



OHIO EPA - DSW
2008 JUN 27 AM 10: 23

Jeff Reynolds
Ohio EPA – Division of Surface Water
Standards & Technical Support Section

Mr. Reynolds,

Enclosed please find the final submission copy of the proposed “2008 French Creek Aquatic Habitat Level 2 Project Study Plan.” I believe that all of the required documentation is in order. Of note is my intention to begin the assessments as soon as possible, potentially as early as Monday, June 30. I sincerely hope that the plan is approved as submitted, and that approval will allow for the data I will collect to be considered credible to Level 2. Thank you for your assistance in the drafting of this plan. I hope that it meets your satisfaction.

Sincerely,

A handwritten signature in black ink, appearing to read "Dan Gouch". The signature is written in a cursive style with a large, looping initial "D".

Dan Gouch
Watershed Coordinator

Lorain County Community Development
226 Middle Avenue, Elyria, OH 44035

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**2008 French Creek Aquatic
Habitat Assessment**

Level 2 Project Study Plan



blackriver
WATERSHED PROJECT

Distribution List

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Introduction – French Creek Sub-Watershed - HUC 04-110-001-050-020

French Creek is the largest tributary to the Black River mainstem, located primarily in northeastern Lorain County, Ohio. This watershed has been experiencing rapid population expansion and suburban development from a predominantly agricultural area to a more residential/commercial district since the late 1990's.

The United States Army Corps of Engineers – Buffalo District (USACE) conducted stream habitat assessments¹ of the proposed project area during the summer of 2002. The USACE assessment was requested by the Black River Remedial Action Plan (RAP) in an attempt to better understand and address problems associated with low dissolved oxygen (DO) concentration in the lower reaches of the Black River mainstem; as well as to assess the French Creek watershed condition and habitat potential at that time. Additionally, the data collected in 2002 can be used to represent the baseline condition of the French Creek watershed. Future habitat studies can reference this work as a means to determine the significant habitat alterations that may have occurred since the baseline information was gathered.

Nearly the entire French Creek watershed is defined by Ohio EPA as a Rapidly Developing Watershed (RDW)². This project aims to replicate the 2002 USACE assessment in order to prepare a longitudinal comparison of the same assessment locations over time. Physical habitat results can then be compared with available land use/land classification to illustrate any correlations between changing land use and associated in-stream habitat impacts.

The area is served by an Ohio Department of Natural Resources (ODNR) Watershed Coordinator planning grant. This project study plan, when completed, will be a significant contribution to existing habitat and water quality information to be included in the Black River Watershed Action Plan.

Section 1 – Project Leader

Daniel A. Gouch, Qualified Data Collector #166
Level 2 QDC for Stream Habitat (QHEI)
Black River Watershed Coordinator
226 Middle Avenue
Elyria, Ohio 44035
dgouch@loraincounty.us
(440) 328-2336

Section 2 – Other Project Personnel

There are no other personnel specifically designated for this project. Local volunteers may assist on an availability basis, however, the Project Leader will stipulate that any volunteers complete at least Level 1 QDC status, for example, by completing Ohio EPA sponsored “Healthy Waters, Healthy People” training. When applicable, the names and certifications of any volunteers will be submitted as an Amendment to this Project Study Plan.

Section 3 – Other Personnel Supervisory Procedure

The majority, potentially all, of the assessment work and data entry will be completed by the Project Leader, who is a Level 2 QDC. Any other personnel will serve only as field assessment support, will be required to complete training to the Level 1 QDC status, and will at all times be working under the direct supervision of the Project Leader.

Section 4 – Project Sampling Objectives

As per the USACE French Creek Watershed Survey¹, the objective of conducting the habitat assessments is to determine the current conditions of the riverine and riparian habitat of the French Creek watershed. Both the Qualitative Habitat Evaluation Index (QHEI) and Primary Headwaters Evaluation Index (HHEI) are to be used, where appropriate, to most accurately reflect the instream habitat conditions of each project site. Specifically the goal of this project is to determine if there has been deviation from baseline habitat values in the time since the USACE assessments were performed. Any substantial deviations from baseline data found will be forwarded to Ohio EPA for potential further review. This information will be used largely as an educational tool to help local officials to make more informed land use decisions that hopefully will lead to increased awareness of how land use impacts the riverine habitat, and biological integrity, of the French Creek watershed.

