

A1. Title

**Quality Assurance Project Plan for the Gogebic Black River
Watershed Stream Monitoring**

Date: 8/22/23

Version #1

Organization: Gogebic Conservation District

QAPP Prepared by: Maxwell Ramsay

Title: District Manager

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SECTION A: PROGRAM DESCRIPTION AND QUALITY OBJECTIVES

A3. Distribution List

- Paul Steen, MiCorps, Huron River Watershed Council
- Beth Schrader, Environmental Officer, Lac Vieux Desert Band of Lake Superior Chippewa Indians
- Chenin Limback, Biology Instructor, Gogebic Community College
- Directors, Gogebic Conservation District Board

A4. Program Organization

1. Program Management Responsibilities:

Maxwell Ramsay, District Manager
Gogebic Conservation District
500 N Moore St.
Bessemer, MI 49938
(906) 663-4512
maxwell.ramsay@macd.org

Maxwell Ramsay is the Program Manager for oversight and management. The Program Manager's responsibilities include, but are not limited to:

- Develop and implement a Quality Assurance Project Plan (QAPP).
- Attending the MiCorps Conference.
- Promote volunteer stream monitoring activities and solicit volunteers and stream access permission from the local community.
- Research and purchase necessary equipment for performing stream monitoring activities.
- Coordinate and assist in volunteer stream monitoring training sessions.
- Coordinate and implement macroinvertebrate identification sessions.
- Implement database development, data entry, and data analysis.
- Develop reports for local governments, special interest groups, lake/stream associations as requested.
- Provide copies of all products and deliverables in both hard copy and electronic formats.
- Evaluate the project.
- Prepare and submit quarterly narrative reports and final reports.
- Track all program expenses and complete financial reports.
- Develop a release of claims statement at project completion.

2. Field Responsibilities:

Field sampling will be performed by trained volunteers. Collectors will receive training in field data collection methods by Stream Leaders. Stream leaders will either be volunteers or staff members of the Gogebic Conservation District who have received MiCorp training. Stream Teams will be organized to do insect sampling and stream habitat assessments at a minimum of six sites over a two-week period in both the spring and fall. Volunteer and Gogebic Conservation District staff roles include the following:

Stream Leaders: organize and coordinate efforts by the individual teams. Field activity will include completing data sheets and communicating with the collector to ensure complete and thorough biological sampling of each site. Leaders will provide ample instruction and guidance to team pickers. The Stream Leaders will also be responsible for returning all the equipment, biological samples, and data sheets to the District office.

Collectors: Collection must be thorough and vigorous. Habitat diversity must include all habitats that are present at the site. The sampling representativeness of the site is strived for using various MiCorps sampling methodologies.

Shuttler: Assists in transfer of collected macroinvertebrates from the net to the sorting trays for processing by pickers. Facilitates equipment to volunteers as needed.

Pickers: Picks the macroinvertebrate specimens from the sorting trays, specimens will be preserved in 70% ethanol for future identification.

Other: Assistance as needed.

3. Laboratory Responsibilities:

Macroinvertebrate collections will be sorted and identified at the Biology Lab at Gogebic Community College, or at the Gogebic Conservation District Offices. Maxwell Ramsay will identify samples to family. Chenin Limback, Biology instructor at Gogebic Community College will oversee and assist with the identification process. This includes spot checking samples identified by Maxwell Ramsay, answering identification questions, and identifying samples directly as time is available. Samples will be retained if further identification is needed.

4. Corrective Action:

Maxwell Ramsay, Program Manager, will be responsible for initiating, developing, implementing, and reporting any needed corrective actions with regards to data quality.

A5. Problem Definition/Background

The purpose of this program is to develop a long-term, volunteer water quality monitoring program in Gogebic County starting with the Black River watershed and expanding to other areas of concerns as needed. Performance of twice-yearly monitoring of key cold-water tributaries to the Black River and strategic locations on the main branch will supply more up-to-date information than current monitoring efforts by state or federal governments. Updated information will allow better-informed management decisions and contribute to supporting the health of one of Michigan's Wild and Scenic rivers. The Gogebic Conservation District (GCD) is also interested in monitoring some Lake Superior tributaries potentially impacted by the Copperwood mining project.

