Fish Creek Phase 4 Hydrologic Modification Project

Bayfield County, Wisconsin

Quality Assurance Project Plan (QAPP)

NOAA Grant Funding Source: Great Lakes Restoration Initiative

Grant #: NA25NMF463C0069

Burke Center for Ecosystem Research
Matt Hudson
Associate Director- Great Lakes

Burke Center
FOR ECOSYSTEM RESEARCH

SECTION 1: BACKGROUND/OVERVIEW

Title and Approval Sheet

Fish Creek Phase 4 Hydrologic Modification Project

Burke Center for Ecosystem Research
P.O. Box 6
Ashland, WI 54806
mhudson@burkectr.org

Award Number: NA25NMF463C0069

Effective Date: Oct 21, 2026

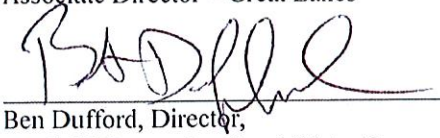
Approval:	**Date:**
Matt Hudson Matt Hudson, Burke Center for Ecosystem Research, Associate Director – Great Lakes	10/21/2026
 Ben Dufford, Director, Bayfield County Land and Water Conservation Department	10/22/26
Paul Piszczek Paul Piszczek, Fisheries Biologist, Wisconsin DNR	10/22/2026
Jeff Tyson Jeff Tyson, GLFC Fisheries Management Project Manager	10/21/2026
HEATLIE.TERRY.SCOTT.1230473559 Digitally signed by HEATLIE.TERRY.SCOTT.1230473559 Date: 2026.10.22 14:44:35 -04'00' Terry Heatlie, NOAA Technical Monitor	

Table of Contents

Section 1: Background/Overview 2
Title and Approval Sheet 2
Table of Contents 3
Distribution List 4
Project/Task Organization 4
Problem Definition/Background 5
Project/Task Description 8
Data Collection 8
Personnel 9
Equipment 9
Work Schedule 10
Maps 11

Section 2: Data Collection & Quality Standards 11
Field Data Collection Requirements 11
Sampling Frequency and Schedule 12
Sampling Methods 12
Engineering Surveys 12
Fishery Surveys 13
Photographic Monitoring 13
Quality Objectives & Criteria for Measurement Data 14
Instrument/Equipment Testing, Inspection, Calibration, & Maintenance 16

Section 3: Data Management & Reporting 16
Data Handling/Storage 16
Data Review, Validation, & Verification 17
Validation and Verification Methods 17
Reconciliation with User Requirements 18
Documentation & Records 18

References 18

Appendix A: Approved Tier 1 Monitoring Plan & Data Management Plan 19

Appendix B: Project Site Map 20

Appendix C: Standard Operating Procedures for WDNR and Burke Center Electrofishing Surveys 24

Appendix D: Wisconsin DNR Wadable Stream Fish Assessment Data Sheet 28

Distribution List

The following individuals and their organizations will receive copies of this approved QAPP and any revisions. This includes people responsible for implementation.

Name	Organization	Telephone Number Email
Terry Heatlie	NOAA – Technical Monitor	(734) 741-2211 terry.heatlie@noaa.gov
Matt Hudson	Burke Center for Ecosystem Research – Associate Director – Great Lakes	(715) 209-4671 mhudson@burkectr.org
Ben Dufford	Bayfield County Land and Water Conservation Department - Director	(715) 373-6167 ben.dufford@bayfieldcounty.wi.gov
Paul Piszczek	Wisconsin DNR – Fisheries Biologist	(715) 392-7990 paul.piszczek@wisconsin.gov
Jeff Tyson	GLFC – Program Manager	(734) 649-2033 jtyson@glfc.org
Rina Studds	NOAA – Federal Program Officer	(301) 427-8651 rina.studds@noaa.gov

Project/Task Organization

Name	Organization	Roles and Responsibilities
Matt Hudson	Burke Center for Ecosystem Restoration	Project Manager and point-of-contact; QAPP development and implementation; Contractor selection and oversight; Fieldwork oversight for in-stream habitat restoration elements of the project; Biological monitoring co-lead
Ben Dufford	Bayfield County Land and Water Conservation Department	Project Manager and point-of-contact for upland "Slow the Flow" elements of the project, including Contractor Selection and Oversight; Fieldwork oversight.
Paul Piszczek	Wisconsin DNR	Biological monitoring co-lead
Jeff Tyson	GLFC	Program coordination; Grant administration; QAPP technical guidance
Terry Heatlie	NOAA	Monitoring, QAPP, and project technical guidance
Rina Studds	NOAA	Project oversight

Problem Definition/Background

Excess sedimentation is widely recognized as the largest nonpoint source of pollution threatening aquatic habitat and nearshore water quality in the Chequamegon Bay region. The Fish Creek watershed is the primary source of excess sedimentation directly to Chequamegon Bay, with about 2/3 of the annual sediment load emanating from a series of large, eroding bluffs along the upper main stems of North and South Fish Creek, exposed by past land cover changes and exacerbated by current land use, water drainage patterns, and a catastrophic flood/bridge failure in 2018. This sediment is the primary contributor to habitat degradation for brook trout and other fish and aquatic life in Fish Creek and downstream areas in the Fish Creek Sloughs and Chequamegon Bay, which contains important spawning habitat for northern pike and yellow perch. The stream has important cold-water habitat for native brook trout that is limited by excess sedimentation. South Fish Creek does not support cold-water habitat but does support a warm-water fish community and provides seasonal habitat for some migratory fish species. It is a substantial contributor of sediment to Lake Superior.

The amount of sediment eroding from bluffs in the Fish Creek watershed is estimated to exceed 72,000 kg/km2/year (32,000 US tons/year). The goal established by project partners for the Fish Creek watershed is to reduce sediment eroding from bluffs by half (16,000 US tons/year). This restoration endpoint was chosen because the human contribution to sedimentation in the entire Fish Creek watershed was estimated to be double pre-European settlement loading rates prior to recent stabilization efforts that began in 2018 (Fitzpatrick et al. 1999). Reducing upland surface runoff rates and in-stream sediment sources at the eroding bluffs are the primary management recommendations to address the problem.

Efforts to implement these recommendations began with 1) a Phase 1 bluff stabilization project and upland runoff attenuation projects on North Fish Creek 2016-2018 and 2) Phase 2 and 3 projects focused on reducing in-stream sediment sources and improving in-stream fish habitat implemented in 2021-2025. To date, the five bluff stabilizations that have been completed through Phases 1-3 reduce an estimated 10,600 U.S. tons/year, 66% of the long-term sediment reduction goal. Phase 4 would reduce sediment loads an additional 4,800 tons/year, bringing the overall project within 96% of the sediment reduction goal.

The proposed project leverages partnerships and experience gained from three previous phases of targeted fish habitat improvement, bluff stabilization, and upland runoff attenuation on North Fish Creek, a Class 1 trout stream draining to Lake Superior in Bayfield Co., WI. Phase 4 will continue and enhance efforts to implement science-informed recommendations to reduce excess sedimentation, the primary non-point pollution issue affecting aquatic and fish habitat within Wisconsin tributaries draining to Lake Superior and address issues resulting from historic flooding in Fish Creek, WI in 2018. The Phase 4 project will save an estimated 4,800 tons of sediment annually from entering the creek and ultimately Chequamegon Bay, Lake Superior and protect and enhance fish habitat along 1,400 feet of riparian corridor directly impacted by the project and to over 16 miles of riparian corridor downstream to Lake Superior. The project will also provide hydrologic modification aimed at reducing the erosive power of flood peaks via floodplain reconnection along approximately 3,400 feet of riparian corridor and by implementing agricultural runoff attenuation practices that will slow the flow of runoff from approximately 1,000 upland acres draining to erosional reaches of the stream channel.

