Great Lakes Basin Program GLRI Project:

Knowlton Creek Watershed Erosion Control Project, Phase III Spirit Mountain Sediment and Erosion Reduction Project

Size: watershed
Grant Amount: $400,000
Year awarded: 2011

Sponsor: Spirit Mountain Recreation Area
Address 1: 9500 Spirit Mountain Place
City: Duluth
State: MN
Zip: 55810
Telephone: (218) 682-2891

Project Manager/ Day to Day Contact: Renee Mattson
E-mail: renee@spiritmt.com
Office Phone: (218) 624-8501
Cell Phone: (218) 310-2627

Submitted Project:

The Spirit Mountain Recreation Area Authority (SMRA) is an authority of the City of Duluth and administers the operation of the Spirit Mountain Recreation Area. The enabling legislation for the creation of Spirit Mountain states the purpose and objective of the authority:

(1) The development of a wide-range recreational facility available to local residents and tourists
(2) To aid in the economy of northeastern Minnesota by encouraging private enterprise efforts in conjunction with recreational facilities
(3) To preserve the environment in the area by a timely and intelligent plan of development

Total Grant Amount Requested: $400,000
(from budget developed below)

Match Amount
(not required but encouraged)
In Kind: $69,000

Cash: (three phases of commitments below):

PHASE I Commitment: from Tallas Island Superfund project	**$5,000,000**
PHASE II Commitment: from DNR led Project:	**$1,600,000**
PHASE III Commitments: from Spirit Mountain led Project:	**$1,553,000**
	$8,153,000

Cash/Commitments and In-Kind detailed descriptions:
The project partners have the ability to secure non-federal matching funds in excess of 50 % of the requested funding. These sources include Minnesota State Dedicated Funding – Lessard Sams Outdoor Heritage Council (L-SOHC), Minnesota State Dedicated Funding – Clean Water Legacy Fund (CWL), Legislative Citizens

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Committee on Minnesota Resources (LCCMR), and the City of Duluth. The process has been initiated to secure funding from each of these sources for distinct phases of the watershed restoration project. The Minnesota Department of Natural Resources (MNDNR) is requesting $1.00 million in 2011 from the Clean Water Legacy Fund for sediment control projects in the Knowlton Creek watershed, including mitigating impacts of run-off from Spirit Mountain, mitigating impacts of water overflows from the City of Cloquet water line, and erosion and sediment control in the I-35 corridor. MNDNR will also submit a proposal to LCCMR for $1.00 million in 2011 for support of the entire watershed project including the portion described in this proposal. MNDNR was awarded $200,000 from CWL in 2010, which will be matched with $400,000 of funding from the United States Army Corps of Engineers (USACE) for planning, design and environmental review of the entire watershed project.

PHASE I COMMITMENTS:

Contractor/Consultant	Project Element	Cost
Superfund	Tallas Island Compensatory Mitigation Project	$5,000,000 (completed 2010)
Total		$5,000,000

PHASE II (MNDNR LED):

Contractor/Consultant	Project Element	Cost
MNDNR	Knowlton Creek Project	$1,000,000 (applied for)
MNDNR	Planning and Design	$200,000 (secured)
USACE	Planning and Design	$400,000 (applied for)
Phase II Commitments Total		$1,600,000

Direct expenditures by SMRA include costs spent on original plan development and concepts developed under Phase IV and Phase V work as part of the SMRA Master Plan, of which the erosion and sediment control project is a part of.

PHASE III (SPIRIT MOUNTAIN SEDIMENT AND EROSION CONTROL PROJECT):

Contractor/Consultant	Project Element	Cost
Johnson Controls	SMRA Master Plan development PH IV	$70,000 (paid by project applicant)
Johnson Controls	SMRA Master Plan development PH V	$42,000 (paid by project applicant)
Short Elliott Hendrickson Inc.	Easement Work	$16,000 (paid by project applicant)
City of Duluth	Tourism Tax allocation	$225,000 (provided to Spirit Mountain for capital expenditures)
SMRA	Sediment Reduction Project	$400,000 from GLR grant (**this application**)
SMRA	Sediment Reduction Project	$400,000 Legacy Grant application (to be submitted in 2011)
SMRA	Sediment Reduction Project	$400,000 from LCCMR grant application (to be submitted in 2011)
Phase III Commitments Total		$1,553,000 (not including in-kind services)

SMRA is also in the process of applying for two minor grants (less than $5,000 each) from the Duluth Superior Area Community Foundation that would be applied toward a match of the GLC grant.

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In Kind Services

Contractor/Consultant	Project Element	Cost
MNDNR	Knowlton Creek Analysis	$20,000
Short Elliott Hendrickson Inc.	Grant preparation	$12,000
Johnson Controls	Grant preparation	$10,000
SMRA staff	Grant preparation	$4,000
SMRA staff	Media Campaign	$8,000
SMRA staff	Water diversion work	$15,000
Total		$69,000

SMRA staff time for administration and media campaign will be provided as an in-kind match, and will not be included as a direct expense to the grant. SMRA and Partner expenditures to date along with future commitments toward work related to erosion and sediment control include:

- In addition, personnel from MNDNR have been applying staff time to the Knowlton Creek Watershed Restoration Project for three years, which will continue until the project is completed. It is estimated that, to date, MNDNR has expended $20,000 worth of effort on the project.
- Short Elliott Hendrickson Inc. has also provided $12,000 in Grant application in-kind services as part of this and other Grant applications.
- Johnson Controls have also provided $10,000 in Grant application in-kind services as part of this and other Grant applications.
- Spirit Mountain Staff has donated over $4,000 in time for grant applications.
- Spirit Mountain Staff has committed to providing the necessary media campaign necessary as part of this application. Value of this in-kind service is $8,000.
- Spirit Mountain Staff commits to donating 400 staff hours and equipment on-site for some of the water diversion work and control barriers necessary as part of the runoff collection system for a value of $15,000.

