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Cedar River Resource Assessment

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For the Cedar Rapids Parks and Recreation Commission

Field Problems in Planning, 102:210
Graduate Program in Urban and Regional Planning
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Associate Professor Heather McDonald, substantive faculty advisor
Assistant Professor Jerry Anthony, Instructor

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Alliant Energy (esp. Karmen Wilhelm), Penford Corp., and the Linn County Trails Association, for their efforts to help with our survey.

Larry Wilson and Bob Brooks of the University of Iowa Department of Campus Planning for sharing their ideas, documents, and experience.

To the faculty of the University of Iowa Graduate Program in Urban and Regional Planning for their thoughtful questions and critical advice throughout the course of this project.

Assistant Professor Jerry Anthony for his patience, diplomacy, and commitment to seeing us through to the completion of this project.
Executive Summary

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EXECUTIVE SUMMARY

Over the past two decades, American urban riverfronts have experienced a sort of renaissance. From San Antonio’s Riverwalk to the Ninemile Run project on the site of Pittsburgh’s retired steelyards and heavy industry, cities are returning to the river heritage that was the reason for their original settlement.

Economic development agencies, planners, and elected officials have all realized that waterfronts are a valuable resource for attracting investment, restoring a city’s image, and connecting community to a sense of place. While riverfront revitalization is not a new trend, many redevelopment efforts ignore the natural dynamics of the river environment.

In the past, most cities (with the help of the federal government) erected floodwalls, regraded riverbanks, and covered their shorelines in riprap and rubble. All this was in an effort to control the natural flow of the river. Meanwhile, the conversion of the urban and suburban landscape to concrete, asphalt, and turf grass lawns was forcing ever increasing quantities of stormwater into streams.

Planners and engineers are now rethinking riverfront design as a first step in restoring a more balanced approach to the urban environment. A number of cities, like Chicago (IL), Hartford (CT), Redmond (WA), and Minneapolis/St. Paul (MN) are taking a natural approach to their riverfronts. The goal is to integrate the city with the beauty of its natural surroundings. Often these plans call for extending vegetation out along city streets and parking lots as well. On a more local level, the University of Iowa in Iowa City has embarked on a project to re-landscape a one mile section of the Iowa River as it cuts through the central campus. The goal is to re-
design the riverfront as a focal point that will unite the two halves of the campus. Through bioengineering and re-landscaping, the project will create a more natural-looking riverbank and a more stable shoreline. This will allow people greater contact with the river.

Cedar Rapids set a course for re-connecting with its namesake river in 1996 when it completed the Cedar River Corridor Master Plan. That document, and the many citizens who helped to shape it, called for improvements that acknowledge the river’s natural dimensions. Protecting the river and its water quality was a primary goal of the Cedar River Corridor Plan. The recommendations in this Cedar River Resource Assessment Project build upon the foundation laid by that earlier planning effort.

That the current status of the riverbanks is less than satisfactory to city residents would seem obvious. Yet, to get a better idea of just how the local community feels about the riverbanks, we conducted interviews with key stakeholders and designed a visual survey and questionnaire to measure their response. We found that while most people do consider the riverfront in downtown Cedar Rapids “ordinary” or “industrial,” most also value the river’s potential, with many people describing the river as “peaceful.” Among the options chosen for improving the downtown riverfront, “ecologically sound,” “flood tolerant,” and “clean and litter free” topped the list. Moreover, respondents to the questionnaire indicated “integrating the river into the natural environment” as an important reason for investing in riverfront improvement. By conducting a Visual Preference Survey (VPS), our team ascertained that native vegetation treatments are considered appropriate and even desirable for the site.

Our visits to the riverfront site in downtown Cedar Rapids built upon the work of the VPS and questionnaire. By observing the land uses and urban landscape around the river we were
convinced that there was a need to integrate the city with the river by providing view corridors—a recommendation that was first suggested first in the Cedar River Corridor Master Plan.

On a more personal level, we were deeply impressed by the level of civic pride demonstrated by so many people who attended our survey and interviews. Many people indicated a strong, individual commitment to the city and its improvement. A number of people wrote in depth comments on their questionnaires or stayed long after the survey concluded to discuss the project with us. We were quite surprised to find that most respondents considered the area safe and clean, and that many, without prompting, discussed the importance of native plants and wildlife in their experience of the urban river. “The eagles are a nice addition,” one respondent wrote, as if a city official had hand-placed them on the bridge.

We recognize that the task of re-landscaping the riverfront is an enormous project that will require significant time and investment. There is no quick fix for a riverfront in this condition. While this document does not replace the expert advice of a landscaping or engineering firm, our recommendations do offer a description of the sort of riverfront that people would like to see—one integrated with the natural environment. We also believe that by working with the natural dynamics of the river the city can create an attractive riverfront landscape that is sustainable, and one that has deep communal meaning for the people of Cedar Rapids.

In order for the project to be a success, it must also have public support. For this reason we have extended our recommendations to areas such as volunteerism and alternative funding. We are confident that with continued efforts to work cooperatively with the public, this project can be seen to its completion and will help make Cedar Rapids a more exciting and livable place.
I N T R O D U C T I O N

“[This plan will] enhance and protect the river and its water quality; promote and enhance public access and use; identify appropriate land use and development opportunities; and provide linkages along and across the river for the community.”

—Goals cited in the Cedar River Corridor Master Plan (1996)

The Cedar Rapids Downtown Development Strategy (1990) identified the riverfront as the city’s greatest and most under-utilized asset. To address this situation, the Cedar Rapids Department of Development commissioned the Cedar River Corridor Master Plan in 1996. Among the principles highlighted in that plan are enhancing and protecting the river, facilitating public access and use (defined as both physical and visual access), and providing links to the community.

To help implement the strategies in the Corridor Plan, the Cedar Rapids Parks and Recreation Commission directed our group to develop a concept plan for the beautification and enhancement of the riverbank landscape within downtown Cedar Rapids. While the project focuses on aesthetic improvement, we were asked to balance this with a number of other concerns, including cost, ease of maintenance, flood tolerance and erosion control, water quality (as it relates to erosion and the use of chemicals maintenance), and Canada geese deterrence.
PROJECT SITE

The Cedar River Resource Assessment study area includes both the east and west riverbanks extending from the 2nd Avenue Bridge at Mays Island southward to the 16th Avenue Bridge (the Bridge of Lions) in the Czech Village. Perhaps the most highly visible section of the riverfront in Cedar Rapids, these riverbanks are viewed by automobile traffic along Interstate 380 and Highway 151/1st Avenue as both roads cross over the river into the central business district.

In addition, a number of prominent government, civic, and corporate buildings have views of the riverbank. These include the City Hall, the Linn County Courthouse, Alliant Energy, the Imax Theatre, the Cedar Rapids Public Library, APAC and the Great America building, just to name a few. One riverfront site, just north of 8th Avenue, will soon become home to a new federal courthouse.

The southern portion of the site falls within the focus of the Cedar Rapids Vision Plan (2002). This redevelopment plan focuses on investment in and rehabilitation of 350 acres of land southwest of the central business district. To “create a stronger destination appeal,” the Vision Plan suggests “improvements to the public realm within the current right-of-way.” These improvements include reinvestment in residential neighborhoods and business districts as well as the development of a new year-round farmers’ market and an X-treme Sports park. If the plan goes through (a referendum for city funding through a sales tax increase is scheduled for June 2003) the area will attract great public attention and tourism.
Important Locations within the Site

1. City Hall
2. Linn County Court House
3. Alliant Tower
4. Great America Building
5. APAC
6. Imax Theatre
7. Cedar Rapids Public Library
8. Future site of Federal Courthouse
9. Cedar Rapids Police Station
10. Penford Corp.
11. African American History Museum
12. National Czech and Slovak Museum

——— ——— Bike and/or pedestrian trails

Map Source: Cedar Rapids Department of Development
THE RIVER AS FOCAL POINT

The Cedar River acts as the primary open space and natural feature for downtown Cedar Rapids and provides an essential connection between the urban and rural landscape that characterizes the region. The gentle curve of the river as it winds its way through the city affords visual relief from the hard-edged, man-made materials and structures that define the city. Thus, it is not surprising that respondents to a survey (conducted as part of this study) described this section of the river as “peaceful” despite its very bustling surroundings.

For the early settlers of Cedar Rapids, the river allowed farmers and manufacturers to transport grain and other goods to market at a time when railroads were not yet constructed and roads were rare. During the 1830s and 1840s, flatboats were the primary mode of river transport whenever high water made it possible. There were great hopes for river transport during the 1840s and 1850s, but despite some early success in bringing steamboats up river during high water, the river was simply too shallow for regular traffic. Eventually the federal government declared the Cedar River unnavigable due to its shifting sandbars and shallow depth. In 1859 the railroad reached the Cedar River, ending the city’s dependence on the river for transportation. Like many American cities, Cedar Rapids turned its back on the river for most of the 20th century, using it as a sort of back alley for the city’s industries.