The Fish Creek Phase 4 Hydrological Modification project is comprised of three elements as described in further detail below.

Element 1: Bluff stabilization and fish habitat enhancement: The two proposed Phase 4 sites were destabilized following the extreme flood event in June of 2018 that caused a "dam break" failure of the road crossing of US Highway 2 at North Fish Creek. The failed road crossing has been replaced with a bridge, which will prevent future "dam break" failures and has provided an opportunity to repair damage to the downstream riparian corridor from the flood. The Phase 2 and 3 bluff stabilization projects repaired damage immediately downstream of the failed road crossing and immediately upstream of the proposed Phase 4 sites. At the proposed Phase 4 sites, the stream is at the base of an approximately 560' long, 100' tall bluff and a 275' long, 120' tall bluff, which contributes about 4,800 tons of sediment to the stream annually. In addition, the Phase 4 sites are located at the upper end of the known fish spawning reach within North Fish Creek, so reducing sedimentation will benefit fish populations both at the restoration sites and downstream. Stabilization of the bluffs will involve stopping channel migration into the valley wall. The channel will be re-routed away from the bluff toe, allowing the upper bluff to stabilize passively. The space between the existing bluff toe and the new river edge will provide an area for the upper bluff material to deposit after failing. Large wood and rock structures will be installed to protect the new channel bank and impede channel migration back to the bluff toe. The wood structures will be designed to replicate natural wood formations that also provide critical aquatic habitat. The structures will be engineered to withstand hydrodynamic forces and potential channel adjustments (e.g., channel bed scour).

Element 2: Floodplain Reconnection: The 2018 flood event led to erosion and corresponding sediment deposition within portions of the North Fish Creek stream channel. Immediately downstream from the proposed Phase 4 bluff stabilization sites is a low gradient, depositional zone within the riparian corridor that extends for approximately 4,000'. A recent LIDAR geomorphic change analysis revealed that from one to over seven feet of sediment was deposited within the floodplain in this stream reach because of the 2018 flood. The deposition has disconnected the stream from its floodplain during most runoff events, which increases the erosional power of water within the stream channel and threatens aquatic habitat in areas downstream (Supplemental Materials). By reducing instream sediment sources upstream through Phases 2-4, there is an opportunity to reconnect the floodplain in portions of this important depositional reach, which will provide attenuation of flood waters and protect important fish habitat areas downstream. Floodplain reconnection will occur in conjunction with the bluff stabilization and fish habitat enhancement projects and will involve using heavy machinery to push accumulated floodplain sediment back towards the valley wall and re-establish a floodplain elevation that will accommodate a 1.5-year bankfull flow along 2,000' of riparian corridor. The Supplemental Materials show photos of floodplain deposition and initial proposed areas for floodplain reconnection. Landowners for the fish habitat improvement portion of the project include the Wisconsin Department of Natural Resources (WDNR) and Victoria Koval who are both supportive of the project.

Element 3: Upland runoff attenuation: A primary management recommendation to reduce erosive peak flows upstream of high erosion areas in North and South Fish Creek is to "slow the flow" or attenuate surface runoff from precipitation events. Reducing erosive peak flows helps protect recent investments in in-stream sediment reduction work and protect important aquatic habitat from flashy flows and excess sedimentation. Priority areas for attenuating surface runoff in the upper and transitional main stem of North and South Fish Creek were identified by Blodgett (2009) and in the Fish Creek Watershed Restoration and Management Plan (2011). Upland runoff attenuation practices that will include a range of practices adhering to NRCS Technical Guide Standards, including: 1) Access Road Standard 560, 2) Critical Area Planting Standard 342, 3) Fence Standard 382, 4) Grade Stabilization Standard 410, 5) Heavy Use Area Protection Standard 561, 6) Nutrient Management Standard 590, 7) Roof Runoff Structure Standard 558, 8) Roofs and Covers Standard 367, 9) Shoreland Habitat Standard 643a, 10) Stream Crossing Standard 578, 11) Streambank and Shoreline Protection Standard 580, 12) Waste Facility Closure Standard 360, 13) Water & Sediment Control Basin Standard 638, 14) Well Water Standard 642, 15) Watering Facility Standard 614, 16) Well Decommissioning Standard 351, 17) Wetland Restoration Standard 657, 18) Trails and Walkways Standard 575, 19) Vegetated Treatment Areas Standard 635, and 19) Livestock Pipeline Standard 516. These practices slow the flow of runoff from agricultural and open land and will be targeted for installation in headwater and upper mainstem portions of the North and South Fish Creek watersheds, with a goal of treating 1,000 acres of land. A targeted landowner engagement approach will be utilized by the Bayfield County Land and Water Conservation Department (BCLWCD) to identify private landowners and install practices within the target areas identified by the Fish Creek watershed plan. Landowners for the upland runoff attenuation portion of the project are to be determined, but prior (Phase 1) upland runoff projects were well supported by landowners in the area. The BCLWCD implemented the upland work within the Phase 1 Fish Creek project and has the connections and capacity to implement similar upland work in Phase 4.

As documented in the approved NOAA Tier 1 Monitoring Plan dated July 23, 2026 (Appendix A), the Burke Center for Ecosystem Research (BCER) and BCLWCD staff (or contractors) will collect environmental data through engineering surveys. Pre-construction data for this QAPP will not be collected for the in-stream habitat restoration elements (Elements 1 and 2), as pre-construction data from surveys completed by the Bayfield County Land Records Department (BCLRD) using LiDAR in 2026 will be used to characterize topography. However, select stream cross sections will be surveyed using Real Time Kinematic (RTK) Global Navigation Satellite Systems (GNSS) to check the LiDAR grades and elevations. For the "Slow the Flow" element of the project (Element 3), pre-construction topographic data will be collected at ~200 points by BCLWCD staff using RTK-GNSS survey methods. This data will be reviewed prior to advancing a recommended project type and design.

Data such as elevation, length, and width will be collected and used to develop design plans, which will be submitted as part of WDNR regulatory permit applications through the Waterways Program, Floodplain Program, and Stormwater Program. Additional regulatory oversight will occur from the U.S. Army Corps of Engineers and Bayfield County through DNR Waterways Program and Floodplain Program, respectively. Following permit issuance, the data will be basis from which post-construction data will be compared. Engineering data will be collected using common engineering survey methods by experienced contractors.

The BCER and WDNR staff will also conduct fish community composition surveys to document post-construction site conditions. Pre-construction fish community composition surveys have been collected by both agencies and will be compared to post-construction fish community composition data using common fishery survey methods by experienced WDNR and BCER fisheries personnel.

Project/Task Description

Data Collection

Data will be collected consistently with the approved NOAA Tier 1 Monitoring Plan dated July 23, 2026, and further discussed in Section 2 of this QAPP.

