1995 Project Abstract
For the Period Ending June 30, 1997
This project was supported by the Environment and Natural Resources Trust Fund

Title: Wetland Restoration and Enhancement to Create Community Amenity and Form

Project Manager: Joan I. Nassauer
Organization: University of Minnesota
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Legal Citation: ML 95, Chp.220, , Sec.19 Subd.8(f)
Total biennial LCMR appropriation: $200,000.

Statement of Objectives:
The metro area and out-state Minnesota have many wetlands which have been preserved. However, many former wetlands have been developed in ways that are inappropriate for their underlining ecological structure and the role they play within their watershed. This inappropriate use of wetlands often creates water quality and watershed problems, eliminates needed wildlife habitat, and robs the community of a valuable amenity.

This project has demonstrated how protected, restored, or constructed wetlands can be designed to realize their function as part of the surface hydrology of the city, maximize their urban habitat value, and be a widely appreciated amenity within the city. Five case study areas were selected to demonstrate a range of wetland potentials in the Twin Cities metropolitan area and in greater Minnesota.

Overall Project Results: Each case study project focused on a different key potential for wetlands as community amenities. These are:.

Cambridge - How wetland landscape patterns can guide urban growth

Marshall - How development patterns across the watershed can ameliorate downstream flooding

Minneapolis - How wetlands can become focal amenities in urban redevelopment

Crystal - How wetland patterns can guide redevelopment of industrial areas

North St. Paul - How constructed or restored wetlands can become settings for environmental education

In each of the five communities, citizens, elected and appointed officials, and local government staff were involved in the design process. In several communities, several other groups (teachers, students, University of Minnesota extension educators) were involved as well. After site analysis, a community process of defining directives for design, and community participation in reviewing alternative design concepts, a final concept was designed for each site. The concepts drew from ideas in landscape ecology, landscape architecture, and urban design. Design principles and recommendations were articulated for each site. Overarching design principles were also developed for urban wetland sites in Minnesota.

Project Results Use and Dissemination. Project reports for each of the five projects (1000 per project) are being disseminated through each city, the Ramsey-Washington Metro Watershed District, the Minnesota Extension Service, or the College of Architecture and Landscape Architecture. The project reports have been written as cases to help other towns and cities throughout Minnesota use the ideas developed for the five case sites.

In North St. Paul, the city and Ramsey-Washington Metro Watershed District are implementing the concept articulated in this project. Teachers in the School district 622 are organizing environmental education curricula around the site, the new urban ecology center, and a new high school environmental science course visits the site nearly every day in the fall and The North St. Paul project has received the following additional support toward implementation: DNR Conservation Partners grants ($19,800), ECOLABS ($1800), the Pollution Control Agency (approx. $40,000.), the Ramsey Washington Metro Watershed District ($42,250.), the City of North St. Paul ($3000), and the Metropolitan Council through a Twin Cities Water Quality Initiative Grant ($100,000.)

The other four cases depend more upon private land owners or other local public entities using the design concepts with the strong support of local governments. In each of the other four cities, local governments have enthusiastically received the concepts.

The success of each of the five concepts should be measured not only in the immediate adoption or construction of the concept, but in its usefulness as a model for communities around the state.

Date of Report: July 1, 1997
LCMR Final Work Program Update Report

I. Project Title and Project Number:
Wetland Restoration and Enhancement to Create Community Amenity and Form—G4

Project Manager: Joan I. Nassauer
Agency Affiliation: University of Minnesota
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A. Legal Citation: ML 95, Chp.220, , Sec.19 Subd.8(f)
Total biennial LCMR appropriation: $200,000.
Balance: $9000.00

Appropriation Language:
This appropriation is from the trust fund to the director of Minnesota planning for an agreement with the University of Minnesota to provide technical design assistance to help five communities create restored and enhanced wetlands that reinforce community form and emphasize habitat creation, water quality, and recreational amenities.

B. Status of Match Requirement: N/A

II. Project Summary: July 1, 1997
The metro area and out-state Minnesota have many wetlands which have been preserved. However, many former wetlands have been developed in ways that are inappropriate for their underlining ecological structure and the role they play within their watershed. This inappropriate use of wetlands often creates water quality and watershed problems, eliminates needed wildlife habitat, and robs the community of a valuable amenity.