The full potential of the river has yet to be realized. Much of the riverbank along the project site has, over time, been modified to constrain the river’s natural flow. While riverfront areas to the far northwest and southeast of the city include a number of premier city parks and trails, the riverfront that runs along the central business district has largely been neglected. Future projects proposed as part of the Cedar Rapids Vision Plan have the potential to make this area of the river a focal point for the city. If left in their present state, the riverbank will be a blight on the redevelopment effort. Landscape improvements to this highly visible riverfront are essential to create an attractive connection between the central business district and the rehabilitated areas in the Cedar Rapids Vision project.

“Even as a pioneer village, Cedar Rapids was a charming little place The name was pleasing and easy to remember; the hills in every direction covered with wildflowers, seemed to suggest a sense of protection. The rapids of the Red Cedar River furnished a musical setting, and their was an atmosphere of friendliness among the people that made us feel welcome.”
—Charles A. Laurene, Pioneer Days in Cedar Rapids
CRITICAL ISSUES

As stated earlier, the Cedar Rapids Parks and Recreation Commission directed our group to develop a concept plan for the beautification and enhancement of the riverbank landscape near downtown Cedar Rapids. While the project focuses on aesthetic improvement, we were asked to balance this with a number of other concerns, including cost, ease of maintenance, flood tolerance and erosion control, water quality (as it relates to erosion and the use of chemicals), and Canada goose deterrence.

The riverbanks present a number of challenges due to their steep grade, lack of easy physical access at many points, and the nature of the river itself with its changing seasonal conditions. In addition, the urban landscape that surrounds the site with its mix of industrial, business, and public land uses makes deciding how to re-landscape the riverbank a complicated issue.
Access

Along the west bank of the river, public access is limited to the northern and southernmost sections of the site: at Brent Sumner Park (a two-block area of city green space adjacent to the 2nd Avenue Bridge on the north) and along a narrow berm between the Czech and Slovak Museum and the 12th Avenue Bridge. These limitations to physical access are significant not only to potential users but to the park crews or other workers who would construct and maintain any improvements to the riverbank. A large portion of the west bank is made entirely inaccessible by the Penford Corp. factory.

On the south end of the site the Czech and Slovak Museum, the new African American Historical Museum and Cultural Center, and a short section of the Cedar River Trail (between 16th and 8th Avenues) draw pedestrians and cyclists into close physical and visual contact with the river from the level areas above the bank.

North of 8th Avenue the trail connects into the Red Cedar Riverway, which runs 700 feet from the Great America Building to 4th Avenue. The Red Cedar Riverway is a highly constructed concrete trail with reinforced floodwall. The northernmost section of trail includes metal railings that allow visual access to the river, but restricts physical access to the riverbanks. Throughout the entire site the riverbanks are so steeply graded that approaching the water’s edge is precarious at best.

Current Vegetation

The current vegetation present in the site is largely a mix of undesirable herbaceous plants and scrub trees, including some noxious weeds. A few areas along the west-central and southeast portions of the site have mature trees that are attractive and help anchor the riverbank. While there is little in the current vegetation that may be considered aesthetically valuable (except along those areas where trees or formal landscaping are present) a plant inventory of the site by the Iowa Department of Natural Resources would be recommended.
Steep Grade and Space Constraints

Throughout the site, the riverbanks are narrow and steeply graded. A steep bank such as this requires careful attention to erosion during the implementation phase and can create an obstacle to maintenance crews. In addition, the instability of the banks along with the steep slope creates a safety concern in certain areas of the trail where public access may need to be discouraged or restricted.

Finally, it is worth noting that the steep grade of the banks was artificially created to inhibit the natural flow of the river. While this is undoubtedly necessary for flood control in many sections of the site—particularly in those areas where development is close to the banks—it may not be required in other areas.

A number of areas within the project site have only a narrow strip of level area above the bank. This will present a significant obstacle for accessing the slope during the implementation and maintenance phases of a re-landscaping project. Attention will need to be paid to maximizing the access to the site along the length of the project area.
River Depth and Flooding

The river along this portion of the site is relatively shallow (approximately 4 feet in the downtown area) and does not allow for motorboat use, except in times of high water. Possibilities for dredging the river are limited by bedrock.

Despite its shallow depths, the Cedar River is subject to periodic seasonal flooding. The entire project site falls within the 100-year floodplain. The alteration of the streambank landscape within the floodplain may require permitting from the Iowa DNR or the Army Corps of Engineers. Careful attention will need to be given to any vegetation installed within the ten-year storm flood elevation zone.

Rocks and Bank Interface

The lower portion of the riverbank is constructed of shotcrete, concrete rubble, and rocks. The removal of riprap or rocks will be necessary to re-vegetate the riverbanks in many areas. In other areas the constructed surface exists only up to the average high water line. While hard, smooth surfaces such as the shotcrete provide protection against erosion, they also speed river flow. It will need to be determined whether it is in the city’s interest to establish a more natural flow to the river and, if so, which areas of the bank and its construction fall under the jurisdiction of the Army Corps of Engineers or Iowa DNR.
**Land Use**

Finally, the urban landscape along this area is a mix of high-rise office buildings, government and public buildings (including museums and the library), parking lots, and industry (Penford Plant). This mix brings with it a great potential for a wide variety of users but also the incompatibility of mixed use.

While a number of the office and public buildings are attractive, the flat, paved expanse of parking lots may detract from area’s beauty and create safety concerns. The Penford Plant takes up a major portion of the west riverbank and makes this area of the site inaccessible and less attractive. While there is no reason to believe that the factory pollutes the river, the presence of an industrial plant inevitably leads to some concern over pollution and water quality. Overcoming this perception and integrating the industrial structure into an overall beautification strategy is a significant challenge for the project.
SITE POTENTIALS

The areas to the south along the African American and Czech and Slovak Museums receive a great deal of pedestrian and bicycle use due to the trail along the east side of the river and the Czech Museum terrace on the west bank. Along the northeast edge of the site, businesses and government offices draw in more passive users to view the river. In addition, there are a number of bridges that span the river within the site, with the 16th Avenue Bridge being the most and attractive and highly used by pedestrians and bicycles.

Open green space along the northwest and southeast portions of the site offer great opportunity to bring people close to the river for festivals and annual fireworks displays and have the potential to draw more regular use during warm weather months.
GOALS OF THE PROJECT

The Cedar Rapids Parks and Recreation Commission directed us to develop a concept plan for the beautification and enhancement of the riverbank landscape near downtown Cedar Rapids. The goal of our study is to provide recommendations for landscape treatments that balance the aesthetic improvement of the site with the potential costs of maintaining the riverbank as well as a number of environmental concerns.

In addition, our recommendations will reflect ideas gathered from the community and take into account the mix of land uses and ownership along the banks. In keeping with the goals identified in Corridor Plan, this report and our recommendations will:

Enhance and Protect the River
• Identify vegetation treatments that are sustainable and appropriate to the use and character of various locations within the project site.

• Consider the environmental limitations (flooding, erosion, bank steepness and instability) as well as the opportunities (wildlife habitat, scenic views, access to the water) connected with the site.

• Consider the river as a natural element in an urban setting.

Facilitate Public Use and Access
• Locate access points and view corridors that guide (visually and physically) people to the river.

• Identify limitations or obstacles to public use and access to various sections of the site.
Links to the Community

- Provide a clearer understanding of community/public perceptions of aesthetics and of values associated with the Cedar River and its banks.

- Explore the ways in which the river relates to the city and how the riverbanks might more effectively function as a focal point for the city.

- Consider the role that citizens—community groups and businesses—can play in the improvement and maintenance of the riverfront area.

Of course, the ability to implement any future plan to improve the riverfront will hinge on funding. Since the Parks and Recreation Department has indicated that their budget is often limited, our study will explore alternative funding sources and ways of leveraging funds to finance the project.
Part One: RESEARCH

Introduction

This portion of the report includes information and research that guided the recommendations that follow in Part Two of the report.

Section A provides information gathered through a literature review pertaining to low-maintenance, sustainable vegetation for riparian and sloping sites.

Section B describes and discusses our methodology as well as the findings of the survey tool and questionnaire.

