Kennesaw State University
DigitalCommons@Kennesaw State University

Bachelor of Architecture Theses - 5th Year
Department of Architecture

Spring 5-4-2018

Emulated Ecology

Erik Graves

Follow this and additional works at: https://digitalcommons.kennesaw.edu/barch_etd
Part of the Environmental Design Commons

Recommended Citation
https://digitalcommons.kennesaw.edu/barch_etd/67

This Thesis is brought to you for free and open access by the Department of Architecture at DigitalCommons@Kennesaw State University. It has been accepted for inclusion in Bachelor of Architecture Theses - 5th Year by an authorized administrator of DigitalCommons@Kennesaw State University. For more information, please contact digitalcommons@kennesaw.edu.
EMULATED ECOLOGY

REQUEST FOR APPROVAL OF THESIS RESEARCH
PROJECT BOOK PRESENTED TO

DR. ARIEF SETIAWAN

CHRISTOPHER WELTY M.ARCH

AND TO THE
FACULTY OF THE DEPARTMENT OF ARCHITECTURE
COLLEGE OF ARCHITECTURE AND CONSTRUCTION MANAGEMENT

BY

ERIK MICHAEL GRAVES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

BACHELOR OF ARCHITECTURE
KENNESAW STATE UNIVERSITY
MARIETTA, GEORGIA

SPRING 2018
DEDICATION

I dedicate this portfolio to my father, David Michael Graves. He won’t be around to see me graduate, but he is the reason I have done all of this. I’ll be the first person in my family to graduate college, and I know he is looking down on me, proud.

I love you Hefty.

ACKNOWLEDGMENTS

Christy Micham, Andrew Micham, Brooke Micham
For standing by me through these long 11 years of college, and never letting me quit on myself.

Bronne Dytoc
It was his classes that made me fall in love with architecture. His friendship and guidance was paramount in my completion of this degree.

Arief Setiawan
His constant concern and words of encouragement helped me through this final and most difficult semester of my college career.

Thank you all.
Figures by Ch.

(all figures marked * are by author)
(all models pictured are by author)
(citation numbers correspond to bibliography)
SECTION ONE

CHAPTER ONE

DESIGN THEOREM
Natural versus built environment. Nature versus man made. Organic versus inorganic. These are arguments that have been stated and debated since the early architectural times of Vitruvius and are still prevalent even in today’s popular practice. As a whole architecture has moved towards a more green direction with the introduction of programs such as LEED and Architecture 2030.

My thesis aims to evaluate the next step of this green equation. Ecological urbanism is a topic that has been widely discussed. In 1998, the book “Eco-Urbanism” by Miguel Ruano, he defines ecological urbanism as “the development of multi-dimensional sustainable human communities within harmonious and balanced built environments.”

The ecosystems on earth operate in a net positive way. If there is an unbalance, be it overpopulation, the ecosystem reacts and re-balances through defined steps. My thesis begs the question, “how as designers can we make the most of our architectural ecosystems?” If we design through the application of ecological principles, we can achieve inherently more sustainable architectural interventions. When we begin to look at the relationships our buildings have with one another in a given urban fabric we begin to move past the ideas of just mimicking natural forms and into the realm where our cities act as net positive ecosystems on their own.
1.2 defining "ECO"

**ECOSYSTEM** - A SYSTEM OR A GROUP OF INTERCONNECTED ELEMENTS, FORMED BY THE INTERACTION OF A COMMUNITY OF ORGANISMS WITH THEIR ENVIRONMENT

**ECOLOGY** - THE SET OF RELATIONSHIPS BETWEEN ORGANISMS AND THEIR ENVIRONMENT; SET OF RELATIONSHIPS EXISTING BETWEEN ANY COMPLEX SYSTEM AND ITS SURROUNDING ENVIRONMENT