This project has made the knowledge that has been developed from previous case studies available for new case studies in Cambridge, Marshall, Minneapolis, Crystal, and North St. Paul. The project team has worked with the communities to examine the potentials for retrofitting and enhancing their wetlands to make them ecologically sound, memorable elements of the community's physical form. The project team has used traditional design methods including: gathering information, analyzing existing context and systems, generating alternative design scenarios, presenting/evaluating alternatives, selecting preferred alternatives, summarizing principles, and recommendations. Recommended principles and strategies have been presented in all five communities ,

Each community project was selected for this study to demonstrate a particular aspect of how to restore or construct wetlands in an ecologically sensitive way that improves water quality, creates habitat, provides new recreational opportunity for city residents, and enhances the physical structure of the community by giving form and identity to a neighborhood. These strategies also stabilize communities by improving property values and attracting private reinvestment.

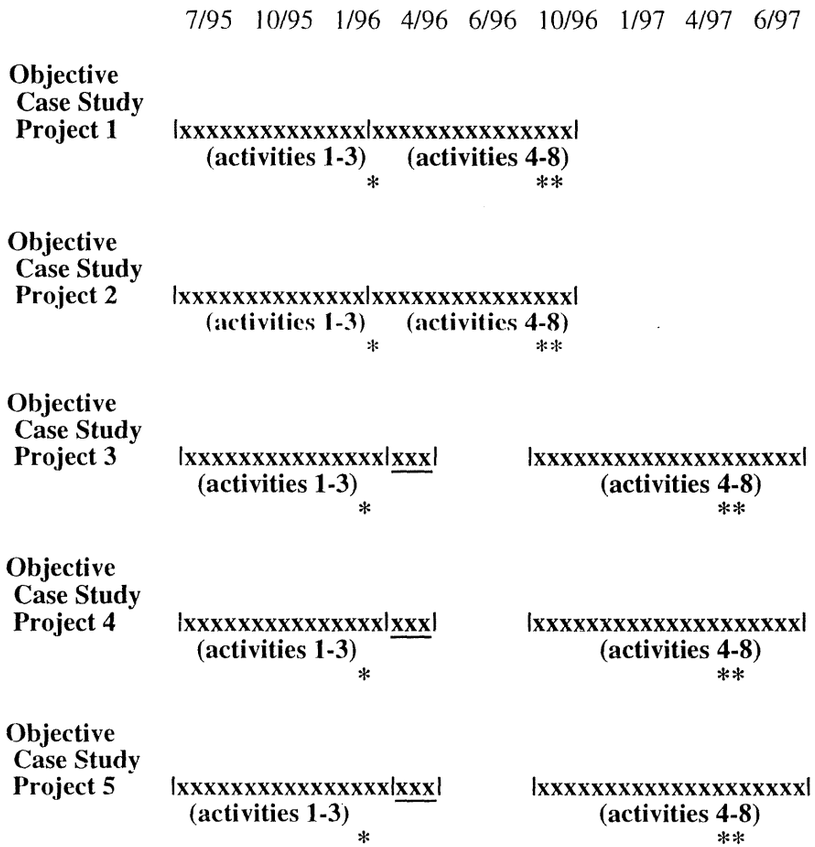
III. Six Month Work Program Update Summary:
Work has been completed for all five case studies .

IV. Statement of Objectives:
The objective is to produce five case study projects with 8 activities repeated for each as follows:

A. Case Study Projects 1-5

A1. Select study case project: Meet with community officials to learn about proposed projects and select the project that has the greatest potential. Projects will be selected in consultation with state program monitors.
A2. Document and analyze existing conditions.
A3. Create wetland and community design program.
A4. Generate alternative design scenarios.
A5. Present alternative designs to community.
A6. Select and develop one alternative.
A7. Abstract principles and recommendations.
A8. Prepare and present final report.

Timeline for Completion of Objectives:



***Interim Reports: In ~~January~~ May 1996, an interim report will be submitted on each of the 5 case study projects. The interim report will be a notebook with a chapter on each of the first 3 activities. Each chapter will begin with a one-page summary of its material and findings.**

****Final Reports: The final report on each case study project will be a continuation of the interim report notebook (including a chapter on each activities 4-8). The new chapters will also begin with a one page summary of the material and findings included in each chapter.**

V. Objectives/Outcome:

A. Case Study Projects 1-5

A.1. Activity: Select Case Study Projects.
Meet with community officials, state agencies (DNR), Minnesota Extension Service Educators and project cooperators to identify and select appropriate projects.

A.1.a. Context within the project:
This is the essential first step which initiates each of the five projects.

A.1.b. Methods:
The project team will use announcements of project opportunities, interviews, and meetings to gather information about potential projects. The project team will develop, refine, and rank a set of selection criteria. Preliminary criteria include:
1) Existence of community planning process interested in incorporating wetland restoration/development as part of community development process.
2) Probability of implementation.
3) Quality of the information available about the site and wetlands.
4) Significance of wetland type and its relationship to watershed.
5) Potential impact on community development.