Low population density, forested landcover, and a lack of intensive agriculture make for generally good water quality in Gogebic County. While regulation of the timber industry has improved greatly since the 1900's lumber baron era, logging activity can still impact riparian land. Forested land is often managed for corporate timber harvest which requires heavy machinery and road building. Add to this a legacy of poorly designed river crossings and there is the potential for streams to be negatively impacted by sediment loading and decreased aquatic organism passage. This is especially true in small cold-water tributaries that serve as spawning and nursery habitat for Brook Trout. For streams that drain municipalities, increased impermeable surfaces and nutrient loading can decrease water quality. Climate change will increase both water temperatures and extreme storm events, which will amplify issues of cold-water habitat loss and sediment/nutrient loading in decades to come. With our monitoring efforts we hope to achieve a long-term dataset that can be used to assess negative impacts on streams and better direct management efforts. A volunteer monitoring program would also serve as a first line of defense against aquatic invasive species.

Gogebic County's water resources provide important recreational and sporting opportunities for area residents and visitors. This resource greatly enhances the quality of life of area residents and contributes economically to the area. For the Black River watershed to continue to provide ecosystem services at its current level, high water quality must be maintained. The Black and Montreal River watersheds contain the largest population centers, making them more vulnerable to degradation than other major watersheds in Gogebic County. We hope that a volunteer stream monitoring program will provide high quality data that can be used to detect problems early. We also hope to empower local citizens to act and raise awareness of issues facing their water resources.

Black River Watershed Description

Land surrounding the upper Black River is primarily second growth forest, with considerable tracts of land being designated as commercial forest land or owned by Gogebic County Forestry and Parks. In Michigan, working county forest is unique to Gogebic County and Gogebic County Forest land is managed heavily for timber production. Surrounding land ownership in the lower Black River is largely United States Forest Service and commercial forest land. There are many private landowners in both the middle/upper sections, and the river briefly flows through some residential areas in Bessemer Township. In addition to hardwood stands of second growth forest, there are large tracts of conifer swamp in the headwater area. After filtering through the decaying organic matter in these conifer swamps the water becomes darkly stained with tannins, giving the Black River its namesake coloration. The lower 14 miles of the Black River is a federally designated Wild and Scenic River with numerous waterfalls on its run to Lake Superior.

The distribution of ground water inputs to the Black River is the result of the underlying glacial geology of the area. Tributaries whose flow contains a large proportion of ground water are cold enough through the warm summer months to provide thermal refugia for cold water species and are areas where natural

reproduction of Brook Trout occurs. The maximum summer water temperature of the Black River's main channel is too warm to be suitable year-round trout habitat. Brook Trout represents a flagship species due to its popularity with anglers, iconic appearance, and cultural importance. In our volunteer monitoring program, we will prioritize cold water tributaries that support trout and have a high potential to be negatively impacted by human activity.

A6. Program Description:

Throughout the Gogebic Conservation District's 60-year history our goal has been to help local citizens manage their lands and preserve our environment. The goal of this volunteer-based water monitoring program is to increase the ability of GCD to make better informed management decisions concerning water quality and cold-water fisheries. We also want to educate and raise awareness of these issues in the community.

We have also partnered with the Lac Vieux Desert Band of Lake Superior Chippewa (LVD), who will lend their expertise of macroinvertebrate surveys to our efforts. This partnership will help ensure that we are meeting the highest professional standards in our sampling efforts. Beth Schrader, Environmental Officer for LVD, has experience in performing macroinvertebrate surveys and identification.

Gogebic Community College (GCC) has also offered its commitment as a partner organization in support of our efforts to obtain and help implement this grant. They have generously offered lab space, microscope use, and staff volunteer time. Chenin Limback, Biology Instructor at GCC, has committed some of her time directly to help with sampling efforts and is willing to lend her expertise in entomology to help with insect identification.

In addition to our currently existing partners, we also continue to seek out consultants and advisors from beneficial organizations, such as the US Forest Service and Michigan DNR to further ensure we will be putting our sampling efforts in the best possible areas.

All current and future volunteers are/will be trained in MiCorps Stream Habitat Assessment protocol and macroinvertebrate sampling protocol, by either, members of GCD staff who have had MiCorp training, or volunteers who have had proper MiCorp training. We will promote volunteer opportunities through social media and other promotional materials distributed throughout the community.