- For the in-stream elements (Elements 1 and 2), the project team will use data collected by BCLRD using drone-based LiDAR in 2026, with validation of elevations from LiDAR at temporary control points using RTK-GNSS survey methods, to characterize pre-construction topography. Post-construction surveys of topography will be collected using a M300 drone equipped with a L2 LiDAR and select stream cross sections will be surveyed and compared to the LiDAR at temporary control points using RTK-GNSS survey methods to check the LiDAR grades and elevations by a qualified contractor. Data collection will take place during leaf-off conditions with no snow or ice cover, to maximize satellite coverage and allow for topographic features to be observed. Lateral cross-sections and longitudinal profiles will be developed from these data and subsequently used for in-stream restoration element design and post-construction verification of consistency with design and will be provided to the GLFC per the Data Management Plan.

- For the upland "Slow the Flow" elements (Element 3), pre-construction topographic data at ~150 points will be collected by BCLWCD at each restoration site using a manual total station for topographic surveys. BCLWCD staff will review the land elevation survey data prior to advancing a recommended project type and design. Pre-construction topographic data will be used for developing designs for each restoration measure at each site. Post-construction topographic data will be collected by BCLWCD using the manual total station for topographic survey ~20 points at each restoration site. BCLWCD staff will add these elevations into the plan view/drawings in the construction plan. Data collection will occur as individual landowners and project sites are identified and construction is completed. As-builts will be conducted by the project team and will be provided to the GLFC per the Data Management Plan.

- Pre-construction fishery surveys upstream, downstream, and at the site have already been completed by BCER and WDNR fisheries staff and include measures of presence/absence of coldwater species such as Brook Trout and relative abundance of various species using standard electrofishing gear. Fish species composition, size structure, and relative abundance will be determined after identifying, measuring (total

length), and enumerating all fish. Post-construction surveys will be conducted at similar locations to the pre-construction surveys. The pre- and post-project data will be compared to determine the extent of any changes in species composition, size structure (i.e., length-frequency), and relative abundance potentially influenced by the project. Fish surveys will be conducted in late summer or early fall, following the project's substantial completion, and additional surveys may be conducted, if necessary in late summer or early fall in subsequent years.

- Photographic Monitoring: Photographic monitoring stations will be established at up to 10 photo monitoring stations for the in-stream restoration elements (Elements 1 and 2) of the project and photographs will be taken of the entire project area pre-, during, five days post-construction and seven months post-construction at the established stations. At the upland "Slow the Flow" sites, a single photo documentation station will be established and photographs will be taken pre-, during, five days post-construction and seven months post-construction. Photo monitoring locations will be georeferenced and photos will be taken from the same coordinates and at the same orientation pre-, during, and post-construction to allow for comparison of changes to the project site to document post-construction conditions and used to produce a PowerPoint presentation with photo documentation. Monitoring photographs will be provided to meet the Outreach and Communication Special Award Condition for this NOAA award and will be provided on the GLFC data management website. Photographs will be taken with a hand-held camera or using trail cameras mounted on nearby trees or installed posts and will be programmed at intervals appropriate for the project stage prior to construction, during construction, and after construction. All photographs will be retained by BCER/WDNR staff.

Personnel

The Project Managers will oversee data collection and retention. A qualified contractor(s) will collect and manage all engineering data from the pre- and post-construction surveys, whereas BCER and WDNR Fisheries staff will collect and manage all post-construction fish community survey data. BCER, BCLWCD and WDNR Fisheries staff will also conduct the photographic monitoring.

Equipment

For in-stream restoration (Element 1 and 2) an M300 drone unit with L2 LiDAR sensor will be used to collect topographic survey information by a qualified contractor in compliance with FAA regulations and local/state/federal regulations for drone operation. Temporary control points will be surveyed with commonly used and accepted equipment, instrumentation, and supplies:

- RTK-GNSS receiver
- Rover Rod and Pole Mounted Phone Holder
- Data collector
- Handheld digital camera

- Personal protective equipment such as safety vests and hard hats
- First aid kit(s)
- Waders and muck boots

For upland "Slow the Flow" restoration sites (Element 3) engineering surveys will be conducted with commonly used and accepted equipment, instrumentation, and supplies:

- Total station and/or surveyor's level
- Stadia rods and receivers
- Tape measures
- Electronic and paper data sheets
- Handheld GPS unit
- Handheld digital camera
- Personal protective equipment such as safety vests and hard hats
- First aid kit(s)
- Waders and muck boots

Fishery surveys will be conducted with commonly used and accepted equipment and supplies:

- Backpack or stream barge electrofishing units with anodes, cathodes, and batteries (e.g., lithium)
- Dip nets
- Plastic buckets
- Measuring boards (metric and English units)
- Handheld digital scales (metric)
- Electronic and paper data sheets
- Handheld thermometer (F)
- Handheld GPS unit
- Personal protective equipment such as ear protection
- First aid kit(s)
- Waders

Photographic monitoring will be conducted with a cell phone with georeferencing capabilities, retail-grade digital cameras, trail cameras, batteries (alkaline or lithium), and memory cards.

The equipment, instrumentation, and supplies will be used under the field conditions typical to the sites and will be inspected, maintained, and cleaned to ensure proper functionality. Any malfunctioning or otherwise inoperable equipment, instrumentation, and supplies will either be repaired prior to use or replaced with properly functioning equipment.

Work Schedule

Engineering and fishery surveys will be conducted during daylight hours of normal business days, with fair weather being the target ambient condition. Further, the surveys will be conducted

during normal or low stream flows and not during high or flood flows to limit any influence the adverse conditions may affect data collection. Each of the pre- and post-construction surveys for the in-stream restoration elements (Elements 1 and 2) will be conducted over the course of several working days, with the post-construction survey being conducted during fall 2028 within 30 days of the project's substantial completion. Each of the pre- and post-construction surveys for the upland "Slow the Flow" restoration sites (Element 3) will be conducted once project sites have been identified throughout 2027 and 2028 and within 30 days of each project's substantial completion. The fishery surveys will be conducted over the course of one to two days following the project's substantial completion, likely in summer/early fall 2029.

Photographic monitoring at the Element 1 and 2 instream project sites will commence within 48 hours prior to construction, continue through the entire construction period, and cease within 48 hours after construction.

Maps

A Project area map with references to specific work sites is provided in Appendix B.

SECTION 2: DATA COLLECTION & QUALITY STANDARDS

Field Data Collection Requirements

The sampling design consists of methods, equipment, and timeframes specific to demonstrating that the project objectives to stabilize the main channel of Fish Creek, reconnect Fish Creek to its floodplain, and implement measures in upland areas that are designed to slow runoff, peak flood flows, enhance in-stream fish habitat, and reduce sediment inputs into Chequamegon Bay from Fish Creek to target levels. Pre- and post-construction data will be (have been) collected for all three elements of the project (Elements 1-3). Additionally, post-construction fish community composition data will be compared to previously collected pre-construction fish community data to evaluate changes in the fish community, size structure, and relative abundance. For example, drone-based LiDAR and a pole-mounted RTK-GNSS receiver will be used to measure dimensions and elevations of the existing site conditions. The data will then be uploaded to software such as AutoCAD to develop 1) cross-sections and longitudinal profiles of the in-stream habitat restoration measures to support project design elements (Elements 1 and 2) and 2) to establish pre-construction site topography for the upland "Slow the Flow" sites (Element 3). Measurements for all topographic surveys will be made with comparable equipment and methods and will be replicated post-construction to verify post-construction dimensions and elevations were constructed as designed. All engineering field data will be collected by qualified contractors, whereas all fishery survey data will be collected by BCER and WDNR trained staff.