Implementation of specific Data Quality Objectives (DQO) is limited for this project due to the scope and intensity of the sampling methods to be used. DQO “PARCC” (Precision, Accuracy, Representativeness, Completeness, and Comparability) concepts will be addressed as follows:

Precision – QHEI and HHEI scoring will be conducted by the Project Leader, Dan Gouch – QDC #166. Any method uncertainties that cannot be rectified through consultation with “Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI)” (Ohio EPA/E. Rankin, 2006), or “Field Evaluation Manual for Ohio’s Primary Headwater Streams” (Ohio EPA, 2002), will be addressed by calling Ohio EPA, Division of Surface Water for advice.

Accuracy – The project QDC passed the QHEI evaluation with a score of 90%, October 17, 2007. Appendix C provides documentation of the Project Leader’s successful completion of the QHEI training course. Additionally, the project QDC has successfully completed a training course offered by Ohio EPA for Primary Headwater Habitat Evaluation Index (HHEI), June 19, 2007. QDC status for HHEI is currently under development and revision by Ohio EPA Division of Surface Water staff. Appendix D provides documentation of the Project Leader’s successful completion of the HHEI training course.

Representativeness – Measures to depict the truest environmental conditions as best as possible for this project include:

- 1) Successful completion of the Ohio EPA Qualified Data Collector process;
- 2) Project leader has successfully designed and implemented a similar study in a neighboring watershed (Rocky River) during the summer of 2007;
- 3) Ability to consult with other local agencies conducting ongoing water quality assessments (Cleveland Metroparks, Lorain County General Health District, Cuyahoga Soil and Water Conservation District), which allows the Project Leader to continuously compare data collection methods with other experienced water quality professionals and QHEI/HHEI QDC’s. In consulting with Ohio EPA staff, the Project Leader will take care to ensure that the assessment locations will not be in close proximity to a road crossing, bridge, or other obvious anthropogenic modification.

Completeness – The completeness goal for this project requires that all data be collected as indicated. If weather or other factors prevent assessment on any given day, the QDC will return to the sites until the data is collected.

Comparability – The data collected will be compared to QHEI/HHEI data collected by USACE employees during the summer of 2002.

Section 5 – Project Study Area

Figure 1 depicts the location of the Black River watershed in relation to the State of Ohio. Figure 2 shows the location of the French Creek sub-watershed relative to the Black River watershed.

The USACE 2002 study included visits to 70 site locations, with 51 actual assessment sites chosen for QHEI, HHEI or both. Only those 51 sites where actual data was recorded will be re-visited as part of this project.

Appendix A graphically shows the relative location of the project area; while Table 1 gives the approximate Latitude and Longitude for each of the sites to be surveyed within the French Creek watershed.

Section 6 – Sampling Equipment

Hip waders (Chest waders as needed)	Field notebook
Meter stick	Metal stakes (2)
Marking flags (3)	30' Jute twine
Metal clipboard	Hand level
Field Data sheets	100' tape measure
Pencils	Garmin “60” GPS unit

Section 7 – Parameters Sampled/Assessed

The QHEI and HHEI methods yield slightly different data sets. Appendix A provides a copy of the QHEI field data sheets while Appendix B provides a copy of the HHEI field data sheets. Field water chemistry analysis (pH, Dissolved Oxygen, Temperature) will not be performed with these assessments.