**ECOMIMICRY** - THE PRACTICE OF DESIGNING SOCIOECONOMICALLY RESPONSIVE AND ENVIRONMENTALLY RESPONSIBLE TECHNOLOGIES FOR A PARTICULAR LOCALE BASED UPON THE CHARACTERISTICS OF THE ECOSYSTEMS IN THAT LOCALE

**ECOLOGICAL BALANCING** - A TERM DESCRIBING HOW ECOSYSTEMS ARE ORGANIZED IN A STATE OF STABILITY WHERE SPECIES COEXIST WITH OTHER SPECIES AND THEIR ENVIRONMENT

**ECOSYSTEM SERVICES** - THE DIRECT AND INDIRECT PROCESS BY WHICH NEW BIOLOGICAL SPECIES ARISE

(ALL DEFINITIONS FROM BISE INTERNATIONAL SITE)
My proposed project would be of an urban nature. Attention paid to pedestrian traffic at the macro with a tighter focus on a social hub/recreational center at the heart of the urban plan. Eco-remediation of the site and surrounding area would also be of utmost importance.
eco principles of the proposed project

1.4
Masdar was originally conceived as a carbon neutral elevated city without cars, instead using pod like underground rapid transit. Since the university was built a new vision began to emerge, one that would make Masdar known as the most sustainable eco city in the world. The CBT design team is focusing on 4 main points: walkability, sustainability, repeatability, and identity.

Thru newly discovered technologies and age old techniques this city has began to give back to the environment.

*FIG. 151B* - During the day time warm winds cool as they flow through the green spaces; at night cool winds enter the city and are channeled through the streets.

*FIG. 151a* - The city grid has been laid out in a 45 degree line of true north so that harsh shadows are cast throughout the day, battling the urban heat island effect that would be dramatized by the already hot and dry climate.

*FIG. 151C* - The multi-phase implementation of the R+D block of the Masdar Institute allows for new green technologies to be introduced in the design phase as they are discovered.

Abu Dhabi, UAE
FIG. 151d - The plan above shows Masdar City Center as the large circle surrounded by a cluster of neighborhoods as smaller circles. There are 2 schools on the NW and SE sides of the larger square. Masdar Institute, the research and development center, and the sustainable administrative facilities are all located on the northern tip of the city’s perimeter.

FIG. 151e - Vegetation in the city is very ample and serves many purposes. Plant the city as a green, that run as surface cars are rarely used. Air purification and passive cooling, while also providing refuge for the v from the sun, are other benefits. All species used in the landscape design are native and therefore a more balanced ecosystem is created.

FIG. 151f - The transit grid is dotted - external exist -ing freeway; blue - secondary streets; cars /buses; red - boulevards; green buses. The pedestrian dot - train stops; blue - main avenues; cars /street. The retail spaces are all centrally located throughout the city. Also notice the placement of retail lots along the street car line. Combining functions of transit and shopping can be related to multi-functional ecology, such as animals that breed and feed in the same areas. Less energy used to achieve life.
Lincoln Park
Chicago, IL

1.5.2

Lincoln Park Zoo was a walkway expansion, a zoo, and a remediation project aimed at fixing a pretty polluted and underutilized part of Chicago. Reshaping the pond and creating an educational nature walk was not only successful in revitalizing the zoo but also teaching people about ways to live more sustainably.

FIG. 152A - Using glulam members and typical construction fastening methods the pavilion was able to be moved and set up with ease. The modules were designed in a way that a singular worker could install everything solo. Also local wood was reclaimed and sourced to off set the carbon cost.

FIG. 152B - Through the cross section of the pavilion we can begin to see the organic nature of the form and also the space created for public events and classes.

FIG. 152C - The skin of the pavilion is made of recycled plastics and creates a safe haven from the elements along the path around the pond. Again the module was designed in a way that a singular worker could install without help.
FIG. 152D - The old pond was too shallow for proper rain collection. That mixed with the hardly defined water edge created a barrier for wild life. Without this the area became desolate.

