

Transportation LOP Checklist

KY 30 – Jackson & Owsley Counties

KYTC Item No. 10-279.61

Transportation LOP (LRL-2006-259) Complete Application Check List/Cover Sheet.

| | | | |
|---|----------------------------------|--------------------------------|-----------|
| Project Name: KY 30 | Corps I. D. LRL-2017-1052 | Corps PM: Crystal Byrd | |
| Applicant: KY Transportation Cabinet | Agent: Tyler Reynolds | KYTC Item No. 10-279.61 | |
| Application Information | | Completed | |
| | N/A | Yes | No |
| D.A. Application w/signature | | X | |
| Maps (Topo w/project & impacts) | | X | |
| JD (prelim or approved) | | X | |
| Wetland Data Sheets (regional supplements) | | X | |
| RBP Sheets | | X | |
| EKSAP sheets | | X | |
| Impact Table & Mitigation Calculations | | X | |
| Mitigation Statement | | X | |
| Final Mitigation Plan (if Permittee Responsible) | X | | |
| Alt. Analysis | | X | |
| Avoidance/Minimization | | X | |
| Cumulative Impacts Table - if required | X | | |
| Section 7 Effects Determination(s)/Concurrence | | | X |
| Section 106 Concurrence & KYSHPO checklist | | X | |
| Individual WQC, waiver or general certification | | X | |
| Electronic Copy of Submitted Documents | | X | |
| ORM Waters Upload Sheet (latest version) | | X | |
| State or Federally Funded Statement | | X | |
| Date of Pre-App Meeting: | | | X |
| Public Interest/Environmental Effects | | Addressed | |
| | N/A | Yes | No |
| Economics | | X | |
| Aesthetics | | X | |
| Special Aquatic Sites | | X | |
| Fish and Wildlife Values | | X | |
| Flood Hazards | | X | |
| Floodplain Values | | X | |
| Land Use Classification | | X | |
| Navigation | | X | |
| Shore Erosion/Accretion Patterns | | X | |
| Recreation | | X | |
| Existing and Potential Water Supplies; Conservation | | X | |
| Water Quality | | X | |
| Energy Needs | | X | |
| Safety | | X | |
| Food and Fiber Production | | X | |
| Mineral Needs | | X | |
| Consideration of Property Ownership | | X | |
| Other: | X | | |

USACE Application

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**

33 CFR 325. The proponent agency is CECW-CO-R.

**Form Approved -
OMB No. 0710-0003
Expires: 30-SEPTEMBER-2015**

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

| | | | |
|--------------------|----------------------|------------------|------------------------------|
| 1. APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED | 4. DATE APPLICATION COMPLETE |
|--------------------|----------------------|------------------|------------------------------|

(ITEMS BELOW TO BE FILLED BY APPLICANT)

| | | | |
|---|--|--|--|
| 5. APPLICANT'S NAME First - Tyler Middle - Last - Reynolds Company - KYTC E-mail Address - tyler.reynolds@ky.gov | | 8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Steve Middle - Last - Rice Company - HMB Professional Engineers, Inc. E-mail Address - srice@hmbpe.com | |
| 6. APPLICANT'S ADDRESS: Address- 200 Mero Street City - Frankfort State - KY Zip - 40602 Country - USA | | 9. AGENT'S ADDRESS: Address- 3 HMB Circle City - Frankfort State - KY Zip - 40601 Country - USA | |
| 7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax 502-564-7250 | | 10. AGENTS PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax 502-695-9800 | |

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT

DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

| | | | |
|---|--|---|--|
| 12. PROJECT NAME OR TITLE (see instructions) 10-279.61 KY 30 reconstruction in Jackson & Owsley Counties, KY | | | |
| 13. NAME OF WATERBODY, IF KNOWN (if applicable) Laurel Fk, Herd Fk, Sturgeon Cr, Little Sturgeon Cr and their tribs | | 14. PROJECT STREET ADDRESS (if applicable) Address City - State- Zip- | |
| 15. LOCATION OF PROJECT Latitude: °N 37.7342652 Longitude: °W 83.900162 | | | |
| 16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Section - Township - Range - | | | |

17. DIRECTIONS TO THE SITE

From Lexington, KY take I75 South to Berea and then take US 421 South to Tyner. This is near the beginning of the project.

18. Nature of Activity (Description of project, include all features)

Reconstruction of KY 30 from Tyner to Travellers Rest. The project involves the construction of approximately 29 culverts and 25 channel changes.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

For safety and added site distance.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

To necessitate the construction of KY 30, the placement of culverts is required.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

| Type Amount in Cubic Yards | Type Amount in Cubic Yards | Type Amount in Cubic Yards |
|--------------------------------|-------------------------------|-------------------------------|
| Native rock and soil: 3,840 CY | | |

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 2.585 acres
or
Linear Feet 24,012 feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

The project uses the existing highway corridor for a significant portion of the project (where feasible) to minimize impacts, and in-lieu fee will be paid to compensate for stream and wetland loss.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City -

State -

Zip -

b. Address-

City -

State -

Zip -

c. Address-

City -

State -

Zip -

d. Address-

City -

State -

Zip -

e. Address-

City -

State -

Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

| AGENCY | TYPE APPROVAL* | IDENTIFICATION NUMBER | DATE APPLIED | DATE APPROVED | DATE DENIED |
|--------|----------------|--------------------------|--------------|---------------|-------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Attachment Block 25

**Jackson & Owsley Counties
KY 30 reconstruction
Item No. 10-279.61**

Phillip & Linda Akemon
P.O. Box 359
Gray Hawk, KY 40434

Phillip Wayne Akemon
1171 Oak Grove Church Road
Tyner, KY 40486

Phillip Akemon
1410 Oak Grove Church Road
Tyner, KY 40486

Christine Anderson
P.O. Box 202
Tyner, KY 40486

Marlene Baldwin
2816 Hwy 1431
Tyner, KY 40486

Vernon & Nicki Baldwin
439 Peters Road
McKee, KY 40447

Wilma Lee Barrett
1100 Kenneth Barrett Road
Booneville, KY 41314

Michael Allen Botner
Route 2 Box 105J
Booneville, KY 41314

Brent & Cynthia Bingham
282 Hickory Flat Road
Tyner, KY 40486

Ricky Joe & Sylvia Gale Boggs
1094 US Hwy 421 South
McKee, KY 40447

Brandi Bowles
17 Zekes Point Road
Tyner, KY 40486

Alan Bowling
39 Don Cunigan Road
Tyner, KY 40486
Gerald & Cynthia Bowling
W3145 Clearview Road
Sheboygan Falls, WI 53085

Ronald Bowling
1118 Seneca Trail
Georgetown, KY 40324

Anna Brewer
Route 2 Box 106
Booneville, KY 41314

Glendon Brewer & Glema & James Dooley
Route 2 Box 106
Booneville, KY 41314

Kathleen Brown
804 South Main Street
Fairmont, IN 46928

Clayton Bank and Trust
520 W Summit Hill Drive Sw. #801
Knoxville, TN 37902

Marlon & Carla Coffey
2856 Hwy 1431
Tyner, KY 40486

Patricia Collinsworth
2985 Indian Ripple Road
Xenia, OH 45385

Terry & Michelle Coomer
P.O. Box 1420
London, KY 40743

Anthony R. Cunagin
219 Meadow Road
Richmond, KY 40475

Donald Ray Cunigan
142 Don Cunagin Road
Tyner, KY 40486

Eddy Cunigan
236 7th Ave South
Sartell, MN 56377

Roy Jr. & Geraldine Davidson
125 Zekes Point Road
Tyner, KY 40486

Jeff Dooley
1200 Candy Branch Road
Booneville, KY 41314

Cody Dooley
1400 Candy Branch Road
Booneville, KY 41314

Wallace & Rita Edwards
10334 KY 30 West
Booneville, KY 41314

William & Wanda Fields
5019 Ells Branch Road
Manchester, KY 40962

Bennie & Debbie Fields
P.O. Box 74
Tyner, KY 40486

Tabitha Finley-Jenkins
P.O. Box 671
Tyner, KY 40486

James E. & Betty Flannery
Route 2 Box 91
Booneville, KY 41314

Michael Scott Flannery
80 Wright Road
Tyner, KY 40486

Raymond Flannery
6807 Hwy 30 East
Tyner, KY 40486

Lena Flannery
6571 Hwy 30 East
723 Hwy 1431

Lonnie Gabbard
723 Hwy 1431
Tyner, KY 40486

Lonnie Gabbard
98 Jackson Drive
Tyner, KY 40486

Lonnie Gabbard
80 Jackson Drive
Tyner, KY 40486

Wanda Hammons
7880 54th Ave North Lot 51
St. Petersburg, FL 33709

Sara Mae Haymons
177 Botner Road P.O. Box 16
Vincent, KY 41386

Bo D. & Shanay Hicks
2200 Hwy 30 East
Tyner, KY 40486

Ronnie & Sharon Hicks
2150 Hwy 30 East
Tyner, KY 40486

Sharon Hicks
2215 Hwy 30 East
Tyner, KY 40486

John & Sally Hornsby
2354 Hwy 30 East
Tyner, KY 40486

Claude Sr. & Adrian & Neil Hudson
2268 Hwy 30 East
Tyner, KY 40486

Cassie Hudson
P.O. Box 997
Booneville, KY 41314

Donald & Peggy Hurst
7259 KY 1071
Tyner, KY 40486

David Jackson
1490 Moore Road
Tyner, KY 40486

Jason Wayne Flannery & Jennifer M. Wilson
6754 Hwy 30 East
Tyner, KY 40486

Wendell & Linda Kilburn
175 Hickory Flat Road
Tyner, KY 40486

L-M Asphalt Partners, LTD
3009 Atkinson Ave Suite 400
Lexington, KY 40509

Jessie Ledgear
314 Zekes Point Road
Tyner, KY 40486

Linda Darlene Madden
70 Zekes Point Road
Tyner, KY 40486

Marjorie Madden
3973 Hwy 30 East
Tyner, KY 40486

Magnum Unlimited, LLC
1050 Shiloh Road STE 306
Kennesaw, GA 30144

Freda Marcum
10270 KY 30 West
Booneville, KY 41314

Paul Marks
677 S.R. 89 North
McKee, KY 40447

Kettisha A. McDowell Revocable Living Trust
116 Beverly Lane
Dry Ridge, KY 41035

Gene & Theresa McQueen
657 South Hwy 1431
Tyner, KY 40486

Stephanie & Ivan McQueen
2322 Hwy 1431
Tyner, KY 40486

Marie Miller
9081 White Water Drive
Brookville, IN 47012

David & Sandra Miller
251 Green Wright Road
Tyner, KY 40486

John M. Moore
528 Hwy 1431
Tyner, KY 40486

Tim & Rhonda Neeley
1529 Privett Road
Tyner, KY 40486

Annette Osborne
208 Beaumont Place
Winchester, KY 40391

Donald & Lucy Pennington
490 Moores Road
Tyner, KY 40486

Peters Farms, LLC
P.O. Box 2043
Lexington, KY 40594

Glen Peters
Route 2 Box 55-A
Booneville, KY 41314

Tony, Brittany, & Connie Price
Route 2 Box 105-A
Booneville, KY 41314

Rena Conner & Rhnea Privett
P.O. Box 1213
Stanton, KY 40380

Helen Ridnour
316 Hwy 1431
Tyner, KY 40486

Helen Ridnour
268 Hwy 1431
Tyner, KY 40486

Shannon & Rhonda Robinson
55 East Hwy 577
Manchester, KY 40962

Edna Roush
Apt #10-B 3551 Tylersville Road
Hamilton, OH 45011

Franklin Rowland
219 Charlie Sizemore Road
Manchester, KY 40962

Glenna Sanders
669 Hwy 1431
Tyner, KY 40486

Chester Smith
669 Hwy 1431
Tyner, KY 40486

Robert Strong
1200 Candy Branch Road
Booneville, KY 41314

James E. & Sheila Strong
1815 Moores Road
Tyner, KY 40486

Virgil H. Thomas
177 Botner Road P.O. Box 16
Vincent, KY 41386

Randy & Teresa Whicker
7291 Hwy 421 South
McKee, KY 40447

Bernard & Ruth Ann Wilson
Route 2 Box 108-L
Booneville, KY 41314

Michael & Wanda Wilson
P.O. Box 281
Booneville, KY 41314

Jason Wayne & Jennifer M. Wilson
7303 Hwy 30 East
Tyner, KY 40486

Russell Wilson
1619 Hwy 1431
Tyner, KY 40486

Jenny Yarbrough
815 Hwy 1431
Tyner, KY 40486

John & Myrtle York
62 Hwy 578 North
Annville, KY 40402

KY Div. of Water Application

COMMONWEALTH OF KENTUCKY
ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER

APPLICATION FOR PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM
AND / OR WATER QUALITY CERTIFICATION

Chapter 151 of the Kentucky Revised Statutes requires approval from the Division of Water prior to any construction or other activity in or along a stream that could in any way obstruct flood flows or adversely impact water quality. *If the project involves work in a stream, such as bank stabilization, dredging or relocation, you will also need to obtain a 401 Water Quality Certification (WQC) from the Division of Water.* This completed form will be forwarded to the Water Quality Branch for WQC processing. The project may not start until all necessary approvals are received from the KDOW. For questions concerning the WQC process, contact the WQC section at 502/564-3410.

If the project will disturb one or more acres of land, or if the project is part of a larger common plan of development or sale that ultimately will disturb one or more acres, you will also need to complete a Notice of Intent for general permit coverage for storm water discharges associated with construction activities (NOI-SWCA). You may find the forms for Kentucky Pollution Discharge Elimination System (KPDES) at http://www.water.ky.gov/homepage_repository/kpdes_permit_aps.htm or <https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7>. Return forms to the Floodplain Management Section of the KDOW. This general permit will require you to create and implement an erosion control plan for the project.

1. OWNER: Kentucky Transportation Cabinet
Give name of person(s), company, governmental unit, or other owner of proposed project.
MAILING ADDRESS: 200 Mero Street, Frankfort KY 40622

TELEPHONE #: (502)564-7250 EMAIL: tyler.reynolds@ky.gov
2. AGENT: Steve Rice
Give name of person(s) submitting application, if other than owner.
ADDRESS: HMB Professional Engineers, Inc., 3HMB Circle
Frankfort, KY 40601
TELEPHONE #: 502-695-9800 EMAIL: srice@hmbpe.com
3. ENGINEER: _____ P.E. NUMBER: _____
Contact Division of Water if waiver can be granted.
TELEPHONE #: _____ EMAIL: _____
4. DESCRIPTION OF CONSTRUCTION: Reconstruction of KY 30 from Tyner to Travellers Rest.
Describe the type and purpose of construction and describe stream/wetland impact

5. COUNTY: Jackson & Owsley NEAREST COMMUNITY: Tyner
6. USGS QUAD NAME: Sturgeon, Tyner, Maulden LATITUDE/LONGITUDE: 37.7342652; -83.900162
7. STREAM NAME: Laurel Fk, Herd Fk, Sturgeon Cr, Little Sturgeon Cr WATERSHED SIZE (in acres): 9,408
8. LINEAR FEET OF STREAM IMPACTED AND/OR ACRES OF WETLAND IMPACT: 24,012 feet of stream
and 2.585 acres of wetlands
9. DIRECTIONS TO SITE: From Lexington, KY take I75 South to Berea and then take US 421 South
to Tyner. This is near the beginning of the project

10. **IS ANY PORTION OF THE REQUESTED PROJECT NOW COMPLETE?** Yes ☒ No ☐ If yes, identify the completed portion on the drawings you submit and indicate the date activity was completed. DATE: _____
11. **ESTIMATED BEGIN CONSTRUCTION DATE:** 2018
12. **ESTIMATED END CONSTRUCTION DATE:** 2019
13. **HAS AN APPLICATION BEEN SUBMITTED TO THE US ARMY, CORPS of ENGINEERS?** ☒ Yes ☐ No
14. **AN APPLICANT FOR A PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM MUST ADDRESS PUBLIC NOTICE:**
- (a) PUBLIC NOTICE HAS BEEN GIVEN FOR THIS PROPOSAL BY THE FOLLOWING MEANS:
- _____ Public notice in newspaper having greatest circulation in area (provide newspaper clipping or affidavit)
- _____ Adjacent property owner(s) affidavits (Contact Division of Water for requirements.)
- (b) ☐ **I REQUEST WAIVER OF PUBLIC NOTICE BECAUSE:**
- ☐ **The scope of work only impacts one willing landowner.** _____
Contact Division of Water for requirements.
- * **PUBLIC NOTICE FOR 401 WATER QUALITY CERTIFICATIONS IS GOVERNED BY 401 KAR 9:010**
15. **I HAVE CONTACTED THE FOLLOWING CITY OR COUNTY OFFICIALS CONCERNING THIS PROJECT:**
- _____
- Give name and title of person(s) contacted and provide copy of any approval city or county may have issued.
16. **LIST OF ATTACHMENTS:** Please reference attached application package
List plans, profiles, or other drawings and data submitted. Attach a copy of a 7.5 minute USGS topographic map clearly showing the project location.
17. **I, (owner) CERTIFY THAT THE OWNER OWNS OR HAS EASEMENT RIGHTS ON ALL PROPERTY ON WHICH THIS PROJECT WILL BE LOCATED OR ON WHICH RELATED CONSTRUCTION WILL OCCUR (for dams, this includes the area that would be impounded during the design flood).**
18. **REMARKS:** _____

I hereby request approval for construction across or along a stream as described in this application and any accompanying documents. To the best of my knowledge, all the information provided is true and correct.

SIGNATURE: _____
Owner or Agent sign here. (If signed by Agent, a Power of Attorney should be attached.)

DATE: _____

SIGNATURE OF LOCAL FLOODPLAIN COORDINATOR:

Permit application will be returned to applicant if not properly endorsed by the local floodplain coordinator.

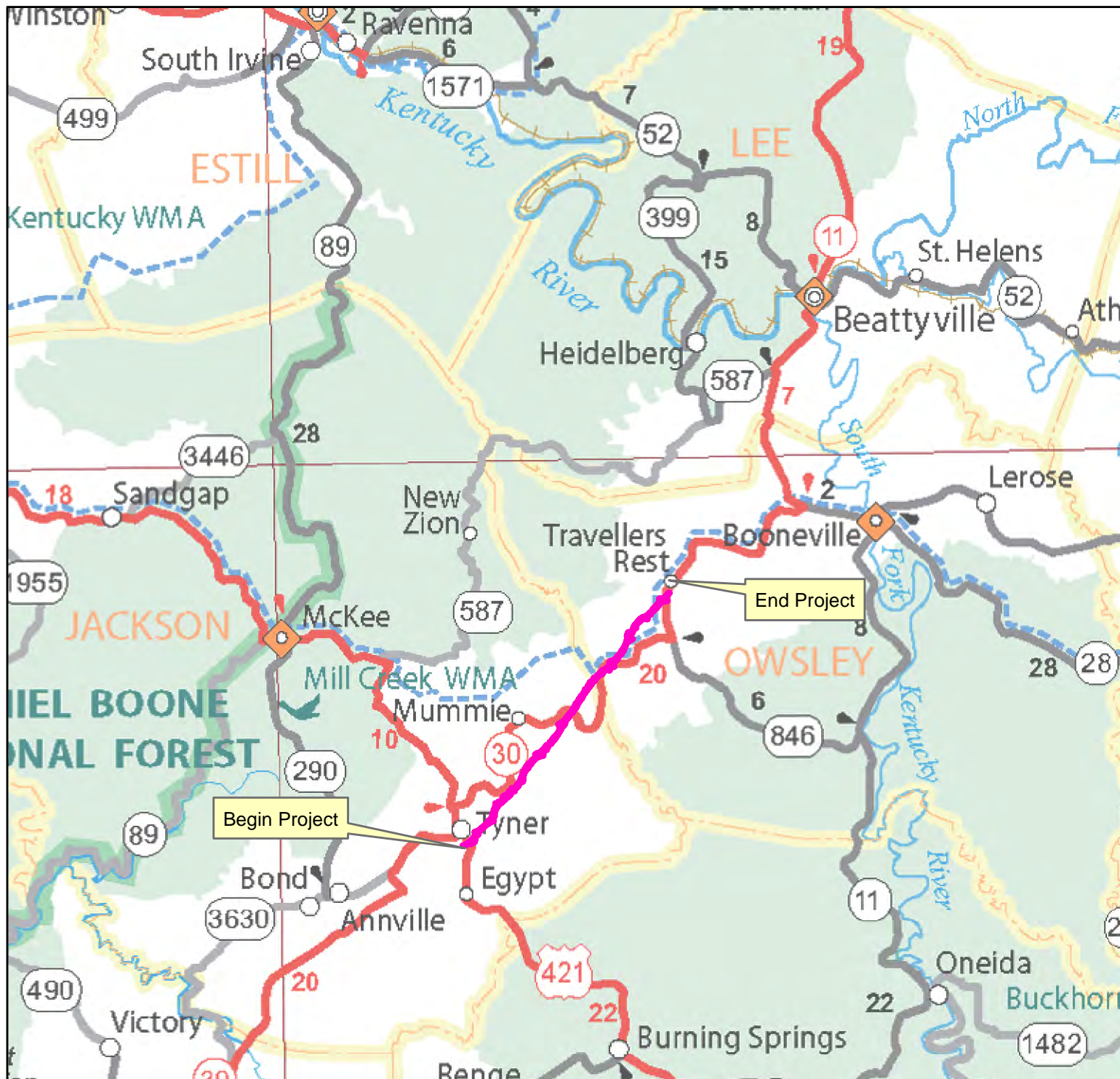
DATE: _____

SUBMIT APPLICATION AND ATTACHMENTS TO:

**Floodplain Management Section
Division of Water
200 Fair Oaks Lane
Frankfort, KY 40601**

Maps

10-279.61 Vicinity Map



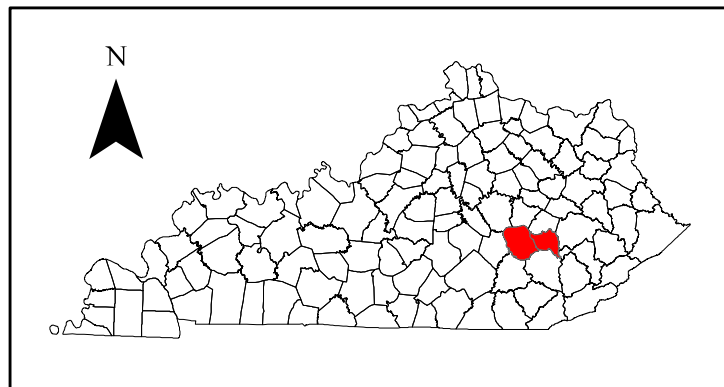
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
HUC 14: 05130102030010, 05100204020010,
05100204020030, 05100204020090,
05100204020110, 05100204020180.

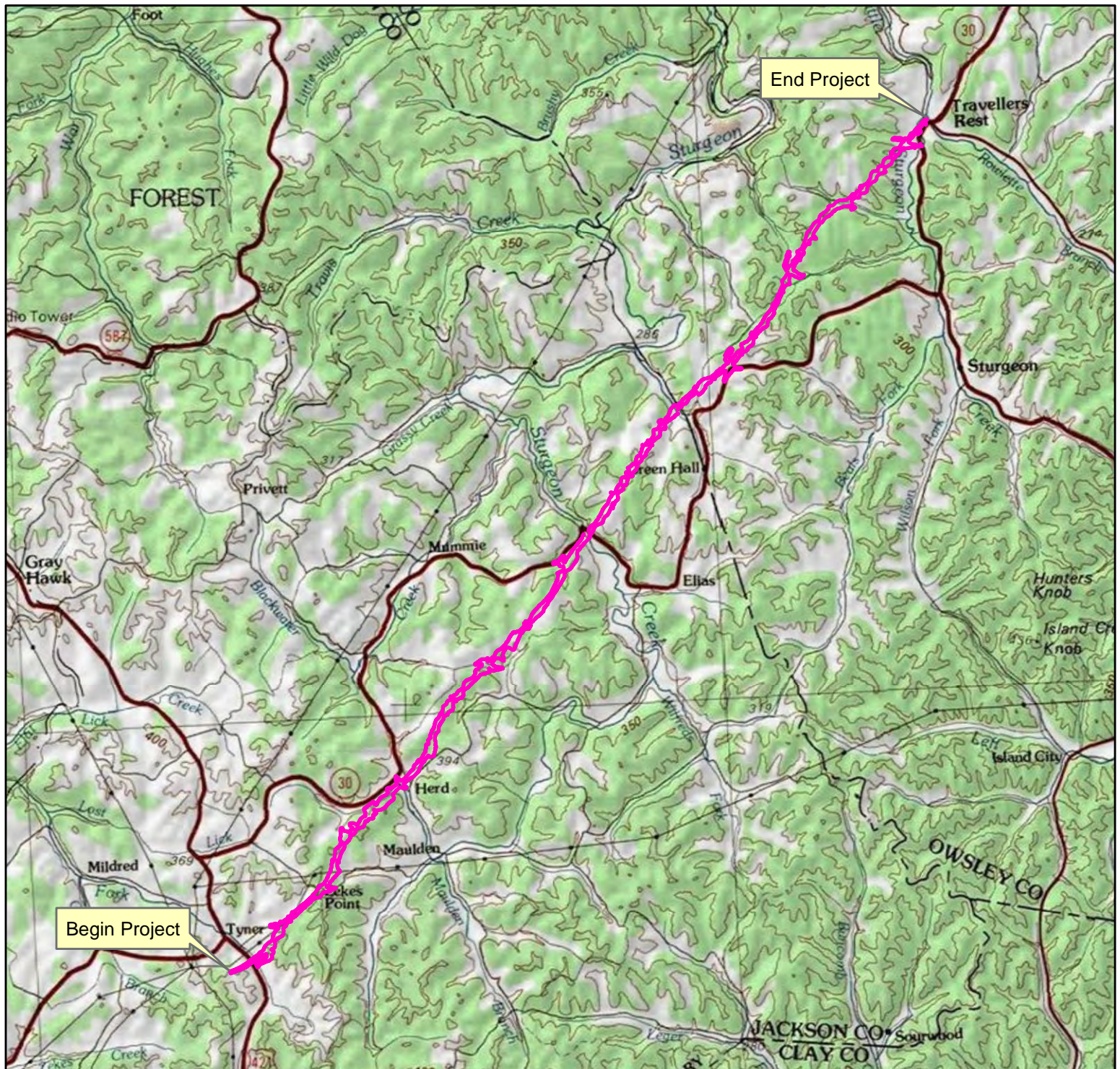
Legend

— Disturb Limits

0 2.5 5 10
Miles



10-279.61 Alignment Location Map



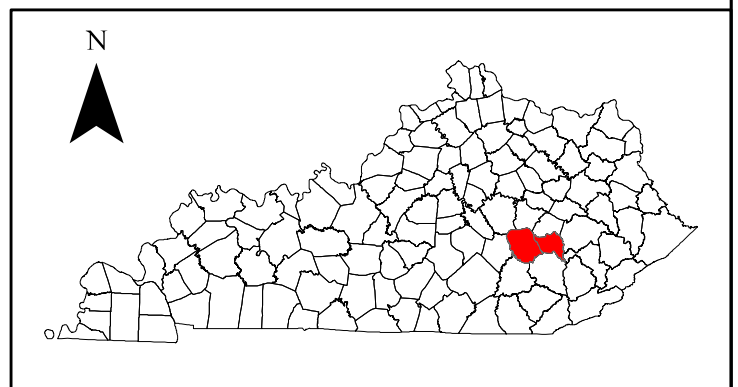
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item # 10-279.61

