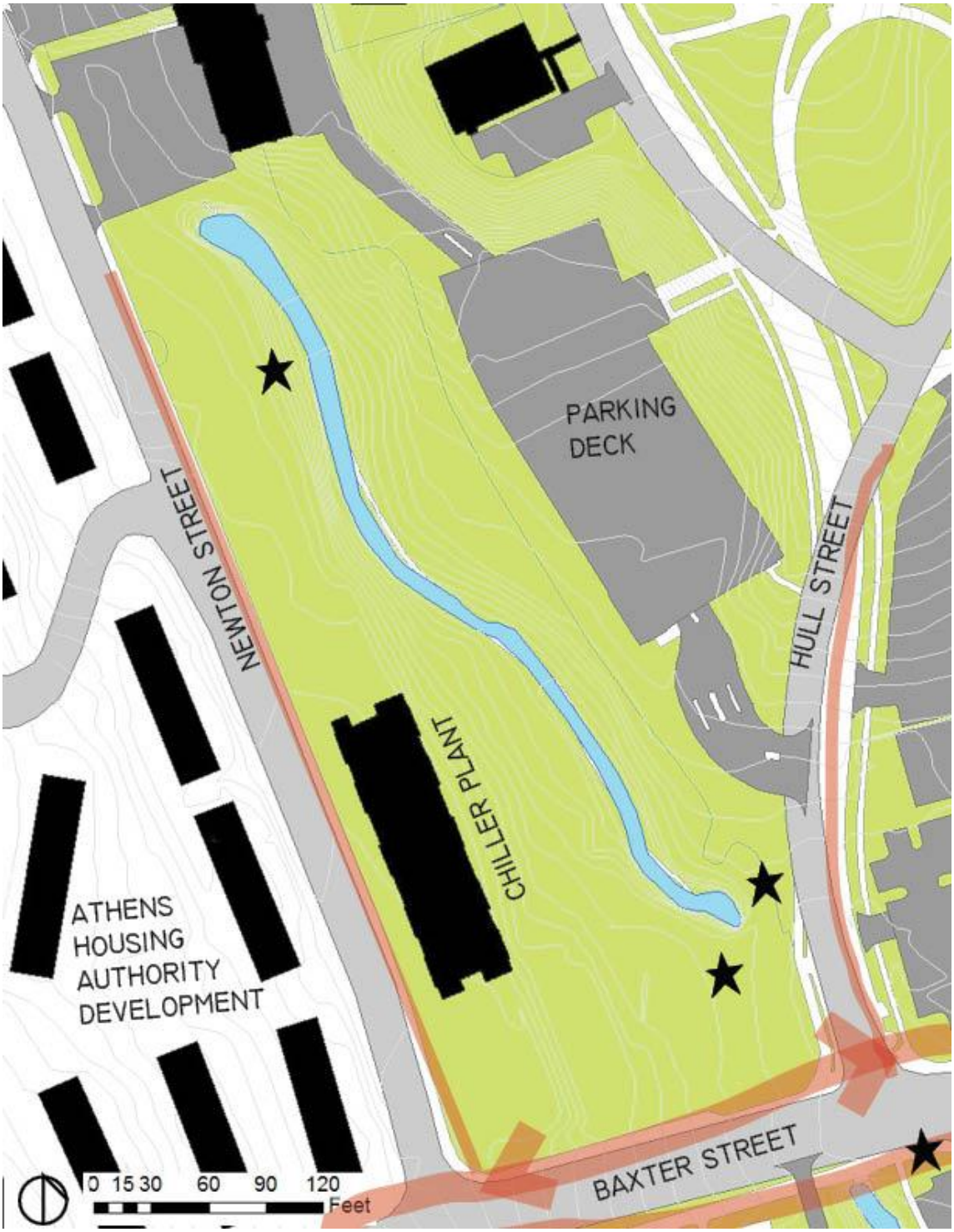


Figure 5.6 Summary of Observations at Tanyard Creek Newton Street Section
Source: created by author

Table 5.3 Legion Pool observation and behavior mapping data summary
Source: created by author

VISIT	1	2	3	4
DATE	2.10.12	2.13.12	2.15.12	2.16.12
TIME	1:15-2:15	12:00-1:00	4:30-5:30	2:00-3:00
WEATHER	GREY, 40-50°	SUNNY, BREEZY, 40°	SUNNY 55-60°	GREY, SLIGHTLY DRIZZLING, 55°
# OF PEOPLE	32	136	104	72
INTERACTIONS WITH CREEK	NONE	NONE	NONE	NONE
USING THE SPACE	NEIGHBORS ARE OUT VISITING	NONE	CONSTRUCTION WORKERS, BIKE COP	NONE
OBSERVATION POINT	CURB ON INTERIOR OF LOT W13 ON NEWTON ST	ON HULL ST BY CULVERT EDG	ON NORTH SIDE OF BAXTER BY CULVERT	ON SOUTH SIDE OF BAXTER BY CULVERT
VISUAL ACCESS	NONE - OVERGROWN VEGETATION CUTS OFF VISUAL ACCESS	CREEK IS VISIBLE DIRECTLY NEXT TO CULVERT AND FENCE	CREEK IS VISIBLE DIRECTLY NEXT TO CULVERT AND FENCE	UNABLE TO SEE CREEK AT ALL
VISUAL APPEAL	LOW - OVERGROWN, UNKEMPT	LOW - FENCE AND ARMORIZATION	LOW - TRASH ON GROUND, AND IN CREEK	LOW - MOUND OF DIRT, FENCING
SOUNDS	LOTS OF BIRDS , CARS	RUSTLING LEAVES, BIRDS, BUSES, TRAFFIC	CONSTRUCTION AND CARS	CARS, CONSTRUCTION
SMELLS	NONE	SUGAR SWEET SMELL, ASSUME UNRELATED TO CREEK	EARTHY	NONE

There were a fair number of people walking by this section of the creek, mainly students going up and down Baxter Street. The most people observed during one visit was 141, the least was 32, and the average was 87. It was rare to see people stopped and using this space; most people were just passing through. The only people stopped and using the space were employees, such as those finishing construction on the Special Collections Library grounds and a police officer who was parked on Baxter for a while observing the area. During the observation from the Newton Street side many neighbors from the housing development were seen on their porches or standing outside visiting neighbors. None of the people walking by stopped or interacted with the creek in any way.

The loudest sounds heard on this site were cars, buses, and construction, buses being the most overwhelming. The sound of the creek could be heard but only if standing right on the edge of the bank. This section of the creek was given a visual appeal rating of low due to off-putting fencing (figure 5.27) surrounding the only visible part of the creek, heavy armorization and exposed unappealing culverts, excessive weedy woody overgrowth, and trash both in the creek and around it.

Figure 5.27 Off-putting fencing – culvert at Baxter and Hull Streets
Source: photo taken by author

Figure 5.28 Culvert going under Baxter St.
Source: photo taken by author

Figure 5.29 Exposed unattractive culvert and trash
Source: photo taken by author

Figure 5.30 Construction debris and overgrown weedy edge
Source: photo taken by author

Figure 5.31 Dense overgrown vegetation edge along creek
Source: photo taken by author

Figure 5.32 Housing across Newton St. from creek
Source: photo taken by author

Legion Pool Observation Summary

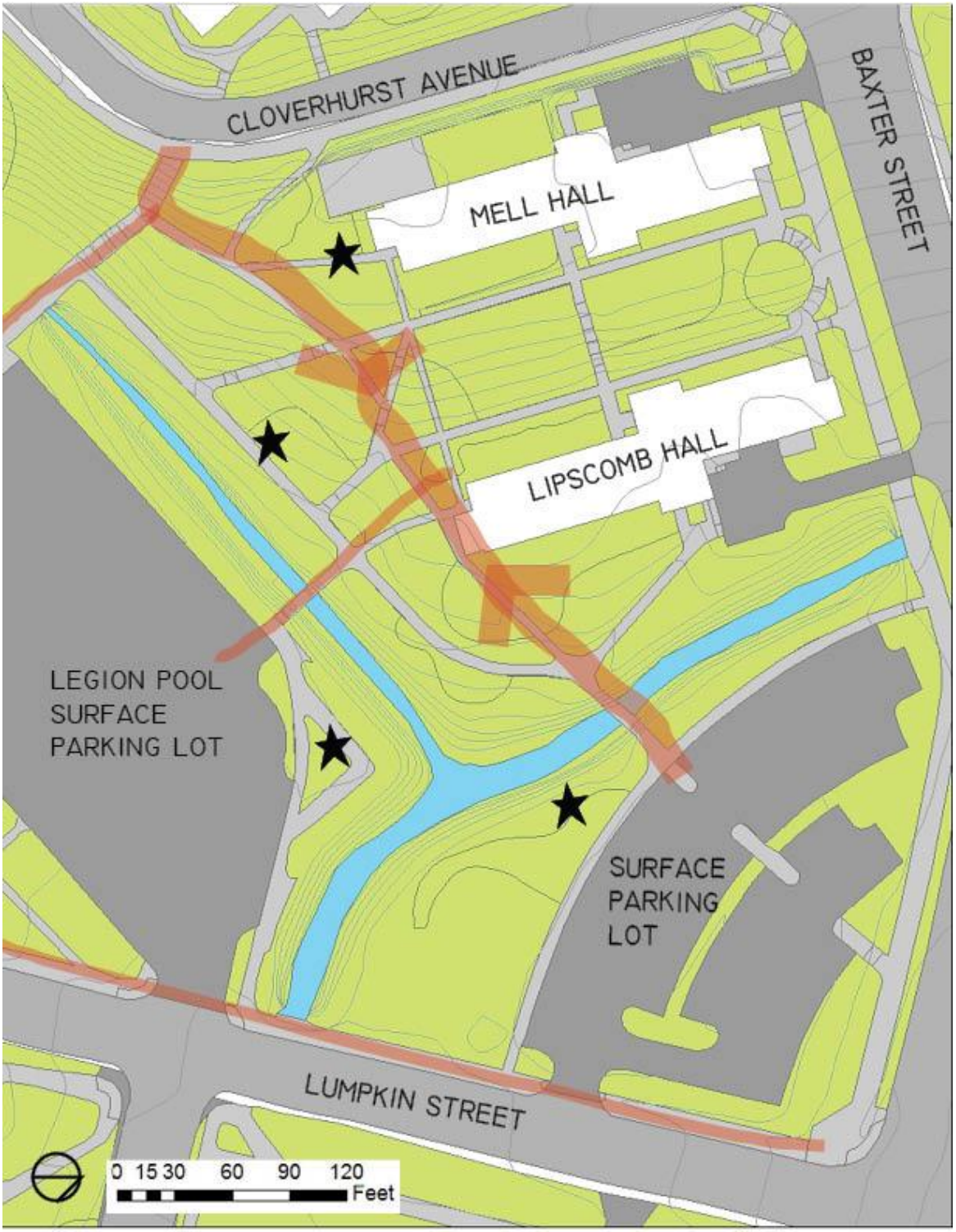


Figure 5.33 Summary of Observations at Tanyard Creek Legion Pool Section
Source: created by author

Table 5.4 Legion Pool observation and behavior mapping data summary
Source: created by author

VISIT	1	2	3	4
DATE	1.18.12	2.6.12	2.15.12	2.16.12
TIME	11:30-12:30	1:45-2:45	3:30-4:30	3:00-4:00
WEATHER	SUNNY, 45-50°	GREY SLIGHTLY CHILLY	SUNNY 55-60°	RIZZLING, GREY, 55
# OF PEOPLE	578	597	418	391
INTERACTIONS WITH CREEK	NONE	NONE	NONE	NONE
USING THE SPACE	2 STUDENTS STOP TO CHAT, 1 GROUNDS KEEPER WORKING	1 STUDENT CHATTING ON PHONE BY BENCHES	1 PERSON PACING BY BENCHES	NONE
OBSERVATION POINT	BENCH BY CULVERT UNDER BRIDGE	MULCHED AREA INBETWEEN CREEK AND BAXTER PARKING LOT	THREE BENCHES NEAR LEGION POOL PARKING LOT	BENCH BY MELL HALL
VISUAL ACCESS	CREEK VISIBLE	CREEK VISIBLE	CREEK IS VISIBLE	CREEK EDGE IS VISIBLE BUT NO WATER IS VISIBLE
VISUAL APPEAL	LOW - ARMORED BANKS, LOTS OF TRASH AND OLD FRUIT BY BANK	LOW - VERY TRASHY, ARMORIZATION, EXCESSIVE VEGETATION DEBRIS IN CREEK	LOW - DEBRIS BUILD UP, TRASH	MED - MAINTAINED VEGETATIVE EDGE
SOUNDS	BUSES, CREEK RIPPLE VERY SOFT	SOME WATER TRICKLING, TRAFFIC, BIRDS	CARS, BUSES, WATER TRICKLE	BUSES!
SMELLS	SOME SWEET ROTTING FRUIT SMELLS	COFFEE ROASTER SMELL	NONE	NONE

At times there were so many people walking through this area that it was impossible to accurately record them all using this observation method. The most recorded during a one hour observation was 597 people, the least, 391 people, with an average of 496 over four visits. It was assumed that this area would be high traffic because of the location next to the two dorms (figure 5.33), but observation noted most students using this space as a cut through path from Cloverhurst Avenue to the corner of Baxter Street and Lumpkin Street. Even though there is a nice green space and benches in this area, it was rare to see people stopping and sitting or using the space. On occasion people were stopped talking on their phone, chatting

with a friend they saw passing by, or sitting on one of the benches, but that was only one or two people out of the hundreds passing by during each observation session. There was no direct interaction with the water in any way besides walking over it. This is an improved relationship compared to the Newton Street section where the creek is not even visible. In addition to this, art was already being used in this area to communicate about the environment, seen in figure 5.35. Placed on a mechanical unit next to a sign that says "caution high voltage keep out' is an image of a face that is communicating an emotional relationship to the mechanical unit.

Some cooking smells wafted through this area, probably coming from Bolton Dining Hall. The only malodor noticed was a sweet rotting fruit smell coming from an excessive number of rotten apples along the edge of the bank. The most overwhelming sound came from buses on Cloverhurst Ave, Lumpkin St, and Baxter St. Other noises included the constant chatter, laughter, and dragging feet of students bustling through the pathway. A soft trickling of the water could be heard if sitting and listening close by. Even though most of the notes during observation indicate a low visual appeal rating, upon further reflection this section has been changed to a rating of medium. The low rating was given because of a heavily armored bank, and excessive trash in the creek bed and its edges. A new rating of medium is given for this section due to reconsidering the maintained landscape surrounding the edge of this section of the creek and the visual and physical access to the creek.

Figure 5.34 Armored bank, low water flow, pedestrian bridge
Source: photo taken by author

Figure 5.35 Existing art in the environment
Source: photo taken by author


Figure 5.36 Maintained landscape edge
Source: photo taken by author


Figure 5.37 Culvert going under Lumpkin Street
Source: photo taken by author


Figure 5.38 Excessive fruit waste dumped on edge of creek
Source: photo taken by author


Figure 5.39 During a small rain event water is a murky greenish-grey
Source: photo taken by author


Figure 5.40 Students using the path to cut through this area
Source: photo taken by author

Tate Center Observation Summary

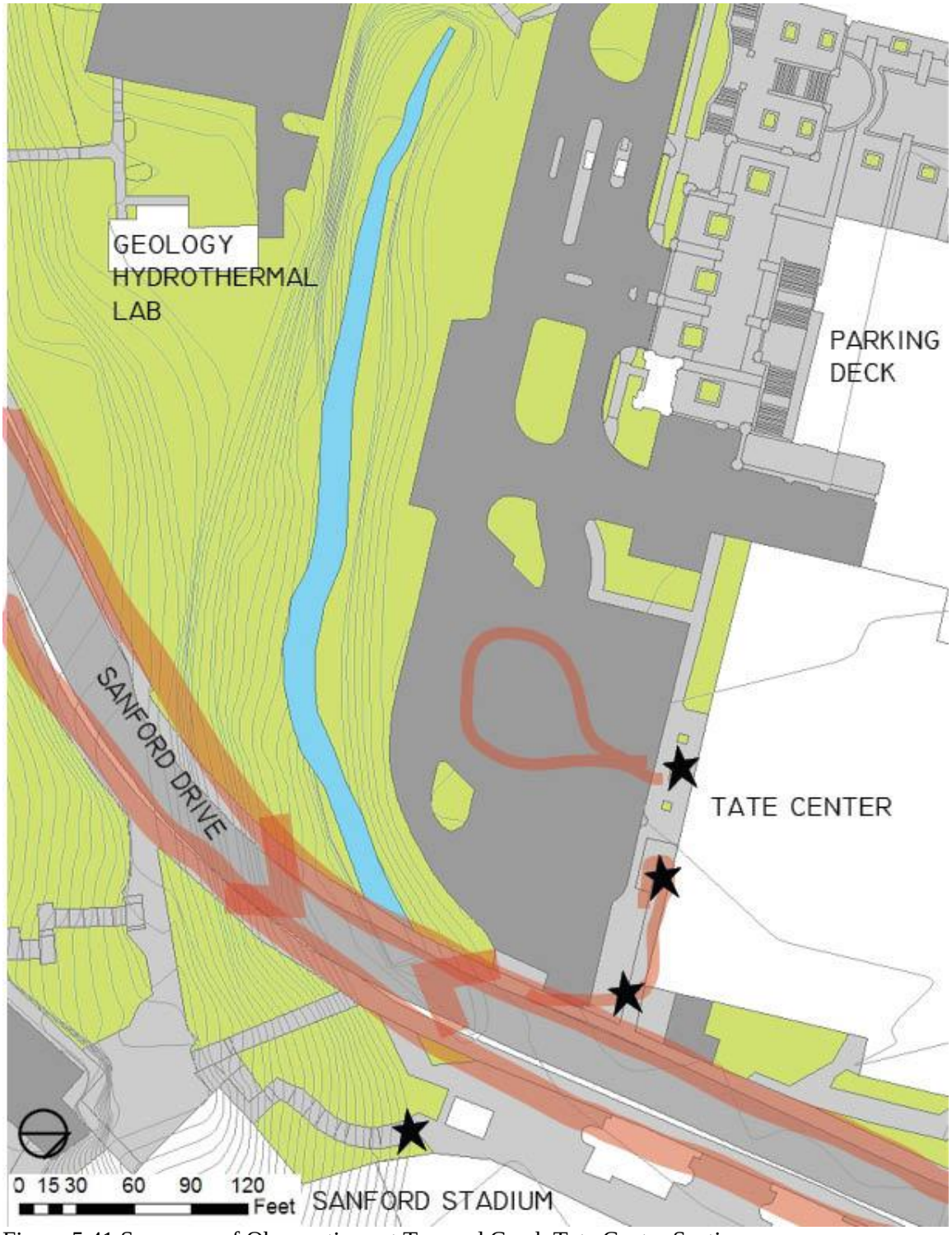


Figure 5.41 Summary of Observations at Tanyard Creek Tate Center Section
Source: created by author

Table 5.5 Tate Center observation and behavior mapping data summary
Source: created by author

VISIT	1	2	3	4
DATE	1.23.12	1.26.12	2.13.12	2.17.12
TIME	4:30-5:30	1:20-2:20	1:30-2:30	3:10-4:10
WEATHER	GREY, CLOUDY, WET 40-50°	FOGGY 60°	SUNNY COOLER	SUNNY 65-70°
# OF PEOPLE	75	668 (SO MANY COULDN'T COUNT THEM ALL)	112 (DOES NOT INCLUDE PEDS ON SANFORD DR. B/C OUT OF VIEW	257
INTERACTIONS WITH CREEK	NONE	ONE PERSON PHOTOGRAPHING CREEK	ONE STOPPED TO LOOK AT CREEK	NONE
USING THE SPACE	NONE	NONE	ONE LOOKING AT STADIUM, 2 TALKING ON BRIDGE	3 BREAK ON TERRACE, 2 VIEWING STADIUM, 2 VIEWING STADIUM
OBSERVATION POINT	BENCH OUTSIDE OF FIRST FLOOR TATE EXIT INTO PARKING LOT	BRIDGE CONNECTION TO TATE	STEPS SOUTH OF CREEK NEXT TO STADIUM	FARTHER DOWN BRIDGE CONNECTION TO TATE
VISUAL ACCESS	LIMITED BY VEG & CARS	VERY CLEAR FROM OBSERVATION POINT	CAN SEE FROM POINT IF STANDING BUT NOT FROM SITTING	CAN SEE A GLIMPSE
VISUAL APPEAL	MED - LOW		LOW - MESSY, TRASH, FENCING, WEEDY, EXPOSED PIPES	LOW - TRASH AND EXPOSED PIPES
SOUNDS	TRAFFIC- MOSTLY BUSES	CONSTRUCTION AND BUSES	CHATTER, BUSES, BRIDGE TENSION, WATER TRICKLE	BUSES!
SMELLS	CIGARETTES!	NONE	NONE	NONE

This section of the creek is bordered by a very steep edge on one side and a parking lot on the other. There are not a lot of reasons to interact with this section of the creek. Sanford Drive towers above the creek here and hordes of students walk the bridge between class periods. Other than that bridge there are no other highly traveled paths that connect with the creek, causing the number of people observed during a visit to vary greatly depending upon the author's visibility of the bridge. The greatest number of

pedestrians seen in one observation was (again with the caveat that there were so many people walking by at one time that it was nearly impossible to record them all) 668, the lowest 75, and the average was 277. Again most people are using this space to just pass through, but a few people were seen stopping here and there. Over two observation periods two separate people were seen at the stream's edge near the culvert going under the stadium to look at the creek and one was taking pictures (figure 5.42). During another observation two sets of two ladies stopped on Sanford Drive to peer into the empty Sanford Stadium. Three people, who looked like they were in employee outfits, took a break out on the balcony of the Tate Center. While the interaction with the creek on this section is extremely small it's the first direct interaction seen with the creek at all.