Parameters to be assessed via QHEI include:

- 1) Substrate - type, quality, origin, and level of embeddedness;
- 2) Instream cover - type and amount;
- 3) Channel Morphology – sinuosity, development, channelization, and stability;
- 4) Bank Erosion and Riparian Zone – erosion, riparian width, and flood plain quality.
- 5) Pool/Glide and Riffle/Run Quality - maximum depth, channel width, current velocity, recreation potential, riffle depth, run depth, riffle/run substrate stability and embeddedness.
- 6) Gradient and Drainage Area - relative steepness of the assessed reach and the total land area drained;

Parameters to be assessed via HHEI include:

- 1) Substrate – both the total number of defined substrates, and the two most dominant types present;
- 2) Maximum Pool Depth – avoiding drop pools and bridge/road culverts;
- 3) Bankfull Width – measured as the average of a minimum of 3 measurements.

For the purposes of HHEI evaluation, only the three listed metrics are used to tabulate an HHEI ‘score’ for any particular stream reach. However, for each reach identified as requiring HHEI, several additional parameters will be assessed:

- 1) Riparian Width and Floodplain Quality
- 2) Flow Regime
- 3) Sinuosity
- 4) Stream Gradient Estimate

Section 8 – Field Sampling and Data Assessment Techniques

Stream Habitat data for this project will be collected using techniques described in “Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI),” (Ohio EPA/E. Rankin, 2006), for sites where this methodology is appropriate, namely locations draining greater than 1 square mile of surface area.

Site draining less than 1 square mile will be subject to assessment via the Primary Headwater Habitat Evaluation Index (HHEI), using techniques described in the “Field Evaluation Manual for Ohio’s Primary Headwater Streams” (Ohio EPA, 2002).

Section 9 – Stream Flow Measurement

Flow measurement is not part of this Project Study Plan. Assessment will not occur if the QDC determines that a high flow condition exists at the scheduled assessment time and location.

Section 10 – Project Schedule

The entire project is scheduled to begin June 26, 2008, and be completed by July 30, 2008. Both the QHEI and HHEI are considered to be rapid assessment methods. The QDC is experienced in using each, and in the past has completed thorough assessments at the rate of 3 – 5 per working day. Given 51 sites for replicate assessment, data collection during this project should be completed in 12 to 17 business days, pending weather conditions.

Section 11 – QDC Documentation



State of Ohio Environmental Protection Agency

STREET ADDRESS:

Lazarus Government Center
50 W. Town St., Suite 700
Columbus, Ohio 43215

TEL: 614-467-2221 FAX: 614-467-2754
www.ohio.gov

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P.O. Box 1049
Columbus, OH 43216-1049

Effective Date: March 31, 2008
Expiration Date: March 30, 2013

Daniel Gouch
Lorain County Commissioners
4434 West 168th
Cleveland, Ohio 44135

I certify this to be a true and accurate copy of the
official documents as filed in the records of the Ohio
Environmental Protection Agency.

CERTIFIED MAIL

By: [Signature] Date: 3-31-08

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Daniel:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 2
QDC Specialty: Stream Habitat Assessment (QH1E)
QDC number: 166

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires five years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

As a reminder, your status is contingent upon the absence of any trespassing violation (within the previous five years) by you or any person sampling under your supervision. Always obtain land owner permission prior to sampling.

Additionally, collection (and retention) of aquatic biological samples (this includes fish, macroinvertebrates, mollusks, and shells) requires a collector's permit from the Ohio Department of Natural Resources/Division of Wildlife. Obtain this permit prior to collection of any biological samples.

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korfus, Director

Permitting Resource Page

Ohio EPA's on-line Regulatory Employer

Permitting Branch

Section 12 – Laboratory Information

This study plan will be performed entirely in the field, no laboratory services are required to complete the habitat assessments. Consequently, no laboratory information has been included.

Section 13 – Scientific Collector’s Permit

There will be no voucher specimen collection associated with the habitat assessments; therefore, an Ohio Department of Natural Resources Wild Animal Permit for either Scientific Collection or Education is not required.

Section 14 – Sample Location Information Statement

Daniel A. Gouch, QDC #166

I will maintain and make available to the Director, for each sampling location, the name of the water body sampled, sampling location latitude and longitude, sampling location river mile where possible or practicable, general location information, the U.S. Geological Survey 7.5 minute quadrangle map name, and the purpose for data collection at each sampling location.

