



# Primary Headwater Habitat Evaluation Form

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

68

SITE NAME / LOC. Stream 4; Canyon Lakes, Bainbridge, Geauga County  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN Chagrin River Drainage Area (mi<sup>2</sup>) 0.04 mi<sup>2</sup>  
 Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE \_\_\_\_\_  
 DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS Eastern reach assessed in area of channelization

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

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

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; font-size: 24px; font-weight: bold;">23</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	2%	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	3%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	5%	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	15%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20%	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	3%	
<input checked="" type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	28%	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	_____	
<input type="checkbox"/> <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	24%	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		Total of Percentages of (B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock = 27%				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">15</div>		TOTAL NUMBER OF SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">8</div>		

**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]	<b>Pool Depth Max=30</b> <div style="border: 1px solid black; padding: 5px; font-size: 24px; font-weight: bold;">25</div>
<input type="checkbox"/> >22.5 - 30 cm [30 pts]	<input type="checkbox"/> <5 cm [5 pts]	
<input checked="" type="checkbox"/> >10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER/MOIST CHANNEL [0 pts]	
COMMENTS: _____		

MAXIMUM POOL DEPTH (centimeters) 

15

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

<input type="checkbox"/> >4.0 meters (13') [30 pts]	<input type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	<b>Bankfull Width Max=30</b> <div style="border: 1px solid black; padding: 5px; font-size: 24px; font-weight: bold;">20</div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13') [25 pts]	<input type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	
<input checked="" type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]		
COMMENTS: _____		

AVERAGE BANKFULL WIDTH (meters) 

2.9

This information must also be completed.

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

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

COMMENTS: \_\_\_\_\_

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

<input checked="" 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 200 ft (61 m) 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 checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> > 3

**STREAM GRADIENT ESTIMATE**

Flat (0.5 ft/100 ft)  Flat to Moderate  Moderate (2 ft/100 ft)  Moderate to Severe  Severe (10 ft/100 ft)

Location / Stream Name: Stream 4-0; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.25 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: Second Ord  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →



Primary Headwater Habitat Evaluation Form

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

61

SITE NAME / LOC. Stream 4-1; Canyon Lakes, Bainbridge, Geauga County
SITE NUMBER RIVER BASIN Chagrin River Drainage Area (mi^2) > 0.04 mi^2
Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE
DATE 3/17/2014 SCORER Mitchell/Allen COMMENTS Stream has been channelized

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

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

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 8). Final metric score is sum of boxes A & B.

Table with columns: TYPE, PERCENT, TYPE, PERCENT. Includes categories like BLDR SLABS, BOULDER, BEDROCK, COBBLE, GRAVEL, SAND, SILT, LEAF PACK/WOODY DEBRIS, FINE DETRITUS, CLAY or HARDPAN, MUCK, ARTIFICIAL.

HHEI Metric Points
Substrate Max = 40
21
A + B

Total of Percentages of (A) 15 (B) 6
Bldr Slabs, Boulder, Cobble, Bedrock = 20%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 6

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):

Options: >30 centimeters [20 pts], >22.5 - 30 cm [30 pts], >10 - 22.5 cm [25 pts], >5 cm - 10 cm [15 pts], <5 cm [5 pts], NO WATER/MOIST CHANNEL [0 pts]

Pool Depth Max=30
25

COMMENTS: MAXIMUM POOL DEPTH (centimeters) 18

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

Options: >4.0 meters (13') [30 pts], >3.0-4.0 m (>9' 7"-13') [25 pts], >1.5-3.0 m (>9' 7"-4' 8") [20 pts], >1.0 m - 1.5 m (>3'3"-4'8") [15 pts], <=1.0 m (<= 3'3") [5 pts]

Bankfull Width Max=30
15

COMMENTS: AVERAGE BANKFULL WIDTH (meters) 1.1

This information must also be completed.

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

RIPARIAN WIDTH (Per Bank) and FLOODPLAIN QUALITY (Most Predominant per Bank) options including Wide > 10 m, Mature Forest, Wetland, etc.