Procedures and Data Use

The Gogebic Conservation District will host twice a yearly Stream Macroinvertebrate Sampling and yearly Stream Habitat Assessments throughout the Black River Watershed. These activities will be done in accordance with standard MiCorp protocols and procedures. The timing of spring and fall sampling events will be chosen to maximize the chances of event success. This document outlines and describes these procedures and the roles of those responsible for undertaking this work. Identification of insects will be done directly by qualified persons or by volunteers under the direct supervision qualified persons. Data that is gathered will be uploaded directly to the MiCorp database and physical copies of datasheets and insect

samples will be archived at GCD's offices. Summary of data collected through this program will be distributed to the public through a once yearly newsletter.

We expect that monitoring data can be used to detect and track changes in water quality rating over time. This information can be used to help determine where to focus investigations and help determine the efficacy of management interventions. GCD will remain committed to supplying high quality data to inform the public and resource managers. GCD will continue to recruit volunteers and grow the program so that more sites can be monitored throughout Gogebic County.

Top priority sites include cold water tributaries that have natural brook trout reproduction; sites that may be impacted by impoundments, and areas near municipal sewage treatment facilities.

Sustainability

We will continue our monitoring activities by performing twice a yearly macroinvertebrate sampling of a minimum of six sites within the Black River Watershed using only MiCorp approved procedures that have been defined in our QAPP. We will continue to recruit fresh volunteers from the community and seek additional funding from MiCorp maintenance grants and other grant sources to continue our efforts. In the long term our District will create an approved watershed management plan and apply for 319 funding.

The Gogebic Conservation District would also serve as a Gogebic County contact point and clearinghouse for information for developing ongoing watershed stewardship practices; further developing aquatic conservation initiatives; and improved overall riparian and watershed health.

A7. Data Quality Objectives:

Precision/Accuracy:

Stream Leaders will be trained in MiCorps standardized protocol and procedures in order to gauge stream health by measuring the diversity and abundance of macroinvertebrate taxa. This protocol includes a thorough and vigorous collecting style; documenting all present habitat diversity at each monitoring site; and a thorough and complete transfer of collected macroinvertebrates from the dipping net to the sample jars. Stream Leaders are retrained in methodology every three years. Stream Leaders and/or Project Manager will accompany teams to observe collection techniques and note any deviation from standard protocols. Sampling techniques will be reviewed during volunteer training.

Since there is inherent variability in accessing the less common taxa in any stream site and program resources do not allow program managers to perform independent (duplicate) collections of the sampling sites, our goal for quality assurance is conservative. A given site's Water Quality Rating (WQR) score or total diversity (D) measure across macroinvertebrate taxa will be noted as "preliminary" until three spring sampling events and three fall sampling events have been completed. At least two of these six measures will be collected by different volunteer teams. The resulting measures of D and WQR for each site will be compared to the composite (median)

results and each should be within 40% of the site's long-term median. Sample results that exceed those standards should then be noted as "outliers" and examined to determine the cause of variation. If a sampling error is determined, the data point will be removed from the data record. Volunteer teams that generate more than one "outlier" will be observed by the program manager at the next sampling event for consideration of retraining.

Only those with laboratory responsibilities as designated in the QAPP will make the final sample identifications.

Bias: Procedures will be adhered to in order to detect any bias in the sampling teams. Different Stream Leaders/Teams will sample sites (minimum of once every three years in each season) for any bias in individual collection styles. The new measure should be within 40% of the median of past measures. Sites not meeting this Data Quality Objective (DQO) will be evaluated by the Program Manager.

Completeness: Following a QA review of all collected and analyzed data, data completeness will be assessed by dividing the number of measurements judged valid by the number of total measurements performed. The data quality objective for completeness for each parameter for each sampling event is 90%. If the program does not meet this standard, the Program Manager will consult with MiCorps staff to determine the main causes of data invalidation and develop a course of action to improve the completeness of future sampling events.

Representativeness: Selected monitoring sites reflect the full variety of stream habitat types locally with riffle habitat emphasized. Monitoring sites will be sampled and documented to ensure a thorough and complete sampling of all the organisms inhabiting the available habitats. Resulting data will be used to represent the ecological conditions of the contributing sub watersheds. Initially monitoring will be only on a minimum of six high priority sites specified in section B1 of the QAPP. Additional sites will be added as resources and volunteers permit.

Comparability: Volunteers will be trained in sampling, site selection, and reporting methods to guarantee data comparability. Using the standard MiCorps monitoring methods given at training sessions by MiCorps staff, volunteer Stream Leaders and Project Manager will oversee that the volunteers follow those methods explicitly for program comparability. To the fullest possible extent, sampling on the sites will be completed within a two-week window each spring and fall.