Kentucky River Basin/Cumberland River Basin
HUC 14: 05130102030010, 05100204020010,
05100204020030, 05100204020090,
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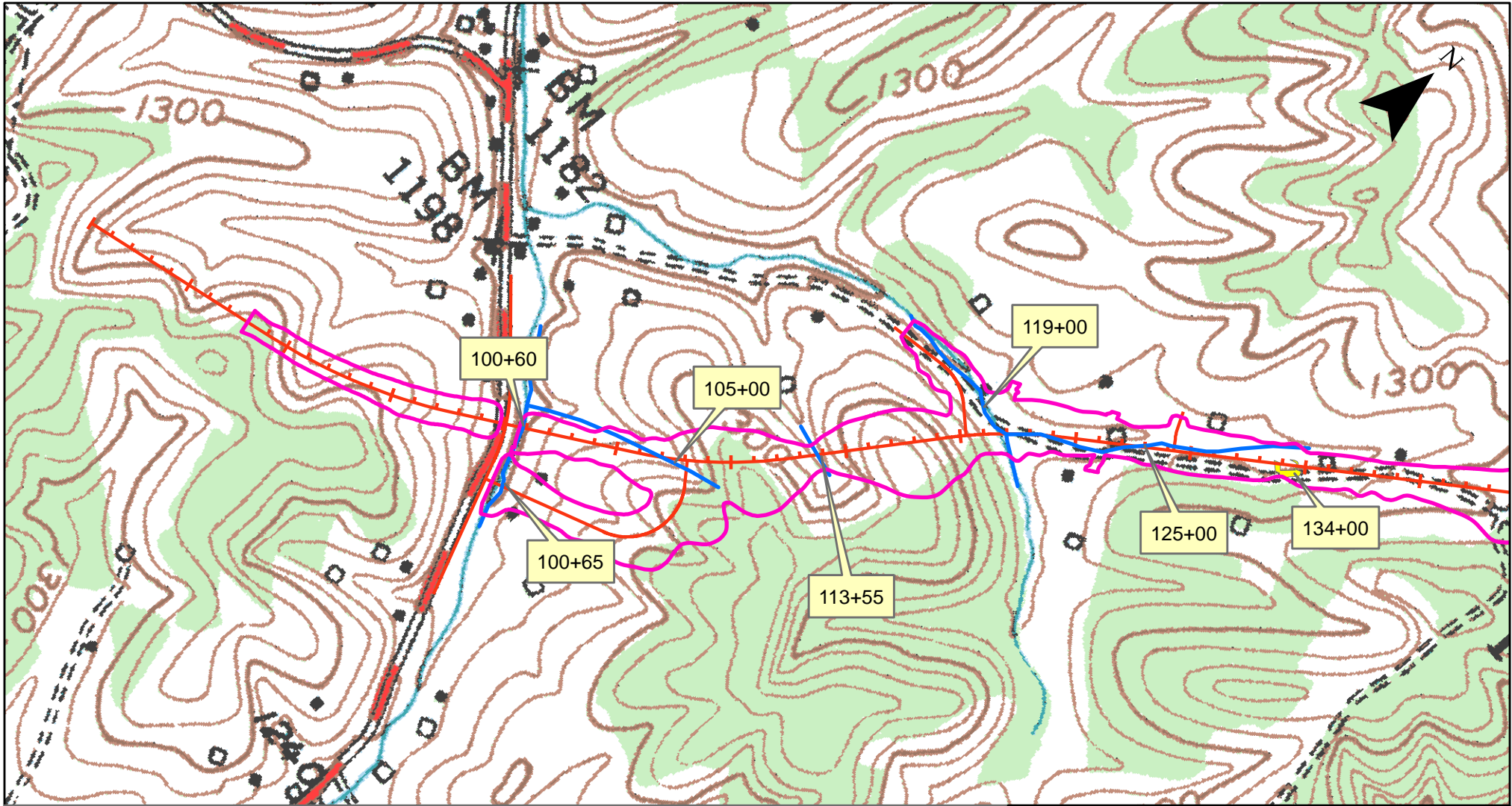
Legend

— Disturb Limits

0 0.75 1.5 3 Miles



10-279.61 Impact Station Map (1 of 9)



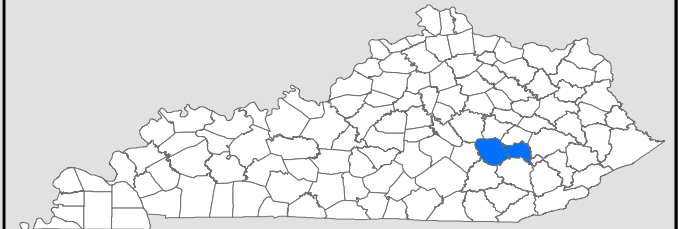
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
HUC 14: 05130102030010, 05100204020010,
05100204020030, 05100204020090
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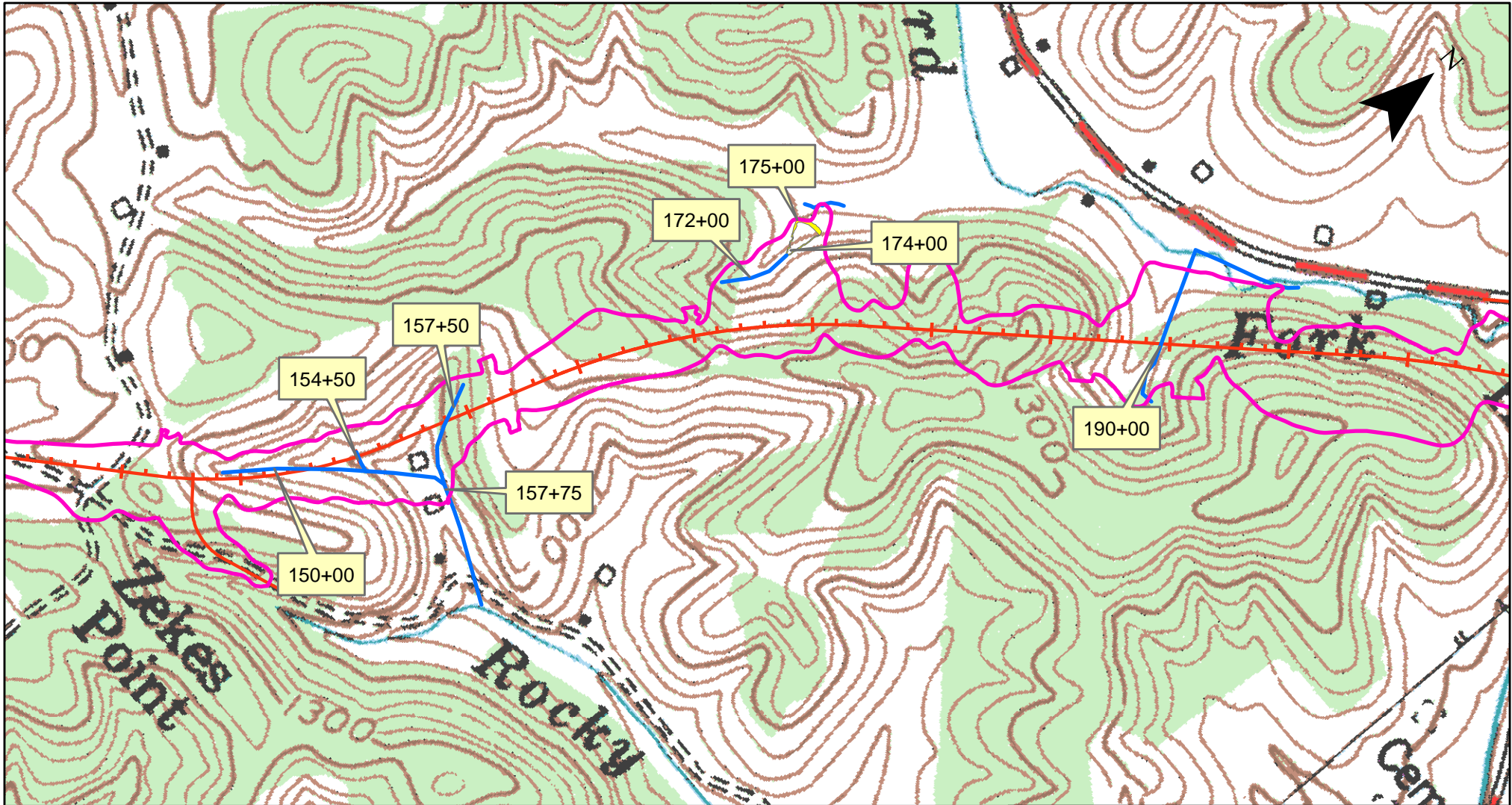
Legend

- Centerline
- Disturb Limits
- Streams
- Wetlands

0 0.1 0.2 0.4 Miles



10-279.61 Impact Station Map (2 of 9)



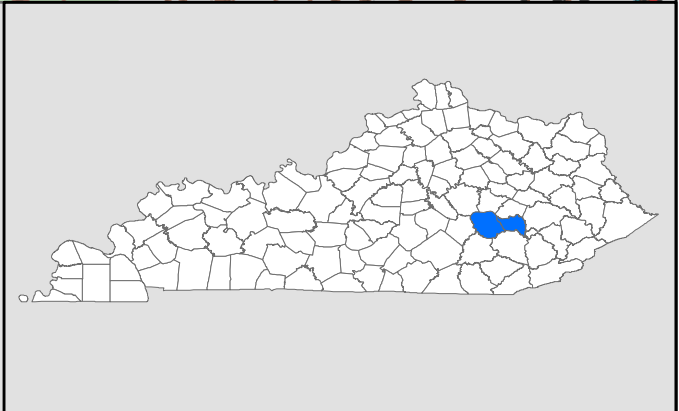
KY 30 Reconstruction
 Jackson and Owsley Counties, KY
 KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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 05100204020030, 05100204020090,
 05100204020110, 05100204020180.

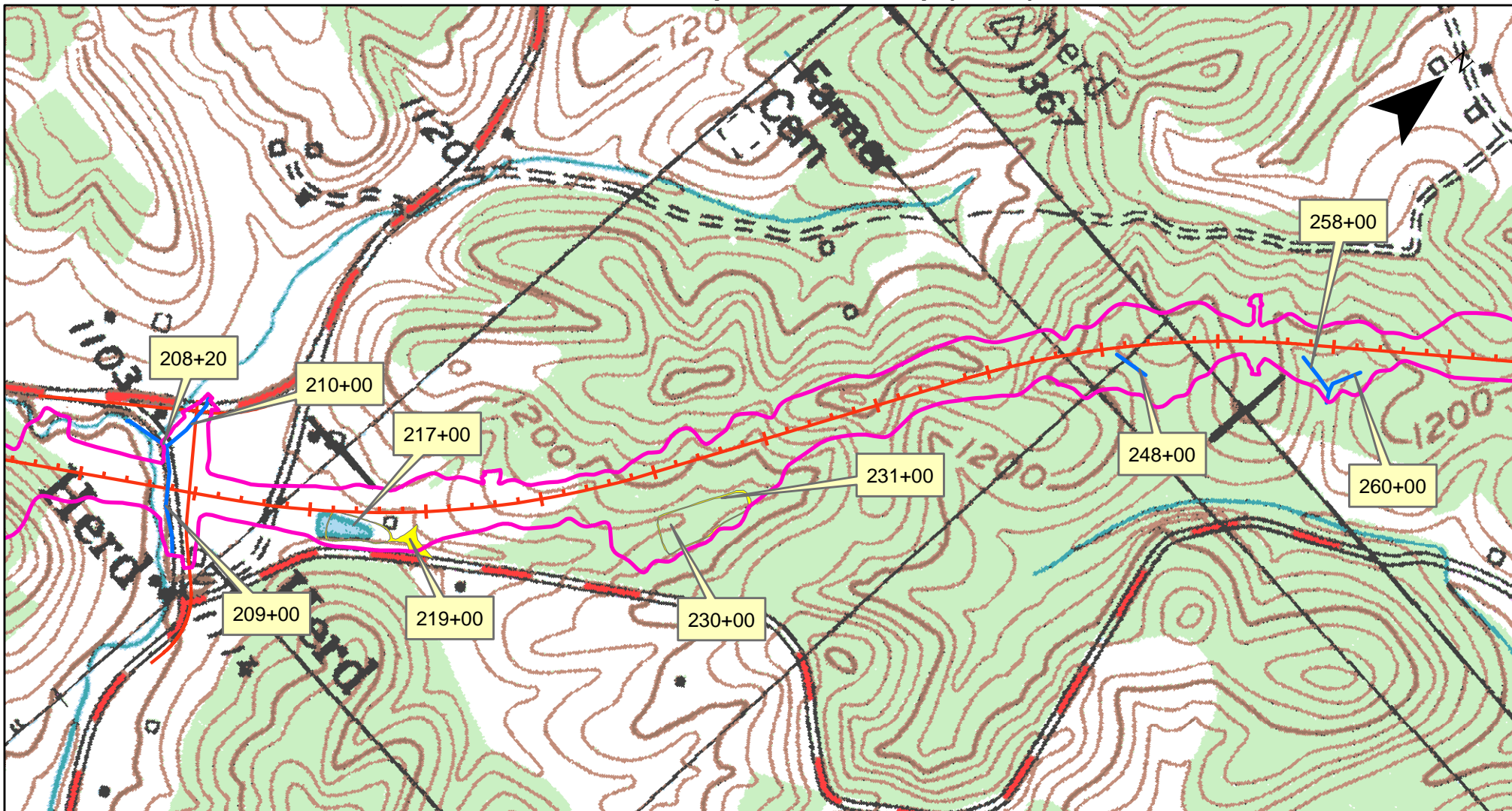
Legend

- Centerline
- Disturb Limits
- Streams
- Wetlands

0 0.05 0.1 0.2 0.3 0.4 Miles



10-279.61 Impact Station Map (3 of 9)



KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item # 10-279.61

Kentucky River Basin/Cumberland River Basin
HUC 14: 05130102030010, 05100204020010,
05100204020030, 05100204020090
05100204020110, 05100204020180

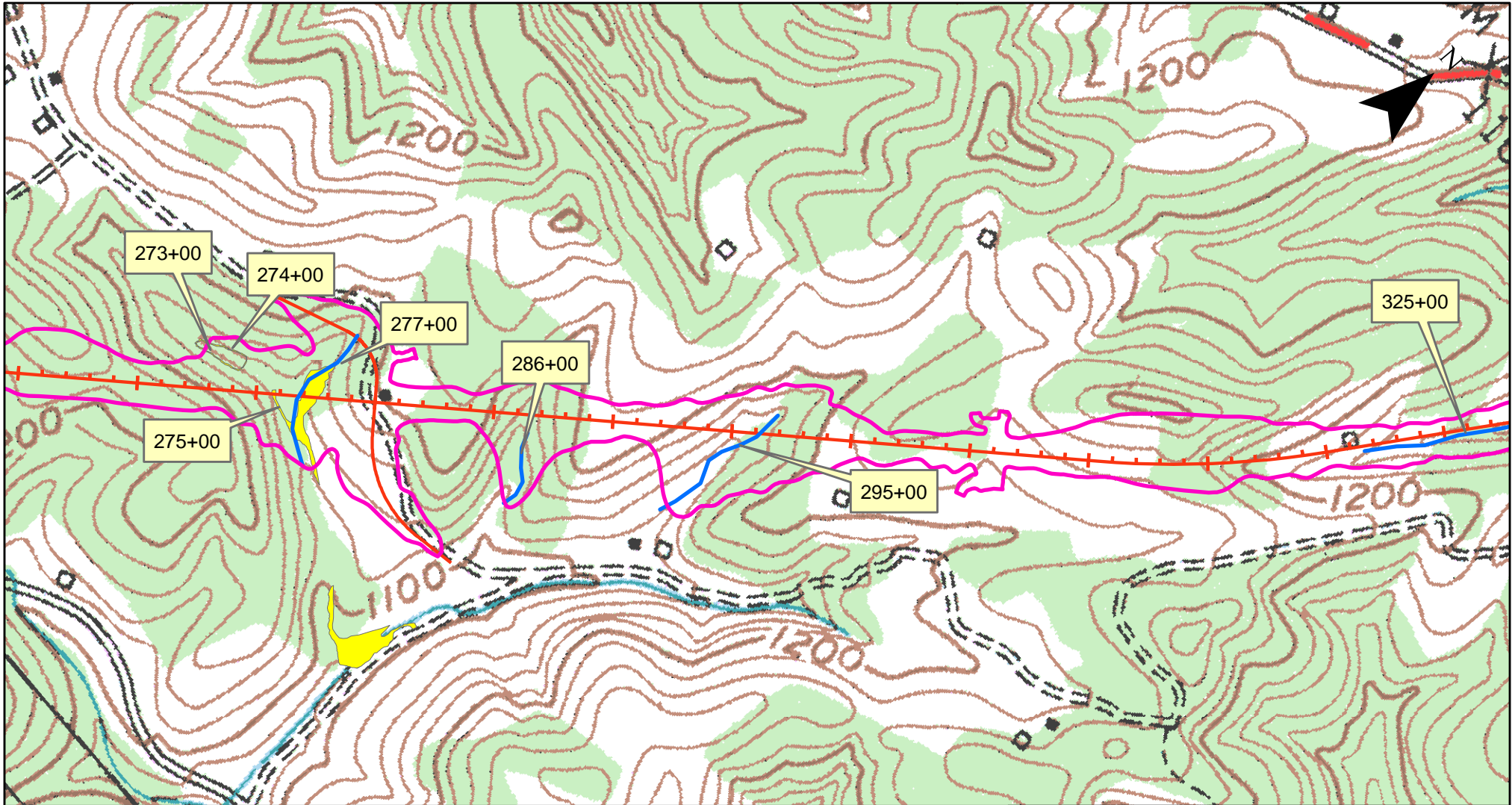
Legend

- Centerline
- Disturb Limits
- Streams
- Wetlands

0 0.05 0.1 0.2 0.3 0.4
Miles



10-279.61 Impact Station Map (4 of 9)



KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
HUC 14: 05130102030010, 05100204020010,
05100204020030, 05100204020090
05100204020110, 05100204020180

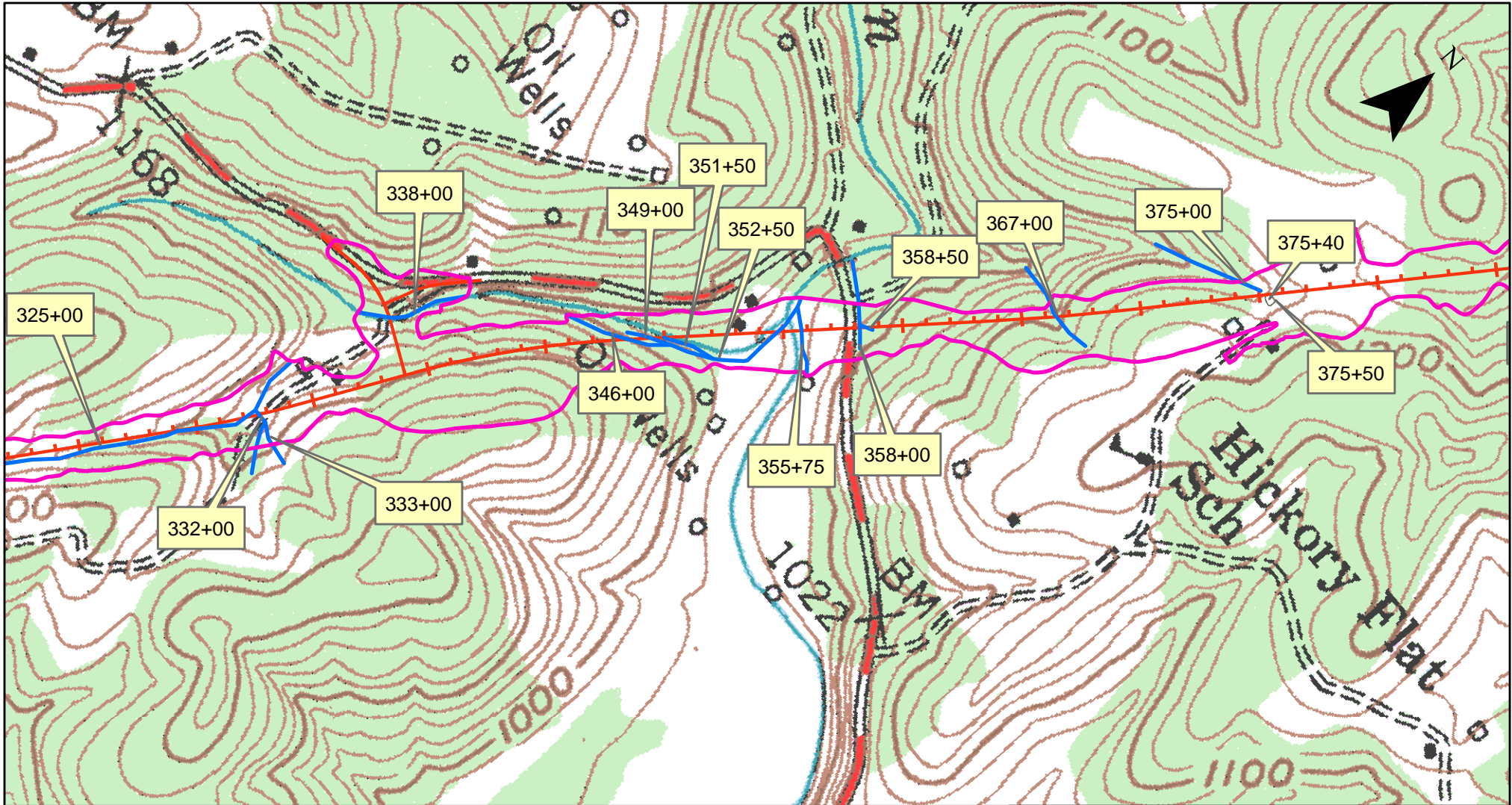
Legend

- Centerline
- Disturb Limits
- Streams
- Wetlands

0 0.05 0.1 0.2 0.3 0.4 Miles



10-279.61 Impact Station Map (5 of 9)



KY 30 Reconstruction
Jackson and Owsley Counties, KY
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Kentucky River Basin/Cumberland River Basin
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05100204020030, 05100204020090,
05100204020110, 05100204020180.

Legend

- Centerline
- Disturb Limits
- Streams
- Wetlands

0 0.05 0.1 0.2 0.3 0.4 Miles



10-279.61 Impact Station Map (6 of 9)



KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item # 10-279.61

Kentucky River Basin/Cumberland River Basin
HUC 14: 05130102030010, 05100204020010,
05100204020030, 05100204020090,
05100204020110, 05100204020180.

Legend

- Centerline
- Disturb Limits
- Streams
- Wetlands

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Miles



10-279.61 Impact Station Map (7 of 9)



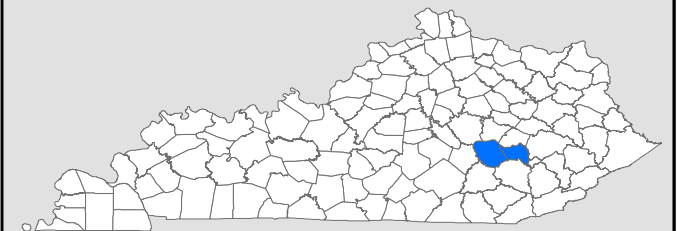
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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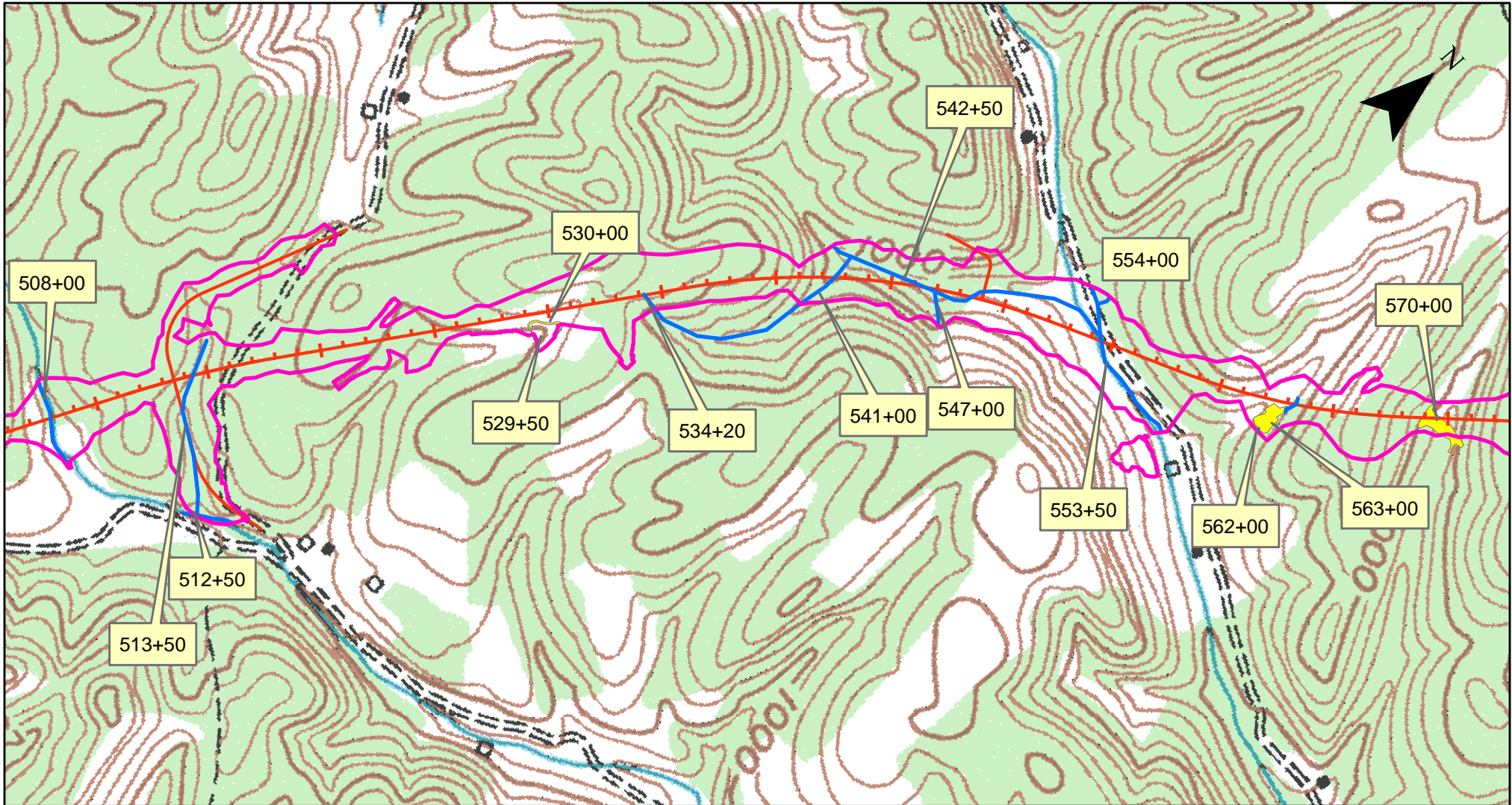
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- Centerline
- Disturb Limits
- Streams
- Wetlands

0 0.05 0.1 0.2 0.3 0.4 Miles



10-279.61 Impact Station Map (8 of 9)



KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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Legend