COMMENTS:

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

Options: Stream Flowing, Subsurface flow with isolated pools (Interstitial), Moist channel, isolated pools, no flow (Intermittent), Dry channel, no water, (Ephemeral)

COMMENTS:

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

Options: None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, > 3

STREAM GRADIENT ESTIMATE

Options: Flat (0.5 ft/100 ft), Flat to Moderate, Moderate (2 ft/100 ft), Moderate to Severe, Severe (10 ft/100 ft)

Location / Stream Name: Stream 4-1; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.3 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 9-Mar-14 Quantity: .35 inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



# Primary Headwater Habitat Evaluation Form

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

61

SITE NAME / LOC. Stream 4-2; Canyon Lakes, Bainbridge, Geauga County  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN Chagrin River Drainage Area (mi<sup>2</sup>) 0.04 mi<sup>2</sup>  
 Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE \_\_\_\_\_  
 DATE 3/17/2014 SCORER Mitchell/Allen COMMENTS \_\_\_\_\_

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

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

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 2px solid black; padding: 5px; font-size: 24px; font-weight: bold;">21</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	10%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	8%	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	15%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	12%	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____	
<input checked="" type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	_____	
<input type="checkbox"/> <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	25%	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		Total of Percentages of (B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock = 20%				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px; font-size: 24px;">15</div>		TOTAL NUMBER OF SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px; font-size: 24px;">6</div>		

**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]	_____	<b>Pool Depth Max=30</b> <div style="border: 2px solid black; padding: 5px; font-size: 24px; font-weight: bold;">25</div>
<input type="checkbox"/> >22.5 - 30 cm [30 pts]	_____	<input type="checkbox"/> <5 cm [5 pts]	_____	
<input checked="" type="checkbox"/> >10 - 22.5 cm [25 pts]	_____	<input type="checkbox"/> NO WATER/MOIST CHANNEL [0 pts]	_____	

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters) 

18

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

<input type="checkbox"/> >4.0 meters (13') [30 pts]	_____	<input checked="" type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	_____	<b>Bankfull Width Max=30</b> <div style="border: 2px solid black; padding: 5px; font-size: 24px; font-weight: bold;">15</div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13') [25 pts]	_____	<input type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	_____	
<input type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]	_____			

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters) 

1.1

This information must also be completed.

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

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

COMMENTS: \_\_\_\_\_

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

<input checked="" 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 200 ft (61 m) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input checked="" 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

Flat (0.5 ft/100 ft)  Flat to Moderate  Moderate (2 ft/100 ft)  Moderate to Severe  Severe (10 ft/100 ft)

Location / Stream Name: Stream 4-2; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.3 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 9-Mar-14 Quantity: .35 inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



Primary Headwater Habitat Evaluation Form

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

54

SITE NAME / LOC. Stream 5; Canyon Lakes, Bainbridge, Geauga County
SITE NUMBER RIVER BASIN Chagrin River Drainage Area (mi^2) 0.07 mi^2
Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE
DATE 3/17/2014 SCORER Mitchell/Allen COMMENTS Eastern reach assessed in area of channelization

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

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

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 8). Final metric score is sum of boxes A & B.

Table with 4 columns: TYPE, PERCENT, TYPE, PERCENT. Includes categories like BLDR SLABS, BOULDER, BEDROCK, COBBLE, GRAVEL, SAND, SILT, LEAF PACK/WOODY DEBRIS, FINE DETRITUS, CLAY or HARDPAN, MUCK, ARTIFICIAL.

HHEI Metric Points

Substrate Max = 40

24

A + B

Total of Percentages of (A) (B)

Bldr Slabs, Boulder, Cobble, Bedrock = 30%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 9

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):

Form with checkboxes for pool depth ranges: >30 centimeters, >22.5 - 30 cm, >10 - 22.5 cm, >5 cm - 10 cm, <5 cm, NO WATER/MOIST CHANNEL.

Pool Depth Max=30

15

COMMENTS: MAXIMUM POOL DEPTH (centimeters) 9

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

Form with checkboxes for bank full width ranges: >4.0 meters, >3.0-4.0 m, >1.5-3.0 m, >1.0 m - 1.5 m, <=1.0 m.

Bankfull Width Max=30

15

COMMENTS: AVERAGE BANKFULL WIDTH (meters) 1.3

This information must also be completed.

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

Form for Riparian Width and Floodplain Quality with checkboxes for various categories like Wide > 10 m, Mature Forest, Wetland, etc.

COMMENTS:

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

Form with checkboxes for flow regimes: Stream Flowing, Subsurface flow with isolated pools, Moist channel, Dry channel.