If a site is temporarily inaccessible, such as due to prolonged high water, the monitoring time may be extended for two additional weeks. If the issue concerning inaccessibility is continued beyond the extended dates, then no monitoring data will be collected during that time and there will be a gap in the data. If a team is unable to monitor their site during the specified time, the Team Leader will contact the Program Manager as soon as possible and no later than the end of the first week in the sampling window in order for the Manager to arrange for another team to complete the monitoring." If no team is available, the Program Manager will, if feasible, sample the

site. Otherwise, the site will go unmonitored for that season.

A8. Special Training/Certifications:

All volunteers will be properly trained. An onsite training session will occur before each monitoring event. The Program Manager will maintain a database of all trained volunteers with the date and success of their training. Onsite training will include (but is not limited to) the following topics:

- Goals of monitoring program
- Potential uses for the data
- Safety protocol
- Description and proper use of the equipment
- Explanation of MiCorps field data sheets
- Onsite data collection methods
- Stream habitat characteristics and assessment
- Sorting and identification of benthic macroinvertebrates
- Quality assurance practices and procedures
- Decontamination practices

The Program Manager also had a side-by-side field training session with a MiCorps staff/representative prior to the first monitoring event. This training occurred on September 15, 2023, where Dr. Paul Steen saw and approved the monitoring techniques used by GCD.

SECTION B: PROGRAM DESIGN AND PROCEDURES

B1. Study Design & Methods

Frequency: Macroinvertebrate communities will be sampled annually in the spring and fall for the first three years, after which the sites will be monitored at a frequency between one and three years. Sites will be sampled during the same time frame each year to minimize seasonal variability in macroinvertebrate distribution or abundance. Sites will be monitored more frequently if a population appears to be changing. The project is intended to continue indefinitely. New sites will be added as resources and volunteers dictate or as problems are detected.

As much as possible, sampling will need to be done within the same two-week period. When a site is temporarily inaccessible, monitoring time may be extended an additional two weeks. If conditions persist that make monitoring unfeasible, no monitoring data will be collected for that period and there will be a gap in the data. The Stream Leader will keep the Program Manager advised accordingly, preferably no later than the end of the first week in the sampling window in order for the Program Manager to arrange for another team to complete the monitoring. If no team is available, the Program Manager will be responsible to see that the site is monitored.

Locations:

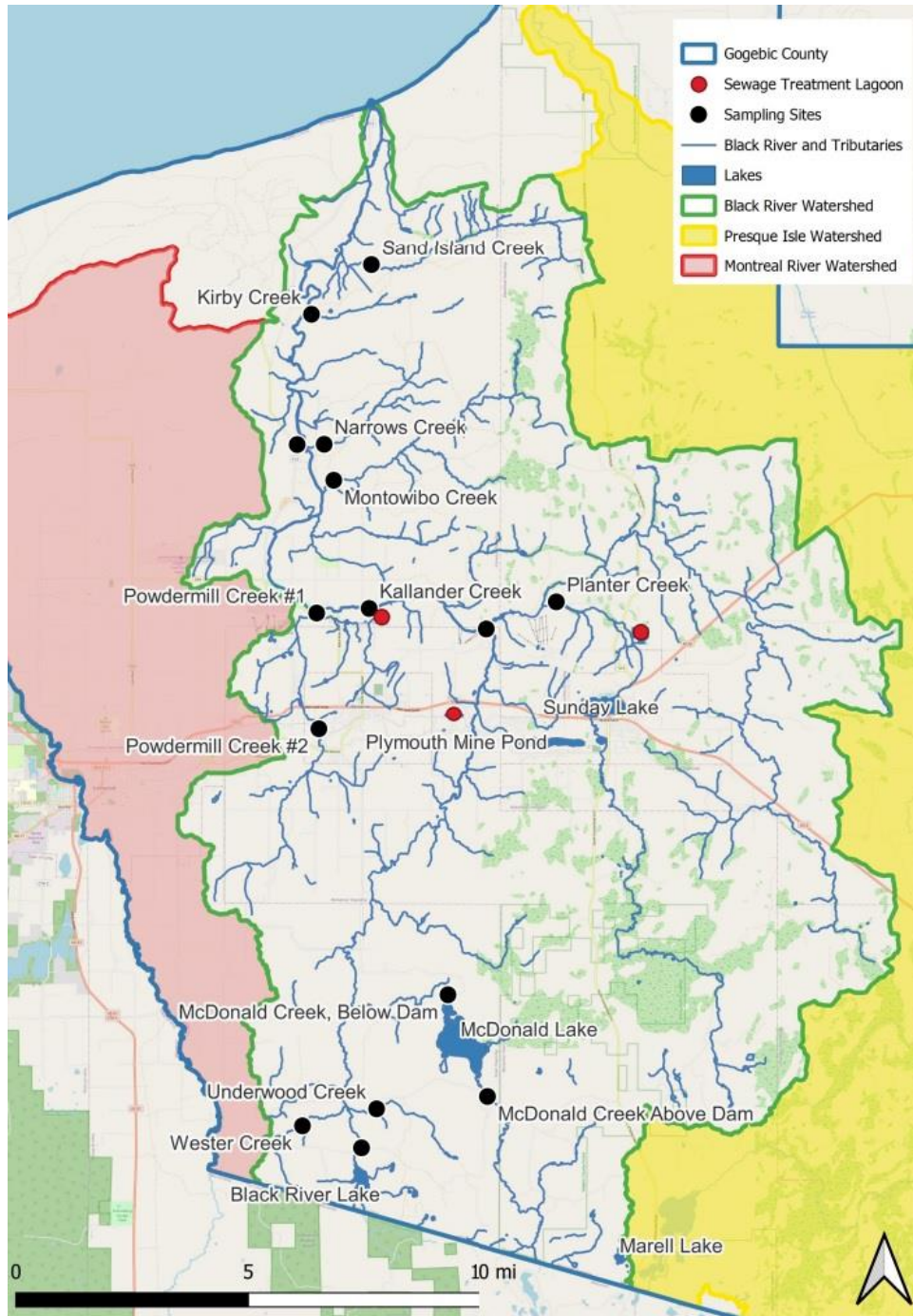


Figure 1. Map of Black River Watershed and tributaries.

Site Descriptions:

High Priority Sites with Accessibility

MiCorp ID: **GCD-1**

Kirby Creek: (46.603507, -90.077474) Small cold-water tributary with a mostly gravel and sand bottom. Mostly shallow with plunge pools created by large woody debris. Surrounded by mature Hemlock forest, nearly full canopy coverage. The mouth is easily accessible and on public land. Park at (46.604333, -90.085005) and follow the trail to the river. Kirby Creek mouth is directly across.

MiCorp ID: **GCD-2**

Reed Creek: (46.571425, -90.086907) Small cold-water creek, sand/gravel bottom, with darkly tannic water. Surrounded by second growth forest with near complete canopy coverage. County gravel pit is close to portions of the creek. Other pits are also close to the headwaters of the creek. Start sampling at edge of county property and head upstream 300ft.

MiCorp ID: **GCD-3**

Narrows Creek: (46.561315, -90.078464) A small cold-water creek with a gravel/cobble bottom. Large woody debris present. Full canopy coverage. Access site by walking along riverbank and crossing to east side of river. Land surrounding the mouth of creek is privately owned, so be sure to stay in creek channel to avoid trespassing. Use a small gravel island in the river near the creek mouth to set up a picking station.

MiCorp ID: **GCD-4**

Black River at Narrows Park: (46.561802, -90.081697) A small rapids with a boulder/cobble bottom. Deep, but still wadable. Easy access for volunteers and close to Narrows Creek.

MiCorp ID: **GCD-5**

McDonald Creek Below Dam: (46.390789, -90.014415) Located at McDonald Dam County park. The substrate is gravel cobble and boulder. McDonald Creek is wide so there is not much canopy coverage.

MiCorp ID: **GCD-6**

McDonald Creek Above Dam: (46.360082, -89.995501) site located on Mosinee Grade (north and south) of McDonald's Creek Bridge; characterized by rapids upstream. Rapids downstream changing to slow moving. Substrate upstream – medium size boulders. Rapids. Downstream has large to medium rock, boulders. Intermittent gravel (medium sized) changes to slow with mud bottom.

MiCorp ID: **GCD-7**

Planter Creek: (46.514229, -89.964086) Planter Creek is accessible via Planter Rd. Planter Rd is no longer maintained and is very rough but is still drivable if care is

taken. Planter Creek is also an outlet of Sunday Lake. Cobble/ gravel bottom.