Congressional District(s) project is located in:
MN-8

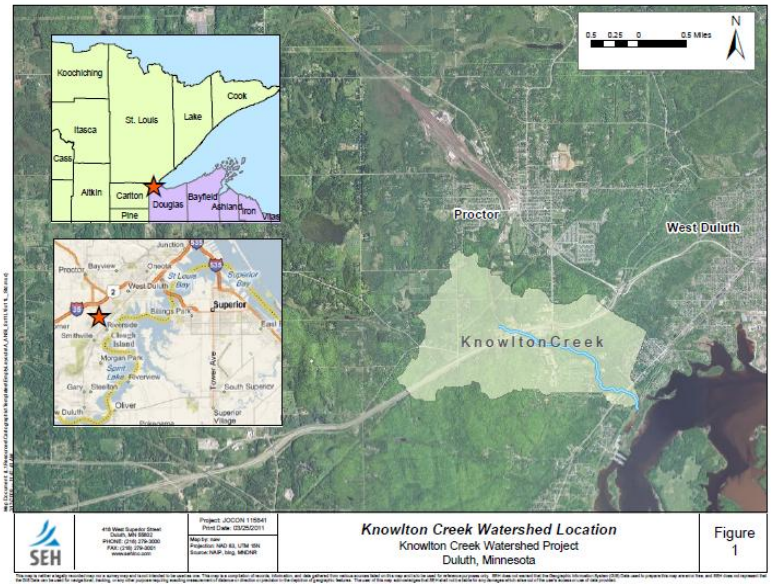
II. Project Background
Project Description

General

As a tributary to the St. Louis River, the Knowlton Creek watershed is part of the St. Louis River AOC as designated by the USEPA. The majority of the Spirit Mountain Recreation Area resides in the Knowlton Creek Watershed. This watershed flows into the St. Louis River AOC, which leads to Lake Superior. The Knowlton Creek Watershed Restoration Project has been undertaken to restore historical fish spawning and nursery areas by dredging sediments deposited at the mouth of Knowlton Creek and restore original habitat values. Another goal of the project is to improve water quality within Knowlton Creek to allow a for a naturally reproducing brook trout population.

Phase I, Tallus Island Project

Phase I of this project, which was completed in 2010 for a cost of approximately $5,000,000, resulted in the removal of sediment deposited at the mouth of Knowlton creek and restoration of a shallow sheltered bay. Collectively, MNDNR, Spirit Mountain and other resource management agencies are working to eliminate the root causes of this impairment to the St. Louis River AOC by addressing flow, erosion and sediment issues within the Knowlton Creek Watershed. Due to logistics associated with funding and coordination between project partners, the remaining portion watershed project is being proposed in phases.

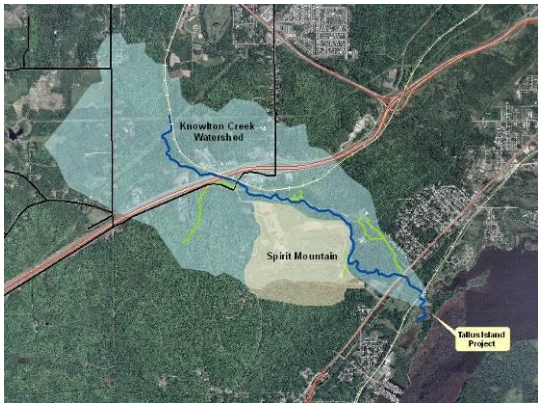


Phase II, MNDNR Sediment Reduction Project

This phase will be completed in close conjunction with the proposed project with the assistance of described non-federal matching funds for a cost of approximately $1.00 million. Planning and design of Phase II will be accomplished with established funding from CWL and USACE.

Phase III Spirit Mountain Recreation Area Erosion Control Project

This is the phase for this grant application proposal and has a project cost of $1,553,000. Planning and design of Phase III will be accomplished with established funding from CWL and USACE. It is anticipated that implementation of Phase III will occur through leveraging of previously described non-federal funding sources. The integrated implementation of Phases II and III of the Knowlton Creek Watershed Restoration Project will eliminate identified impairments and result in the preservation of the Tallas Island Restoration Project, restoration of Knowlton Creek stream channel, restoration of the Knowlton Creek brook trout population and elimination of impairments that are impacting the St. Louis River AOC.



Sediment Sources

Briefly describe the sediment loading issues, including sediment sources, in your watershed and their relevance to sediment loadings to a Great Lake.

The proposed project area is the 2.5 square mile Knowlton Creek Watershed that drains into the St. Louis River about 11 river miles from its mouth at Minnesota Point on Lake Superior (watershed location in Figure 1). Approximately 200 acres within the

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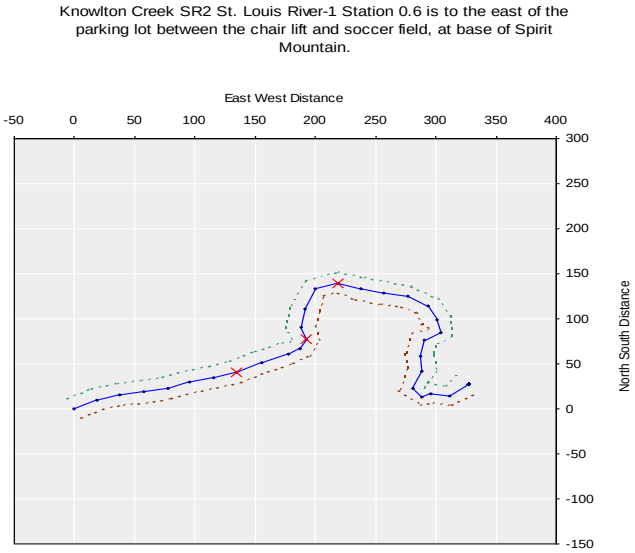
watershed was converted from forest to grass and impervious surface as a result of the development of Spirit Mountain in 1972. Knowlton Creek takes water eastward from the Spirit Mountain Recreation Area ski hill to the St. Louis River. The change in land coverage from woodland forest to grasses (development of ski runs) increases the amount and speed of surface water on the landscape in any runoff event. A stream forms based on the size of its watershed and the amount of water transported through that watershed from precipitation. An unnatural increase in discharge can change the stream's ability to effectively transport its sediment load without aggrading or degrading the streambed. In this case, a new source of spring melt (in the form of man-made snow) further increases the volume of surface water in the watershed during that critical runoff period. The annual addition of water added to the watershed by Spirit Mountain is approximately 63.5 million gallons (see figure 2).