Signature  Date 6-24-08

Section 15 – Digital Photo Statement

Daniel A. Gouch, QDC #166

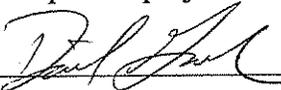
I will maintain and make available to the Director upon request a digital photo catalog of all sampling locations, including photos of the specific sampling location, riparian zone adjacent to the sampling location, and any adjacent land use deemed to impact the specific sampling location and documented on the specific sampling location field data sheet.

Signature  Date 6-24-08

Section 16 – Voucher Materials Statement

Daniel A. Gouch, QDC #166

I hereby attest that no voucher specimen collection will occur at any time by the Project Leader, nor anyone under his supervision, either before, during, or after sampling each specific project location.

Signature  Date 6-24-08

Section 17 – Trespass Certification

Daniel A. Gouch, QDC #166

I hereby attest that I have not been convicted of, nor plead guilty to, a violation of Section 2911.21 of the Ohio Revised Code (Criminal Trespass) or a substantially similar municipal ordinance within the previous five (5) years.

Signature 

Date 6-24-08

Figure 1. The Black River Watershed

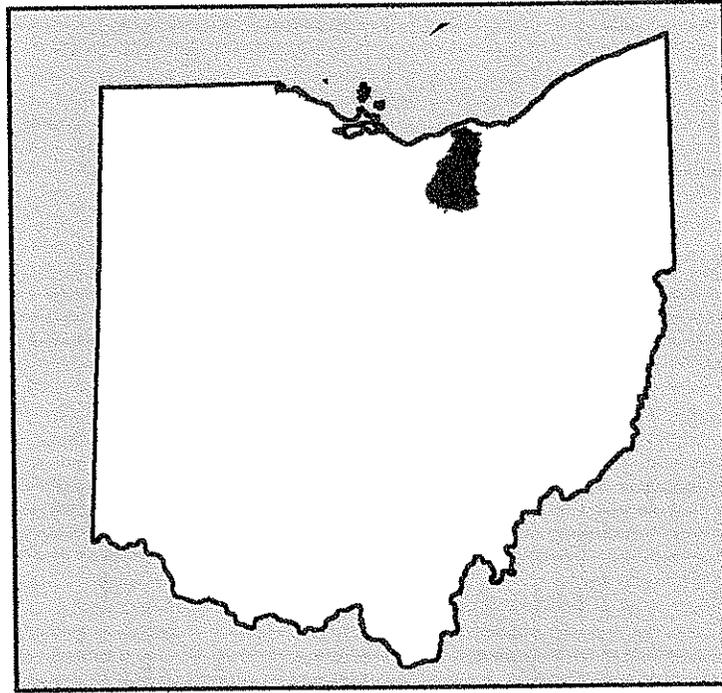
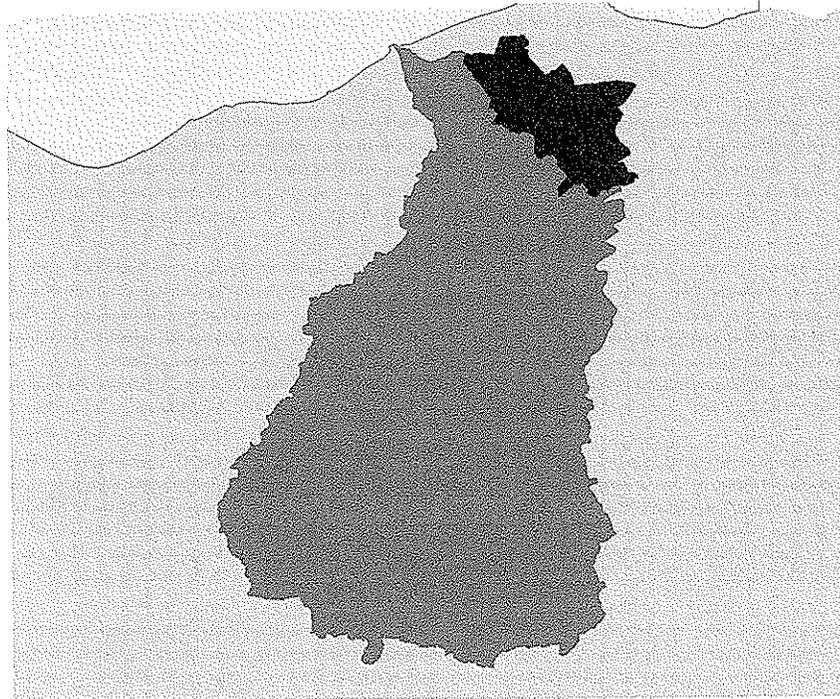