Section C summarizes other research that contributed to this project.
“Only the implementation of [projects that are] visually beautiful, functionally efficient, economically sound, and environmentally sustainable will [produce] . . . an exciting and livable river city.”
—Cedar River Corridor Master Plan (1996)

SECTION A: VEGETATION

Over the past 10 to 15 years, a number of Midwestern cities like Chicago, Minneapolis/St. Paul, and Madison have added native vegetation as a standard landscaping solution for controlling and stabilizing the problems associated with steep slopes and riverbanks—erosion, stormwater run-off, seasonal flooding, and pollution. In addition, native plants present a significant cost savings since they are low maintenance, require no pesticides, no fertilizers, and no irrigation. These benefits have sparked a resurgence of interest in native landscaping and have persuaded many top landscaping and engineering firms and city planners to reconsider the way they approach projects such as riverfront design.

Conversion Checklist
Times when it makes sense to convert lawn to native landscaping:

- The soil is too wet or too dry for lawn.
- The lawn is rarely used.
- The soil is eroding or at risk for erosion.
- Canada geese are a problem.
- Water quality is a problem.

Source: Recreation Management (April, 2003)
Tall grass open prairies were the prevailing landscape before the European settlements in the Midwest. These prairies were rolling and flat, interspersed with poorly drained lowland and dry, well-drained uplands. Additionally, there were savanna tracts consisting primarily of scattered oak trees interspersed with characteristic grasses and forbs. Able to withstand periods of drought and inundation, vegetation native to the prairie region were adapted to the unpredictable climate of the Midwest (NIPC, 1997).

Over the past 150 years, native plants have been displaced to a large extent by non-native plants familiar to the people who first farmed and developed urban centers in the Midwest. The predominant landscaping material in urban areas today is the green grass lawn, which is borrowed from the heavily grazed, short grass pastures and formal gardens of Europe. The Midwest provides an inhospitable climate for short-cropped, short-rooted grass. Therefore a contemporary weed-free lawn is maintained at a high price, monetary and environmentally (NICP, 1997). Regular maintenance includes the application of pesticides and fertilizers (on a seasonal basis) as well as regular mowing and watering.

One area of riverfront landscaping that has received significant attention in recent times is the issue of environmental inadequacies associated with the conventional green grass, also referred to as turf grass. Because of its extremely shallow root system, turf grass can neither use nor hold water at the rate that is naturally required, and this has been major recommendation against its use. In order to deal with the impacts of erosion and stormwater loads, native waterway vegetation is increasingly becoming the favored stream management tool. Native landscaping often suggests not just the attempt to make the landscape look as it did prior to development, but also to restore or reconstruct the function of the landscape to absorb water and hold soil.

The numerous potential benefits of natural landscaping may be categorized into economic, environmental and educational/recreational themes (NICP, 1997).

**Economic benefits:** reduced costs of landscape installation and maintenance, reduced expense for storm water management facilities, creation of a distinctive community image that strengthens real estate markets, and supports the natural landscaping component of the “green industry.”

**Environmental benefits:** reduced soil erosion, improved water quality, reduced air pollution (esp. associated with pollen allergies), reduced noise pollution, climatological benefits and reduced greenhouse effect, habitat restoration and protection, and beautification.

**Educational and recreational benefits:** conservation education, passive recreation opportunities; enhanced regional recreational corridors, and scientific study.
**Cost of Maintenance**

The predominant landscaping material today is the green grass lawn. While turf grass may be an essential component to some active recreational areas (such as golf courses and soccer fields) it comes at a heavy price (Pizzo, 2003). In addition to regular mowing, turfgrass requires pesticides, fertilizer, and irrigation. In short, it is ill-adapted to extremes of the changing and unpredictable climate in the Midwest. The same may be said of many of the hybrid and imported trees, shrubs, and flowering plants that are used to ornament the landscape. Beyond a simple aesthetic uniformity, shading, or screening, much traditional vegetation offers little in the way of additional benefits.

While it is difficult to provide a general cost comparison for ornamental vegetation (trees, shrubs, and flowering plants) due to the range and variety of species, it is possible to consider the costs of lawn grasses versus native plantings. The following tables show substantial cost savings for landscapes restored to native vegetation compared to those established in lawn or turf grass. Most striking is the substantial cost savings in subsequent years of maintenance—a savings of more than 79% over the course of 20 years according to one source (Pizzo, 2003).

<table>
<thead>
<tr>
<th>Procedures &amp; Material Site Prep</th>
<th>Sodded Turf Grasses</th>
<th>Seeded Turf Grasses</th>
<th>Prairie or Wetland Seeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spraying 1</td>
<td>$140</td>
<td>$140</td>
<td>$140</td>
</tr>
<tr>
<td>Irrigation 2</td>
<td>$1,680</td>
<td>$1,680</td>
<td></td>
</tr>
<tr>
<td>Top Soil 3</td>
<td>$4,480</td>
<td>$4,480</td>
<td></td>
</tr>
<tr>
<td>Tilling</td>
<td>$392</td>
<td>$392</td>
<td>$392</td>
</tr>
<tr>
<td>Sod &amp; Seeding</td>
<td>$5,964</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed &amp; Seeding</td>
<td></td>
<td>$1,064</td>
<td>$1,232</td>
</tr>
<tr>
<td>Wild Flower Planting *</td>
<td></td>
<td>$1,680</td>
<td></td>
</tr>
<tr>
<td>First Year Mowing</td>
<td>$784</td>
<td>$672</td>
<td>$196</td>
</tr>
<tr>
<td>Total Installation/Acre</td>
<td>$13,440</td>
<td>$8,428</td>
<td>$1,960 to $3,640</td>
</tr>
<tr>
<td>Subsequent Annual Upkeep/Acre 4</td>
<td>$1,120</td>
<td>$1,120</td>
<td>$168</td>
</tr>
</tbody>
</table>

1. Spraying must be done on sites with live, undesirable vegetation such as quack grass or thistle.
2. Irrigation cost figure assumed on underground automatic system.
3. Top Soil is figured at approx. 3 inches depth and hauled from off-site.
4. Wildflower planting is optional for low profile sites. This figure is based on 1,000 seedlings installed per acre planted.

* Wildflower planting is optional for low profile sites. This figure is based on 1,000 seedlings installed per acre planted.

Source: Applied Ecological Service, Brodhead, WI
<table>
<thead>
<tr>
<th><strong>Existing Turf Grass</strong></th>
<th>Year 1</th>
<th>Year 5</th>
<th>Year 10</th>
<th>Year 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mowing</td>
<td>$3500</td>
<td>$3825</td>
<td>$4,434</td>
<td>$5,959</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>$525</td>
<td>$574</td>
<td>$665</td>
<td>$894</td>
</tr>
<tr>
<td>Overseeding &amp; Aeration</td>
<td></td>
<td>$1,075</td>
<td></td>
<td>$1,250</td>
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<tr>
<td>Annual per acre expense</td>
<td>$4,025</td>
<td>$4,398</td>
<td>$6,174</td>
<td>$8,102</td>
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<tr>
<td>Cumulative per acre expense</td>
<td>$4,025</td>
<td>$22,691</td>
<td>$48,767</td>
<td>$112,572</td>
</tr>
</tbody>
</table>

**New Prairie, Savannah, or Wetland From Seed**

<table>
<thead>
<tr>
<th><strong>Year 1</strong></th>
<th><strong>Year 5</strong></th>
<th><strong>Year 10</strong></th>
<th><strong>Year 20</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>$3,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herbicide</td>
<td>$330</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weed control</td>
<td>$2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burn management</td>
<td>$546</td>
<td>$633</td>
<td>$851</td>
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<tr>
<td>Annual per acre expense</td>
<td>$5,830</td>
<td>$546</td>
<td>$633</td>
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<tr>
<td>Cumulative per acre expense</td>
<td>$5,830</td>
<td>$13,187</td>
<td>$16,175</td>
</tr>
<tr>
<td>Per acre savings</td>
<td>-$1,805</td>
<td>$9,504</td>
<td>$32,592</td>
</tr>
<tr>
<td>% savings</td>
<td>-44%</td>
<td>41.9%</td>
<td>66.8%</td>
</tr>
</tbody>
</table>
Erosion Control and Water Quality Issues

According to the U.S. Environmental Protection Agency, native landscaping should be considered along streambanks and shorelines, as well as in areas where erosion or flooding may be a problem. A 25 foot buffer of native trees, shrubs, or grasses and forbs (flowering plants) are recommended on either side of streams and drainage-ways.

Due to their deep, dense root systems, native plants are extremely effective at holding erodible soils on steep slopes and streambanks. The root structures of native prairie plants account for as much as 65% of the plant's total biomass, even during their peak season. Many native plants have root structures that reach to depths of several feet (once established), while the roots of turf grasses are less than 6 inches deep. Furthermore, plants that rely on irrigation and fertilizer often develop shallow root systems.