A.1.c. Materials:
The materials for this activity will include normal drafting and clerical supplies including copying and printing.

A.1.d. Budget:
Total Biennial LCMR Budget: $22,130
LCMR Balance: $0.

A.1.e. Timeline:

7/95 10/95 1/96 4/96 6/96 10/96 1/97 4/97 6/97

Project #1 |xxxxxxxxxx|xxx|
Selection of
5 case study
projects with
reasons.

A.1.f. W rogram Update:

North Saint Paul, Bassett Creek in North Minneapolis, Marshall, Crystal,and Cambridge were selected as case studies. Additional funds have been identified for each. Two of the five are Greater Minnesota case studies, Cambridge and Marshall. The five cases emphasize (respectively): environmental education, urban redevelopment, new ecological neighborhoods to prevent downstream flooding, integration with commercial/industrial development, and using wetlands as part of a growth management strategy.

A.2. Activity: Document and analyze existing conditions
Collect relevant physical information and data for project site. Prepare descriptive material and analyses of existing conditions.

A.2.a. Context within the project:
This activity provides the physical data and information which describes the problems and opportunities to be addressed. It is the essential information gathering and analysis phase of the project.

A.2.b. Methods:
The methods used are drawing, mapping, diagramming and modeling techniques which reveal the physical characteristics and systems which are operating on the site. It is impossible to specify the exact maps, drawings, diagrams, models, etc., which will be used for each project description and analysis because the context and focus of each will be different. It is sufficient to say that the descriptive and analytical means will be tailored for each project. The documentation and analysis will explore the wetland type, hydric soils, high water levels, and different means for constructing habitat. In addition, it will examine the relationship of the wetland to community patterns including all related infrastructure.

A.2.c. Materials:
The materials for this activity will be typical drafting and clerical supplies including copying and printing.

A.2.d. Budget:
Total Biennial LCMR Budget: $25,750
LCMR Balance: $0

A.2.e. Timeline:

7/95 10/95 1/96 4/96 6/96 10/96 1/97 4/97 6/97

Project #2 |xxxxxxxxxxxxx|
(Site analysis

documentation)

A.2.f. Work Program Update
Site analysis and documentation have been completed for all 5 projects, and were submitted to LCMR as an interim report in May, 1996.

A.3. Activity: Create wetland and community design program
From the analysis of the site and discussion with the community, a design program will be developed which describes the design agenda and issues to be addressed by the design scenarios.

A.3.a. Context within the project:
This activity documents the design goals and objectives for the project. It describes the issues and agenda to be addressed. It is the essential step which defines the design problem

A.3.b. Methods:
The methods used include discussion with community members and leaders to establish possible goals and objectives, asking "what if" questions, developing agenda of issues, documenting user goals and objectives, identifying physical opportunities and constraints. The design program will describe: 1) what kinds of wetlands are to be developed; 2) what kind of activities are to be integrated with the wetland; 3) what kind of community facilities are to be provided; 4) what kind of private development is to be encouraged; 5) what kind of public infrastructure improvements will be necessary, etc.

A.3.c. Materials:
The materials for this activity will involve typical drafting and clerical supplies including copying and printing.

A.3.d. Budget:
Total Biennial LCMR budget: $15,840.
LCMR Balance: $0

A.3.e. Timeline:

	7/95	10/95	1/96	4/96	6/96	10/96	1/97	4/97	6/97
Project #3 (Design program)		xxxxxx	xxx						

A.3.f. Work Program Update:
The wetland and community design program has been completed for all 5 projects, and was submitted to LCMR as an interim report in May, 1996.

A.4. Activity: Generate alternative design scenarios.
From the site analysis and the design program, alternative design scenarios are developed and represented.

A.4.a. Context within project:
This activity is the creative problems-solving core of the project.

A.4.b. Methods:
This activity uses typical problem-solving methods of design. They include 1) developing physical concepts which respond to the issues, agenda, goals, and objectives of the program; 2) representing and modeling (including drawings, sketches, 3-D physical models) those concepts; 3) analyzing, evaluating, and revising the concepts until they address the issues from the program.

A.4.c. Materials:
This activity uses typical drafting, modeling, and clerical supplies including copying, printing, and photographs.

A.4.d. Budget:
Total Biennial LCMR Budget: $14,415 x 5 = $72,075
LCMR Balance: $0

A.4.e. Timeline

	7/95	10/95	1/96	4/96	6/96	10/96	1/97	4/97	6/97
Project #4 (Alternative Design representation)			xxxxxxx						

A.4.f. Work Program Update:
Multiple preliminary alternative design proposals were completed for each of the five communities. Development of alternative proposals allowed the designers to incorporate emerging ecological insights and changing community perspectives on what was achievable or desirable in each community. In part, community perspectives changed because of the design process.