COMMENTS:

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

Form with checkboxes for sinuosity values: None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, > 3.

STREAM GRADIENT ESTIMATE

Form with checkboxes for stream gradient estimates: Flat, Flat to Moderate, Moderate, Moderate to Severe, Severe.

Location / Stream Name: Stream 5-0; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.5 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 9-Mar-14 Quantity: .35 inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



# Primary Headwater Habitat Evaluation Form

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

36

SITE NAME / LOC. Stream 5-1; Canyon Lakes, Bainbridge, Geauga County  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN Chagrin River Drainage Area (mi<sup>2</sup>) 0.07 mi<sup>2</sup>  
 Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE \_\_\_\_\_  
 DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS \_\_\_\_\_

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

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

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">16</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	5%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	5%	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	20%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	10%	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	10%	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	10%	
<input checked="" type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	40%	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		Total of Percentages of (B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock = 15%				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">9</div>		TOTAL NUMBER OF SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">7</div>		

**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 checked="" type="checkbox"/> >5 cm - 10 cm [15 pts]	_____	<b>Pool Depth Max=30</b> <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">15</div>
<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/MOIST CHANNEL [0 pts]	_____	

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters) 

9

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

<input type="checkbox"/> >4.0 meters (13') [30 pts]	_____	<input type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	_____	<b>Bankfull Width Max=30</b> <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">5</div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13') [25 pts]	_____	<input checked="" type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	_____	
<input type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]	_____			

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters) 

0.9

This information must also be completed.

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

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

COMMENTS: \_\_\_\_\_

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

<input type="checkbox"/> Stream Flowing	<input checked="" 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 200 ft (61 m) of channel) (Check ONLY one box):**

<input type="checkbox"/> None	<input checked="" type="checkbox"/> 1.0	<input type="checkbox"/> 2.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5
		<input type="checkbox"/> 3.0
		<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 checked="" type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
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Location / Stream Name: Stream 5-1; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.3 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



Primary Headwater Habitat Evaluation Form

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

18

SITE NAME / LOC. Stream 5-2; Canyon Lakes, Bainbridge, Geauga County
SITE NUMBER RIVER BASIN Chagrin River Drainage Area (mi^2) 0.07 mi^2
Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE
DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS

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

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

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 8). Final metric score is sum of boxes A & B.
TYPE PERCENT TYPE PERCENT
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pts] COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] SILT [3 pts] LEAF PACK/WOODY DEBRIS [3 pts] FINE DETRITUS [3 pts] CLAY or HARDPAN [0 pts] MUCK [0 pts] ARTIFICIAL [3pts]
Total of Percentages of (A) 3 (B) 5
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 3 TOTAL NUMBER OF SUBSTRATE TYPES: 5
HHEI Metric Points Substrate Max = 40 8 A + B

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):
>30 centimeters [20 pts] >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] >5 cm - 10 cm [15 pts] <5 cm [5 pts] NO WATER/MOIST CHANNEL [0 pts]
COMMENTS: MAXIMUM POOL DEPTH (centimeters) 3
Pool Depth Max=30 5

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):
>4.0 meters (13') [30 pts] >3.0-4.0 m (>9' 7"-13') [25 pts] >1.5-3.0 m (>9' 7"-4' 8") [20 pts] >1.0 m - 1.5 m (>3'3"-4'8") [15 pts] <=1.0 m (<= 3'3") [5 pts]
COMMENTS: AVERAGE BANKFULL WIDTH (meters) 0.8
Bankfull Width Max=30 5

This information must also be completed.

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

RIPARIAN WIDTH (Per Bank) L R (FLOODPLAIN QUALITY) (Most Predominant per Bank) L R
Wide > 10 m Mature Forest, Wetland Conservation Tillage
Moderate 5 - 10 m Immature Forest, Shrub or Old Field Urban or Industrial
Narrow < 5 m 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):
Stream Flowing Moist channel, isolated pools, no flow (Intermittent)
Subsurface flow with isolated pools (Interstitial) Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) of channel) (Check ONLY one box):
None 1.0 2.0 3.0
0.5 1.5 2.5 > 3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

Location / Stream Name: Stream 5-2; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.3 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



Primary Headwater Habitat Evaluation Form

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

24

SITE NAME / LOC. Stream 5-3; Canyon Lakes, Bainbridge, Geauga County
SITE NUMBER RIVER BASIN Chagrin River Drainage Area (mi^2) 0.07 mi^2
Length of Stream Reach ( 55 lf Lat. -81.356322 Long. 41.391964 RIVER MILE
DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS

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

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

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 8). Final metric score is sum of boxes A & B.

