A TRAIL SYSTEM
FOR PRAIRIE CREEK
RESERVOIR PARK

LA 404 COMPREHENSIVE PROJECT
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PARK

1. INTRODUCTION

The following paper is the final project of my formal education at Ball State University. This project is undertaken with the intent to demonstrate my ability to manage the skills required to complete typical work done by Landscape Architects. While many aspects of this project are very much real, it should be understood that this is a purely hypothetical undertaking in which I am functioning as both the client and the Landscape Architect.

When I met Ron Bohnam, Superintendent of Prairie Creek Reservoir Park, he described to me his vision of what Delaware County’s primary outdoor recreation area could one day become. Of course the heart of that vision was the reservoir. Prairie Creek’s picturesque nature and variety of uses have already made it a popular destination for many residents of this region. On the land surrounding the reservoir Mr. Bonham envisioned improvements such as; more camping area, more dock space, a new shower house, and a trail system which would surround the reservoir.

I was impressed by Mr. Bonham’s ideas because they seemed to be aimed at creating new activities for the reservoir. With these new activities the reservoir would come close to providing something for everyone. I felt that this was very important because there are so few places in this region which have the potential to attract so many different users.

I was intrigued by the idea of placing a trail system around the reservoir. Because it could be used year round, the trail had the possibility
of becoming a very popular feature for the park. So, this project was
initially undertaken with the intent to design a trail system for Prairie
creek Reservoir Park.

2. BACKGROUND

There are several reasons which led me to do my comprehensive
project at Prairie Creek Reservoir Park. The first reason was a result of
personal experiences at the park. I began visiting the park four years ago
to take advantage of the trails located on the southwest corner of the site.
The trails were the only place in the area where I could ride my off-road
bicycle. I thoroughly enjoyed riding on the trails, but I also quickly learned
only to visit when it hadn't rained for at least a week. Many of the trails at
the park had large puddles of water which would completely cover sections
of trail. The water on the trails often created conditions which greatly
detracted from my bicycle riding experience. Even when it had not rained
for weeks, trails were often so muddy that they were not useable.

As I continued to visit the park I also noticed that it was becoming
more and more torn up looking. Deep ruts on the trails were becoming
more frequent. Standing water on the trails was also increasing each year.
Several spots had no plant life because so many off-road vehicles were
driving over the southwest corner of the park. Trash dumping also seemed
to be a problem which was getting worse. All of these problems combined to
discourage me from even bothering to visit the park to use the trails.

I didn't think about Prairie Creek much until I started considering

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what to do for my comprehensive project. I knew I wanted to do an outdoor recreation project so I began thinking about the different recreation areas I was familiar with. Because Prairie Creek was very accessible for visiting I decided it would be a good site to work with. Reclamation of degraded land, trail layout, and trail construction, were all topics which I thought about using for my project at Prairie Creek.

Another reason for choosing the reservoir for my project was its importance as an outdoor recreation area. Prairie Creek is this area’s only public opportunity for many types of outdoor recreation. The park has the largest potential for boating, fishing, camping, and trails in Delaware County. While the water based use was clearly being taken advantage of, I felt that the trails which existed in the park needed to be redone. A trail system which would be useable by hikers, bicyclists, horseback riders, and motorcyclists, was what I decided to do for my project at Prairie Creek.

3. PROBLEM STATEMENT

Prairie Creek Reservoir is this county’s largest recreation area. While it currently has many visitors, additional people would visit the park if improvements were made to the land surrounding the reservoir. A trail system which was constructed for hiking, bicyclists, horseback riding, and motorcyclists, would attract many users. Prairie Creek is the only public land in the county which has this potential.

As a Landscape Architecture student undertaking my comprehensive project, I planned to address the following questions. 1)
How can a trail system be placed in the park which will not end up so torn up that it isn't useable? 2) How can the trail areas that are already severely disturbed be brought back to a useable state?

4. GOALS

My primary goal for this project is to produce a useable product. While it is not required that the student have a real client for the comprehensive project, I felt that it would be beneficial to create a real product for a real client. Even though my work at Prairie Creek is not a real project, the work I produce will be of use to anyone who plans to do any type of trail layout at the park.