Once again buses were the most consistent and noticeable noise. This is to be expected since Sanford Drive is a main bus thoroughfare. The sound of the creek was audible from directly next to the edge of the creek or from the stairs that go from Sanford Drive down towards the culvert of the creek. This section was given a visual appeal rating of low due to unattractive fencing around the culvert, exposed pipes crisscrossing the stream, and trash present in stream bed.

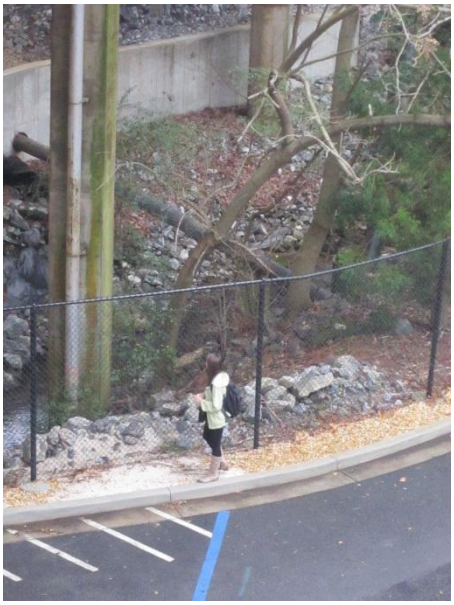


Figure 5.42 Student taking notice of the creek through chain link fence
Source: photo taken by author

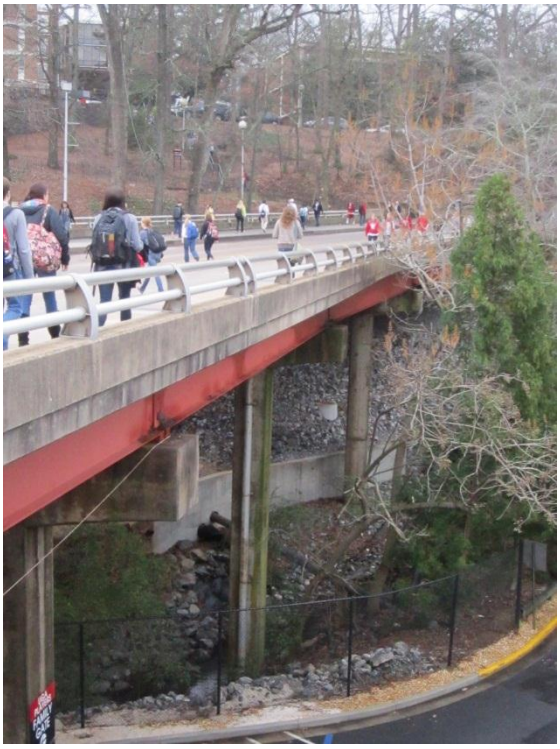


Figure 5.43 Relationship of high traffic pedestrian flow to creek below
Source: photo taken by author

Game Days

While no formal observations were done on a football game day it should be noted that the number of people in the vicinity of the creek changes drastically. The following images are included to illustrate how this changes.


Figure 5.44 Tailgating in the parking lot next to the Legion Pool section
Source: photo taken by author

Figure 5.45 Legion Pool section with football fans in the background
Source: photo taken by author

Figure 5.46 Fans crossing at Lumpkin St and Baxter St
Source: photo taken by author

Figure 5.47 Sanford Drive, Sanford Stadium, the Tate Center parking lot, and Tanyard Creek
Source: photo taken by author

Figure 5.48 The traditional Dawg Walk through the Tate Center Parking lot
Source: courtesy of University of Georgia Athletic Department

VISIBILITY AND ACCESS

It is apparent through observation that the physical and visual access to the creek is limited. This limits the potential for a relationship with the creek. The following maps show the areas which, from ground level, the creek is visible, inferable, and not visible at all with a color gradient of green, yellow, and red respectively (figure 5.49). The term inferable and color yellow refer to a landscape condition that one might be able to associate with a creek, if they were knowledgeable about reading the landscape. Pathways are displayed in black on top of the color gradient to show when and if pathways are in an area where the creek is visible. The diagrams of pedestrian traffic patterns are shown in conjunction in order to further understand where and how people are visual accessing the creek.

Figure 5.49 Legend for visual and physical access diagrams
Source: created by author

Figure 5.50 Broad St. section visibility and access diagram
Source: created by author

The comparison of the visual access diagram with the pedestrian traffic patterns shows an overlap in path and visibility. This section of the creek is relatively open with no high vegetation blocking the view. There was only an average of fourteen pedestrians seen traveling through this area during the four observation sessions. That means that although this section of the creek is visible, it still remains relatively unseen.

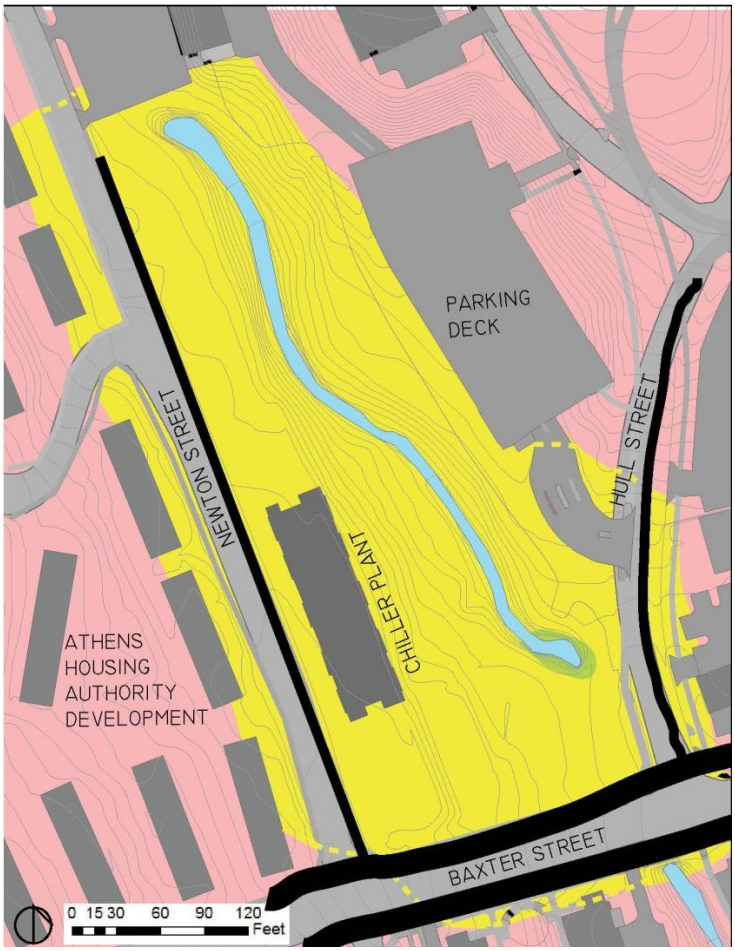


Figure 5.51 Newton St. section visibility and access diagram
Source: created by author

As seen above, the Newton Street section of the creek is only truly visible right before it is piped under Baxter Street and then again when it resurfaces on the other side of the road. Extremely dense, "messy" vegetation in this area blocks the view to the creek. But, it is exactly this dense vegetation that implies to a viewer that a creek is there, or in other words, makes the creek inferable. The high traffic flows on Baxter Street and the lower traffic flows on Newton Street both pass through areas where the creek can be inferred but not necessarily seen directly. This section of the creek received an average of 87 pedestrians an hour during observations. Comparing the notes from observation with the visual access diagram shows potential for the green space on the north side of Baxter Street. This area has high traffic, potential to sense the creek's presence, and green space that is under-utilized.

Figure 5.52 Potential for green space on the north side of Baxter Street
Source: created by author

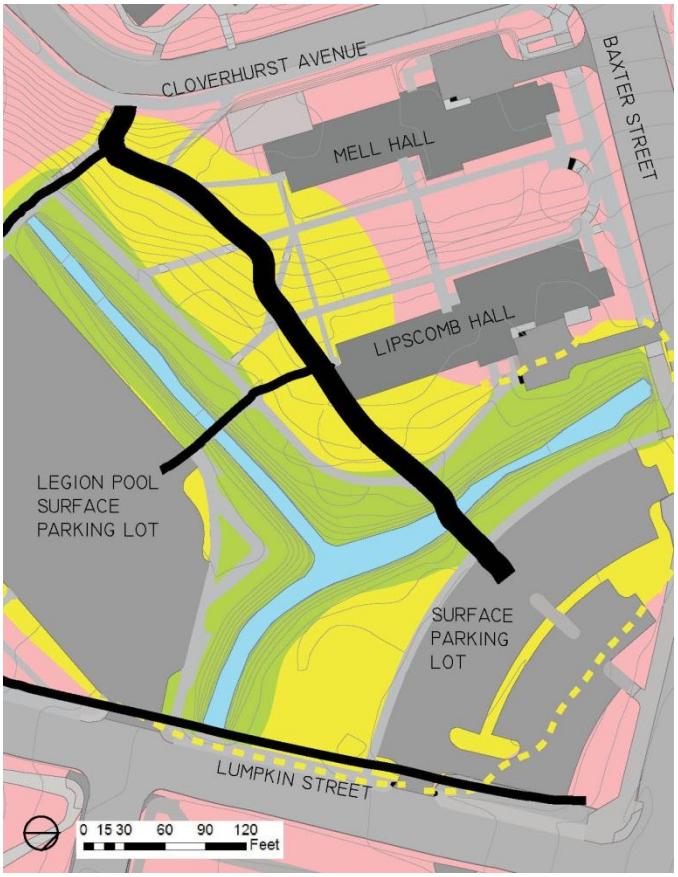


Figure 5.53 Legion Pool section visibility and access diagram
Source: created by author

Figure 5.53, depicting the Legion Pool section of the creek, shows three areas where path ways actually cross through an area where the creek itself is visible. These locations are the three pedestrian bridges that cross over the creek. The bridge that connects with the surface lot on the corner of Lumpkin

and Baxter, the future location of a student dining hall, is a place where high traffic flow is crossing a visible section of the creek. This is the only place that this happens for Tanyard Creek. The remaining pathways of pedestrian traffic are located in areas where the creek is inferable or it is a low traffic area that crosses an area where the creek is visible. It is the sloping topography and armored bank in this section that imply the creek's presence, when it is not visible.

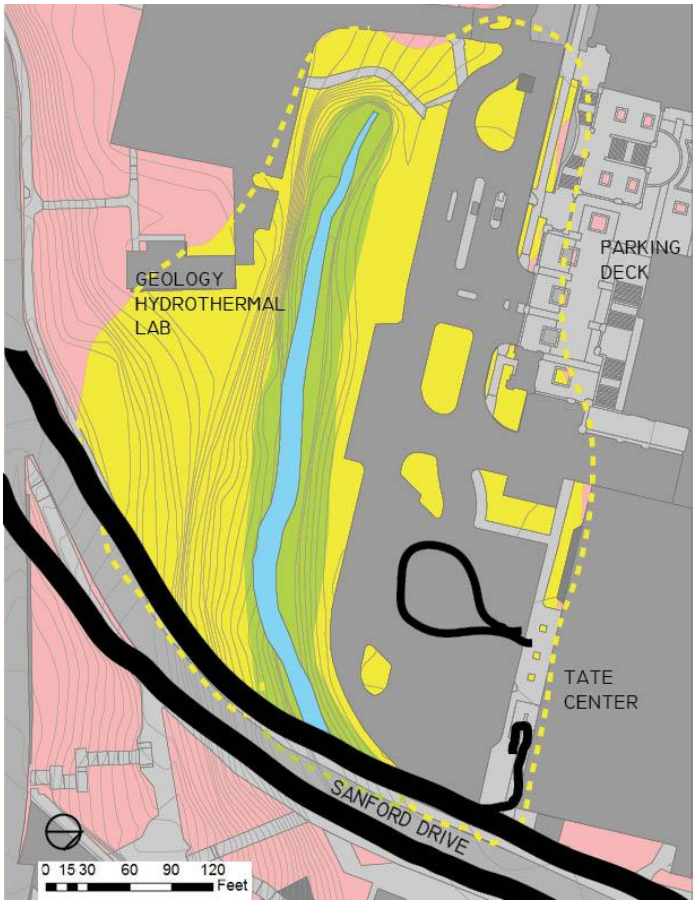


Figure 5.54 Tate Center section visibility and access diagram
Source: created by author

Figure 5.54 shows the comparison of visual access and observed pedestrian traffic in the Tate Center section of Tanyard Creek. This section, similarly to the Newton Street section, is surrounded by dense "messy" vegetation which blocks the view to the creek but insinuates the creek's presence. Additionally, the cars parked in the surface lot bordering the creek on the north side prohibit views to the channel. Sanford Drive had the highest average pedestrian traffic observed at 277 per hour. The creek is directly visible from this road, but only if pedestrians peer over the side of the bridge when it is crossing

over the creek's path, which no pedestrians were noted doing. Comparing the notes from observation with the visual access diagram shows potential for this location on Sanford Drive. This spot does have prohibiting factors, in that the sidewalk is narrow and pedestrian and bus traffic are high through this area. Creating a stopping point on this location could pose a safety hazard. The proposed pedestrian bridge extension shown in the far right image of figure 5.20 could alleviate some of this high traffic and create an interesting mirrored opportunity for drawing attention to the creek below.

From this information it can be concluded that overall there is a fair amount of pedestrian traffic passing nearby the creek that does not have direct visual access to the creek. From this analysis certain locations have come to light as opportunistic spaces for drawing attention to the creek. These locations include but are not limited to both higher and lower pedestrian traffic patterns that are within the creek's visible or inferable zones.

PHOTO REVEAL

The photo reveal project reviewed in this thesis was an assignment from a freshman course in the College of Environment and Design that was based on the idea of a photo voice project, discussed in chapter two. The photo reveal project uses the camera to give a voice in the same way, but instead of giving a voice to underrepresented social groups, the photographs are used to reveal the ways that the photographers are relating to the watershed in an urban condition. This photo reveal attempts to further illuminate ways that people are interpreting and interacting with the watershed associated with Tanyard Creek. The author understands that this is a very limited group of people and further research would be needed to get a clearer understanding of the wider communities' relationship to the watershed.

Students were given one week to be mindful of the watershed as they went about their daily routines. Whenever the students noticed a system, device, or way they were interacting with the watershed, they photographed the incident. Students were also asked to reflect on three questions: How are we connected to this hydrologic system in an urban condition? What are the forms or aesthetics that

we associate with the water system? Where are the points that we interact with the system? The questionnaire can be found appendix B.

In order to understand the meaning of these photos received they were divided into form categories and then also tallied in qualifier categories. Images divided into their form categories can be found in appendix C. The form categories include: BMPs, channels, downspouts, fire hydrants, fountains, gutters, interior devices, manholes, pipes, pollution, storm drains, storm grates, surface types, watering devices, and weep holes. After the images were categorized, descriptive qualifiers were given to groups of images in order to quantify perceptions of the watershed elements. The qualifiers and the corresponding quantities are: manmade 209, natural 63, control 120, utilize 20, access 33, hide 10, slow 32, transport 128, reveal 23, and celebrate 31 as seen in figure 5.56

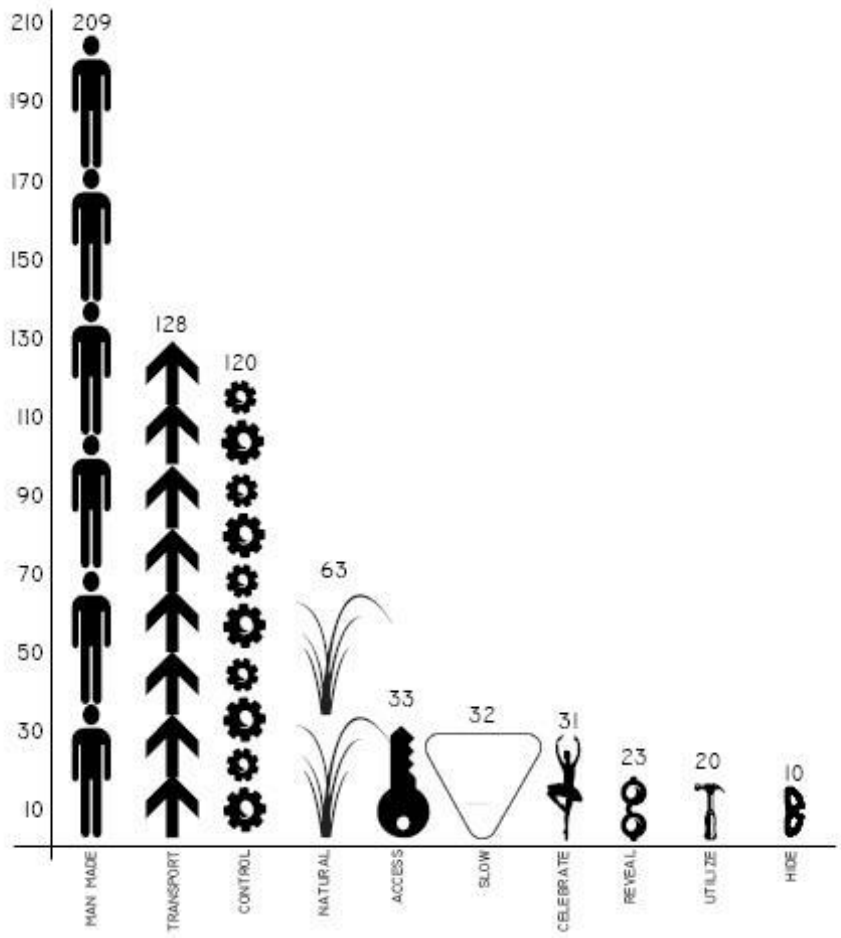


Figure 5.55 photo reveal qualifiers
Source: created by author

This charts shows that people with limited knowledge of the watershed are mostly cognizant of connecting to the watershed through manmade elements that control and transport storm water. This does not come as a surprise seeing as how these are the main ways that water navigates through an urban condition. Representative images from the qualifier categories can be seen below.

Figure 5.56 Manmade representative images
Source: courtesy of professor Shelley Cannady

Figure 5.57 Transport representative images
Source: courtesy of professor Shelley Cannady

Figure 5.58 Control representative images
Source: courtesy of professor Shelley Cannady

Figure 5.59 Natural representative images
Source: courtesy of professor Shelley Cannady

Figure 5.60 Access representative images
Source: courtesy of professor Shelley Cannady

Figure 5.61 Slow representative images
Source: courtesy of professor Shelley Cannady

Figure 5.62 Celebrate representative images
Source: courtesy of professor Shelley Cannady

Figure 5.63 Reveal representative images
Source: courtesy of professor Shelley Cannady

Figure 5.64 Utilize representative images
Source: courtesy of professor Shelley Cannady

Figure 5.65 Hide representative images
Source: courtesy of professor Shelley Cannady

The students' responses to the questionnaires were reviewed for key terms or phrases that were then categorized into objects, emotions, and actions. The author thinks it's especially interesting that students responded with many emotional descriptions, as none of the questions were leading for this type of answer, showing that water has a strong emotional resonance. Key object terms can be categorized even further into water bodies, manmade water related landscape elements, infrastructure, and devices or fixtures. The terms and number of times noted in the students' responses are as follows. Water body terms include: ponds (11), streams (10), rivers (9), puddles (6), lakes (4), runoff (4), rain (4), waterfalls (2),

ocean (1), creek (1), and floodplain (1). Manmade water related landscape elements used include: fountains (21) (often mentioned as a focal point), pools (8), reservoirs (1), water walls (1), and bird baths (1). Infrastructure terms include: drains (10), rain gardens (6), sewer (6), gutters (5), pipes (5), sidewalks (4), bridges (3), bioswales (1), spillways (1), and roads (1). Water devices or fixture terms include: showers (7), toilets/bathroom (5), drinking fixtures (4), sinks (3), fire hydrants (2), and irrigation (2). Emotional or sensory related terms used to describe the watershed in an urban condition include: sounds (5), reflections/reflective (3), recreation (3), dependence on (3), beauty (2), peaceful (2), leisure (1), meditation (1), touch (1), taste (1), appreciation (1), chaos (1), pleasing (1), and elegant (1). Action words used to describe the watershed or how they interacted with the watershed in an urban condition include: collect (5), walking outside (2), purifying (2), prevent erosion (1), prevent floods (1), create domino effect (1), build bridges (1), consume (1), driving (1), fishing (1), pollute (1), and reroute (1).

