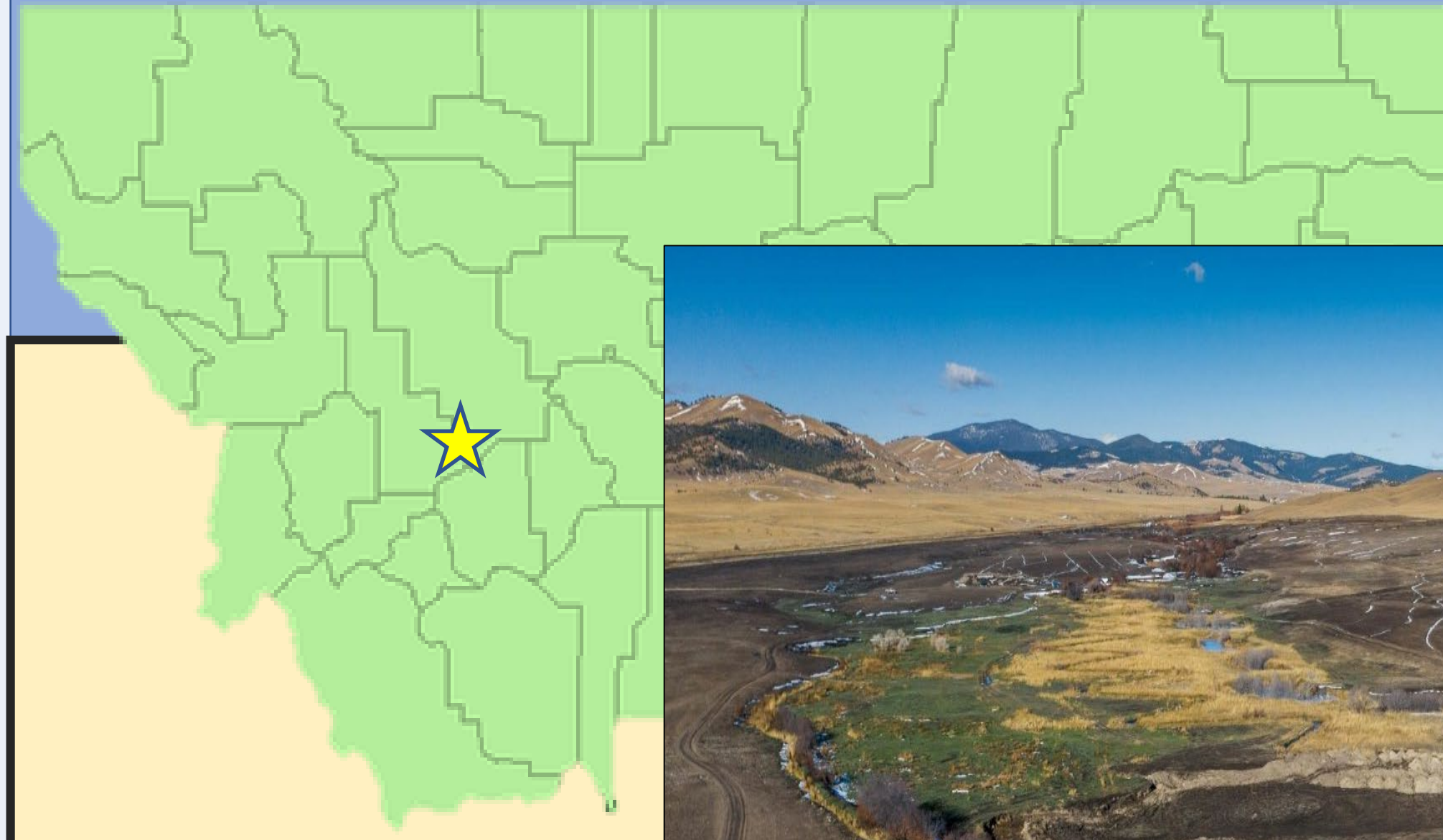


Stream Flow Analysis and Channel Stability on Recently Restored Sevenmile Creek - Comparison before and after restoration

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Study Area

Sevenmile Creek, located northwest of Helena, Montana. Above photo from Prickly Pear Land Trust after channel restoration in Reach 3 in 2018.