MiCorp ID: **GCD-8**

Powdermill Creek: (46.473756, -90.071865) Iron Belle Bridge crossing. Start at bridge and sample upstream from bridge. Very brushy. Cobble substrate. Powdermill Creek is the largest cold-water tributary to the Black River.

MiCorp ID: **GCD-9**

Underwood Creek: (46.355437, -90.051986) Small forested creek. Cobble and gravel substrate. Purported to have held trout although current status is unknown.

MiCorp ID: **GCD-10**

Wester Creek: (46.354028, -90.064404) site is upstream (west) from its mouth into Black River, approximately 400 yards (max) south from Black River Bridge on Mosinee Grade Rd.

MiCorp ID: **GCD-11**

Black River at Blackjack Bridge: (46.505024, -89.996208) Site is directly upstream from Blackjack Rd bridge crossing. Boulder and cobble substrate. Swift current. Rocks are very slippery here. Would be difficult to sample in high flow conditions.

Additional sites if time and logistics allow.

MiCorp ID: **GCD-12**

Black River Lake Dam: (46.339711, -90.055560) Site location is south of Black River Bridge on Underwood Grade. Approximately 3-3.5 miles east of south end of South Davis Road. Site characterized by small rapids. (south of dam – ripples, etc. – medium to sharp banks; med/small rocks; gravel to sand going north. Substrate gravel and rocks as above but north is mud bottom. Slow and meandering stream.

MiCorp ID: **GCD-13**

Devils Creek: (46.421051, -90.047469) Heavily impounded by numerous beaver dams. Not much is known about this creek. One of the larger tributaries of the Upper Black River. More information on this tributary would fill in a gap in knowledge. Rumored to have once been a good trout stream, current status unknown.

MiCorp ID: **GCD-14**

Jackson Creek: (46.515489, -89.880786) Possible sampling site is located on the south side of M-28 bridge east of Wakefield. Shallow to medium depth. North of bridge site is characterized by slow to med/fast water. Wider; moderate amount of sand in pockets. Upstream somewhat slower. Banks are sloping and gradual to sharp cuts. The substrate is small gravel and sand. Medium to small rapids with boulders and large rocks.

MiCorp ID: **GCD-15**

Kallander Creek: (46.495759, -90.050809) This creek flows through residential areas in the City of Bessemer. Gravel and Cobble bottom. Access is dependent on

permission from landowners.

MiCorp ID: GCD-16

Montowibo Creek: (46.551603, -90.064531) Small cold-water creek. Known to hold trout. Creek mouth is difficult to access on foot. However, access is potentially possible on Forest Rd 484. This is potentially hazardous if logging activity is heavy in the area.

MiCorp ID: GCD-17

Sand Island Creek: (46.617172, -90.058392) Small cold-water creek, supports trout. Creek mouth is surrounded by dense alder shrubs, sandy/gravel bottom, and low gradient. Gradient increases further up and bottom type changes to cobble/gravel. Here second growth forest dominates although alders are still present. Accessibility is difficult. Camp 6 Rd is one possibility but is rough and is utilized by logging operations. Hiking to the creek mouth is another option but is arduous for a group of volunteers.

MiCorp ID: GCD-18

Sapsucker Creek: (46.540359, -90.072014) Small cold-water creek, supports trout. Creek mouth is on public land, but no road or trail leads to this site making accessibility a major issue.

Final note on sites: The above list of sites is by no means comprehensive. There are many other tributaries to the main branch of the Black River and tributaries to sub watersheds of the Black River that may have value for the sampling program's objective. It is important to continuously expand the knowledge of these potential sites through scouting and seeking those with local knowledge.

Methodology:

Sampling the benthic community: The standard MiCorps methodology will be used, linked in Section D. The following summarizes this approach.

Multiple collections will be taken from each habitat type present at the site, including riffle, rocks or other large objects, leaf packs, submerged vegetation or roots, and depositional areas, while wading and using a D-frame kick net. The trained collector will transfer the material from the net into buckets held by the shuttler. This material will be transferred to white pans for picking. The remaining volunteers (pickers) will pick out samples of all different types of macro-invertebrates from the pans and place them into jars of 70% ethyl alcohol for later identification.

During the collection, the collector will provide information to the team streamside leader in response to questions on the data sheet that review all habitats to be sampled, the state of the creek, and any changes in methodology or unusual observations. Data is summarized using the MiCorps Water Quality Rating (WQR) located on the macroinvertebrate data sheet. The streamside leader will instruct and assist other team

members in detecting and collecting macroinvertebrates in the sorting pans, including looking under bark and inside of constructions made of sticks or other substrates.