Comments from students reveal a few key findings. Water does create an emotional response. Even though students were not asked to give information about emotional stimulation, they used emotional language to describe their interactions. Students had an overwhelming connection to water fountain features and their ability to draw the eye. The author assumes this is because they are more visible and audible than other elements and they embody a sense of celebration of water. Some comments also showed a misunderstanding about the watershed system. One example is the idea that the watershed system is mostly seen in pools and fountains, which was written by many students. Another example includes three different comments suggesting that people were only connected to the watershed in parks. On the other hand, the assignment seemed to be eye opening for some with comments such as, surprise at the number of water related infrastructure they passed by every day and never noticed, or commenting on the ubiquity of our effect on the watershed and how most people don't recognize this. Some comments showed that students really understood the urban condition describing how non-permeable surfaces increase runoff and manipulate the watershed. One students comment spoke directly about their experience with Tanyard Creek on the Sanford Drive bridge: "one of the few natural elements I

encountered, Tanyard Creek, I don't even get close to. I walk high above it. It would be nice to have a stream I could sit next to and observe closely".

The Relationship of the Community to Tanyard Creek Findings

This section shows that there is a large quantity of people walking nearby Tanyard Creek (in some cases close to 600 an hour), who have a very limited relationship to the creek. Most people are simply hurrying by from point A to point B. These people are mostly walking close enough to infer that a creek is there but not really able to see or hear or experience the creek in any other way besides the heavy vegetation growing on its banks or the change in topography that suggests a creek is there. Most of the images that people associate with the watershed are manmade devices that control and transport stormwater. While some imagery from the photo reveal revealed and celebrated the watershed system, those images were few and grossly outnumbered by those images of manmade, controlling, and transporting devices. It also showed that there are some misunderstandings about what a watershed is and how we interact with it. The author thinks one of the most interesting findings from the photo reveal is that once asked to simply be mindful or aware of the watershed, that many students seemed to gain an appreciation, a greater understanding, and an emotional response to the water system around them.

CHAPTER 6

CONCLUSION AND SITE APPLICATION

SUMMARY OF PREVIOUS FINDINGS

The problem of degraded urban streams is not unique. They exist all over the world and their degraded conditions greatly affect the health of our drinking water supplies and the health of riparian eco-systems all the way to the oceans. Water is a necessary resource for life to continue. Its healing powers go beyond hydration, evoking a sense of calm and restoration. The United Nations Population Fund (UNFPA) says that more than half the world's population is now living in cities, with that percentage expected to rise. Cities have many benefits for people including access to resources, social interactions, and economic opportunities. Higher density human settlements are beneficial for the environment in a larger scale perspective for such reasons as preserving natural resources and open space in other areas and limiting travel distances for daily needs. But for natural resources, such as waterways, within the urban zone there is an innate conflict. The form, density, and economic drivers of urban areas do not support the needs of the hydrologic system. When most people are living in urban areas, where waterways are degraded and technologies separate us from interacting with the systems, these precious life giving systems are left forgotten and undervalued.

While our development practices have become "less bad" for stream health, our social relationship and value of these waterways is still need of repair. This thesis has suggested that art in the environment could be a strategy for improving the social value and therefore social sustainability of urban waterways. Art has a history of being used as a catalyst for social change and when art moved out of the gallery and into the environment it didn't take long for those works to begin to tackle environmental issues. Landscape architects have developed theories and strategies around the issue of humans' perception and relationship to the environment. Chapter three looked at the research of Joan Nassauer, the practice of eco-revelatory design, and the research of Stephen Kaplan. The motives and strategies

used by these three ideologies were reorganized into categories of motives, action strategies, form strategies, sensory strategies, and time based strategies. The five case studies reviewed in chapter four showed ways that art in the environment employs parallel motives and strategies but also provided additional motives and strategies. Figure 6.1 shows the cumulative preferred motives and strategies discerned by the author. It was also made clear in the case studies chapter, that for art in the environment to be successful and reach more people, it should partner with supporting institutions the scale of the issue to which the project responds. Partnering organizations can provide connections to an audience, to volunteers, to a participatory community, to funding sources, and to data relevant to the environmental issue.

The site analysis of Tanyard Creek showed that the creek is in fact degraded and has been affected by development stress since the late 1800's. The University Architects Office as well as UGA students have included restoration efforts for Tanyard Creek in their future development plans. The implementation of these plans will depend on the many factors that contribute to the conflict between urban priorities and environmental needs. Major issues for the creek and its relationship to the community are pollution, low visibility, limited access, and noise pollution that drowns out the sound of the creek. Most of the ways we interact with the creek are through man made devices to control and transport water. Students participating in the photo reveal project spoke of emotional responses such calmness, tranquility, and reflection. The students writing also showed there are some misunderstandings about the watershed and education might be necessary for a wider community.

CONCLUSION

The author concludes from the previous chapters that art in the environment can increase an appreciation or awareness towards degraded urban streams. After completing the research in this thesis the author finds that a social sustainability is a larger goal than art in the environment can tackle on its own. Although, increasing awareness and appreciation for these waterways might be a beneficial first step towards achieving a social sustainability. There are a few different ways that art in the environment increases awareness and appreciation. It can do this is by making urban waterways visible where they

were previously unnoticed. Art in the environment can use site markers, as seen in chapter two, to draw attention to locations that, as seen in the observation data, most people may walk by without noticing. The observation data showed that there are a large number of people walking by the creek, not noticing it, giving these areas a high potential for creating a visible connection. Art in the environment can also make these urban waterways visible from off site by using technology to set up ways for people to view the channel from a distance. Visibility is an important step for promoting social sustainability. Urban dwellers cannot be expected to place a positive social value on their associated urban waterway if they don't even know that they are there.

Figure 6.1 Cumulative preferred strategies discerned by the author
Source: created by author

A second way that art in the environment can increase appreciation and awareness is through using educational elements. Education, as seen in chapters two, three, and four, can be used to shift an individual's or group's perspective on, or relationship to marginalized groups of people or marginalized environmental systems. Simply making the location visible is a form of education in itself, in that it brings awareness and knowledge of the marked location. Also off-site viewing is a potential way for people to visually make a connection to other ways we affect the water channel. For example, off-site viewing at the edge of the drainage basin allows people to have an interactive understanding of how the watersheds are situated in their community. Additionally, on site signage can give more information to interested viewers. There can be three levels of information gathering available from site signage: information about the site, a web address with further information, and links to other organizations from the website. This creates a self-motivated and self-paced learning scenario, which is supported by Kaplan's research of environmentally responsible behavior described in chapter three. Also, as mentioned in chapter four, a dedicated website is important for coherence of the project and access to information. Education is an important part of increasing awareness and appreciation because ignorance is often a cause for the mistreatment or the de-valuing of a social group or environmental system. Knowledge and a deeper understanding of the world around us can increase people's value and appreciation for it.

Art in the environment can also increase awareness and appreciation by creating an emotional shift in the relationship between the viewer and the viewed. Chapters two and three and four discussed the ways some art works have created an emotional or sensory response from viewers in order to shift their perspective on the given issue. Those sensory strategies the author deems most powerful are visibility, self-satisfying or enjoyable, referential sounds (in this case water sounds), emotional resonance, fun, play, humor, and celebration.

Finally, the author feels that if art in the environment is going to make a difference for urban waterways it must have a structure of resiliency because a continued awareness and appreciation over time will be more impactful for the social sustainability of these systems. This means partnering with

organizations that are established and have a demonstrated history of stability, as was seen from the case studies in chapter three. In addition the case studies showed that ongoing events or a structure that promotes renewed interest can assist in the projects ability to promote a long term connection between the community and their associated urban waterway.

SITE DESIGN APPLICATION

The design application for promoting a social sustainability for Tanyard Creek, based on the conclusions drawn from this thesis, will include a support structure, dedicated website, site markings, and a temporary installation, that aim to use educational elements and create an emotional sensory experience for the viewer. The author would like to make clear that her process for the design is not data driven but a creative process drawn from personal inspiration.

Organizational Structure

The author proposes the implementation of an annual artist in residency program be integrated into the university structure. The university has a strong presence physically and socially and it is a highly established and stable organization with the capability of supporting this endeavor. Artists will apply for the residency program that would follow the academic schedule, beginning their residency in the fall, continuing their research and work throughout the year, and installing their designs over the summer. This cycle would repeat annually so that the previous artist's work would be displayed throughout the year of the new artist's residency.

The program should be overseen by a board, made up of members representing ACC organizations, ACC community members, UGA departments, and students from both water quality related and arts related pursuits. Board members should be chosen through an open public nomination process. Possible ACC and UGA arts organizations to connect with include: the Georgia Museum of Art, the Lyndon House Arts Center, ATHICA, Lamar Dodd School of Art, UGA Department of Dance, UGA Department of Theatre and Film Studies, Trace Gallery, Mercury Art Works at Hotel Indigo, Blue Tin Studio, Good Dirt, Athens Area Arts Council, Athens Design Development, EcoFocus, and the AUX Experimental Arts Festival. Possible ACC and UGA water or environmental organizations to connect

with include: UGA Office of Sustainability, Odum School of Ecology, College of Environment and Design, Altamaha River Keepers, Georgia Climate Change Coalition, Warnell School of Forestry and Natural Resources, Upper Oconee Watershed Network (UOWN), ACC Stormwater, Georgia Adopt-A-Stream, Georgia River Network, and the Oconee River Land Trust.

The board will be charged with writing the application requirements and residency requirements. This allows the requirements to change over time as needs in the community and the environment change over time. They will also be charged with reviewing the artists' applications and awarding the position. Board members will also be charged with overseeing funding initiatives.

The artists in residency program will require its own funding to give the project economic freedom, which can be acquired through a few sources. Funding can be acquired through a membership initiative that gathers members from the organizations listed above as well as the general public. Additional funding can be sought through alumni asks which can be focused to alumni from the colleges listed above. Grants from the National Endowment for the Arts (NEA) and the EPA are other possible funding sources. Our Town is a specific grant from the NEA that supports art works for "livable, sustainable neighborhoods with enhanced quality of life" (NEA 2012).

The annual residency program responds to the finding that the project should have a structure of resiliency by partnering with established organizations. Integrating the program with the academic school year gives the project renewed interest every year, responding to another key finding.

Components

This proposed installation will consist of a dedicated website, an annual kickoff event called "creek week" a large scale map and viewing installation in the Miller Learning Center (MLC), which overlooks the Tate Center section of the creek, site markers, and a temporary installation that takes advantage of game day crowds.

The dedicated website, responding to another key finding from the case studies, should give browsers links to all the associated organizations, a historic overview of Tanyard Creek, up to date summaries of Tanyard Creek's health assessments, applications for the residency program, archive of past

projects and artists' biographies, and an overview of the currently installed work. The overview should give information about the elements of the design, their locations, and information on how they relate to Tanyard Creek. This should include photo and video documentation of the installation(s) and how they exhibit change over time. The website should have share-ability through links that allow viewers to share the website through email and social networking sites. The website should also be accessible from various aligned UGA websites, such as, Office of Sustainability, Art Department, Ecology department, College of Environment and Design, and others. The website might look something like the image shown in figure 6.2.

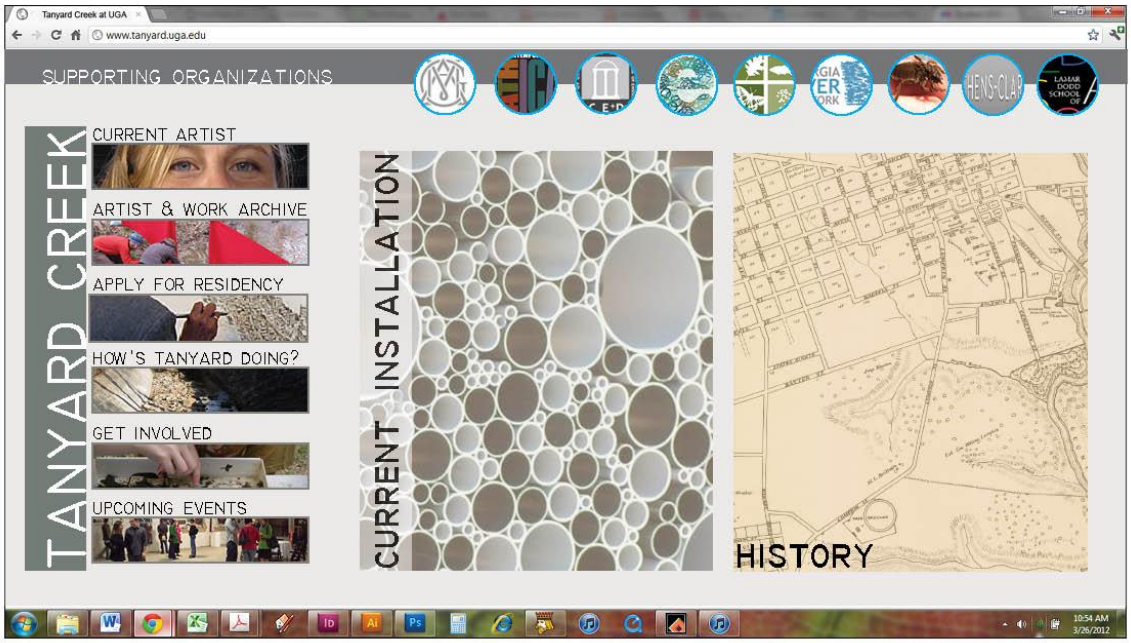


Figure 6.2 A visualization of a possible dedicated webpage for Tanyard Creek
Source: created by author

An annual kickoff event will occur in the Fall, at the beginning of the academic calendar. This will help to highlight the installation to new and returning students. The kickoff event will be called "creek week". During this week a series of events will be held that celebrate, interpret, and educate the community about the installation, the health of Tanyard Creek, and ways to get involved now, throughout the year, or in their daily lives. Events could consist of: the introduction of the new artist, tours of the

current work on display, tour of the creek, tableing by support organizations, panel discussions, films, and any other events that would be relevant.

All the site markers will be represented on a map of the creek and the drainage basin with buildings and roads for reference on the walls/floor of the MLC building (figure 6.3). “Sneak-a-peek” viewers (figure 6.6) will be connected with site markers that are highlighted on the map. The viewers will stream live video and sound feed from points along the creek or they will exhibit still images with associated text that succinctly explain the image coupled with the sound of water.

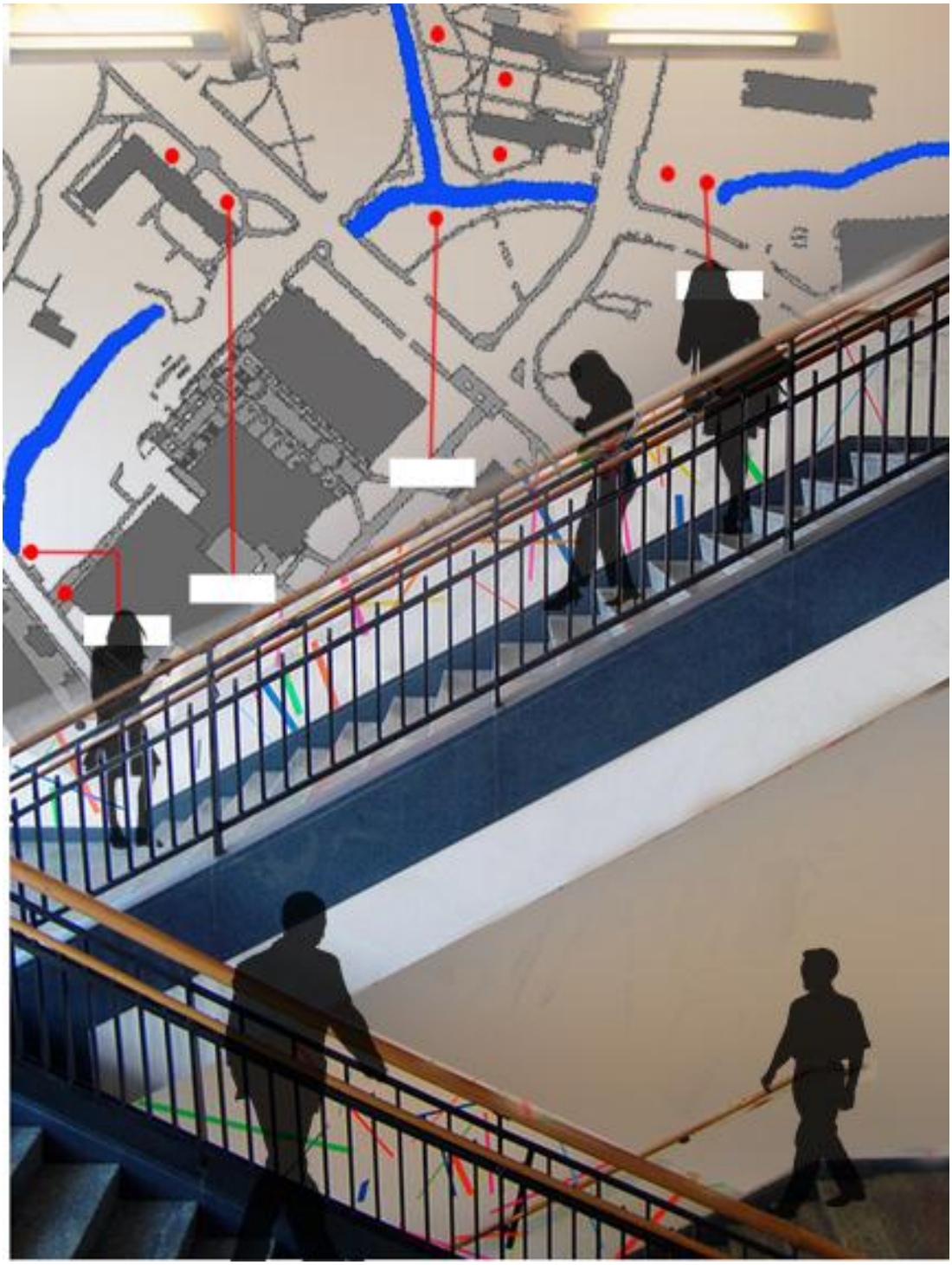


Figure 6.3 Map of Creek's course with marked sites highlighted and viewers
Source: created by author

Site markers would be installed around the Tanyard Creek drainage basin. Two different recycled materials will be used for the markers: PVC pipe and aluminum cans. These materials subtly reference the causes of degradation to the creek: people and development. These materials can easily be found and

reused on campus. PVC pipe is a commonly used material for piping water. The material is cheap and often thrown in landfills. UGA has a strong commitment to construction material reuse and they have a storage facility to keep materials like this for reuse on campus. In addition there is a sorted recycling program on campus for accessing aluminum cans as well as other materials. The author suggests taking advantage of this volunteer program associated with game days, when a significantly larger amount of cans can be diverted from the waste stream, and applying this towards the art works. Parts for the aluminum can design can easily be made by volunteers. So volunteers can not only collect cans but also be a part of art making if they desired.

One way the PVC pipe will be used is in sculptural pieces that can take on different forms at different sites. The form can be sinuous from side to side and up and down (figure 6.3) as well as create seating (figure 6.4). Seating is important to provide an opportunity for passersby to stop and enjoy the creek, as one student mentioned in the photo reveal. The sculptural pieces can have text on the long end of the pipes to inform viewers of the website or other facts regarding Tanyard Creek (figure 6.5). Different sized PVC pipes can be stacked in a meandering to reference the waters sinuosity and a sort of bubbling feel (figures 6.3-4). The other way PVC pipe will be used is in conjunction with live video and sound feed from the creek. The piping will be used to create a viewer, "sneak a peek" (figure 6.6). A funnel will be attached along the side with the sound feed. Peering into the viewer creates an isolated sensory experience, a shared moment between the viewer and the creek, where all other sounds and distractions are removed. The real time video and sound feed will focus the viewer's attention on the changing creek's dynamic, allowing this component to exhibit change over time. Sculptural markers will be sited where the most pedestrian traffic takes place near the creek and the viewing markers will be located where the creek is hard to see, at the edge of the drainage basin, and along with the large scale map in MLC. Viewers can also be incorporated into the sculptural sites.

