

EIGHTEENMILE CREEK AREA OF CONCERN



2023 REPORT CARD



A COMPILATION OF SUCCESSSES, IMPROVEMENTS & CURRENT CONDITIONS



2023 AOC Newsletter Update

Progress has continued at Eighteenmile Creek Area of Concern (AOC) throughout 2023. In the past few years many studies have been completed to assess the status of each Beneficial Use Impairment (BUI). Last year we completed our final assessment for our BUIs that investigated the benthic macroinvertebrate community and sediment toxicity. All of the studies or assessments have been posted the Eighteenmile Creek AOC website at <http://eighteenmilerap.com/DATA.html>.

Benthos Final Report Summary

Last years report card reviewed the benthic macroinvertebrate criteria and why we needed assessments. This years report card is dedicated to reporting the results of our most recent benthic macroinvertebrate study led by the United States Geological Survey (USGS) (sampling occurred in 2019 and a final report was released in 2023). One of the goals of this project was to collect enough samples within the AOC to completely characterize the macroinvertebrate community and also have a reference site. Our most recent study had eight sites spread throughout the AOC (from Lake Ontario to Burt Dam). Oak Orchard Creek had six sites to use as a reference where no known legacy contaminants have been found (free of PCBs and heavy metals as an example). To fully assess the benthic macroinvertebrate removal criteria there were two parts of this study—community condition and sediment toxicity.

Community Condition:

Macroinvertebrate community condition is an important metric in determining stream health. One of the main ways NYS DEC and other organizations determine community health is through a Biological Assessment Profile (BAP) score. The BAP score takes ten different metrics and averages them into a health score. In general, a higher score is caused by a diverse macroinvertebrate community which is an indicator of good water and sediment quality. Eighteenmile Creek macroinvertebrate communities ranked in the middle tiers of slightly to moderately impacted. It's important to also notice the reference sites sampled at the same time that had similar community rankings. Sometimes BAP scores aren't just an indicator of pollution, but also may be impacted by other stressors such as poor habitat or seasonal eutrophication of the watershed. Even though these scores don't satisfy the AOCs first benthos BUI removal criteria mentioned later in this report card, it does satisfy our second criteria showing it's similar to a reference site.

Sediment Toxicity:

Toxicity testing in a nut shell is taking sediment from a stream and introducing known organisms (*Chironomus dilutus* and *Hyalella azteca*) to the sediments in a controlled environment to determine survivability and

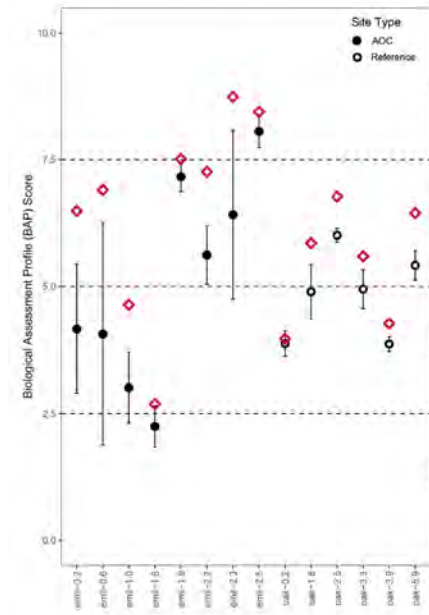


Figure 2. BAP scores for each site

growth of the organisms while being exposed to the sediment. Survivability and growth of each organism showed Eighteenmile Creek sediments are similar or superior when compared to the reference sites at Oak Orchard Creek. Surprisingly, a few sites at Oak Orchard Creek saw no survival and limited growth of a test organism. While three sites ranked poorly, other reference sites had relatively normal results compared to historical samples from similar areas in the creek.

What's next?:

Comparing these results to the current BUI removal criteria shows while we don't meet the first criteria (BAP scores ranking only in Nonimpacted or Slightly impacted), this study does support removal of the second and third criteria. The results of this study will be presented to the Remedial Advisory Committee (RAC) for the AOC to determine if removal of the Degradation of Benthos BUI is appropriate. If the RAC agrees, a BUI removal report will be created highlighting all relevant studies of the benthic macroinvertebrate community. A public outreach event will be held to receive any additional feedback from the local community prior to removal which may occur in 2025.

Degradation of Fish and Wildlife Populations BUI Removal Update

Removal of this BUI was partially delayed until a final report was complete for the benthic macroinvertebrate study. Niagara County SWCD and NYS DEC are drafting a removal report that will be ready for public view in 2024. In general, the final report highlights recent studies performed on Eighteenmile Creek that prove removal criteria are met. A public outreach event highlighting supporting studies can be expected in summer or fall 2024. Follow the Eighteenmile Creek AOC Facebook page for updates.