Because I have chosen to make this project as real as possible, I must come up with a plan that could be implemented at a very low cost. If trails are to be installed in the park, money will be needed for both construction and upkeep. As with most any park in the country, very little money is available for expansion.

To design a trail system which will not end up like the one already existing, thorough site analysis work will be required. Before a design can be drafted, understanding of the soils, slopes, vegetation, and all other existing conditions must be gained.

Whether a trail system is installed or not, something needs to be done to halt and begin to correct the degradation of the area in the southwest corner of the park. Any design for this portion of the park must address the reclamation of the areas which are currently in such poor condition.
5. LITERATURE REVIEW

After I had gained some understanding of what I wanted to do for my comprehensive project, I began to do some research. First I looked for a good definition of what recreation is. In his book Outdoor Recreation Planning, Alan Jubenville states, "Recreation is an activity that occurs after work and rejuvenates us, making us better workers and citizens"(6).

Much has been written about the importance of going outdoors for recreation. An often quoted line by John Muir states, "Everybody needs beauty as well as bread, places to play in and pray in where nature may heal and cheer and give strength to body and soul alike." Clayne Jensen adds, "Recreation is essential to the cultural, physical, moral, and spiritual well-being of the American people. Recreation is not frivolous. On the contrary, it is a necessity of life"(6).

In the history of recreation in the United States one can find many factors which are still influencing the way Americans pursue recreation. The industrialization and vast transportation network of our country are two of the greatest influences on recreation. As our country evolved from an agrarian society to an industrial one, leisure time activities became significant. The automobile allowed for the pursuit of recreation which required specific conditions to enjoy. People living in urban settings did not need to have recreation areas at their doorsteps because the automobile allowed them to quickly drive to a regional, state, or national park, to pursue outdoor activities(5).

Another area of research involved gaining an understanding of what
was wrong with the existing trail system and how those problems
developed. Erosion was an obvious problem. By understanding the ways in
which water can damage recreation areas, methods of control can be
implemented(3). The use of vegetation to control water damage is of great
benefit and is often not only better looking, but also less expensive than built
solutions(1). In situations where construction is required, the book The
Earth Manual, by Malcolm Margolin, provides techniques which utilize
found materials(9). The use of found materials not only helps keep
construction costs down, but also helps control the visual intrusion of the
control technique.

6. ASSUMPTIONS

Assumptions are often used in comprehensive projects. The student
can make assumptions which in turn allow the project to continue.
Because the work that I produced will be a resource for future work at the
reservoir, it was crucial that I did not make any assumptions. Ron
Bonham, Superintendent of Prairie Creek Reservoir Park, gave me an idea
of what could take place on the land around the reservoir. Within his
suggestions and criteria I completed my comprehensive project.

7. METHODOLOGY

To begin my comprehensive project I did research in the library on
recreation. My goal was to gain a better understanding of what recreation
is and why people need it. As I gained a basic understanding of the concept
of recreation I began doing research directly related to trails, their layout, and construction. When I had a clear idea of exactly what I wanted to do for my project I began to collect the maps, soil survey, and information on the history of the site.

With a general understanding of the topic and the basic information about the park in hand I began the site inventory phase of the project. This process was carried out by careful study of contour maps, park visits, aerial photographs, and a county soil map. All existing features and adjoining land uses were cataloged, as well as topographic and soil information.

When the site inventory information was completed, I began to create maps of the information and to analyze them. Site analysis was a major portion of my work because the park is very large. Due to the degradation of much of the land, my analysis of the soils was very detailed. Early on in the process I hypothesized that many of the trail problems were due to unstable soils.

As my analysis phase progressed I began to look at different concepts for laying out trail systems. When I completed my analysis I was able to lay out a loop trail on the site based on the findings of all of my inventory and analysis work.

8. METHODS

Large color coded maps were the graphic method I chose to display the findings of my comprehensive project. These maps included information on site features, analysis of site conditions, and trail layout. To
make my final design decisions, maps were overlaid and the prime trail location was determined. Appendix A contains color reproductions of all of these maps.

My first maps were basic site inventory. Map A listed all of the features which are within the park. Picnic shelters, boat docks, a campground, trail areas, and playgrounds are a sampling of the types of features located in the park. Also shown on the map were the private residences which are adjacent to Prairie Creek.