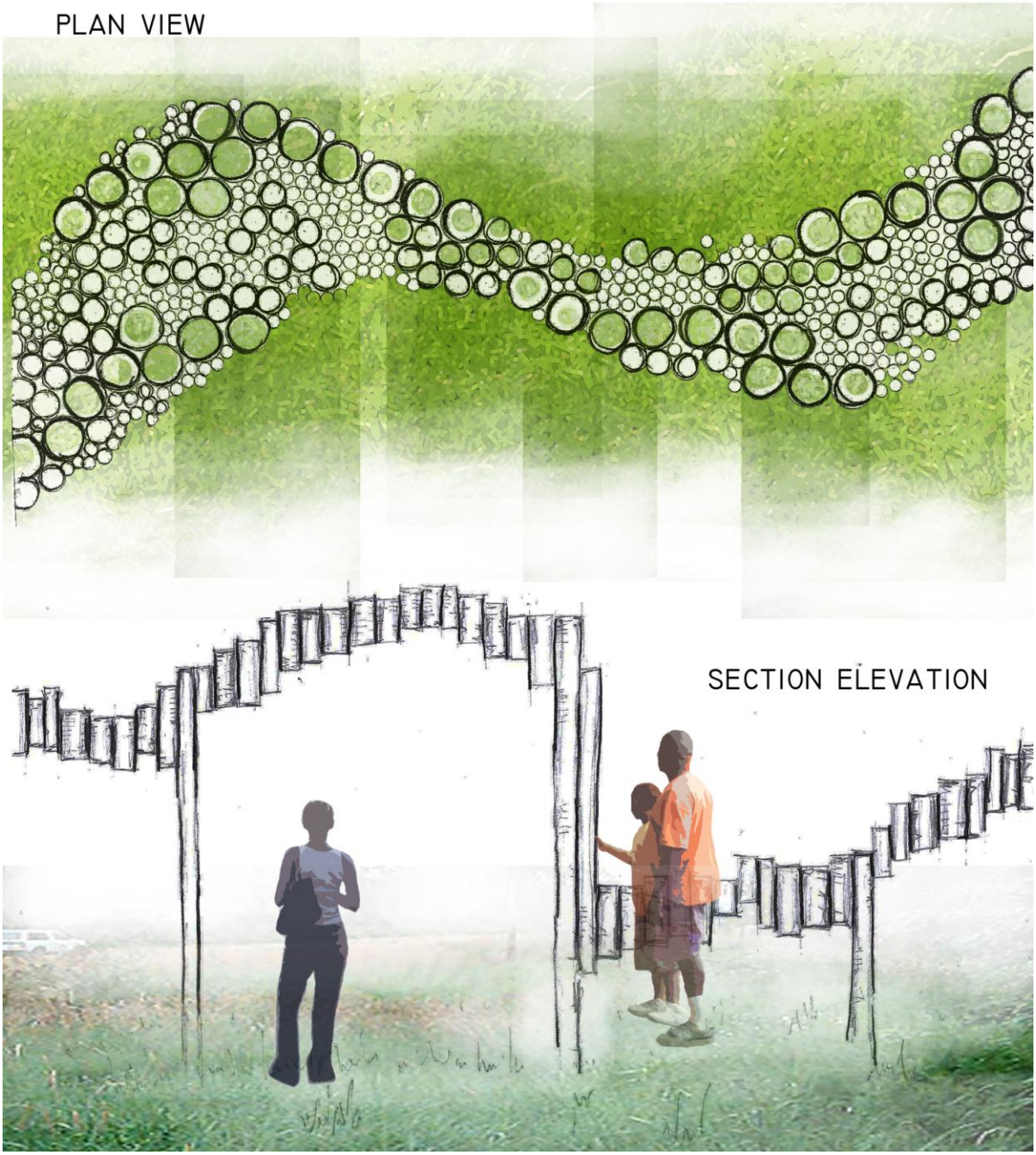


Figure 6.3 Sculptural PVC site marker
Source: created by author

Figure 6.4 PVC sculptural marker, shape and size can be modified by site
Source: created by author

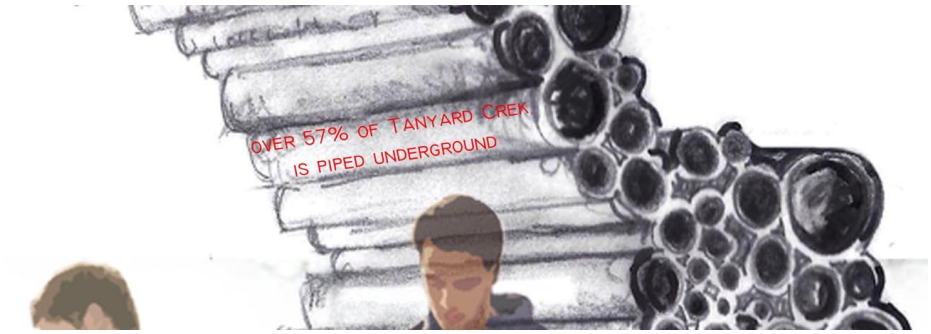


Figure 6.5 Information can be written on the long ends of the PVC pipe
Source: created by author

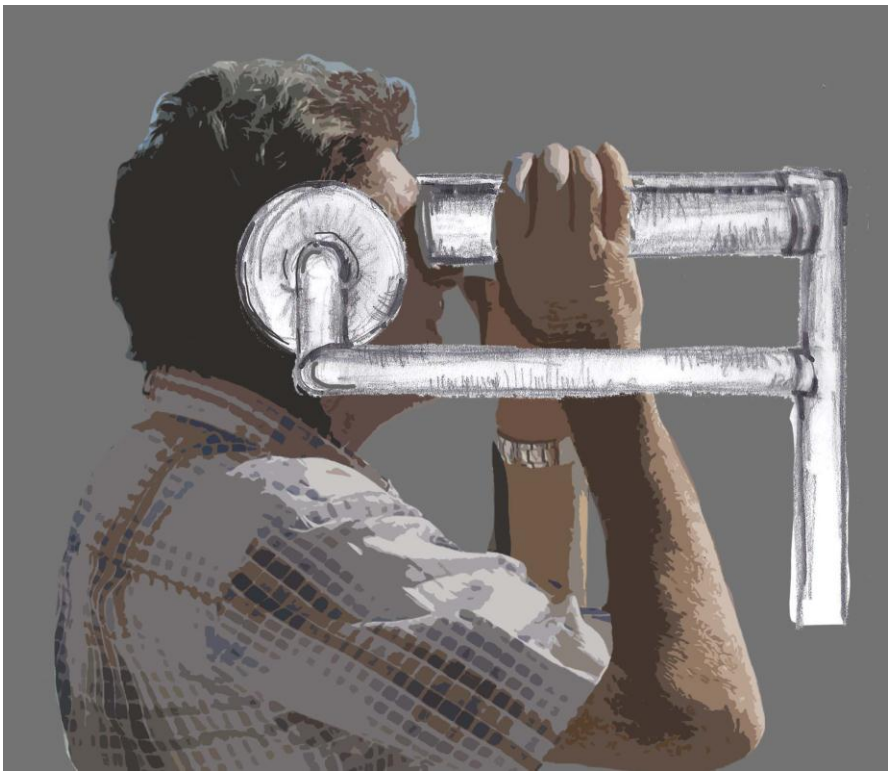


Figure 6.6 Sneak-a-Peek marker
Source: created by author

Figure 6.7 Sneak-a-Peek marker on the Tate Parking Deck
Source: created by author

The aluminum can site markers called “flashy stream” will be attached to beautify the unattractive fencing around the culvert near Baxter and the culvert under the stadium (figures 6.8–9). The aluminum will be punched into circles of two different sizes and attached to the fencing in a way that allows the aluminum to shake. Two same sized silver circles will be sandwiched together so that the silver side is always facing out and when there is even the slightest breeze it will shake and give a sparkling water like effect. The circles will be attached in a sinuous pattern to reinforce the water reference. Near the stadium the shaking circles can creep all the way up to the Sanford Drive by extending wire mesh out from the fence and up along the piers of the bridge. The form will then flow upwards along the pedestrians’ path and spill back downward, making a visual connection between the pedestrians and the creek below. These forms can be attached to signage for BMPs. A larger sturdier aluminum circle can hold the text necessary to tell viewers that this landscape amenity is helping to improve the health of the creek and the sinuous, shaking, sparkling circles can swirl around the sign bring the viewer’s attention towards the sign. A proto-type of this installation was created and installed indoors, seen in figures 6.9-10.

Figure 687 Proposed aluminum can attachment to fence at Baxter St culvert
Source: created by author

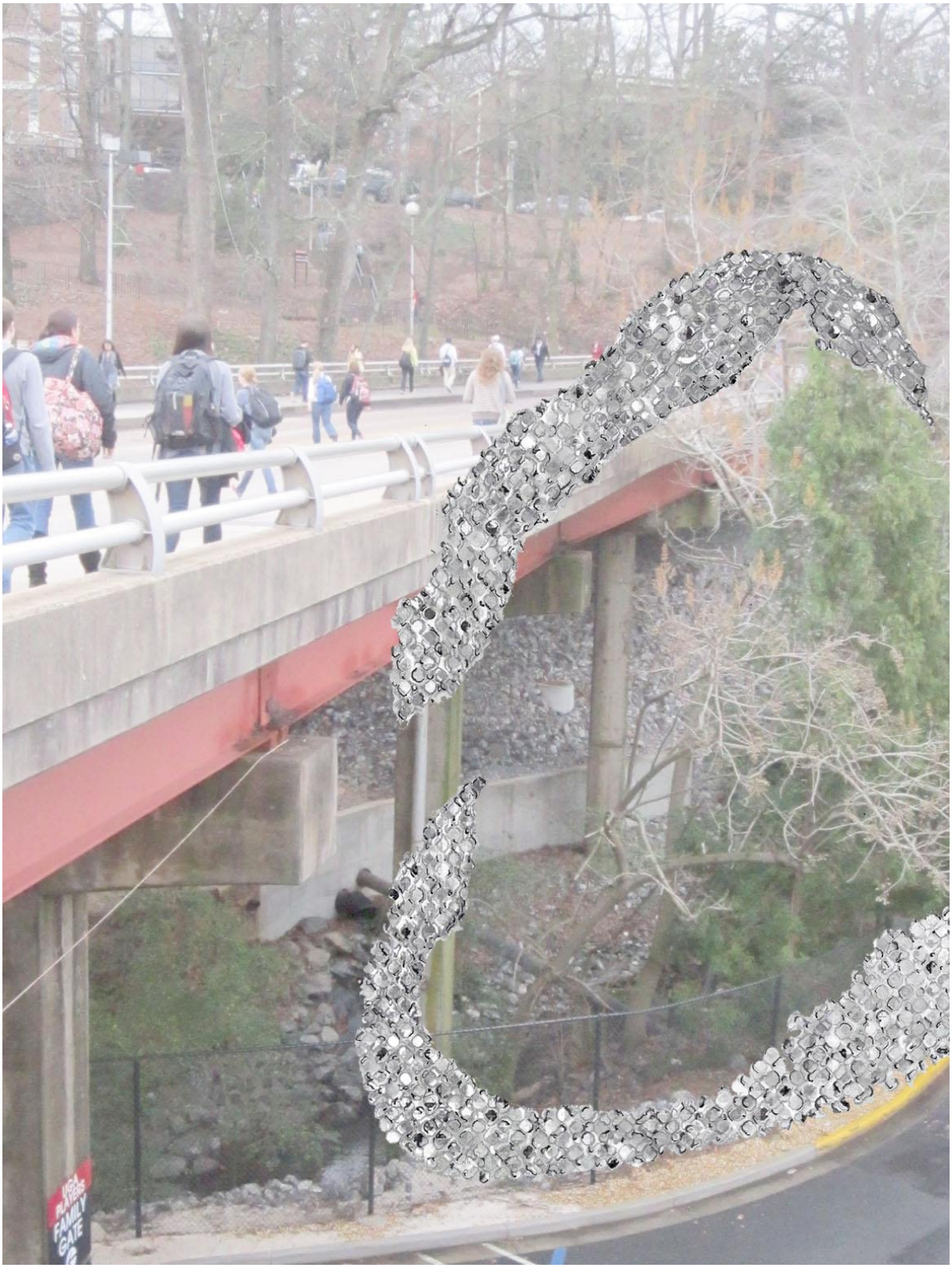


Figure 6.9 Proposed aluminum can attachment to fence and bridge at Sanford Drive
Source: created by author

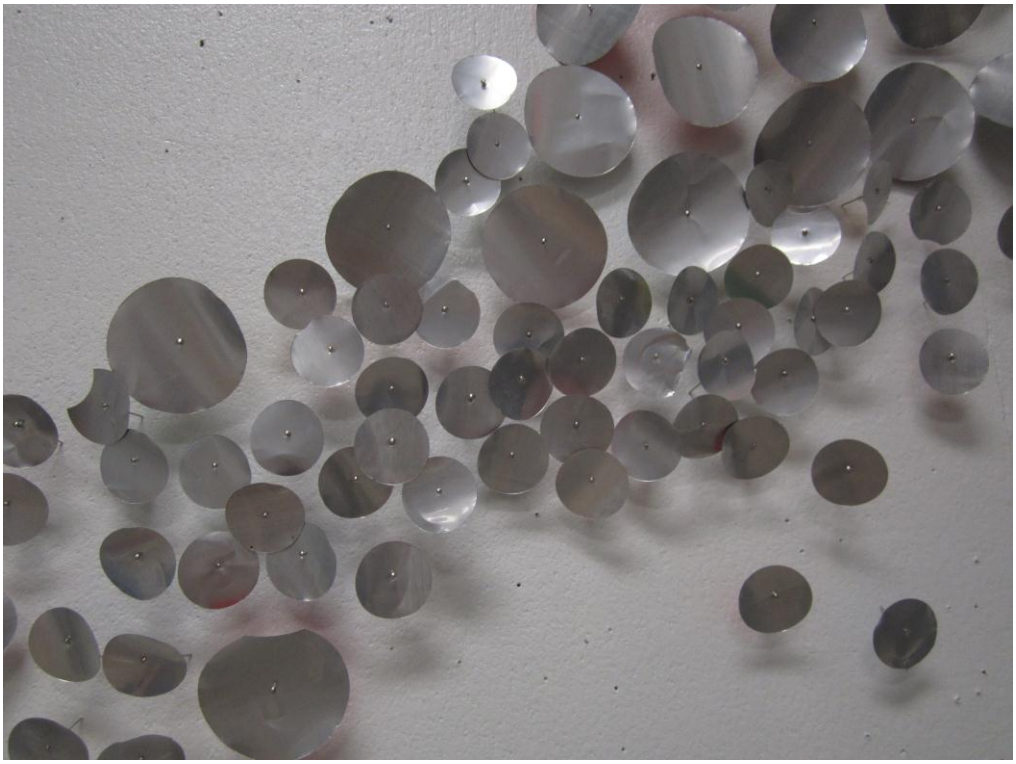


Figure 6.10 Close up of a proto-type installation indoors
Source: created by author, photo taken by author

Figure 6.11 Proto-type installation indoors
Source: created by author, photo taken by author

The placement for sculptural markers, sneak-a-peek markers, and aluminum sparkle markers can be seen on the map below (figures 6.12-13). Markers were not placed near the Broad Street section of the creek because the property ownership, population, traffic, and relationship to the creek was very different in this section and would require a different strategy that will not be addressed in this thesis.

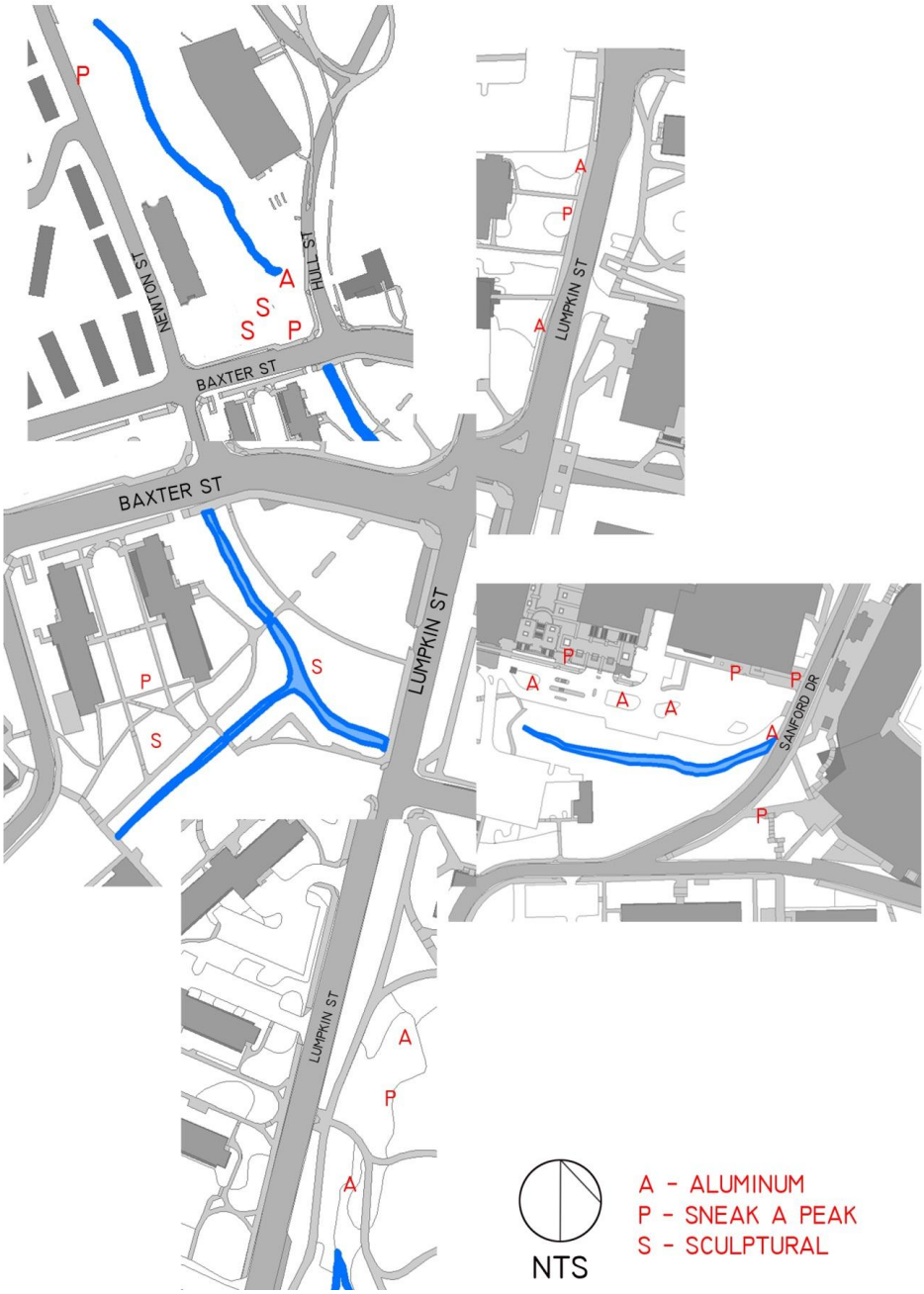


Figure 6.12 Location of site markers
Source: created by author

Figure 6.13 Sneak-a-peek locations on edge of drainage basin
Source: created by author

During a night UGA football game a temporary installation will be installed. Light beams created from solar will form a path in the sky that will follow the course of the creek and the edge of the drainage

basin (figure 6.12). This will give game day goers a reminder of the creek and a new perspective of the scale of the channel and what its drainage basin looks like. Along with the beams of light would be accompanying signage on the ground to explain the installation.

Figure 6.14 Looking South on Lumpkin Street during the proposed solar light beam installation
Source: created by author

The charts below show how the structure and specific installation designed for Tanyard Creek utilize the motives and strategies from the cumulative list created from the baseline and the case studies. This work utilizes many of the preferred motives and strategies but also uses additional ones.