Potential sources of variability such as weather/stream flow differences, season, and site characteristic differences will be noted for each event and discussed in study results. There are places on the data sheet to record unusual procedures or accidents, such as losing part of the collection by spilling. Any variations in procedure should be explained in the data sheet. Potential resource/time constraints: The timing of the event (taking unpredictable weather into consideration) can affect the availability of volunteers. It may be difficult to find an “ideal” sampling date in our two-week window.

At the collecting site, all invertebrate sample jars receive a label written in pencil, stating date, location, name of collector, and number of jars containing the collection from this site. The data sheet also states the number of jars containing the collection from this site. The collection jars will be pre-labeled. The volunteer team leader is responsible for returning all jars and all equipment to the project manager at the Gogebic Conservation District Office upon return from the collection site. The collections are checked for labels, the data sheets are checked for completeness and for correct information on the number of jars containing the collection from the site, and the jars are secured together with a rubber band and site label and placed together in one box.

Decontamination Procedures.

- a. Conduct a visual inspection of gear before any sampling; thoroughly inspect and remove all plants, dirt and mud, and any other visible debris like seeds, shoots, animals, insects, and eggs from clothing and equipment.
- b. If going to another site on the same sampling day, disinfect with dilute bleach and allow to sit for 10 minutes before rinsing with tap water and towel dry all equipment before leaving the site.
- c. After sampling is done for the day, inspect, clean, towel dry and air dry before using gear again.
- d. If necessary, Team Leaders should use high pressure hot washes to clean monitoring equipment if areas are known to be infected by invasive species.
- e. Be on the lookout for New Zealand mud snails.
- f. Additional details can be found in the MiCorps Volunteer Monitoring Invasive Species Prevention Kit Use Guide: <https://www.hrwc.org/volunteer/decontaminate/>

Specimen ID: Counting and identification will occur as those designated in section A4-3 with laboratory responsibilities have time. However, this must occur within a reasonable amount of time from the sampling date. At the time of identifying the sample, the sample identifier checks the data sheet and jars to ensure that all the jars, and only the jars, from that collection are present prior to emptying them into a white pan for sorting. If any specimens are separated from the pan during identification, a site label accompanies them. Other volunteers may participate/contribute to ID events by sorting all individuals from a single jar into look-alike groups. Designated persons

can then do final ID of specimens.

When identification of a sample is complete, the entire collection is placed in a single jar of fresh alcohol with a poly-seal cap and a printed label inside the jar and stored in a designated storage area. The alcohol is carefully changed (to avoid losing small specimens) in the jars every few years. Samples will be stored in a cool, dry, closed cabinet at room temperature.

Equipment Quality Control

- Check to make sure equipment is in working order and not damaged.
- Clean equipment before and after taking it into the field.
- Maintain inventory of equipment.

Habitat Analysis

GCD staff will conduct a stream habitat analysis during every Fall macroinvertebrate sampling event following the MiCorps procedures in Section D. Currently, Max Ramsay will lead volunteers through the habitat analysis personally. As the program grows, this will be reevaluated, as necessary.

B2. Instrument/Equipment Testing, Inspection, and Maintenance

Monitoring supplies and equipment will be stored at the Gogebic Conservation District building at 500 N. Moore Street, Bessemer, MI. Equipment quality control measures include, but are not limited to, the following:

1. D-Frame nets will be inspected regularly for damage or holes. Replaced if necessary.
2. All equipment must be cleaned, dried, and stored securely after each sampling event.
3. Batteries on any equipment will be checked and replaced, as necessary.

B3. Inspection/Acceptance for Supplies and Consumables

The following is a list of supplies and consumables:

- Monitoring procedures and field data sheets
- D-Frame collection nets (mesh size: 20X24 mesh/inch)
- Sorting trays
- Forceps
- Squirt bottles and/or eye droppers
- Preservative (70% ethanol)
- Jars/Lids
- Measuring tape
- Yardsticks
- Clipboards
- Pencils
- Waders

- Map
- Camera

Other equipment may include GPS unit, communication plan, insect repellent, first aid kit, sunscreen, bottled water, string, and stakes. Upon retrieval, volunteers will inspect the equipment for holes or damage. Any damaged or misused equipment will be noted to the Program Leader and replaced, as necessary.