Figure 2 – The French Creek Watershed



Appendix A – Qualitative Habitat Evaluation Index (QHEI) field data sheet.



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:

Stream & Location: _____ RM: _____ Date: / /

River Code: _____ STORET #: _____ Scorer's Full Name & Affiliation: _____
 Lat./ Long.: _____ 18 Office verified location

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES: estimate % or note every type present

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR / SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	Substrate Maximum 20
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> SAND [6]	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> NORMAL [0]	
<input type="checkbox"/> BEDROCK [5]				<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> FREE [1]	
				<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> EXTENSIVE [-2]	

NUMBER OF BEST TYPES: 4 or more [2] 3 or less [0]

Comments _____

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools)

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	AMOUNT Check ONE (Or 2 & average) EXTENSIVE >75% [11] MODERATE 25-75% [7] SPARSE 5-<25% [3] NEARLY ABSENT <5% [1] Cover Maximum 20
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	
<input type="checkbox"/> ROOTMATS [1]			

Comments _____

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	Channel Maximum 20
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]	
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		

Comments _____

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY	Indicate predominant land use(s) past 100m riparian. Riparian Maximum 10
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	
<input type="checkbox"/> NONE [0]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	

Comments _____

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential Primary Contact Secondary Contact (circle one and comment on bank) Pool / Current Maximum 12
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> SLOW [1]	
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	

Comments _____

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments _____

6] GRADIENT (ft/mi) VERY LOW - LOW [2-4] MODERATE [6-10] HIGH - VERY HIGH [10-6]

DRAINAGE AREA (mi²)

% POOL: % GLIDE: % RUN: % RIFFLE:

Gradient Maximum 10

Appendix B – Primary Headwater Evaluation Index field data sheets.



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

1

SITE NAME/LOCATION _____
 SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____
 DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 9). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [10 pts]	0%	<input type="checkbox"/> SILT [3 pt]	0%
<input type="checkbox"/> BOULDER (>256 mm) [10 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [10 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) TOTAL NUMBER OF SUBSTRATE TYPES: 1 (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 0 TOTAL NUMBER OF SUBSTRATE TYPES: 1

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): _____

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.3 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.3 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): _____

HHEI Metric Points

Substrate Max = 40

1

A + B

Pool Depth Max = 30

0

Bankfull Width Max=30

0

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH		FLOODPLAIN QUALITY			
L	R	L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Per Bank)		(Most Predominant per Bank)			
Wide >10m		Mature Forest, Wetland		Conservation Tillage	
Moderate 5-10m		Immature Forest, Shrub or Old Field		Urban or Industrial	
Narrow <5m		Residential, Park, New Field		Open Pasture, Row Crop	
None		Fenced Pasture		Mining or Construction	

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
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ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: _____ Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: Wyandot Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: 0.00

Photograph Information: _____

Elevated Turbidity? (Y/N): Y Canopy (% open): 0%

Were samples collected for water chemistry? (Y/N): Y (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N): Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): Y (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N): Y Voucher? (Y/N): Y Salamanders Observed? (Y/N): Y Voucher? (Y/N): Y

Frogs or Tadpoles Observed? (Y/N): Y Voucher? (Y/N): Y Aquatic Macroinvertebrates Observed? (Y/N): Y Voucher? (Y/N): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW →



**Ohio University's
Voinovich School of Leadership and
Public Affairs**

Awards this Training Certificate To

Daniel Gouch

For Completion of

**Ohio's Volunteer Monitoring Training Program:
Two Day Biological/Habitat Training
October 16 - 17, 2007**

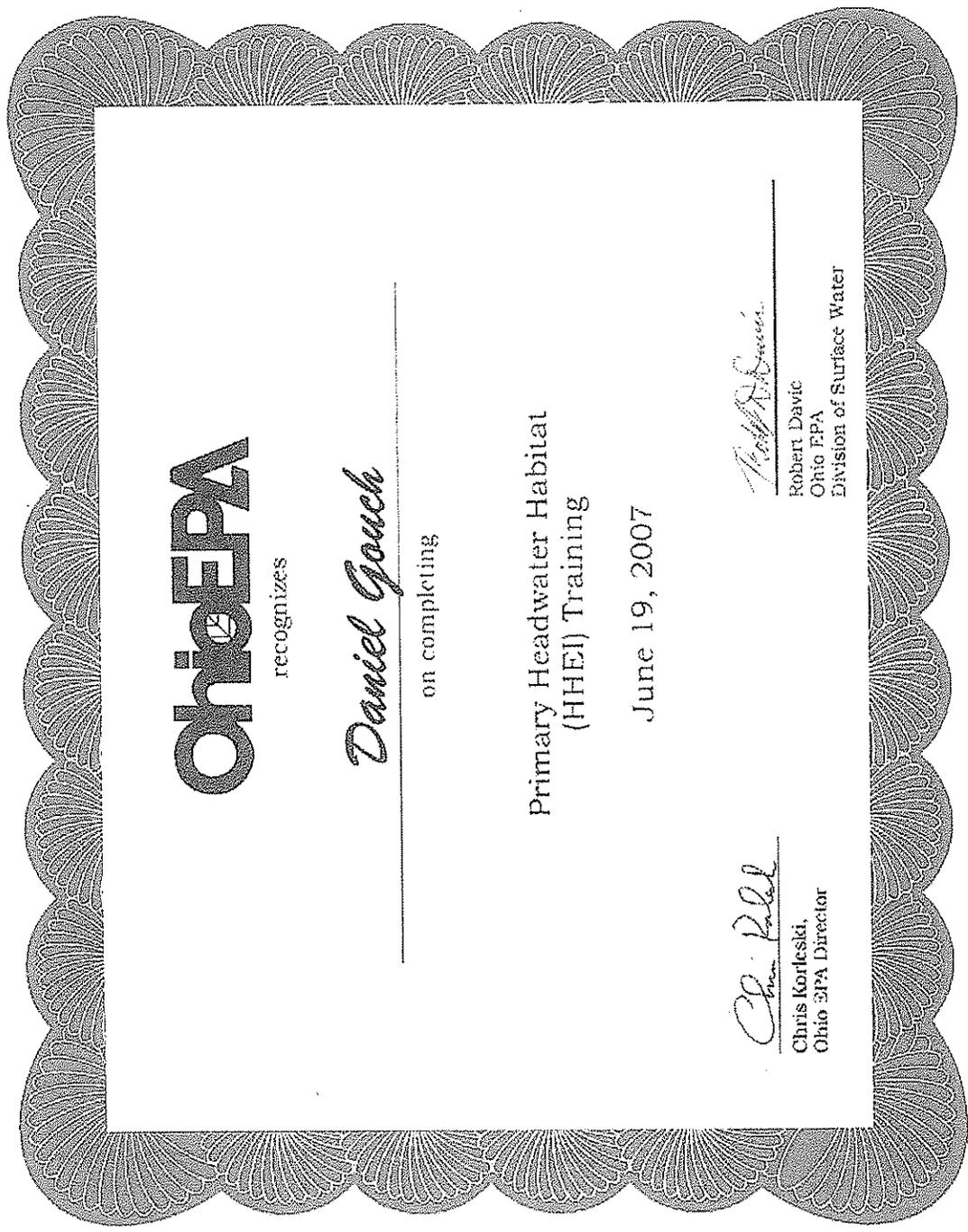
[Signature]

INSTRUCTOR

Instructed by:
Ohio Environmental Protection Agency,
Midwest Biodiversity Institute, and Ohio University