Figure 2 Annual Water Usage for Snow-making for Spirit Mountain

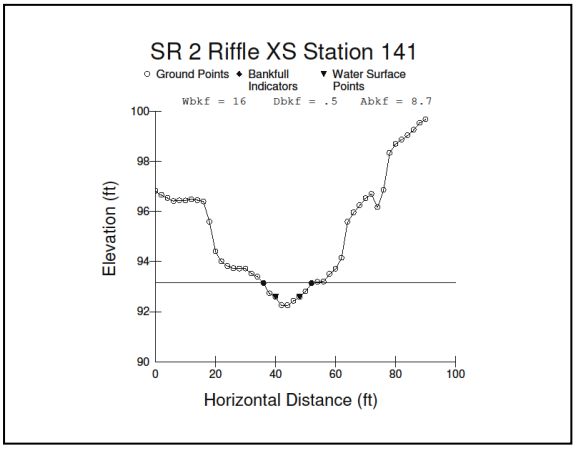
Season	Total Water Used
1998 to 1999	59,169,400
1999 to 2000	56,863,000
2000 to 2001	57,467,000
2001 to 2002	71,622,000
2002 to 2003	72,409,604
2003 to 2004	68,619,707
2004 to 2005	58,180,229
2005 to 2006	61,557,032
2006 to 2007	64,753,212
Annual Average	63,404,576

The current spring runoff volume to Knowlton Creek is estimated at more than 120 % of natural discharge. Several areas along the creek have been badly eroded and down-cut. The altered hydrograph demonstrates the destabilized stream channel, resulting in substantial sediment deposition into the St. Louis River estuary. In addition to the Spirit Mountain Recreation Area, other contributors of increased runoff and sediment in the Knowlton Creek watershed are the City of Cloquet water line, failing culverts, and the I-35 urbanized corridor. The following page illustrates the pattern, dimension and profile of Knowlton Creek along with some pictures of the badly eroded Knowlton Creek.

Pattern of Knowlton Creek



Dimension of Knowlton Creek



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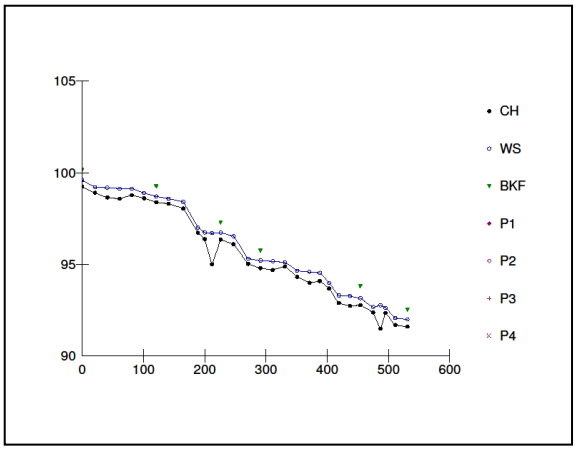
Profile of Knowlton Creek



…a stable channel is one whose most probable form amongst rivers is the channel morphology that, over time, in the present climate, transports the water and sediment produced by its watershed in such a manner that the stream maintains its dimension, pattern and profile without aggrading nor degrading (Rosgen, 1996).

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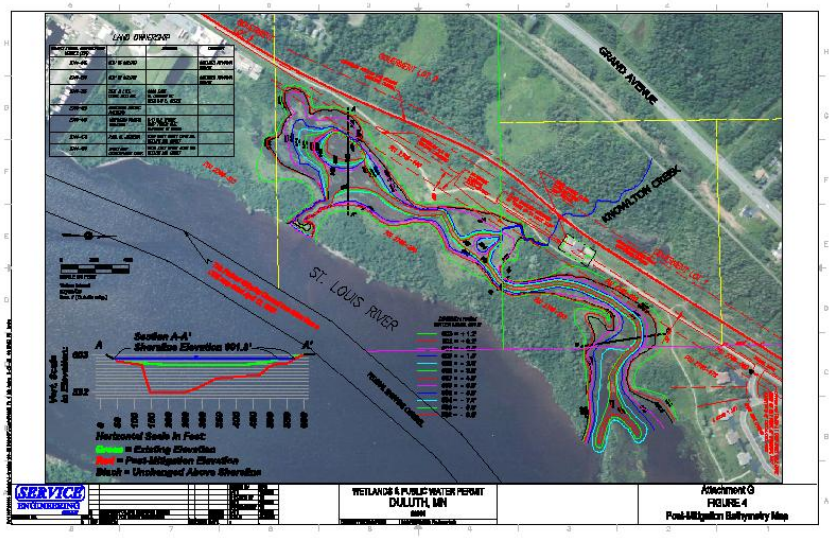
Impacts of the increased sedimentation were clear at Tallas Island in the St. Louis River, just off the mouth of Knowlton Creek. Historically, the creek side of the island was a sheltered bay providing submerged aquatic vegetation that was nursery habitat for northern pike, muskellunge, yellow perch, bluegills, and black crappies. In addition to fish spawning, sheltered bays are critical habitat for bird nesting and provide forage for many species. Sediment laden runoff from the Knowlton Creek watershed eventually filled the bay, connecting Tallas Island to the shore. See pictures below that show Tallas Island in 1990 and 2003. You can notice visually how the bay has been filled in with sediment over time.

Tallas Island 1990

Tallas Island 2003

Valuable habitat was lost as shallow wetlands were converted to upland or became isolated from the estuary. As a result of a $5,000,000 Superfund compensatory mitigation project in 2010, 53,000 cubic yards of sediment was removed, which restored the wetlands at the mouth of Knowlton Creek and their connectivity to the estuary. However, there is still a substantial amount of unconsolidated sediment that has been deposited in the stream but has not yet reached the estuary. These continuing impairments of flow, erosion, and sedimentation must be addressed in order to preserve the newly restored bay.