FIG. 152E - The pathway around the pond not only serves as connection to the three different zones but also contains educational kiosks noted by green dots. These kiosks focus is to bring attention to clean living and teach people how our built environment doesn't always have to compete with Mother Nature.

FIG. 152F - The vegetation was a key aspect to the remediation of the pond naturally. Local fauna and flora were cultivated and planted strategically in high and low lying areas. Also a lush island was created to give the wildlife an untouched part of the park all to themselves.

FIG. 152G - The resulting pond has a variance in depth to create striation in the aquatic ecosystem. The engineered hard edge gives animals a direct route to water. Finally the reuse of the excavated fill from the deepening of the pond was used to create mounds and a new realized topography for directing watersheds into the pond.
Kenneth Yeang’s ecological design in the tropics, or EDITT, is a theoretical skyscraper that takes the green spaces below and thrusts them into the sky. With almost 55% surface coverage of vegetation from locally sourced fauna, one could live in the clouds but still be surrounded by lush greenery. The main idea behind the tower was to rehabilitate the local ecosystem and increase the locations biodiversity. Also being a hybrid building with offices, restaurants, public gathering areas, and living spaces, again this building becomes an eco-system all on its own.
FIG. 153g - The green areas in this project are on every level and give the building a sense that it is living by itself. More realistically, the building is offsetting its carbon output by purifying the air and run off water.

FIG. 153h - The rain water is collected via catch scallops and is sent down overflow tubes into the cistern below.

FIG. 153i - The trash waste is collected on each level and it is at that point that the user selects what type of waste it is. The cistern is then separated by bottom into the different material bins and creates a closed loop that engages the inhabitants to realize what they use and how to recycle effectively.

FIG. 153j - In this diagram we see the location and angle of the PV panels. They are arranged in a way to maximize their solar gain and to shield the office spaces from harsh direct light. This in turn keeps the building cooler and increases sustainability even more.
1.5.4 Trinity River Park

Trinity River Park is a remediation project to fix not only the flood zone in the center of Dallas but also provide some new city buildings for public use. The designer’s use of natural processes integrated with some use of technology has created a project that serves, first, the environment and, second, the man.

FIG. 154b - In this large rendering we can see how the use of bioswales has created different levels for which runoff water to settle. Also notice the potential buildings in the surrounding area.

FIG. 154c - Flooding is the main concern behind the creation of this project. The basin fills every three years and one can see that there is ample depth and area to capture, safely, all that water.

FIG. 154a - The parti to the left shows how the city center relates to the site and how the paths meander and cross Trinity River.

DALLAS, TX
**FIG. 154d** - Through the cross section of the river we begin to see how the different cross sections begin to work. Using bioswales and low and high areas, not only can the project handle runoff water but it also provides a landscape not easily found in Dallas or its surrounding area.

**FIG. 154e** - The basic master plan of Trinity River Park. Interwoven walking paths loop around the natural creek landscape. Also, there are a lot of heavy highway bridges crossing which, over time, could be redesigned and constructed to give Dallas a new identity.

**FIG. 154f** - The north bridge overlooking the skyline and park below.

**FIG. 154g** - Wetland area, used for water filtration and river interaction at low water level.

**FIG. 154h** - The central area of the park is lush with overgrowth and thriving.
Circulation

On the right you can see the basic parti diagram of each of the projects discussed. While all are quite different in scale and function, similarities can be drawing between them, in the way they act and react with their parts of the whole. Circulation becomes a large focus as in the larger projects they serve as the veins for the organism that is the city that they are part of.

FIG. 162a - In the EdITT tower we see how the two towers sit with each other and add to the over all circulation of the underground retail. As the larger of the towers on the left has a spiral type circulation and on the right a perimeter style circulation around a central void for thermodynamic cooling.