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Miles



10-279.61 Impact Station Map (9 of 9)



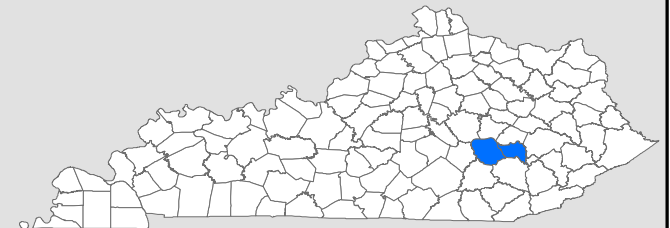
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Jackson and Owsley Counties, KY
KYTC Item # 10-279.61

Kentucky River Basin/Cumberland River Basin
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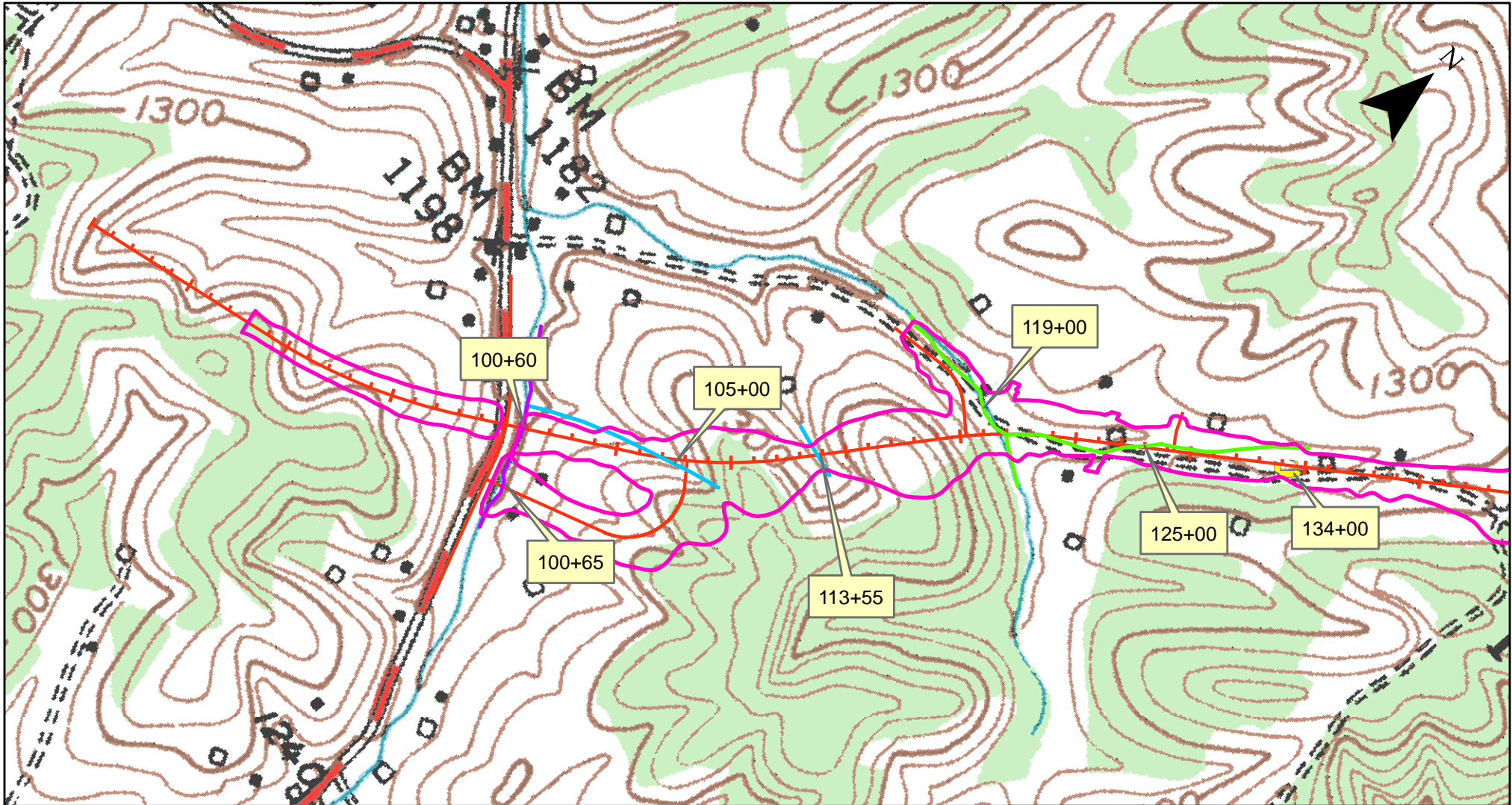
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- Centerline
- Disturb Limits
- Streams
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0 0.05 0.1 0.2 0.3 0.4 Miles



10-279.61 JD Map (1 of 9)



KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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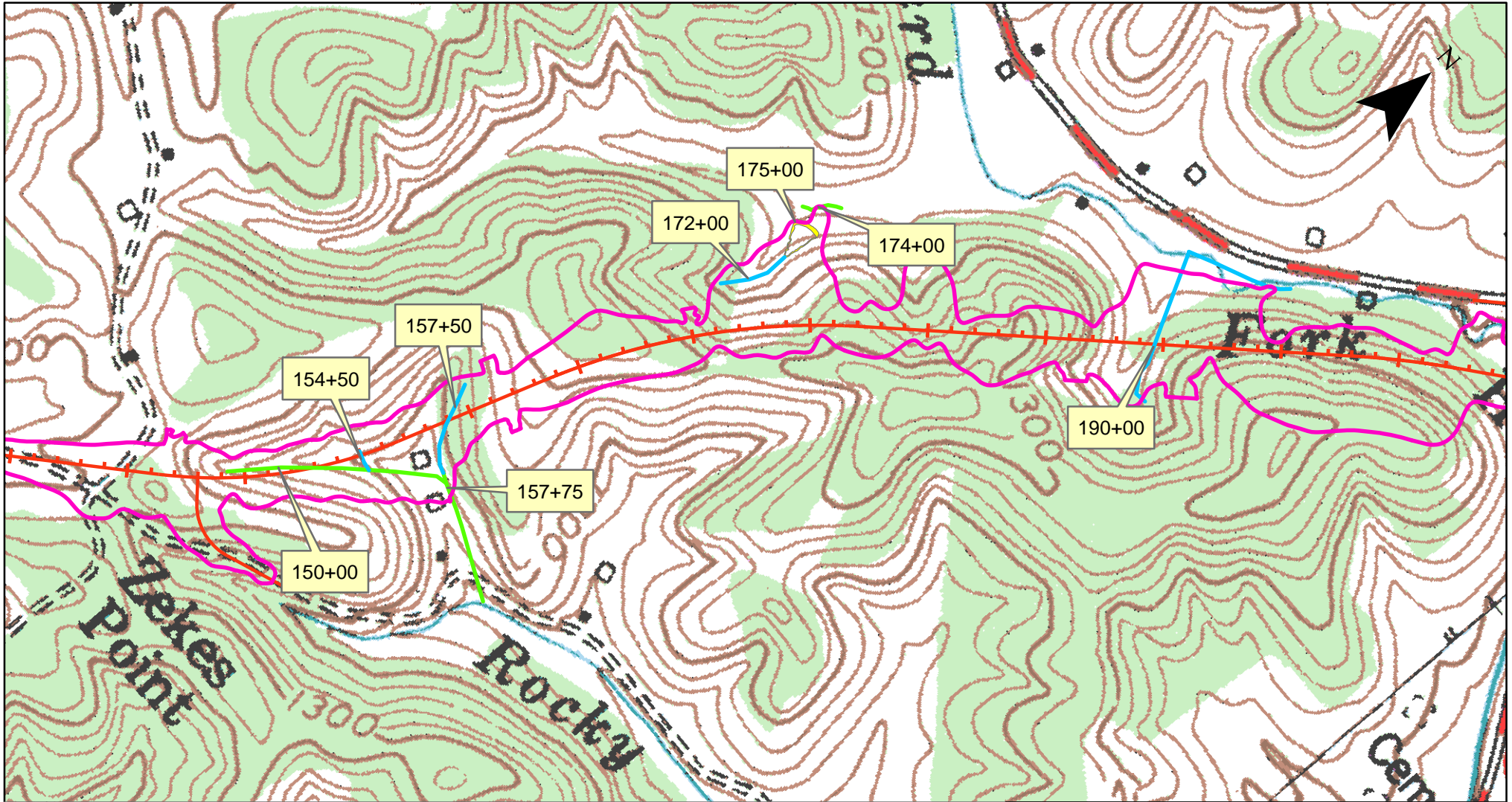
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Miles

Legend

- Centerline
- Disturb Limits
- Ephemeral
- Intermittent
- Perennial
- Wetlands



10-279.61 JD Map (2 of 9)



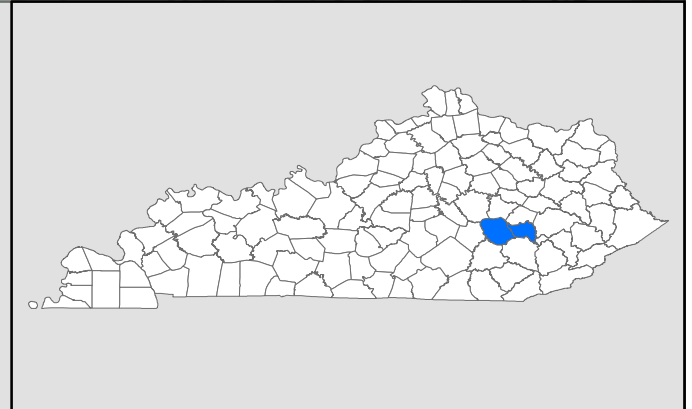
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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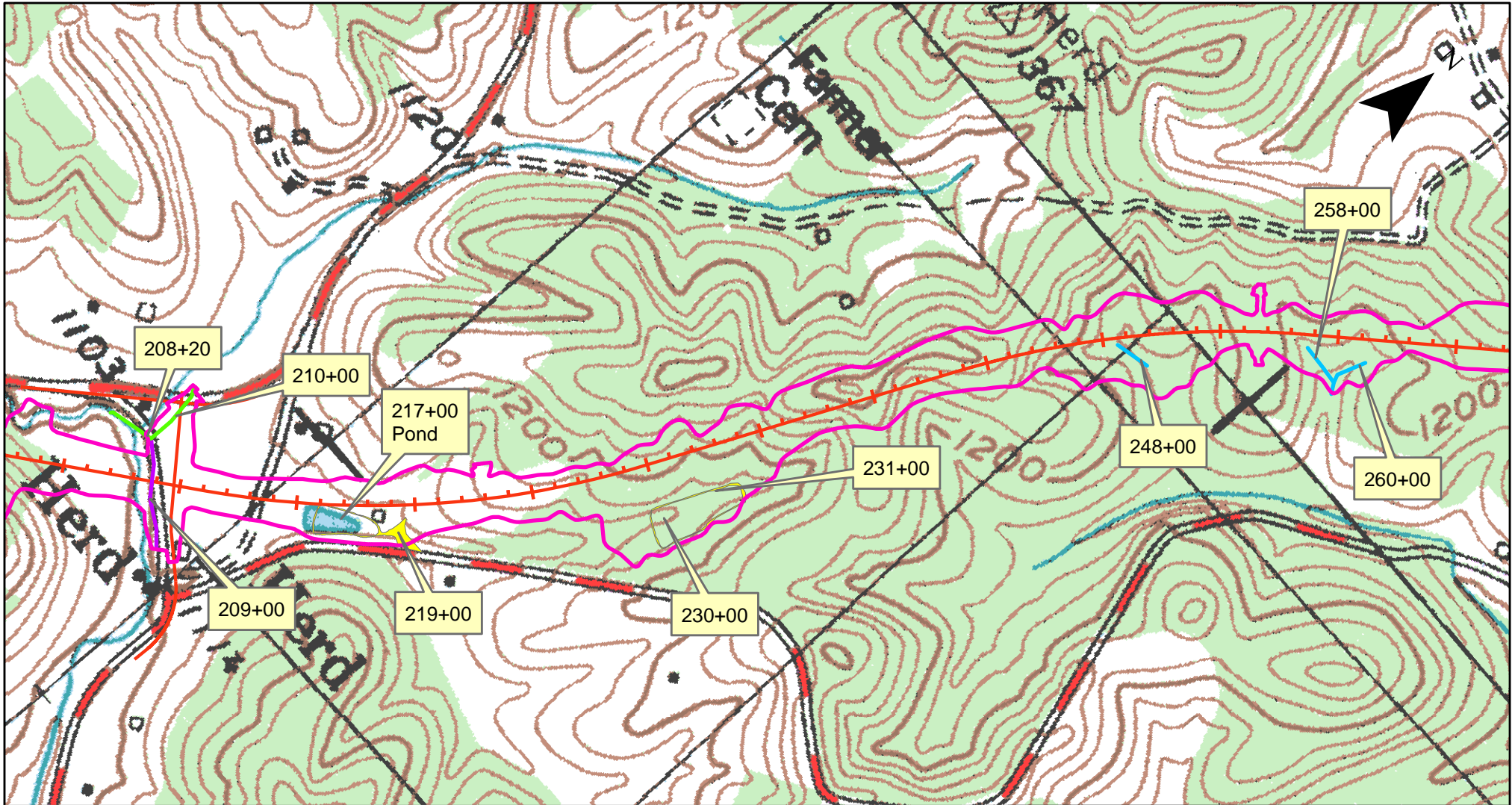
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Miles

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- Centerline
- Disturb Limits
- Ephemeral
- Intermittent
- Perennial
- Wetlands



10-279.61 JD Map (3 of 9)



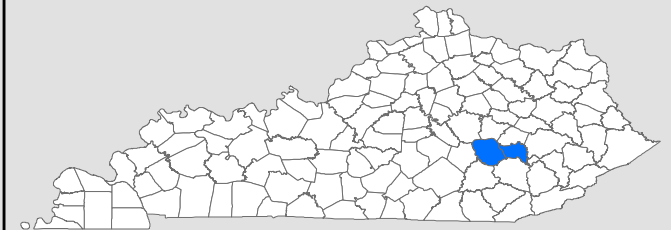
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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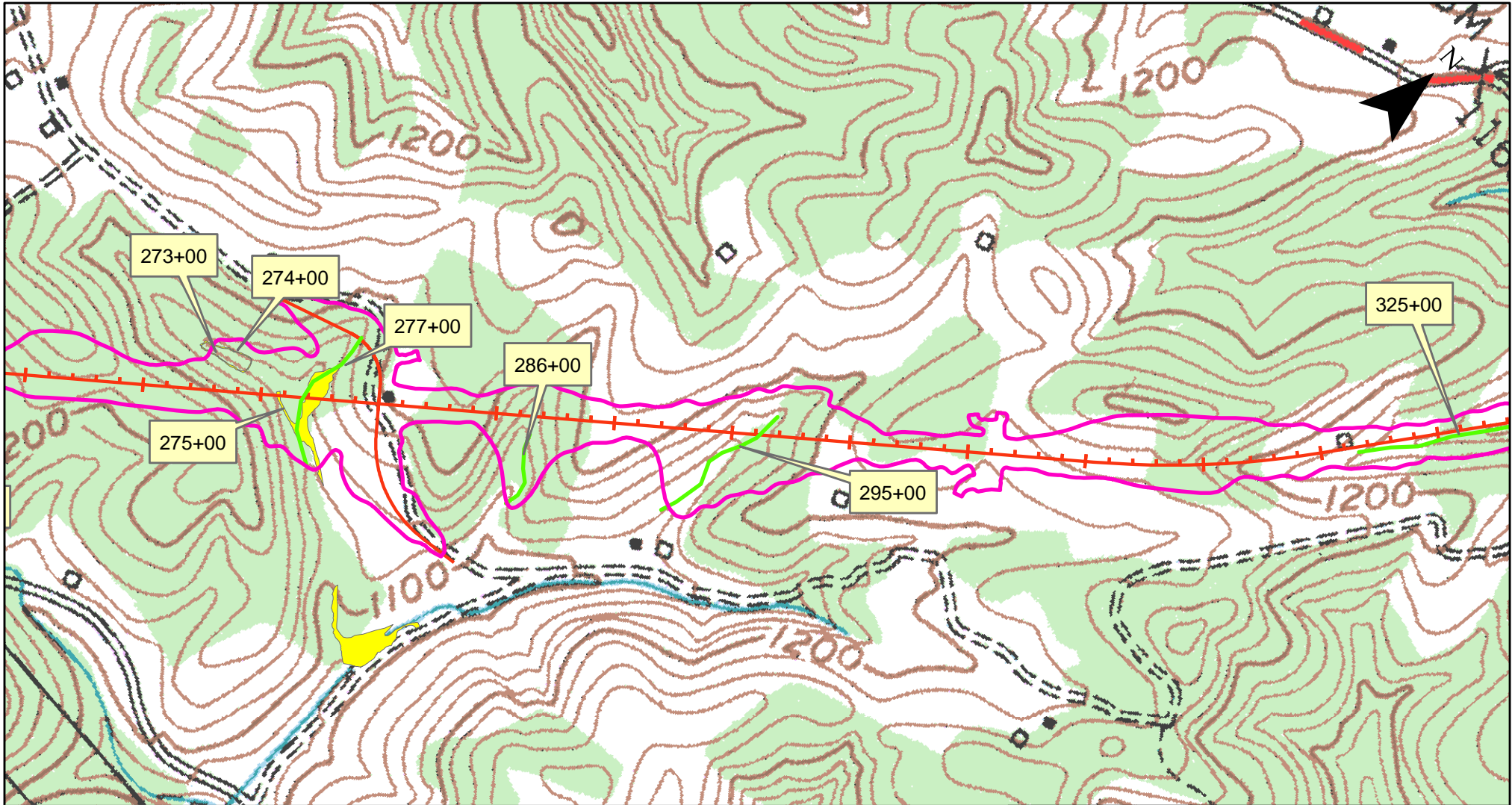
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Miles

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- Centerline
- Disturb Limits
- Ephemeral
- Intermittent
- Perennial
- Wetlands



10-279.61 JD Map (4 of 9)



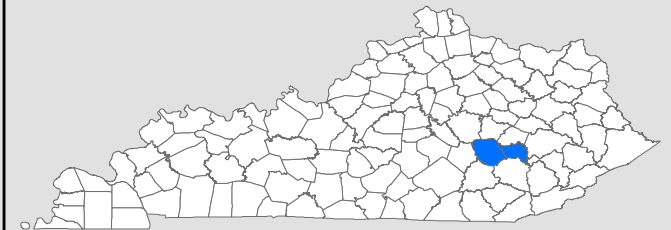
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

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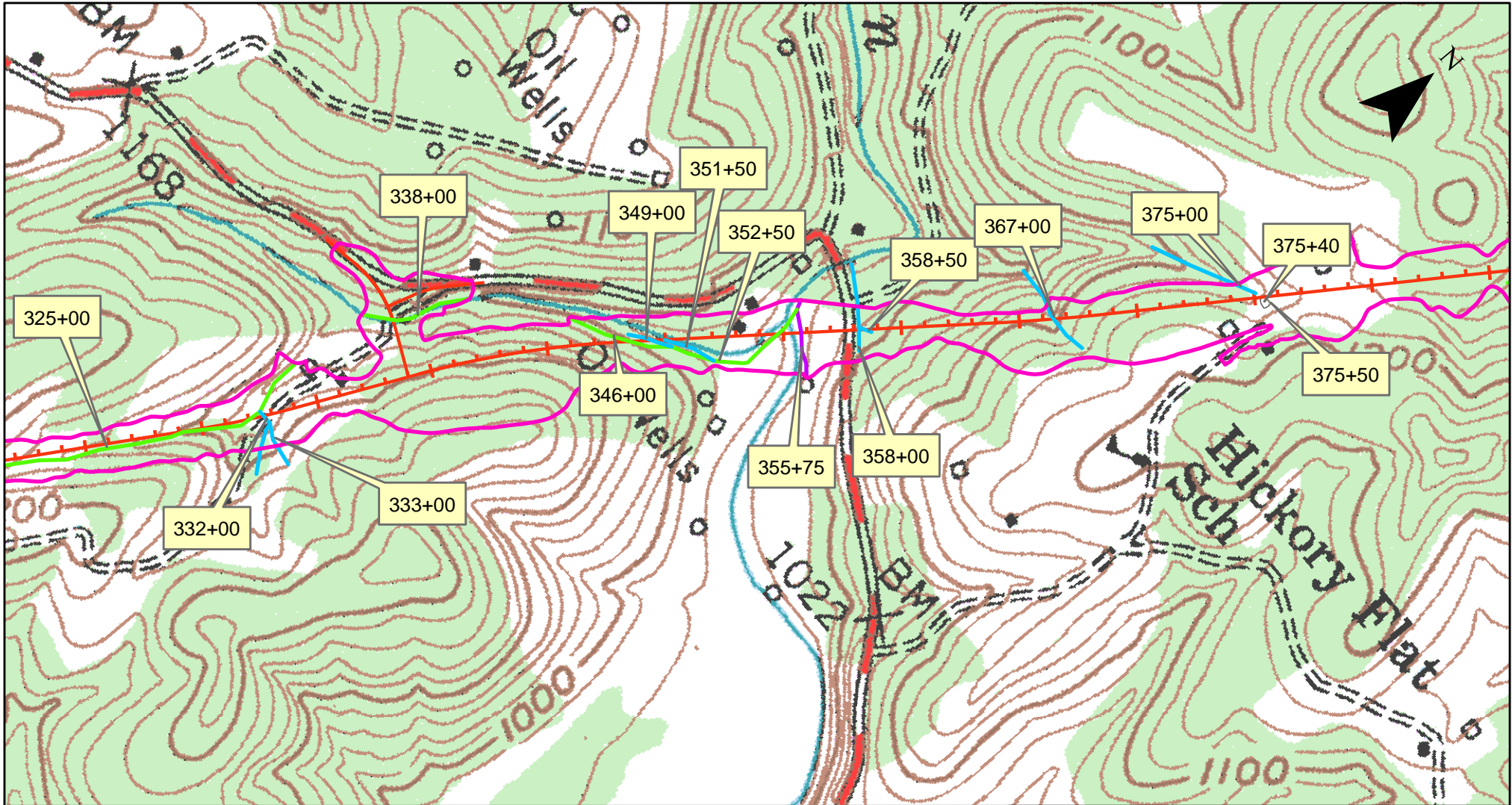
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Legend

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10-279.61 JD Map (5 of 9)



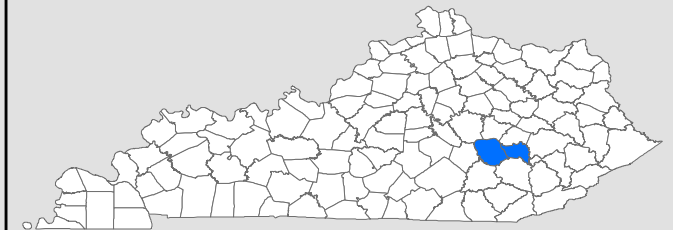
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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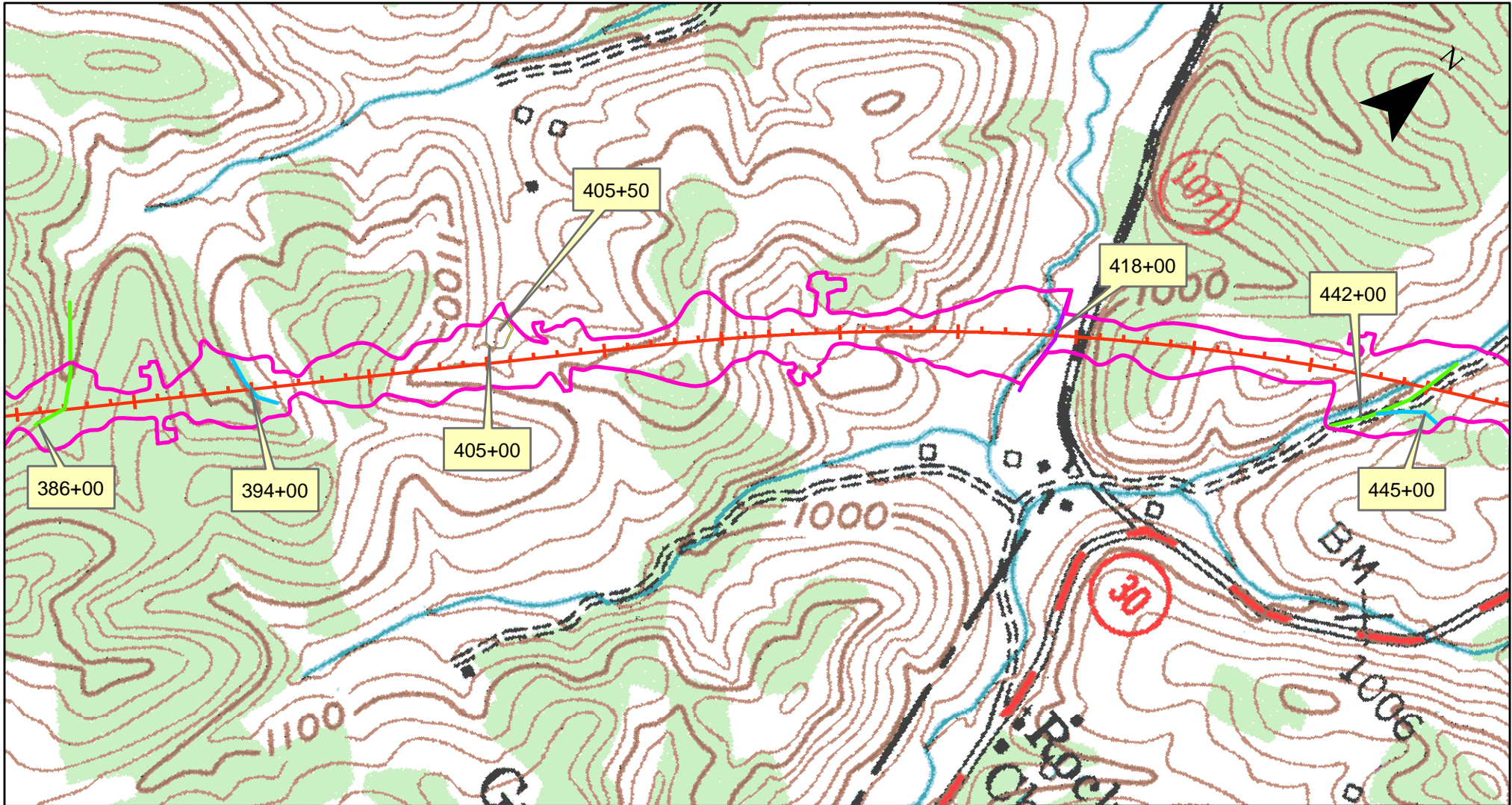
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10-279.61 JD Map (6 of 9)