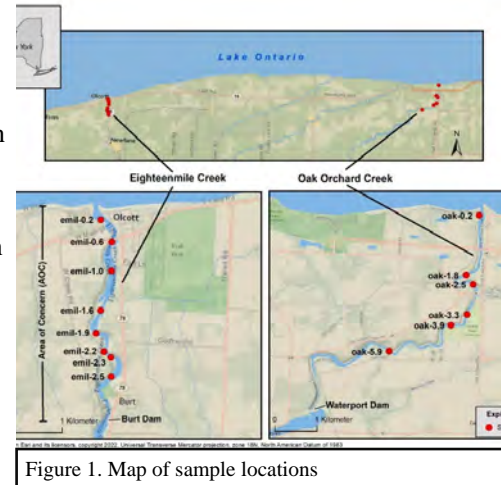


Figure 1. Map of sample locations

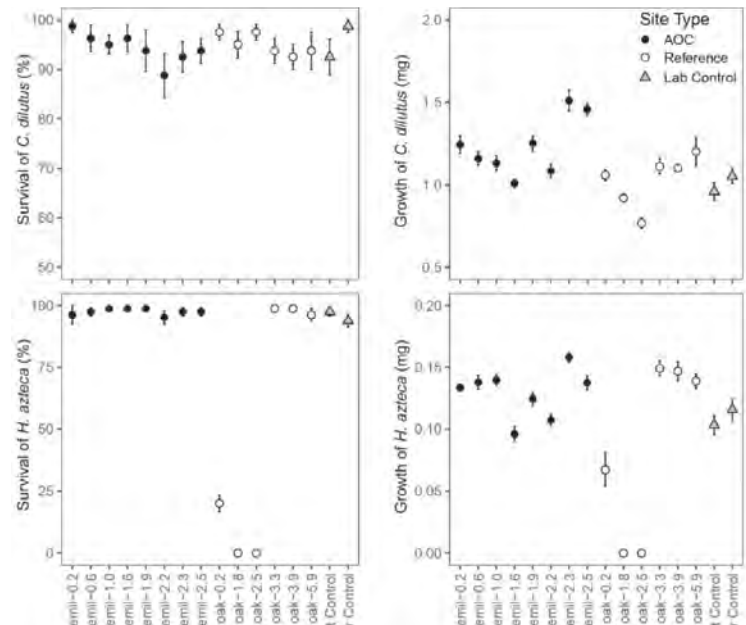
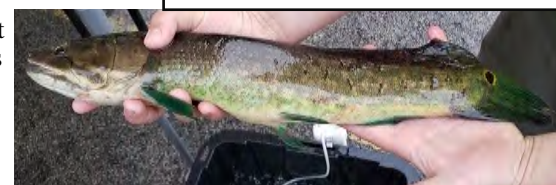


Figure 3. Toxicity test results for each site showing growth and survivability

Study Reference below and can be accessed using the URL or QR code:
 S.D. George, B.P. Baldigo, S.M. Collins, D.B. Clarke B.T. Duffy. 2023. Comprehensive assessment of macroinvertebrate community condition and sediment toxicity in the Eighteenmile Creek Area of Concern, New York, 2021. J. Great Lakes Research. In press.
<https://doi.org/10.1016/j.jglr.2023.08.004>



Below: Bowfin caught during a 2019 fish community assessment.



Where are we at with the BUIs?

It's easiest to discuss these as their own separate topics.