Native vegetation established on slopes and streambanks intercept contaminants from stormwater and run off. Emergent wetland plants along the water’s edge provide additional benefits by anchoring the streambank and filtering out pollutants.
Canada Geese Control

Throughout the Midwest non-migratory Canada Geese have become a problem. Well-kept lawns, golf courses, business parks, city parks, and recreational fields provide an excellent food source and a safe area to congregate. Many parks and open spaces include water sources such as ponds, streams, or artificial lakes that are surrounded by little, if any, tall vegetation. Easy access between land and water creates an ideal setting for geese, since it makes it easy for them to escape from predators. In urban environments, natural predators (and hunters) are almost non-existent, so geese feel safe. Mowing and fertilizing lawn grass only makes it more nutritious for the geese, so the healthier the lawn, the more attractive it is for the geese (Gosser, 1997).

While many people enjoy seeing or feeding geese, many people who frequent parks and open space consider them a nuisance. Large flocks leave behind a great deal of feces that can be annoying and even dangerous, especially on trails.

While there are a number of ways to eliminate or minimize the damage caused by Canada geese, the most cost effective method is to make the site less attractive by modifying the landscape. According to the International Association of Fish and Wildlife Agencies, landscape modification is one of the most effective and environmentally sound methods for reducing and controlling Canada geese in urban areas (Gosser, 1997). Many other conservation agencies in the Midwest are now recommending the use of native landscaping on shorelines and near water sources to deter geese and other water fowl. Vegetation of 12–18 inches or higher deters geese from sites by restricting their ability to move freely between water and land and by reducing their ability to see predators.
Places for Passive Recreation

According to one planning document promoted by the U.S. Environmental Protection Agency, “Natural landscaping is an aesthetically exciting, ever-changing tapestry of hardy, primarily native plantings well adapted to the local climate and soil” (NIPC, 1997).

While lawn grasses offer few additional benefits, native vegetation supports local wildlife habitat, including migratory birds. Areas planted in native vegetation provide valuable recreation space in the form of outdoor classrooms and areas of passive recreation. Many cities now take advantage of local knowledge at high schools, community colleges, and universities to use areas planted in native vegetation as outdoor classrooms. In addition, non-profit organizations, gardening clubs, and environmental and sporting groups frequently become involved in the implementation, maintenance, and public awareness efforts for their local parks department when native vegetation is included.
A number of economic and environmental concerns have shaped our recommendations. From the outset, maintenance costs, flood tolerance and erosion control, water quality, and Canada geese deterrence along with the topography and physical condition of the site pointed toward the use of native vegetation. Yet the primary goal of this project is aesthetic improvement—beautification of the riverbank. Identifying what will be attractive and sustainable for any site depends on the local context and local preferences of those who will be most impacted by any change. Beauty is a subjective criterion and one that is not easily measured. Evaluating or measuring the aesthetic preferences is essential to providing a successful plan.

Three of the planning principles outlined in the Cedar River Corridor Master Plan relate to the visual image of the river. These include: “emphasis on both physical & visual public access to the river” and “foster[ing] a distinctive identity, a recognizable theme, and an image that has both personal and communal meaning.” These principles can be better met with the knowledge of what the public accepts as an attractive riverfront landscape.
Methodology

The Visual Preference Survey (VPS) technique was developed by urban designer, Anton Nelessen in order to better assess community preferences regarding the appearance of different developments. Visual surveys traditionally consist of various or contrasting images of a region's built or natural environment. Photographs are often taken from within a community, although images can come from outside sources if a depiction of specific or particular design or vegetation principles cannot be found in the survey area (Nelessen, 2002).

Images are gathered and shown to residents at public meetings or workshops. Participants are asked to rate or score each image on a specific scale (1-10, -5 to +5, negative to positive, etc.). Images are shown at a relatively fast pace in order to determine each individual’s initial or ‘gut’ reaction. Those taking the survey are informed and assured that there is no right or wrong answer in order to get actual individual preferences.

The scores for each image are tallied to determine the average score of those taking the survey. The results can be called a “quantified collective opinion.” The images with the highest and lowest average value indicate where there is the most agreement in the group. The responses may be used in future planning efforts that shape what is to be done, how to best accomplish this, and what the community desires (Nelessen, 2002).

Visual Preference Surveys have an additional benefit in that they provide an effective means for educating and involving community members in land use and community planning processes. The survey makes individuals aware of the compromises inherent in design and land use decisions. By using images of various land-use or vegetation patterns, participants are better able to evaluate the existing environment while envisioning the future possibilities for the area (LGC, 2002).
Summary of the Process

Visual Preference Surveys (VPS) are useful tools for addressing the issue of local taste and for quantifying the degree to which a group prefers one style or approach over another. Our survey sought to identify not so much a single preferred style of landscaping, but rather to determine whether a more natural or native style of landscaping, which seemed to meet the secondary goals of the project, would be appropriate. The point of our survey was not to find the most highly desirable or preferred landscape, but rather to determine what kinds of vegetation were acceptable or desirable in the local context.

To accomplish our visual survey, we needed to present an array of vegetation types, including native and traditional plants. Also included in the survey were different types of riprap and mulch placed along the riverbank as well as maintained and unmaintained settings with and without vegetation. It was important to include all vegetation possibilities along the riverfront so that individuals would not be limited by a lack of images or guided to a specific image.

The results of the VPS allowed the project team to make better recommendations to the Parks and Recreation Commission based on an analysis of what the community accepts or finds attractive. It was important that community members participate in the survey, especially those that live in the area and those that use the trails and attractions and businesses along the riverfront.

While the survey tool helped our group to gain knowledge from the public in a more formal manner, it also allowed for the public to have input and a sense of accomplishment from having their views taken into account prior to implementing the project.
Our survey included a sample size of 83 targeted stakeholders—individuals with a direct interest in what the area looks like. The target audience in this case was taken to be individuals that live, work, or recreate within and four blocks (1/4 mile of the riverfront) on either side of the river within the project site. Through a spatial analysis of the land use patterns identified within this boundary, we determined that our target audience should consist of 45% commercial and industrial representatives, 30% residents of the area, and 25% representatives of civic or public groups. This comprised our “ideal” target audience for completing the survey, and the groups that we contacted to participate in the process were based on this demographic breakdown.

We chose an ideal sample size of 96 based on the population for the city of Cedar Rapids, which is 120,563. Accurately assessing and quantifying the number of total riverfront stakeholders (workers, residents, trail users, etc.) was not feasible within the scope of this research. Because we did not want to underestimate the usage of the area, we relied on the broadest context and used the city’s total population. In order to get a 95% confidence level, a sample size of 96 was needed for a 10% sampling error. Given the scope and timing of this research, we decided to go with 96 people as a reasonable sample size.

Eight separate survey sessions were conducted during February and March at numerous sites: the Cedar Rapids Public Library (Feb. 26 and 27), at Alliant Tower (Feb. 28), at Paul Engle Center (March 5), at the Czech Neighborhood (March 6), and at the Penford Plant (March 24). Participants were contacted through the Czech and Slovak Museum and neighborhood association and guild, the African American Museum, Alliant Energy, the Renaissance Group, Linn County Trails Association, Community Garden Group, and the Penford Corporation. Additional participants were solicited through the Parks and Recreation Commission and through postings at the Cedar Rapids Public Library. While our target number was 96 participants, due to inclement weather and the time constraints, our efforts drew in 83 total participants.
The visual preference survey included a slide presentation of images that illustrated a range of vegetation and landscaping styles from the sort of un-maintained spontaneous vegetation that is common to disturbed riverbanks, to the riprap associated with some portions of this site, to healthy native landscaping and highly formal traditional lawn and ornamental landscapes. Some of the slides depicted landscapes with minimal trail designs, while others included ornate, highly constructed trails with railings or retaining walls.

Participants were asked to respond to the statement “This image represents an attractive riverbank” by rating each image on a scale that ranged from strongly disagree (-5) to strongly agree (+5). The slides were divided into two groups—one set showing close-ups of riverbank vegetation and the other showing wider-angle views of riverbank landscapes. The presentation was set on an automatic timer allowing participants 15 seconds per slide. Instructions were given asking respondents to judge each slide based on their own, personal first impression of the image (or “how would you like to view this image from the trail in downtown Cedar Rapids?”). Space was also provided for participants to write any questions or comments they had about the survey or the images they had seen.
Each survey took approximately 20 minutes to administer with another 5 to 10 minutes to fill out the questionnaire. Time was left at the end for participants to ask questions of us or to make comments about their concerns or ideas about the site. Several of these discussions yielded interesting information.

In addition to the VPS, participants filled out questionnaires that gathered additional information on how often and in what ways they came into contact with the project site. The questionnaire also asked them for information on their impression of the site’s current conditions and the issues that they felt were critical to a successful riverfront improvement. Following the visual survey and questionnaire, participants were allowed to make comments or ask questions about the project.
For the purpose of our analysis, images were classified under three categories: vegetation type, organization, and color. In order to understand the findings from our research, we provide the following brief definitions of the primary characteristics that will be discussed.

