



Raspberry River Streambank Stabilization Efforts on Spirit Island

Partnering with the Red Cliff Band of Lake Superior Chippewa Reservation

Above: Volunteers work to stabilize the eroded streambank on Spirit Island by completing plantings.

The Red Cliff Reservation, established during the treaty of 1854, is one mile wide and 14 miles long, located at the top of the Bayfield Peninsula, on the shores of Lake Superior in northern Wisconsin. The reservation has 7,021 total enrolled tribal members and natural resources and conservation has always been of the utmost importance to those members. Spirit Island is a small piece of upland land surrounded by an extensive, frequently flooded marshy area and coastal estuary for the Raspberry River system on the south shore of Lake Superior. “The island is located within the Red Cliff Band of Lake Superior Chippewa (RCB) reservation and has significant historical and cultural value to the Red Cliff Tribe,” said Todd Norwood, Project Coordinator, RCB. For many years, community members and tribal councils expressed concern that the southwest facing bank of Spirit Island along the Raspberry River was heavily eroding and depositing the sandy soil downstream and at the mouth of the river. “Not only did the erosion and sedimentation cause a potential threat to fish, wildlife and wild rice habitat, it also raised concern about the longevity of the island itself,” said Chad Abel, Division Administrator, Treaty Natural Resources Division, RCB.

In 2012, following a heavy rainfall event of 5-6 inches in 24 hours, Red Cliff Treaty Natural Resources (TNR) staff observed the Spirit Island streambank eroding more heavily along its 335 foot distance. “Numerous large pine trees were now losing their underlying support and falling into the river, taking large portions of the streambank with them,” said Chad. As a result, TNR staff approached the U.S. Department of Agriculture’s Natural Resources Conservation Service (NRCS) for assistance through their Environmental Quality Incentive Program (EQIP). “NRCS places special emphasis on working with

tribes and building tribal partnerships; we were excited for the opportunity to work with the Red Cliff Band of Lake Superior Chippewa to restore their streambank, putting conservation on the ground and directly into the watershed,” said Tom Krapf, NRCS Assistant State Conservationist for Programs.

In an effort to assess damages and focus on conservation planning and implementation, in spring 2016, NRCS engineering and conservation staff, along with TNR staff, surveyed the stream channel from the river mouth to upstream of the erosion site. The results suggested that the extensive wetland network in the Raspberry River estuary helped prevent high velocities that would erode the toe of the streambank at



Project site prior to restoration. Note the tree root and erosion issues.



Left: Volunteers and staff work to drive stakes that hold bio-logs in place.

Right: Volunteers and staff work during the second planting event on the streambank.

Middle: Volunteers and staff work on the streambank stabilization.

Bottom: Completed streambank stabilization project.

the project site. It was determined the erosion was mostly the result of the lack of streambank vegetation that resulted in an unstable bank condition. Based on survey results, NRCS developed an initial plan requiring large equipment for placement of bioengineering of large root wads and woody material to protect the bank. This idea was presented to the Tribal Council by NRCS District Conservationist, Gary Haughn. “The Council was concerned about the impact the large equipment would have on sacred and fragile tribal lands and asked if a less invasive method could be developed,” explained Gary. NRCS re-evaluated options for low impact methods the tribe would accept. The revised low impact plan required hand labor only, to eliminate the negative environmental impacts associated with heavy machinery in the fragile area. RCB Tribal Council accepted the plan during summer 2016 and work began. Protection was required at the waterline and was provided by aspen fiber ‘bio-logs’ rather than root wads that required machinery. Bio-logs were secured into the streambank with wooden stakes and natural fiber rope, all of which are designed to biodegrade over a 3–5 year period. “Following some minor bank shaping and site preparation, we planted approximately 12,000 plants to help stabilize the bank,” said Todd.

Plants were selected based on species already existing on site or nearby with some species originating from seed collected on Spirit Island. Wetland species used for the Spirit Island restoration include Lake Sedge, Tussock Sedge, Common Rush, Softstem Bulrush and Broadfruit Bur-Reed. Upland species used for the restoration include American Marram Grass, Poverty Oatgrass and

Wavy Hair-Grass. Plants were spaced at 8 inches for the upland dry section and at 12 inches for the wetland portion. Todd explains, “The uplands were planted along the entire slope and onto the upper flats where the former trail existed and vegetation was lacking. The wetlands were planted directly into the bio-log with some plants placed directly behind the bio-log where soil was wet.” Partnerships were key in completing the 12,000 plug planting. TNR held a community event where Red Cliff tribal members could take part in preserving Spirit Island. Area Bayfield High School science students also provided planting assistance. “A subsequent planting event with the students occurred two weeks after our initial planting, followed by a few days of final planting by TNR staff,” said Todd. The former trail was re-routed inland to help prevent future vegetation loss and slope failure, while also allowing for new plant establishment and bank stabilization. “One month post planting, the site looks excellent and the plants are thriving,” explained Chad. “This project wouldn’t have been possible without the technical and financial support of the Natural Resources Conservation Service (NRCS) and the U.S. Fish and Wildlife Service; their successful partnership with the Red Cliff Band was instrumental,” said Todd. “The NRCS partnership with the tribal council and staff lead to strong community support for this project. With community support, the protection needed to preserve Spirit Island’s sacred importance was possible and a great cultural gain for present and future generations,” said Gary.