Table 6.1 Comparison of Tanyard Creek installation motives with cumulative motives
Source: created by author

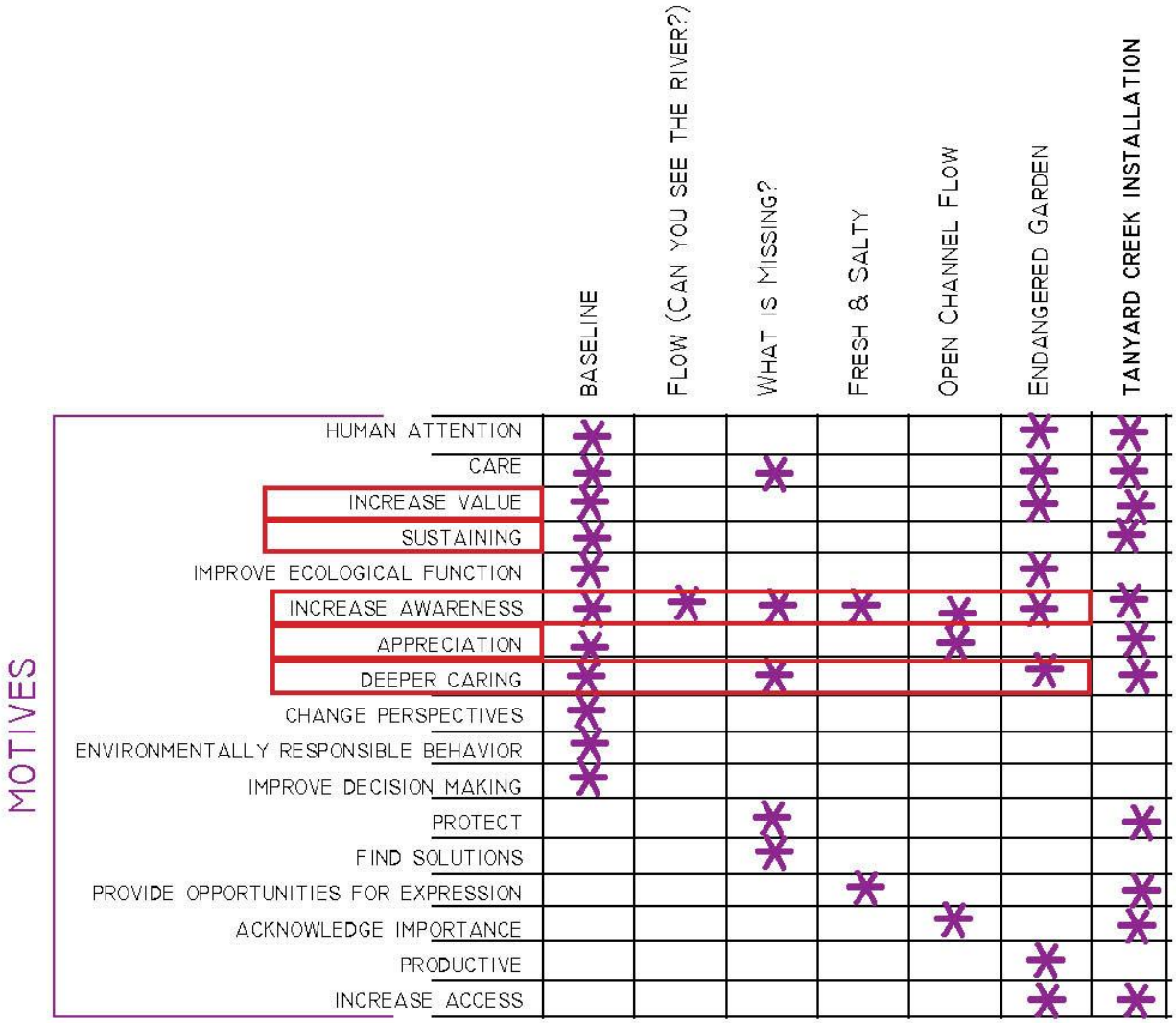


Table 6.2 Comparison of Tanyard Creek installation action strategies with cumulative action strategies
Source: created by author

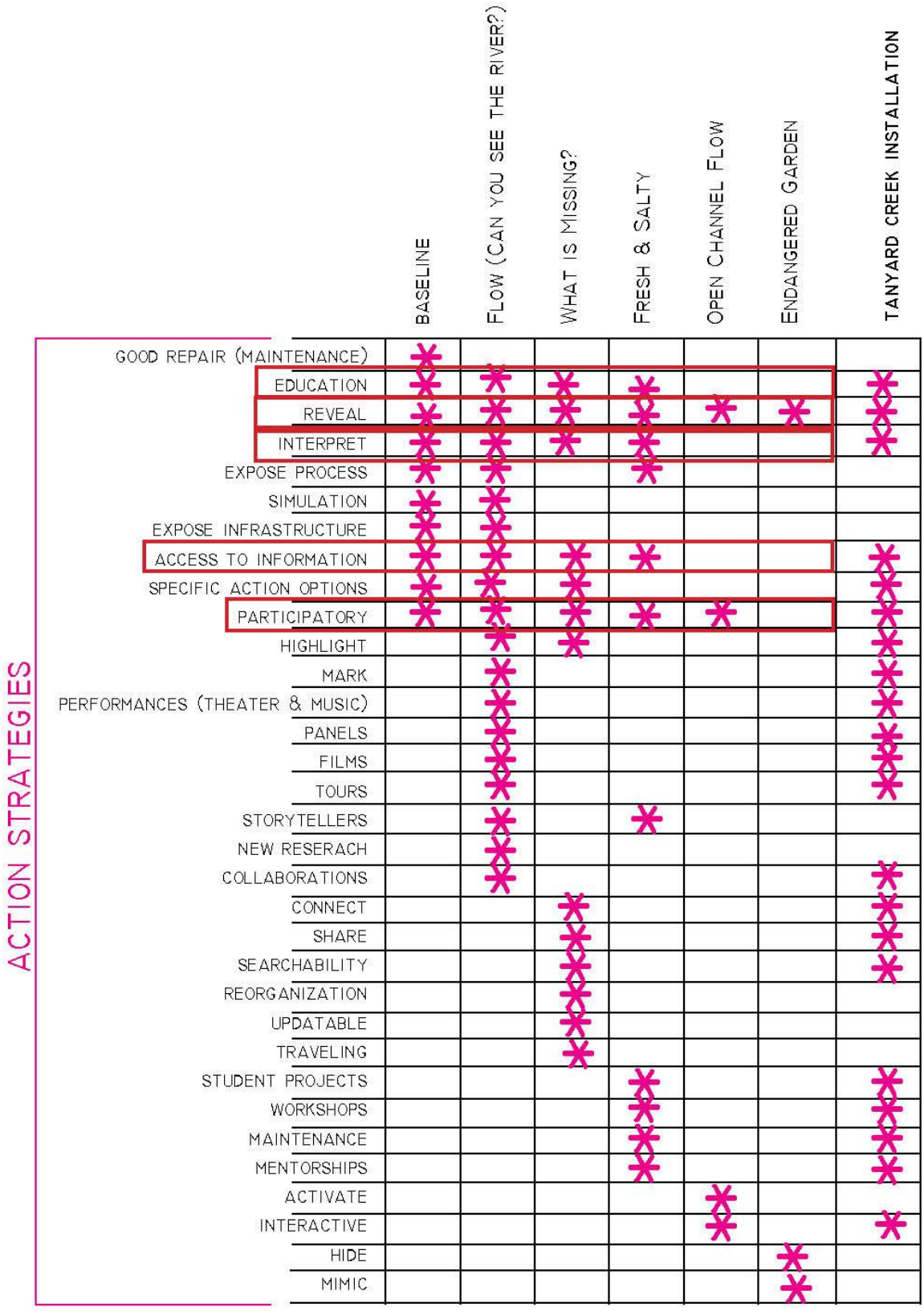
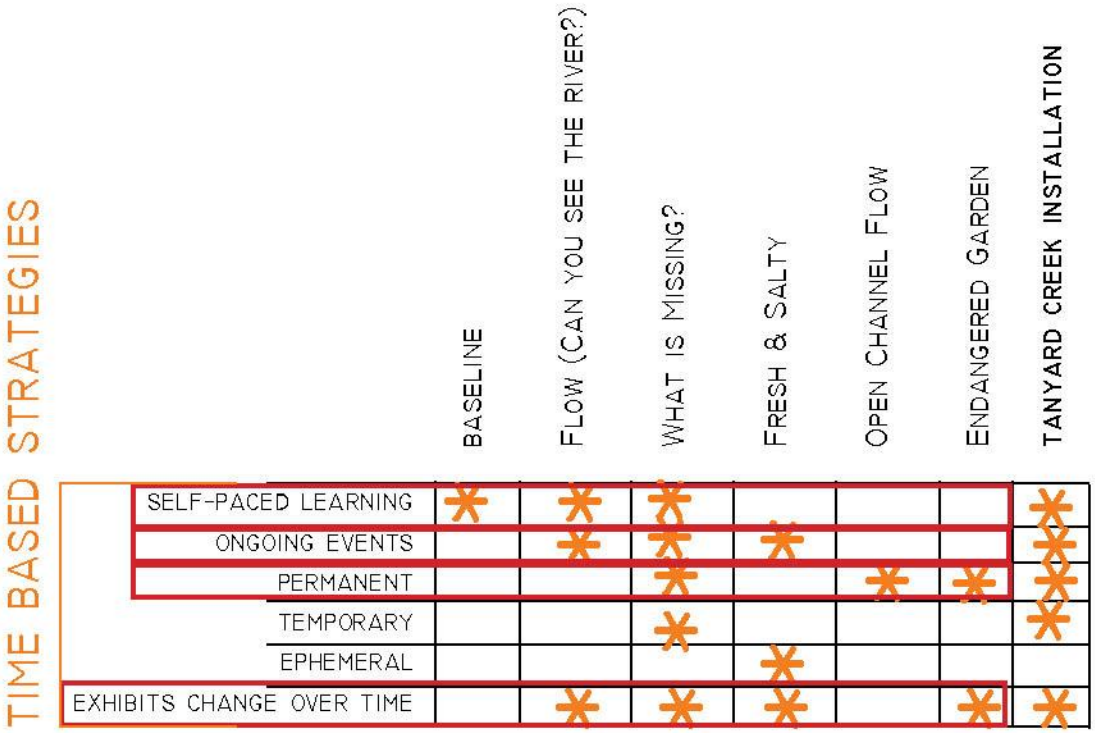


Table 6.3 Comparison of Tanyard Creek installation form strategies with cumulative form strategies
Source: created by author

Table 6.4 Comparison of Tanyard Creek installation sensory strategies with cumulative sensory strategies
Source: created by author

Table 6.5 Comparison of Tanyard Creek installation time based strategies with cumulative time based strategies
Source: created by author



FUTURE RESEARCH

More research is necessary on how art in the environment can promote a social sustainability for urban waterways. The author believes that the relationship between art in the environment and landscape architecture could be further explored. How are landscape architects partnering with artists? How are landscape architects creating "works of art"? How do individual practitioners draw the line between art and design? What are the potentials here?

The reviewed case studies used literature from the makers of the work. It would be interesting to get more information from those viewers who experienced the work. Did in fact these works effect people in the ways that the artist intended? Did many people search out more information and follow through with actions in their community after visiting the work? Most importantly, did these works make these landscape systems more valuable to those who viewed them? A survey of viewers would help illuminate

the answers to some of these questions. Which communities are accessing these works? Is the audience that these works are reaching limited in diversity? Are there groups who are being excluded?

More historic information about Tanyard Creek is necessary. The literature painted a fuzzy picture of this creek and the author believes there is more to find out. Further knowledge concerning the history of the site could be relayed with information or referential imagery in the installation. The author believes that the more informed citizens are about the world around them then the more interesting they find it and the greater appreciation they might have for it. This includes understanding the history of this site and providing a deeper richer understanding of Tanyard Creek.

The photo reveal was conducted with a very limited selection of people and a photo reveal with a larger random sample would produce some interesting images and diverse responses. More surveys of the populations that walk by the creek would reveal relationships and knowledge of the creek and could provide some interesting information.

In addition, prototype installations could be installed throughout the campus and drainage basin. Further data through observation and behavior mapping as well as interviews or surveys could help illuminate how these types of works effect the awareness and appreciation level that Athens citizens have for Tanyard Creek.

Tanyard Creek has been pushed out of the consciousness of the surrounding community by the urban conditions. A sustained effort of recognition through art in the environment may help bring the creek back into the community's consciousness instigating a renewed ownership of the creek. The next steps would be to collect data on the level of consciousness surrounding degraded urban waterways and the how those levels change if art in the environment is used as a strategy. Next data should be collected on the relationship between levels of awareness and subsequent actions towards improving the health conditions of urban waterways. While more research is necessary this thesis does suggest that art in the environment has potential for improving the communities' awareness and appreciation for urban waters, such as Tanyard Creek, which may be a vital link towards a collective environmental action.

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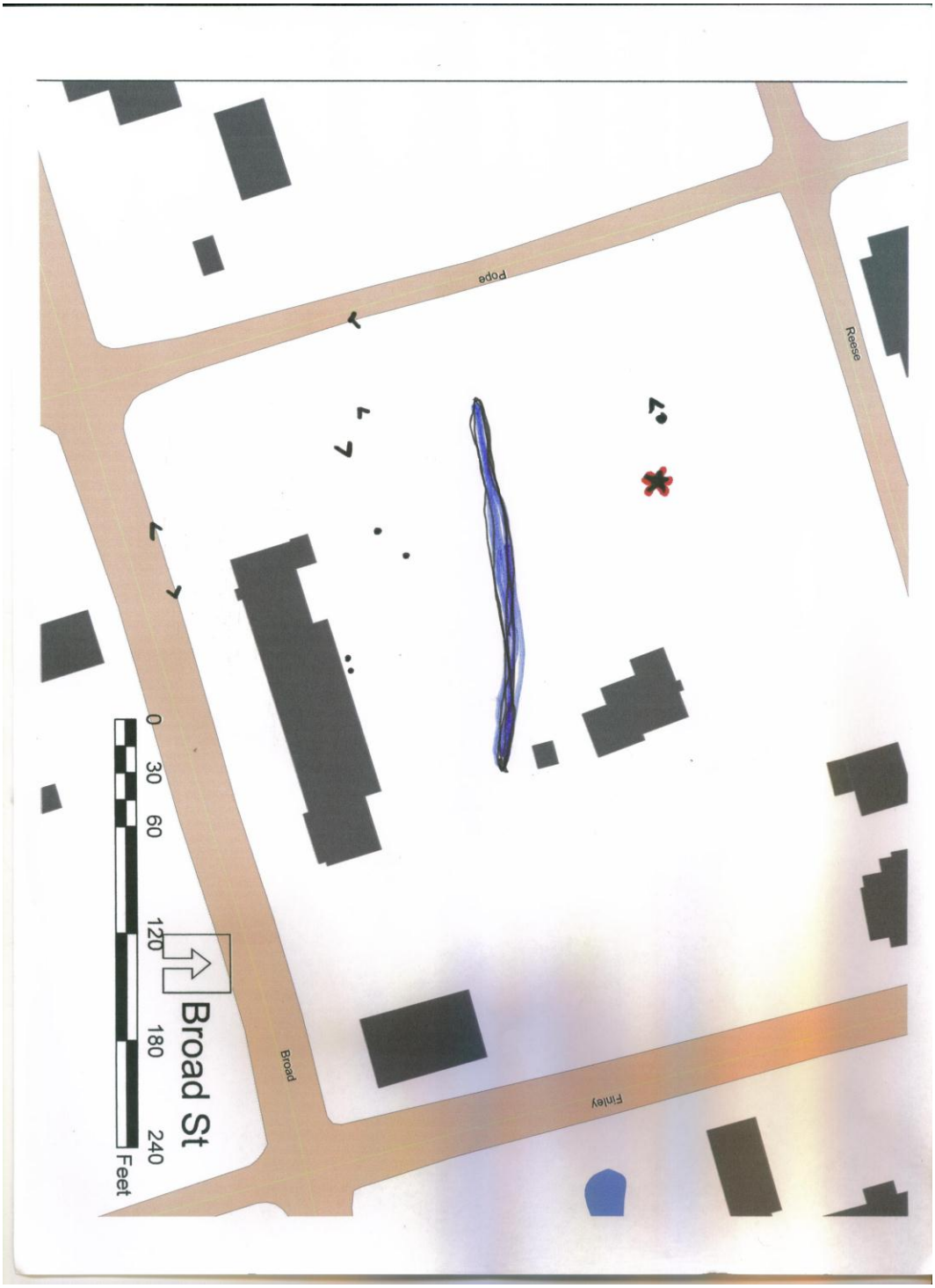
APPENDIX A: OBSERVATION AND BEHAVIOR MAPPING DATA

BROAD STREET SECTION



Observation and Behavior Mapping

Date: FRIDAY 1/13/12

Time start: 10:50AM Time end: _____

Weather: sunny cold about 40°, occasional gusts of wind

Section of Creek: Bens Bikes

Place of observation: path below park

Smells: _____

Sounds: turning diesel engine, leaves rustling, in wind, traffic on road, dog barking, woodpecker?, other birds airplane, train horn

Visual appeal: overgrown but not trashed, planted edge along BB parking lot

Visual access to creek: no overstory trees but deep bank + low veg.

Fauna: birds, dog

People Ages: youth | ~~young adult~~ | adult ||||

Access: natural bridge made to cross | no path along edge but is accessible by foot.

Observation and Behavior Mapping

Date: 1/26 Thurs.

Time start: 3pm Time end: 4pm

Weather: Foggy 60° ish.

Section of Creek: Broad

Place of observation: next to tree + path

Smells: none

Sounds: birds, people talking at park

Visual appeal: overgrown but somewhat tended.

Visual access to creek: medium

Critters: birds, bugs, squirrels.

People
Ages: youth adult

𝍸 𝍸 ||||

people
hanging out
at park

people working
at Bars Bikes.
hanging out front
some customers
but not many.

Observation and Behavior Mapping

Date: 2/6 Mon.

Time start: 12 Time end: 1

Weather: grey sort of chilly.

Section of Creek: Broad

Place of observation: next to tree by path.

Smells: none really.

Sounds: birds, cars, motorcycle

Visual appeal: medium. some care has been taken + its obvious there is intention to this section of creek

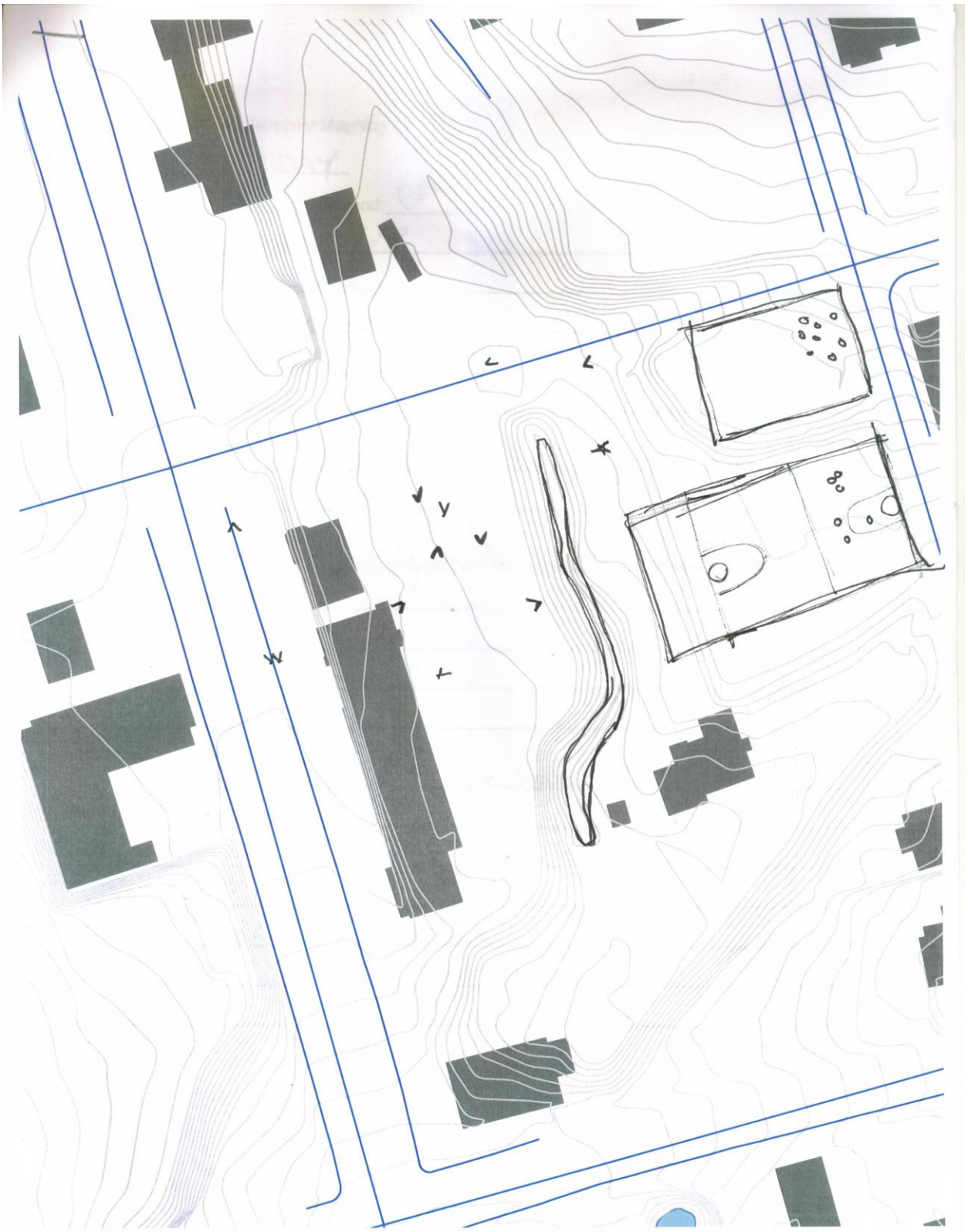
Visual access to creek: medium.

Critters: birds. squirrels, normal urban critters.

People
Ages: youth adult

|||| |||

not
very
many
people today.



Observation and Behavior Mapping

Date: 2.17 FRIDAY

Time start: 4:30 Time end: 5:30

Weather: sunny 65°

Section of Creek: Broad.

Place of observation: by park

Smells: none

Sounds: cars, playing basketball, yelling talking in park. birds

Visual appeal: mucho overgrowth. but semi taken care of.

Visual access to creek: med. can see bank but no water.