A.5. Activity: Present alternative designs to community
The intention is to present the design scenarios to the stake holders in the community.

A.5.a. Context within project:
This activity provides the essential feedback on the design scenarios to help select and refine one.

A.5.b. Methods:
The methods involve public presentation(s) to appropriate groups in each community with drawings, presentation boards, models, photographs, diagrams, and data as necessary. Feedback is oral and written.

A.5.c. Materials:
This activity uses typical drafting, modeling, and clerical supplies including copying, printing, and photographs.

A.5.d. Budget:
Total Biennial LCMR Budget: $3,125 x 5 = $15,625
LCMR Balance: $4500.

A.5.e. Timeline:

	7/95	10/95	1/96	4/96	6/96	10/96	1/97	4/97	6/97
Project #5 (Report of alternative scenarios with Feedback))				**|xxx|**					

A.5.f. Work Program Update
Alternative designs were presented to community members and local government staff in each of the five communities. Participants included appointed environmental review boards , entire city councils, teachers and school administrators, city planning and engineering staffs, watershed district staffs, county planning staffs, Minnesota extension educators, and many citizens. Community participation brought many good ideas to the projects, community commitment to the implementation of the ideas in the projects, and, a new community awareness of what could be achieved and of a higher standard for development decisions in the community.

A.6. Activity: Select and develop one alternative.
As a result of community feedback and further analysis and evaluation, one alternative is selected and developed

A.6.a. Context within project:
This activity is the final, synthesizing process of the project. It is where all the concerns and issues must be resolved.

A.6.b. Methods:
This activity repeats all the problem-solving methods of design described in A.4.b. on the previous page.

A.6.c. Materials:
This activity continues to use typical drafting, modeling, and clerical supplies including copying, printing, and photographs

A.6.d. Budget:
Total Biennial LCMR Budget: $9,375 x 5 = $46,875
LCMR Balance: $4500.

A.6.d. Timeline:

	7/95	10/95	1/96	4/96	6/96	10/96	1/97	4/97	6/97
Project #6 (Final Design documentation)						**|xxx|**			

A.6.e. Work Program Update
One of the alternatives was selected and developed in each of the five communities. Each emphasized a different aspect of the potential for wetlands to enhance community amenity and ecological quality. They are detailed in the final reports. The following grants (DNR Conservation Partners grants ($19,800), ECOLABS ($1800), the Pollution Control Agency (approx. $40,000.), the Ramsey Washington Metro Watershed District ($42,250.), the City of North St. Paul ($3000), and the Metropolitan countil through a Twin Cities Water Quality Initiative Grant ($100,000.) have been made to construct the Urban Ecology Center that was developed as a design concept in this project. Other communities are enthused about carrying forward ideas offered in design concepts completed in spring of 1997.

A.7. Activity: Abstract principles and recommendations

The purpose is to reduce the specifics of the selected design solution to a simple set of principles and recommendations.

A.7.a. Context within the project:
This activity is important because it establishes the design principles and recommendations by which the project can proceed into implementation.

A.7.b. Methods:
This activity uses methods of reductive reasoning and analysis. It will take the form of written principles and may include sample diagrams.

A.7.c. Materials:
The activity will continue to use typical drafting, modeling, and clerical supplies including copying, printing and photographs.

A.7.d. Budget:
Total Biennial LCMR Budget: $350 x 5 = $1750
LCMR Balance: $0

A.7.e. Timeline

	7/95	10/95	1/96	4/96	6/96	10/96	1/97	4/97	6/97
Project #7 (Documen-tation of principles and recommendations					I xxxI				

A.7.f Work program Update
Principles and recommendations were documented for each of the five communities. An overarching set of 6 principles to apply to wetland restoration or construction projects in communities across Minnesota also was developed. Particular design principles for each community emphasized the focus for which each project was selected. For example, the North St. Paul principles emphasize how to use wetlands for environmental education, the Cambridge project emphasizes how to use wetlands to guide urban growth, etc.

A.8. Activity: Prepare and present final reports

A.8.a. Context within the project:
This activity summarizes the whole process including the final design selected, its principles and recommendations in a final report for each of the case studies.

A.8.b. Methods:
This activity brings together all the elements of the project. It will involve writing, editing, drawing, graphic design, proofing, and printing

A.8.c. Materials:
This activity will use typical materials which support activities described above.