Table with columns: TYPE, PERCENT, TYPE, PERCENT. Includes categories like BLDR SLABS, BOULDER, BEDROCK, COBBLE, GRAVEL, SAND, SILT, LEAF PACK/WOODY DEBRIS, FINE DETRITUS, CLAY or HARDPAN, MUCK, ARTIFICIAL.

HHEI Metric Points

Substrate Max = 40

14

A + B

Total of Percentages of (A) 9 (B) 5
Bldr Slabs, Boulder, Cobble, Bedrock = 10%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5

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):

Table with columns: [ ] >30 centimeters [20 pts], [ ] >22.5 - 30 cm [30 pts], [ ] >10 - 22.5 cm [25 pts], [ ] >5 cm - 10 cm [15 pts], [X] <5 cm [5 pts], [ ] NO WATER/MOIST CHANNEL [0 pts]

Pool Depth Max=30

5

COMMENTS: MAXIMUM POOL DEPTH (centimeters) 4

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

Table with columns: [ ] >4.0 meters (13') [30 pts], [ ] >3.0-4.0 m (>9' 7"-13') [25 pts], [ ] >1.5-3.0 m (>9' 7"-4' 8") [20 pts], [ ] >1.0 m - 1.5 m (>3'3"-4'8") [15 pts], [X] <=1.0 m (<= 3'3") [5 pts]

Bankfull Width Max=30

5

COMMENTS: AVERAGE BANKFULL WIDTH (meters) 0.8

This information must also be completed.

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

Table for Riparian Width and Floodplain Quality with checkboxes for various categories like Wide > 10 m, Mature Forest, Wetland, etc.

COMMENTS:

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

Table for Flow Regime with checkboxes for Stream Flowing, Subsurface flow with isolated pools, Moist channel, Dry channel.

COMMENTS:

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

Table for Sinuosity with checkboxes for None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, > 3

STREAM GRADIENT ESTIMATE

Table for Stream Gradient Estimate with checkboxes for Flat, Flat to Moderate, Moderate, Moderate to Severe, Severe

Location / Stream Name: Stream 5-3; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.5 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



# Primary Headwater Habitat Evaluation Form

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

42

SITE NAME / LOC. Stream 7; Canyon Lakes, Bainbridge, Geauga County  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN Chagrin River Drainage Area (mi<sup>2</sup>) 0.05 mi<sup>2</sup>  
 Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE \_\_\_\_\_  
 DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS \_\_\_\_\_

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

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

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">22</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	9%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	5%	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	18%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	15%	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	3%	
<input checked="" type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	25%	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	_____	
<input type="checkbox"/> <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	25%	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		Total of Percentages of (B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock = 20%				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 5px; font-size: 24px;">15</div>		TOTAL NUMBER OF SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 5px; font-size: 24px;">7</div>		

**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]	_____	<b>Pool Depth Max=30</b> <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">5</div>
<input type="checkbox"/> >22.5 - 30 cm [30 pts]	_____	<input checked="" type="checkbox"/> <5 cm [5 pts]	_____	
<input type="checkbox"/> >10 - 22.5 cm [25 pts]	_____	<input type="checkbox"/> NO WATER/MOIST CHANNEL [0 pts]	_____	

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters) 

4

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

<input type="checkbox"/> >4.0 meters (13') [30 pts]	_____	<input checked="" type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	_____	<b>Bankfull Width Max=30</b> <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">15</div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13') [25 pts]	_____	<input type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	_____	
<input type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]	_____			

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters) 

1.3

This information must also be completed.