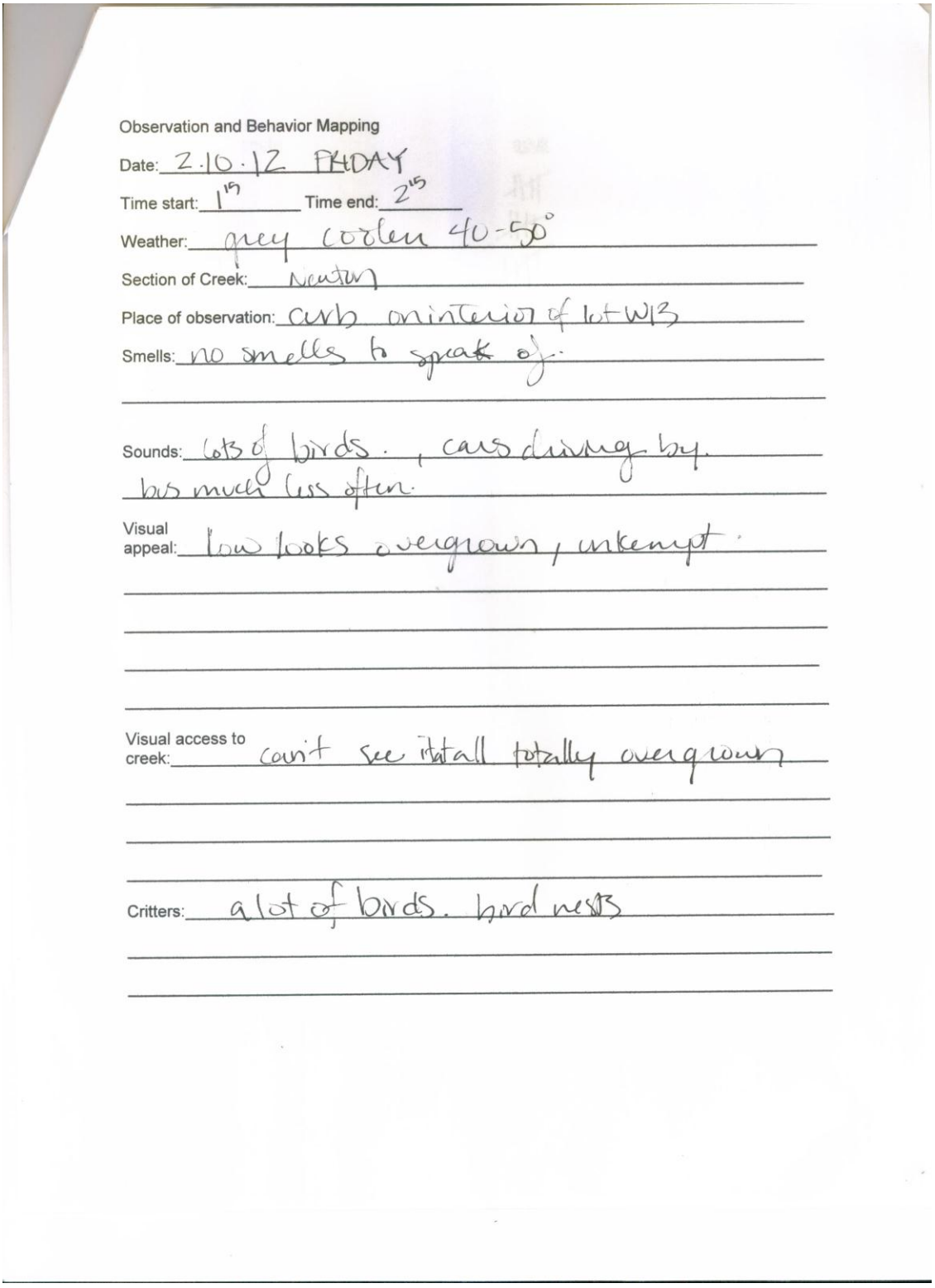
Critters: birds. cardinal.

People
Ages: youth adult

29

- Playing BBall
- sitting in the park
- visitors of Bens Bikes

NEWTON STREET SECTION



Observation and Behavior Mapping

Date: 2.10.12 FRIDAY

Time start: 1:15 Time end: 2:15

Weather: grey cooler 40-50°

Section of Creek: Newton

Place of observation: curb on interior of lot WB3

Smells: no smells to speak of.

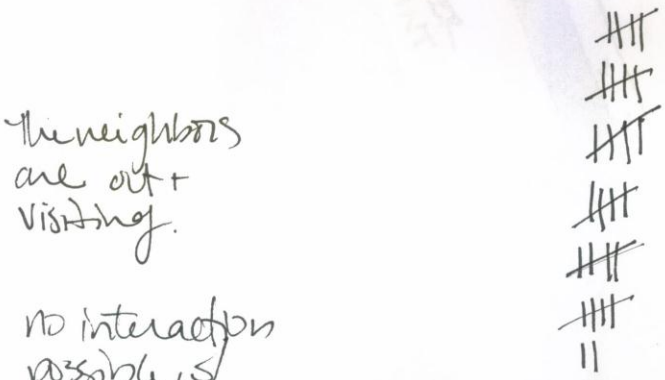
Sounds: lots of birds., cars driving by. bus much less often.

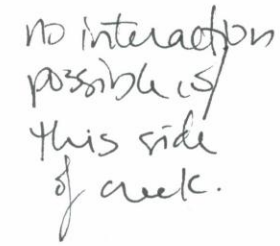
Visual appeal: low looks overgrown, unkempt.

Visual access to creek: can't see it at all totally overgrown

Critters: a lot of birds. bird nests

People
Ages: youth adult






CHILLER PLANT
HULL DECK

Observation and Behavior Mapping

Date: 4/13/12 Friday

Time start: ~~12:00 noon~~ Time end: 1pm

Weather: sunny cold breezy 40° about

Section of Creek: newton

Place of observation: on hill by culvert edge

Smells: whiff of sugary sweet, no malodors

Sounds: sweet sugar motorcycle, leaves rustling in wind, birds, cars, diesel engine, footsteps, buses, trucks

Visual appeal: limited, fenced, armored.

Visual access to creek: only at culvert rest blocked by excessive vegetation.

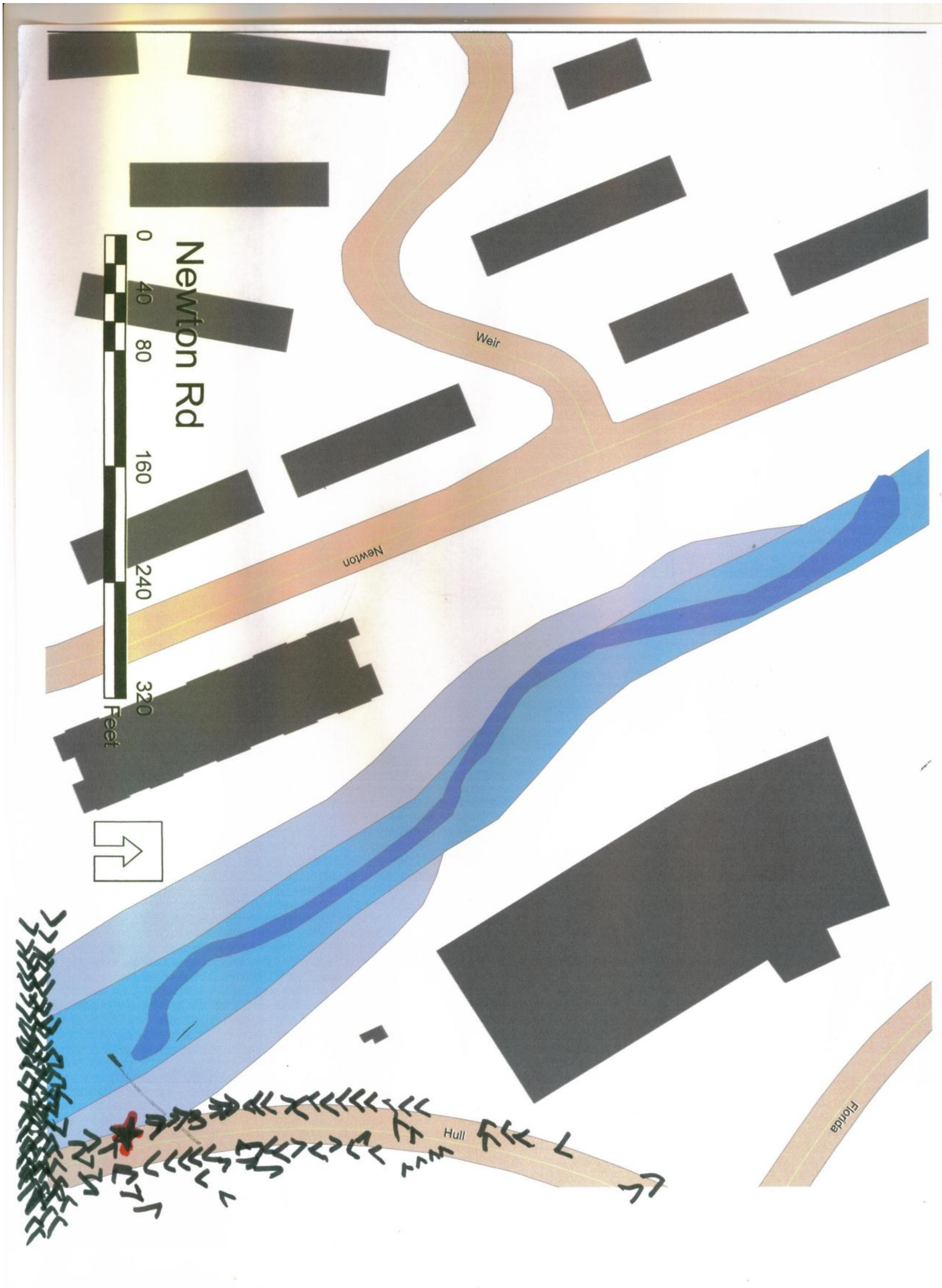
Fauna: birds

nothing visible in creek.

People Ages: youth ~~young adult~~ adult

access

no path starting next to creek but turf that you can walk across -


Newton Rd
0
40
80
160
240
320
Feet
Weir
Newton
Hull
Florida

Observation and Behavior Mapping

Date: 2/15/12 Wed.

Time start: 4:30 Time end: 5:30

Weather: sunny cool 55°-60°

Section of Creek: Newton

Place of observation: by culvert

Smells: earthy.

Sounds: construction! cars.

Visual appeal: low trashy. unkempt. open mowed edge. no seating.

Visual access to creek: have to be right next to edge.

Critters:

People
Ages: youth

adult

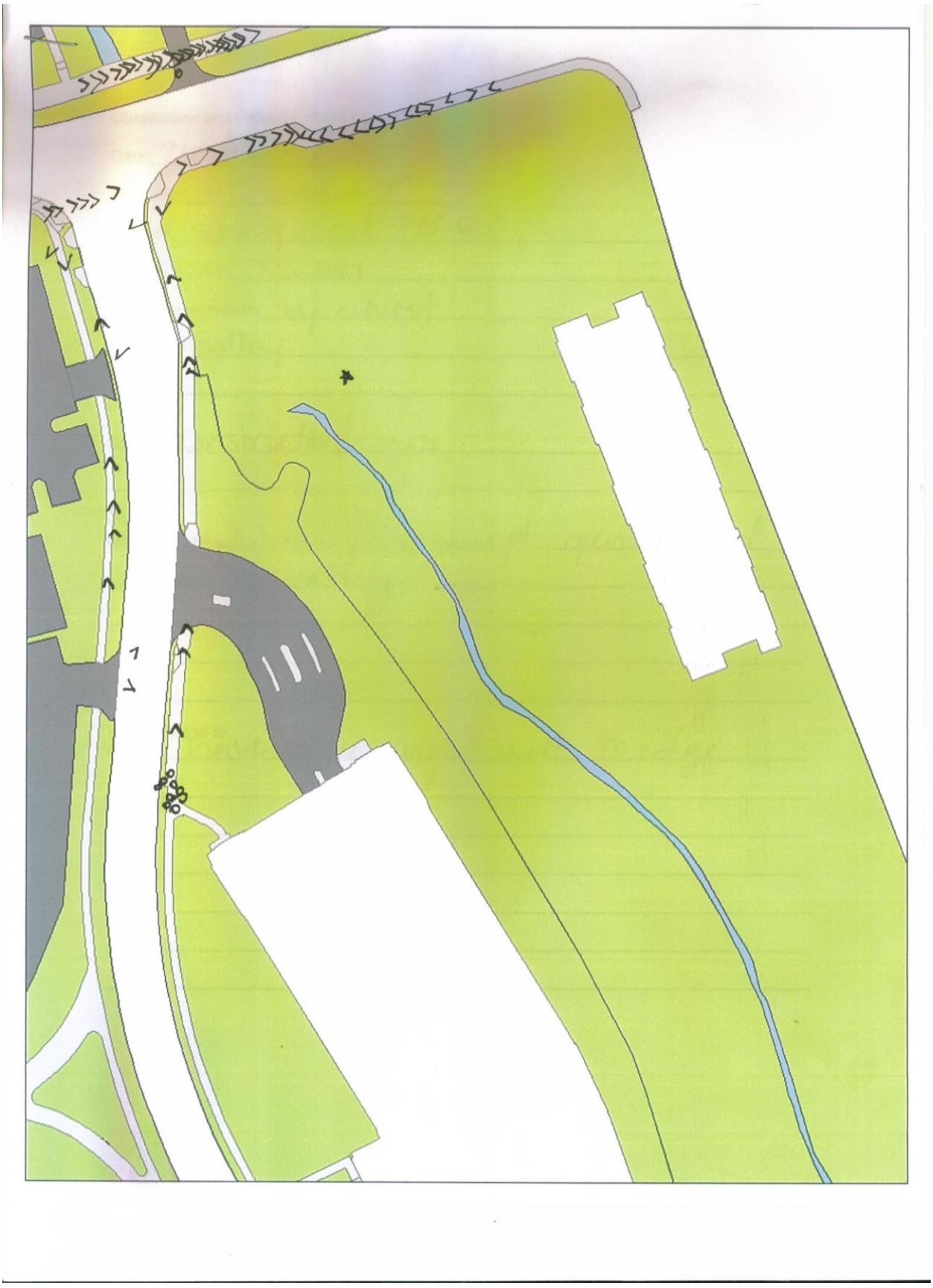
104

construction workers up by lib.

cop sitting across street.

for such a nice day not a lot of people out!

way more cars than people now.



Observation and Behavior Mapping

Date: 2.16.12

Time start: 2 pm Time end: 3 pm

Weather: slightly drizzling. grey 55° ish.

Section of Creek: newton

Place of observation: across st. by legion culvert.

Smells: none.

Sounds: airplane, cars, construction.

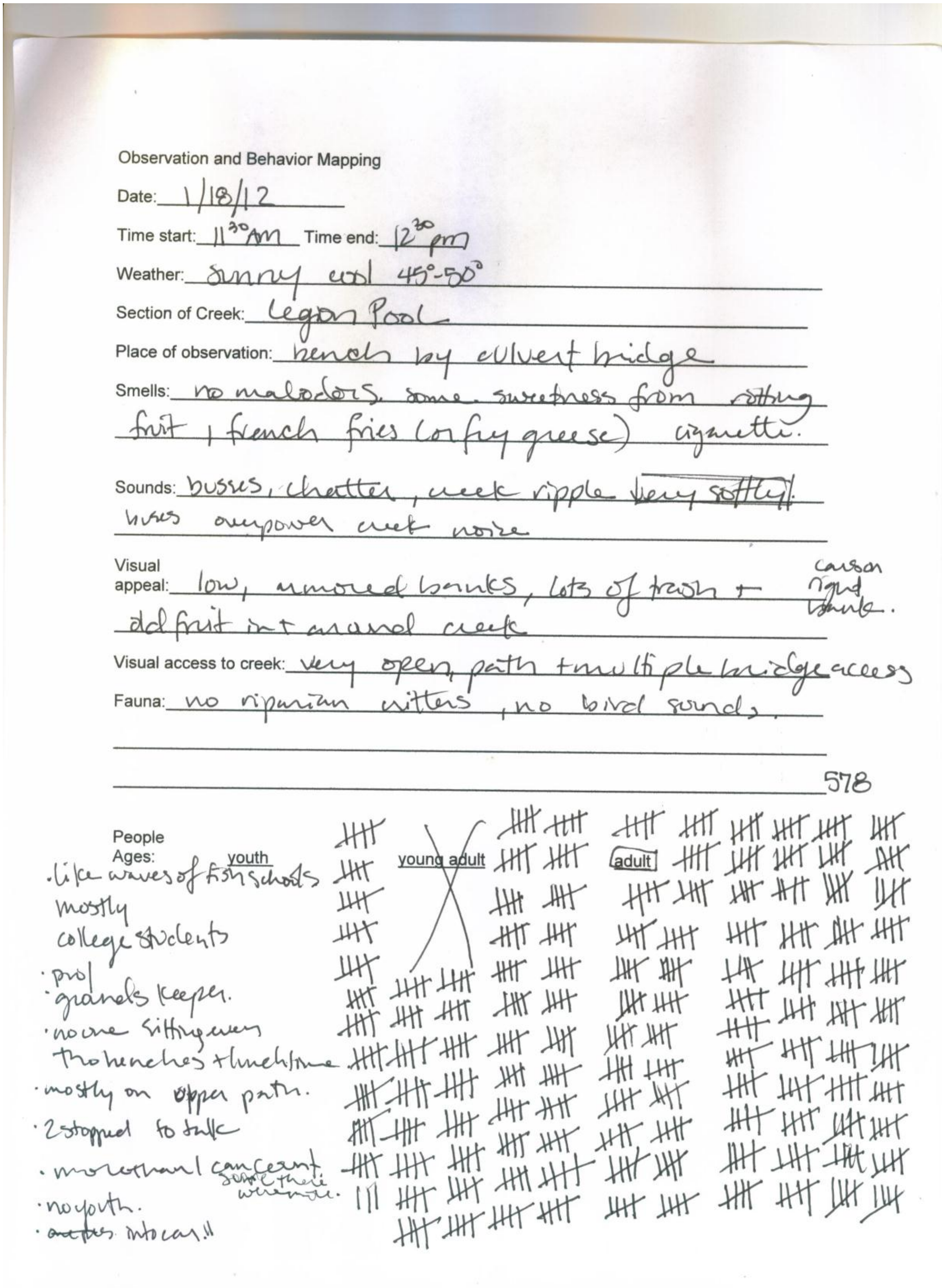
Visual appeal: low - mound of dirt, fence. squished in between buildings.

Visual access to creek: none from here.

Critters: none to speak of. can't even see or hear any birds.

People
Ages: youth adult

LEGION POOL SECTION



Observation and Behavior Mapping

Date: 1/18/12

Time start: 11^30 AM Time end: 12^30 pm

Weather: sunny cool 45°-50°

Section of Creek: Legion Pool

Place of observation: bench by culvert bridge

Smells: no malodors, some sweetness from rotting fruit, french fries (or fry greese) cigarette.

Sounds: busses, chatter, creek ripple ~~very softly~~. buses overpower creek noise

Visual appeal: low, armored banks, lots of trash + old fruit in + around creek. carson right bank.

Visual access to creek: very open, path + multiple bridge access

Fauna: no riparian critters, no bird sounds.

578

People Ages: youth, young adult, adult

· like waves of fish schools

mostly college students

· prof

· grounds keeper.

· no one sitting even tho benches + lunchtime

· mostly on upper path.

· 2 stopped to talk

· more than 1 cancer. some there were more.

· no youth.

· ~~another~~ into car.!!


Lumpkin
Hull
Baxter
Cloverhurst
Legion Pool
0
40
80
160
240
320
Feet

Observation and Behavior Mapping

Date: 2/6/12

Time start: 1:45 Time end: 2:45

Weather: grey, chilly but not cold - getting colder.

Section of Creek:

Place of observation: parking lot corner of Baxter + Lumpkin on grass

Smells: no malodors or other strong smells, whiff of coffee roaster?

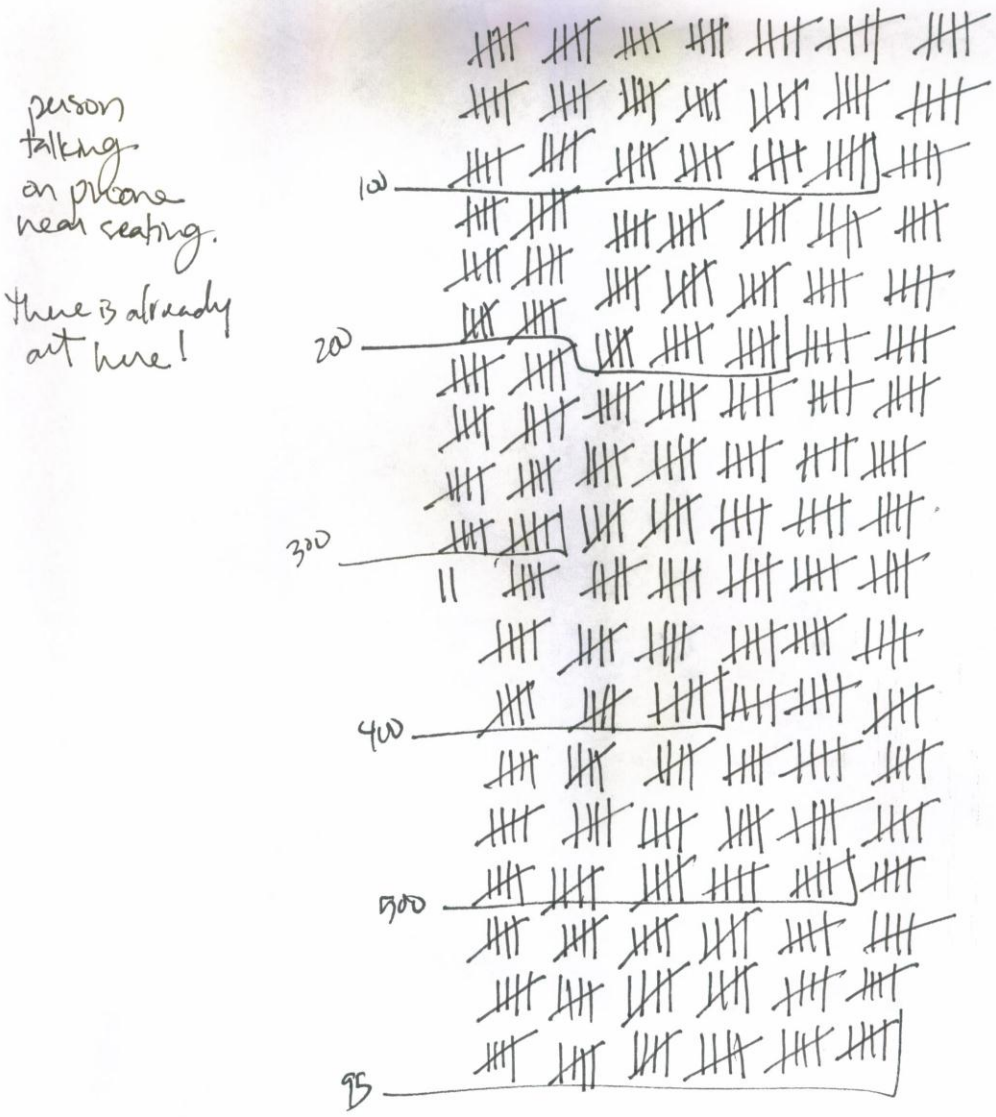
Sounds: I can hear some water trickling cars, trucks, motorcycles, back up beeps, some bird chirps.