All survey data will be retained and managed by the respective contractor(s), BCLWCD, BCER and WDNR staff in paper and electronic files, and the respective equipment and supplies used to collect the data will be retained in the offices and storage facilities operated by contractors,

BCLWCD, BCER, and WDNR staff. The Project Managers will compile and share all data with the GLFC for its publicly accessible projects page as a part of the data management plan.

Sampling Frequency and Schedule

Work Site	Task	Frequency	Timeframe
Element 1	Pre-construction engineering survey – LiDAR validation (RTK-GNSS)	Once	Fall 2026
Element 1	Post-construction engineering survey – LiDAR and RTK-GNSS	Once	Fall 2028
Element 2	Pre-construction engineering survey – LiDAR validation (RTK-GNSS)	Once	Fall 2026
Element 2	Post-construction engineering survey – LiDAR and RTK-GNSS	Once	Fall 2028
Element 3	Pre-construction engineering survey – Manual total station	Once per site	2027-2028
Element 3	Post-construction engineering survey – Manual total station	Once per site	2027-2028
In-stream and upland sites	Photographic monitoring	pre-, during, five days post-construction and seven months post-construction	2027-2028
Fish Creek	Post-construction fishery survey	Once	Summer-fall 2028
		Once	Summer-fall 2029?

Sampling Methods

Engineering Surveys

Element 1 and 2
BCLRD drone-based LiDAR data collected in May 2026 will be utilized to characterize the pre-construction site topography. Qualified contractors will verify elevations at selected temporary control points using RTK-GNSS survey methods to check the LiDAR grades and elevations. To characterize post-construction topography for as-built surveys, qualified contractors will utilize drone-based LiDAR. Qualified contractors will verify elevations at selected temporary control points using RTK-GNSS survey methods to check the LiDAR grades and elevations.
Element 3

The pre-construction surveys at upland "Slow the Flow" sites will be conducted using a manual total station or level and stadia rod with receiver. The total station or level will be situated at as many stations as necessary to establish a clear sight line with the stadia rod and receiver. All stations will be geo-referenced among one another with a known or otherwise established base elevation. Approximately 150 elevation data points (to the nearest 0.01') will be collected for each upland restoration site. The measurements will be recorded electronically or on paper, then uploaded or entered into computer software such as AutoCAD to represent the site topography. These data will be used to guide project type and incorporated into the design. The post-construction survey will follow the methods used for the pre-construction survey, collecting elevation data at approximately 20 points.

Fish Community Composition Surveys

The post-construction fish community composition surveys will be conducted using standard BCER or WDNR-owned electrofishing equipment: (1) backpack electrofishing units with pulsed DC current; and (2) stream barge unit with DC current depending upon water depth and current at the selected sites. Stations will be surveyed downstream, upstream, and at the restoration site. For backpack electrofishing units, two/three BCER/WDNR staff will carry and operate a backpack unit (one anode per unit) and collect all stunned fish, and an additional staff member will also collect stunned fish and transfer fish from the backpack staff to a bucket to hold the fish until completing the survey. For sites sampled with the stream barge unit (two anodes), each of two BCER/WDNR staff handle an anode and a dip net and collect all stunned fish, and a third BCER/WDNR staff tows the barge, collects stunned fish, and transfers fish from the anode staff to the barge's on-board holding tank until completing the survey. Regardless of fish collection method, all fish will be identified to species, measured to the nearest 0.1-inch, weighed to the nearest gram, recorded either on a paper data sheet or an electronic tablet, and returned to the stream. If recorded on paper, such as on WDNR's Wadable Stream Fish Assessment sheet (Appendix C), the data will be transcribed onto a MS Excel worksheet, reviewed for transcription errors, and uploaded directly into the WDNR Fisheries Information System database or BCER databases. If recorded on the tablet, the data will be reviewed for errors and automatically transferred to the WDNR Fisheries Information System database or BCER database.

Photographic Monitoring

The photographic monitoring will be conducted with BCER/BCLWCD/WDNR-owned cell phone and/or retail-grade trail cameras by trained BCR/BCLWCD/WDNR staff immediately prior to, during, five days post-construction and seven months after completion of the project. BCER/WDNR staff will install the cameras in existing trees or on posts to optimize the upstream and downstream views at the in-stream restoration sites. At the upland restoration sites a single photo documentation station will be established and photographs will be taken pre-, during, five days post-construction and seven months post-construction by BCLWCD staff. Photo monitoring locations will be georeferenced and photos will be taken from the same coordinates and at the same orientation pre-, during, and post-construction to allow for comparison of

changes to the project sites to document post-construction conditions. The batteries and memory card for each camera will be checked for full operation and storage at the onset of monitoring. The cameras will be programmed to photograph the site at regular intervals. The cameras will be inspected and maintained during their periods of use, with the batteries and memory cards being changed, as necessary. The cameras will be removed within seven months of substantial completion of the project, and all photographs will be transferred to external hard drives at the WDNR/BCER offices. The photographs will then be collated in a MS PowerPoint or equivalent software to produce a time-lapse record of project construction.

Quality Objectives & Criteria for Measurement Data

The Project for which the data are being collected will address hydrologic restoration at the Fish Creek Phase 4 project site. NOAA Tier 1 hydrologic restoration project performance metrics include land elevations to verify that post-construction as-built surveys align with restoration design plans. Additionally, photographic monitoring at select locations will provide evidence of hydrologic restoration (e.g. reconnection of Fish Creek to its floodplain), with additional benefits associated with sediment reduction and in-stream habitat restoration. Data will be of sufficient quality to:

- Provide land elevation measurements that support final engineering design for the project, demonstrate that the project was built as designed, and provide for evidence of hydrologic reconnection to the floodplain at the project site;

- Provide photographic evidence pre-, during, and post-restoration. Monitoring photos will show floodplain inundation extent throughout the project area at various discharge levels and restoration measures installed at both the in-stream and upland restoration sites; and

- Provide documentation of the fish community composition following project construction.

Hydrologic restoration is the primary implementation monitoring metric that the data will address, as referenced in the approved Tier 1 Monitoring Plan (Appendix A). Because there are no formal targets for comparing pre- and post-restoration hydrographs, the three metrics above will be used to provide weight of evidence that indicates progress towards the project's overall goals.

Precision and Accuracy: Neither duplicate nor replicate measurements will be made during the topographic surveys, fishery surveys, and photographic monitoring. The drone-based LiDAR, RTK-GNSS surveys, and manual total station surveys are anticipated to function normally and therefore produce precise and accurate data. The drone-based L2 LiDAR sensor has a vertical accuracy of cm and horizontal accuracy of 5 cm under normal operating conditions while the RTK-GNSS survey equipment has a vertical accuracy of 4 cm and a horizontal accuracy of 2 cm. The manual total station has a vertical accuracy of 2.5 cm and a horizontal accuracy of 3 mm.

Each drone flight will be 20-30 minutes in length from an altitude of approximately 250 feet. The flight path will generally be parallel to the stream, with multiple passes overlapping at least 20% of the coverage area. All takeoff and landing locations will be on public lands or public road rights of way Any indication of erroneous measurements (e.g., excessively higher or lower road elevations compared to previous measurements) will immediately be corrected by the survey crew. The fishery surveys are one-time efforts that are not repeated, due to the lack of opportunity for survey replication at the specific stations of interest in Fish Creek. Following capture, all fishes will be identified either through the knowledge of the specific fish handler or by the collective knowledge of the field personnel. If necessary, fish will be vouchered and returned to the laboratory for identification. Individual fish measurements will be repeated if miscommunications occur between the fish handler(s) and data recorders. Photographs will be taken by hand using cell phone cameras and using trail cameras mounted on fixed structures (e.g., tree or post) that will remain in place and will maintain the same viewing area through the duration of the project.