Introduction:

- Sevenmile Creek had a deeply incised stream channel and altered riparian zone due to historical agriculture influences.
- Prickly Pear Land Trust began restoration efforts on in the fall of 2017. Most dramatic alteration were restoring the lower two reaches (Reach 3 and 4) to the normal floodplain and filling the incised channels. Restoration work and revegetation efforts are ongoing

Research Objectives:

- Quantify changes in channel form and floodplain before, during and after restoration activity along Reach 4 of Sevenmile Creek.
- Establish a baseline for future monitoring and restoration efforts of Sevenmile creek.

Methods:

- Created a cross-sectional profile of the current channel and floodplain
- Measured flow and discharge rates of the stream along the transect
- Compared current streamflow and discharge and streambed cross section with data taken in Fall of 2021 and Spring of 2022
- Compared imagery from 2019, Fall of 2021, Spring of 2022

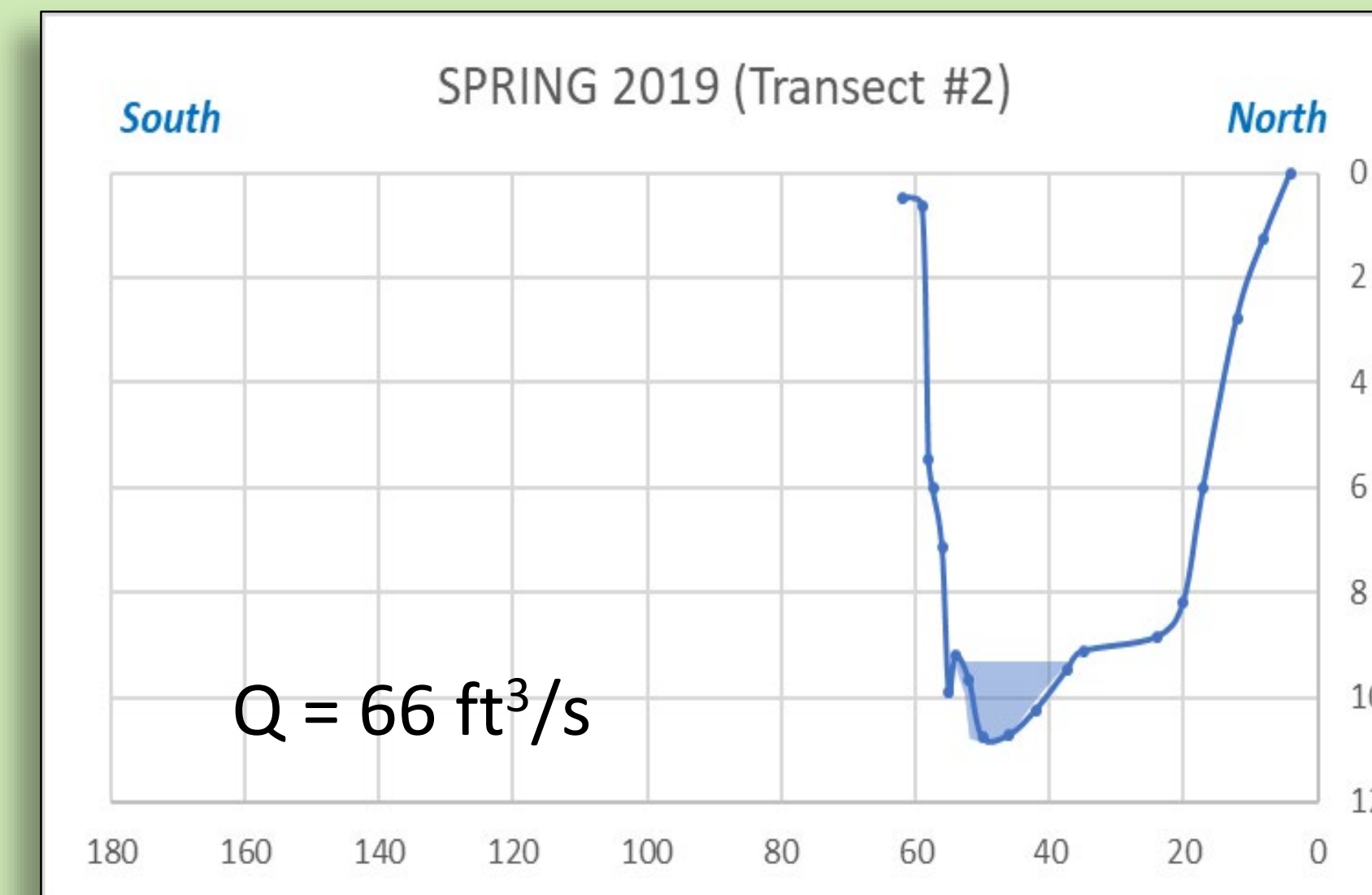


Figure 1. Deeply incised channel of Reach 4 Sevenmile Creek before restoration (Q=discharge)