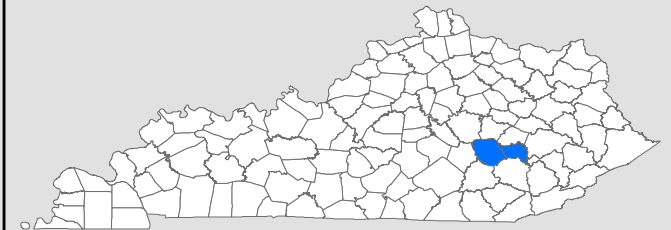
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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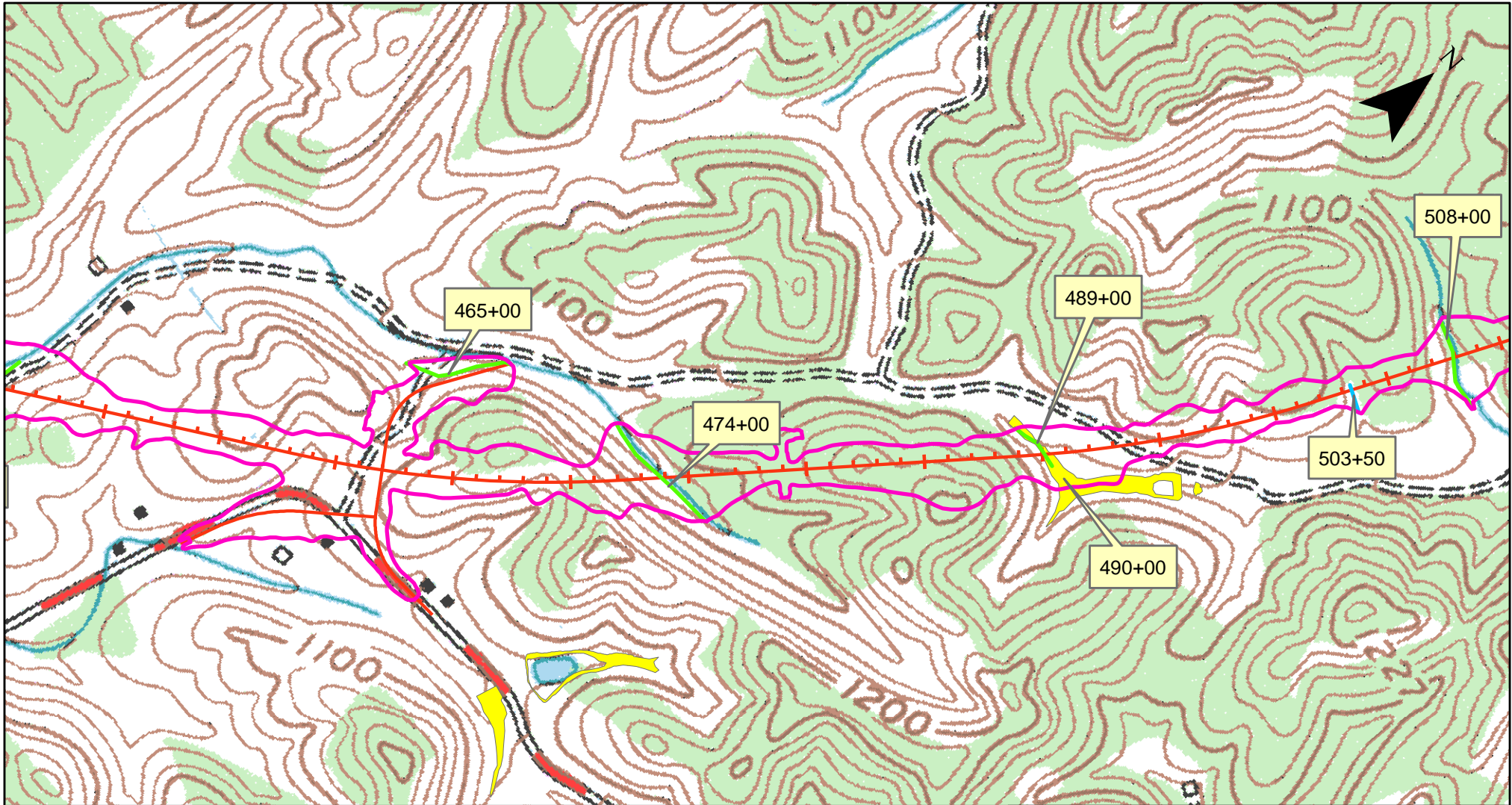
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10-279.61 JD Map (7 of 9)



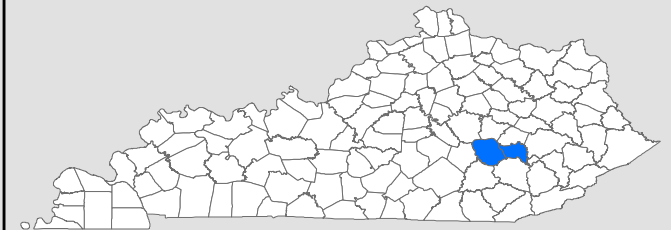
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Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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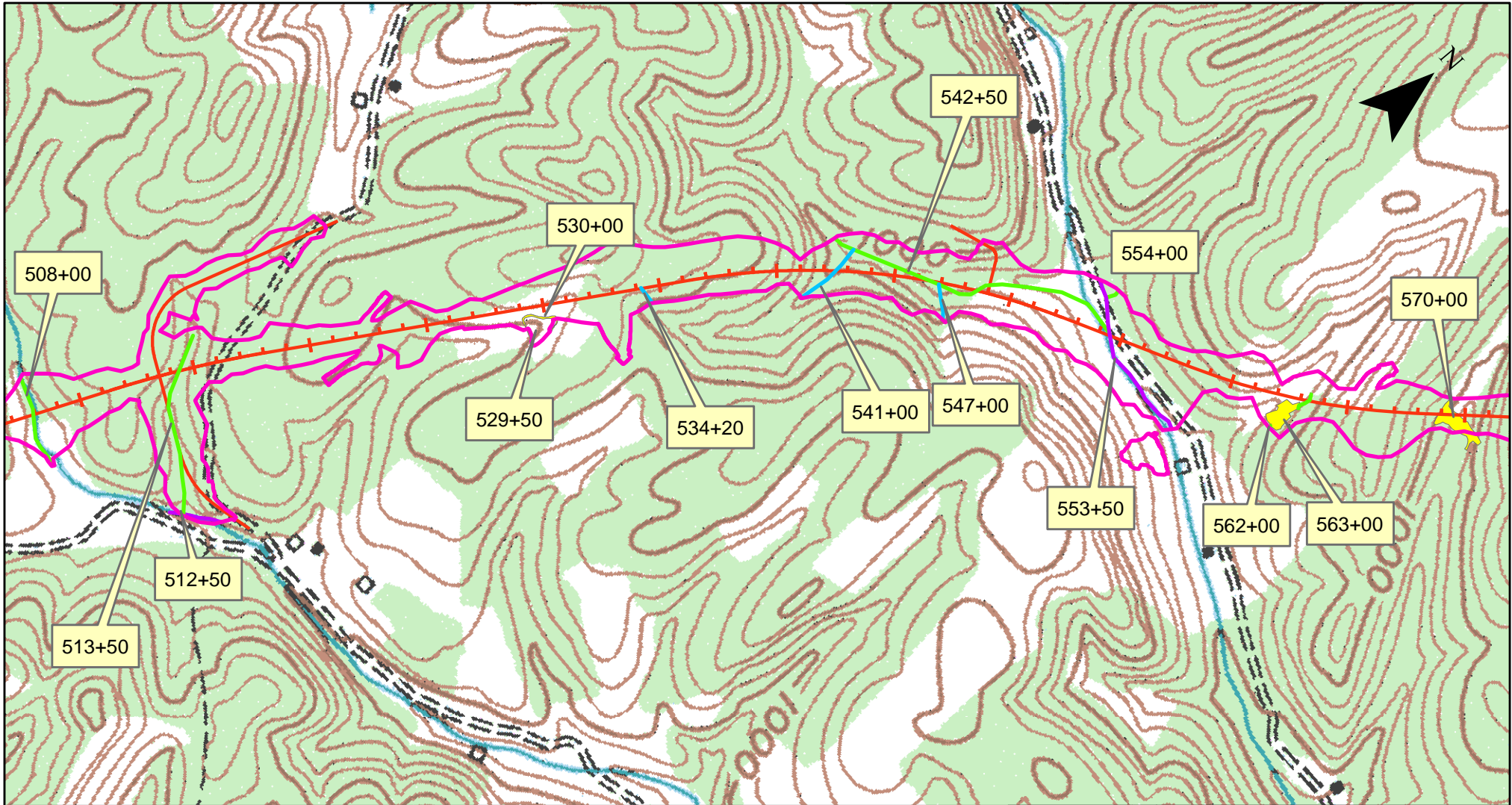
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10-279.61 JD Map (8 of 9)



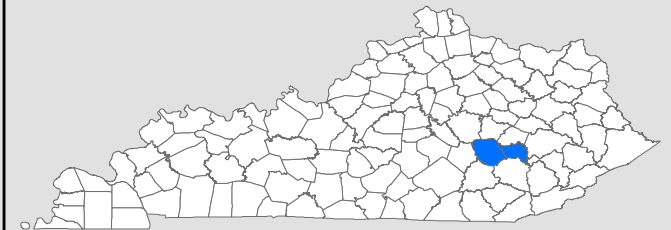
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Jackson and Owsley Counties, KY
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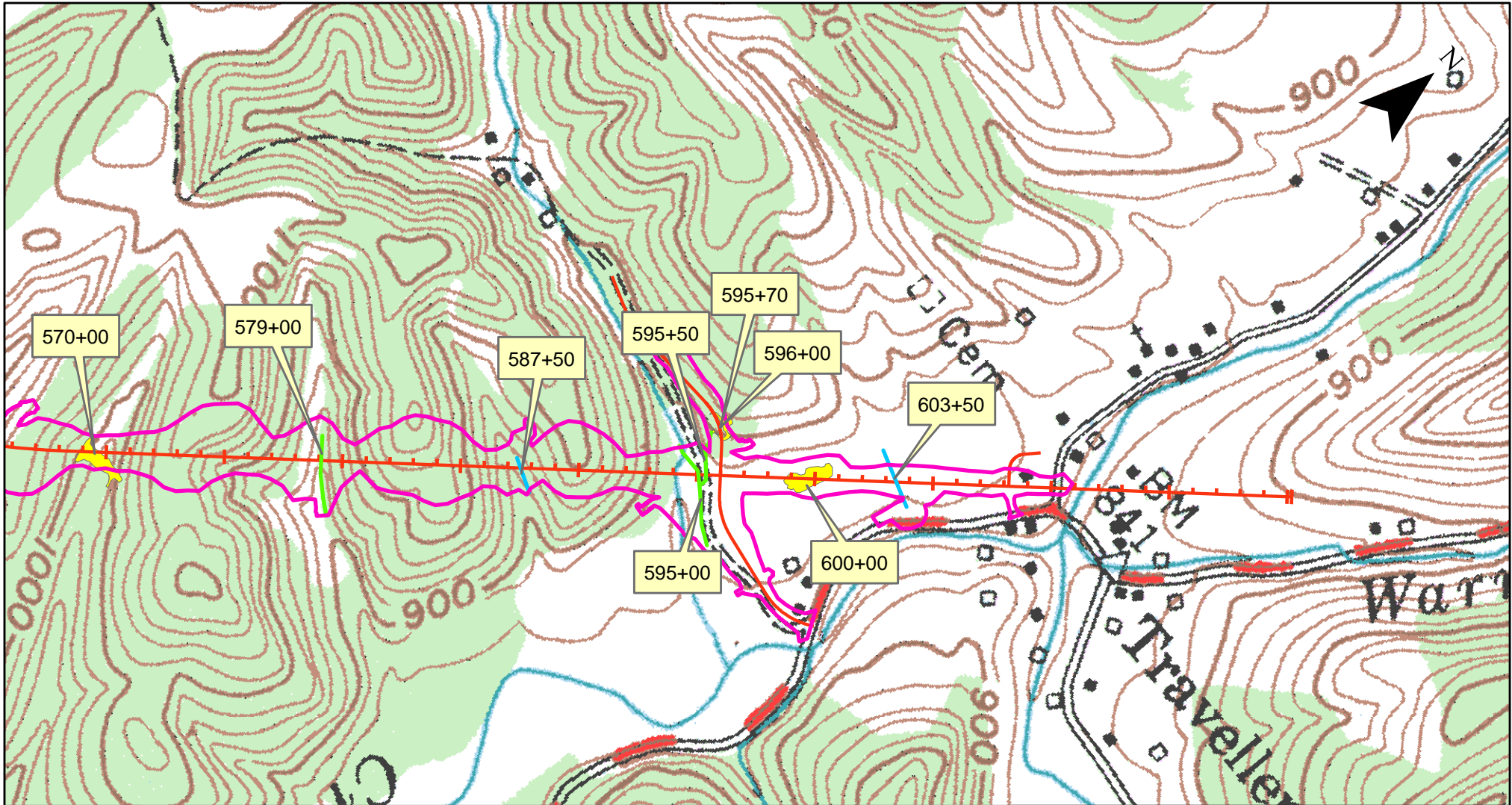
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10-279.61 JD Map (9 of 9)



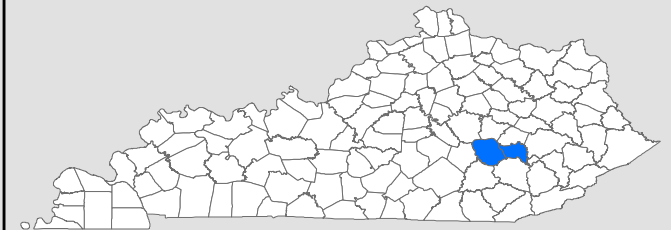
KY 30 Reconstruction
Jackson and Owsley Counties, KY
KYTC Item #10-279.61

Kentucky River Basin/Cumberland River Basin
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Miles

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- Perennial
- Wetlands



Summary of 404 Impacts

SUMMARY OF SECTION 404/401 IMPACTS
Jackson & Owsley Counties
KY 30 reconstruction from US 421 at Tyner to KY 847 at Travellers Rest
Item No. 10-279.61
LRL-2017-1052

Roadway

- Crossing 1**
Station 100+60
- Construct a 240 foot long 2-span bridge. Piers will be set outside the ordinary high water mark and cyclopean rip-rap will be used around the abutment slopes to reduce scour during large flood events. A temporary crossing may be constructed. It will be built to accommodate a 2-year storm event, with excess flow designed to overtop the structure, with the structure remaining intact. A total of **0 feet of perennial stream** (Laurel Fork) will be impacted. This impact measures **0 acre**. The drainage area is 402 acres.
Lat./Long.: 37.342652, -83.900162
- Crossing 1**
Station 100+65
- Construct 89 linear feet of 12' X 5' RCBC culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 200 feet. A total of **300 feet of perennial stream** (Laurel Fork) will be impacted. This impact measures **0.034 acre**. The drainage area at the culvert is 402 acres.
Lat./Long.: 37.342268, -83.899803
- Crossing 1**
Station 105+00
- Construct 202 linear feet of 2 foot wide (bottom width) channel. A total of **561 feet of ephemeral stream** (UT to Laurel Fork) will be impacted. This impact measures **0.013 acre**. The drainage area is 9 acres.
Lat./Long.: 37.343801, -83.898646
- Crossing 2**
Station 113+55
- Construct the new alignment and toe of slope which will fill this stream. A total of **121 feet of ephemeral stream** (UT to Laurel Fork) will be impacted. This impact measures **0.006 acre**. The drainage area is 7 acres.
Lat./Long.: 37.345256, -83.896992
- Crossing 3**
Station 119+00
- Construct 463 linear feet of 6 foot wide (bottom width) channel, and 308 linear feet of 6' X 5' RCBC culvert under the road. These will replace an existing 37 foot long, 6' X 5' box culvert under the existing road. A total of **777 feet of intermittent stream** (UT to Laurel Fork) will be impacted. This impact measures **0.071 acre**. The drainage area at the culvert is 194 acres.
Lat./Long.: 37.347125, -83.895914

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| Crossing 3 Station 125+00 | Construct 1,266 linear feet of 2 foot wide (bottom width) channel, and 70 linear feet of 42 inch pipe culvert, and 63 linear feet of 42 inch pipe culvert under the road. These will replace an existing 66 foot long 48" box culvert, a 13 foot long 18" box culvert, and a 19 foot long 18" pipe under the existing road. A total of 1,224 feet of intermittent stream (UT to Laurel Fork) will be impacted. This impact measures 0.056 acre . The drainage area at the culvert is 59 acres. Lat./Long.: 37.348418, -83.893765 |
| Crossing 3 Station 134+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.092 acres . Lat./Long.: 37.349313, -83.892198 |
| Crossing 4 Station 150+00 | Construct 533 linear feet of 2 foot wide (bottom width) channel. A total of 514 feet of intermittent stream (UT to Rocky Branch) will be impacted. This impact measures 0.024 acre . The drainage area is 16 acres. Lat./Long.: 37.353729, -83.886931 |
| Crossing 4 Station 154+50 | Construct the new alignment and toe of slope which will fill this stream. A total of 90 feet of ephemeral stream (UT to Rocky Branch) will be impacted. This impact measures 0.003 acre . The drainage area is 3 acres. Lat./Long.: 37.353518, -83.887400 |
| Crossing 4 Station 157+50 | Construct 310 linear feet of 30 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 44 feet. A total of 463 feet of ephemeral stream (UT to Rocky Branch) will be impacted. This impact measures 0.011 acre . The drainage area at the culvert is 12 acres. Lat./Long.: 37.354480, -83.886972 |
| Crossing 4 Station 157+75 | Construct 162 linear feet of 2 foot wide (bottom width) channel. A total of 118 feet of intermittent stream (UT to Rocky Branch) will be impacted. This impact measures 0.008 acre . The drainage area is 29 acres. Lat./Long.: 37.353812, -83.885552 |
| Crossing 5 Station 172+00 | Construct 618 linear feet of 2 foot wide (bottom width) channel. A total of 303 feet of ephemeral stream (UT to Herd Fork) will be impacted. This impact measures 0.007 acre . The drainage area is 12 acres. Lat./Long.: 37.358475, -83.885571 |

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| Crossing 5 Station 174+00 | Construct the new alignment and toe of slope which will fill this pond (0.235 acre). The pond was constructed by damming an intermittent channel that was approximately 1' in width. The total stream estimated to be impounded by this pond is 146 feet. Total stream impact is 146 feet of intermittent stream (UT to Herd Fork). Total stream area impacted is 0.003 acres . The drainage area is 14 acres. Lat./Long.: 37.359213, -83.885596 |
| Crossing 5 Station 175+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.089 acres . Lat./Long.: 37.359213, -83.885596 |
| Crossing 6 Station 190+00 | Construct 516 linear feet of 42 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 20 feet. A total of 593 feet of ephemeral stream (UT to Herd Fork) will be impacted. This impact measures 0.020 acre . The drainage area at the culvert is 20 acres. Lat./Long.: 37.361535, -83.881209 |
| Crossing 7 Station 208+20 | Construct 30 linear feet of 2 foot wide (bottom width) channel. A total of 25 feet of intermittent stream (Herd Fork) will be impacted. This impact measures 0.002 acre . The drainage area is 505 acres. Lat./Long.: 37.365205, -83.876700 |
| Crossing 7 Station 209+00 | Construct 325 linear feet of 30 foot wide (bottom width) channel, and 155 linear feet of double 14' X 7' RCBC culvert under the road. A total of 505 feet of perennial stream (Herd Fork) will be impacted. This impact measures 0.139 acre . The drainage area at the culvert is 871 acres. Lat./Long.: 37.364742, -83.876020 |
| Crossing 7 Station 210+00 | Construct 142 linear feet of 8 foot wide (bottom width) channel, and 132 linear feet of 10' X 5' RCBC culvert under the road. These will replace an existing 24 foot long 5.5' X 3.75' box culvert, and a 42 foot long 48" box culvert under the existing road. A total of 218 feet of intermittent stream (UT to Herd Fork) will be impacted. This impact measures 0.04 acre . The drainage area at the culvert is 222 acres. Lat./Long.: 37.365573, -83.876693 |
| Crossing 8 Station 217+00 | Construct the new alignment and toe of slope which will fill this pond (0.606 acre). The pond was constructed by damming an intermittent channel that was approximately 3' in width. The total stream estimated to be impounded by this pond is 270 feet. Total stream impact is 270 feet of intermittent stream (UT to Herd Fork). Total stream area impacted is 0.019 acres . The drainage area is 129 acres. Lat./Long.: 37.366648, -83.873227 |

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| Crossing 8 Station 219+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.225 acres . Lat./Long.: 37.366648, -83.873227 |
| Crossing 9 Station 230+00 | Construct the new alignment and toe of slope which will fill this pond (1.202 acre). The pond was constructed by damming an intermittent channel that was approximately 3' in width. The total stream estimated to be impounded by this pond is 417 feet. Total stream impact is 417 feet of intermittent stream (UT to Herd Fork). Total stream area impacted is 0.029 acres . The drainage area is 18 acres. Lat./Long.: 37.369517, -83.870871 |
| Crossing 9 Station 231+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.147 acres . Lat./Long.: 37.369517, -83.870871 |
| Crossing 10 Station 248+00 | Construct 495 linear feet of 2 foot wide (bottom width) channel. A total of 601 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.028 acre . The drainage area is 11 acres. Lat./Long.: 37.374435, -83.868151 |
| Crossing 11 Station 258+00 | Construct 153 linear feet of 2 foot wide (bottom width) channel, and 237 linear feet of 30 inch pipe culvert under the road. A total of 184 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.008 acre . The drainage area at the culvert is 5 acres. Lat./Long.: 37.376005, -83.866220 |
| Crossing 11 Station 260+00 | Construct 310 linear feet of 24 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 25 feet. A total of 214 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.010 acre . The drainage area at the culvert is 15 acres. Lat./Long.: 37.376181, -83.865983 |
| Crossing 12 Station 273+00 | Construct the new alignment and toe of slope which will fill this pond (0.228 acre). The pond was constructed by damming an intermittent channel that was approximately 11' in width. The total stream estimated to be impounded by this pond is 224 feet. Total stream impact is 224 feet of intermittent stream (UT to Sturgeon Creek). Total stream area impacted is 0.057 acres . The drainage area is 26 acres. Lat./Long.: 37.379245, -83.863429 |
| Crossing 12 Station 274+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.052 acres . Lat./Long.: 37.379191, -83.863335 |

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| Crossing 12 Station 275+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.563 acres . Lat./Long.: 37.379580, -83.862088 |
| Crossing 12 Station 277+00 | Construct 562 linear feet of 2 foot wide (bottom width) channel, and 594 linear feet of 54 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 71 feet. A total of 664 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.168 acre . The drainage area at the culvert is 45 acres. Lat./Long.: 37.380158, -83.862287 |
| Crossing 13 Station 286+00 | Construct 501 linear feet of 24 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 25 feet. A total of 333 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.015 acre . The drainage area at the culvert pipe is 15 acres. Lat./Long.: 37.380905, -83.859290 |
| Crossing 14 Station 295+00 | Construct 764 linear feet of 48 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 69 feet. A total of 936 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.064 acre . The drainage area at the culvert pipe is 38 acres. Lat./Long.: 37.382589, -83.857663 |
| Crossing 15 Station 325+00 | Construct 1,330 linear feet of 2 foot wide (bottom width) channel, and 288 linear feet of 42 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 64 feet. A total of 1,535 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.053 acre . The drainage area at the culvert is 44 acres. Lat./Long.: 37.390222, -83.850220 |
| Crossing 15 Station 332+00 | Construct 354 linear feet of 2 foot wide (bottom width) channel. A total of 386 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.018 acre . The drainage area is 8 acres. Lat./Long.: 37.390868, -83.849417 |
| Crossing 15 Station 333+00 | Construct the new alignment and toe of slope which will fill this stream. A total of 113 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.004 acre . The drainage area is 5 acres. Lat./Long.: 37.390931, -83.849289 |

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| Crossing 16 Station 338+00 | Construct 306 linear feet of 6' X 6' RCBC culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 60 feet. A total of 381 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.035 acre . The drainage area at the culvert pipe is 129 acres. Lat./Long.: 37.392996, -83.849335 |
| Crossing 17 Station 346+00 | Construct 974 linear feet of 2 foot wide (bottom width) channel. A total of 415 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.057 acre . The drainage area is 150 acres. Lat./Long.: 37.394964, -83.846667 |
| Crossing 17 Station 349+00 | Construct the new alignment and toe of slope which will fill this stream. A total of 192 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.004 acre . The drainage area is 5 acres. Lat./Long.: 37.394975, -83.846829 |
| Crossing 17 Station 351+50 | Construct the new alignment and toe of slope which will fill this stream. A total of 227 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.005 acre . The drainage area is 5 acres. Lat./Long.: 37.395272, -83.846337 |
| Crossing 17 Station 352+50 | Construct 626 linear feet of 2 foot wide (bottom width) channel. A total of 703 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.032 acre . The drainage area is 161 acres. Lat./Long.: 37.396044, -83.845607 |
| Crossing 17 Station 355+75 | Construct a 566 foot long 4-span bridge. Piers will be set outside the ordinary high water mark and cyclopean rip-rap will be used around the abutment slopes to reduce scour during large flood events. A temporary crossing may be constructed. It will be built to accommodate a 2-year storm event, with excess flow designed to overtop the structure, with the structure remaining intact. A total of 0 feet of perennial stream (Sturgeon Creek) will be impacted. This impact measures 0 acre . The drainage area is 9,408 acres. Lat./Long.: 37.396296, -83.845292 |
| Crossing 17 Station 358+00 | Construct the new alignment and toe of slope which will fill this stream. A total of 48 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.002 acre . The drainage area is 10 acres. Lat./Long.: 37.396965, -83.844991 |

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| Crossing 17 Station 358+50 | Construct the new alignment and toe of slope which will fill this stream. A total of 127 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.006 acre . The drainage area is 7 acres. Lat./Long.: 37.396947, -83.844823 |
| Crossing 18 Station 367+00 | Construct 167 linear feet of 2 foot wide (bottom width) channel. A total of 260 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.012 acre . The drainage area at the culvert pipe is 7 acres. Lat./Long.: 37.398682, -83.843064 |
| Crossing 19 Station 375+00 | Construct the new alignment and toe of slope which will fill this stream. A total of 121 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.003 acre . The drainage area is 8 acres. Lat./Long.: 37.400598, -83.841543 |
| Crossing 19 Station 375+40 | Construct the new alignment and toe of slope which will fill this pond (0.037 acre). The pond was constructed by damming an ephemeral channel that was approximately 1' in width. The total stream estimated to be impounded by this pond is 55 feet. Total stream impact is 55 feet of ephemeral stream (UT to Sturgeon Creek). Total stream area impacted is 0.001 acres . The drainage area is 6 acres. Lat./Long.: 37.400699, -83.841242 |
| Crossing 19 Station 375+50 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.010 acres . Lat./Long.: 37.400699, -83.841242 |
| Crossing 20 Station 386+00 | Construct 346 linear feet of 48 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 20 feet. A total of 420 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.019 acre . The drainage area at the culvert pipe is 23 acres. Lat./Long.: 37.403316, -83.839083 |
| Crossing 21 Station 394+00 | Construct 226 linear feet of 2 foot wide (bottom width) channel, and 320 linear feet of 30 inch pipe culvert under the road. A total of 537 feet of ephemeral stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.018 acre . The drainage area at the culvert is 10 acres. Lat./Long.: 37.404964, -83.837658 |
| Crossing 22 Station 405+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.049 acres . Lat./Long.: 37.407722, -83.835586 |

Crossing 22
Station 405+50

Construct the new alignment and toe of slope which will fill this pond (0.311 acre). The pond was constructed by damming an **ephemeral** channel that was approximately 1.5' in width. The total stream estimated to be impounded by this pond is 153 feet. Total stream impact is **153 feet of ephemeral stream** (UT to Sturgeon Creek). Total stream area impacted is **0.005 acres**. The drainage area is 10 acres.
Lat./Long.: 37.407722, -83.835586