FIG. 162b - The circulation of Lincoln Park is a round about that connects all the different districts of the surrounding program. Also nodes along the way serve as educational and recreational hubs for the visitors to more easily connect with the project.

FIG. 162c - Trinity Park in Dallas is a remediation project that not only aims to fix a flood zone in the middle of the city but also serves to reconnect the two sides of the city. The central island serves as a wildlife preserve for the surrounding animals to have a refuge free of people.

FIG. 162d - Masdar is the largest of the precedents and by using long green fingers that cut across the city we see how green corridors can serve as the life veins of a largely populated area. Housing retail and keeping its inhabitants relatively comfortable in what would otherwise be a hot habitat.
The way that the natural vegetation is treated in all these projects is another strong correlation and truly informs my final process and outcome. The way in which all these projects treat the flora and fauna is first and foremost in the design. It becomes the driving force behind what is to come and how other design decisions are made.
Atlanta, GA

Fig. 21a - Atlanta, GA has a pretty temperate climate that sees regular rainfall and sunshine. Average low and high temperatures all operate in a relatively comfortable range. Our average precipitation days are a bit lower than the national average but our rainfall remains in the range of the average, which means when we get rain we get more of it on a fewer number of days. This can be utilized in my design as oversized gutters and rain-catchers to capture all the rain we do get and recycle that water for another function.

Fig. 21b - On the right you can see 3 wind roses. The first is an average for the year. Prevailing winds come from every direction. Designing for this condition is not necessary, and at this point I cannot see a reason this would affect my design process. The next diagram is the wind on high aerosol days, with spikes of high northerly winds. The last is the wind rose for low aerosol days, again nothing out of the ordinary here, so prevailing winds being generated in almost every cardinal direction.

Fig. 21d - This last map is a topographic of Atlanta and some local suburbs. My first site choice for my thesis would be in Marietta on Roswell Road, because my second choice, located in the west side beltline expansion, Atlanta is known as the canopy city and has some of the highest forestation density of any city. This will be emulated and utilized in my final project as what naturally occurs in the city is what I want to emulate in my design.
Rotten Wood Creek runs from the campuses of KSU and Life University. It feeds directly into the Chattahoochee River and supplies water directly to Atlanta. Using a vernacular approach to biological design we can begin to better remediate and educate the local area. Using the top ten most endangered species list as inspiration for the design and focus of a rework of the retention pond located on KSU campus and also a research center to be located between Life University and KSU along the Rotten Wood Creek corridor.

Rotten Wood Creek serves as an overflow runoff for the campus of KSU and the city of Marietta. It flows through Life University's campus and down into the Chattahoochee. My thesis intervention will be two stages. The first being the management of the waste water and remediation of flora in the retention park. The second intervention will be a research center and educational hub that will serve not only the public but also both KSU and Life University. This will not only serve to remediate some of the endangered species here in Cobb County but will also serve to reconnect the schools with each other and the surrounding suburbs.
2.1.2. The existing condition of the site is largely a heavily forested region that has little to no access with the surrounding area. The site has very little connection to KSU or other local schools and residences, which is the main reason this site has been chosen. It can serve a higher purpose for not only the environment but the local inhabitants as well.
2.1.3

*topo survey/
applicable zoning*

The topography of the site is nothing really too intense or hard to deal with. More than the elevation changes, the challenge with this site will be navigating the creek in a way that doesn’t further harm the already eroding surroundings.

The zoning of the campus, as it sits now, with some future program locations shows that a connection along the creek could be very useful.
2.14 geo/natural patterns

**Fig. 214a** - The largest concern with the natural pattern of the site would be the run off into the retention pond and further into Rotten Wood Creek.

**Fig. 214b** - The natural focus of the site is that of the creek. It is a riparian zone that will be elaborated on in further sections.

