

1993 Project Abstract

For the period ending June 30, 1995

This project was supported by the Minnesota Future Resources Fund

Title: GRANITE QUARRY PARK AND INTERPRETIVE CENTER PLANNING.

Program Manger: Charles B. Wocken, Park Director

Organization: COUNTY OF STEARNS

Legal Citation: M.L. 93 Ch. 172, Sec. 14, Subd. 71

Appropriation Amount: \$50,000

Statement of Objectives:

- A. Develop base map.
- B. Measure volume, size and bathymetry of quarries.
- C. Measure volume and size of spoil piles.
- D. Measure and map wetland area and distribution.
- E. Assess water quality in quarries.
- F. Study geology.
- G. Inventory site biology.
- H. Develop Master Plan.

Overall Project Results:

An analysis of the park site was accomplished. This analysis was the basis of a Master Plan which maps the cultural and physical features for interpretive purposes. The Master Plan also introduces public access for recreational activities.

Project Results Use and Dissemination:

This project has provided the basis for University classes and field trips in the areas of petrology, hydrology and environmental education. This study will be the basis for wise use of fragile resources for public recreation. The project may provide a national model for reclamation of abandoned dimensional stone quarries for public interpretation and recreation. The reports will be part of grant applications for parkland acquisition and development in the near future from the State of Minnesota, Federal Government and private foundations. The master plan map has already been printed in the St. Cloud Daily Times (circulation of 60,000). Geological information will be published in journals. Local universities will have access to all research for continued ongoing studies. The Master Plan will be the basis for \$6 million worth of development in the park.

JUL 11 1995

Date of Report: July 1, 1995
LCMR Final Work Program Update Report

I. Project Title: Granite Quarry Park and Interpretive Center Planning.

Program Manager: Charles Wocken
Agency Affiliation: Stearns County Parks
Address: 425 South 72nd Avenue
St. Cloud, Minnesota 56301
Phone: (612) 255-6172

A. Legal Citation: M.L. 93 Chpt. 172, Art. __, Sect. 14, Subd. 7l

Total Biennial LCMR Budget: \$50,000
Balance: \$ 0

This appropriation is from the future resources fund to the commissioner of natural resources for a contract with Stearns County to study the features of the quarry sites and plan for the development of an interpretive and recreational regional park. This appropriation must be matched by \$50,000 of nonstate funds.

B. LMIC Compatible Data Language: ARC/INFO G.I.S. program is compatible.

C. Status of Match Requirement:

Match required: \$50,000
Funds Raised to Date: \$ 66,006

II. Narrative: This project will assess physical features, provide a recreation program, development plan and baseline for a multi-use interpretive regional park using abandoned granite quarries unique to the United States.

III. Statement of Objectives:

- A. Develop base map.
- B. Measure volume, size and bathymetry of quarries.
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- E. Assess water quality in quarries.
- F. Study geology.
- G. Inventory site biology.
- H. Develop master plan.

A. Title of Objective: Develop base map.

A.1. Narrative: Design topographical map, gather and transfer existing information.

A.2. Procedures:

- a. Set elevation control points (Stearns County Surveyor).
- b. Contract with Horizons, Inc. (an aerial photograph company) for Geographical Information System (G.I.S.) compatible topographical map with 2' contours in digitized and printed format.

- c. Input topographical information into County G.I.S. program.
- d. Gather existing site information (St. Cloud State University Earth Sciences Department).
- e. Transfer existing site information into County G.I.S. program (Stearns County).

A.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$4,944	\$5,697
b. Balance: \$ _____	\$0	\$0

A.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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- a. Detailed topographical maps with 2' contours.
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
- b. Mapped inventory of available information.
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

A.5. Status: Topographical map completed. Quarry bottom contours transferred to G.I.S. Expanded base maps generated for field work. Underwater maps accuracy verification. Established benchmarks on quarry ledges for base map verification and water elevation correction.

A.6. Benefits: Establish a G.I.S. base map for the project site and synthesize all known existing data of site into a usable database. The base map will be the foundation for further information gathering. St. Cloud State University is now using base information for staff research & student studies.

B. Title of Objective: Volume, size and bathymetry of large quarries.

B.1. Narrative: Analyze and measure characteristics of larger quarries.

B.2. Procedures:

- a. Measure volume of larger quarries (St. Cloud State University Earth Sciences Department).
- b. Measure size of larger quarries (St. Cloud State University Earth Sciences Department).
- c. Determine bathymetry (St. Cloud State University Earth Sciences Department).