Representativeness, Comparability, and Sensitivity: L2 LiDAR sensors, RTK-GNSS survey and manual total station survey methods are commonly used and accepted equipment from which to measure topography/land elevations. Enough points will be surveyed for both Elements 1 and 2 (drone-based LiDAR (20% overlap)) and Element 3 (RTK-GNSS survey methods) to accurately characterize the in-stream topo/bathymetry and upland restoration sites. Similarly, backpack and stream barge electrofishing equipment and catch-per-effort surveys are commonly used and accepted methods to capture fish for wadable stream fishery assessments, particularly for producing representative data across survey stations and pre- and post-construction timeframes. Photographs will be taken by trail cameras mounted on fixed structures such as a tree or post that will remain in place and will maintain the same viewing area through the duration of the Project.

Completeness: All surveys are expected to be completed in the prescribed timeframes. Complete engineering data sets will be those with sufficient measurements (90%) to design the in-stream restoration elements (Elements 1 and 2) and the upland restoration elements (Element 3). The fishery data will be complete if at least two stream barge stations or two backpack stations are surveyed, 75% of the survey station length is surveyed, and 90% of all fish collected are accurately identified, measured, weighed, and enumerated. The photographic monitoring record will be deemed complete if 75% of the planned number of photographs are taken.

Instrument/Equipment Testing, Inspection, Calibration, & Maintenance

The data objectives will be met through standardized methods and repeated use of properly functioning and calibrated equipment. Instrumentation will be inspected and calibrated daily before each use and cleaned as necessary. In the engineering surveys for example, the drone-based LiDAR, RTK-GNSS survey and manual total station survey methods will be used according to manufacturer's specifications and guidelines, starting with turning the units on and allowing any self-calibration procedures to run as designed. Loss of battery power is the only anticipated potential interruption to the surveys, and any occurrence will be remedied by changing the batteries. Should the equipment malfunction beyond the batteries, the equipment will be replaced with comparable equipment, again following manufacturer's specifications and guidelines prior to use. The fishery surveys will follow similar concepts. The electrofishing equipment will be tested for functionality by turning the units on and immersing the anodes in the water immediately before the survey. Any loss of power to the electrofishing units during the surveys will be remedied by changing the batteries or using comparable replacement units. The trail cameras will be inspected and maintained during their periods of use; the batteries and memory cards will be changed, as necessary.

SECTION 3: DATA MANAGEMENT & REPORTING

Data Handling/Storage

All engineering and fishery survey data will be recorded immediately upon collection, either on paper or electronic forms, as noted in the approved NOAA Tier 1 Monitoring Plan dated July 23, 2026 (Appendix A). Data on paper forms will be transcribed to computer software such as MS Excel, proofed for transcription errors, and corrected as necessary by the individuals who collected the data and the Project Managers. The data will then be uploaded to respective analytical programs and databases. For example, the fishery survey data will be uploaded to WDNR's Fisheries Information System, where it will be retained indefinitely and retrieved for analysis to compare the fish community prior to and after construction. Analyses will be conducted using MS Excel, R, or other comparable analytical software. Paper data sheets will be retained in BCER/BCLWCD/WDNR Fisheries files. Engineering data will be compiled and analyzed using AutoCAD or comparable software to develop design plans and verify as-built conditions of the restoration sites. All data will be shared with the Great Lakes Fishery Commission for its publicly accessible projects page as a part of the data management plan. The Project Managers will oversee all data handling and storage and will prepare any summary reports, which will include the following NOAA disclaimer:

> "These data and related items of information have not been formally disseminated by NOAA and do not represent any agency determination, view, or policy."

Data Review, Validation, & Verification

BCER/BCLWCD/WDNR will work with the contractors for each element of the project to review, validate, and verify all data immediately at the time of collection, while producing design drawings and as-built drawings, and after all data collection has ceased. Any inconsistencies will either be corrected or rejected from use in the design and as-built drawings. The Project Managers will instruct the contractor(s) to collect additional data, if necessary. The Project Managers will also examine the initial design drawings (e.g., 30%) for any inconsistencies in the drawings that could be attributed to the data, at which time will communicate the inconsistencies to the contractor(s). The Project Managers will review, validate, and verify all fishery survey data by comparing at least 25% of all data recorded in the field versus those transcribed to MS Excel or other software prior to uploading to the WDNR Fisheries Information System. All errors will be corrected or rejected based on communications with the individuals who collected and entered the data. The Project Managers will review the photographic record for any inconsistencies, particularly for absent or out-of-sequence photographs that do not produce the desired time-lapse record. Any inconsistencies will be discussed with staff who maintained the cameras and processed the photographs.

Validation and Verification Methods

All data will be validated and verified by contractor(s) and the Project Managers by written confirmation with contractors and survey personnel that:

- the data were collected with instrumentation and equipment specific to the measurement tasks, such as RTK-GNSS receivers and/or manual total stations, backpack or stream barge electrofishing units, measuring boards, cell phone cameras, programmable trail cameras;

- the data were recorded on paper or electronic forms specific to the measurement tasks;

- erroneous data were corrected prior to use or rejected;

- the fishery data
  - were collected during summer/early fall to encounter resident fish communities during non-migration seasons;
  - consisted of species common to the Fish Creek watershed or northwestern Wisconsin; and
  - consisted of individual lengths and weights common to each species observed (e.g., a data record of a five-inch Brook Trout that weighed 100 grams requires reconciliation, as five-inch Brook Trout typically weigh approximately 20 grams).

- the photographs showed the restoration project sites; and

- the data were compiled for submission to the Great Lakes Fishery Commission.

Reconciliation with User Requirements

The Project Managers will reconcile the data, including those that may have influenced design verification, by screening the field data sheets (paper and electronic forms), design and as-built drawings for errors. The Project Managers will discuss with contractors any errors or inconsistencies to determine whether to retain or reject the data and request modifications to design and as-built drawings. All data are expected to be fully usable to demonstrate the Fish Creek was hydrologically connected to its floodplain at the project location and appropriate upland "Slow the Flow" restoration projects were implemented.

Documentation & Records

All data will be retained indefinitely by contractor(s), BCER, BCLWCD, and WDNR Fisheries. The Project Managers will write a report that describes the types of data collected and any respective errors and corrections. The report will also comment on any problems encountered during data collection, review, and analysis. The report will be retained in electronic files by BCER, BCLWCD, and WDNR Fisheries and shared with GLFC and NOAA staff.

References

Fitzpatrick, F.A., Knox, J.C., and Whitman, H.E., 1999, Effects of historical land-cover changes on flooding and sedimentation, North Fish Creek, Wisconsin: U.S. Geological Survey Water-Resources Investigations Report 99-4083, 12 p., https://doi.org/10.3133/wri994083.