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

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

COMMENTS: \_\_\_\_\_

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

<input checked="" 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 200 ft (61 m) of channel) (Check ONLY one box):**

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input checked="" 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 checked="" 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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Location / Stream Name: Stream 7-0; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.1  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



Primary Headwater Habitat Evaluation Form

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

45

SITE NAME / LOC. Stream 8; Canyon Lakes, Bainbridge, Geauga County
SITE NUMBER RIVER BASIN Chagrin River Drainage Area (mi^2) 0.05 mi^2
Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE
DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS Portions of this stream have been channelized

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

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

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 8). Final metric score is sum of boxes A & B.
TYPE PERCENT TYPE PERCENT
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pts] COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] SILT [3 pts] LEAF PACK/WOODY DEBRIS [3 pts] FINE DETRITUS [3 pts] CLAY or HARDPAN [0 pts] MUCK [0 pts] ARTIFICIAL [3pts]
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 20%
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 6

HHEI Metric Points
Substrate Max = 40
15
A + B

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):
>30 centimeters [20 pts] >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] >5 cm - 10 cm [15 pts] <5 cm [5 pts] NO WATER/MOIST CHANNEL [0 pts]
COMMENTS: MAXIMUM POOL DEPTH (centimeters) 8

Pool Depth Max=30
15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):
>4.0 meters (13') [30 pts] >3.0-4.0 m (>9' 7"-13') [25 pts] >1.5-3.0 m (>9' 7"-4' 8") [20 pts] >1.0 m - 1.5 m (>3'3"-4'8") [15 pts] <=1.0 m (<= 3'3") [5 pts]
COMMENTS: AVERAGE BANKFULL WIDTH (meters) 1.4

Bankfull Width Max=30
15

This information must also be completed.

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

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

COMMENTS:

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):
Stream Flowing Subsurface flow with isolated pools (Interstitial) Moist channel, isolated pools, no flow (Intermittent) Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) of channel) (Check ONLY one box):
None 0.5 1.0 1.5 2.0 2.5 3.0 > 3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

Location / Stream Name: Stream 8-0; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.5 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



# Primary Headwater Habitat Evaluation Form

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

26

SITE NAME / LOC. Stream 8-1; Canyon Lakes, Bainbridge, Geauga County  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN Chagrin River Drainage Area (mi<sup>2</sup>) 0.05 mi<sup>2</sup>  
 Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE \_\_\_\_\_  
 DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS \_\_\_\_\_

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

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

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">16</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	10%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	10%	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	20%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	10%	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	5%	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	15%	
<input checked="" type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	30%	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		Total of Percentages of (B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock = 20%				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">9</div>		TOTAL NUMBER OF SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">7</div>		

**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]	_____	<b>Pool Depth Max=30</b> <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">5</div>
<input type="checkbox"/> >22.5 - 30 cm [30 pts]	_____	<input checked="" type="checkbox"/> <5 cm [5 pts]	_____	
<input type="checkbox"/> >10 - 22.5 cm [25 pts]	_____	<input type="checkbox"/> NO WATER/MOIST CHANNEL [0 pts]	_____	

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters) 

3

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

<input type="checkbox"/> >4.0 meters (13') [30 pts]	_____	<input type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	_____	<b>Bankfull Width Max=30</b> <div style="border: 2px solid black; padding: 10px; font-size: 24px; font-weight: bold;">5</div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13') [25 pts]	_____	<input checked="" type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	_____	
<input type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]	_____			

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters) 

0.6

This information must also be completed.

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

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

COMMENTS: \_\_\_\_\_

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

<input type="checkbox"/> Stream Flowing	<input checked="" 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 200 ft (61 m) of channel) (Check ONLY one box):**

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input checked="" type="checkbox"/> 3.0
<input checked="" 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 checked="" type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
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PHWH Form Page 1

Location / Stream Name: Stream 8-1; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.5 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



# Primary Headwater Habitat Evaluation Form

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

12

SITE NAME / LOC. Stream 8-1-2; Canyon Lakes, Bainbridge, Geauga County  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN Chagrin River Drainage Area (mi<sup>2</sup>) 0.05 mi<sup>2</sup>  
 Length of Stream Reach ( 167 lf Lat. -81.356322 Long. 41.391964 RIVER MILE \_\_\_\_\_  
 DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS \_\_\_\_\_

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

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

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; font-size: 24px; width: 40px; margin: 0 auto;">7</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	5%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	40%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	5%	<input checked="" type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	50%	
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		Total of Percentages of (B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock = 0%				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">3</div>		TOTAL NUMBER OF SUBSTRATE TYPES: <div style="border: 1px solid black; padding: 2px 10px; font-size: 24px;">4</div>		

**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]	_____	<b>Pool Depth Max=30</b> <div style="border: 1px solid black; padding: 5px; font-size: 24px; width: 40px; margin: 0 auto;">0</div>
<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 checked="" type="checkbox"/> NO WATER/MOIST CHANNEL [0 pts]	_____	

COMMENTS: \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters) 

0

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

<input type="checkbox"/> >4.0 meters (13') [30 pts]	_____	<input type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	_____	<b>Bankfull Width Max=30</b> <div style="border: 1px solid black; padding: 5px; font-size: 24px; width: 40px; margin: 0 auto;">5</div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13') [25 pts]	_____	<input checked="" type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	_____	
<input type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]	_____			

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters) 

0.4

This information must also be completed.