USACE collected information on flow and sedimentation rates in the watershed in 2010. However, the outcomes of this study will not be finalized by the application deadline for this submission. In lieu of being able to present this more precise information, it is possible to estimate the sedimentation rate based on the amount of material removed from the estuary during the Tallas Island compensatory mitigation project. Calculations suggest that sediment was deposited at a rate of 1,470 cubic yards a year between 1974 and 2010 (Figures 2 and 3). It should also be noted that a substantial volume of unconsolidated sediments, which have been transported down the watershed within the same time period, are located within the low gradient zone at the base of the hill on both the main stem and tributary to Knowlton Creek.

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Readiness to implement project

Describe your ability to readily implement conservation practices proposed in this project. Include each of the following:

What fund raising activities from other sources have you engaged in, including local public and private sources, to fund watershed projects? As part of this, list approved grants over $25,000 received from other sources within the past three years. Include the Grantor's name and a brief description of the projects.

As described earlier, MNDNR is in the process of developing a partnership with USACE that will result in the application of $600,000 to the planning, design, and environmental review of the entire watershed project, including the portion described in this proposal. With this investment, the Knowlton Creek Watershed project will be "shovel-ready" in March of 2012. BMPs identified as outcomes of the design process will be applied during mitigation of flow and sediment impairments in Phase II and III of the Knowlton Creek Watershed Restoration Project. Identified BMP's for individual project phases will be applied as funding becomes available.

MNDNR and the Habitat Workgroup of the St. Louis River Alliance (SLRA) have been developing the process for completion of this watershed project for over five years. The SLRA Habitat Workgroup includes the MNDNR, Wisconsin Department of Natural Resources (WDNR), Minnesota Pollution Control Agency (MPCA), Fond du Lac Resource Management (FdL), US Environmental Protection Agency (USEPA), US Fish and Wildlife Service (FWS), Minnesota Land Trust (MLT), Minnesota Sea Grant, Natural Resources Research Institute, Western Lake Superior Sanitary District, West Wisconsin Land Trust, and concerned citizens. There have been 10 proposals submitted for the completion of various aspects of the watershed project during that time. It is anticipated by the project partners that completion of design and environmental review, coupled with the relationships that have been developed with funding entities (L-SOHC, CWL, LCCMR, City of Duluth and USACE), will result in the successful acquisition of matching funds for this proposal within the next eight months.

Is there a state approved watershed plan (or one in development) that includes your designated implementation HUCs? If yes, does the watershed plan denote specific soil/sediment reduction BMPs and list implementation locations for those BMPs?

Although no state approved watershed plan exists, this proposal aligns with the Remedial Action Plan (RAP) for St. Louis River AOC, SLRA habitat plan (available at http://www.stlouisriver.org/habitatplan2.html), and the MNDNR Knowlton Creek stream management plan.

As a tributary to the St. Louis River, the Knowlton Creek watershed is part of the St. Louis River AOC as designated by the USEPA. The RAP for the AOC identifies Beneficial Use Impairments (BUI) for the estuary – three of which the proposed project addresses directly: BUI #6, Excessive Loading of Nutrients and Sediments, BUI #9, Loss of Fish and Wildlife Habitat, and BUI #2, Degraded Fish and Wildlife Populations. The St. Louis River Estuary has been designated as one of the top five AOC's in the United States; it was identified in the Great Lakes Restoration Initiative action plan for FY 2010 – FY 2014 as a watershed of extreme ecological sensitivity, and one where environmental problems and their solutions have been clearly identified. As a priority project of the implementation group (Habitat Workgroup) of the St. Louis River RAP process, it has been determined that completion of the Knowlton Creek Watershed Restoration Project will strongly contribute to the delisting process for the St. Louis River AOC.

The proposed project implements strategies identified in the SLRA habitat plan. The plan identifies critical stresses on the river, including increased sedimentation that threatens the viability of habitats such as the

sheltered bay at the mouth of Knowlton Creek. The identified strategy for reversing habitat loss and degradation is to support projects that control hydrologic extremes and associated erosion and sedimentation. In other words, the plan promotes projects that reduce peak stream flows resulting from land use patterns (like the urban and recreational development on Spirit Mountain). When developing the Habitat Plan, the SLRA Habitat Workgroup put Tallas Island on list of priority restoration projects.

The MNDNR Knowlton Creek Stream Management Plan (published 2010) identifies the long-range goal of establishing a wild brook trout population in the stream. Knowlton Creek is a designated cold-water stream, and designated trout stream, and sampled water temperature indicates that it has the potential to foster naturally reproducing trout. Objectives outlined in the plan include working with Spirit Mountain to reduce sedimentation, decrease unnatural peak flows, and cool water before it flows into Knowlton Creek. The stream management plan also calls for implementation of the comprehensive Knowlton Creek Watershed Project as laid out in the St. Louis River Habitat Plan. Funding of this proposal will provide a vital catalyst to the completion of the entire watershed project, which will fulfill the goals of the identified plans and significantly contribute to the delisting process of a priority Great Lakes AOC.

What other on-going conservation activities are taking place in the HUCs? Are there any existing projects being implemented such as a Section 319 project?

Agency and citizen groups in the St. Louis River estuary area have been highly active in conservation projects and planning. The project partners have been working together for years to identify key issues and find workable solutions.

A recent success in the Knowlton Creek watershed was the completion of the Tallas Island Compensatory Mitigation Project in 2010. The project restored 23 acres of sheltered bay habitat behind Tallas Island and at the mouth of Knowlton Creek, at a cost of approximately $5,000,000. This restoration mitigated for impacts related to the clean-up of the St. Louis River/Interlake/Duluth Tar (SLRIDT) Superfund site in Stryker Bay. Restoration at Tallas Island involved the removal of approximately 53,000 cubic yards of sediment that had been deposited in the estuary. Basins for fish habitat and sediment control were constructed behind the island in conjunction with the restoration. Reducing the mobilization of large amounts of sediment from upstream will extend the useful life of those BMPs. The long-term health of restored habitat behind Tallas Island is dependent upon mitigation of upstream hydrological impairments and restoration of the Knowlton Creek stream channel.