Appendix A: Approved Tier 1 Monitoring Plan & Data Management Plan

NOAA-GLFC Regional Partnership Grant
Fish Creek Phase 4 Project

Monitoring and Data Management Plan

Monitoring Plan

Project Goals and Objectives

This project leverages partnerships and experience gained from three previous phases of targeted fish habitat improvement, bluff stabilization, and upland runoff attenuation on North Fish Creek, a Class 1 trout stream draining to Lake Superior in Bayfield Co., WI. Phase 4 will continue and enhance efforts to implement science-informed recommendations to reduce excess sedimentation, the primary non-point source pollution issue affecting aquatic and fish habitat within Wisconsin tributaries draining to Lake Superior and address issues resulting from historic flooding in Fish Creek in 2018. The Phase 4 project will save an estimated 4,800 tons of sediment annually from entering the creek and ultimately Chequamegon Bay, Lake Superior and protect and enhance fish habitat along 1,400 feet of riparian corridor directly impacted by the project and over 16 miles of riparian corridor downstream to Lake Superior. The project will also provide hydrologic modification aimed at reducing the erosive power of flood peaks via floodplain reconnection along approximately 3,400 feet of riparian corridor by implementing in-stream restoration elements. Additionally, for upland "Slow the Flow" restoration elements agricultural runoff attenuation practices will be implemented to slow the flow of runoff from approximately 1,000 acres draining to erosional reaches of the stream. Agricultural runoff attenuation practices will include a range of practices adhering to NRCS Technical Guide Standards, including: 1) Access Road Standard 560, 2) Critical Area Planting Standard 342, 3) Fence Standard 382, 4) Grade Stabilization Standard 410, 5) Heavy Use Area Protection Standard 561, 6) Nutrient Management Standard 590, 7) Roof Runoff Structure Standard 558, 8) Roofs and Covers Standard 367, 9) Shoreland Habitat Standard 643a, 10) Stream Crossing Standard 578, 11) Streambank and Shoreline Protection Standard 580, 12) Waste Facility Closure Standard 360, 13) Water & Sediment Control Basin Standard 638, 14) Well Water Standard 642, 15) Watering Facility Standard 614, 16) Well Decommissioning Standard 351, and 17) Wetland Restoration Standard 657. Upon landowner permission, one or more of the above agricultural runoff attenuation practices will be implemented. All elements of the proposed project directly address the Lake Superior Committee environmental priority to address hydrological modifications that impact Brook Trout production on south shore tributaries in Wisconsin's portion of Lake Superior.

The purpose of collecting environmental data for this project is to verify whether the proposed remediations meet the target metrics for hydrologic reconnection at the project site. The data will be used to demonstrate the project goals were successfully met. Topographic data will be used to compare post-project monitoring metrics to pre-project metrics and fish community composition will be assessed through standardized surveys. In addition, georeferenced photo monitoring stations will be established at various sites in the project area to document changes made to the site.

Implementation Monitoring Metrics

Pre-Construction Survey (in-stream restoration elements) Methods

For in-stream restoration elements, Fish Creek Restoration LLC (FCR) will utilize Bayfield County Land Records Department (BCLRD) LiDAR data from 2026 to establish pre-construction topography, and select stream cross sections will be surveyed and compared to the LiDAR at temporary control points using Real Time Kinematic (RTK) Global Navigation Satellite Systems (GNSS) to check the LiDAR grades and elevations. Survey data will be collected by staff with experience in operating GNSS survey equipment and developing topographic base maps. Data collection will take place during leaf-off conditions with no snow or ice cover, to maximize satellite coverage and allow for topographic features to be observed. FCR staff will review LiDAR data before commencing the survey to understand the general site topography, and in general, cross sections will be surveyed to define topography with section spacing equal to or less than the channel width or less than the height of the valley walls or berms. Utilities and infrastructure will also be surveyed.

Pre-Construction Survey (upland "Slow the Flow" elements) Methods

For upland "Slow the Flow" elements, pre-construction topographic data at ~200 points will be collected by Bayfield County Land and Water Conservation Department (BCLWCD) using the RTK-GNSS survey methods described above at each restoration site. BCLWCD staff will review land elevation survey data prior to advancing a recommended project type and design.

Post-Construction (as-built) Survey (in-stream restoration elements) Methods

The as-built survey (i.e. post-construction topographic survey) will be conducted using drone-based LiDAR. An M300 drone unit with L2 LiDAR sensor will be used to collect topographic survey information by Bayfield County Land Records Department (BCLRD) with one of three licensed pilots and in compliance with FAA regulations and local/state/federal regulations for drone operation. Flights will be 20-30 minutes in length from an altitude of approximately 250 feet. The flight path will generally be parallel to the stream channel, with multiple passes overlapping at least 20% of the coverage areas. All takeoff and landing locations will be on public lands, public road rights of way, or with the permission of the private landowner. Temporary control points will be surveyed using the above detailed RTK/GNSS equipment to verify elevations from the LiDAR drone flights. Resulting land elevations will be determined during the as-built post-construction survey and compared to the design target values and values calculated from pre-construction channel cross-section land elevation survey data and adjustments to log and rock structures will be noted. As-builts will be conducted by the project team and will be provided to the GLFC per the Data Management Plan.

Post-Construction (as-built) Survey (upland "Slow the Flow" elements) Methods

For upland "Slow the Flow" elements, post-construction topographic data will be collected by BCLWCD using the RTK-GNSS survey methods described above at ~20 points at each restoration site. Bayfield County Land and Water Conservation Department staff will add these elevations into the plan view/drawings in the construction plan. As-builts will be conducted by the project team and will be provided to the GLFC per the Data Management Plan.

Topographic Schedule:

Pre-construction topographic surveys will be completed to support final design and monitoring once the QAPP is approved. The expected completion date for the pre-construction topographic surveys for the in-stream restoration element is December 2026. The expected completion date for the pre-construction topographic surveys for the upland "Slow the Flow" sites will be

Estimated Cost:
Year 1 –

- $17,500 - Pre-construction topographic surveys, archeology and plant surveys, and photographic equipment installation (Consultant and project team)
- $0 for fish community composition assessments conducted previously

Year 3 –

- $20,000 – Post-construction land elevation surveys and as-built surveys
- $7,500 for fish community composition assessments

Operation and Maintenance Costs

Method:

- Pre-construction – No annual O&M costs are incurred at this site.
- Post-construction – Annual O&M costs will be estimated based on project design and scope and if there are modifications needed post-construction.

Schedule:
Post-construction O&M costs will be calculated based on design once the design has been sufficiently completed and will be estimated as needed.

Metric Target:
No O&M costs post-construction.

Public Safety

No public safety concerns are expected with this project given there are no state, county, or township roads on the project site and the project will occur on State property or privately owned property, with landowner permission.

Data Management Plan

The Fish Creek Phase 4 project will generate environmental data and information, including survey data, digital photographs, and operation, and maintenance information. These data and information will be used to support project design and evaluate project outcomes by comparing post-construction data with design targets and pre- and post-construction data. Environmental data will be made available on the Great Lakes Fishery Commission website (http://www.glfc.org/fish-habitat-protection-and-improvement.php) and will be updated as new information is received. All future sub-awardees not identified in this plan will have this data sharing plan as a condition of their contract acceptance. Any additional data sharing stipulations for future sub-awardees may be outlined at that time and described in their contract.

Environmental Data

The following are the kinds of environmental data we plan to collect, with costs incurred included in the above Monitoring Planning estimates:

- **Pre-construction survey data**
  Pre-construction topographic surveys will be conducted to support design and document existing channel floodplain, and valley edge geometry. Cross sections of the channel will document underwater grades (not captured by LiDAR), bed substrate composition, and sediment deposits. The survey will also include a longitudinal profile of the bed, water surface, sediment deposits, and terrace elevations, extending within the project reach and several thousand feet upstream and downstream from the project site. Pre-construction topographic survey data will be made available on the GLFC website and will be updated as new information is received.