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

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

COMMENTS: \_\_\_\_\_

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

Stream Flowing  Moist channel, isolated pools, no flow (Intermittent)  
 Subsurface flow with isolated pools (Interstitial)  Dry channel, no water, (Ephemeral)

COMMENTS: \_\_\_\_\_

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

None  1.0  2.0  3.0  
 0.5  1.5  2.5  > 3

**STREAM GRADIENT ESTIMATE**

Flat (0.5 ft/100 ft)  Flat to Moderate  Moderate (2 ft/100 ft)  Moderate to Severe  Severe (10 ft/100 ft)

Location / Stream Name: Stream 8-1-2; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.5 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



Primary Headwater Habitat Evaluation Form

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

22

SITE NAME / LOC. Stream 8-2; Canyon Lakes, Bainbridge, Geauga County
SITE NUMBER RIVER BASIN Chagrin River Drainage Area (mi^2) 0.05 mi^2
Length of Stream Reach ( 200 lf Lat. -81.356322 Long. 41.391964 RIVER MILE
DATE 11/19/2013 SCORER Mitchell/Allen COMMENTS

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

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

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 8). Final metric score is sum of boxes A & B.

Table with 4 columns: TYPE, PERCENT, TYPE, PERCENT. Includes categories like BLDR SLABS, BOULDER, BEDROCK, COBBLE, GRAVEL, SAND, SILT, LEAF PACK/WOODY DEBRIS, FINE DETRITUS, CLAY or HARDPAN, MUCK, ARTIFICIAL.

HHEI Metric Points

Substrate Max = 40

12

A + B

Total of Percentages of (A) (B)

Bldr Slabs, Boulder, Cobble, Bedrock = 10%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6

TOTAL NUMBER OF SUBSTRATE TYPES: 6

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):

Table with 2 columns: Pool Depth options and their corresponding points. Options include >30 centimeters, >22.5 - 30 cm, >10 - 22.5 cm, >5 cm - 10 cm, <5 cm, NO WATER/MOIST CHANNEL.

Pool Depth Max=30

5

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 3

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

Table with 2 columns: Bank Full Width options and their corresponding points. Options include >4.0 meters, >3.0-4.0 m, >1.5-3.0 m, >1.0 m - 1.5 m, <=1.0 m.

Bankfull Width Max=30

5

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.9

This information must also be completed.

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

Table for Riparian Width and Floodplain Quality. Includes categories like Wide > 10 m, Moderate 5 - 10 m, Narrow < 5 m, None, Mature Forest, Wetland, etc.

COMMENTS:

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

Table for Flow Regime options: Stream Flowing, Subsurface flow with isolated pools (Interstitial), Moist channel, isolated pools, no flow (Intermittent), Dry channel, no water, (Ephemeral).

COMMENTS:

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

Table for Sinuosity options: None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, > 3.

STREAM GRADIENT ESTIMATE

Table for Stream Gradient Estimate options: Flat (0.5 ft/100 ft), Flat to Moderate, Moderate (2 ft/100 ft), Moderate to Severe, Severe (10 ft/100 ft).

Location / Stream Name: Stream 8-2; Canyon Lakes, Bainbridge, Geauga County

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: McFarland Creek Distance from Evaluated Stream <0.5 Miles  
 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 Quad Name: South Russell NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: First Order  
County: Geauga Township/City: Bainbridge

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: 17-Nov-13 Quantity: .67inches

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) N (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**



# Primary Headwater Habitat Evaluation Form

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

0

SITE NAME / LOC. \_\_\_\_\_

SITE NUMBER \_\_\_\_\_ RIVER BASIN \_\_\_\_\_ Drainage Area (mi<sup>2</sup>) 0.00 mi<sup>2</sup>