**Vegetation**

Native/Natural: Refers to the use of plants—for example, prairie, woodland and wetland plants—that are naturally adapted to a particular region and flourished in a particular region (largely the Midwest in the case of this project) prior to settlement.

Traditional: This definition includes hybrid or non-indigenous herbaceous plants or shrubs. The predominant traditional landscaping material today is turf or lawn grass.

No Vegetation: Somewhat self-explanatory and is typified by riverbanks that have been paved over or covered in riprap or other non-vegetative material.

**Organization**

Organized: Any landscape treatment that is designed and maintained to create a harmony or pattern.

Unorganized: Refers to those landscapes for which there is no consistent theme or pattern, where vegetation is arranged in a seemingly random fashion.

**Color**

Colorful: Refers to vegetation or landscapes that are multi-colored.

Monocolor: Vegetation or landscape that is predominantly green or brown.

To analyze the results of the survey and accompanying questionnaire, we considered the overall average score for each image. We also broke the ratings down according to whether the respondents used the trails along the river and whether they work in downtown Cedar Rapids (see Appendix C).
Table 1 shows the average scores for slides (from -5 to +5) depicting the point at which riverbank vegetation interfaces with the river. The survey identified an overall preference for native vegetation. Slides that showed vegetation that was particularly colorful or well organized were scored higher (on average) than slides that depicted vegetation that was mono-colored (green or brown), unmaintained (eroded), or random (large gaps in vegetation). One important finding was the clear dislike for treatments such as riprap that eliminate vegetation altogether. You can view the complete list of scores and images in Appendix C.

A slide depicting native riverbank vegetation that is organized and colorful.

<table>
<thead>
<tr>
<th>Slide #</th>
<th>Organization</th>
<th>Vegetation Color</th>
<th>Vegetation Type</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organized</td>
<td>Colorful</td>
<td>Native/Natural</td>
<td>0.24</td>
</tr>
<tr>
<td>2</td>
<td>Unorganized</td>
<td>Colorful</td>
<td>Traditional</td>
<td>2.00</td>
</tr>
<tr>
<td>3</td>
<td>Organized</td>
<td>Colorful</td>
<td>No Veg.</td>
<td>-0.97</td>
</tr>
<tr>
<td>4</td>
<td>Organized</td>
<td>Colorful</td>
<td>Native/Natural</td>
<td>1.11</td>
</tr>
<tr>
<td>5</td>
<td>Organized</td>
<td>Colorful</td>
<td>Traditional</td>
<td>1.29</td>
</tr>
<tr>
<td>6</td>
<td>Organized</td>
<td>Colorful</td>
<td>No Veg.</td>
<td>2.47</td>
</tr>
<tr>
<td>7</td>
<td>Organized</td>
<td>Colorful</td>
<td>Native/Natural</td>
<td>3.03</td>
</tr>
<tr>
<td>8</td>
<td>Organized</td>
<td>Colorful</td>
<td>Traditional</td>
<td>-0.32</td>
</tr>
<tr>
<td>9</td>
<td>Organized</td>
<td>Colorful</td>
<td>No Veg.</td>
<td>0.42</td>
</tr>
<tr>
<td>10</td>
<td>Organized</td>
<td>Colorful</td>
<td>Native/Natural</td>
<td>0.82</td>
</tr>
<tr>
<td>11</td>
<td>Organized</td>
<td>Colorful</td>
<td>Traditional</td>
<td>-1.39</td>
</tr>
<tr>
<td>12</td>
<td>Organized</td>
<td>Colorful</td>
<td>No Veg.</td>
<td>1.45</td>
</tr>
</tbody>
</table>

| Score   | 1.21 | 0.49 | 1.72 | -0.03 | 1.23 | 0.58 | -1.39 |
Analysis of responses to those slides that depicted overall riverfront landscape revealed that both native and traditional approaches to landscaping are acceptable. While overall traditional treatments that included formal paths were rated slightly higher than native treatments, the highest scoring slide was one in which both native and non-native plants were combined. Trail users and non-users both rated landscapes that included a variety of vegetation higher than those that were limited to just turfgrass (see Appendix C). Again, landscapes in which little or no vegetation was visible were ranked lowest.

Color appeared to be a factor that most influenced the scores assigned to slides, with colorful landscapes scoring significantly higher than low color or mono-colored landscapes. Surprisingly, there was no significant difference between slides that showed highly organized (maintained) landscapes and less organized (natural) landscapes.

Slides that depicted shorelines without vegetation were rated lowest.
Questionnaire

Each survey was accompanied by a brief questionnaire that gathered basic information on stakeholders’ impressions of the site as well as their ideas on what characteristics an improved riverfront should include.

We attempted to identify the nature of the respondents’ interactions or relationships with the site by asking questions about how often they used the trail, whether they work or live near the site, and what brings them to downtown Cedar Rapids. The answers to these questions would allow us to see if there were differences in the perception of the present riverfront or preferences about the future landscape based on whether the respondent lived, work near the site, or used the trail. This information could help us to better assess responses to the VPS.

Other questions were intended to gather information on general concepts or characteristics that make for a pleasant riverfront. One question asked respondents to choose three out of ten options that described their impression of the current riverfront. Theses option ranged from “clean” and “natural/ecological” to “polluted” and “unsafe/dangerous.” While most respondents described the current riverfront as “ordinary” and “industrial,” many also found it to be “clean” and “peaceful.” Another question asked why the riverfront should be improved. Again, respondents were instructed to choose three options. The top four answers were “to attract visitors,” “to integrate the city into its natural environment,” “to improve the city’s image,” and “to encourage people to use and value the river.”

On the issue of future improvements to the downtown riverfront, we asked respondents to choose three options out of ten describing those characteristics that are most important to improving the riverfront. “Ecologically sound,” “flood tolerant,” and “clean and litter free,” along with making the riverfront “more natural looking” were ranked as the most important considerations.

Description of the Current Riverfront

1. Ordinary 24.12%
2. Industrial 14.91%
9. Natural/Ecological 3.52%
10. Unsafe/Dangerous 0.88%

The most popular and least popular responses from the questionnaire. Each respondent could choose up to three options from a list of ten.
Finally, the questionnaire asked two open-ended questions for which respondents could write their own answer. When asked to comment on what they liked best about the riverfront, respondents listed the vegetation and trails and the opportunity to view wildlife. As for the things they disliked about the trails, geese garnered the most comment, along with lack of maintenance and attention to landscaping along the southern sections of the trail. A number of people commented on the lack of green space and the over-built character of the northern-most section of trail. The concern that trails or riverfront might be “over-built” or un-natural in character was a consistent theme in our post-survey discussions.

Accessibility was listed as both a positive and negative among respondents. On the positive side, the river’s location within the downtown makes it accessible in the sense that one does not have to travel far to get to the river. It is also visible from a number of buildings and major roads. However, many respondents commented that they were uncertain about where to access the trails or where to park in order to use the trails. Still others complained that it was impossible or unsafe to get down to the water. Fishing piers, docks, and other issues related to accessing the water itself were listed as potential improvements.

A copy of the questionnaire along with a complete breakdown and analysis of the responses may be found in Appendix D and Appendix E.
Respondents were asked to choose three options for what an improved riverfront should do for the city. Choices were not ranked according to preference. Percentages are based on 242 total responses.
"... most important to improving the riverfront in downtown Cedar Rapids?"

Respondents were asked to choose three options for what an improved riverfront should do for the city. Choices were not ranked according to preference. Percentages are based on 242 total responses.
Section C: OTHER RESEARCH

Interviews
The project team also conducted interviews with representatives of the two major stakeholders at the south end of the site—the National Czech and Slovak Museum and the African American Historical Museum (see Appendix F). We chose to focus on these two stakeholders since the area in which they are located is perhaps the most under-maintained or unimproved section of the project site. These interviews allowed us to gather information on how the museums currently use (or intend to use) their riverfront views as well as their assessment of current conditions and ideas for improving the site. A transcript of stakeholder interviews may be found in Appendix F.

Site Analysis
With assistance from the Parks and Recreation Commission and the Cedar Rapids Department of Development, we were able to assemble information and maps on the current land use and proposed redevelopment areas within the site. Our team also walked the site several times in order to gather information and photograph the area.