  Pre-construction land surveys will be conducted to support design and document existing topography, structures, wetlands and floodplains for the upland "Slow the Flow" elements when identified. Pre-construction land elevation survey data will be made available on the GLFC website and will be updated as new information is received.

- **Post-construction survey data**
  Post-construction as-built surveys and topographic data will be collected using LiDAR methods described above and compared to design plans for the in-stream elements. Additionally, post-construction as-built surveys and topographic data will include post-restoration topography for each practice implemented for the upland "Slow the Flow" element of the project. As built surveys and topographic data will be available on the GLFC website and will be updated as new information is received.

- **Photo Monitoring**
  Station photographs of the entire project area (In-stream restoration and upland "Slow the Flow" elements) will be captured pre-, during, and post-construction at georeferenced locations. A PowerPoint presentation with photo documentation will also be available on the GLFC website and will be updated as new information is received. The habitat monitoring photos are not a Tier 1 monitoring requirement but will be provided to meet the Outreach and Communication Special Award Condition for this NOAA award.

- **Fish Community Composition Assessment**
  Surveys will be conducted upstream, downstream, and within the project reach at similar locations to pre-construction surveys. The pre- and post-construction surveys will be compared to determine the extent of any changes in species composition, size structure (i.e. length frequency), and relative abundance potentially influenced by the project. Burke Center staff will continue using standard electrofishing gear to document parameters such as presence/absence of coldwater species such as Brook Trout, species composition, size structure, and relative abundance. Wisconsin DNR anticipates continuing its surveys at the North Fish Creek and Pine Creek stations, also using standard electrofishing gear and documenting fish species composition, size structure, and relative abundance after identifying, measuring (total length),

and enumerating all fish. A summary of pre- and post-construction fish community composition will be included on the GLFC website.

Progress Reports

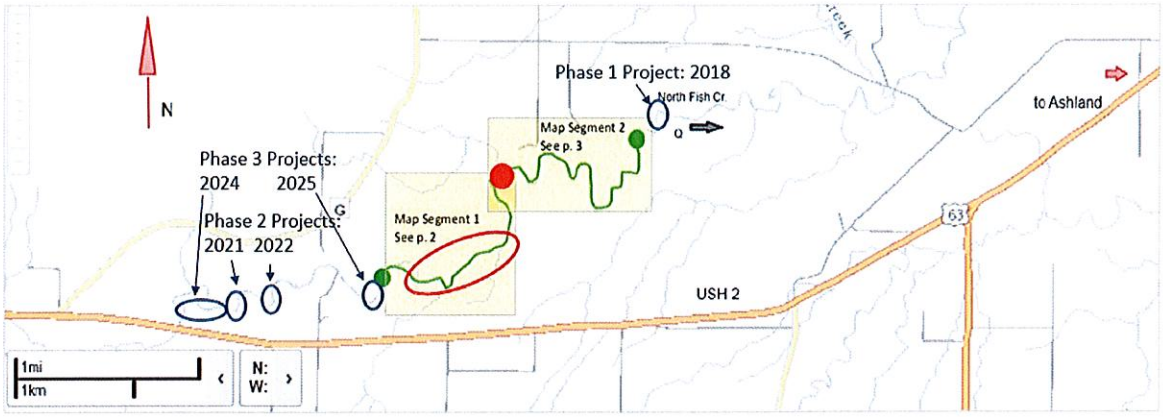
Tier 1 data and derived information will also be shared on a semi-annual basis as part of the NOAA progress reporting system.

Other

Details regarding how data will be collected, including sampling frequency and collection methodologies, the standards to be used for data/metadata format and content, including a quality control process; and the approximate total volume of data to be collected will be developed for the QAPP and updated in the Monitoring plan and Data Management Plan once the QAPP is complete.

All survey data will be retained and managed by the respective contractor(s) and Burke Center/BCLWCD/WDNR staff in paper and electronic files, and the respective equipment and supplies used to collect the data will be retained in the offices and storage facilities operated by contractors and Burke Center/BCLWCD/WDNR staff.

Appendix B: Project Site Map



Appendix C: Standard Operating Procedures for WDNR and Burke Center Electrofishing Surveys

Electrofishing

Electrofishing surveys will occur within the immediate area of remediated impediments as site conditions allow. WDNR staff will record data for the following:

- General site and stream conditions
- General weather conditions
- Date and time of electrofishing surveys
- Electrofishing backpack conditions and settings
- Number of fish, by species, captured per stream segment
- Number of larval or young of year (YOY) fish captured
- Number of target species captured
- Total length of species captured
- Total effort (length of stream segment) and catch rate (fish/day) of YOY and adult fish per stream

Electrofishing sampling efforts are gauged in three ways, specifically:

1. Sample collection duration (i.e. the enumeration of hours expended sampling each site)
2. Sample site length (i.e. the channel centerline length measured in meters)

3. Sample site water surface area (i.e. measured in square meters, this is the channel centerline length multiplied by an estimate of average channel width determined to the nearest meter using the Bayfield County GIS orthophotos)

In addition to the fishery survey, electrofishing data will be used for the following:

1. Community level sample statistics, including sample means and variances for:

i. Total Relative Abundance (i.e. CPUE)

ii. Native Species Relative Abundance (i.e. CPUE)

iii. Total Species Richness

iv. Native Species Richness

2. Population level sample statistics for potential native indicator species, including sample means and variances for:

i. Species-Specific Relative Abundance (i.e. CPUE)

As field conditions allow, trained WDNR staff will complete a minimum of one single pass sampling survey both downstream and upstream of the remediated impediment. WDNR staff will use two HT-2000 backpack electrofishing units per pass. All fish caught will be identified to species and returned to the stream immediately after processing. Lengths of game fish (e.g., i.e. Rainbow Trout, Coho Salmon, and Brook Trout) will also be recorded.

WDNR staff will enter and analyze the recorded data for the following:

- General site and stream conditions
- General weather conditions
- Date and start and stop time of electrofishing surveys (beginning and ending)
- Number of fish, by species, captured per stream reach
- Total effort (sampling days, length of stream segment) and catch rate (fish/day) of fish per stream reach
- Number of fish, by species, captured per stream reach

Fishery surveys will be conducted with commonly used and accepted equipment and supplies:

Backpack electrofishing units with anodes, cathodes, and batteries (e.g., lithium) or stream barge electrofishing unit

Dip nets

Plastic buckets

Measuring boards (metric and English units)

Handheld spring scales (metric)

Electronic and paper data sheets

Handheld thermometer (F)

Handheld GPS unit

Personal protective equipment such as ear protection

First aid kit(s)

Waders

The equipment, instrumentation, and supplies will be used under the field conditions typical to the sites and will be inspected, maintained, and decontaminated to ensure proper functionality and prevention of potential aquatic invasive species. Any malfunctioning or otherwise inoperable equipment, instrumentation, and supplies will either be repaired prior to use or replaced with properly functioning equipment.

B2.3 Field Quality Control

Data quality control and assurance is required for data collected, processed, analyzed, evaluated, and reported for this project. Data will be considered accurate and sufficient if the following criteria is met:

A. Sampling site boundaries will be documented using a GPS unit with sub-foot accuracy that is checked for accuracy and precision by collecting location data for known points (benchmarks) established through the U.S. Public Land Survey System before and after sample site boundary locations are documented.

