

# Rethinking the Red Clay Project: Restoration in the Nemadji Watershed

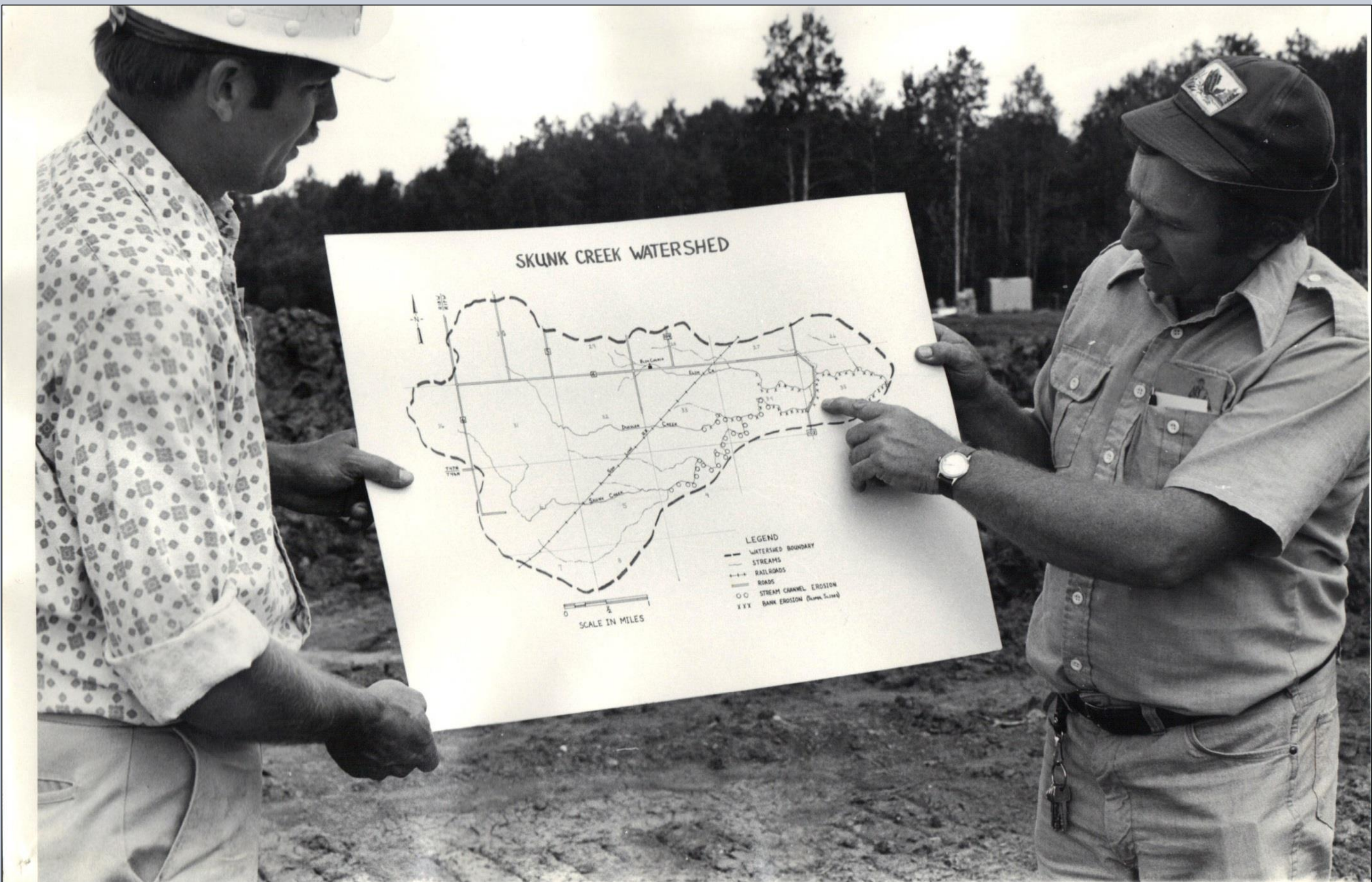
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## History



In the 1970s, the Nemadji Watershed was part of a multi-agency effort to reduce sediment erosion in Lake Superior called the Red Clay Project. Past and current studies have demonstrated the majority of the Nemadji's sediment pollution comes from in-channel erosion and that reduced stream velocities are needed to reduce sediment pollution. Using this logic, the Red Clay project funded installation of earthen dams that reduced peak flows and collected sediment. While the dams did reduce peak flows by as much as 40%, they have damaged valuable aquatic habitat by destroying connectivity and warming waters. In addition, no plans were made for funding structure maintenance. The structures were all installed on private land.