Length of Stream Reach ( 200 ft ) Lat. 81 ° 48' 54.50" W Long. 41 ° 18' 49.76"N 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  NONE / NATURAL CHANNEL  RECOVERED  RECOVERING  RECENT OR NO RECOVER MODIFICATIONS:

**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 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT	<b>HHEI Metric Points</b> Substrate Max = 40 <div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	_____	
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3pts]	_____	
Total of Percentages of (A) _____		(B) _____		
Bldr Slabs, Boulder, Cobble, Bedrock				
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <input type="text"/>		TOTAL NUMBER OF SUBSTRATE TYPES: <input type="text"/>		

**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]	_____	<b>Pool Depth Max=30</b> <div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>
<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/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"/> >4.0 meters (13') [30 pts]	_____	<input type="checkbox"/> >1.0 m - 1.5 m (>3'3"-4'8") [15 pts]	_____	<b>Bankfull Width Max=30</b> <div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>
<input type="checkbox"/> >3.0-4.0 m (>9' 7"-13' ) [25 pts]	_____	<input type="checkbox"/> ≤1.0 m (≤ 3'3") [5 pts]	_____	
<input type="checkbox"/> >1.5-3.0 m (>9' 7"-4' 8") [20 pts]	_____			

COMMENTS: \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters)

This information must also be completed.

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

<b>RIPARIAN WIDTH</b>		<b>(FLOODPLAIN QUALITY)</b>	
L	R	L	R
<input type="checkbox"/> <input type="checkbox"/> Wide > 10 m	<input type="checkbox"/> <input type="checkbox"/> Mature Forest, Wetland	<input type="checkbox"/> <input type="checkbox"/> Conservation Tillage	
<input type="checkbox"/> <input type="checkbox"/> Moderate 5 - 10 m	<input type="checkbox"/> <input type="checkbox"/> Immature Forest, Shrub or Old Field	<input type="checkbox"/> <input type="checkbox"/> Urban or Industrial	
<input type="checkbox"/> <input type="checkbox"/> Narrow < 5 m	<input type="checkbox"/> <input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/> <input type="checkbox"/> Open Pasture, Row Crop	
<input type="checkbox"/> <input type="checkbox"/> None	<input type="checkbox"/> <input type="checkbox"/> Fenced Pasture	<input type="checkbox"/> <input type="checkbox"/> 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 200 ft (61 m) of channel) (Check ONLY one box):**

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input checked="" 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**

Flat (0.5 ft/100 ft)  Flat to Moderate  Moderate (2 ft/100 ft)  Moderate to Severe  Severe (10 ft/100 ft)

Location / Stream Name: \_\_\_\_\_

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 Quad Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: \_\_\_\_\_ Township/City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N) Y Date of Last Precipitation: \_\_\_\_\_ Quantity: \_\_\_\_\_

Photograph Information: See Attached

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

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

Field Measures: Temp (C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH(S.U.) \_\_\_\_\_ Conductivity(pmhos/cm) \_\_\_\_\_

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

Additional comments/description pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N) \_\_\_\_\_ (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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs/Tadpoles Observed? \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ 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 →**

**Location/Stream Name:** \_\_\_\_\_

Review: 4/19/06

**PHWH STREAM BIOLOGICAL CHARACTERISTICS FIELD SHEET:**

**1. Fish:** Voucher Specimens Retained? (Y/N) \_\_\_\_\_ Time Spent (Minutes): 30

Sample Method: fine mesh benthic invert net Stream Length Assessed (meters): 200

Species	Number Caught	Notes


2. **Salamanders:** Voucher Specimens Retained? (Y/N) \_\_\_\_\_ Time Spent (Minutes): 30  
 Sample Method: Visual Encounter Survey (VES) Stream Length Assessed (meters): 200

Species (Genus)	# Larvae	# Juveniles / Adults	Total Number
<b>Mtn. Dusky</b> ( <i>Desmognathus ochrophaeus</i> )			
<b>Northern Dusky</b> ( <i>Desmognathus fuscus</i> )			
<b>Two-lined</b> ( <i>Eurycea bislineata</i> )			
<b>Long-tailed</b> ( <i>Eurycea longicauda</i> )			
<b>Cave</b> ( <i>Eurycea lucifuga</i> )			
<b>Red</b> ( <i>Pseudotriton ruber</i> )			
<b>Mud</b> ( <i>Pseudotriton montanus</i> )			
<b>Spring</b> ( <i>Gyrinophilus porphyriticus</i> )			
<b>Mole spp.</b> ( <i>Ambystoma</i> spp.)			
<b>Four-toed</b> ( <i>Hemidactylium scutalum</i> )			
<b>Other</b> (name)			
<b>Total</b>	0	0	0