**Fig. 214c** - A pattern emerges of connecting the natural spaces using the natural creek corridor with a focus on the research center to be used to remediate the Chattahoochee River. Connecting the future plans of recreation is also vital to the success of such a project.
2.1.5 pedestrian/vehicle path

The connectivity on campus tends to lean more towards the road and cars, with a secondary focus on some pedestrian paths that connect the living areas with the educational ones. Also, it is important to note the broad grey lines. These are connections that are made every day by students, but they have no given or direct path between them.

The vehicle is the least important thing to consider as this will be a nature walk, and everything will need to be accessed by foot.
2.1.6 Site Potential

The potentials of the site are pretty wide. My focus will be on the rehabilitation of the water runoff/supply with a secondary focus on the re-connectivity of the campus with its surroundings via the nature trail that would connect the research center and the retention pond.

By massing the different areas on campus (rec fields, on campus student housing, fraternity housing) the concept begins to emerge on how these areas might be connected via a nature path.
Siting and Design

Objectives

My first choice for a site will be the Rotten Wood Creek expansion that has already begun planning. The idea is to create a green corridor that connects Marietta, Ksu, and Life University. This path can serve multiple functions and my objective would be to create public circulation, linearally, and a recreational center as the focused node along the path.

Fig. 217b - Creating a linear park that serves as a circulation area, as in Dallas above, is the main outcome of this idea. In the macro scale creating a boardwalk on the ground provides room for the natural inhabitants of the local ecosystem and serves the natural habitats on the local ecosystem. As far as the architectural micro project, along this path I will create a recreation hub for students and local Marietta people alike. A place where ideas can be exchanged and team building like exercises can take place. Also it serves as an education center much like in Lincoln Park.

Fig. 217c - Using ideas from Atlanta's already thriving ecosystem, I will use the tree canopy to naturally shield the boardwalks, increasing their longevity and keep the users from direct sunlight. This will also create a desirable aesthetic with filtered light falling down through the trees.

Fig. 217d - Another technique I will use is to suspend the boardwalk off the ground. A raised boardwalk, made from locally sourced wood, will keep the overall footprint of the project low while giving the user a more dynamic experience. Also air flow above and below the walkway will increase the comfort of the user.
Site Analysis
Section 2.2
2.2.1 Site Plan

**Fig. 221a** - The basic parti is a "Ying Yang" type form based on the crayfish claw. Using two large separate sweeps we can create two crossing bridges over the creek and separate the public educational program from the research.

**Fig. 221b** - In this quick sketch we begin to see how the circulation is removed from the roadside and the user is flanked by the pond and expansive planted area. Also the tree screen serves to create the sense of being surrounded completely.

**Fig. 221c** - The retention pond is the first line of defense against the pollution of the creek and furthermore the Chattahoochee River. We also see here the proximity to the student housing which will be the main user of such a park.
2.2.2 Context Analysis

The context of the Rotten Wood Creek site is one of isolated adjacency. While the site is near KSIU Life University, and downtown Marietta, it is still a rather isolated site as of now because no pedestrian paths or vehicles can reach the areas as of yet. There are many time made trails that people have used but none exist explicitly.

The context of this site is the driving force behind the entire concept and decision making. Without the local schools and town, there would be no reason for an intervention at this location.
In the map to the left we can begin to see how the surrounding buildings interact with the Rotten Wood Creek corridor. The lack of buildings along the corridor gives us the opportunity to create a large nature walk that will connect our two sites and also serve to connect some of the surrounding buildings with other parts of Life University and Downtown Marietta.
2.2.4 Boundary + Relation

*Fig. 224a* - The corridor of influence begins to define the area in which the nature trails and architectural interventions might be located.

*Fig. 224b* - In this diagram we can begin to see the boundaries created by the creek and also the areas of interest that relate to the site.

*Fig. 224c* - The water runoff becomes the main concern and focus for our boundary relationship. Close attention to what parts of the creek take on the most water during rain is also important for site location.