BUI 1. Restrictions on Fish and Wildlife Consumption	
Removal Criteria:	There are no AOC-specific fish and wildlife consumption advisories issued by New York State
Discussion:	In recent years migratory fish such as trout and salmon had their advisories to allow one meal per month. This is an improvement, but resident fish above and below Burt Dam continue to have elevated levels of PCBs. An AOC consumption advisory is expected to remain in place until remedial work is complete and there has been a declining trend of contaminant levels in fish. Knowing Superfund remedial work will take years to complete, this BUI is unlikely to be removed in the near future.
BUI 3. Degradation of Fish and Wildlife Populations	
Removal Criteria:	Fish community metrics (e.g., diversity, abundance, biomass, and condition) are similar to reference site(s); AND Benthic macroinvertebrate community composition is within the range expected and similar to reference site condition; AND PCB concentrations in fish tissue and other prey are below thresholds likely to result in acute toxicity to fish or piscivorous wildlife (birds and mammals).
Discussion:	The first part of this removal criteria was addressed in the fish community study by USGS in 2019. In general, there are no major differences in fish communities between Eighteenmile Creek and Oak Orchard Creek. Since the communities are similar, this part of the criteria is considered to be met. Benthic macroinvertebrate communities were addressed in reports from 2013, 2017 and 2023. Minor differences in macroinvertebrate communities were found between Eighteenmile Creek and Oak Orchard Creek. Results of recent studies have found benthic communities are at a minimum similar to reference site, supporting BUI removal. The third part of this criteria was addressed with the mink study from SUNY Brockport. SUNY Brockport modeled acute (lethal) toxicity to mink and determined no impairment. The RAC approved removal of this BUI, pending results of the USGS study that were released this year. With no impairment being found, a BUI removal report will be released in 2024. In addition, a public outreach event will also occur in 2024 to receive any public comments.
BUI 5. Bird or Animal Deformities/Reproductive Problems	
Removal Criteria:	PCB concentrations in fish tissue from comparable functional feeding groups are similar to reference site(s); OR PCB concentrations in fish and other prey are below tissue concentrations known to cause deformities or reproductive impairment in piscivorous wildlife.
Discussion:	It's well known that fish in the AOC have elevated levels of PCBs. Therefore, the first part of the BUI will not likely be met until after remediation is complete (see BUI 1 Discussion). The second criteria for deformities or reproductive impairment is also impaired based on the SUNY Brockport mink study.
BUI 6. Degradation of Benthos	
Removal Criteria:	Benthic macroinvertebrate communities are “non-impacted” or “slightly impacted” according to NYSDEC indices; OR Benthic macroinvertebrate community condition is similar to unimpacted control sites of comparable physical and chemical characteristics; AND Toxicity of sediment-associated contaminants is similar to unimpacted control sites of comparable physical and chemical characteristics.
Discussion:	The first criteria uses DEC guidelines as a measuring stick, which is a good starting point for assessment. Previous studies have shown that benthic macroinvertebrate at both Eighteenmile Creek and a suitable reference site are slightly to moderately impacted using DEC indices, requiring use of the second and third criteria for a chance at removal. Analysis of benthic macroinvertebrate community structure and sediment toxicity are generally similar between Eighteenmile and Oak Orchard Creek. As discussed earlier in this report card, this BUI will undergo review from the Remedial Advisory Committee and other technical experts to determine if BUI removal is appropriate. If removal is appropriate, a removal report will be written and presented at public outreach event.

WHAT IS THE EIGHTEENMILE CREEK AREA OF CONCERN (AOC) ?

Local, state and federal officials identified a section of Eighteenmile Creek as one of 42 “Areas of Concern” (AOC) in the Great Lakes Basin. Eighteenmile Creek received this designation because of poor water quality and contaminated sediments present throughout the watershed. Eighteenmile Creek’s long history of use by major industries in the area, especially near the City of Lockport and Town of Newfane, has played a large role in the present condition of the creek.

WHAT IS THE EIGHTEENMILE CREEK REMEDIAL ACTION PLAN (RAP) ?

A RAP is an integrated, whole ecosystem approach to remediating impaired water bodies. The RAP first identifies use impairments, their causes, and contaminant sources, using existing studies and data. Next, existing cleanup and regulatory programs which apply to the water body are identified. A coordinated cleanup strategy is then developed to eliminate the use impairments. The NYS Department of Environmental Conservation produced the Stage 1/2 RAP in 1997 in an effort to restore the integrity of the creek’s ecosystem. An update to the RAP was written in 2011 by Niagara County Soil and Water Conservation District.

WHAT IS THE EIGHTEENMILE CREEK REMEDIAL ADVISORY COMMITTEE (RAC) ?

The Eighteenmile Creek RAC is comprised of a group of local, state and federal stakeholders, representing industries, organizations and local communities with a vested interest in the health of Eighteenmile Creek. The RAC is responsible for implementing the RAP, monitoring restoration efforts, and assessing ongoing needs and conditions. After a brief hiatus, the RAC reconvened in 2005 and is currently making progress in moving the RAP forward.

If you have a vested interest in Eighteenmile Creek and want to help advance the RAP, contact our office and we would be happy to speak with you!

GREEN Outreach and Clean Sweep

Through the Global Rivers Environmental Education Network (GREEN) we’ve teamed up with our local General Motors plant in Lockport to explore the Eighteenmile Creek watershed. The program allows students from Lockport, Newfane, and Niagara BOCES to visit streams within the Eighteenmile Creek watershed and county to investigate water quality issues. Throughout the school year classes discuss solutions to the issues found on their fall field trips. The classes will implement a watershed improvement project in spring 2024. Recent projects completed this year include expanding a pollinator habitat and installing an invasive/nuisance species disposal bin in the Olcott Harbor. Be sure to look at these projects when visiting the area.

Our 2023 Clean Sweep event was successful thanks to Cub Scout and Boy Scout Pack #4. The team of 9 volunteers collected over 150 pounds of garbage at Fisherman’s Park!



FOR MORE INFORMATION
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