The previously described project funded by CWL and USACE to design and completed environmental review for the entire watershed project will be completed between July of 2011 and March of 2012. In addition to providing an implementation-ready project for this proposal, results of the effort will provide an implementation-ready plan for the restoration portion of the watershed project. The plan will include a design for the restoration of 3,000 ft of stream channel on Knowlton Creek from the mouth to the base of the ski hill, and continuing up a tributary to the City of Cloquet water line pump station. This stream restoration will be possible as a result of the mitigation of peak flows realized through completion of the Knowlton Creek Watershed Erosion Control Project. Tangible outcomes will include a restored stream corridor for the movement of fish and wildlife between the estuary and city-owned Magney-Snively forest complex and allow restoration of a native brook trout fishery. Unconsolidated sediments within the existing riparian corridor will be utilized to implement the stream restoration design. Unconsolidated sediments that are not utilized during the stream restoration will be rehabilitated as part of the project. The MNDNR will be acquiring an easement on the entire the stream bank extending 50 feet on either side of the stream channel, to preserve the creek in perpetuity for public use and conservation.

SMRA is committed to using environmentally sound practices in future development activities. A future coordinating project is an upgrade of the Grand Avenue parking lot at the base of the ski hill. The lot is planned

to be converted using Best Management Practices for stormwater runoff, providing additional stormwater treatment of runoff before it enters the stream.

Is there an established watershed council or steering committee involved with the project? If yes, briefly describe the mission of the group. When was it established, how often does it meet, what is the average attendance at the meetings? If not, what is your plan for broad based community involvement in implementing the project?

The steering committee for the Knowlton Creek Watershed Restoration Project was formed in 2008 as a partnership between SMRA and MNDNR. The partnership formed as a result of the operational alignment of initiatives between the SLRA Habitat Workgroup (including MNDNR) and SMRA. The steering committee recognized the need to closely coordinate the future development plans of SMRA with watershed restoration objectives defined in the Habitat Plan. The committee has met on an undefined schedule based on the need to coordinate activities between the partners and develop funding proposals. Attendance at meetings varies depending on the need to involve members of local, state and federal resource management agencies as well as municipal administrators and consultants.

Because the Knowlton Creek Watershed Restoration Project is located within the St. Louis River AOC and identified as a high-priority in the Habitat Plan, the Habitat Workgroup of the SLRA is considered a partner to this proposal. The Habitat Workgroup meets bi-monthly and has an average attendance of approximately 20 representatives from member agencies and organizations. The Habitat Workgroup has been adopted by the agencies responsible for the delisting process (USEPA, MPCA, MNDNR, WDNR, and Fond du Lac Resource Management) as the primary implementation group within the AOC.

Background of the SLRA (from www.stlouisriver.org):

> The St. Louis River Alliance began as a Citizen Advisory Committee formed to assist Minnesota and Wisconsin state agencies develop a Remedial Action Plan (RAP) for the St. Louis River AOC. Created in 1996 as a nonprofit, the St. Louis River Citizens Action Committee's (SLRCAC) primary focus was to foster communication between public and tribal agencies, industry groups and community stakeholders in the implementation of the RAP. The CAC also advocated for and sponsored stewardship efforts as well as promoted sound management of the resources provided by the St. Louis River, Lake Superior, and their watersheds. In 2009, the SLRCAC began doing business as the St Louis River Alliance. Alliance members include individuals, families, businesses, organizations, local and tribal governments – all helping to improve the St. Louis River.

What partnerships (outside of your organization) have you established to help implement this project? List your partners.

The Knowlton Creek Watershed Erosion Control Project is being coordinated by SMRA in cooperation with MNDNR and the Habitat Workgroup of the SLRA. The proposed project is part of a complex initiative to eliminate impairments and restore habitat within the watershed, with the ultimate goal of reducing identified BUI's within the St. Louis River AOC. The steering committee and the Habitat Workgroup have spent three years identifying implementation partners and funding sources necessary for the completion of all phases of the watershed project.

A summary of partnerships associated with implementation of the watershed project includes:

- **Knowlton Creek Watershed Erosion Control Project** – SMRA, MNDNR, USACE, MLT, MPCA, City of Cloquet, Minnesota Board of Water and Soil Resources (BWSR), and the South St. Louis County Soil and Water Conservation District (SWCD). Partners that will assist in the securing of non-federal match from CWL, LCCMR grants include MNDNR, MPCA, MLT, BWSR and SWCD. The partners have successfully

obtained $200,000 from CWL in 2010 that will be matched with approximately $400,000 of USACE funding to complete planning, design and environmental review of the proposed project. The partners will develop another proposal to CWL in 2011 to be used as non-federal match for the proposed project. The partners will also develop a proposal to be submitted to LCCMR in 2011. Active participation of all identified partners during the implementation of the project will help ensure a successful outcome.

- **Knowlton Creek Stream Restoration Project** - MNDNR, MLT, USACE, USFWS, MPCA, SMRA, BWSR and SWCD. Although the restoration of Knowlton Creek will not be completed prior to the implementation of the erosion control project, partners have been actively coordinating the planning, design and implementation strategy. The $600,000 of funding described in the previous section will also be used to plan, design, and complete design and environmental review of the stream restoration project. MNDNR and MLT will coordinate the submission of a proposal to L-SOHC in 2011 for completion of the stream restoration project. Also, MNDNR will coordinate with partners to submit a proposal to LCCMR in 2011 for completion of the stream restoration project.
- **Other partnerships associated with the proposed project** – Because the proposed project and the overall watershed project is located within the community of West Duluth, the Spirit Valley Citizens Neighborhood Development Authority (SVCNDA) has been actively participating with SMRA and resource management agencies during the planning of the project. The partnership with SVCNDA has strengthened the coordination between the proposed project and other local development initiatives. Partnerships and participation from SVCNDA and other local groups will help increase the probability of successful outcomes as a result of funding the proposed project.