*Fig. 224d* - Looking at how the different programmatic areas on campus begin to interact with one another begins to give a framework for the nature trail to be strung. Looking at entry and exit points along the trail is also important.
2.3.1 Spatial Program Explorations

Fig. 23.4 - In the initial program analysis the focus was to place the different research center functions into 2 separate wings.

The more public being on the North side, toward the school and the path. The thought here is to keep the educational and public gallery together so that their special functions won't interrupt the daily bustle of the research/scientific side of the center.

The research and auxiliary areas are strictly used for private student and faculty function. They are located across the river toward the open runoff field so that not only the river can be studied but the watershed areas as well.
2.3.2 Connection + Constraint

Fig. 232b - In the perspective to the right we can see the issues and solutions to our design problem, which is that the two areas of focus for the site are isolated by forest from each other and the surrounding buildings. The forest becomes the solution because it can contain the necessary pedestrian zones needed to connect these new areas with the other existing parts of campus.

Fig. 232a - The blue regions represent areas of interest outside of our site. These are the main areas that need to be connected. The green region represents the constraint of the forest, how it blocks direct access to the campus. This will be overcome through nature trails and biking lanes. The green is both the problem and the solution.
2.3.3 Relative to Site

It is important that the building become the site. The original intent was to look into a suspended tree top structure, to minimize the environmental impact. Instead the use of a sloped green roof gives the same amount of exterior space, as if the building wasn't there at all.
2.34 3D to Site

Fig. 234a - In the section view, we can begin to see how the exterior nature path will flow through the interior of the building, giving the inhabitants and the walker/biker a chance for encounter and interaction.

Fig. 234b - The green roof of the building serves to lessen the impact of the building on the site while also creating a circulatory system for crossing the river and a leisure spot on the roof for people to congregate and enjoy being in nature and enjoy the creek.

The two sloped masses can almost dissipate into the landscape from the approach angles. Pedestrians might view it, from afar, as a hill or a park.
-SECTION TWO-

CHAPTER THREE

DESIGN PROCESS
The site context that becomes the focus of the thesis process isn’t so much the surrounding buildings or people but instead the local plants and animals of Cobb County. Taking the “vernacular” approach to biomimicry gives us the opportunity to not only learn from the organisms but also gives attention to their rehabilitation through emulation of some of the natural wonders they have to offer.

The site context that becomes the focus of the thesis process isn’t so much the surrounding buildings or people but instead the local plants and animals of Cobb County. Taking the “vernacular” approach to biomimicry gives us the opportunity to not only learn from the organisms but also gives attention to their rehabilitation through emulation of some of the natural wonders they have to offer.

### Top Ten Endangered Species in Cobb County

1. Cherokee Darter
2. Bluestripe Shiner
3. Henslow’s Sparrow
4. Delicate Spike
5. Gulf Moccasin Shell
6. Chatahoochee Crayfish
7. Monkey Face Orchid
8. Sun Loving Draba
9. Bay Star Vine
10. Dwarf Sumac
Out of the ten organisms broadly researched, the four that were focused on were three aquatic animals and one bird.

Now from their inspiration, one can begin to see how a building might be shaped or run based on the different inherent traits of the animal.

**Henslow's Sparrow**
- **Status:** Listed as rare in Georgia, no federal legal status.
- **Threats:** Loss of feeding habitat, loss of summer habitat on Gulf Coast.

**Cherokee Darter**
- **Status:** Listed as threatened in Georgia and federally.
- **Threats:** Development and subsequent runoff into water supply.

**Bluestripe Shiner**
- **Status:** Listed as rare in Georgia, no federal legal status.
- **Threats:** Loss of feeding habitat, loss of summer habitat on Gulf Coast.

**Delicate Spike**
- **Status:** Endangered in Georgia, no federal status.
- **Threats:** Dams, sediment and overuse of water.
3.2 Program

HENSLOW’S SPARROW

Fig. 32a - Here is a program plan based on the sparrow’s feathers. Long, elongated corridors and rooms are modeled after the longer flight feathers and the screen in the front is based on the down feathers in between the others.