In Map B, site features which would interrupt a loop trail system were listed. Color codes were used to show if the obstacle was either severe or moderate. Examples of severe obstacles included, private property within the park boundaries, and the dam structure at the north end of the reservoir. Obstacles given the moderate label included, farm fields, and areas were there is very little room between the water and the road.

Topographic features were shown in Map C. Each color on the map represented a ten foot change in elevation. The highest points on the site were approximately sixty foot above the water level of the reservoir. This map was useful for drawing up sections across the site which showed the variety of topography which can be found within the park.

The different types of vegetation which exist in the park were listed in Map D. Four categories of vegetation exist within the park. Wooded areas, which area characterized by a thick canopy which allows for very little undergrowth, are shown on the map. Another type of vegetation was turf. A considerable portion of the site is kept mowed for large gathering spaces.
and access to the water. Farm fields are located on the northeast side of the park. Crops planted in these fields are intended to offer additional food for the wildlife which resides within and adjacent to the park.

The final vegetation type in the park is successional plots. Throughout the forty year history of the reservoir, land has been laid fallow and the succession process has created many young woodlands. These areas are characterized by young trees, shrubs, and non-woody vegetation such as grasses and plants commonly referred to as weeds.

Map E showed the suitability of the soils in the park for trails. Again a color code was used in which green areas were well suited, yellow moderately suited, and red severely limited. This information was found in the Delaware County Soil Survey. First, all of the soils and their characteristics were listed. I was then able to rank them as to their ability to support typical trail activities. Theses typical trail activities included uses such as horseback riding and hiking, but not uses such as motorized vehicles.

In Map F, the soil survey charts were used to establish the suitability of the soils within the park for growing trees. Green and yellow areas indicated the areas well and moderately suited for woodland. No soils on the site were severely limited for tree growth.

With Map G I began the process of overlaying several of the maps to produce a single map. These maps would combine analysis and inventory information which would indicate all of the areas suitable for trails. Map G shows the soil suitability for trails within the existing wooded areas of the
park. This information seemed important because trail systems are commonly thought of as features found in wooded areas. At this point I was only considering the opportunity and had yet to make any design decisions such as placing the majority of trails within the wooded areas.

Map H indicated the trail suitability of all the soils found outside the areas which are currently wooded. Again, I thought this would be important to know this because I didn't want to limit myself to just putting trails within the existing wooded areas. I also wanted to know the trail suitability of the successional areas because I knew that in another fifteen years some of them will have become woodlands.

With Map I, I was able to further condense the information I had compiled. Prime trail and woodland areas are indicated in green while all of the areas not suited for these uses are indicated in tan. This map did not prove very useful because it neglected to consider areas which were labeled as obstacles in Map B.

The final map of the analysis phase was Map J. This map was a result of overlaying the maps of soil suitability along with the map indicating the obstacles to a loop trail. The overall suitability of the site for having a loop trail placed on it was indicated by a color code system in which green showed areas well suited, yellow for moderately suited, and red for areas not suited. With this information in hand I could now make an informed decision about where a trail could go.

Conceptual Trail Layout was the title of Map K. This map shows an approximate location for the loop trail. I did not indicate an exact location
of the trail because I feel that this would be best accomplished by going to the park and choosing the exact location. On the map, a two-hundred foot wide band indicates the general location based on the site analysis and inventory. By laying the exact trail location out in the park, features such as views, small changes in topography, patches of shade trees, and design issues such as variety of experience, can be maximized. This map also indicated areas which would be best suited for low or high impact trail use. A variety of issues influenced this decision such as: wildlife habitat intrusion, noise, visibility, parking, vegetation, terrain, and the resiliency of soils and vegetation. Another important consideration involved the expectation of park visitors. Hikers or horseback riders are not very interested in spending a lot of time out in an open field.

9. RESULTS

Through careful study of the park features and the adjoining land use, I was able to make decisions about the location of trails within the park. My research into the soils of the site helped explain the reasons for the torn-up look of the park. Many of the soil types within the park are not well suited for trail use because of their high sand content. When these soils are found on steep slopes conditions exist which can easily lead to severe erosion. Even light trail use such as hiking can cause severe erosion problems because trail use usually destroys the vegetative cover on the trail surface. The vegetative cover is what currently holds much of the site
together because approximately one third of the park has poor soils for trail use.