B.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$5,000	\$0
b. Balance: \$ _____	\$0	\$0

B.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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- a. Map and/or report of volume sizes and bathymetry of larger quarries.
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

B.5. Status: Volume and sizes of all quarries measured. Bathymetry determined for 19 quarries with bottom contours mapped.

B.6. Benefits: Determines future usability of quarries for interpretation and recreation.

C. Title of Objective: Volume and size of spoil piles.

C.1. Narrative: Measure volume and size of waste grout piles located within project site (Stearns County Surveyor).

C.2. Procedures: Compute size and volume through G.I.S. format utilizing ARC/INFO.

C.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$1,446	\$500
b. Balance: \$ _____	\$0	\$0

C.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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a. Chart volumes and sizes of spoil piles.
XXXXXXXXXXXXXX

C.5. Status: Completed.

C.6. Benefits: It will help determine the best way to deal with the grout piles: whether to dismantle, cover-up, or incorporate into the interpretive and recreational plan.

D. Title of Objective: Wetland area and distribution.

D.1. Narrative: Measure and map area and distribution of existing wetlands.

D.2. Procedures: Study soils, vegetation and topography of project site which includes National Wetland Survey data (Stearns County Planning, Soil and Water Conservation District, Park Department).

D.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$2,685	\$0
b. Balance: \$ _____	\$0	\$0

D.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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a. Map of wetlands in G.I.S. format.
XXXXXXXXXXXXXXXXXXXX

D.5. Status: Vegetation map showing wetland complete. Information is being used by St. Cloud State University for environmental studies curriculum planning.

D.6. Benefits: Protect, preserve and incorporate the wetlands into the interpretive and recreation program.

E. Title of Objective: Water quality assessment.

E.1. Narrative: Study water quality of selected quarries.

E.2. Procedures: Gather and analyze water sample from varying depths and quarries. Study physical condition, chemical condition, and trophic state index (St. Cloud State University Biology Department).

E.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$375	\$375
b. Balance: \$ _____ 6/5/94	\$0	\$0

E.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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a. Report of finding.
XXX

E.5. Status: Underwater inspection for hazardous waste. New trophic state data was not procured. Water quality parameters need re-evaluation before further site design occurs. A 1953 Department of Conservation study on the quarry water chemistry was found.

E.6. Benefits: Determine the suitability of the quarries for interpretive and recreational uses.

F. Title of Objective: Geological study.

F.1. Narrative: Study the geology of the project site in a series of progressively more detailed steps. Start with the surrounding area of several square miles, emphasize characteristics of the site itself including descriptions of individual outcrops, and synthesize findings in a folio of maps and written reports.

F.2. Procedures:

- a. Describe surrounding area using all available well logs and a reconnaissance of selected outcrops. Maps of bedrock geology, glacial geology and bedrock configuration prepared at 1:24,000 (1 in. = .4 mi.) (St. Cloud State University Earth Sciences Department).
- b. Reconnaissance site characterization using air photos, site topographic maps, inventory of all outcrops, test hole information, and seismic data. Prepare maps of bedrock configuration and overburden geology at scale of 1:1,200 (1 in. = 100 ft.) (St. Cloud State University Earth Sciences Department and U.S. Bureau of Mines).
- c. Detailed site characterization using reconnaissance maps, complete outcrop descriptions including dominant rock type and structural features, and laboratory analyses (St. Cloud State University Earth Sciences Department).
- d. Final synthesis using all available site characterization and surrounding area data to produce a folio of site maps including bedrock geology, overburden geology and hydrogeologic features (St. Cloud State University Earth Sciences Department).

F.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$33,000	\$18,988
b. Balance: \$ _____	\$0	\$0

F.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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- a. Surrounding area maps.
XXXXXXXXXX
- b. Reconnaissance site characterization maps.
XXXXXXXXXX
- c. Detailed site characterization maps and data compilations.
XXXXXXXXXX
- d. Final synthesis map folio and written report.
XXXXXXXXXX

F.5. Status: Surrounding area description complete. Reconnaissance maps at park, site maps; aerial photography, coordination of high density soil survey, area report complete. Underwater bedrock configuration. Final reports and maps completed detailing geological features, including faults.