Watershed/ Project Work Area

*List up to three **12 digit USGS HUC codes** that comprise your watershed implementation area:*

Spirit Lake/St. Louis River, 040102011603

Enter the total acres are in the selected HUCs: 32,679 acres

Enter the number of acres in those HUCs that are in the following land uses (acreages below are for the Minnesota portion of the HUC only):

- *Agriculture including pasture landuse:* 681
- *Forest including brushland landuse:* 11,321
- *Urban, suburban, industrial, commercial and rural residential landuse:* 4,813

Is your proposed area upstream from a significant dam? If so, explain why the reservoir is not acting as a sediment trap, especially for clay particles, and how your project is reducing sediment in the Great Lakes.

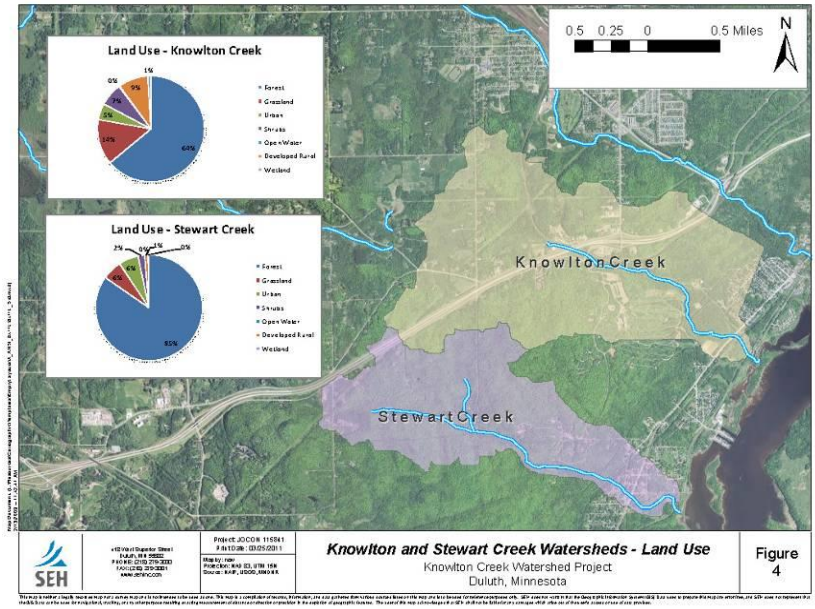
No – there is no significant dam in the Knowlton Creek Watershed, or downstream from Knowlton Creek on the St. Louis River. Sediment from Knowlton Creek is exported to the St. Louis River and ultimately to Lake Superior.

*Describe the **Priority Areas** within the watershed where you are going to concentrate your efforts, list by geographic area or narrative description of specific conditions.*

The project location is within the St. Louis River major watershed (169,636 acres) and the St. Louis River minor watershed (31,087 acres). This area of the minor watershed contains several streams, including Knowlton Creek, which drain to the St. Louis River and eventually to Lake Superior. The headwaters of Knowlton Creek are west of I-35 and the creek outlets on the western side of Tallas Island, into an approximately 25-acre area forming an embayment between the island and the western shore of the St. Louis River. Although the Knowlton Creek Watershed is small (2.5 square mile - 6.5 square km), it is contributing a

large amount of sediment and nutrient loading to the St. Louis River AOC. Land use in the Knowlton Creek watershed is 64% forest, 14% grassland, 9% developed rural, 7% shrub, 5% urban, and 1% wetland (land use data from www.lakesuperiorstreams.org). Funding of the proposed project will mitigate impairments associated with flow, erosion and sedimentation within an entire 2.5 square mile watershed. Successful completion of the project will allow for the restoration of the stream corridor, which will reduce the volume of sediment being transported from the watershed to the AOC. Resource professionals are considering the completion of this watershed scale mitigation/restoration project as an important tool to be applied to other impaired sub-watersheds surrounding the AOC and along the North Shore of Lake Superior.

Knowlton Creek, which contributes a large volume of sediment to the St. Louis River AOC relative to its size, will be compared to the adjacent and similarly sized Stewart Creek watershed. Unlike Knowlton Creek, Stewart Creek watershed is relatively undeveloped, its stream channel is not degraded and it contributes a small volume of sediment to the AOC. Comparisons between the adjacent watersheds will continue to be developed throughout the process leading to the restoration of Knowlton Creek watershed. These comparisons will be important to the design and implementation of the proposed project. Figure 4 shows the two watersheds and compares land use in each.



III. Implementation
Project start date will be October 1, 2011

Implementation Strategy

Briefly describe the specific methodology(ies) you are going to use to implement the project. These can be traditional or creative nontraditional efforts. ***While 100% cost-share is allowed it is not encouraged.*** *Include such items as:*

- *The types of BMPs you are planning to install i.e. tree planting, easements, conservation tillage, streambank stabilization, hay in rotation, sediment basins, buffers, other*
- *timeline for implementation*
- *priority areas identification process*

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- *incentive methods*
- *equipment purchases*

BMPs implemented as part of this phase of the watershed project will reduce flow and sediment reaching the impaired section of Knowlton Creek. Implementing BMPs associated with other phases of the project will provide additional ecological benefits, including nutrient load reduction, protection of the existing restoration project at Tallas Island, and restoration of a native brook trout fishery. Each project phase can be built independently and still realize positive outcomes. MNDNR and project partners are working concurrently to integrate and complete the comprehensive Knowlton Creek Watershed Restoration Project.

The Knowlton Creek Watershed Erosion Control Project is a catchbasin/detention pond at the base of the Spirit Mountain ski area, with an associated runoff collection system and pipeline. The project will capture and convey spring snow-melt and stormwater runoff directly to the St. Louis River, allowing peak flows to bypass sensitive portions of Knowlton Creek. Reduction in rate and volume of runoff will reduce erosion in the creek, and reduce the amount of sediment entering the St. Louis River and ultimately Lake Superior. The project will entail the BMPs (collect the accelerated runoff from the ski area and divert it directly to the St. Louis River avoiding Knowlton Creek. This water flow management and flow diversion will reduce Spirit Mountain water runoff to Knowlton Creek. As a result of the mitigation of peak flows realized through completion of the Knowlton Creek Watershed Erosion Control Project, it will be possible to implement the restoration of 3,000 ft of stream channel on Knowlton Creek from the mouth to the base of the ski hill, and continuing up a tributary to the City of Cloquet water line pump station. As described earlier, outcomes will include a restored stream corridor for the movement of fish and wildlife between the estuary and a forest complex and allow restoration of a native brook trout fishery. The MNDNR will be acquiring an easement on the entire the stream bank extending 50 feet on either side of the stream channel, to preserve the creek in perpetuity for public use and conservation.