Funded by:
Ohio Water Resource Council

Appendix D – HHEI Training Certification Form



OhioEPA

recognizes

Daniel Gouch

on completing

Primary Headwater Habitat
(HHEI) Training

June 19, 2007

Chris Korleski

Chris Korleski,
Ohio EPA Director

Robert Davic

Robert Davic
Ohio EPA
Division of Surface Water

Table 1 – Site Locations

Site #	Code	RM	Location	QHEI	HHEI	DD Latitude	DD Longitude
1	FC	0.1		49.25		41.45861111	-82.11222222
2	FC	0.38		70		41.45777778	-82.10666667
3	FC	0.54		69.5		41.45833333	-82.10527778
4	FC	1.4		74		41.46	-82.09833333
5	FC	3.2		69.5		41.45152778	-82.07633333
6	FC	4		64.5		41.46608333	-82.06216667
7	FC	4.5		43.5		41.46086111	-82.05683333
8	FC	5.5		61.75		41.45697222	-82.04086111
9	FC	6.1		59		41.4505	-82.03677778
10	FC	6.9		69.25		41.44408333	-82.03019444
11	FC	7.65		45.5		41.44722222	-82.01952778
12	FC	8.9		42		41.43675	-82.00302778
13	FC	10.4		27		41.41877778	-82.01338889
14	FC	10.7		40		41.41533333	-82.01405556
15	FC	12.4		45.5		41.39061111	-82.017
16	FC	12.7		45		41.39111111	-82.01152778
17	FC	14.1		34		41.39966667	-81.98913889
18	QD	0		50	62	41.4575	-82.10666667
19	JD	0		58.5		41.45805556	-82.10527778
20	JD	1		65		41.45458333	-82.0925
21	JD	1.6		35.5		41.44955556	-82.08277222
22	JD	3.15		59		41.42958333	-82.07713889
23	JD	4.13		46.5		41.42347222	-82.06272222
24	WD	0		66.5		41.45916667	-82.09833333
25	WD	0.6		67		41.45925	-82.09633333
26	WD	1.7		23		41.45480556	-82.07616667
27	WD	2.2		23.5	61	41.44938889	-82.07222222
28	WD	3.3		31.5	52	41.43377778	-82.07236111
29	WD	3.45		29.5	73	41.43244444	-82.07141667
30	KD	0		65	58	41.46611111	-82.06441667
31	KD	0.85			46	41.45188889	-82.05933333
32	KD	1.22		32.75	50	41.44944444	-82.05808333
33	KD	2.15		51.5	74	41.43922222	-82.05205556
34	AD	0			31	41.46619444	-82.06183333
35	AD	0.47			27	41.46805556	-82.05344444
36	SD	0		29		41.43674444	-82.00277778
37	SD	0.3		35		41.43747222	-81.99825
38	SD	0.52		40.5		41.43786111	-81.99313889
39	SD	0.71		21.5		41.43744444	-81.98944444
40	MC	0.22		31.5		41.42894444	-82.00344444
41	MC	1.32		45.5		41.42144444	-81.98955556
42	MC	1.55		51.5		41.41883333	-81.98752778
43	MC	2.5		52.75		41.41063889	-81.98061111
44	MC	2.7		63		41.40802778	-81.97902778
45	MC	3.21		41	65	41.404	-81.97419444
46	MC	3.45		46.5	77	41.40197222	-81.97124444
47	FD	0		50.75		41.39097222	-82.00988889
48	FD	0.5		40.75		41.38516667	-82.00644444
49	FD	1.3		32.5		41.37402778	-82.00186111
50	FD	1.93		57.25		41.36916667	-82.00169444
51	ND	0.37		34		41.39619444	-81.98508333

Additional Works Cited

1. Available as a download through the Black River Watershed Project Website.
http://www.blackriverwatershed.org/pub2.asp?Dept_ID=7&News_ID=66
2. Ohio EPA Division of Surface Water's Storm Water Permittees webpage:
http://www.epa.state.oh.us/dsw/permits/MS4_RDW.pdf