F.6. Benefits:

- a. Surrounding area maps provide geologic and hydrologic context for the site.
- b. Reconnaissance site maps provide a preliminary look at the site to aid in planning detailed work.
- c. Detailed site maps and data compilations will be aimed at providing specific input for the recreational master plan.
- d. Final synthesis summarizes all work for communication and repository, as well as aid in continued site development plans. Final synthesis compiled.

G. Title of Objective: Inventory site biology.

G.1. Narrative: Inventory plant communities and wildlife habitat of project site.

G.2. Procedures: Identify and map plant communities and wildlife habitat in format compatible with County Biological Survey (Audubon Society, St. Cloud Area Environmental Council).

G.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$2,550	\$10,390
b. Balance: \$ _____	\$0	\$0

G.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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- a. Map and list of plant communities and wildlife habitat.
XXXXXXXXXXXXXXXXXXXXXXXXXX

G.5. Status: Tree and shrub inventory begun. Tree/shrub inventory completed. Underwater reconnaissance on vegetation and fish species. Plant inventory field work completed. Ecological assessment completed. Small mammal survey complete.

G.6. Benefits: Identifies locations of significant plants and animals for potential interpretive and recreational value; and protection of special species. Cactus research is continuing through St. John's University. No rare species were found on site.

H. Title of Objective: Recreational master plan.

H.1. Narrative: Prepare a recreation program and development plan to preserve, interpret and utilize a unique geologic resource.

H.2. Procedures:

- a. Contract with landscape architect.
- b. Review physical features of site.
- c. Prepare development options.
- d. Present conceptual designs of development options with preliminary cost alternatives.
- e. Develop final plan with pre-engineering cost estimates.

H.3. Budget:	<u>LCMR</u>	<u>Match</u>
a. Amount budgeted:	\$0	\$30,056
b. Balance: \$ _____	\$0	\$0

H.4. Timeline:

7/93	1/94	6/94	1/95	6/95
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- a. Establish recreation program.
XXXXXXXXXXXXXXXXXXXXXXXXXX
- b. Provide conceptual design options.
XXXXXXXXXXXXXXXXXX
- c. Provide master plan with cost estimates.
XXXXXXXXXXXXXXXXXX

H.5. Status: Preliminary recreation program established. Potential interim uses identified. Selection of landscape architecture firm completed. AD HOC Advisory Committee established. Two conceptual design options presented at public meeting. User Group and Technical Advisory Committees established. Master plan was completed and accepted by County Board.

H.6. Benefits: A master plan for the project site will be available for budgeting, fundraising and recreational planning purposes.

V. Evaluation:

- A. Maps and reports of the site's physical features will be available for planning.
- B. A master plan will be produced indicating short and long term park plans and funding requirements. The public will be able to view the future plans for accessing this park with its unique natural and scenic features.

VI. Context:

A. Current and previous work related to reclamation of abandoned granite quarries is unknown or non-existent in the United States.

- B. The proposed work will be supplementary by synthesizing scattered data on reclamation of granite quarries for recreation. The project will be foundational for future research on the hydrological characteristics of bedrock granite. Future hydrological research could study site meteorology, communication of groundwater within fractured bedrock to area water supplies, and the effects of granite mining on groundwater supplies. This project site is also being reviewed by the United States Bureau of Mines for potential long range research of granite characteristics and how they relate to the quarrying and mining industries.
- C. LCMR recommended funding provided seed money to Stearns County for acquisition and development of coordinated recreational facilities on the Sauk River. LCMR recommended funding also provided seed money for the acquisition of Mississippi River County Park (230 acres) and Warner Lake County Park (241 acres). Future recommended funding will be essential for continued acquisition and development of county parks in a fast growing region of Minnesota deficient in natural resource-based outdoor recreation opportunities.

VII. Qualifications:

- 1. Program Manager:
 - a. Chuck Wocken, Stearns County Park Director since 1980.
 - b. Co-Program Manager - Robert Swanberg, Community Development Director since 1987.
- 2. Cooperative/Other Investigators:
 - a. Garry Anderson, Ph.D., and George Shurr, Ph.D., professors of earth science at St. Cloud State University.
 - b. Landscape architect, Brauer and Associates. (Applied Ecological Services, Barr Engineering, Wilderness Inquiry)

VIII. Reporting Requirements:

Semiannual status reports will be submitted not later than January 1, 1994, July 1, 1994, January 1, 1995, and a final status report by June 30, 1995.