Secondary Sources
Our research relied on a number of secondary sources from government agencies that can provide the basic information for our comparison of landscape alternatives and vegetation, including implementation and maintenance costs. These agencies include the Soil and Water Conservation Service, the Iowa Department of Natural Resources, the National Resources Conservation Service, and the U.S. Environmental Protection Agency. We also interviewed representative from the University of Iowa’s Office of Campus Planning to learn more about a comparable project now under construction along the Iowa River on the University of Iowa campus. We researched additional information on flooding and other issues related to bank stability with the United States Geological Survey and the U.S. Army Corps of Engineers.
Cedar River Resource Assessment Project

**Part Two : RECOMMENDATIONS**

**INTRODUCTION**

Improvements to the landscape along the riverbank in downtown Cedar Rapids will be most successful and sustainable if community tastes and values (aesthetics) are balanced with the natural dynamics of the river. The steep grade of the present riverbank makes ornamental vegetation impractical (especially for maintenance crews), and risks further soil erosion and destabilization during both planting and maintenance phases. In addition, concerns over maintenance costs as well as the use of pesticides and other chemicals in close proximity to the river helped to guide our recommendations toward an alternative or native approach to landscaping.

Landscape improvements to the riverbank—which is currently stabilized with riprap, shotcrete, and/or concrete rubble—will require a substantial investment. A healthy and attractive riverbank will thrive only if some of the man-made materials are removed and replaced with soil and erosion control mats or other engineered fabrics while plants become established. While no vegetation can be guaranteed withstand the sort of flooding that Cedar Rapids experienced in 1993, a re-landscaped riverbank that includes native vegetation can survive and even thrive during short periods of inundation associated with the more likely ten-tear storm event.

Recommendations for this site will balance a native approach to lower riverbank throughout the site, with more traditional vegetation on the upper bank and level areas depending on the specific use and character of each section of the site. We have organized our recommendations into five subsections within the site to accommodate the different, and sometimes conflicting, uses that exist along the project area.
BIOENGINEERING AND RE-GRADING

Bioengineering—a combination of natural science and engineering—provides a state-of-the-art, environmentally sound approach to problems traditional associated with riverfronts. A bioengineered riverbank provides an aesthetic and environmental advantages over traditional engineering by maintaining the appearance and biological function of a natural system while addressing the long-term stability of the riverbank.

Industrial, commercial, and residential development along watersheds places a heavy burden on streams and rivers particularly when it comes to managing stormwater loads. While there are a number of ways to deal with these issues, engineers have relied predominantly on “hard” on manufactured solutions, ignoring the benefits of bioengineering. (Sotir, 1998) While these hard solutions may provide relief from site-specific problems, they may exacerbate problems downstream. Soil bioengineering not only stabilizes the riverbank, but also retains and filters water, slows stream flow and water runoff. Moreover, manufactured walls and retention materials that degrade over time, bioengineered riverbanks actually improve with age as plant materials become established.

Another option for making the riverbank and the shoreline more physically and visually accessible would be to regrade the slopes. Regrading may provide a more natural looking river as well as a more accessible shoreline. The Parks and Recreation Commission might investigate this approach on certain riverbanks within the site. A more gradual slope would allow better access for implementing and maintaining the landscape and also provide a sense of great visual access to the river.

The University of Iowa is currently employing bioengineering and regrading in its rehabilitation of a one-mile stretch of the Iowa River. The goal of this plan is to make the riverfront a unifying focal point for the campus by making the shoreline accessible. Native plants are used to stabilize slopes, minimize maintenance, and deter geese and ducks that congregate along open grassy areas along the shore.
VEGETATION

In order to make appropriate recommendations, we have broken the project area into five sections based on current use and accessibility. The northernmost sections of the site are currently the most highly used sections, at least during the business day. These areas have also received the most landscaping and maintenance attention.

In the southern half of the site, south of 8th Avenue, the riverbanks are not landscaped and suffer from a sort of benign neglect. With the opening of the African American History Museum and the anticipated redevelopment improvements included in the Cedar Rapids Vision Plan, this area will be more highly visible and frequently used.

Finally, a substantial portion of the west riverbank is made inaccessible by the location of the Penford Corp. This section of the riverfront will need to be treated in a completely different manner from the other areas of the site.

In addition, we will consider the topmost or upper portion of the riverbank separate from the lower riverbank, which is that area that falls within the 10-year storm flood level and is most susceptible to flooding and erosion.

As mentioned at the outset, the primary obstacles to implementing or maintaining any new landscape in the project area is the lack of access due to the steep banks and the changing nature of the river itself. It must be stressed that whatever solution is ultimately chosen, most of the riverbank will need to be maintained by hand as mowers and other heavy equipment will be difficult if not impossible to use.
SITE ONE: NORTHEAST RIVERBANK

Upper Portion of the Riverbank and Level Areas:
The riverbank north of 8th Avenue has a more urban/commercial character and use than other areas within the site. On the Northeast bank, between 2nd and 5th Avenues, the upper portion of the riverbank is already landscaped in a style that we have referred to as “traditional” or “formal.” While not ideal from an erosion standpoint, this traditional treatment along the upper bank is considered appropriate given the more formal, business setting.

In other locations along the top of the riverbank, particularly between the Great America Building and the 8th Avenue Bridge, there are wider areas of turf grass. This level green space combined with the openness of the parking lots creates an ideal place for ducks and geese to congregate. While maintaining the area’s fairly traditional landscape treatment may be desirable, we recommend introducing more low native shrubs or other vegetation of no less than 18 inches on both sides of the trail in order to deter the geese.

Lower Portion of the Riverbank:
Since most of the lower riverbank in the northeast section is not only inaccessible but also subject to periodic, seasonal flooding use of natural vegetation will provide the best approach. A riverbank consisting of native grasses, sedges, and forbs will help retain the view from the upper riverbank while stabilizing the lower portion. Along the lowest section of the riverbank, we recommend taller grasses and forbs that decrease in height as they come up the bank in order to maintain the view from the trail. A minimum height of 18 inches at the top of the bank will discourage geese and ducks from using the shore, while preserving the view for trail users.
SITE TWO: SOUTHEAST RIVERBANK

Upper and Lower Portions of the Riverbank

The riverbank south of 8th Avenue has less commercial use. Here, mixed-use residential neighborhoods along with public, educational, and open green space—including Masaryk Park—invite more active recreational use of the trails by bikers, walkers, and joggers.

Drawing on the visual preference survey and questionnaire, we found that most people (especially regular trail users) feel comfortable with native vegetation so long as it is well-organized and maintained. Here we recommend integrating the upper and lower riverbanks by using native vegetation throughout while maintaining the mature, healthy trees that are already present in some sections of the site.

The tallest plants should be established at the river’s edge and decrease in height as they ascend the bank. Tall vegetation (18 inch min.) will discourage geese from congregating. In addition to preserving the view from the upper riverbank by using lower vegetation, we recommend maintaining a two-foot wide swath of turf grass on both sides of the path in order to create a sense of natural transition between the path and the riverbank.

On the opposite side (city side) of the path, where there are open areas of turf grass, we recommend interspersing trees and shrubs in order to provide shade and to screen out the view of parking lots. By keeping trees or tall shrubs on the city side (rather than the river side) of the trail you can preserve the view of the river and provide shade while simultaneously deterring the geese and ducks. Again, it is important to maintain at least a two-foot wide swath of turf grass as a transition between the trail and any

A map of the southeast riverbank with the project area outlined in green.
shrubs or trees for visibility and safety purposes.

Level Areas:

On the level areas above the riverbank, native vegetation may transition into a traditional landscape treatment. South of 12th Avenue along the trail connecting the African American Museum to Masaryk Park the site might benefit from more formal vegetation. This portion of the site would be ideal for a partnership between the parks department and the museums and neighborhood.

Representatives from both museums indicated that they would like to see some visual continuity between the two sides of the river. Both also expressed a willingness to organize volunteers to help with the project. The museums could collaborate to create flower beds or other plantings that guide pedestrians using the trail between the two museums. One suggestion is to combine the Czech neighborhood’s traditional red and white theme along the Museum (on the west bank) and Masaryk Park (on the east) to merge with the colors of the African American museum—green, red, yellow, and black.

Another possible area for partnership exists in the open lot between Masaryk Park and the African Museum. Some type of garden, whether formal or native, would invite people to stop and look. A butterfly or touch garden or a prairie demonstration site would be appropriate solutions for the empty lot. There may also be an opportunity to develop a garden that has distinct cultural significance for Czech and African American or other immigrant communities.
SECTION 3: SOUTHWEST RIVERBANK

Upper and Lower Portions of the Riverbank:
As with the lower riverbank on the east side of the river, the slopes on the west bank are far too steep for traditional vegetation. Re-vegetating the lower riverbank in native grasses and forbs will create continuity with the opposite side of the river and help to stabilize the slopes. This area may also benefit from a bio-engineered riverbank to extend the toe of the slope.