DELICATE SPIKE

Fig. 32b - Here is a program plan based on the spike’s shell. More than just the shell form, it is based on the deterioration of the shell in a layer cake sort of way. A tiered garden or interior atrium space would seem to fit best.

CHEROKEE DARTER

Fig. 32c - This is an auditorium plan based on the fins of the darter fish. Using the arrangement of fins in an acoustical and screening manner the auditorium seems to just exist out of planes. Also using the natural structure of the fish fin could give the lightness that is envisioned above.

BLUESTRIPED SHINER

Fig. 32d - Here is a program plan based on the shiner’s head nodules. The interconnected spaces and round annivers create a rather interesting and unique take on the typical plan. A cafeteria setting or research space type setup might work best for this solution.

DELICATE SPIKE

Fig. 32e - This is intended to be an urban plan, using the decaying nature of the spike shell, different areas of the “city” are separated by pedestrian and vehicle paths. The areas where one can pass from one area to another become determined based on the organic decomposition of the shell.
3.3 Eco Strategies

Henslow's Sparrow

Fig. 33a - The bridge is an ecological strategy to reduce the footprint on the creek and the surrounding woodlands. Raising the user off the ground gives them a sense of being above the vegetation and in turn, lets that vegetation thrive.

Henslow's Sparrow

Fig. 33b - Another ecological strategy is one of filtered light. Using the shape of the flight wing and the natural overlapping arrangement we could clad a building in a way that the sunlight would filter through desirably. We can begin to see how that detail might work for a facade on the model to the left.

Bluestripe Shiner

Fig. 33c - Another eco strategy could be that of a green roof/surface. Covering the roof in a garden substance reduces heat gain and gives area back to the site. Also, using a system of filtration, water might be able to be filtered through such an apparatus.

Alongside the eco benefits, we have a lush green space to meet and relax. Using nodules shaped after the shiner we see how seats and separation form naturally and organically.
34. Public Systems

Delicate Spike

Fig. 34a - The seat is derived from the mechanism of the delicate spike, serving as possibly a public storage for outdoor equipment, that when emptied, serves as a lounger for any sport goers.

Bluestripe Shiner

Fig. 34b - This public system is one of an interior ecosystem. Looking at how people move through space and how the spaces all connect with one another. Using a secondary, interior array of rounded surfaces the outside can begin to tell the story of inside as well.

Cherokee Darter

Fig. 34c - Looking at the darter tail fin as inspiration for an outdoor seat that will return upright when not in use, prolonging the life of the public item, which in turn is more sustainable. Also looking at the woven strands that make up the structure of the tail. We have another bridge idea that is less focused on low impact and more focused on creating a focal point in a park for people to be drawn to.
Integrating the different biological aspects of the endangered species into different areas and functions of the site brings attention to the at-risk local species. Emulating form and function, both, shows both the beauty and science behind these animals and plants.
CHAPTER FOUR
RESPONSE TO PROCESS THEOREM
Reflections by the Author

I just want to also take a moment to say thank you so much for flipping through my portfolio. This is something I am very proud of and is the culmination of many years of biology studies before I began my trek through architecture school. Many long nights and coffees made this all possible and I couldn’t be more satisfied with the work I have produced. So again thank you.

The environment is the most important thing on this planet. It has given us everything we have, including each other. We must begin to look for inspiration in nature, not only in form, but also in function.

Overall, I am happy with the work I completed this year. I think that my thesis was far more focused on the process than the final product of a research center. I understand more now I might begin to integrate different systems into an overall scheme to reduce the carbon emissions and create a more sustainable and desirable habitat for, not only the building users, but also the local ecosystem. I am still very proud of what I have done and I look forward to taking this information with me into the field of architecture and beginning my career as a designer.

- Erik M Graves
WORKS CITED