Visual appeal: low, very trashy, heavily armored, excessive veg. debris in creek.

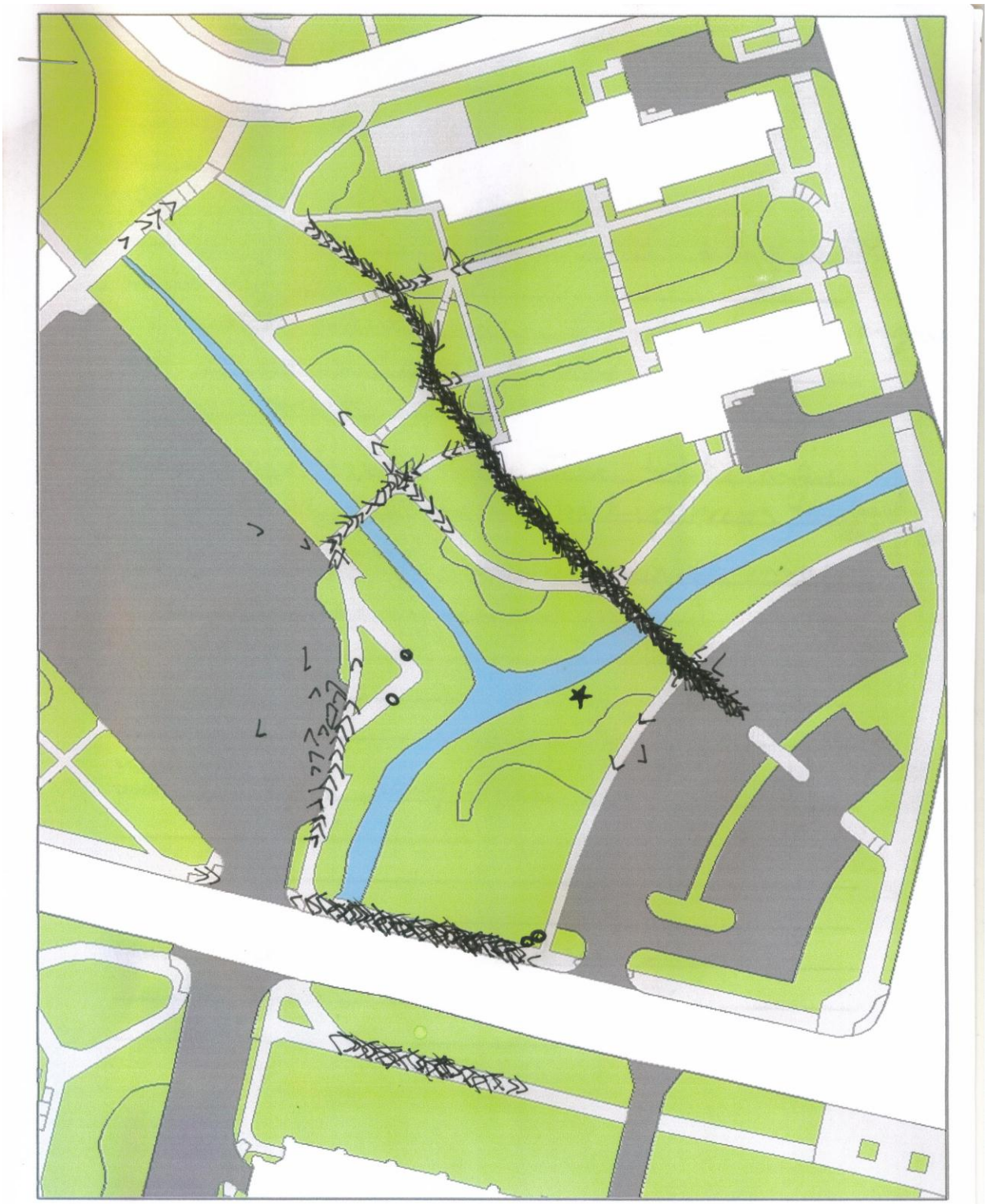
Visual access to creek: high, very open.

Critters: hear birds but don't see any no squirrels or fish or otherwise.

People
Ages: youth adult



597



Observation and Behavior Mapping

Date: Wed 2/15/12

Time start: 3:30 Time end: 4:30

Weather: sunny nice 55°-60°

Section of Creek:

Place of observation:

Smells:

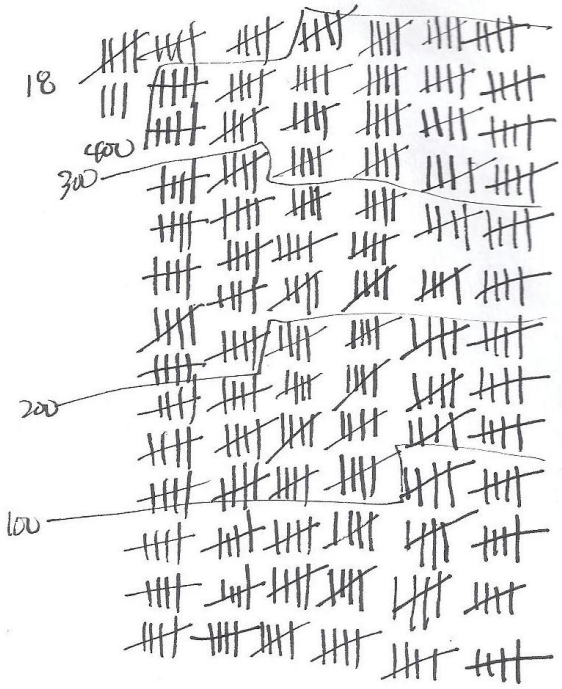
Sounds: cars, water trickle, laughter, buses, birds

Visual appeal: excessive build up of debris, trash.

Visual access to creek: very good.

Critters: a bird here + there

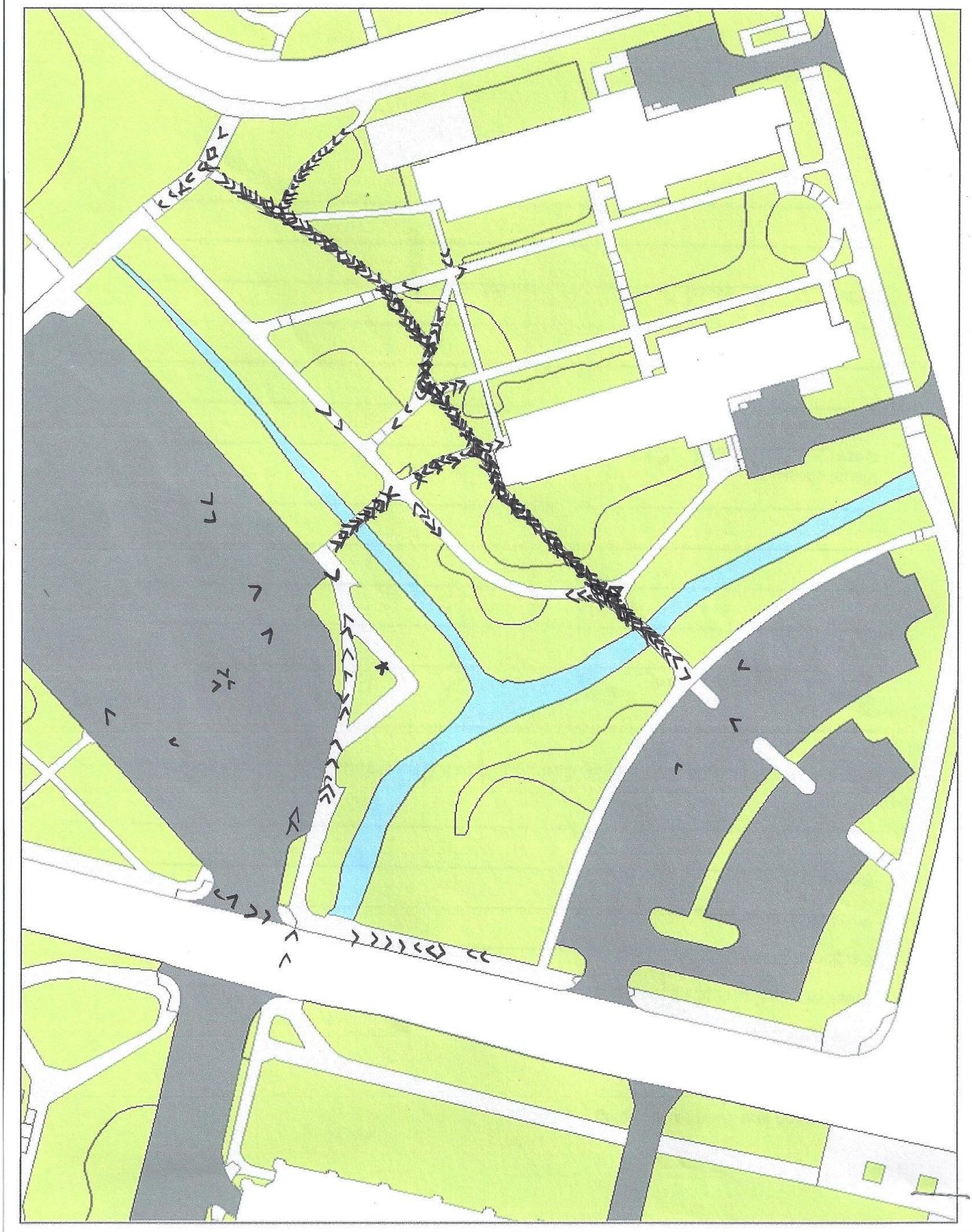
People
Ages: youth adult



slower traffic today than before.

one woman pacing around sitting one may be waiting for someone.

418



Observation and Behavior Mapping

Date: 2.16. ~~W~~ Thurs.

Time start: 3 Time end: 4

Weather: drizzly grey 55°

Section of Creek: Upper

Place of observation: bench in dorm area

Smells: none.

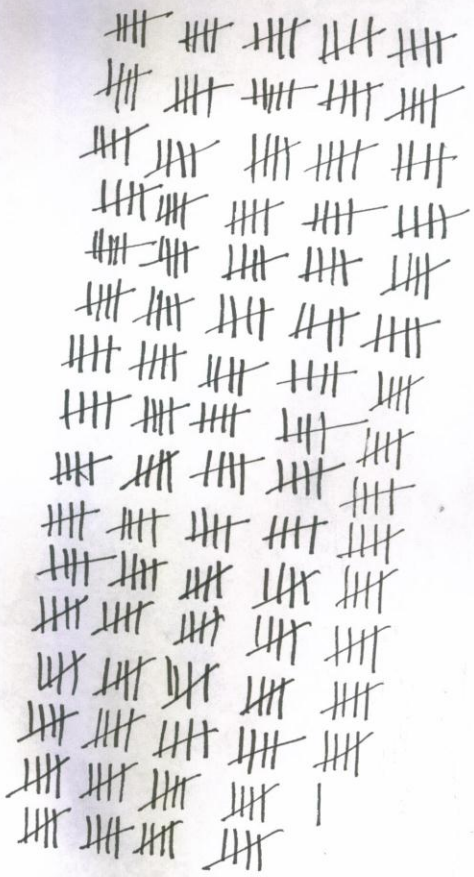
Sounds: buses! music in cars, chatting, birds.

Visual appeal: medium high vantage point. Nice.

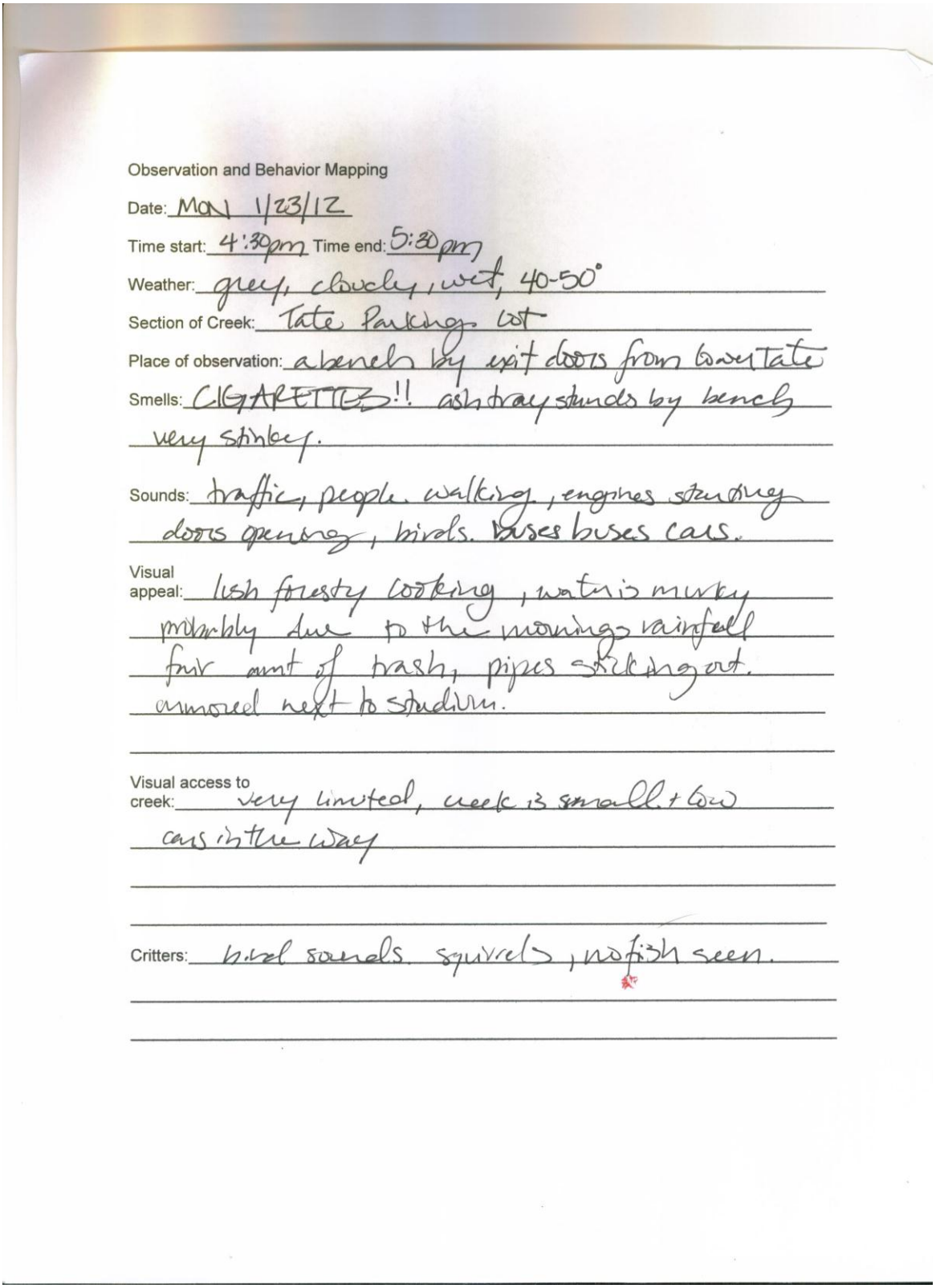
Visual access to creek: I guess this is medium I can see creek walls but no water really

Critters: squirrels

People
Ages: youth adult



TATE CENTER SECTION



Observation and Behavior Mapping

Date: MON 1/23/12

Time start: 4:30pm Time end: 5:30pm

Weather: grey, cloudy, wet, 40-50°

Section of Creek: Tate Parking Lot

Place of observation: a bench by exit doors from lower Tate

Smells: CIGARETTES!! ash tray stands by bench very stinky.

Sounds: traffic, people walking, engines starting doors opening, birds. buses buses cars.

Visual appeal: lush forestry looking, water is murky muddy due to the mornings rainfall fair amt of trash, pipes sticking out. armored next to stadium.

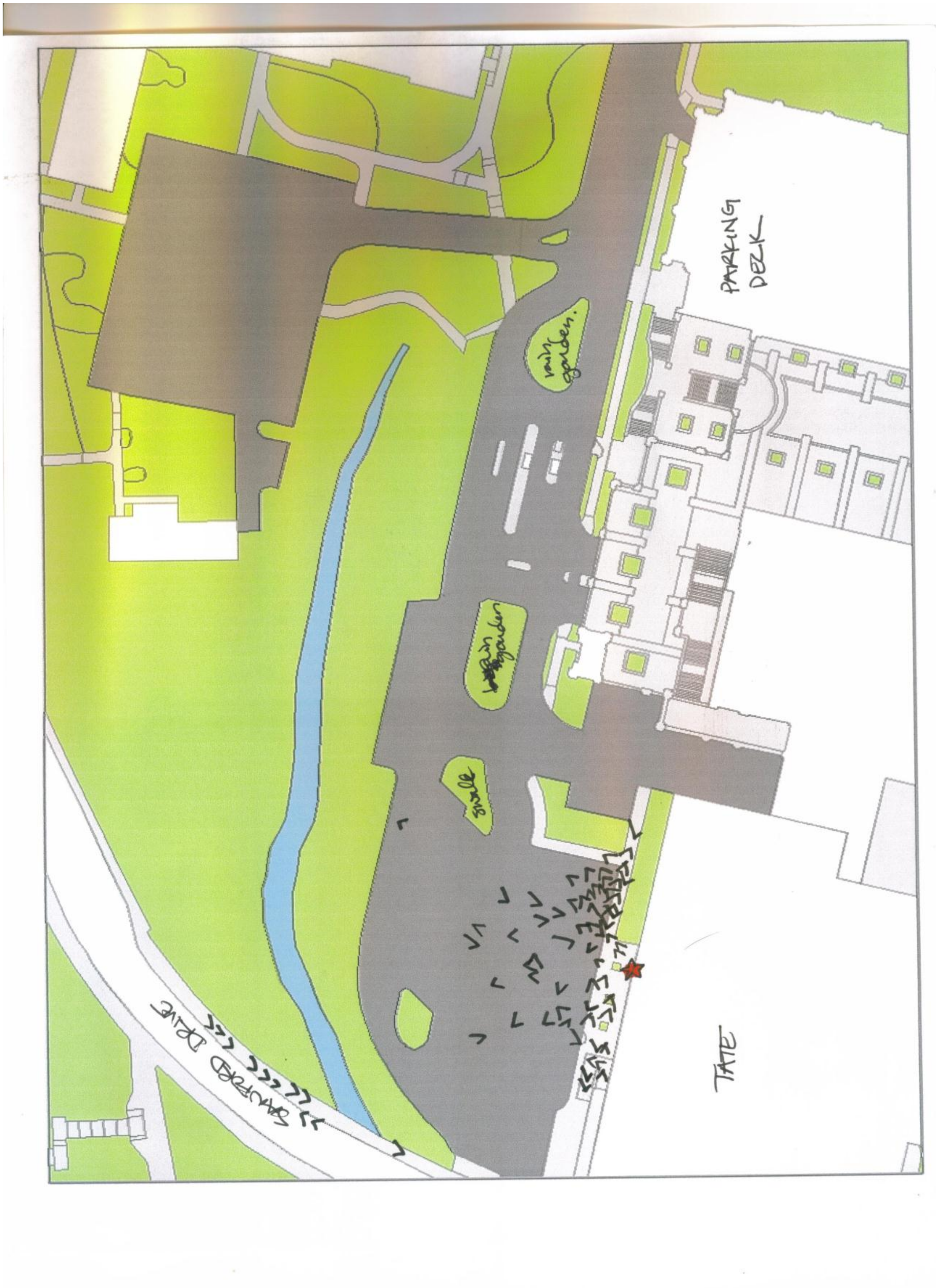
Visual access to creek: very limited, creek is small + low cars in the way

Critters: bird sounds squirrels, no fish seen.