B. All field data collection:

a. Be led by experienced WDNR staff familiar with completing habitat assessments, water quality sampling, and identifying adult, juvenile, and larval fish in the Lake Superior Basin and Cranberry River Watershed.

b. Follow suitable, standard methodology as described in this QAPP and WDNR SOPs.

c. Be completed using appropriate sampling gear.

d. Be documented on standardized forms kept on file in the Superior WDNR office.

e. Be recorded in metric units as applicable unless otherwise noted.

f. Occurs during "normal flow" periods (e.g., less than bankfull depths and at least a connected baseflow through the sample reach).

g. Time entries are recorded in standard time (e.g., 2:00PM). Dates are recorded in month, day, year format (e.g., 07/22/2023). For electroshocking, beginning and ending date, duration of sampling, and length of survey reach will be recorded.

h. Measurements that are assessed visually are confirmed by all staff members working on that station. Measurements that are considered visual are indicated as such on the field data sheet(s) and in the database.

i. All staff that collect data for a station or event are listed on the respective data sheet.

j. Data is collected during normal seasonal conditions and will not include extreme weather events that could produce spurious results (e.g., thunderstorms, floods, etc.).

C All project data will be processed by WDNR staff by entering into MS Excel spreadsheets to facilitate analysis and evaluation. A sub-set equaling no less than 10% of the data entered will be verified for both accuracy and consistency with project goals by the WDNR Principal Investigator.

D. All data analysis will be performed by experienced WDNR staff and verified for accuracy by the Principal Investigator.

E. All findings, conclusions, and recommendations reported will be verified for both accuracy and consistency with project goals by the WDNR Program Manager, or their designee. Draft and/or final project reports will be submitted to the WDNR and Bayfield LWCD.

F. All reports will contain at minimum:

a. Background information

b. Sampling locations and dates

c. Sampling methods

d. Analytical methods

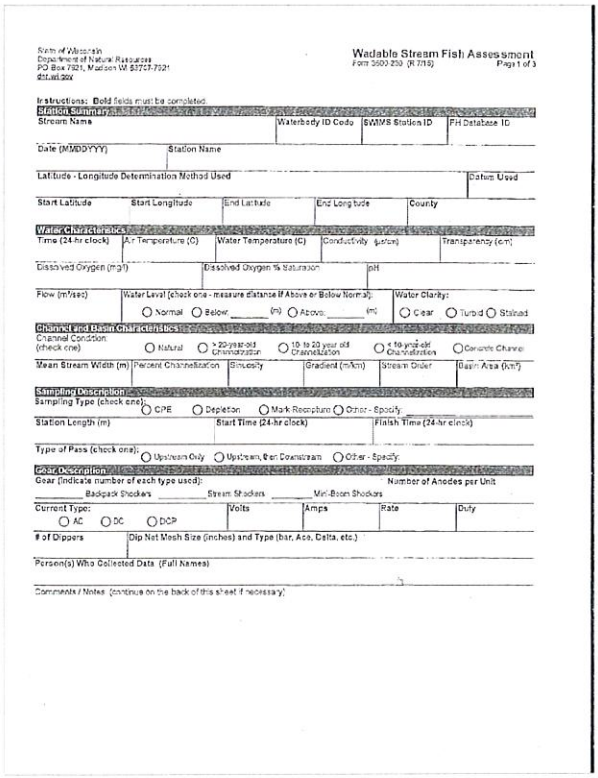
e. Relevant assumptions

f. Results

g. Conclusions and recommendations

Data entry and analysis will be completed in MS Excel. All project data forms will be scanned and preserved in hard copy (Superior WDNR office) and digital form (network drive, backed up daily).

Appendix F: Wisconsin DNR Wadable Stream Fish Assessment Data Sheet



State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Wadable Stream Fish Assessment
Form 3500-230 (R 7/16) Page 1 of 3

Instructions: Bold fields must be completed.

Station Summary

Stream Name	Waterbody ID Code	SWIMS Station ID	FH Database ID

Date (MM/DD/YYYY) | Station Name

Latitude - Longitude Determination Method Used | Datum Used

Start Latitude | Start Longitude | End Latitude | End Longitude | County

Water Characteristics

Time (24-hr clock) | Air Temperature (C) | Water Temperature (C) | Conductivity (µs/cm) | Transparency (cm)

Dissolved Oxygen (mg/l) | Dissolved Oxygen % Saturation | pH

Flow (m³/sec) | Water Level (check one - measure distance if Above or Below Normal): ○ Normal ○ Below _____ (in) ○ Above _____ (in) | Water Clarity: ○ Clear ○ Turbid ○ Stained

Channel and Basin Characteristics

Channel Condition (check one): ○ Natural ○ >20-year-old Channelization ○ 10- to 20-year-old Channelization ○ <10-year-old Channelization ○ Concrete Channel

Mean Stream Width (m) | Percent Channelization | Sinuosity | Gradient (m/km) | Stream Order | Basin Area (km²)

Sampling Description

Sampling Type (check one): ○ CPE ○ Depletion ○ Mark Recapture ○ Other - Specify

Station Length (m) | Start Time (24-hr clock) | Finish Time (24-hr clock)

Type of Pass (check one): ○ Upstream Only ○ Upstream, then Downstream ○ Other - Specify

Gear Description

Gear (indicate number of each type used): Number of Anodes per Unit

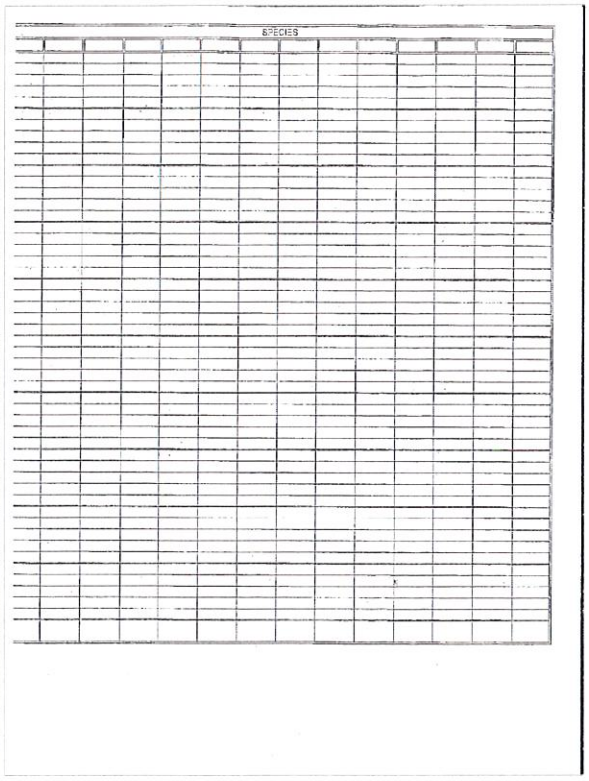
_____ Backpack Shockers _____ Stream Shockers _____ Mini-Boom Shockers

Current Type: ○ AC ○ DC ○ DCP	Volts	Amps	Rate	Duty

# of Dippers | Dip Net Mesh Size (inches) and Type (bar, Aca, Delta, etc.)

Person(s) Who Collected Data (Full Names)

Comments / Notes (continue on the back of this sheet if necessary)



SPECIES