By thoroughly studying the park, I gained enough knowledge to be fairly comfortable in making suggestions as to where a trail should go. When I actually began trying to place the trail, several areas were problematic. These areas consisted of poor conditions for having a trail but there was nowhere else for the trail to be placed. My final decision was to do everything I could to minimize places where the trail ran through severely limited areas. I also realized that a trail could be placed in these areas as long as it was understood by the client that it would be more expensive to install and maintain. These higher costs would occur because the environmental constraints were greater there than in other areas. While this situation was less than ideal, it seemed worthwhile because it would allow the loop trail system to occur.

10. DISCUSSION

Several developments in my comprehensive project have greatly advanced my understanding of Landscape Architecture. The first area in which I now realize I have a lot to learn has to do with determining the scope of a project. When I began to list what I wanted to produce for my presentation I had a list which involved three areas. I wanted to prepare a trail masterplan, a handbook of trail construction techniques, and a booklet which offered suggestions on low cost reclamation techniques. At the time I felt that all of these areas needed to be explored before construction could
ever begin. I sincerely believed that I would be able to take this project to a point where all the park board would have to do was hire the contractor to put the trail system in. While I still believe that my original three topic areas need to be investigated before new trails are installed, I realize that I was naive to think I could do all three in a semester. What I ended up with was a conceptual trail layout which was a result of a very extensive and time consuming study of the park. Fortunately, I was also able to complete the reclamation handbook because I used it to fulfill the final project requirement in one of the classes I completed this semester. (Appendix B)

Another area in which I expanded my understanding of the profession was in my definition of what a Landscape Architect can do. Early on in my investigation of trail damage at the park I realized that motorcycles were playing a significant role in the degradation of the site. In addition to my own observations, people I consulted often said things like, “I hope you ban the motorcycles”, or “What are you going to do about the motorcycles?”. I quickly became involved in a dilemma. How was I, a lowly college student, going to tell a bunch of motorcyclists that they couldn’t use the park anymore? What authority did I have? After all, I am just a Landscape Architecture student.

Unable to come to any conclusions on the topic of who will have access, I put that question on the back burner and dove into my study of the park. When I had completed all of my maps I spread them out and looked at them all together. Each one detailed a specific feature of the park. Soil types, vegetation, slopes, opportunities, constraints, etc. were all there in
front of me. As I looked at them I finally realized that I wasn’t going to have to tell anyone anything about who could or could not use the trails. The earth knew exactly what should and shouldn’t happen on it, and the maps I had done showed that perfectly. What I realized was that rather than filling the typical role of designer, I was acting as an interpreter. I wasn’t telling my client what I thought was best, I was showing what the site was capable of supporting. This came as a bit of a revelation because so often I had seen my role merely as an organizer of objects or spaces. This idea of being the voice for what the land wanted has made an impression on me that I believe will continue to be a part of what I do in the profession.

11. CONCLUSION

When a project is began it is a common practice to list out a few goals which the final product should accomplish or fulfill. As I look back on what I had determined as goals for my comprehensive project I realize that several were not met. There are many reasons why I was unable to meet all of my goals for this project. A lack of knowledge about what it would take to thoroughly understand the nature of the park was the biggest problem I faced. For some reason, early on I had overlooked the fact that I was dealing with a very large and diverse site.

Even though I didn’t finish everything I wanted to do, I still feel that I was successful for two reasons. The first feeling of accomplishment comes from knowing that the work I have done will be useful to the park board. With the work I have done they can gain some understanding of
what will need to be done if they want to install a loop trail.

My second, and most important reason for feeling a sense of accomplishment is related to what I feel the purpose of the comprehensive project was. I believe that after five years of classes the student should be able to demonstrate his or her ability to complete a project in a thorough and competent manner. Even though I didn’t do as much as I had initially hoped, I am confident that the information I have provided my client is both accurate and thorough.
12. BIBLIOGRAPHY


COLOR REPRODUCTIONS
OF MAPS REFERRED
TO IN SECTION 8
RECLAMATION HANDBOOK
REFERRED TO IN SECTION 10