People
Ages: youth adult

mostly going to
~~people getting off~~ and
~~work going~~ from
~~to~~ their
cars.

above
sanford
dr. mostly
students.


PARKING DECK
rain garden
rain garden
swale
SANFORD DRIVE
TATE

Observation and Behavior Mapping

Date: 1/26/12 THURSDAY

Time start: 1[illegible] Time end: 2:20

Weather: 60° Foggy

Section of Creek: Tate Center Parking Lot.

Place of observation: bridge to tate from Sanford

Smells: no strong odors.

Sounds: construction, buses, cars, people. keys car doors

Visual appeal: some trash in trees. pipe across bank. fence not pleasant

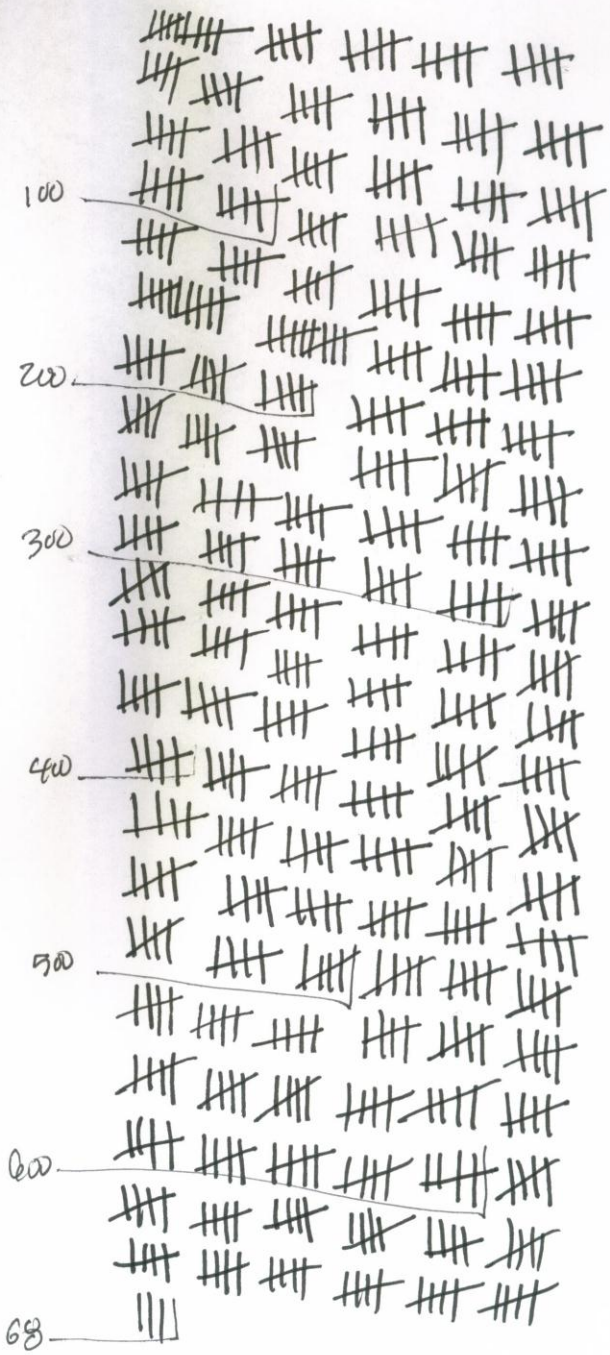
Visual access to creek: very low from bridge but high from my vantage point.

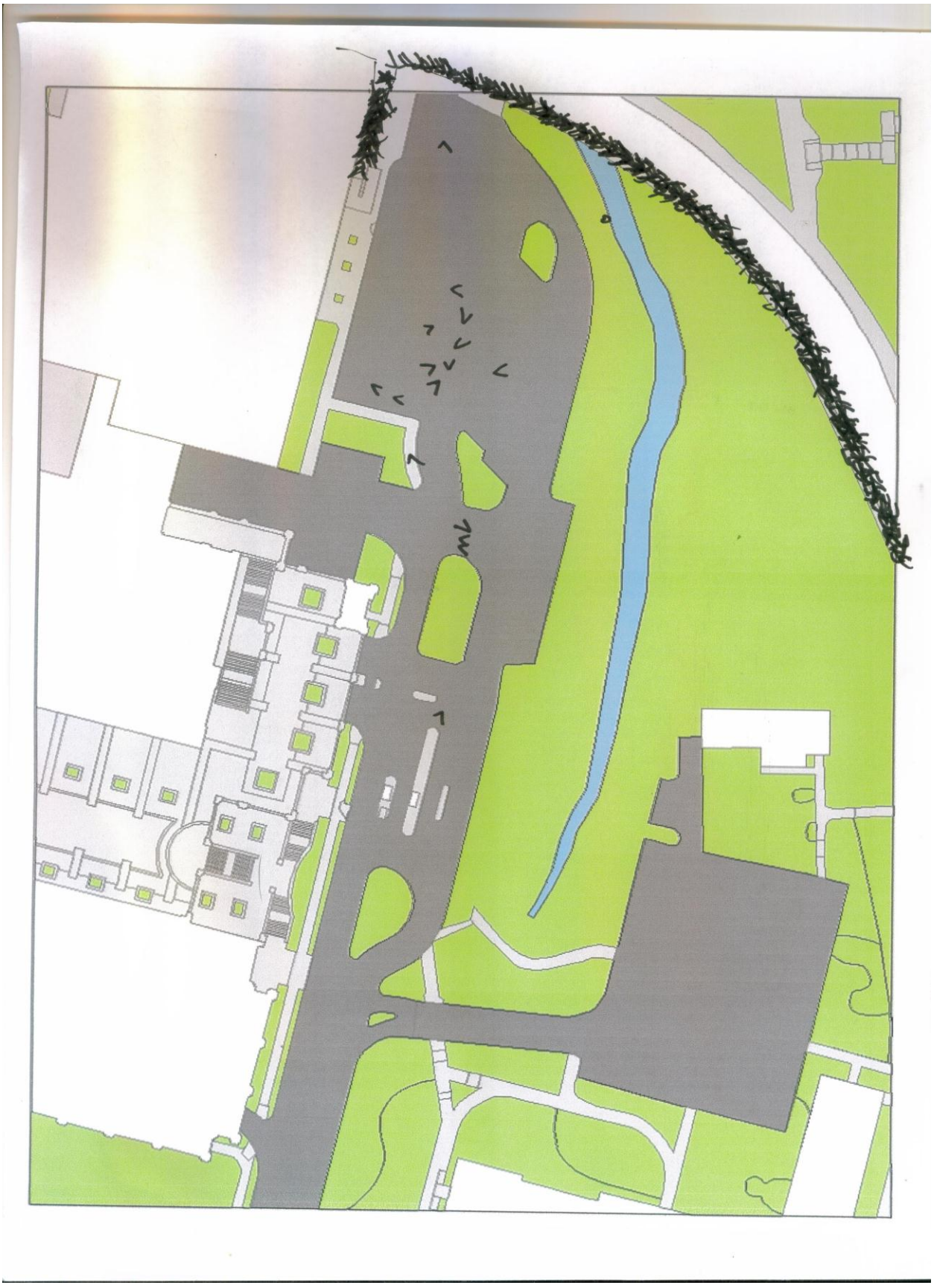
Critters: just squirrels in parking lot veg.

People
Ages: youth adult

- one girl photographing creek
- mostly students some older folks.
- didn't even count folks on opp. sidewalk.
- at around 2pm major lull.

- 668 people!





Observation and Behavior Mapping

Date: 2.13.12

Time start: 1:30 Time end: 2:30

Weather: sunny, cooler

Section of Creek: Tate Center

Place of observation: steps below sanford.

Smells:

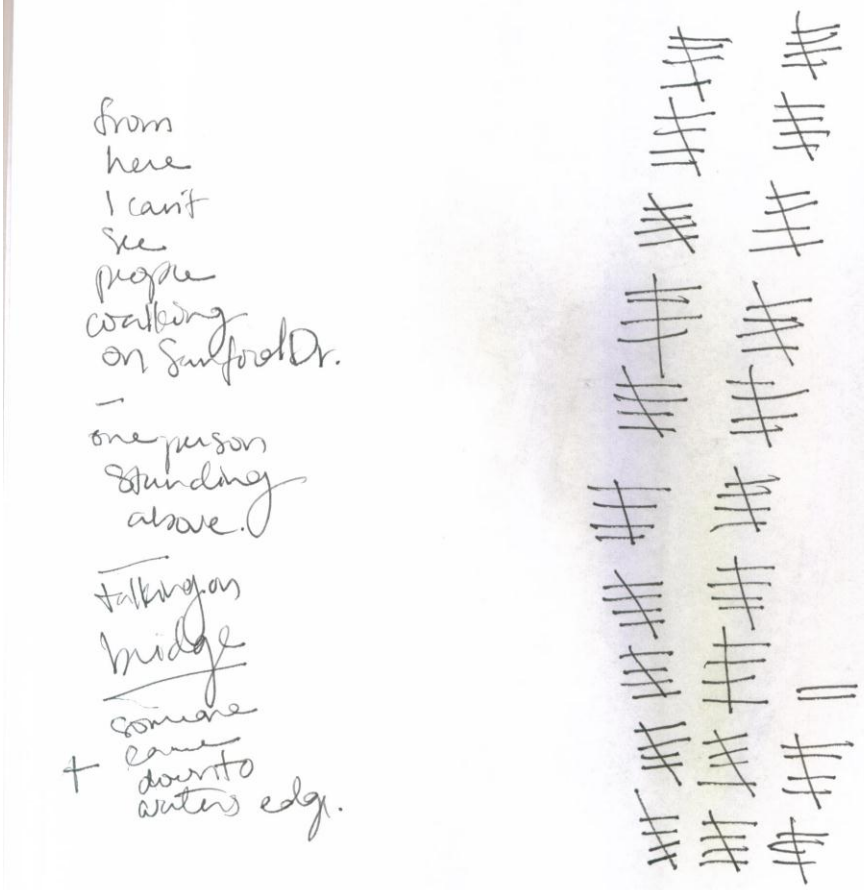
Sounds: buses + cars overhead, water trickling, bridge tension shaking, people talking above

Visual appeal: very low, messy, pipes, trash, fencing, weedy.

Visual access to creek: from this point standing or sitting can only see banks no water but can hear trickle when there are no cars.

Critters:

People
Ages: youth adult



from
here
I can't
see
people
walking
on Sanford Dr.
—
one person
standing
above.
—
talking on
bridge
—
square
came
down to
waters edge.

Observation and Behavior Mapping

Date: 2.17.12

Time start: 3:10 Time end: 4:10

Weather: warm sunny 65-70°

Section of Creek: Tate

Place of observation:

Smells: no smell.

Sounds: buses buses buses. cars. birds.

Visual appeal:

Visual access to creek: from here ok from where people are walking no.

Critters: ladybug. squirrel on I beam underbridge. birds

People
Ages: youth adult

women sitting in cal.
- 2 bikes.
- USA employees. standing on opposite balcony.
Ladies looking at stadium / another set of ladies looking at stadium
- not in between classes? not very busy.
- joggers underneath.

APPENDIX B: PHOTO REVEAL QUESTIONNAIRE

Lab 2:

Observing the Urban Watershed

Due date: BOC Thursday, Feb. 2

NAME: _____ Cannady Buitrago

Assignment:

Without going outside of your normal routine become mindful of how you interact with the watershed! Using your digital or phone camera, or a provided disposable camera, document the moments during your day when you become aware of being connected to a watershed. Do this for one full week. Don't think about completing a certain number of pictures and then being finished, but be mindful and aware every day during the week and take as many pictures as is reflective of your experience. After taking the photos, log their location on page 2 of this lab and make sure your photos are numbered the same as your log entries.

Answer the following questions:

Start and end date of photography? _____

How are we connected to this system in an urban condition?

What are the forms or aesthetics that we associate with the water system?

Where are the points that we interact with the system?

All photos will be submitted digitally to the class folder in a folder with your name.

APPENDIX C: PHOTO REVEAL IMAGES

BMPs


R1-06756-024A


Athens-20120201-00159


BKL-5


BKL-8


BKL-9


BKL-13


BKL-14


image %288%29


image %289%29


IMG_0580


IMG_1823


JMO 2


JMO 3


JMO 6


JMO 7


JMO 8


KBT 1


KBT 2


KBT 3


KBT 4


KBT 5


mjr3


mjr4


mjr5


mjr10


mjr11


MKB 6


MKB 13


NDH-3


photo-6


photo-12

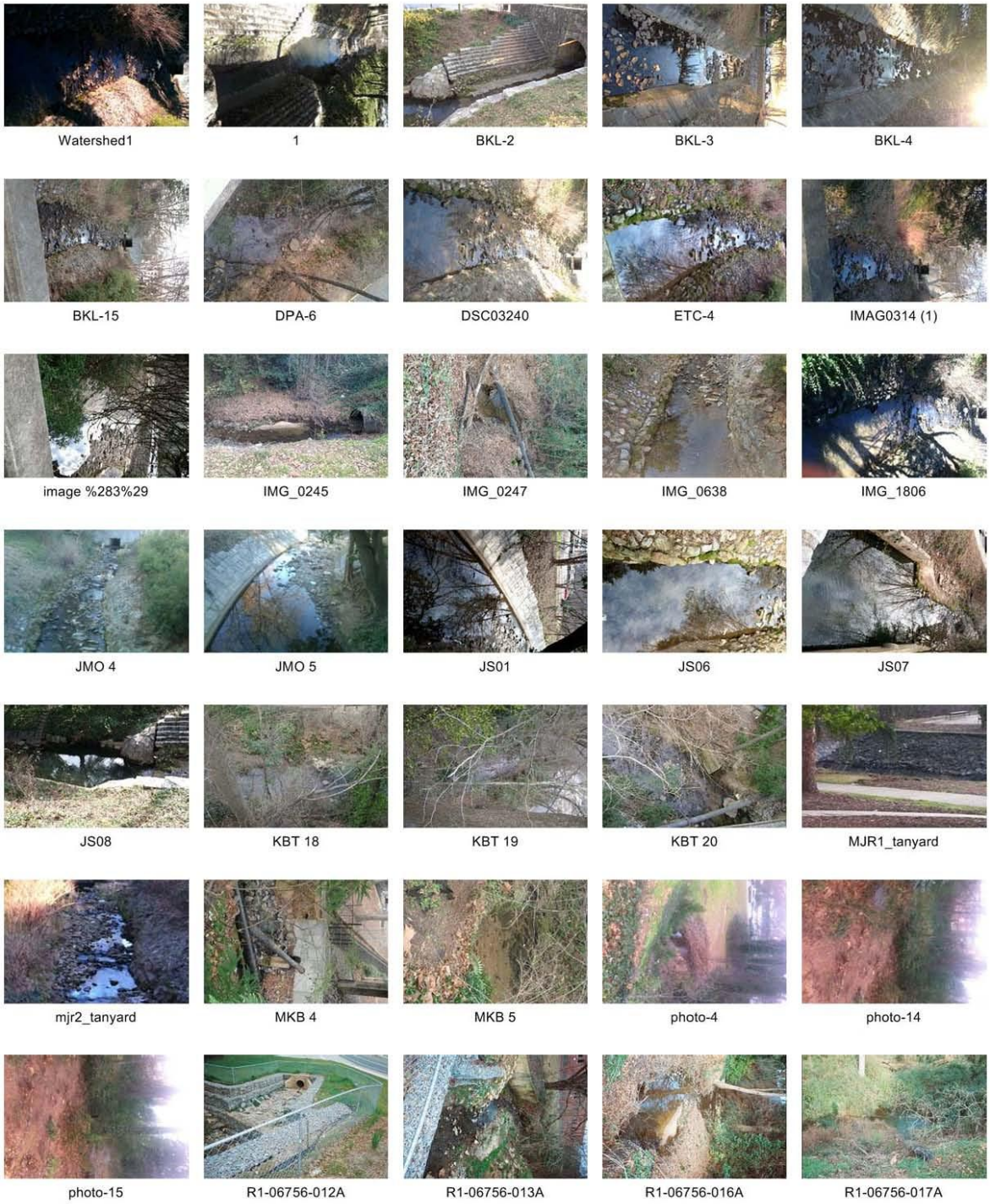

photo-13


R1-06756-014A


R1-06756-019A


R1-06756-021A

Channels


Watershed1
1
BKL-2
BKL-3
BKL-4
BKL-15
DPA-6
DSC03240
ETC-4
IMAG0314 (1)
image %283%29
IMG_0245
IMG_0247
IMG_0638
IMG_1806
JMO 4
JMO 5
JS01
JS06
JS07
JS08
KBT 18
KBT 19
KBT 20
MJR1_tanyard
mjr2_tanyard
MKB 4
MKB 5
photo-4
photo-14
photo-15
R1-06756-012A
R1-06756-013A
R1-06756-016A
R1-06756-017A


R1-06756-018A


R1-06756-022A


R1-06756-023A


TTF-2


TTF-4


TTF-5

Downspouts


NDH-2


photo-2


1


Athens-20120201-00156


DSC03229


DSC03231


IMG_0252


IMG_1813


mjr9


MKB 8


MKB 10


MKB 16

Erosion


NDH-4


BKL-10


BKL-16


Drainage Near Geology 2


IMG_3288


JK-2


KBT 6


KBT 13


KBT 14


KBT 15

Fire Hydrants

Fountains


KBT 17


1


7


8


9


Athens-20120111-00132


BKL-1


DPA-1


DPA-3


DPA-4


DPA-5


DSC03222


DSC03223


DSC03228


DSC03236


ETC-1


ETC-2


ETC-3


Fountain by Herty Field


IMAG0307 (1)


IMAG0308


IMAG0309


IMG_0567


IMG_1808


IMG_1815


IMG_3214


JK-3


JK-7

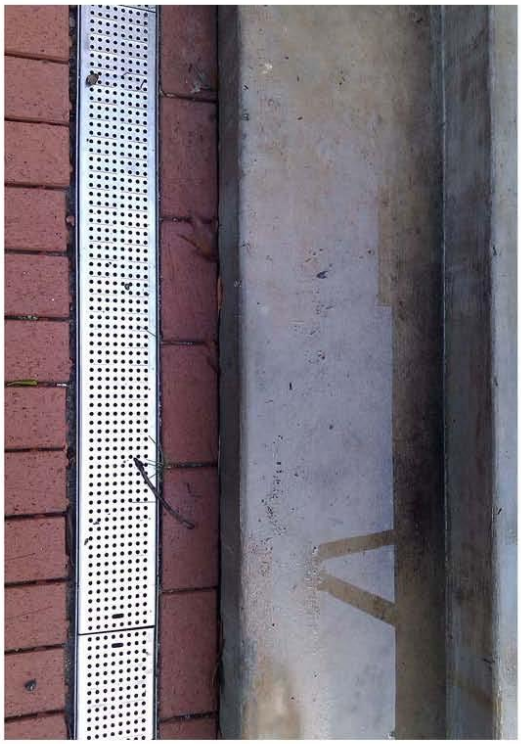

JMO 1


JS02


JS03


KBT 16

Gutters



Interior devices

Manholes




ATHENS-CLARKE COUNTY
UPPER OCONEE WATERSHED

SEWER


ATLANTA
GEORGIA

SEWER

Pipes


R1-06756-025A
Athens-20120201-00158
DSC03233
image %287%29
image %2810%29
IMG_0245
IMG_0247
IMG_0580
IMG_1821
KBT 13
KBT 14
KBT 15
MKB 4
photo-11
photo-16
photo-17

Ponds

Storm Drains


Athens-20120201-00155


BKL-12


BKL-17


DSC03224


DSC03225

DSC03226


DSC03227


image %285%29


IMG_0240


IMG_0243


IMG_0246


IMG_0249


IMG_0251


IMG_1814


IMG_1824


IMG_3261


IMG_3262


IMG_3263


JK-2


JK-9


JMO 2


JMO 9


JMO 10

KBT 8


KBT 11


KBT 12


mjr3


mjr4


mjr5


MKB 1


MKB 7


MKB 11


MKB 13


MKB 15


MKB 17


MKB 21


MKB 22


MKB 23


NDH-1


photo-1


photo-8


R1-06756-015A


R1-06756-019A


R1-06756-020A


TTF-6


TTF-7


1


2


5


6

Surface Types


MKB 21


MKB 22


MKB 23


NDH-1


photo-1


photo-8


R1-06756-015A


R1-06756-019A


R1-06756-020A


TTF-6


TTF-7


1


2


5


6


Athens-20120201-00155


BKL-12


BKL-17


DSC03224


DSC03225

DSC03226


DSC03227


image %285%29


IMG_0240


IMG_0243


IMG_0246


IMG_0249


IMG_0251


IMG_1814


IMG_1824


IMG_3261


IMG_3262


IMG_3263


JK-2


JK-9


JMO 2


JMO 9


JMO 10

KBT 8


KBT 11


KBT 12


mjr3


mjr4


mjr5


MKB 1


MKB 7


MKB 11


MKB 13


MKB 15


MKB 17

Watering Devices

Weep Holes