Crossing 23
Station 418+00

Construct 193 linear feet of 24 inch pipe culvert and 76 linear feet of 24 inch pipe culvert under the road. The inlet/outlet area of the pipe culverts will have Class II channel lining and will extend an additional 23 feet. A total of **328 feet of perennial stream** (UT to Sturgeon Creek) will be impacted. This impact measures **0.053 acre**. The drainage area at the culvert pipe is 1,041 acres.
Lat./Long.: 37.411960, -83.830193

Crossing 24
Station 442+00

Construct 610 linear feet of 6' X 6' RCBC culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 114 feet. A total of **745 feet of intermittent stream** (UT to Sturgeon Creek) will be impacted. This impact measures **0.103 acre**. The drainage area at the culvert pipe is 154 acres.
Lat./Long.: 37.415132, -83.826276

Crossing 24
Station 445+00

Construct 448 linear feet of 2 foot wide (bottom width) channel. A total of **276 feet of ephemeral stream** (UT to Sturgeon Creek) will be impacted. This impact measures **0.006 acre**. The drainage area is 3 acres.
Lat./Long.: 37.414951, -83.826246

Crossing 25
Station 465+00

Construct 410 linear feet of 2 foot wide (bottom width) channel. A total of **410 feet of intermittent stream** (UT to Sturgeon Creek) will be impacted. This impact measures **0.019 acre**. The drainage area is 61 acres.
Lat./Long.: 37.419970, -83.821663

Crossing 26
Station 474+00

Construct 505 linear feet of 42 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 65 feet. A total of **619 feet of intermittent stream** (UT to Sturgeon Creek) will be impacted. This impact measures **0.028 acre**. The drainage area at the culvert pipe is 30 acres.
Lat./Long.: 37.420614, -83.818527

| | |
|--------------------------------------|--|
| Crossing 27 Station 489+00 | Construct 272 linear feet of 36 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 20 feet. A total of 182 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.006 acre . The drainage area at the culvert pipe is 10 acres. Lat./Long.: 37.424085, -83.815651 |
| Crossing 27 Station 490+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.483 acres . Lat./Long.: 37.424100, -83.814946 |
| Crossing 28 Station 503+50 | Construct 158 linear feet of 18 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 45 feet. A total of 123 feet of ephemeral stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.004 acre . The drainage area at the culvert pipe is 7 acres. Lat./Long.: 37.427251, -83.813038 |
| Crossing 29 Station 508+00 | Construct 314 linear feet of 36 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 95 feet. A total of 553 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.051 acre . The drainage area at the culvert pipe is 56 acres. Lat./Long.: 37.428349, -83.812409 |
| Crossing 30 Station 512+50 | Construct 27 linear feet of 2 foot wide (bottom width) channel. A total of 28 feet of perennial stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.002 acre . The drainage area is 162 acres. Lat./Long.: 37.429044, -83.809838 |
| Crossing 30 Station 513+50 | Construct 455 linear feet of 2 foot wide (bottom width) channel, 294 linear feet of 24 inch pipe culvert, and 124 linear feet of 24 inch pipe culvert under the road. A total of 754 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.035 acre . The drainage area at the culvert is 16 acres. Lat./Long.: 37.429395, -83.810654 |
| Crossing 31 Station 529+50 | Construct the new alignment and toe of slope which will fill this pond (0.251 acre). The pond was constructed by damming an ephemeral channel that was approximately 1' in width. The total stream estimated to be impounded by this pond is 119 feet. Total stream impact is 119 feet of ephemeral stream (UT to Little Sturgeon Creek). Total stream area impacted is 0.003 acres . The drainage area is 4 acres. Lat./Long.: 37.433508, -83.808810 |

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|--------------------------------------|--|
| Crossing 31 Station 530+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.061 acres . Lat./Long.: 37.433508, -83.808810 |
| Crossing 32 Station 534+20 | Construct the new alignment and toe of slope which will fill this stream. A total of 80 feet of ephemeral stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.002 acre . The drainage area is 12 acres. Lat./Long.: 37.435460, -83.806516 |
| Crossing 33 Station 541+00 | Construct 252 linear feet of 30 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 31 feet. A total of 354 feet of ephemeral stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.012 acre . The drainage area at the culvert pipe is 14 acres. Lat./Long.: 37.436621, -83.806409 |
| Crossing 33 Station 542+50 | Construct 990 linear feet of 2 foot wide (bottom width) channel, and 165 linear feet of 36 inch pipe culvert under the road. These will replace an existing 19 foot long 36 inch pipe culvert and an existing 60 foot long 36" pipe under the existing road. A total of 1,237 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.085 acre . The drainage area at the culvert is 79 acres. Lat./Long.: 37.437990, -83.804493 |
| Crossing 33 Station 547+00 | Construct 54 linear feet of 2 foot wide (bottom width) channel. A total of 180 feet of ephemeral stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.004 acre . The drainage area is 5 acres. Lat./Long.: 37.437204, -83.804983 |
| Crossing 33 Station 553+50 | Construct 603 linear feet of 8' X 7' RCBC culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 70 feet. A total of 765 feet of perennial stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.140 acre . The drainage area at the culvert pipe is 297 acres. Lat./Long.: 37.438294, -83.802565 |
| Crossing 33 Station 554+00 | Construct the new alignment and toe of slope which will fill this stream. A total of 85 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.006 acre . The drainage area is 37 acres. Lat./Long.: 37.438773, -83.803438 |

| | |
|--------------------------------------|--|
| Crossing 34 Station 562+00 | Construct 287 linear feet of 24 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 30 feet. A total of 347 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.008 acre . The drainage area at the culvert pipe is 17 acres. Lat./Long.: 37.439597, -83.800425 |
| Crossing 34 Station 563+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.208 acres . Lat./Long.: 37.439266, -83.800536 |
| Crossing 35 Station 570+00 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.227 acres . Lat./Long.: 37.440779, -83.798727 |
| Crossing 36 Station 579+00 | Construct 321 linear feet of 30 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 101 feet. A total of 339 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.012 acre . The drainage area at the culvert pipe is 22 acres. Lat./Long.: 37.442588, -83.796396 |
| Crossing 37 Station 587+50 | Construct 119 linear feet of 24 inch pipe culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 10 feet. A total of 155 feet of ephemeral stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.005 acre . The drainage area at the culvert pipe is 12 acres. Lat./Long.: 37.444444, -83.794641 |
| Crossing 38 Station 595+00 | Construct 337 linear feet of 8' X 6' RCBC culvert under the road. The inlet/outlet area of the pipe culvert will have Class II channel lining and will extend an additional 164 feet. These will replace an existing 34 foot long, 48" pipe under the existing road. A total of 467 feet of intermittent stream (UT to Little Sturgeon Creek) will be impacted. This impact measures 0.032 acre . The drainage area at the culvert is 182 acres. Lat./Long.: 37.445716, -83.792514 |
| Crossing 38 Station 595+50 | Construct the new alignment and toe of slope which will fill this stream. A total of 249 feet of intermittent stream (UT to Sturgeon Creek) will be impacted. This impact measures 0.017 acre . The drainage area is 5 acres. Lat./Long.: 37.446075, -83.792857 |
| Crossing 38 Station 595+70 | Construct the new alignment and toe of slope which will fill this wetland. This impact measures 0.062 acres . Lat./Long.: 37.446453, -83.793091 |

Crossing 38
Station 596+00

Construct the new alignment and toe of slope which will fill this pond (0.082 acre). The pond was constructed by damming an **ephemeral** channel that was approximately 1' in width. The total stream estimated to be impounded by this pond is 28 feet. Total stream impact is **28 feet** of **intermittent stream** (UT to Little Sturgeon Creek). Total stream area impacted is **0.001 acres**. The drainage area is 3 acres.

Lat./Long.: 37.446453, -83.793091

Crossing 39
Station 600+00

Construct the new alignment and toe of slope which will fill this wetland. This impact measures **0.317 acres**.

Lat./Long.: 37.446845, -83.791683

Crossing 40
Station 603+50

Construct the new alignment and toe of slope which will fill this stream. A total of **115 feet** of **ephemeral stream** (UT to Little Sturgeon Creek) will be impacted. This impact measures **0.003 acre**. The drainage area is 11 acres.

Lat./Long.: 37.447615, -83.790933

Table 1: Stream & Wetland Impacts

TABLE 1: Stream and Wetland Impacts - KY 30 reconstruction; Jackson & Owsley Cos.; Item No. 10-279.61; LRL-2017-1052

| Crossing | Station | Name | River Basin | HUC 14 | Latitude/ Longitude | Stream Type | Impact Type | Length of Impact (ft) | Stream Width (ft) | Acreage of Impact (ac) | Cubic Yards | Drainage Area (ac) | RBP score | Spec. Cond. | EII Score | Riffle/Pool Complex | EIUs Impacted |
|----------|---------|------------------------|------------------------|------------------|-----------------------|--------------|--------------------------|-----------------------|-------------------|----------------------------|-------------|--------------------|-----------|-------------|-----------|---------------------|---------------|
| 1 | 100+60 | Laurel Fork | Upper Cumberland River | 05130102-030-010 | 37.342652; -83.900162 | perennial | bridge | 0 | 5 | 0.000 | 0 | 402 | 115 | 840 | 0.18 | No | |
| | 100+65 | Laurel Fork | Upper Cumberland River | 05130102-030-010 | 37.342268; -83.899803 | perennial | culvert | 300 | 5 | 0.034 | 44 | 402 | 115 | 840 | 0.18 | No | 54 |
| | 105+00 | UT Laurel Fork | Upper Cumberland River | 05130102-030-010 | 37.343801; -83.898646 | ephemeral | channel change | 561 | 1 | 0.013 | 10 | 9 | 77 | 224 | 0.44 | No | |
| | 113+55 | UT Laurel Fork | Upper Cumberland River | 05130102-030-010 | 37.345256; -83.896992 | ephemeral | fill | 121 | 2 | 0.006 | 3 | 7 | 82 | 224 | 0.44 | No | |
| 3 | 119+00 | UT Laurel Fork | Upper Cumberland River | 05130102-030-010 | 37.347125; -83.895914 | intermittent | culvert & channel change | 777 | 4 | 0.071 | 58 | 194 | 117 | 224 | 0.53 | No | 411.81 |
| | 125+00 | UT Laurel Fork | Upper Cumberland River | 05130102-030-010 | 37.348418; -83.893765 | intermittent | culvert & channel change | 1224 | 2 | 0.056 | 45 | 59 | 75 | 335 | 0.29 | No | 354.96 |
| | 134+00 | wetland | Upper Cumberland River | 05130102-030-010 | 37.349313; -83.892198 | NA | fill | NA | NA | 0.092 | 73 | NA | NA | NA | NA | No | |
| | | | | | | | | | | | | | | | | | |
| 4 | 150+00 | UT Rocky Branch | Upper Kentucky River | 05100204-020-010 | 37.353729; -83.886931 | intermittent | channel change | 514 | 2 | 0.024 | 11 | 16 | 86 | 88.7 | 0.55 | No | 282.7 |
| | 154+50 | UT Rocky Branch | Upper Kentucky River | 05100204-020-010 | 37.353518; -83.887400 | ephemeral | fill | 90 | 1.5 | 0.003 | 1 | 3 | 80 | 88.7 | 0.55 | No | |
| | 157+50 | UT Rocky Branch | Upper Kentucky River | 05100204-020-010 | 37.354480; -83.886972 | ephemeral | culvert | 463 | 1 | 0.011 | 3 | 12 | 95 | 88.7 | 0.55 | No | |
| | 157+75 | UT Rocky Branch | Upper Kentucky River | 05100204-020-010 | 37.353812; -83.885552 | intermittent | channel change | 118 | 3 | 0.008 | 7 | 29 | 91 | 88.7 | 0.55 | No | 64.9 |
| | | | | | | | | | | | | | | | | | |
| 5 | 172+00 | UT Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.358475; -83.885571 | ephemeral | channel change | 303 | 1 | 0.007 | 2 | 12 | 84 | 88.7 | 0.55 | No | |
| | 174+00 | Pond/UT Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.359213; -83.885596 | intermittent | channel change | 146 | 1 | pond-0.235; stream- 0.003 | 1 | 14 | 84 | 88.7 | 0.55 | No | |
| | 175+00 | wetland | Upper Kentucky River | 05100204-020-010 | 37.359213; -83.885596 | NA | fill | NA | NA | 0.089 | 70 | NA | NA | NA | NA | No | |
| | | | | | | | | | | | | | | | | | |
| 6 | 190+00 | UT Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.361535; -83.881209 | ephemeral | culvert | 593 | 1.5 | 0.020 | 10 | 20 | 62 | 169 | 0.52 | No | |
| 7 | 208+20 | Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.365205; -83.876700 | intermittent | channel change | 25 | 3 | 0.002 | 1 | 505 | 75 | 160 | 0.54 | No | 13.5 |
| | 209+00 | Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.364742; -83.876020 | perennial | culvert & channel change | 505 | 12 | 0.139 | 224 | 871 | 114 | 160 | 0.61 | No | 308.05 |
| | 210+00 | UT Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.365573; -83.876693 | intermittent | culvert & channel change | 218 | 8 | 0.040 | 32 | 222 | 83 | 160 | 0.54 | No | 117.72 |
| | | | | | | | | | | | | | | | | | |
| 8 | 217+00 | Pond/UT Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.366648; -83.873227 | intermittent | fill | 270 | 3 | pond-0.606; stream- 0.019 | 15 | 129 | 91 | 88.7 | 0.55 | No | 148.5 |
| | 219+00 | wetland | Upper Kentucky River | 05100204-020-010 | 37.366648; -83.873227 | NA | fill | NA | NA | 0.225 | 177 | NA | NA | NA | NA | No | |
| | | | | | | | | | | | | | | | | | |
| 9 | 230+00 | Pond/UT Herd Fork | Upper Kentucky River | 05100204-020-010 | 37.369517; -83.870871 | intermittent | fill | 417 | 3 | pond-1.202; stream - 0.029 | 23 | 18 | 91 | 88.7 | 0.55 | No | 229.35 |
| | 231+00 | wetland | Upper Kentucky River | 05100204-020-010 | 37.369517; -83.870871 | NA | fill | NA | NA | 0.147 | 113 | NA | NA | NA | NA | No | |
| | | | | | | | | | | | | | | | | | |
| 10 | 248+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.374435; -83.868151 | ephemeral | channel change | 601 | 2 | 0.028 | 9 | 11 | 68 | 125 | 0.55 | No | |
| 11 | 258+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.376005; -83.866220 | ephemeral | culvert & channel change | 184 | 2 | 0.008 | 4 | 5 | 57 | 125 | 0.55 | No | |
| | 260+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.376181; -83.865983 | ephemeral | culvert | 214 | 2 | 0.010 | 5 | 15 | 58 | 125 | 0.55 | No | |
| | | | | | | | | | | | | | | | | | |
| 12 | 273+00 | Pond/UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.379245; -83.863429 | intermittent | fill | 224 | 11 | pond-0.228; stream- 0.057 | 18 | 26 | 62 | 125 | 0.55 | No | 123.2 |
| | 274+00 | wetland | Upper Kentucky River | 05100204-020-030 | 37.379191; -83.863335 | NA | fill | NA | NA | 0.052 | 40 | NA | NA | NA | NA | No | |
| | 275+00 | wetland | Upper Kentucky River | 05100204-020-030 | 37.379580; -83.862088 | NA | fill | NA | NA | 0.563 | 452 | NA | NA | NA | NA | No | |
| | 277+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.380158; -83.862287 | intermittent | culvert & channel change | 664 | 11 | 0.168 | 54 | 45 | 62 | 125 | 0.55 | No | 365.2 |
| | | | | | | | | | | | | | | | | | |
| 13 | 286+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.380905; -83.859290 | intermittent | culvert | 333 | 2 | 0.015 | 7 | 15 | 97 | 32.1 | 0.55 | No | 183.15 |
| 14 | 295+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-030 | 37.382589; -83.857663 | intermittent | culvert | 936 | 3 | 0.064 | 73 | 38 | 86 | 26.6 | 0.55 | No | 514.8 |

| Crossing | Station | Name | River Basin | HUC 14 | Latitude/ Longitude | Stream Type | Impact Type | Length of Impact (ft) | Stream Width (ft) | Acreage of Impact (ac) | Cubic Yards | Drainage Area (ac) | RBP score | Spec. Cond. | EII Score | Riffle/Pool Complex | EIUs Impacted |
|----------|---------|-------------------------------|----------------------|------------------|-----------------------|--------------|---------------------------|-----------------------|-------------------|---------------------------|-------------|--------------------|-----------|-------------|-----------|---------------------|---------------|
| 15 | 325+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.390222; -83.850220 | intermittent | culvert & channel change | 1,535 | 1.5 | 0.053 | 26 | 44 | 94 | 149 | 0.55 | No | 844.25 |
| | 332+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.390868; -83.849417 | ephemeral | channel change | 386 | 2 | 0.018 | 9 | 8 | 83 | 149 | 0.55 | No | |
| | 333+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.390931; -83.849289 | ephemeral | fill | 113 | 2 | 0.004 | 2 | 5 | 76 | 149 | 0.55 | No | |
| 16 | 338+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.392996; -83.849335 | intermittent | culvert | 381 | 4 | 0.035 | 56 | 129 | 101 | 140 | 0.56 | No | 213.36 |
| 17 | 346+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.394964; -83.846667 | intermittent | channel change | 415 | 6 | 0.057 | 92 | 150 | 125 | 149 | 0.68 | No | 282.2 |
| | 349+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.394975; -83.846829 | ephemeral | fill | 192 | 1 | 0.004 | 2 | 5 | 75 | 149 | 0.55 | No | |
| | 351+50 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.395272; -83.846337 | ephemeral | fill | 227 | 1 | 0.005 | 3 | 5 | 92 | 149 | 0.55 | No | |
| | 352+50 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.396044; -83.845607 | intermittent | channel change | 703 | 2 | 0.032 | 26 | 161 | 108 | 149 | 0.59 | No | 414.77 |
| | 355+75 | Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.396296; -83.845292 | perennial | bridge | 0 | 18 | 0.000 | 0 | 9,408 | 133 | 100 | 0.72 | No | |
| | 358+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.396965; -83.844991 | ephemeral | fill | 48 | 1.5 | 0.002 | 1 | 10 | 51 | 100 | 0.55 | No | |
| | 358+50 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.396947; -83.844823 | ephemeral | fill | 127 | 2 | 0.006 | 3 | 7 | 49 | 100 | 0.55 | No | |
| 18 | 367+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.398682; -83.843064 | ephemeral | channel change | 260 | 2 | 0.012 | 6 | 7 | 92 | 100 | 0.55 | No | |
| 19 | 375+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.400598; -83.841543 | ephemeral | fill | 121 | 1 | 0.003 | 1 | 8 | 70 | 100 | 0.55 | No | |
| | 375+40 | Pond/UT Sturgeon Creek | Upper Kentucky River | 05100204-020-050 | 37.400699; -83.841242 | ephemeral | fill | 55 | 1 | pond-0.037; stream- 0.001 | 1 | 6 | 70 | 100 | 0.55 | No | |
| | 375+50 | wetland | Upper Kentucky River | 05100204-020-050 | 37.400699; -83.841242 | NA | fill | NA | NA | 0.010 | 16 | NA | NA | NA | NA | No | |
| 20 | 386+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.403316; -83.839083 | intermittent | culvert | 420 | 2 | 0.019 | 9 | 23 | 97 | 29.4 | 0.55 | No | 231 |
| 21 | 394+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.404964; -83.837658 | ephemeral | culvert & channel change | 537 | 1.5 | 0.018 | 6 | 10 | 80 | 29.4 | 0.55 | No | |
| 22 | 405+00 | wetland | Upper Kentucky River | 05100204-020-090 | 37.407722; -83.835586 | NA | fill | NA | NA | 0.049 | 79 | NA | NA | NA | NA | No | |
| | 405+50 | Pond/UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.407722; -83.835586 | ephemeral | fill | 153 | 1.5 | pond-0.311; stream- 0.005 | 2 | 10 | 80 | 29.4 | 0.55 | No | |
| 23 | 418+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.411960; -83.830193 | perennial | culverts | 328 | 7 | 0.053 | 85 | 1041 | 101 | 197 | 0.49 | No | 160.72 |
| 24 | 442+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.415132; -83.826276 | intermittent | culvert | 745 | 6 | 0.103 | 166 | 154 | 127 | 209 | 0.6 | No | 447 |
| | 445+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.414951; -83.826246 | ephemeral | channel change | 276 | 1 | 0.006 | 1 | 3 | 57 | 209 | 0.47 | No | |
| 25 | 465+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.419970; -83.821663 | intermittent | channel change | 410 | 2 | 0.019 | 9 | 61 | 54 | 382 | 0.23 | No | 94.3 |
| 26 | 474+00 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-090 | 37.420614; -83.818527 | intermittent | culvert | 619 | 2 | 0.028 | 23 | 30 | 88 | 640 | 0.1 | No | 61.9 |
| 27 | 489+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.424085; -83.815651 | intermittent | culvert | 182 | 1.5 | 0.006 | 3 | 10 | 65 | 576 | 0.1 | No | 18.2 |
| | 490+00 | wetland | Upper Kentucky River | 05100204-020-180 | 37.424100; -83.814946 | NA | fill | NA | NA | 0.483 | 387 | NA | NA | NA | NA | No | |
| 28 | 503+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.427251; -83.813038 | ephemeral | culvert | 123 | 1.5 | 0.004 | 2 | 7 | 82 | 56.9 | 0.55 | No | |
| 29 | 508+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.428349; -83.812409 | intermittent | culvert | 553 | 4 | 0.051 | 41 | 56 | 88 | 444 | 0.16 | No | 88.48 |
| 30 | 512+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.429044; -83.809838 | perennial | channel change | 28 | 3 | 0.002 | 2 | 162 | 112 | 324 | 0.36 | No | 10.08 |
| | 513+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.429395; -83.810654 | intermittent | culverts & channel change | 754 | 2 | 0.035 | 17 | 16 | 110 | 56.9 | 0.6 | No | 452.4 |
| 31 | 529+50 | Pond/UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.433508; -83.808810 | ephemeral | fill | 119 | 1 | pond-0.251; stream- 0.003 | 1 | 4 | 53 | 33.5 | 0.55 | No | |
| | 530+00 | wetland | Upper Kentucky River | 05100204-020-180 | 37.433508; -83.808810 | NA | fill | NA | NA | 0.061 | 48 | NA | NA | NA | NA | No | |
| 32 | 534+20 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.435460; -83.806516 | ephemeral | fill | 80 | 1 | 0.002 | 1 | 12 | 53 | 33.5 | 0.55 | No | |
| 33 | 541+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.436621; -83.806409 | ephemeral | culvert | 354 | 1.5 | 0.012 | 6 | 14 | 108 | 33.5 | 0.59 | No | |
| | 542+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.437990; -83.804493 | intermittent | culvert & channel change | 1237 | 3 | 0.085 | 69 | 79 | 96 | 52.7 | 0.55 | No | 680.35 |
| | 547+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.437204; -83.804983 | ephemeral | channel change | 180 | 1 | 0.004 | 1 | 5 | 70 | 33.5 | 0.55 | No | |
| | 553+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.438294; -83.802565 | perennial | culvert | 765 | 8 | 0.140 | 340 | 297 | 120 | 98.7 | 0.65 | No | 497.25 |
| | 554+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.438773; -83.803438 | intermittent | fill | 85 | 3 | 0.006 | 8 | 37 | 110 | 172 | 0.57 | No | 48.45 |

| Crossing | Station | Name | River Basin | HUC 14 | Latitude/ Longitude | Stream Type | Impact Type | Length of Impact (ft) | Stream Width (ft) | Acreage of Impact (ac) | Cubic Yards | Drainage Area (ac) | RBP score | Spec. Cond. | EII Score | Riffle/Pool Complex | EIUs Impacted |
|----------|---------|-------------------------------|----------------------|------------------|-----------------------|--------------|-------------|-----------------------|-------------------|--------------------------|-------------|--------------------|-----------|-------------|-----------|---------------------|---------------|
| 34 | 562+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.439597; -83.800425 | intermittent | culvert | 347 | 1 | 0.008 | 1 | 17 | 65 | 262 | 0.39 | No | 135.33 |
| | 563+00 | wetland | Upper Kentucky River | 05100204-020-180 | 37.439266; -83.800536 | NA | fill | NA | NA | 0.208 | 161 | NA | NA | NA | NA | No | |
| 35 | 570+00 | wetland | Upper Kentucky River | 05100204-020-180 | 37.440779; -83.798727 | NA | fill | NA | NA | 0.227 | 177 | NA | NA | NA | NA | No | |
| 36 | 579+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.442588; -83.796396 | intermittent | culvert | 339 | 1.5 | 0.012 | 6 | 22 | 90 | 262 | 0.39 | No | 132.21 |
| 37 | 587+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.444444; -83.794641 | ephemeral | culvert | 155 | 1.5 | 0.005 | 1 | 12 | 68 | 452 | 0.15 | No | |
| 38 | 595+00 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.445716; -83.792514 | intermittent | culvert | 467 | 3 | 0.032 | 42 | 182 | 82 | 174 | 0.52 | No | 242.84 |
| | 595+50 | UT Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.446075; -83.792857 | intermittent | fill | 249 | 3 | 0.017 | 8 | 5 | 98 | 216 | 0.46 | No | 114.54 |
| | 595+70 | wetland | Upper Kentucky River | 05100204-020-180 | 37.446453; -83.793091 | NA | fill | NA | NA | 0.062 | 48 | NA | NA | NA | NA | No | |
| | 596+00 | Pond/UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.446453; -83.793091 | intermittent | fill | 28 | 1 | pond-0.082; stream-0.001 | 1 | 3 | 46 | 216 | 0.46 | No | 12.88 |
| 39 | 600+00 | wetland | Upper Kentucky River | 05100204-020-180 | 37.446845; -83.791683 | NA | fill | NA | NA | 0.317 | 258 | NA | NA | NA | NA | No | |
| 40 | 603+50 | UT Little Sturgeon Creek | Upper Kentucky River | 05100204-020-180 | 37.447615; -83.790933 | ephemeral | fill | 115 | 1 | 0.003 | 1 | 11 | 46 | 216 | 0.46 | No | |
| | | | | | | | TOTALS | 24012 | | 4.332 | 3,840 | | | | | | 8354 |
| | | | | | | | | TOTAL WETLAND ACREAGE | | 2.585 | | | | | | | |

Mitigation for Impacts to Waters of U.S.

Total EIUs and AMUs

The total EIUs from all impacts is 8,007 and total AMUs is 5.2.

Streams

Table 1 lists all stream impacts, and the computed impact EIUs. Total impacted stream EIUs are 8,354. KYTC proposes to mitigate these stream impacts by in-lieu fee.

Wetlands

A total of 2.6 acres (5.2 AMU's) of wetland will be impacted by the project (see Table 1). KYTC proposes to mitigate these wetland impacts by payment of in-lieu fee.