Technical Assistance
Grant money can be used to pay for technical assistance. Briefly describe the technical assistance required to implement the project over a three year period. You will be required to provide in-kind office space, administrative support, computer and other equipment, general office supplies, and other items and services required to perform their job. This can be shown as match.

Spirit Mountain has an established professional relationship with program management firms that provide the engineering, design, and technical capacity necessary for the project. SMRA would employ construction contractors to implement the design. Also, SMRA has the administrative capacity to submit quarterly reports of expenses and activities as well as other required documentation. Other project partners described in the proposal are committed to providing technical assistance throughout the implementation process of the proposed project. These project partners are also committed to integrating the process that will link the proposed project to the completion of the entire Knowlton Creek Watershed Restoration Project.

BMPS - Fill out all that apply (A-E):

A. Agronomic/Cover-based Practices (BMPAs) installed by Landowners/Landusers with incentives paid for with this grant (ex. Cover Crops, conservation tillage, no-till.) *If you have more than three BMPAs, copy and paste BMPA1 section and change the number as appropriate.*

NOT APPLICABLE

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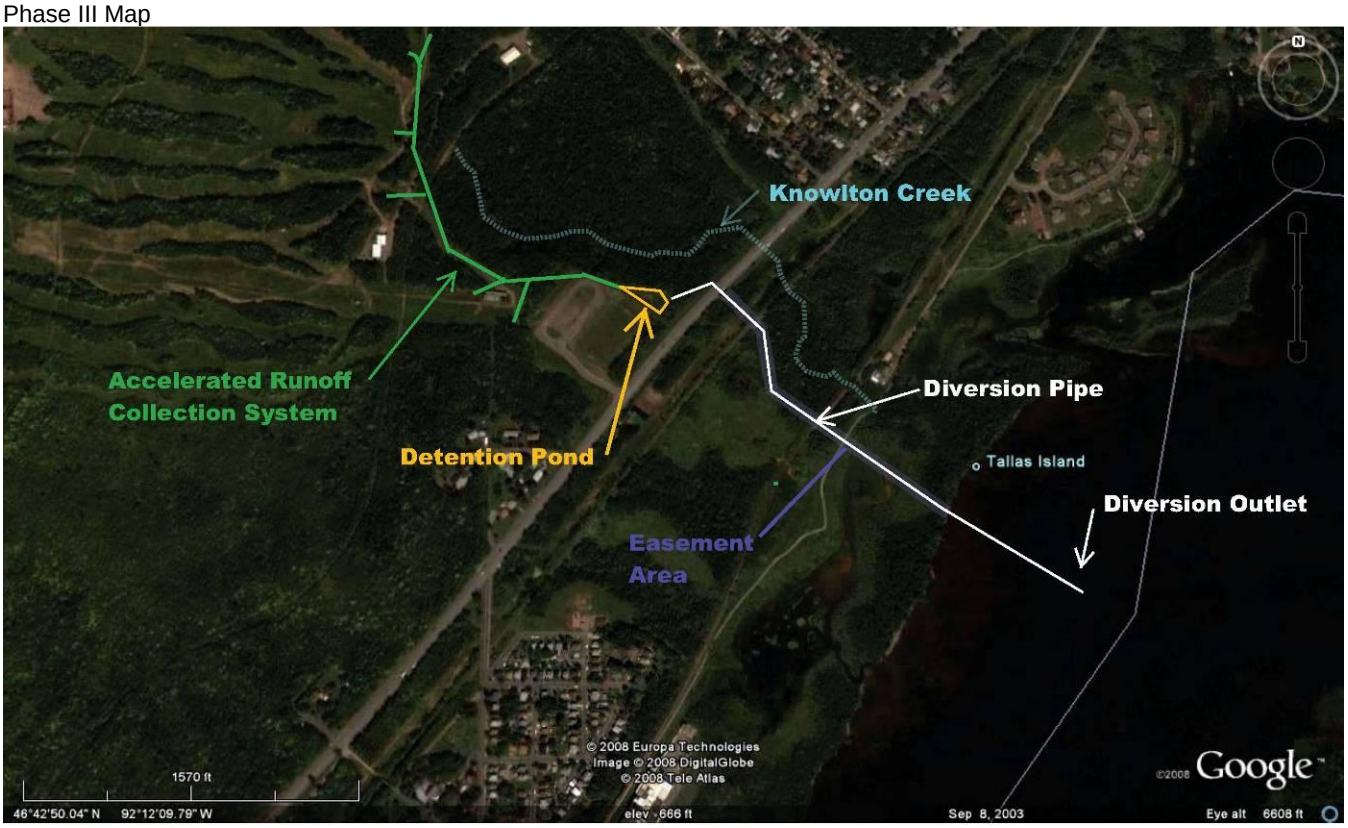
B. Engineering Practices (BMPEs) installed by Landowners/Landusers with Financial Assistance provided for with this grant (ex. Grass Waterway, Streambank Stabilization.) *If you have more than three BMPEs, copy and paste BMPE1 section and change the number as appropriate. All engineering practices must be approved by NRCS or an equivalent professional engineer.*

BMPE1

Description:
Knowlton Creek Restoration, Phase III Spirit Mountain Sediment and Erosion Reduction Project is a system to collect the accelerated runoff from the Spirit Mountain Recreation Area and harmlessly divert it past the lower reach of Knowlton Creek to the St Louis River, thus preventing erosion damage to the creek, and the associated downstream sedimentation.