B4. Non-direct Measurements

Not applicable.

B5. Data Management

Data sheets along with collected specimens will be returned to the Program Manager after each monitoring event. Raw data will be entered and managed in Microsoft Excel spreadsheets. All data will be backed up and stored offsite in a secure location. Electronic data will be entered into the online MiCorps database by the Program Manager or another trained volunteer and stored and updated annually on the MiCorps database exchange system. Copies of data sheets will be retained along with sample jars at the Gogebic Conservation District office for a period of at least five years.

Data Management Quality Control:

- Upon receiving data from volunteers, the Program Manager will review field records to minimize errors before entering it into the MiCorps database.
- Data entered into the computer will be reviewed by comparing hard copy printouts with field data sheets.
- Data analysis methods will be reviewed on a five-year basis.

SECTION C: SYSTEM ASSESSMENT, CORRECTION AND REPORTING

C1. System Audits and Response Actions

A performance and system audit will be conducted following each spring and fall monitoring event to evaluate the capability and performance of the program. A systems audit will evaluate the process of the program including on-site reviews of field sites and facilities where data is processed and analyzed. A performance audit will be used to evaluate how well volunteers are doing their responsibilities of collecting and analyzing the data. The Stream Leaders (trained by MiCorps) will ensure that quality assurance protocols are being followed and report any issues possibly affecting data quality.

Data sheets will incorporate essential QAPP procedures. If deviation from the QAPP is noted at any point in the sampling or data management process, the affected samples may be deleted from the data set. Re-sampling will be conducted if warranted and feasible, given that the deviation is noted soon after the occurrence and volunteers are available. Otherwise, a gap may be left in the monitoring record. All corrective actions, such as above, will be documented and communicated to MiCorps.

C2. Data Review, Verification, and Validation

After each sampling/ID event, a review and verification of the data will occur. During that time, the Project Manager will review the hard copies of the sampling forms to make sure each is filled out correctly. Following that, the corresponding data entered into the database will be checked against its respective hard copy of the form. Upon that review the WQR will be evaluated to determine its similarity to previous samples from the same site and/or same water body. If a sample is found to be outside of the accepted two standard deviations around the median from previous samples, the site will be re-sampled to verify or discard such unusual results, which could be the result of less-than-thorough sampling. Any abnormalities to the process set forth in this QAPP will be immediately communicated to MiCorps staff. In addition to that notification, all processes and events surrounding the volunteer monitoring efforts of this project will be reported regularly to MiCorps by the Project Manager based on the reporting frequency and requirements set forth in the MiCorps contract.

C3. Reconciliation with Data Quality Objectives

Data quality objectives will be reviewed after each monitoring event to ensure that objectives are being met. Deviations from the data quality objectives will be reported to the Program Manager and MiCorps for assessment and corrective action. Also, data quality issues will be recorded as a separate item in the database and provided to program leaders and data users. Response to and reconciliation of problems that occur in data quality are outlined in Section A7.

C4. Reporting

Throughout the duration of this stream monitoring MiCorps program, quality control reports will be included with the quarterly project reports that are submitted. After, quality control reports will be generated as quality control issues occur and shared with program volunteers and MiCorps staff. Quality control reports will provide information regarding problems or issues arising in quality control of the program. These could include but are too limited to deviation from quality control methods, identification, data input, diversity calculations and analyses. Program staff will generate yearly reports sharing results of the program with volunteers, special interest groups, local municipalities, and stakeholders. Data and reports will be made available upon request to the Gogebic Conservation District.

SECTION D: LINKS TO PROCEDURES

Macroinvertebrate and Habitat Stream Monitoring Procedures

<https://micorps.net/wp-content/uploads/2021/01/VSMP-MonitoringProcedures.pdf>

Stream Habitat Datasheet

[MiCorps_Habitat_2020.pdf](#)

Guide to Entering Data on the MiCorps website.

<https://micorps.net/wp-content/uploads/2022/12/How-to-Enter-Stream-data-2022.pdf>

Stream Equipment List/ Stream Macroinvertebrate Bibliography

<https://micorps.net/wp-content/uploads/2023/05/VSMP-monitoring-equip-1.docx>

Macroinvertebrate Datasheet – Family Level

<https://micorps.net/wp-content/uploads/2021/07/VSMP-Macro-FamilyLevel-Datasheet-2020.pdf>