Photographs

PHOTOS OF IMPACTED STREAMS AND WETLANDS

Roadway:

Sta. 100+60, Perennial, RBP Score 115, Sp. Cond. 840, EII 0.18



Sta. 100+65, Perennial, RBP Score 115, Sp. Cond. 840, EII 0.18



Sta. 105+00, Ephemeral, RBP Score 77, Sp. Cond. 224, EII 0.44



Sta. 113+55, Ephemeral, RBP Score 82, Sp. Cond. 224, EII 0.44



Sta. 119+00, Intermittent, RBP Score 117, Sp. Cond. 224, EII 0.53



Sta. 125+00, Intermittent, RBP Score 75, Sp. Cond. 335, EII 0.29



Sta. 134+00, wetland



Sta. 150+00, Intermittent, RBP Score 86, Sp. Cond. 88.7, EII 0.55



Sta. 154+50, Ephemeral, RBP Score 80, Sp. Cond. 88.7, EII 0.55



Sta. 157+50, Ephemeral, RBP Score 95, Sp. Cond. 88.7, EII 0.55



Sta. 157+75, Intermittent, RBP Score 91, Sp. Cond. 88.7, EII 0.55



Sta. 172+00, Ephemeral, RBP Score 84, Sp. Cond. 88.7, EII 0.55



Sta. 174+00, Intermittent, RBP Score 84, Sp. Cond. 88.7, EII 0.55



Sta. 175+00, wetland



Sta. 190+00, Ephemeral, RBP Score 62, Sp. Cond. 169, EII 0.52



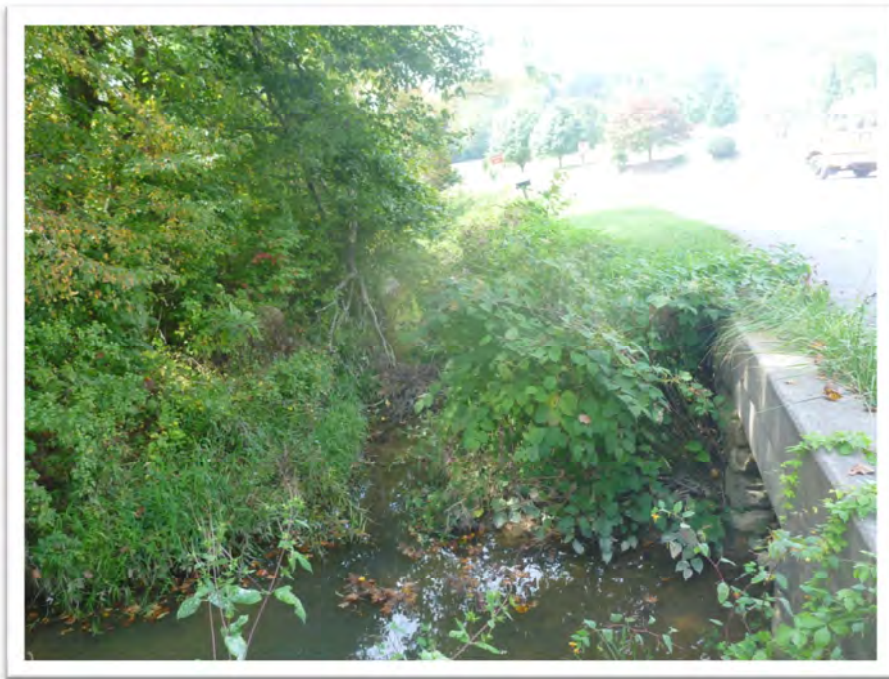
Sta. 208+20, Intermittent, RBP Score 75, Sp. Cond. 160, EII 0.54



Sta. 209+00, Perennial, RBP Score 114, Sp. Cond. 160, EII 0.61



Sta. 210+00, Intermittent, RBP Score 83, Sp. Cond. 160, EII 0.54



Sta. 217+00, Intermittent, RBP Score 91, Sp. Cond. 88.7, EII 0.55



Sta. 219+00, wetland



Sta. 230+00, Intermittent, RBP Score 91, Sp. Cond. 88.7, EII 0.55



Sta. 231+00, wetland



Sta. 248+00, Ephemeral, RBP Score 68, Sp. Cond. 125, EII 0.55



Sta. 258+00, Ephemeral, RBP Score 57, Sp. Cond. 125, EII 0.55



Sta. 260+00, Ephemeral, RBP Score 58, Sp. Cond. 125, EII 0.55



Sta. 273+00, Intermittent, RBP Score 62, Sp. Cond. 125, EII 0.55



Sta. 274+00, wetland



Sta. 275+00, wetland



Sta. 277+00, Intermittent, RBP Score 62, Sp. Cond. 125, EII 0.55



Sta. 286+00, Intermittent, RBP Score 97, Sp. Cond. 32.1, EII 0.55



Sta. 295+00, Intermittent, RBP Score 86, Sp. Cond. 26.6, EII 0.55



Sta. 325+00, Intermittent, RBP Score 94, Sp. Cond. 149, EII 0.55



Sta. 332+00, Ephemeral, RBP Score 83, Sp. Cond. 149, EII 0.55



Sta. 333+00, Ephemeral, RBP Score 76, Sp. Cond. 149, EII 0.55



Sta. 338+00, Intermittent, RBP Score 101, Sp. Cond. 140, EII 0.56



Sta. 346+00, Intermittent, RBP Score 125, Sp. Cond. 149, EII 0.68



Sta. 349+00, Ephemeral, RBP Score 75, Sp. Cond. 149, EII 0.55



Sta. 351+50, Ephemeral, RBP Score 92, Sp. Cond. 149, EII 0.55



Sta. 352+50, Intermittent, RBP Score 108, Sp. Cond. 149, EII 0.59



Sta. 355+75, Perennial, RBP Score 133, Sp. Cond. 100, EII 0.72



Sta. 358+00, Ephemeral, RBP Score 51, Sp. Cond. 100, EII 0.55



Sta. 358+50, Ephemeral, RBP Score 49, Sp. Cond. 100, EII 0.55



Sta. 367+00, Ephemeral, RBP Score 92, Sp. Cond. 100, EII 0.55



Sta. 375+00, Ephemeral, RBP Score 70, Sp. Cond. 100, EII 0.55



Sta. 375+40, Ephemeral, RBP Score 70, Sp. Cond. 100, EII 0.55



Sta. 375+50, wetland



Sta. 386+00, Intermittent, RBP Score 97, Sp. Cond. 29.4, EII 0.55



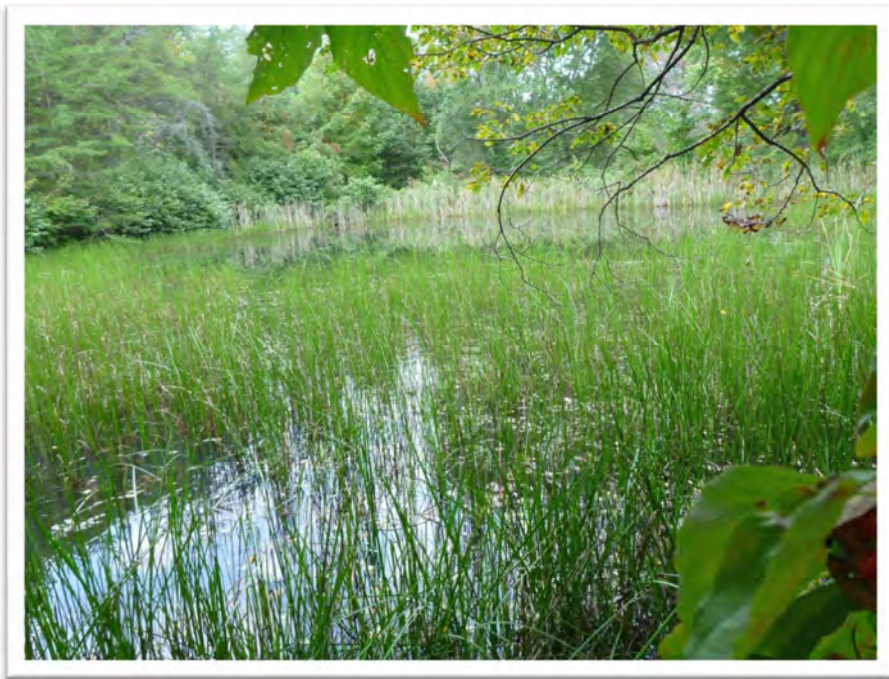
Sta. 394+00, Ephemeral, RBP Score 80, Sp. Cond. 29.4, EII 0.55



Sta. 405+00, wetland



Sta. 405+50, Ephemeral, RBP Score 80, Sp. Cond. 29.4, EII 0.55



Sta. 418+00, Perennial, RBP Score 101, Sp. Cond. 197, EII 0.49



Sta. 442+00, Intermittent, RBP Score 127, Sp. Cond. 209, EII 0.6



Sta. 445+00, Ephemeral, RBP Score 57, Sp. Cond. 209, EII 0.47



Sta. 465+00, Intermittent, RBP Score 54, Sp. Cond. 382, EII 0.23



Sta. 474+00, Intermittent, RBP Score 88, Sp. Cond. 640, EII 0.1



Sta. 489+00, Intermittent, RBP Score 65, Sp. Cond. 576, EII 0.1



Sta. 490+00, wetland



Sta. 503+50, Ephemeral, RBP Score 82, Sp. Cond. 56.9, EII 0.55



Sta. 508+00, Intermittent, RBP Score 88, Sp. Cond. 444, EII 0.16



Sta. 512+50, Perennial, RBP Score 112, Sp. Cond. 324, EII 0.36



Sta. 513+50, Intermittent, RBP Score 110, Sp. Cond. 56.9, EII 0.6



Sta. 529+50, Ephemeral, RBP Score 53, Sp. Cond. 33.5, EII 0.55



Sta. 530+00, wetland



Sta. 534+20, Ephemeral, RBP Score 53, Sp. Cond. 33.5, EII 0.55



Sta. 541+00, Ephemeral, RBP Score 108, Sp. Cond. 33.5, EII 0.59



Sta. 542+50, Intermittent, RBP Score 96, Sp. Cond. 52.7, EII 0.55



Sta. 547+00, Ephemeral, RBP Score 70, Sp. Cond. 33.5, EII 0.55



Sta. 553+50, Perennial, RBP Score 120, Sp. Cond. 98.7, EII 0.65



Sta. 554+00, Intermittent, RBP Score 110, Sp. Cond. 172, EII 0.57



Sta. 562+00, Intermittent, RBP Score 65, Sp. Cond. 262, EII 0.39



Sta. 563+00, wetland



Sta. 570+00, wetland



Sta. 579+00, Intermittent, RBP Score 90, Sp. Cond. 262, EII 0.39



Sta. 587+50, Ephemeral, RBP Score 68, Sp. Cond. 452, EII 0.15



Sta. 595+00, Intermittent, RBP Score 82, Sp. Cond. 174, EII 0.52



Sta. 595+50, Intermittent, RBP Score 96, Sp. Cond. 216, EII 0.46



Sta. 595+70, wetland



Sta. 596+00, Intermittent, RBP Score 46, Sp. Cond. 216, EII 0.46



Sta. 600+00, wetland



Sta. 603+50, Ephemeral, RBP Score 46, Sp. Cond. 216, EII 0.46



RBP Habitat Assessment Field Data Sheets

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>S62</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT EPH) |
| LA <u>37.392652</u> LONG <u>-83.900162</u> | RIVER BASIN <u>Upper Cumberland</u> |
| STATION # <u>100+60 & 100+65</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>4-25-17</u> TIME <u>1:36</u> AM <input checked="" type="checkbox"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>11</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 <u>14</u> 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material; increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>11</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $\leq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: _____

Bankfull Depth: 9" Bankfull Width: 5' Bankfull Area: _____

Max. Wetted Depth: 3" Avg. Wetted Depth: 1" Specific Conductivity: 840 Temp: 70.2°

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 115 Along road, has culvert

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>SCI</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT (EPH) <u> </u> |
| LAT <u>37.343801</u> LONG <u>83.898646</u> | RIVER BASIN <u>Upper Cumberland</u> |
| STATION # <u>105+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u> </u> AM <u> </u> PM <u> </u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees:

Bankfull Depth: 6 Bankfull Width: 11 Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: 224 Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 77

use old form

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|------------------|--------------------------|----------------------|
| STREAM NAME | SG6 | LOCATION | KY 30 Jackson/Owsley |
| STATION # | RIVERMILE | STREAM CLASS (PER INT) | EPH |
| LAT | 37.345256 | LONG | 83.896992 |
| RIVER BASIN | Upper Cumberland | | |
| STATION # | 113+55 | AGENCY | KYTC |
| INVESTIGATORS | | | |
| FORM COMPLETED BY | EUS | DATE | 9-25-17 |
| | | TIME | 1:24 PM |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $\geq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple, Tulip Poplar, Sycamore

Bankfull Depth: 3" Bankfull Width: 7' Bankfull Area: _____

Max. Wetted Depth: _____ Avg. Wetted Depth: _____ Specific Conductivity: (224) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | |

Total Score 82 From hollow into pond

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|----------------|------------------------------|----------------------|
| STREAM NAME | S 59 | LOCATION | KY 30 Jackson/Owsley |
| STATION # | RIVERMILE | STREAM CLASS (PER INT EPH) | |
| LA 37.347125 | LONG 83.895914 | RIVER BASIN | Upper Cumberland |
| STATION # | 119+00 | AGENCY | KYTC |
| INVESTIGATORS | | | |
| FORM COMPLETED BY | ELS | DATE | 9-25-17 |
| | | TIME | 1:05 AM PM |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple White Oak

Bankfull Depth: 6" Bankfull Width: 4' Bankfull Area: _____

Max. Wetted Depth: 6" Avg. Wetted Depth: 1" Specific Conductivity: 224 Temp: 66.5

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 117

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|---|---|------------------------------|
| STREAM NAME <u>S 58</u> | LOCATION <u>KY 30 Jackson/Owsley</u> | |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT <u>2000</u>) | |
| LA <u>37.348418</u> LONG <u>83.893765</u> | RIVER BASIN <u>Upper Cumberland</u> | |
| STATION # <u>125+00</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>4-25-17</u> TIME <u>12:55</u> AM <u>PM</u> | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|---|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>(6)</u> | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(6)</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is <0.3 m/s, deep is >0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |

3 Dominant Trees: Maple

Bankfull Depth: 6" Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: 2" Avg. Wetted Depth: 1" Specific Conductivity: 335 Temp: 66.5

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|-----|----|----|---|-----|-----|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | (5) | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | (6) | | | 5 | 4 | 3 | | | 2 | 1 | | 0 | | |
| SCORE __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | (6) | | | 5 | 4 | 3 | | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | (6) | | | 5 | 4 | 3 | | | 2 | 1 | | 0 | | |
| SCORE __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | (6) | | | 5 | 4 | 3 | | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | (3) | | | 2 | 1 | | 0 | | |
| SCORE __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | (3) | | | 2 | 1 | | 0 | | |

Total Score 75 Drainage from neighborhood

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>555</u> | LOCATION <u>KY 30 Jackson/Crosby</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT (EPH)) |
| LA <u>82.353729</u> LONG <u>83.886931</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>150+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY | DATE <u>1-25-17</u> TIME <u>12:35</u> AM <u>PM</u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|--|---|--|--------------------|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. | |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. | |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). | |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. | |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. | |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Maple

Bankfull Depth: 2' Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: 88.7 Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 86

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S56</u> | LOCATION <u>KY30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT EPI) |
| LA <u>37.353518</u> LONG <u>83.887400</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>154t50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-25-17</u> TIME <u>12:30</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>9</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Poplar, Maple

Bankfull Depth: 4" Bankfull Width: 7.5' Bankfull Area: _____

Max. Wetted Depth: _____ Avg. Wetted Depth: _____ Specific Conductivity: (88.7) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Parameters to be evaluated broader than sampling reach

Total Score 80 Core drillings and power line break on right

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>557</u> | LOCATION <u>KY 30 Jackson/Overley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT) <u>(EPH)</u> |
| LAT <u>37.354480</u> LONG <u>83.886972</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>157+50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>4-25-17</u> TIME <u>12:40</u> AM <u>PM</u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Maple, Poplar

Bankfull Depth: 2" Bankfull Width: 1' Bankfull Area:

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (88.7) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 95 Road on right

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>554</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER <u>(N)</u> EPH) |
| LAT <u>37.353812</u> LONG <u>83.885552</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>157+75</u> | AGENCY <u>ISYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-25-17</u> TIME <u>12:21</u> AM <u>(PM)</u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>(8)</u> 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>(7)</u> 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 <u>(1)</u> 0 |

3 Dominant Trees: Silver Maple

Bankfull Depth: 6" Bankfull Width: 5" Bankfull Area:

Max. Wetted Depth: <1" Avg. Wetted Depth: <1" Specific Conductivity: (88.7) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 91

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S53</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT (EPH)) <u> </u> |
| LA <u>37.358475</u> LONG <u>-83.885571</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>172+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-25-17</u> TIME <u>1201</u> AM <u>PM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red Maple

Bankfull Depth: 2' Bankfull Width: 1' Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: (88.7) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 84 not much channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME: <u>550</u> | LOCATION: <u>KY 30 Jackson/Chesley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT) <u>(EPH)</u> |
| LA <u>82.36/535</u> LONG <u>83.88/209</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>190+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-25-17</u> TIME <u>11:04</u> <u>AM</u> PM |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>(7)</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>(2)</u> 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>(8)</u> 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>(0)</u> |

3 Dominant Trees: Hickory Sycamore

Bankfull Depth: 3" Bankfull Width: 15' Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: (169) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream | | | | | | | | | | | | | | | | | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 62 Logging currently

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|---|--|---|
| STREAM NAME <u>S 46</u> | LOCATION <u>KY 30 Jackson/Owsley</u> | |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER <u>NT</u> EPH) | |
| LAT <u>37.365205</u> LONG <u>83.876700</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>208+20</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS <u> </u> | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-16-17</u> TIME <u>1:20</u> AM <input checked="" type="radio"/> PM <input type="radio"/> | REASON FOR SURVEY <u> </u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>8</u> 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or >25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>8</u> 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Black willow

Bankfull Depth: 6" Bankfull Width: 3' Bankfull Area:

Max. Wetted Depth: 2" Avg. Wetted Depth: 1" Specific Conductivity: (160) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | 2 | 1 | 2 | 1 | 0 | | | |

Total Score 75 Channelized

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|--|--|------------------------------|
| STREAM NAME <u>S45</u> | LOCATION <u>KY 30 Jackson/Owsley</u> | |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (<u>PER</u>) INT EPH) | |
| LAT <u>37.364742</u> LONG <u>83.876020</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>209+00</u> | AGENCY <u>KY TC</u> | |
| INVESTIGATORS | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>1:15</u> AM <input checked="" type="radio"/> PM | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 (14) 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles—estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | (10) 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | (15) 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 (7) 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 (16) | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple White oak Sycamore

Bankfull Depth: 1' Bankfull Width: 12' Bankfull Area: _____

Max. Wetted Depth: 6" Avg. Wetted Depth: 5" Specific Conductivity: 160 Temp: 69.8°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems, < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 114

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|----------------|------------------------------|-----------------------|
| STREAM NAME | 547 | LOCATION | KY 30 Jackson/Dowsley |
| STATION # | RIVERMILE | STREAM CLASS (PER INT EPH) | |
| LA 87.365573 | LONG 83.876693 | RIVER BASIN | Upper Kentucky |
| STATION # | 210+00 | AGENCY | KYTC |
| INVESTIGATORS | | | |
| FORM COMPLETED BY | | DATE | REASON FOR SURVEY |
| ELS | | 9-14-17 1:25 AM | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 (9) 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 (6) | 5 4 3 2 1 0 |
| 3. Velocity-Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s; deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | (10) 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 (7) 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 (11) | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: White oak, Red Maple

Bankfull Depth: 6" Bankfull Width: 8' Bankfull Area: _____

Max. Wetted Depth: 4" Avg. Wetted Depth: 2" Specific Conductivity: 160 Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|-----|---|-----|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | (7) | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | (3) | | 2 | 1 | | 0 | | |
| SCORE: ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | (3) | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | (3) | | 2 | 1 | | 0 | | |
| SCORE: ____ (RB) | Right Bank | 10 | | 9 | | (8) | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 83 joins 540 to form 545

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|--|---|------------------------------|
| STREAM NAME <u>Sy4</u> | LOCATION <u>KY 30 Jackson/Owsley</u> | |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT (EPH)) | |
| LAT <u>37.374935</u> LONG <u>83.868151</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>248+00</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>11:35</u> AM <u>PM</u> | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red Maple

Bankfull Depth: 2' Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: - Avg. Wetted Depth: - Specific Conductivity: (125) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 68

Not much of a channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>543</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT) <u>EPH</u> |
| LAT <u>37.376005</u> LONG <u>83.866220</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>258+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>11:15</u> <u>PM</u> REASON FOR SURVEY <u> </u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or >25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: White oak, Poplar

Bankfull Depth: 3" Bankfull Width: 2' Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: (125) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream $\leq 7:1$ (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25 . | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. $<5\%$ of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone ≥ 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 57 Almost completely gone from bulldozed path

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>S 47</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT <u>EPIV</u>) |
| LAT <u>37.376181</u> LONG <u>83.865983</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>260+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-15-17</u> TIME <u>11:16</u> <u>AM</u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>2</u> 1 0 |
| 3. Velocity Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red Maple, Poplar

Bankfull Depth: 3' Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: _____ Avg. Wetted Depth: — Specific Conductivity: 125 Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | |
|--|--|--|---|---|
| | Optimal | Suboptimal | Marginal | Poor |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. |
| Note: determine left or right side by facing downstream. | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |

Total Score 58 New bulldozed path crosses stream

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>541</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT <u>200</u>) |
| LAT <u>37.380158</u> LONG <u>83.862287</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>277+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>10:51</u> <u>AM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation; mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material; increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or < 25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: _____

Bankfull Depth: 2" Bankfull Width: 1' Bankfull Area: _____

Max. Wetted Depth: _____ Avg. Wetted Depth: _____ Specific Conductivity: (125) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 62 Road through stream is clearing

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S 39</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT EPH) |
| LA <u>37.380905</u> LONG <u>83.859290</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>286+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>5:43</u> PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>8</u> 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (In pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>8</u> 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |

3 Dominant Trees: Red Maple

Bankfull Depth: 4" Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: 4" Avg. Wetted Depth: <1" Specific Conductivity: 32.1 Temp: 61.0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 97

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S38</u> | LOCATION <u>KY 30 Jackson/Owley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT EPH) <u> </u> |
| LAT <u>37.382589</u> LONG <u>83.857663</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>295+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>9:30</u> <u>AM</u> PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>(8)</u> 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>(6)</u> | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>(6)</u> | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>(8)</u> 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: White oak, Poplar, Red Maple

Bankfull Depth: Bankfull Width: Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: 26.6 Temp: 64.9°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|-----|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 (3) | | | | | 2 1 0 | | | | | |
| SCORE ____ (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 (3) | | | | | 2 1 0 | | | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | (5) 4 3 | | | | | 2 1 0 | | | | | |
| SCORE ____ (RB) | Right Bank 10 9 | | | | | 8 (7) 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 (3) | | | | | 2 1 0 | | | | | |
| SCORE ____ (RB) | Right Bank 10 9 | | | | | 8 (7) 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |

Total Score 84

New bulldozed reach on left

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S35</u> | LOCATION <u>Key 30 Jackson Overlook</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER <u>IN</u> EPH) |
| LA <u>37.390222</u> LONG <u>-83.850220</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>325+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>9:04</u> <u>AM</u> PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover: mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>8</u> 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple Poplar

Bankfull Depth: 4" Bankfull Width: 1.5' Bankfull Area:

Max. Wetted Depth: 2" Avg. Wetted Depth: <1" Specific Conductivity: (149) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems; < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 94

upstream of 5301

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>536</u> | LOCATION <u>KY 30 Jackson Overlook</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT EPH) <u> </u> |
| LA <u>82.390868</u> LONG <u>83.849417</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>332100</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>9:10</u> AM PM |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple

Bankfull Depth: 3" Bankfull Width: 8" Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: 149 Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 83

Road on left

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|---|
| STREAM NAME <u>537</u> | LOCATION <u>KY 30 Jackson/Oriskany</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT <u>CPH</u>) |
| LAT <u>37.390931</u> LONG <u>83.849289</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>333+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>1:13</u> <u>PM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 <u>6</u> | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>4</u> 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red maple white oak

Bankfull Depth: 3' Bankfull Width: 15' Bankfull Area: _____

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (149) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 76 flows into 536

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>534</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER <u>INT</u> EPH) |
| LAT <u>37.392996</u> LONG <u>83.849335</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>338+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-19-17</u> TIME <u>8:49</u> <u>AM</u> PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>19</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>8</u> 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Sycamore, Red Oak, White Oak

Bankfull Depth: 1' Bankfull Width: 4' Bankfull Area: _____

Max. Wetted Depth: 4' Avg. Wetted Depth: 1' Specific Conductivity: 140 Temp: 62.4°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | |
|--|--|--|---|---|
| | Optimal | Suboptimal | Marginal | Poor |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. |
| Note: determine left or right side by facing downstream. | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |

Total Score 101

road average middle of section

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|-----------|------------------------------|-----------------------|
| STREAM NAME | 531 | LOCATION | KY 30 Jackson/Dowsley |
| STATION # | RIVERMILE | STREAM CLASS (PER INT EPH) | |
| LAT | 37.324964 | LONG | 83.84667 |
| STATION # | 346+00 | RIVER BASIN | Upper Kentucky |
| INVESTIGATORS | | AGENCY | KYTC |
| FORM COMPLETED BY | ELS | DATE | 9-18-17 |
| | | TIME | 3:30 AM |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Oak - Red Maple

Bankfull Depth: 1' Bankfull Width: 6' Bankfull Area: _____

Max. Wetted Depth: 4" Avg. Wetted Depth: 1" Specific Conductivity: (149) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE __ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE __ (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE __ (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE __ (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |

Parameters to be evaluated broader than sampling reach

Total Score 125 wooded section of 538

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S33</u> | LOCATION <u>KY 30 Jackson County</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT) <u>(EPH)</u> |
| LA <u>37.324975</u> LONG <u>83.846829</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>349+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>3:45</u> AM <u>PM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Buckeye

Bankfull Depth: 3' Bankfull Width: 1' Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: (149) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 75

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>S 22</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVER MILE <u> </u> | STREAM CLASS (PER INT (EPH)) <u> </u> |
| LA <u>37.395222</u> LONG <u>83.846337</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>351+50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>3:46</u> AM <u>PM</u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple, Bur Oak

Bankfull Depth: 3" Bankfull Width: 1' Bankfull Area:

Max. Wetted Depth: 1" Avg. Wetted Depth: <1" Specific Conductivity: (149) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | |
|--|--|--|---|---|
| | Optimal | Suboptimal | Marginal | Poor |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. |
| SCORE | 20 19 18 17 16 | 15 14 13 (12) 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 (9) 8 7 6 | 5 4 3 2 1 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. |
| Note: determine left or right side by facing downstream. | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | (3) 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | (5) 4 3 | 2 1 0 |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 (6) | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 (6) | 5 4 3 | 2 1 0 |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 (7) 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 (7) 6 | 5 4 3 | 2 1 0 |

Total Score 92

runs parallel to S31
looks like it was possible broad of S31

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|-----------|------------------------------|-----------------------|
| STREAM NAME | S 30 | LOCATION | 12930 Jackson Cowsley |
| STATION # | RIVERMILE | STREAM CLASS (PER INT EPH) | |
| LAT | 37.396044 | LONG | 83.845607 |
| STATION # | 352+50 | RIVER BASIN | Upper Kentucky |
| INVESTIGATORS | | AGENCY | KYTC |
| FORM COMPLETED BY | ELS | DATE | 9-8-17 |
| | | TIME | 3:20 AM |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover: mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Poplar, Sycamore