This system at the base of Spirit Mountain will collect a portion of the runoff, (with a system of check dams, swales and pipes), and route it into the existing detention pond. The pond will be modified so sediments and floatable materials will be trapped. Then up to 35cfs will be diverted directly to the edge of the shipping channel in the St Louis River. This diversion of flow will prevent the damage to the stream banks in Knowlton Creek.

Phase III Map



Check the quarters the task is to be started and completed:

Quarter	1	2	3	4	5	6	7	8	9	10	11	12
Start/Complete	X	X	X	X	X	X	X	X	X	X	X	X

Timeline:
Project design and engineering: Fall and Winter of 2011 and 2012

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PHASE II and/or PHASE III projects to begin in Spring of 2012 and be completed by summer of 2014.

*Number of acres/units of BMP to be installed during project*_____

Incentive method _____ *and rates* _____

Expected soil savings from BMPE1: **25,000** total tons over the life of the BMPs.

Project Soil Savings:

53,000 cubic yards of sediment was removed from the Tallas Island Compensatory Mitigation Project. Historical aerial photos indicate that sedimentation at the mouth of Knowlton Creek began in the early 1970's, resulting in the conversion of aquatic habitat to upland within the estuary and deposition of a large volume of unconsolidated sediment along the lower stream channel of Knowlton Creek. Completion of Phase II and III of the Knowlton Creek Watershed Restoration Project will reduce peak runoff and associated sediment transport from the watershed (including Spirit Mountain Recreation Area). Restoration of flow and sediment rates to pre-1970's levels will preserve habitat gains realized at the Tallas Island project and reduce an on-going sediment impairment to the St. Louis River estuary.

Phase III Soil Savings:
By associating approximately one third of the 53,000 cubic yards of sediment removed from the Tallas Island Compensatory Mitigation Project to accelerated water runoff from the development at the Spirit Mountain Rec. Area, 17,700 CY or 25,000 tons of sediment can be saved.

BMPE3

C. Agronomic/Plant-based Practices installed by Landowners/Landusers with the use of equipment purchased by this grant for which you retain ownership (ex. No-till Planters or Drills, Residue Management machines and Residue Management Attachments and tools.) *If you have more than two Equipments, copy and paste Equipment 1 section and change the number as appropriate.*

NOT APPLICABLE

D. Alternate (ALT) Incentive Methods (ex. pay per ton/unit reduced/increased) *List each unit separately (ex. Pay per ton of sediment reduced rather than pay for a particular BMP.) If you have more than one ALT, copy and paste the ALT1 section and change the number as appropriate.*

NOT APPLICABLE

E. Easements, purchased in part or whole with grant funds, over which you or your assigns retain ownership. *If you have more than one type of Permanent Easement (EASP), or Temporary Easement (EAST) copy and paste the EASP1 or EAST1 section and change the number as appropriate.*

Grant Funds are not anticipated to be used for easement acquisition

PHASE III, the Spirit Mountain portion of this project will take place on Spirit Mountain property and on easements already obtained or in process by Spirit Mountain in route to the St. Louis River.

The majority of PHASE II, the MNDNR led project, will take place on City of Duluth/Spirit Mountain property. The MNDNR will pursue conservation easements along the stream corridor, and take responsibility for enforcing the acquired easements.

EASP1

EAST1

Note: The first quarter is from October 1, 2011 to December 31, 2011. *A written contract will be required between you and the landusers/landowners to fund conservation practices with GLBP funds. The contract will include among other items, the type, number and location of each practice to be installed as well as the cost-share/incentive rate to be paid for each practice. (We will also use the signed contract as proof of commitment of funding for reimbursement of your expenses.)*

Media Campaign

1. You will be required to conduct a kickoff event in the first quarter of the project. *You are specifically to invite, among others, all members of congress who have a portion of their district within your watershed project boundaries, the media and the chairperson of the Great Lakes Commission delegation from your state. Describe how and what you will do to meet this requirement.*

Spirit Mountain Media Campaign

Spirit Mountain Recreation Area will plan and host the kickoff event for this project. Spirit Mountain will work with the St. Louis River Alliance on media outreach and events. With a spectacular view of Lake Superior, the St. Louis River, and the City of Duluth, Spirit Mountain provides a scenic and natural setting for the unveiling of the project. And, as a popular venue for banquets and events, the facility and experienced staff are well suited to host the media reception and press conference surrounding the project announcement. The intense public interest in Spirit Mountain is anticipated to drive large numbers of attendees from the local community and surrounding area. Ample space is available on site to host up to 500 people during the media event and reception. Awareness of the event (to the general public) will be communicated through an advertisement in the local newspaper, which reaches a large regional audience. The event will also be promoted through the Spirit Mountain website, Facebook and Twitter postings. The following dignitaries will be invited to the reception by way of printed invitation:

a. Great Lakes Commission Delegation
b. U.S. Senators Klobuchar and Franken
c. MN 8th District Congressman Cravaack
d. MN State Legislative Delegation
e. St. Louis County Commissioners
f. Duluth Mayor Don Ness and Duluth City Councilors

SMRA maintains an extensive local and regional media contact list and will work within such to ensure comprehensive coverage of the kickoff event. In addition, SMRA will furnish complimentary meeting space, light appetizers and beverages for the event. Staff time and the media promotion will not be an expense to the grant, but instead an in-kind contribution.

2. You are also required to establish an on-going outreach campaign. *Describe your on-going outreach campaign strategy for the general public/media, landowners/landusers and elected officials*

In order to keep the media and public sector informed of the progress of the project:

1. SMRA will create and maintain a page on the Spirit Mountain website dedicated to information about the project, along with status reports from beginning to completion of the project.
2. The media will be kept apprised of the progress through frequent media advisories as the project reaches significant milestones on the road to completion.
3. SMRA will create a quarterly newsletter that will be distributed to all dignitaries and politicians noted above to keep them engaged, involved, and well-versed on the progress.

4. The City of Duluth publishes quarterly reports to the citizens of Duluth designed to keep them informed of city initiatives and activities. As an authority of the city, SMRA will have the ability to reach a large audience on a regular basis through this communication.

The media campaign will not be an expense to the grant, but instead an in-kind contribution.

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