Figure 2. Location of Reach 4 survey transect before restoration efforts

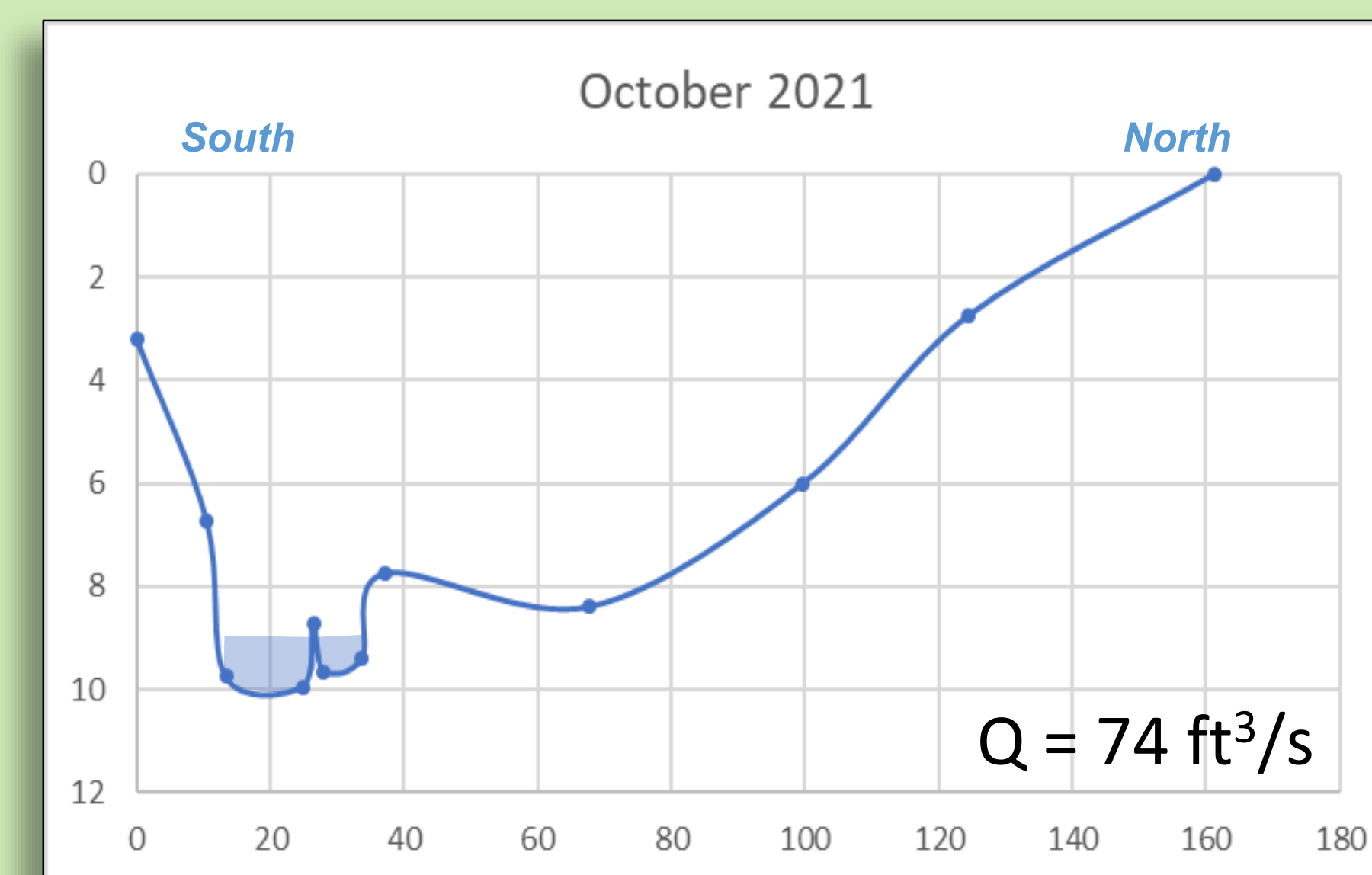


Figure 3. Sevenmile Creek channel profile after 2020 restoration, and after spring flooding in 2021 caused the channel to avulse and deepen (below).