Level Areas:
Directly behind the Czech Museum is an extremely narrow area of level bank above steep slopes. Since the Czech Museum makes use of the adjacent veranda for formal events, we recommend creating some sort of transition between the level bank and the slope. While turf grass would be appropriate here, we suggest bringing in the colors of the Czech neighborhood (red and white) to complement and reflect any formal vegetation described in the recommendations for the southeast riverbank.

The berm and level area north of the museum (between the parking lot and the 12th Avenue bridge) provides an exceptional view of the river. We recommend maintaining the turf grass to create a zone of transition above the slope. Visitors to the museum or from the adjacent farmers market might be encouraged to stop and view the river from this location. The addition of a few trees to provide shade in the summer and color in the fall would enhance the view.

A sketch of the re-landscaped section of the west riverbank, between the 12th Avenue Bridge and the Czech Museum. This area affords an excellent view of the river.
SECTION 4: WEST CENTRAL RIVERBANK

Lower Portion of the Riverbank

In this large industrial section of the site there is little, if any, access to riverbank as it exists behind the Penford Plant. While this makes maintaining the riverbank extraordinarily difficult, it also means there is no view from this riverbank. While on the east riverbank our recommendations are concerned with preserving the view, here the view is one to be hidden or disguised. For this reason, we recommend a mix of native trees along with native grasses, sedges, and forbs along the riverbank.

Further south, an open lot next to 8th Avenue includes a road end (7th Ave. SW) that could provide an access point to the river and streambank. This lot is currently unvegetated except for a line of trees and low brush along the bank. The present condition of the site, with uncovered loose soil, poses an erosion threat to the river. Establishing a green buffer of vegetation at least 25 feet wide will help hold the soil and filter out any run-off from the site.
SECTION 5: NORTHWEST RIVERBANK

Upper and Lower Riverbank

The northwest riverbank is an outside bank where the river bends slightly east. While the riverbank here is not as tall or steep as those on the east side of the river, it may be more vulnerable to flooding and scouring in times of high water. Introduction of native vegetation will help to stabilize the riverbank in this area and will discourage ducks and geese from using the shore area.

Level Areas:

This site also has a wide, open grassy area that is used as a park. The open lawn and adjacent parking lot attract geese and ducks to the site. We recommend interspersing low shrubs or islands of native grasses and forbs in the lawn area in order to discourage geese.
OTHER RECOMMENDATIONS

Visual Cues and View Corridors

A concern raised frequently during our survey was the lack of access points to the riverfront in this area. Survey participants indicated that it was difficult to find how and where to access the trails. To people unfamiliar with downtown Cedar Rapids, it may not seem obvious that you are approaching the river until you are directly upon it.

On a broad level there a visual disconnect exists between the more natural or green aspect of the river and the ubiquitous concrete and asphalt of the surrounding urban landscape. Because there is no area of transition or continuum between the river and the city, people approaching the river will not recognize any visual cue that they are heading toward an important location.

Visual cues to signal that the river is close at hand may be provided in a number of ways. The simplest, and perhaps least expensive way, is to provide signage such as the lamppost banners displayed near the Red Cedar Riverway. These banners provide an economical and highly effective way to direct people toward the trail system or the river corridor. They also signal the community’s identification with the river and the city’s commitment to improving the corridor.

A more effective visual cue could be achieved through the creation of view corridors along those roads and sidewalks that bring people near the river. 8th, 12th, and 16th Avenues are three roadways that should provide effective view corridors. By extending vegetation along the boulevards and traffic islands of these corridors the city could create continuity with the riverfront. Streetscape vegetation can serve as a visual transition between the hard-edge of the roads and the soft line of the riverfront. A number of communities use low maintenance native vegetation along city streets as an attractive way to introduce natural elements into an urban setting. Extending vegetation along the streetscape provides an additional benefit by minimizing the hard surfaces that contribute to stormwater run off.
Access Points and Fishing Piers

A number of people who participated in our survey expressed interest in being able to access the water along the Cedar River. Access to the river could be created at several points along the river: along with east bank at the 8th, 12th and 16th Avenue bridges, or on the west bank at Sumner Park or at the end of 7th Avenue off H Street. Informal paths would allow trail users and maintenance crews to access the riverbank more easily and safely. The construction of fishing piers would allow fishermen and perhaps even kayakers or canoers to access the water.

This map shows streets that should serve as view corridors to the site and access points where paths or stairs could provide access to the lower riverbank and water. Fishing piers could be located near these access points.

Access Points

View Corridors
Amenities
A concern that surfaced during our interviews and surveys was the lack of amenities along the southern portion of the trail. Along the Red Cedar Walk there is lighting as well as benches and trash receptacles, and at the skate park on Riverside Road there is a water fountain and porto-john. These and other amenities such as trail signs and educational kiosks not only make the trail more convenient and also safer by making it more widely used. Educational signs and kiosks provide a great opportunity to educate the public about native vegetation along the slopes.

We recommend introducing lighting and other amenities to the southern portion of the trail between 8th and 16th Avenues. Lighting and emergency phones would help to improve the misperception of this area as being unsafe. Trash receptacles, benches, picnic tables, and water fountains invite people to make the trail a destination point.
Summary of Recommendations

1. Throughout the site, use native vegetation to re-landscape the lower portion of the riverbank, which falls within the ten-year storm flood level.

2. Treatment of the uppermost portions of the riverbank may vary throughout the site depending on land use and present conditions.
   - Preserve the formal landscaping along the northeast riverbank.
   - Consider introducing native vegetation along upper riverbank where trail or riverfront usage is more recreational.
   - Preserve mature, healthy trees wherever they exit.
   - Where trees are desired for shading or goose deterence, consider preserving the view of the river by planting them on the city side of the trail.
   - Use vegetation heights to deter geese and to preserve views of the river.

3. Treatment of the level areas should include interspersing of low native shrubs, trees, or other plantings to discourage geese.

4. Form a partnership with local stakeholders at the African American and Czech Museum to plan for vegetation that will create continuity between the museums and communal meaning for visitors to the area.

5. Take advantage of open space and river views near the two museums to create destination points along the trail. This includes the open lot near Masaryk Park and the berm north of the Czech Museum.
6. Introduce lighting and other amenities to create a safe and usable trail along the southern portion of the site.

7. Construct access paths and fishing piers to allow access for maintenance crews as well as fisherman and kayakers.

8. Consider a bioengineered approach to strengthen the riverbank and regrading to provide more natural and accessible slopes.

9. Create view corridors or visual cues to guide people to the riverfront and trails through the use of signage (banners) and vegetation along key entries to the site.

Purple Coneflower growing on a slope above a naturally vegetated pond shoreline in Naperville, IL, three years after planting plugs. Photo Source: Recreation Management.


FUNDING SOURCES

Introduction

Funding is an important resource for making the Cedar Rapids Parks and Recreation Departments plans to improve the riverbanks a reality. While Cedar Rapids has the potential to fund such a project through its capital improvements program (CIP) and through potential future funds as part of the Cedar Rapids Vision Plan, there are no guarantees that money will be available. Therefore, we recommend that the Parks and Recreation Commission consider alternative sources for funding. This section will identify outside funding sources that seem particularly appropriate to this project.

Much of the information we’ve gathered here is taken from guide to federal funding sources put together by American Rivers, a national non-profit agency dedicated to improving and protecting American waterways. You can view the full content of their funding guide at http://www.amrivers.org/riverfronttoolkit/financinglinks.htm. American Rivers also provides useful information and “tool kits” for planning to improve riverfronts and urban rivers. These include case studies from other cities that have undertaken riverfront revitalization and improvement projects.

The River Network, another non-profit organization, provides an extensive directory of more than 300 private, corporate and federal funding sources for river and watershed groups. However, you must be a member to view their on-line source at http://www.rivernetwork.org/library/index.cfm?doc_id=117.

Note: Two important factors that increase the likelihood of alternative funding are partnerships with other agencies (particularly non-profit and volunteer organizations) and environmentally sensitive and sustainable riverfront designs.
Sources

One potential source of funding is the State of Iowa’s Resource Enhancement and Protection Program (REAP). This money aims to increase the protection of natural and cultural resources such as city parks, open space, land management, roadside vegetation, etc. Funds are distributed on a formula basis. There are three areas of REAP funding under which this project may be eligible.

REAP Soil and Water Enhancement

Funds designated for soil and water enhancement are directed towards protecting the state’s surface and ground water resources from point and non-point sources of contamination. Projects include reforestation, woodland protection and enhancement, wildlife habitat preservation and enhancement, protection of highly erodible soils, and water quality protection. This portion of REAP is administered by the Division of Soil Conservation in the Department of Agriculture and Land Stewardship. Grant applications and information are available from the Linn County Soil and Water Conservation District located in Marion.