A.8.d. Budget: 0
Match: (from each community) $7000 x 5 = $35,000
Match Balance:
LCMR Balance:

A.8.e. Timeline:

	7/95	10/95	1/96	4/96	6/96	10/96	1/97	4/97	6/97
Project #8 (Final Report)					|xxxxx|				

A.8.f. Work Program Update

Final reports have been developed and printed for each of the five communities. Reports on the Crystal and Bassett Creek, Minneapolis, projects are being disseminated by the Design Center of the College of Architecture and Landscape Architecture, which collaborated in conducting the Crystal and Bassett Creek projects, Remaining project reports are being disseminated by the cities that were the sites of each of the projects.

Case Study Project 2
Case Study Project 3
Case Study Project 4
Case Study Project 5

Each case study project repeats the eight (8) activities outlined above except that activities 4-8 of Case Study Projects 3- 5 are shifted from October 1996 to June 1997 (see timeline for Completion of Objectives in IV).

VI. Evaluation:

This project will be successful if the communities incorporate the technical assistance provided in this project in their planning and development process. Ideally, it will lead to the implementation of wetland restoration as an amenity and form giver in each community. However, project success cannot be measured by how many wetlands are actually implemented. Although the projects will be selected with the probability of implementation as an important factor and will be pursued with implementation as a goal, too many factors including local politics and economics are beyond the scope of this project to have implementation be the measure of success.

VII. Context within the field:

This project is at the forefront of knowledge in its field. It builds on the unique credentials and experience of faculty in the College of Architecture and Landscape Architecture. The previous work and projects by CALA faculty in this field have been published nationally and internationally and are considered exemplary models for integrating environmental concerns within community development.

This project is a logical extension of the work listed below.

- *Landuse and Design Strategies to Enhance Environmental Quality,* Harrison Fraker, $100,000, LCMR, 1991-93.
- *Reclamation of Recreational Systems and Environmental Resources from Existing Urban/Suburban Neighborhoods,* William Morrish, $200,000, LCMR, 1991-93.
- *Phalen Watershed Project,* Joan Nassauer $20,000 from the Ramsey Washington Watershed District, McKnight Foundation, 1992-93.
- *Urban Landscape Ecology,* Joan Nassauer $60,000 USDA Forest Service, 1990-93.
- *Design for Public Safety,* Mary Vogel $24,800 City of Saint Paul, 1993.

VIII. Budget Context:

This project will be able to build on three ongoing projects within the college listed below:

- Minnesota Extension Service (MES) project to provide technical assistance for outstate communities in the area of community development: $75,000, 1995.

- Design Center for the American Urban Landscape (DC/AUL) project with Hennepin County entitled: "Hennepin Community Works" to provide technical assistance in three projects which create good jobs, provide access to employment, and build long-term value of communities by investing in infrastructure public works, parks, and the natural environment: "$32,000, 1995."

- DC/AUL LCMR Project entitled: Recreation Resource Planning in the Metropolitan Mississippi Corridor - $175,000, 1993-95.

While the projects listed above are not involved in any direct matching funds for this project, they will provide information of great value to the project.

X. Dissemination:

The final reports for the case study projects will be in a form to enable wide distribution. The distribution networks are not chosen yet, but will probably include the Minnesota Extension Service system.

X. Time: The project will not exceed the two year period.

XI. Cooperation:

Project Manager:
Joan Nassauer, Prof , Dept. of LA 8%

Cooperators
Bill Morrish, Assoc. Prof & Dir., DCAUL 5%

Catherine Brown, Coord. of Special Projects, DCAUL	5%
Mary Vogel, Research Fellow, Dept. of LA	20%
Susan Galatowitch, Asst. Prof. Dept. of LA	4%
Case Study Project Leaders	
Leader 1 (to be determined)	12%
Leader 2 (to be determined)	12%
Leader 3 (to be determined)	12%
Leader 4 (to be determined)	12%
Leader 5 (to be determined)	12%

Note:
CALA = College of Architecture and Landscape Architecture
Dept. of LA = Department of Landscape Architecture
DCAUL = Design Center for the American Urban Landscape

XII. Reporting Requirements:
Semi-annual six-month work program reports will be submitted not later than January 1, 1996, July 1, 1996, January 1, 1997 and a final six-month update and final report by June 30, 1997.

XIII. Required Attachments:

1. Curriculum vitae for the following project team members are attached:
   Project Manager: Joan Nassauer
   Cooperators:
   Mary Vogel
   Bill Morrish
   Catherine Brown
   Susan Galatowitsch

2. Project Staffing Summary: see attached.