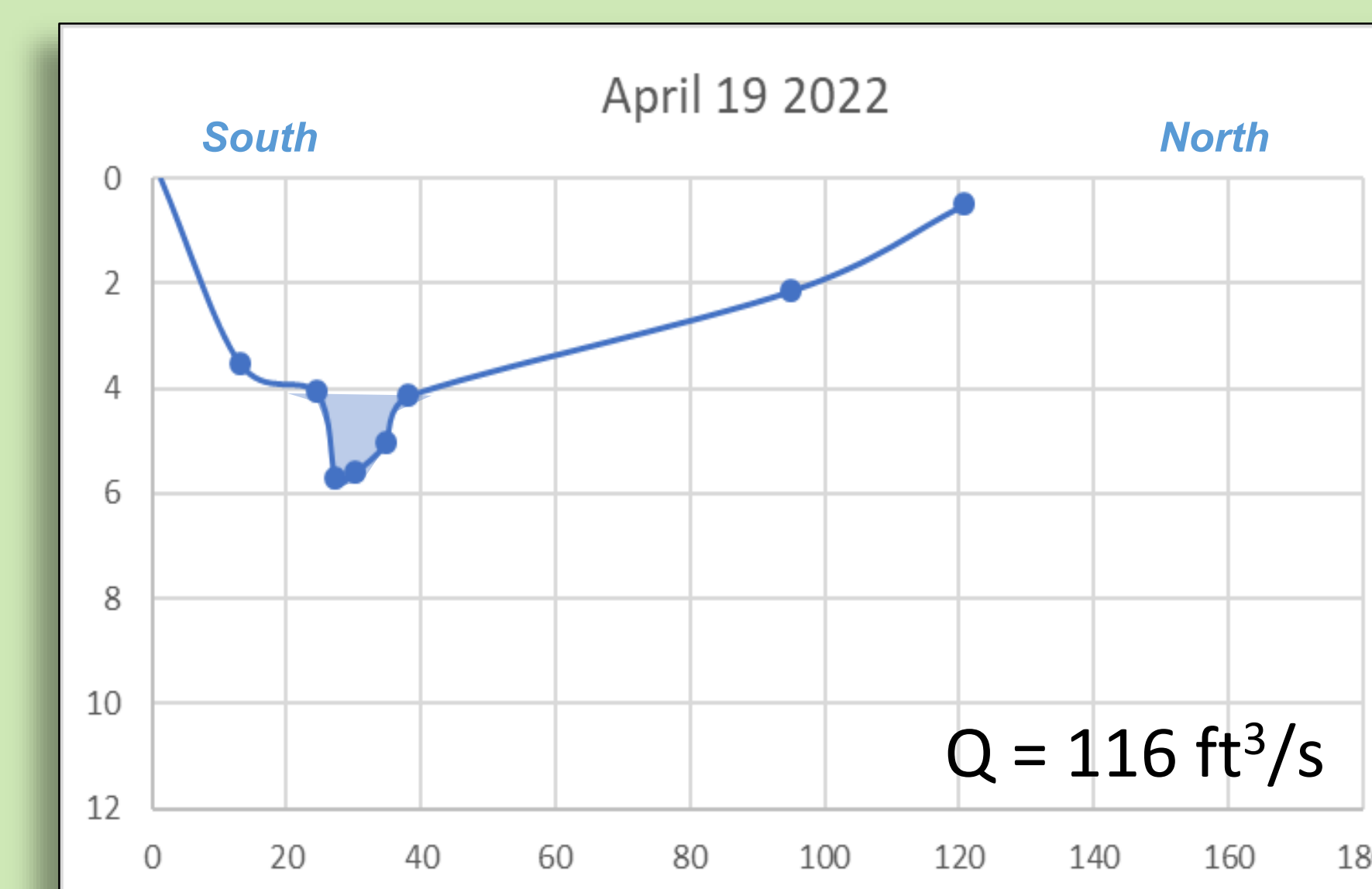


Figure 4. Stream channel profile after the restoration 'repair' and regrading work completed in spring 2022 (below).



Results:

- Sevenmile Creek has been returned to its natural floodplain in the lower reaches and the incised channels infilled or turned into ponds.
- The avulsed stream channel was regraded and has remained there so far.
- Although this project aimed to monitor spring flooding and channel changes in 2022, no floods have occurred yet.
- This study provides a baseline for the continued observation and longer term monitoring of the Sevenmile restoration efforts.



Acknowledgments

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