Notes on Vertebrates: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Location/Stream Name: 0

3. **Macroinvertebrate Scoring Sheet:**

**THE HEADWATER MACROINVERTEBRATE FIELD EVALUATION INDEX (HMFEI) SCORING SHEET**

Indicate Abundance of Each Taxa Above each White Box.  
 Record HMFEI Scoring Value Points Within each Box.  
 For EPT taxa, also indicate the different taxa present.

**Key:** V = Very Abundant ( > 50 ); A = Abundant ( 10 - 50 ); C = Common ( 3 - 9 ); R = Rare ( < 3 )

Sessile Animals ( <b>Portifera, Cnidaria, Bryozoa</b> ) (HMFEI pts= 1) <input type="text"/>	Crayfish ( <b>Decopoda</b> ) (HMFEI pts= 2) <input type="text"/>	Fishfly Larvae ( <b>Corydalidae</b> ) (HMFE pts= 3) <input type="text"/>
Aquatic worms ( <b>Turbellaria, Oligochaeta, Hirundinea</b> ) (HMFEI pts= 1) <input type="text"/>	Dragonfly Nymphs ( <b>Anisoptera</b> ) (HMFEI pts= 2) <input type="text"/>	Water Penny Beetles ( <b>Psephenidae</b> ) (HMFE pts= 3) <input type="text"/>

Sow Bugs <b>(Isopoda)</b> (HMFEI pts= 1) <input type="text"/>	Riffle Beetles (Dryopidae, <b>Elmidae, Ptilodactylidae)</b> (HMFEI pts= 2) <input type="text"/>	Cranefly Larvae <b>(Tipulidae)</b> (HMFE pts= 3) <input type="text"/>
Scuds <b>(Amphipoda)</b> (HMFEI pts= 1) <input type="text"/>	Larvae of Other Flies <b>(Diptera) Name:</b> (HMFEI pts= 2) <input type="text"/>	<b>EPT TAXA</b> Total No. EPT Taxa _____
Water Mites <b>(Hydracarina)</b> (HMFEI pts= 1) <input type="text"/>	Midges (Chironomidae) (HMFEI pts= 2) <input type="text"/>	Mayfly Nymphs <b>(Ephemeroptera)</b> Taxa Present: [HMFEI pts= <input type="text"/> No. Taxa (x) 3] <input type="text"/>
Damselfly Nymphs <b>(Zygoptera)</b> (HMFEI pts= 1) <input type="text"/>	Snails <b>(Gastropoda)</b> (HMFEI pts= 2) <input type="text"/>	
Alderfly Larvae <b>(Sialidae)</b> (HMFEI pts= 1) <input type="text"/>	Clams <b>(Bivalvia)</b> (HMFEI pts= 2) <input type="text"/>	Stonefly Nymphs <b>(Plecoptera)</b> Taxa Present: [HMFEI pts= <input type="text"/> No. Taxa (x) 3] <input type="text"/>
Other Beetles <b>(Coleoptera)</b> (HMFEI pts= 1) <input type="text"/>	Other Taxa: <input type="text"/>	
Other Taxa: <b>(Hemiptera)</b> Water Striders <input type="text"/>	Other Taxa: <input type="text"/>	Caddisfly Larvae <b>(Trichoptera)</b> Taxa Present: [HMFEI pts= <input type="text"/> No. Taxa (x) 3] <input type="text"/>
Other Taxa: <input type="text"/>	Other Taxa: <input type="text"/>	

\*Note: EPT identification based upon Family or Genus level of taxonomy

Voucher Sample ID: \_\_\_\_\_

Time Spent (minutes): 30

**Notes on Macroinvertebrates:** (Predominant Organisms; Other Common Organisms; Diversity Estimate): \_\_\_\_\_

Final HMFEI Calculated Score (Sum of All White Box Scores) =

IF Final HMFEI Score is > 18,	Then CLASS III PHWH STREAM
IF Final HMFEI Score is 6 to 18,	Then CLASS II PHWH STREAM
IF Final HMFEI Score is < 6,	Then CLASS I PHWH STREAM

0