



1. Young brook trout. 2. Electrofishing for brook trout. 3. Anesthetizing caught brook trout and implanting tracking devices in their abdomens.

## Otter Creek Study



Historically (pre-logging era), fish habitat in Otter Creek was provided by wind thrown cedar, dead or dying trees, and beaver cuttings from aspen, maple and white birch. Subsequent to settlement and associated land use practices such as logging, marl extraction and agriculture, the channel of Otter Creek was drastically modified to serve as a sluiceway for the logging and sawmill operation that once supported the historic thriving town of Aral. Consequently, little argument exists that the abundance of instream large woody debris (LWD) was significantly higher than what is seen today. This major disturbance combined with the delicate nature of the marl soils, has had the most effect on the stream's ecological dynamics as Otter Creek has adjusted over the last hundred years.

### Unique Features of Otter Creek

- It is one of very few tributaries to Lake Michigan where naturally reproducing brook trout exist with direct access to the Lake.
- Anecdotal information suggests that members of this brook trout population move freely to and from Lake Michigan.
- Otter Creek brook trout thrive even though heavy runs of non-native Pacific salmonids ascend from Lake Michigan annually and typically outcompete brook trout in other stream systems.
- Dominance of soft substrates (marl, sand, muck) enhance the influence of LWD on pool formation important for brook trout survival and growth, while serving to preclude Pacific salmonid reproduction (salmon and steelhead require gravel for spawning habitat).
- Overall physical and biological features of this stream are uniquely favorable to brook trout, and contribute to restoring an extraordinary nearshore brook trout fishery with relatively minor habitat restoration efforts.

### Evaluation of Restoration Feasibility

The simplicity of restoring habitat inspired Grand Traverse Band's Fishery Biologists to take a closer look at this brook trout population and its habits.

- Otter Creek brook trout growth rates were nearly double the statewide average.
- Wide ranging movement patterns were observed suggesting that, in some years, fish leave and return to the system from Lake Michigan or other connected lakes.
- Instream temperature, while potentially limiting in extreme circumstances, is likely more of an influence on migratory patterns than mortality.
- The lack of instream LWD and low frequency of LWD inputs into the system were identified as key limiting factors to brook trout survival, abundance and behavior.
- Findings helped support the Otter Creek Bridge project and future plans to increase woody debris habitat in Otter Creek.

