



### **Project 11-1 Knowlton Creek Watershed Restoration**

**Background:** Knowlton Creek flows down the high gradient topography and into a shallow sheltered bay behind Tallus Island on the Minnesota side of the St. Louis River estuary. Historically, an undisturbed mix of forest cover protected the steep gradients of Knowlton Creek's riparian corridor. Aerial photos taken of the wetland complex behind Tallus Island in 1961 and 2003 document the effects of increased sedimentation. Prior to 1961, the wetland complex behind Tallus Island was connected to the estuary and was providing habitat functions of a shallow sheltered bay. By 2003, erosional deposition had converted a large portion of the wetland complex to upland and almost completely isolated the remaining wetland from the estuary. The wetland complex will be restored to 1961 conditions as mitigation for remediation of the Sediment Operable Unit at the SLRIDT Superfund Site. Results of initial investigation into causes of sedimentation at the mouth of Knowlton Creek suggest that the creek is degrading its bed and moving that sediment downstream. Mitigation of the impairment would result in longer-term preservation of habitat gains realized by the Tallus Island Restoration Project.

**Problem Statement:** A substantial amount of the Knowlton Creek watershed was converted from forest to grass as a result of the development of the Spirit Mountain Recreation Area (ski hill) in the 1960's. Management activities associated with the Recreation Area have increased the amount of water (in the form of man-made snow) that is being deposited within the watershed, which increases spring runoff into Knowlton Creek. It is presumed that the increased runoff generated by the melting of man-made snow has negatively impacted Knowlton Creek by increasing annual peak discharge. Streams are formed by the size of their watershed and the amount of water transported through the watershed from precipitation. An unnatural increase in discharge can change the rivers ability to effectively transport its sediment without aggrading or degrading the streambed. In the Knowlton Creek watershed, the altered hydrograph has destabilized the stream channel, resulting in substantial sediment deposition into the St. Louis River estuary. Currently, a large amount of unstable sediments are located in the wetland between the Munger Trail and the Western Waterfront Trail. A large storm event could result in additional movement of sediments into the estuary. Additionally, illegal OHV and other recreational activity have increased the threat of erosion within the immediate riparian corridor of Knowlton Creek. Sedimentation from Knowlton Creek could threaten the post-project conditions of habitat restoration planned for the wetland complex behind Tallus Island.

#### **Goals:**

1. Determine current flow and sedimentation rates
2. Reduce flow and sediment rates to levels that are acceptable for a watershed of this size and slope
3. Develop an effective plan to restore in-stream and riparian habitat along Knowlton Creek
4. Enhance fish and wildlife corridor between St. Louis River estuary and Magney Snively Natural Area
5. Increase migratory pathways through replacement of culverts
6. Eliminate unnaturally high peak flows down a tributary that are originating from the City of Cloquet water line
7. Eliminate impacts of illegal OHV operation within the watershed

**Priority:** High

**Task Duration:** 3 years

**Potential Mechanism:** LSOHC, CWL, GLRI, LCCMR, City of Duluth, USACE, TS

**Potential Partnering Organization(s):** DNR, City of Duluth (Spirit Mountain Authority), USACE, SWCD

**Estimated Cost:** \$2,900,000

**Comments:** The estimated cost includes only the wildlife portion of the project. The water control portion of the project (approximately 2.5 million) will be submitted for completion through State Clean Water Legacy and GLRI funding sources.

**Special Considerations:** The Knowlton Creek project will be accomplished through a partnership between the MnDNR, the City of Duluth, the SLRA as well as other partners active on the Habitat Work group of the SLRA.

**Accomplishments:**

- A proposal for the project has been submitted to the LSOHC.
- A proposal for the project has been submitted to the GLRI.
- The USACE has agreed to model flow and sediments within the watershed.

**Measure(s) of Success:**

- Greatly reduce sediment loading to the St. Louis River estuary
- Stabilize riparian and in-stream habitat
- Establish a wildlife corridor between the estuary and the forest complex
- Establish a naturally reproducing brook trout population
- Enhance fish migratory pathways within the watershed

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*Vision Statement: Maintain, protect, and restore healthy cold water ecosystems with relatively stable flows and a diversity of habitat for fish and wildlife to enhance our quality of life.*

*For project information: [www.lrcd.org/links/lsc projects.htm](http://www.lrcd.org/links/lsc projects.htm)*