## Current Conditions

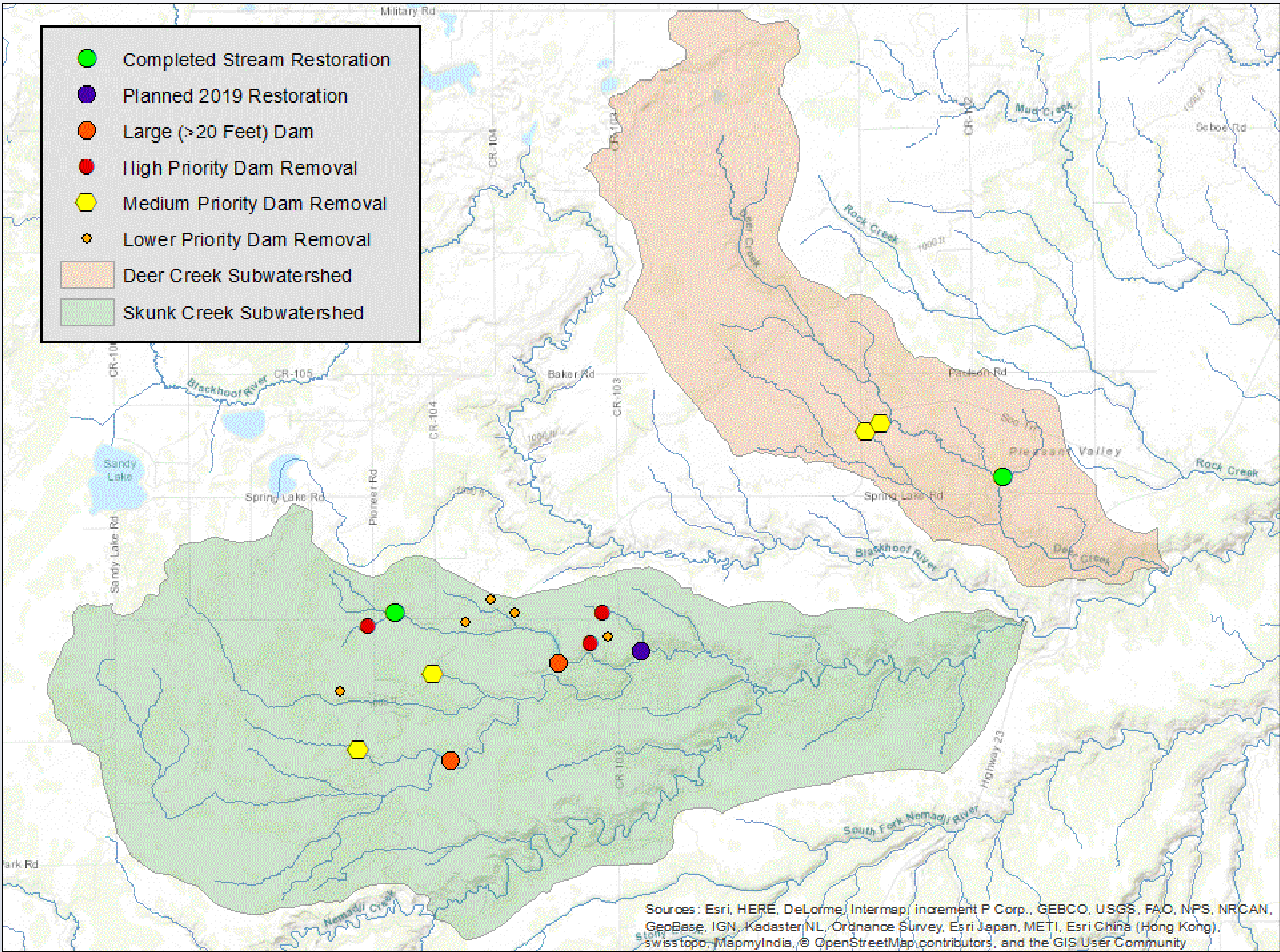


**Above:** The designed life expectancy of the Red Clay structures was between 10 and 25 years. In many cases, corrosion of the metal infrastructure has led to dam failures, releasing tons of sediment both from the earthen embankments and accumulated sediment in the pond areas. For structures that have not yet failed, there is a significant challenge persuading the landowner to give up their pond.

**Below:** In 2014 and 2016 the Carlton SWCD worked with private landowners to restore two stream reaches where failed or failing dams were contributing significant sediment into impaired streams. The 2014 project involved a series of three smaller dams on Elim Creek. The 2016 project involved a large failed dam on a tributary to Deer Creek. TSA III Engineers used Rosgen Natural Channel Design to restore the channel meander and floodplain connectivity. In-stream structures included grade control with wood stream vanes, bank-full benches reinforced with coarse sediments, rock step-pools and toe-wood.



## Future Restorations



## Lessons Learned and Conclusions

1. There are several challenges working with private landowners on such large restoration projects, especially for rural properties. Land changes hands, multiple landowners with different interests are involved and landowners have difficulty in understanding project scope. Communication at each step in the process is a challenge but vital to project success.
2. Often these projects involve the coordination of multiple agencies/partners and landowners. Thinking outside the box and looking for opportunities is a necessary skill. Employee turn-over can create problems for long, complicated projects.
3. Temporary Construction Easements should be signed and recorded early in the process. This ensures project success, even if circumstances change or land changes hands.
4. Both of our completed projects took longer and cost more than was initially estimated. The length of time between project identification, grant application, project design and construction can be years. Cost over-runs are also challenging when working with limited grant funding.
5. Project maintenance is a challenge. Grant funding only covers the cost of construction and is generally only available for a few years. Private landowners are uncomfortable signing maintenance agreements.
6. In cases where dam infrastructure is still intact, it is challenging to convince landowners to give up their pond. We hope as some of our large and publically visible projects are completed, landowners will be able to better understand what the finished project will look like and also feel confident that the project will succeed.
7. Many of the landowners worked with the SWCD to install these structures in the 1970s based on the science of the time, thinking they were improving water quality. There is some level of distrust now that we are asking them to remove the dams. Project success is essential to rebuild trust.
8. Even with theses challenges, removal of dams and restoration of steam habitat has led to positive changes in the Nemadji Watershed. An estimated reduction of over 2000 tons of sediment and ¼ mile of stream restoration will help delisting of some of the Nemadji's impaired waters.

## Acknowledgements

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