State contact person:
Jim Gillespie or Bill McGill
Division of Soil Conservation
Department of Agriculture and Land Stewardship
Wallace State Office Building, Des Moines, IA 50319
Phone: (515) 281-7043 or 281-6148

Source: www.iowadnr.com
**REAP City Parks and Open Space**

Funds are available to cities through competitive grants. Three city size categories have been established to assure grants are distributed to all sizes of cities. Cedar Rapids would qualify in the category of cities with populations of greater than 25,000. Local matching funds are not required. The DNR administers the city grant program.

Contact person:
Ross Harrison
Iowa Department of Natural Resources
Wallace State Office Building, Des Moines, IA 50319
Phone: (515) 281-5973
Email: Ross.Harrison@dnr.state.ia.us

**REAP Roadside Vegetation**

The establishment of attractive gateways into cities is a popular use for this money. The overall concept of roadside vegetation management is to introduce native prairie species in the right-of-ways. These species have been shown to out-compete noxious and other unwanted weeds without the need for chemical spraying. Therefore, roadside maintenance costs are reduced through less spraying and mowing while at the same time providing cover for wildlife and scenic roadsides for travelers. Demonstration and research projects are typically funded under this program in an effort to learn and share new approaches to vegetation management. You can find complete information on the program through the Living Roadway Trust site at www.iowalivingroadway.com.

Contact person:
Steve Holland
Iowa Department of Transportation
800 Lincoln Way, Ames, IA 50010
Phone: (515) 239-1768
Kodak American Greenways Awards
The Kodak American Greenways Awards provides small grants to stimulate the planning and design of greenways in communities throughout America. Awards primarily go to local, regional, or statewide nonprofit organizations. Although public agencies may also apply, community organizations will receive preference. Information about Kodak and other greenway funding is available through the Conservation Fund at www.conservationfund.org. An on-line application form is available at www.conservationfund.org/?article=2372.

Five-Star Restoration Challenge Grants
This grant provides financial assistance to support community-based wetland, riparian, and coastal habitat restoration projects that build diverse partnerships and foster local natural resource stewardship through education, outreach, and training activities. In 2002, 52 projects received grants out of approximately 200 applications received. The stars in “Five-Star” are the partners, funders, and/or participants necessary to complete the project including: schools or youth organizations, local or tribal governments, local businesses, state and federal management agencies, conservation organizations or local citizens groups, and foundations or other funders. Awards are between $5,000 and $20,000; the average grant is $10,000.

Information is available through the National Fish and Wildlife Service at http://nfwf.org/programs/5star-rfp.htm and at the U.S. Environmental Protection Agency Web Site at www.epa.gov/owow/wetlands/restore/5star/

Defense Department (Army Corps of Engineers)
Aquatic Ecosystem Restoration (Sec. 206)
This program provides design and engineering assistance to restore degraded aquatic ecosys-
tems to a more natural condition. Requested assistance does not need to be related to an existing Army Corps project. A local sponsor (usually a state or local government) first requests assistance from the appropriate Corps district office. The Corps district office then prepares a preliminary restoration plan, requests funding for the project based on the preliminary plan, and if approved, conducts a feasibility study (e.g., plan and engineering design for dam removal and disposal, incl. social/economic considerations), and negotiates a project cooperative agreement with the local sponsor to conduct the actual work. The Army Corps of engineers web site has complete information at http://www.mvp.usace.army.mil/environment/default.asp?pageid=113

Contact Person:
Tom Crump
(651) 290-5284
thomas.l.crump@usace.army.mil
**Defense Department (Army Corps of Engineers)**

Project Modifications for Environmental Improvements (Sec. 1135)

This program provides for the restoration of rivers, wetlands, and floodplains degraded by an existing Army Corps water project, including dams, flood control, and navigation structures. The objective of these projects should be “restoring degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition, which will involve consideration of the ecosystem’s natural integrity, productivity, stability, and biological diversity.” The program also allows for restoration of areas impacted by a project that are not at the project location (e.g., downstream erosion from upstream channel-hardening). The restoration project must provide public benefits and may not be for limited interests (e.g., private hunting clubs).

A description of the grant is available on the American Rivers website at www.americanrivers.org/tableofcontents/pmei.htm

Contact:

Bradley.E.Thompson@usace.army.mil

or Ecosystem Restoration, Project Manager

US Army Engineer District, Rock Island

Clock Tower Building

P.O. Box 2004

Rock Island IL, 61204-2004
Interior Department (National Park Service)
Rivers, Trails, and Conservation Assistance Program (RTCA)
RTCA has helped communities revitalize neglected areas, restore natural floodplains, identify potential Wild and Scenic Rivers and develop community-based consensus management plans for various kinds of public and natural resources. Projects are locally initiated by landowners, public officials, and citizens, who then work cooperatively with RTCA staff. RTCA has 80 staff located in 25 offices around the country. Applications for project assistance are competitive and are considered by the local RTCA offices along with projects submitted.
For more information visit http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply_details.html

U.S. Department of Transportation
Transportation Equity Act for the 21st Century (TEA-21)
This program promotes and funds alternatives to highway transportation. All funding and grant programs are coordinated through state transportation departments, and in some instances, state natural resource or environmental protection agencies. TEA-21 provides funding on a 50/50 matching basis for environmental protection through a number of funding programs. Funds are dispersed through state agencies and program guidelines and priorities vary widely from state to state. TEA-21 funds may be used for a variety of projects associated with this site including the construction of access paths and piers for non-motorized boats. TEA-21 is set to expire in October 2003, it is hoped that the new transportation bill (FY04-05) will include this provision in it. For more information visit http://www.fhwa.dot.gov/tea21/.
Million More by 2004 Tree Planting Program Funds Available

This program provides reimbursable grants ranging from $500 to $5,000 to be used only for the purchase and planting of trees on publicly-owned property. Qualifying public planting areas include street right-of-ways, parks, public school grounds, courthouse lawns, public buildings, fairgrounds, cemeteries, libraries, and trails.

Applicants must match their grant funds with cash on a dollar-for-dollar basis. This match can be from existing project funds or local fund raising efforts. Applications must show how they will involve local volunteer resources in this project.

Applications are available by e-mail at jbabcock@dunbarjones.com or by calling 515-280-8026. Applications may be found at www.dunbarjones.com.
Volunteers and Partnerships

One of the goals associated with re-landscaping the riverbanks is to draw people to the downtown areas of Cedar Rapids. According to the Urban Parks Institute (www.pps.org/urbanparks), involving volunteers in improving parks and open space is a valuable way to get people to use a public area. While local governments can make improvements to parks, a sense of local ownership is essential for such spaces to become popular and sustainable.

Volunteers are the most underutilized resource in leveraging a city’s budget. Volunteers bring more than free labor to a city’s revitalization efforts, volunteer involvement at every level brings ownership to the city’s programs and dedication to community values and goals (Lokemoen, 2001). For example, anecdotal evidence from volunteer trash removal projects in Chicago (IL) and Columbus (GA) found that as riverfronts were cleaned up, people seemed less likely to litter (Houston, 2002). In addition, the recommendations on alternative funding for projects such as this one, shows that programs that include volunteers (and especially those that include multiple partnering organizations) are eligible for more sources of public and private funding. Why? Because volunteer involvement shows the community’s present support for the project and volunteers show the capacity of the city to sustain the effort in future years.

A number of regional programs have recognized the value of involving volunteers in their river improvement projects. Two of the most successful and widely recognized volunteer programs associated with riverfront improvements in the Midwest are the Friends of the Chicago River and the Great River Greening Project in Minneapolis/St. Paul. Over the years both programs moved from being purely volunteer organizations to professionally staffed non-profit agencies.
In Cedar Rapids there are a number of opportunities to work effectively with volunteers. The parks commission might look to volunteer partnerships with local business and corporate leaders. The Renaissance Group has a long and successful history of volunteerism and has a particular interest in improving downtown Cedar Rapids. Alliant Energy has a strong history of corporate volunteerism specifically for environmental projects. Alliant established the Stewards of Nature Program in 1992 and provides both funding and a volunteer work force. A major strength of this program is its partnership with other local environmental and community groups to accomplish its projects.

Other volunteer groups and non-profit organizations that are currently involved in environmental projects include Western Fraternal Life Association Lodge 500, Neighborhoods United, Izaak Walton League, Pheasants Forever, the Iowa Prairie Network, Boy Scouts and Girl Scouts, Coe College, Kirkwood Community College, Community Garden Club, and Linn County Trails Organization. An important local resource to consider when planning a volunteer event is the Indian Creek Nature Center, which has an active program that draws volunteers from far beyond the city limits of Cedar Rapids.