Bankfull Depth: 6" Bankfull Width: 2' Bankfull Area:

Max. Wetted Depth: 2" Avg. Wetted Depth: 1" Specific Conductivity: 149 Temp: 68.7°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 108 from woods through field to sludge

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S29</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (<u>PER</u>) INT EPH) |
| LA <u>37.396296</u> LONG <u>-83.845292</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>355+75</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>3:10</u> AM <u>PM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars, and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple, Sycamore, Birch

Bankfull Depth: 3' Bankfull Width: 18' Bankfull Area:

Max. Wetted Depth: 1.5' Avg. Wetted Depth: 6" Specific Conductivity: 100 Temp: 71.9°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 133

Between fields

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|---|
| STREAM NAME <u>S28</u> | LOCATION <u>154 30 Jackson/Dawley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT EPI) |
| LA <u>37.396965</u> LONG <u>83.84491</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>358+00</u> | AGENCY <u>124TC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-11</u> TIME <u>3:07</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: _____

Bankfull Depth: 4" Bankfull Width: 1.5' Bankfull Area: _____

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (100) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 51

Along road (K130)

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>527</u> | LOCATION <u>10930 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT) <u>(EPH)</u> |
| LA <u>37.396947</u> LONG <u>-83.844823</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>358+50</u> | AGENCY <u>124TC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE TIME <u>9-18-17</u> AM <u>5:04</u> PM <u>(M)</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new full and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red oak

Bankfull Depth: 4" Bankfull Width: 2" Bankfull Area:

Max. Wetted Depth: Avg. Wetted Depth: Specific Conductivity: (160) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | |
|--|--|--|---|---|
| | Optimal | Suboptimal | Marginal | Poor |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. |
| Note: determine left or right side by facing downstream. | | | | |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. |
| SCORE ____ (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |
| SCORE ____ (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 |

Total Score 49 from woods to roadside

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|---|
| STREAM NAME <u>526</u> | LOCATION <u>KY 30 Jackson/Quincy</u> |
| STATION # <u>367+00</u> RIVERMILE | STREAM CLASS (PER INT (EPH)) |
| LA <u>37.88682</u> LONG <u>83.843064</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>367+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>2:32</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles—estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red Maple, Red oak, tulip poplar

Bankfull Depth: 4" Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (100) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|------|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | (13) | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | (12) | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | (8) | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | (8) | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | (8) | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | (8) | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 92

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S25</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT (EPH)) <u> </u> |
| LA <u>87.400598</u> LONG <u>83.84543</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>375+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>2:32</u> AM <input checked="" type="radio"/> PM <input type="radio"/> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>2</u> 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: White oak, Red Maple

Bankfull Depth: 3' Bankfull Width: 1' Bankfull Area:

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (100) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 70

from pond, through woods

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>S23</u> | LOCATION <u>KP 30 Jackson/Overday</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT EPH) |
| LA <u>82.403316</u> LONG <u>83.839083</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>386+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>1:35</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Hickory Red Maple Tulip Poplar

Bankfull Depth: 3' Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: 1' Avg. Wetted Depth: <1' Specific Conductivity: 29.9 Temp: 69.8 °F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 97 Trail along right bank

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>524</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT EPH) <u> </u> |
| LA <u>37.404964</u> LONG <u>-83.837658</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>394+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-18-17</u> TIME <u>1:54</u> AM <input checked="" type="radio"/> PM <u> </u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Hickory Red Maple White oak

Bankfull Depth: 2" Bankfull Width: 1.5' Bankfull Area:

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity (29.4) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Parameters to be evaluated broader than sampling reach

Total Score 80 Trail along right bank

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|---------------------|-----------------------|--|-----------------------------|
| STREAM NAME | <u>S21</u> | LOCATION | <u>KY 30 Jackson/Owsley</u> |
| STATION # | <u>RIVERMILE</u> | STREAM CLASS | <u>(PER) INT EPH</u> |
| LA <u>37.411960</u> | LONG <u>83.830913</u> | RIVER BASIN | <u>Upper Kentucky</u> |
| STATION # | <u>418+00</u> | AGENCY | <u>ICGTC</u> |
| INVESTIGATORS | | | |
| FORM COMPLETED BY | | DATE | REASON FOR SURVEY |
| <u>ELS</u> | | <u>9-18-17</u> TIME <u>12:10</u> AM <u>(PM)</u> | <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 <u>(13)</u> 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 <u>(12)</u> 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 <u>(12)</u> 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Walnut Birch

Bankfull Depth: 1' Bankfull Width: 7' Bankfull Area: _____

Max. Wetted Depth: 8" Avg. Wetted Depth: 3" Specific Conductivity: 197 Temp: 69.2°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 101 Between two fields

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|-----------|--------------------------------|----------------------|
| STREAM NAME | S19 | LOCATION | KY 30 Jackson/Owsley |
| STATION # | RIVERMILE | STREAM CLASS (PER (IND) EPH) | |
| LAT | 37.415132 | LONG | -83.826276 |
| STATION # | 442+00 | RIVER BASIN | Upper Kentucky |
| INVESTIGATORS | | AGENCY | KYTC |
| FORM COMPLETED BY | ELS | DATE | 9-7-17 |
| | | TIME | 1:25 AM (PM) |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 (12) 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles — estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 (12) 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | (10) 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | (10) 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 (11) | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple, Red Oak, Tulip Poplar

Bankfull Depth: 1' Bankfull Width: 6' Bankfull Area: _____

Max. Wetted Depth: 6' Avg. Wetted Depth: 2' Specific Conductivity: 209 Temp: 66.8°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 127

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>570</u> | LOCATION <u>KY 30 Jackson Overday</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT (EPH)) |
| LAT <u>37.414951</u> LONG <u>-83.826246</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>445 +00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-7-16</u> TIME <u>1:30</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>2</u> 1 0 |
| 3. Velocity Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>3</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>3</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Red Maple Beech

Bankfull Depth: 1' Bankfull Width: 1' Bankfull Area: _____

Max. Wetted Depth: - Avg. Wetted Depth: - Specific Conductivity: 209 Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 57 stream down trail

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>518</u> | LOCATION <u>KY30 Jackson/Owsley</u> |
| STATION # _____ RIVERMILE _____ | STREAM CLASS (PER <u>INT</u> EPH) |
| LA <u>87.419910</u> LONG <u>83.821663</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>465+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS _____ | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-7-10</u> TIME <u>11:10</u> <u>AM</u> PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate: Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover: mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars, and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or >25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple, Birch

Bankfull Depth: 4" Bankfull Width: 2' Bankfull Area: _____

Max. Wetted Depth: 3" Avg. Wetted Depth: 1" Specific Conductivity: 382 Temp: 67.4 °F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 54 Pushed to Road, cow pasture

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|-----------|----------------------|---------------------|
| STREAM NAME | 517 | LOCATION | K930 Jackson/Owsley |
| STATION # | RIVERMILE | STREAM CLASS (PER) | (INT) EPH) |
| LAT | 37.420614 | LONG | 83.818527 |
| STATION # | 474+00 | RIVER BASIN | Upper Kentucky |
| INVESTIGATORS | | AGENCY | KYTC |
| FORM COMPLETED BY | EU | DATE | 9-7-17 |
| | | TIME | 10:50 AM |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $\geq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Red Maple, White poplar

Bankfull Depth: 6" Bankfull Width: 2' Bankfull Area:

Max. Wetted Depth: 6" Avg. Wetted Depth: 1" Specific Conductivity: 640 Temp: 60.4°C

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Parameters to be evaluated broader than sampling reach

Total Score 88 channel along hillside

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>S16</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER (IN) EPH) <u> </u> |
| LAT <u>37.424085</u> LONG <u>83.815651</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>489+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-7-17</u> TIME <u>10:35</u> <u>0</u> PM |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>2</u> 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |

3 Dominant Trees: Black Willow, Red Maple

Bankfull Depth: 3" Bankfull Width: 1.5' Bankfull Area:

Max. Wetted Depth: 1' Avg. Wetted Depth: 0.1' Specific Conductivity: 576 Temp: 61.7

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE: (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE: (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE: (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |

Parameters to be evaluated broader than sampling reach

Total Score 65 Stream into wetland & disrupted by cattle

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | | |
|-------------------|-----------|------------------------------|----------------------|
| STREAM NAME | 515 | LOCATION | KY 30 Jackson-Owsley |
| STATION # | RIVERMILE | STREAM CLASS (PER INT (PPT) | |
| LAT | 37.427251 | LONG | 83.813038 |
| STATION # | 503+50 | RIVER BASIN | Upper Kentucky |
| INVESTIGATORS | | AGENCY | KY TC |
| FORM COMPLETED BY | ELS | DATE | 9-7-16 |
| | | TIME | 10:03 AM |
| | | REASON FOR SURVEY | 404 |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material; increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $\leq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Beech Silver Maple

Bankfull Depth: 4' Bankfull Width: 15' Bankfull Area: _____

Max. Wetted Depth: _____ Avg. Wetted Depth: _____ Specific Conductivity: 56.9 Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ___ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ___ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ___ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ___ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ___ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ___ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 82

bulldozer at bottom

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>S14</u> | LOCATION <u>KY 30 Jackson/Cresley</u> |
| STATION # <u> </u> RIVERMILE | STREAM CLASS (PER <u>(N)</u> EPH) |
| LAT <u>32.428349</u> LONG <u>83.812409</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>508100</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-7-07</u> TIME <u>4:55</u> <u>PM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 3. Velocity-Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 <u>9</u> 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: White oak, Silver Maple, Beech

Bankfull Depth: 6" Bankfull Width: 4' Bankfull Area:

Max. Wetted Depth: 2" Avg. Wetted Depth: 1" Specific Conductivity: 444 Temp: 60.6°

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|-----|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas; frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | (4) | | 3 | | 2 | 1 | | 0 | | |
| SCORE: (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | (4) | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | (4) | | 3 | | 2 | 1 | | 0 | | |
| SCORE: (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | (4) | | 3 | | 2 | 1 | | 0 | | |

Parameters to be evaluated broader than sampling reach

Total Score 82 Trails through stream

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>513</u> | LOCATION <u>KY30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT <u>ENT</u>) |
| LA <u>37.429395</u> LONG <u>-83.810654</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>513+50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-7-17</u> TIME <u>4:30</u> <u>PM</u> REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 <u>12</u> 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Beech, White Oak, Water Maple

Bankfull Depth: 3" Bankfull Width: 2' Bankfull Area:

Max. Wetted Depth: 2" Avg. Wetted Depth: <1" Specific Conductivity: 56.4 Temp: 60.4°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion, high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing. 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 110

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>S12</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE | STREAM CLASS (<u>PER</u> INT EPH) |
| LA <u>37.429044</u> LONG <u>-83.809838</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>S12+50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u> </u> AM <u> </u> PM <u> </u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | <u>20</u> 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material; increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | <u>15</u> 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $< 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>11</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Sycamore red oak

Bankfull Depth: 9" Bankfull Width: 3' Bankfull Area:

Max. Wetted Depth: 1' Avg. Wetted Depth: 1" Specific Conductivity: 324 Temp: 57.7°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: __ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE: __ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | 6 | | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 112 flows from woods to cleared section by gravel drive

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|---|---|------------------------------|
| STREAM NAME <u>S11</u> | LOCATION <u>KY30 Jackson/Owsley</u> | |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT <u>(EPH)</u>) | |
| LAT <u>37.435460</u> LONG <u>83.806516</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>534+20</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS <u> </u> | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>3:15</u> AM <u>(PM)</u> | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: Water Maple, Red Maple, White Oak

Bankfull Depth: 3' Bankfull Width: 1' Bankfull Area:

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (33.5) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream = 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 53 *logging activities, trees down in channel*

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|---|---|------------------------------|
| STREAM NAME <u>510</u> | LOCATION <u>KY30 Jackson/Dowsley</u> | |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT (PI)) | |
| LAT <u>32.436621</u> LONG <u>83.806409</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>541+00</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>3:03</u> AM <input checked="" type="radio"/> PM <input type="radio"/> | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (in riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $\leq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: White oak, Black Walnut, Box Elder

Bankfull Depth: 3' Bankfull Width: 1.5' Bankfull Area:

Max. Wetted Depth: 1' Avg. Wetted Depth: <1' Specific Conductivity: 33.5 Temp: 67.1 °F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | 8 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | 8 | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 108 From Cleared area, bed rock

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|--|---|------------------------------|
| STREAM NAME <u>568</u> | LOCATION <u>KY30 Jackson/Owsley</u> | |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER <u>(N)</u> EPH) | |
| LAT <u>37.437990</u> LONG <u>83.804493</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>542+50</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>2:40</u> AM <u>(PM)</u> | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>(8)</u> 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 <u>(8)</u> 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Water Maple

Bankfull Depth: 6" Bankfull Width: 3' Bankfull Area: _____

Max. Wetted Depth: 2" Avg. Wetted Depth: 1" Specific Conductivity: 527 Temp: 65.1°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE: (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE: (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score: 96

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>509</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT) <u>(EPH)</u> |
| LAT <u>37.437204</u> LONG <u>83.804983</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>547+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>2:56</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 <u>7</u> 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $\geq 75\%$ of the available channel; or $\leq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: White oak, Tulip Poplar, Water Maple

Bankfull Depth: 2" Bankfull Width: 1' Bankfull Area: _____

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: (33.5) Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 70 interrupt by trail

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|---|
| STREAM NAME <u>506</u> | LOCATION <u>KY30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (<input checked="" type="radio"/> PER <input type="radio"/> INT <input type="radio"/> EPH) |
| LAT <u>37.438214</u> LONG <u>-83.802565</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>553 + 50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u> </u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>2:17</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 <u>(13)</u> 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>(11)</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 <u>(13)</u> 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Water Maple Sycamore

Bankfull Depth: 1.5' Bankfull Width: 8' Bankfull Area:

Max. Wetted Depth: 1' Avg. Wetted Depth: 2" Specific Conductivity: 98.7 Temp: 64.5°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 120 along road

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>507</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER <u>INT</u> EPH) |
| LAT <u>37.938773</u> LONG <u>-83.803438</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>554+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>EU</u> | DATE <u>9-6-17</u> TIME <u>2:30</u> AM <input checked="" type="radio"/> PM <input type="radio"/> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover: mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>11</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>11</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is ≤ 0.3 m/s, deep is ≥ 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>11</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills $>75\%$ of the available channel; or $\leq 25\%$ of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>10</u> 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Beech, Water Maple, White oak

Bankfull Depth: 9" Bankfull Width: 5' Bankfull Area: _____

Max. Wetted Depth: 2" Avg. Wetted Depth: 1" Specific Conductivity: 172 Temp: 54.8°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement, over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score 110

flows into SOG trail along left bank

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|--|---|------------------------------|
| STREAM NAME <u>505</u> | LOCATION <u>KY 30 Jackson/Owdsley</u> | |
| STATION # _____ RIVERMILE _____ | STREAM CLASS (PER (IN) EPH) | |
| LA <u>37.439597</u> LONG <u>-83.800425</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>562+00</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS _____ | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>1:50</u> AM <input checked="" type="radio"/> PM | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 <u>0</u> |

3 Dominant Trees: White Oak, Black Willow, Virginia Pine

Bankfull Depth: 1' Bankfull Width: 1' Bankfull Area: _____

Max. Wetted Depth: — Avg. Wetted Depth: — Specific Conductivity: 262 Temp: _____

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE: | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | 2 | 1 | | 0 | | |

Total Score ~~65~~ 65 flows into wetland 5, pushed against side of hollow

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|---|
| STREAM NAME <u>S04</u> | LOCATION <u>KY30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER (IN) EPH) |
| LAT <u>37.442588</u> LONG <u>83.796396</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>529+00</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> AM PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | (5) 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 (4) 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 (9) 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 (6) | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 (8) 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: _____

Bankfull Depth: 4" Bankfull Width: 18" Bankfull Area: _____

Max. Wetted Depth: 3" Avg. Wetted Depth: <1" Specific Conductivity: 762 Temp: 64.9°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|------|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | (12) | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | (10) | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE ___ (LB) | Left Bank 10 9 | | | | | 8 7 6 | | | | | (5) 4 3 | | | | | 2 1 0 | | | | | |
| SCORE ___ (RB) | Right Bank 10 9 | | | | | 8 7 6 | | | | | 5 4 (3) | | | | | 2 1 0 | | | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ___ (LB) | Left Bank 10 9 | | | | | 8 7 (6) | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE ___ (RB) | Right Bank 10 9 | | | | | 8 7 (6) | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ___ (LB) | Left Bank 10 9 | | | | | (8) 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |
| SCORE ___ (RB) | Right Bank 10 9 | | | | | (8) 7 6 | | | | | 5 4 3 | | | | | 2 1 0 | | | | | |

Parameters to be evaluated broader than sampling reach

Total Score 90 through hollow, logged 20+ years ago

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | | |
|---|--|------------------------------|
| STREAM NAME <u>S03</u> | LOCATION <u>1430 Jackson/Owsley</u> | |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER INT (PH)) | |
| LA <u>82.444444</u> LONG <u>83.744641</u> | RIVER BASIN <u>Upper Kentucky</u> | |
| STATION # <u>587+50</u> | AGENCY <u>KYTC</u> | |
| INVESTIGATORS | | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>12:53</u> AM <input checked="" type="radio"/> PM | REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>2</u> 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 <u>4</u> 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>3</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE: | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 <u>6</u> | 5 4 3 2 1 0 |

3 Dominant Trees: Black willow, Virginia Pine

Bankfull Depth: 1" Bankfull Width: 1.5" Bankfull Area: _____

Max. Wetted Depth: 1" Avg. Wetted Depth: <1" Specific Conductivity: 452 Temp: 67.8 °F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|------|---|-----|---|-----|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | (11) | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | (6) | 4 | | 3 | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | (3) | 4 | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | (5) | 4 | | 3 | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | (3) | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | (3) | | 2 | 1 | | 0 | | |

Total Score 68 down hollow, cleared within 20 yrs

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|--|--|
| STREAM NAME <u>SG 2</u> | LOCATION <u>KY 30 Jackson/Owsley</u> |
| STATION # <u>RIVERMILE</u> | STREAM CLASS (PER <u>INT</u> EPH) |
| LAT <u>37.445716</u> LONG <u>83.712514</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>595+60</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-15</u> TIME <u>12:12</u> AM <u>PM</u> |
| REASON FOR SURVEY <u>404</u> | |

| Habitat Parameter | Condition Category | | | |
|--|---|--|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 <u>(9)</u> 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>(11)</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>(5)</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 <u>(11)</u> | 10 9 8 7 6 | 5 4 3 2 1 0 |

3 Dominant Trees: Black Willow, Sycamore

Bankfull Depth: 9" Bankfull Width: 5' Bankfull Area: _____

Max. Wetted Depth: 3" Avg. Wetted Depth: 1' Specific Conductivity: 174 Temp: 68.9

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|-----|----|----|---|-----|-----|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | (8) | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | (9) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | (3) | | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | (6) | | | 5 | 4 | 3 | | | 2 | 1 | | 0 | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | (3) | | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | (6) | | | 5 | 4 | 3 | | | 2 | 1 | | 0 | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | (4) | | 3 | | 2 | 1 | | 0 | | |
| SCORE ____ (RB) | Right Bank | 10 | | 9 | | 8 | 7 | | 6 | | 5 | 4 | | 3 | | (2) | 1 | | 0 | | |

Total Score 82 stream next to driveway

Flow's OUT OF WETLAND

Has Flow OUT of Pond POSSIBLY INT. T3/C

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

POND SEEMS TO BE SPRING FED

| | |
|--|--|
| STREAM NAME <u>S63</u> | LOCATION <u>JACKSON / OWSEN</u> |
| STATION # <u> </u> RIVERMILE | STREAM CLASS (PER INT (EPH)) |
| LAT <u> </u> LONG <u> </u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>S95+50</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u>MTM ELS</u> | |
| FORM COMPLETED BY <u>MTM</u> | DATE <u>11-15-17</u> TIME <u>2:30</u> AM PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 <u>(9)</u> 8 7 6 | 5 4 3 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 <u>(13)</u> 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). <u>Slow / Fast Shallow</u> | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | <u>(10)</u> 9 8 7 6 | 5 4 3 2 1 0 |
| 4. Sediment Deposition (In pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 <u>(13)</u> 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>(2)</u> 1 0 |

3 Dominant Trees: VIRGINIA PINE WHITE OAK

Bankfull Depth: 4" Bankfull Width: 3' Bankfull Area:

Max. Wetted Depth: 1" Avg. Wetted Depth: .5" Specific Conductivity: (216) Temp:

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE __ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE __ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Total Score 98

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

| | |
|---|--|
| STREAM NAME <u>501</u> | LOCATION <u>KY30 Jackson/Owsley</u> |
| STATION # <u> </u> RIVERMILE <u> </u> | STREAM CLASS (PER INT) <u>(PH)</u> |
| LA <u>83.447615</u> LONG <u>83.790933</u> | RIVER BASIN <u>Upper Kentucky</u> |
| STATION # <u>603650</u> | AGENCY <u>KYTC</u> |
| INVESTIGATORS <u>ELS, MSB</u> | |
| FORM COMPLETED BY <u>ELS</u> | DATE <u>9-6-17</u> TIME <u>11:45</u> <u>AM</u> PM REASON FOR SURVEY <u>404</u> |

| Habitat Parameter | Condition Category | | | |
|--|---|---|---|--|
| | Optimal | Suboptimal | Marginal | Poor |
| 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale). | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 <u>3</u> 2 1 0 |
| 2. Embeddedness (In riffles – estimated from 5 largest rocks in 4 quads) | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 3. Velocity/Depth Regime (At Bankfull) | All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/depth regime (usually slow-deep). |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 4. Sediment Deposition (in pools) | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | <u>5</u> 4 3 2 1 0 |
| 5. Channel Flow Status (Bars must be covered to score high bankfull) | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 <u>2</u> 1 0 |

3 Dominant Trees: _____

Bankfull Depth: 4' Bankfull Width: 1' Bankfull Area: _____

Max. Wetted Depth: 2" Avg. Wetted Depth: <1" Specific Conductivity: 216 Temp: 66.9°F

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat Parameter | Condition Category | | | | | | | | | | | | | | | | | | | | |
|--|--|----|----|----|----|--|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | Optimal | | | | | Suboptimal | | | | | Marginal | | | | | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | | | | | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | | | | | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | | | | | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Frequency of Riffles (or bends) | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. | | | | | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. | | | | | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. | | | | | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. | | | | | |
| SCORE | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Bank Stability (score each bank) | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | | | | | Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion. | | | | | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | | | | | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. | | | | | |
| Note: determine left or right side by facing downstream. | | | | | | | | | | | | | | | | | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | | | | | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | | | | | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. | | | | | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | | | | | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | | | | | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | | | | | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | | | | | |
| SCORE ____ (LB) | Left Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |
| SCORE ____ (RB) | Right Bank | 10 | 9 | | | 8 | 7 | 6 | | | 5 | 4 | 3 | | | 2 | 1 | 0 | | | |

Parameters to be evaluated broader than sampling reach

Total Score 46 Channelized stream through field into culvert

EII Forms

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 100+60 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.18 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|-----------|---------|-------|
|-----------|---------|-------|

Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 11 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 14 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 11 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 10 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 13 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 10 | no units (0-20) |

| | | | |
|--|-----|--------------------------|-----------------|
| Total Habitat Score | 115 | no units | Subindex |
| Habitat Integrity Index | | | 0.25 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 840 | microMHOs | 0.10 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 100+65 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.18 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 11 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 14 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 11 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 10 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 13 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 10 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 115 | no units | Subindex |
| Habitat Integrity Index | | | 0.25 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 840 | microMHOs | 0.10 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 105+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.44 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 14 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 8 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 77 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 224 | microMHOs | 0.79 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 113+55 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.44 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 5 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 14 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 16 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 82 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 224 | microMHOs | 0.79 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 119+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.53 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 12 | no units (0-20) |
| 2. <i>Embeddedness</i> | 10 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 13 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 7 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 14 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 13 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 117 | no units | Subindex |
| Habitat Integrity Index | | | 0.27 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 224 | microMHOs | 0.79 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 125+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.29 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 5 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 5 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 75 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 335 | microMHOs | 0.48 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 150+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 10 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 86 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 154+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 80 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 157+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 9 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 6 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 14 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 16 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 13 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 95 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 157+75 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 8 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 1 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 11 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 91 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 172+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 15 | no units (0-20) |

| | | | |
|--|-------------|--------------------------|-----------------|
| Total Habitat Score | 84 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 174+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 15 | no units (0-20) |

| | | | |
|--|-------------|--------------------------|-----------------|
| Total Habitat Score | 84 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 190+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.52 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 13 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 12 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 5 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 16 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 94 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 169 | microMHOs | 0.95 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 208+20 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.54 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 8 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 8 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 8 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 6 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 75 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 160 | microMHOs | 0.97 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 209+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.54 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 9 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 11 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 11 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 7 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 83 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 160 | microMHOs | 0.97 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 210+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.54 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 9 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 11 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 11 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 7 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 83 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 160 | microMHOs | 0.97 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 217+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 8 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 1 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 11 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 91 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 230+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 8 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 1 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 11 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 91 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 88.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 248+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 4 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 0 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 57 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 125 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 258+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 4 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 0 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 57 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 125 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 260+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 2 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 4 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 6 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 8 | no units (0-20) |

| | | | |
|---|------------|--------------------------|-----------------|
| Total Habitat Score | 58 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 125 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 273+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 7 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 62 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 125 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 277+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 7 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 62 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 125 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 286+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 8 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 8 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 5 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 16 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 97 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 32.1 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 295+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 8 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 6 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 8 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 10 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 84 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 26.6 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 325+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 8 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 7 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 12 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 94 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 332+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 8 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 11 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 83 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 333+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 3 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 8 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 76 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 338+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.56 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

Variables Measure Units

Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 8 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|------------|--------------------------|-----------------|
| Total Habitat Score | 101 | no units | Subindex |
| Habitat Integrity Index | | | 0.11 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 140 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 346+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.68 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 11 | no units (0-20) |
| 2. <i>Embeddedness</i> | 10 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 10 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 8 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 15 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 13 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 18 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 18 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 125 | no units | Subindex |
| Habitat Integrity Index | | | 0.35 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 349+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 3 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 16 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 75 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 351+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 5 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 11 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 5 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 12 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 92 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 352+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.59 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 13 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 10 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 13 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 16 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 108 | no units | Subindex |
| Habitat Integrity Index | | | 0.18 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 149 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 355+75 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.72 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 16 | no units (0-20) |
| 2. <i>Embeddedness</i> | 13 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 15 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 12 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 14 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 13 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 14 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 10 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 133 | no units | Subindex |
| Habitat Integrity Index | | | 0.43 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 100 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 358+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 5 | no units (0-20) |
| 2. <i>Embeddedness</i> | 10 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 6 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 5 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 3 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 51 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 100 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 358+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 3 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 6 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 49 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 100 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 367+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 10 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 15 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 12 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 16 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 92 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 100 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 375+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 6 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 14 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 11 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 13 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 97 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 100 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 375+40 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 6 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 14 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 11 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 13 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 97 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 100 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 386+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 7 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 6 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 14 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 11 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 13 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 97 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 29.4 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 394+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 80 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 29.4 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 405+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 80 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 29.4 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 418+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.49 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|-----------|---------|-------|
|-----------|---------|-------|

Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 13 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 12 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 12 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 11 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 8 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|--|------------|--------------------------|-----------------|
| Total Habitat Score | 101 | no units | Subindex |
| Habitat Integrity Index | | | 0.11 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 197 | microMHOs | 0.87 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 442+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.60 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|-----------|---------|-------|
|-----------|---------|-------|

Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 13 | no units (0-20) |
| 2. <i>Embeddedness</i> | 12 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 10 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 11 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 14 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 15 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 16 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|--|-----|--------------------------|-----------------|
| Total Habitat Score | 127 | no units | Subindex |
| Habitat Integrity Index | | | 0.37 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 209 | microMHOs | 0.83 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 445+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.47 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 4 | no units (0-20) |
| 2. <i>Embeddedness</i> | 2 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 8 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 57 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 209 | microMHOs | 0.83 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 465+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.23 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 6 | no units (0-20) |
| 2. <i>Embeddedness</i> | 3 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 4 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 7 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 8 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 4 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 2 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 54 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 382 | microMHOs | 0.37 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 474+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.10 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 11 | no units (0-20) |
| 2. <i>Embeddedness</i> | 8 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 8 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 8 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 9 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 8 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 88 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 640 | microMHOs | 0.10 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 489+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.10 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| | | |
|-----------|---------|-------|
| Variables | Measure | Units |
|-----------|---------|-------|

Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 2 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 3 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 6 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 10 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 8 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 9 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 11 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 65 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 576 | microMHOs | 0.10 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 503+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 14 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 16 | no units (0-20) |

| | | | |
|--|------|--------------------------|-----------------|
| Total Habitat Score | 82 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 56.9 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 508+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.16 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 7 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 9 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 9 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 8 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 82 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 444 | microMHOs | 0.23 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 512+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.36 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 20 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 15 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 11 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 11 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 8 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 112 | no units | Subindex |
| Habitat Integrity Index | | | 0.22 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 324 | microMHOs | 0.50 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 513+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.60 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 12 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 10 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 13 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 12 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 12 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 110 | no units | Subindex |
| Habitat Integrity Index | | | 0.20 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 56.9 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 529+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 6 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 7 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 6 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 8 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 53 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 33.5 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 534+20 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 6 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 7 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 6 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 8 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 53 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 33.5 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 541+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.59 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 2 | no units (0-20) |
| 2. <i>Embeddedness</i> | 20 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 16 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 6 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 12 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 18 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 108 | no units | Subindex |
| Habitat Integrity Index | | | 0.18 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 33.5 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 542+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 10 | no units (0-20) |
| 2. <i>Embeddedness</i> | 8 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 8 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 10 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 12 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 96 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 52.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 547+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.55 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 7 | no units (0-20) |
| 2. <i>Embeddedness</i> | 6 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 6 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 8 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|------|--------------------------|-----------------|
| Total Habitat Score | 70 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 33.5 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 553+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.65 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 13 | no units (0-20) |
| 2. <i>Embeddedness</i> | 11 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 10 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 13 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 13 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 13 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 14 | no units (0-20) |

| | | | |
|--|------|--------------------------|-----------------|
| Total Habitat Score | 120 | no units | Subindex |
| Habitat Integrity Index | | | 0.30 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 98.7 | microMHOs | 1.00 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 554+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.57 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 11 | no units (0-20) |
| 2. <i>Embeddedness</i> | 11 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 11 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 10 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 12 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 14 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 14 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 12 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 110 | no units | Subindex |
| Habitat Integrity Index | | | 0.20 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 172 | microMHOs | 0.94 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 562+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.39 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 3 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 0 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 11 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 11 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 65 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 262 | microMHOs | 0.68 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 579+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.39 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 5 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 9 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 6 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 8 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 12 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 10 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 16 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 90 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 262 | microMHOs | 0.68 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 587+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.15 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|-----------|---------|-------|
|-----------|---------|-------|

Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

| | | |
|---|----|-----------------|
| 1. <i>Epifaunal Substrate</i> | 2 | no units (0-20) |
| 2. <i>Embeddedness</i> | 4 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 6 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 11 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 10 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 10 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|--|------------|--------------------------|-----------------|
| Total Habitat Score | 68 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| Macroinvertebrate Data - Genus/species Level (All Habitats) | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 452 | microMHOs | 0.21 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 595+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.52 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 9 | no units (0-20) |
| 2. <i>Embeddedness</i> | 11 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 11 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 8 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 9 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 9 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 9 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 6 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 82 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 174 | microMHOs | 0.93 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 595+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.46 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 9 | no units (0-20) |
| 2. <i>Embeddedness</i> | 13 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 10 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 13 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 2 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 7 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 12 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 16 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 12 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 4 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 98 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 216 | microMHOs | 0.81 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 596+00 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.46 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 2 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 3 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 2 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 46 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 216 | microMHOs | 0.81 |

Insert Photo Here

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (VERSION 2002.6)
**** (Genus/species Level Taxonomy - All Habitats) ****

| | |
|-------------------------------|----------------------------------|
| Project ID: | Jackson & Owsley Counties, KY 30 |
| Stream/Reach: | 603+50 |
| Assessment Objectives: | |

| EII | Model |
|------|---|
| NA | Ecological Integrity Index (MBI + Habitat Integrity + Conductivity) |
| 0.46 | Ecological Integrity Index (Habitat Integrity + Conductivity) |

| Variables | Measure | Units |
|---|---------|-----------------|
| Enter quantitative or categorical measure from Field Data Sheet in shaded cells | | |
| <u>RBP Habitat Parameters</u> | | |
| 1. <i>Epifaunal Substrate</i> | 3 | no units (0-20) |
| 2. <i>Embeddedness</i> | 5 | no units (0-20) |
| 3. <i>Velocity/Depth Regime</i> | 5 | no units (0-20) |
| 4. <i>Sediment Deposition</i> | 5 | no units (0-20) |
| 5. <i>Channel Flow Status</i> | 2 | no units (0-20) |
| 6. <i>Channel Alteration</i> | 3 | no units (0-20) |
| 7. <i>Freq. Of Riffles (bends)</i> | 7 | no units (0-20) |
| 8. <i>Bank stability (both combined)</i> | 8 | no units (0-20) |
| 9. <i>Veg. Protection (both combined)</i> | 6 | no units (0-20) |
| 10. <i>Riparian Width (both combined)</i> | 2 | no units (0-20) |

| | | | |
|---|-----|--------------------------|-----------------|
| Total Habitat Score | 46 | no units | Subindex |
| Habitat Integrity Index | | | 0.10 |
| <u>Macroinvertebrate Data - Genus/species Level (All Habitats)</u> | | | |
| 11. <i>Genus/species Taxa Richness</i> | | # of taxa sampled | |
| 12. <i>Genus/species EPT Richness</i> | | # of EPT species sampled | |
| 13. <i>% Ephemeroptera</i> | | % Mayflies (0-100) | |
| 14. <i>% Chironomidae & Oligochaeta</i> | | % Midges & Worms (0-100) | |
| 15. <i>% Clingers</i> | | % Clingers (0-100) | |
| 16. <i>mHBI</i> | | no units | |
| Macroinvertebrate Bioassessment | NA | no units | NA |
| Conductivity | 216 | microMHOs | 0.81 |

Insert Photo Here

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

134+00

Project/Site: KY 30 City/County: JACKSON Sampling Date: 9/19/07
 Applicant/Owner: KYTC State: KY Sampling Point: W10
 Investigator(s): MJG, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 21
 Subregion (LRR or MLRA): _____ Lat: 37.349334 Long: -83.842238 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____
 Hydric Soil Present? Yes ☒ No _____
 Wetland Hydrology Present? Yes ☒ No _____

Is the Sampled Area within a Wetland? Yes ☒ No _____

Remarks:

* Low lying area, w/poor drainage, collapsed mobile home situated adjacent to wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ☒ Depth (inches): _____
 Water Table Present? Yes _____ No ☒ Depth (inches): _____
 Saturation Present? Yes _____ No ☒ Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------|------------------|
| 1. <u>ACER RUFUM</u> | <u>10</u> | <u>✓</u> | <u>FAC</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: 5 20% of total cover: _____

| Sapling/Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

| Herb Stratum (Plot size: <u>5</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|-------------------------------------|------------------|-------------------|------------------|
| 1. <u>SOLIDAGO GIGANTEA</u> | <u>30</u> | <u>✓</u> | <u>FACW</u> |
| 2. <u>TIMOTHY EFFUSUS</u> | <u>20</u> | <u>✓</u> | <u>FACW</u> |
| 3. <u>EUPATORIUM PEAFOLIATUM</u> | <u>10</u> | _____ | <u>FACW</u> |
| 4. <u>SOLANUM CAROLINENSES</u> | <u>10</u> | _____ | <u>FACU</u> |
| 5. <u>IMPATIENS CAPENSIS</u> | <u>5</u> | _____ | <u>FACW</u> |
| 6. <u>EUTROCHUM PURPUREUM</u> | <u>5</u> | _____ | <u>FAC</u> |
| 7. <u>STACHYS TENUIFOLIA</u> | <u>3</u> | _____ | <u>FACW</u> |
| 8. <u>LOBELIA CARDINALIS</u> | <u>2</u> | _____ | <u>FACW</u> |
| 9. <u>CAREX SPA</u> | <u>5</u> | _____ | _____ |
| 10. <u>MENTHA ARVENSIS</u> | <u>3</u> | _____ | <u>FACW</u> |
| 11. <u>TOXICODENDRON INDICUM</u> | <u>2</u> | _____ | <u>FAC</u> |

_____ = Total Cover
50% of total cover: 50 20% of total cover: 20

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

| | |
|--------------------------|--------------|
| Total % Cover of: | Multiply by: |
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ✓ 1 - Rapid Test for Hydrophytic Vegetation
- _____ 2 - Dominance Test is >50%
- _____ 3 - Prevalence Index is ≤3.0¹
- _____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- _____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ✓ No _____

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | |
|---------------------------------------|---------------------|----------------------|---------------------|---------------------------|
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------|--------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) (LRR N)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (MLRA 147, 148)
- ___ Thin Dark Surface (S9) (MLRA 147, 148)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- ___ Umbric Surface (F13) (MLRA 136, 122)
- ___ Piedmont Floodplain Soils (F19) (MLRA 148)
- ___ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16)
(MLRA 147, 148)
- Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Remarks:

Hydric Soil Present? Yes ☒ No ☐

175+00

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: KY30 City/County: JACKSON Sampling Date: 9/25/17
 Applicant/Owner: KITC State: KY Sampling Point: W12
 Investigator(s): MJB, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 1
 Subregion (LRR or MLRA): _____ Lat: 37.359097 Long: -83.885675 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: 1PUSH4
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>POND w/ FRINGE; STREAM 100' N OF POND</u> | |

HYDROLOGY

| | | | |
|--|---|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> | | <u>Secondary Indicators (minimum of two required)</u> | |
| <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) | |
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8"</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | | |
| Remarks: | | | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W12

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | | | | | | | | | | | | | | | |
|--|------------------|-------------------|------------------|---|-------------------|--------------|----------------------|----------------|------------------------|-----------------|-----------------------|-----------------|------------------------|------------------|-------------------|-------------|------------------------------|----------------|--------------------------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: _____ (B) | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>5</u></td> <td>x 1 = <u>5</u></td> </tr> <tr> <td>FACW species <u>48</u></td> <td>x 2 = <u>96</u></td> </tr> <tr> <td>FAC species <u>15</u></td> <td>x 3 = <u>45</u></td> </tr> <tr> <td>FACU species <u>27</u></td> <td>x 4 = <u>108</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: <u>95</u> (A)</td> <td><u>254</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.67</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>5</u> | x 1 = <u>5</u> | FACW species <u>48</u> | x 2 = <u>96</u> | FAC species <u>15</u> | x 3 = <u>45</u> | FACU species <u>27</u> | x 4 = <u>108</u> | UPL species _____ | x 5 = _____ | Column Totals: <u>95</u> (A) | <u>254</u> (B) | Prevalence Index = B/A = <u>2.67</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>5</u> | x 1 = <u>5</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>48</u> | x 2 = <u>96</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>15</u> | x 3 = <u>45</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>27</u> | x 4 = <u>108</u> | | | | | | | | | | | | | | | | | | | |
| UPL species _____ | x 5 = _____ | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>95</u> (A) | <u>254</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>2.67</u> | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| <div style="text-align: right;">_____ = Total Cover</div> <div>50% of total cover: _____ 20% of total cover: _____</div> | | | | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) 1. <u>LIPODENDRON TROPICUM</u> <u>2</u> <input checked="" type="checkbox"/> <u>FACU</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ | | | | | | | | | | | | | | | | | | | | |
| <div style="text-align: right;">_____ = Total Cover</div> <div>50% of total cover: _____ 20% of total cover: <u>1</u></div> | | | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5</u>) 1. <u>JUNCUS EPHOSUS</u> <u>35</u> <input checked="" type="checkbox"/> <u>FACW</u> 2. <u>URTICA DIOICA</u> <u>25</u> <input checked="" type="checkbox"/> <u>FACU</u> 3. <u>MICROSTEGIUM VINIVIVUM</u> <u>15</u> <u>FAC</u> 4. <u>SUBSABO GRANITIS</u> <u>10</u> <u>FACW</u> 5. <u>CAREX SPP.</u> <u>5</u> _____ 6. <u>ELEOCHARIS ORTUSA</u> <u>5</u> <u>OBL</u> 7. <u>LAGERHIA CALOMACIA</u> <u>3</u> <u>FACW</u> 8. _____ 9. _____ 10. _____ 11. _____ | | | | | | | | | | | | | | | | | | | | |
| <div style="text-align: right;">_____ = Total Cover</div> <div>50% of total cover: <u>49</u> 20% of total cover: <u>20</u></div> | | | | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ | | | | | | | | | | | | | | | | | | | | |
| <div style="text-align: right;">_____ = Total Cover</div> <div>50% of total cover: _____ 20% of total cover: _____</div> | | | | | | | | | | | | | | | | | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | | | | | | | | | | | | | | | | | |

Hydrophytic Vegetation Present? Yes ☒ No _____

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|---|------------------|-------------------|------------------|---|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: _____ (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | Hydrophytic Vegetation Present? Yes _____ No _____ |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | Herb Stratum (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ _____ = Total Cover 50% of total cover: _____ 20% of total cover: _____ Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover 50% of total cover: _____ 20% of total cover: _____ |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| 11. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | |

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
Hydric Soil Indicators

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) |
| <input checked="" type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
 — Coast Prairie Redox (A16)
 (MLRA 147, 148)
 — Piedmont Floodplain Soils (F19)
 (MLRA 136, 147)
 — Very Shallow Dark Surface (TF12)
 — Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

219700

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: K130 City/County: JACKSON Sampling Date: 9/25/17
 Applicant/Owner: KYTC State: KY Sampling Point: W11
 Investigator(s): MJA, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 21
 Subregion (LRR or MLRA): _____ Lat: 37.366525 Long: -83.873478 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: PVOH4

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ☒ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Yes ☒ No _____ Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>WETLAND AROUND POND / VEG MAINTAINED PERIODICALLY</u> | |

HYDROLOGY

| Wetland Hydrology Indicators: | | Secondary Indicators (minimum of two required) |
|---|--|--|
| Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> Aquatic Fauna (B13) | | <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>8"</u> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ | | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5'1)

| | | | |
|-----------------------------------|-----------|----------|-------------|
| 1. <u>TIPHA ANGUSTIFOLIA</u> | <u>25</u> | <u>✓</u> | <u>OBL</u> |
| 2. <u>EUPATORIUM PRILLIQUATUM</u> | <u>15</u> | <u>✓</u> | <u>FACW</u> |
| 3. <u>EUTROCHUM PURPUREUM</u> | <u>15</u> | _____ | <u>FAC</u> |
| 4. <u>CAREX SPP.</u> | <u>15</u> | _____ | _____ |
| 5. <u>SOLIDAGO GIGANTEA</u> | <u>10</u> | _____ | <u>FACW</u> |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: 40 20% of total cover: 16

Woody Vine Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0¹
_____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|---------------------|----------------------|---------------------|--|
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| <p>Remarks: (Include photo numbers here or on a separate sheet.)</p> | | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------|--------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |
| Prevalence Index = B/A = _____ | |

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No _____

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|-------------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-3 | 25Y 5/2 | 90 | | | | | | |
| 3-12 | 25Y 6/2 | 98 | 5Y 6 5/8 | 2 | C | PL | | 10% organic matter |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 0-10 | 10Y 4/3 | 100 | | | | | | outpoint |
| | | | | | | | | (37.366198, -83.874365) |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| ___ Histosol (A1) | ___ Dark Surface (S7) |
| ___ Histic Epipedon (A2) | ___ Polyvalue Below Surface (S8) (MLRA 147, 148) |
| ___ Black Histic (A3) | ___ Thin Dark Surface (S9) (MLRA 147, 148) |
| ___ Hydrogen Sulfide (A4) | ___ Loamy Gleyed Matrix (F2) |
| ___ Stratified Layers (A5) | ✓ Depleted Matrix (F3) |
| ___ 2 cm Muck (A10) (LRR N) | ___ Redox Dark Surface (F6) |
| ___ Depleted Below Dark Surface (A11) | ___ Depleted Dark Surface (F7) |
| ___ Thick Dark Surface (A12) | ___ Redox Depressions (F8) |
| ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| ___ Sandy Gleyed Matrix (S4) | ___ Umbric Surface (F13) (MLRA 136, 122) |
| ___ Sandy Redox (S5) | ___ Piedmont Floodplain Soils (F19) (MLRA 148) |
| ___ Stripped Matrix (S6) | ___ Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (MLRA 147)
☐ Coast Prairie Redox (A16)
 (MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
 (MLRA 136, 147)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

231+00

Project/Site: KY30 City/County: JACKSON Sampling Date: 9/25/17
 Applicant/Owner: KYTC State: KY Sampling Point: W13
 Investigator(s): MTG, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: 37.364489 Long: -83.870636 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____
 Hydric Soil Present? Yes ☒ No _____
 Wetland Hydrology Present? Yes ☒ No _____

Is the Sampled Area within a Wetland? Yes ☒ No _____

Remarks:

POND W/FRINGE, VEG. MAINTAINED PERIODICALLY

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☒ Sparsely Vegetated Concave Surface (B8)
- ☒ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No _____ Depth (inches): 6"
 Water Table Present? Yes _____ No _____ Depth (inches): _____
 Saturation Present? Yes ☒ No _____ Depth (inches): ~10"
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: <u>70</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------|------------------|
| 1. <u>SALIX NIGRA</u> | <u>5</u> | <u>✓</u> | <u>OBL</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: 3 20% of total cover: 2

| Sapling/Shrub Stratum (Plot size: <u>15</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>SALIX NIGRA</u> | <u>10</u> | <u>✓</u> | <u>OBL</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: 5 20% of total cover: 2

| Herb Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. <u>ELFOCHARIS OBTUSA</u> | <u>40</u> | <u>✓</u> | <u>OBL</u> |
| 2. <u>TIPIHA ANGSTIFOLIA</u> | <u>20</u> | <u>✓</u> | <u>OBL</u> |
| 3. <u>SOLIDAGO GIGANTEA</u> | <u>10</u> | _____ | <u>FACW</u> |
| 4. <u>EUPATORIUM PURPUREUM</u> | <u>10</u> | _____ | _____ |
| 5. <u>CAREX SIP</u> | <u>5</u> | _____ | _____ |
| 6. <u>SALIX NIGRA</u> | <u>5</u> | _____ | <u>OBL</u> |
| 7. <u>RUBUS ALGERIENSIS</u> | <u>5</u> | _____ | <u>FACU</u> |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: 45 20% of total cover: 19

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | |
|---|---------------------|----------------------|---------------------|---------------------------|
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | |

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
 Total Number of Dominant Species Across All Strata: _____ (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------|--------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |
| Prevalence Index = B/A = _____ | |

Hydrophytic Vegetation Indicators:
 _____ 1 - Rapid Test for Hydrophytic Vegetation
 _____ 2 - Dominance Test is >50%
 _____ 3 - Prevalence Index is ≤3.0¹
 _____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 _____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No _____

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|------------|-----------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-2 | 2.5Y5/2 | 60 | | | | | SILTY CLAY | 10% ORGANIC MATTER |
| " | 2.5Y5/4 | 27 | 5YR 4/6 | 3 | C | PL | CLAY | |
| 2-8 | 2.5Y5/2 | 95 | 5YR 4/6 | 5 | C | M | | |
| 8-12 | 5Y5/2 | 30 | | | | | CLAY | |
| " | 7.5YR 6/8 | 30 | | | | | | |
| " | 10YR 6/6 | 25 | | | | | | |
| " | GLAY 2.5/5PB | 15 | | | | | | |
| 0-10 | 7.5YR 3/3 | 100 | | | | | SILTY | SUPPOINT |
| | | | | | | | | (37.36441, -83.87071) |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- | |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

27400

Project/Site: KY 3D City/County: JACKSON Sampling Date: 9/19/17
 Applicant/Owner: KIT State: KY Sampling Point: N09
 Investigator(s): MJG, PCS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 21
 Subregion (LRR or MLRA): _____ Lat: 37.379237 Long: -83.863478 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |

Remarks:

* WETLAND FORMER AROUND POND

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☒ Aquatic Fauna (B13)

- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No _____ Depth (inches): 8"
 Water Table Present? Yes ☒ No _____ Depth (inches): -1"
 Saturation Present? Yes ☒ No _____ Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. <u>N/A</u> | | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

| Sapling/Shrub Stratum (Plot size: <u>15</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>LIRODENDRON TULIPIFERA</u> | <u>5</u> | <u>✓</u> | <u>FACU</u> |
| 2. <u>ACEA RUBRA</u> | <u>3</u> | <u>✓</u> | <u>FAC</u> |
| 3. <u>PLATANUS OCCIDENTALIS</u> | <u>2</u> | <u>✓</u> | <u>FACW</u> |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |

_____ = Total Cover
50% of total cover: 5 20% of total cover: 2

| Herb Stratum (Plot size: <u>5</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|-------------------------------------|------------------|-------------------|------------------|
| 1. <u>TYPA ANGLUSTIFOLIA</u> | <u>30</u> | <u>✓</u> | <u>OBL</u> |
| 2. <u>ACEA RUBRA</u> | <u>5</u> | | <u>FAC</u> |
| 3. <u>SALICORD GRANTIA</u> | <u>10</u> | <u>✓</u> | <u>FACW</u> |
| 4. <u>DIANTHUM FLANDRISTIMUM</u> | <u>15</u> | <u>✓</u> | <u>FAC</u> |
| 5. <u>SALIX NIGRA</u> | <u>5</u> | | <u>OBL</u> |
| 6. <u>PLATANUS OCCIDENTALIS</u> | <u>5</u> | | <u>FACW</u> |
| 7. <u>RUBUS ACERIFOLIUS</u> | <u>10</u> | | <u>FACU</u> |
| 8. <u>LIRODENDRON TULIPIFERA</u> | <u>5</u> | | <u>FACU</u> |
| 9. <u>CAREX SPP.</u> | <u>10</u> | | |
| 10. _____ | | | |
| 11. _____ | | | |

_____ = Total Cover
50% of total cover: 48 20% of total cover: 19

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:
OBL species _____ x 1 = _____
FACW species _____ x 2 = _____
FAC species _____ x 3 = _____
FACU species _____ x 4 = _____
UPL species _____ x 5 = _____
Column Totals: _____ (A) _____ (B)
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|---------------------|----------------------|---------------------|---------------------------|
| Tree Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| | | | | _____ = Total Cover |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Dominance Test worksheet: | | | | |
| Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) | | | | |
| Total Number of Dominant Species Across All Strata: _____ (B) | | | | |
| Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) | | | | |
| Prevalence Index worksheet: | | | | |
| Total % Cover of: | | Multiply by: | | |
| OBL species | _____ | x 1 = | _____ | |
| FACW species | _____ | x 2 = | _____ | |
| FAC species | _____ | x 3 = | _____ | |
| FACU species | _____ | x 4 = | _____ | |
| UPL species | _____ | x 5 = | _____ | |
| Column Totals: | _____ (A) | _____ (B) | | |
| Prevalence Index = B/A = _____ | | | | |
| Hydrophytic Vegetation Indicators: | | | | |
| ___ 1 - Rapid Test for Hydrophytic Vegetation | | | | |
| ___ 2 - Dominance Test is >50% | | | | |
| ___ 3 - Prevalence Index is ≤3.0 ¹ | | | | |
| ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | | | |
| ___ Problematic Hydrophytic Vegetation ¹ (Explain) | | | | |
| ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | |
| Definitions of Five Vegetation Strata: | | | | |
| Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). | | | | |
| Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. | | | | |
| Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. | | | | |
| Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. | | | | |
| Woody vine – All woody vines, regardless of height. | | | | |
| Hydrophytic Vegetation Present? Yes _____ No _____ | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | |

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
Hydric Soil Indicators

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) (LRR N)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (MLRA 147, 148)
- ___ Thin Dark Surface (S9) (MLRA 147, 148)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- ___ Umbric Surface (F13) (MLRA 136, 122)
- ___ Piedmont Floodplain Soils (F19) (MLRA 148)
- ___ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (MLRA 147)
☐ Coast Prairie Redox (A16)
 (MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
 (MLRA 136, 147)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Remarks:

Hydric Soil Present? Yes 1 No

Could only do 2nd

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

275700

Project/Site: KY30 City/County: JACKSON Sampling Date: 9/19/17
 Applicant/Owner: KYTL State: KY Sampling Point: W08
 Investigator(s): MJG, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 21
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|--|--|
| Hydrophytic Vegetation Present? | Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: <u>* SITUATED IN FIELDS, IMPACTED REGULARLY</u> | | |

HYDROLOGY

| | | |
|---|--|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) _____ Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) _____ Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | | Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>~6"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>~4"</u> (includes capillary fringe) | | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W08

| Tree Stratum (Plot size: _____) | | | | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------|--|--|---------------------------|-------------------|------------------|
| 1. | <u>N/A</u> | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| | | | | _____ = Total Cover | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ | | |

| Sapling/Shrub Stratum (Plot size: _____) | | | | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------|--|--|---------------------------|-------------------|------------------|
| 1. | <u>N/A</u> | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| | | | | _____ = Total Cover | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ | | |

| Herb Stratum (Plot size: <u>5'</u>) | | | | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|--------------------------------|-----------|----------|-------------------------------|-------------------|------------------|
| 1. | <u>JUNCUS EFFUSUS</u> | <u>15</u> | <u>✓</u> | <u>FACW</u> | | |
| 2. | <u>SOLIDAGO GIGANTEA</u> | <u>15</u> | <u>✓</u> | <u>FACW</u> | | |
| 3. | <u>DICHRANTHEMUM CLAUDETUM</u> | <u>15</u> | <u>✓</u> | <u>FAC</u> | | |
| 4. | <u>LOBELIA CARDINALIS</u> | <u>5</u> | <u>✓</u> | <u>FACW</u> | | |
| 5. | <u>STACHYS TENNIFOLIA</u> | <u>10</u> | <u>✓</u> | <u>FACW</u> | | |
| 6. | <u>EUTROCHUM PURPUREUM</u> | <u>10</u> | | <u>FAC</u> | | |
| 7. | <u>CAREX SPP.</u> | <u>2</u> | | <u>—</u> | | |
| 8. | <u>TRIFOLIUM PRATENSE</u> | <u>3</u> | | <u>FACU</u> | | |
| 9. | <u>FRAXINUS SP.</u> | <u>5</u> | | <u>—</u> | | |
| 10. | <u>CAREX SPP.</u> | <u>5</u> | | <u>—</u> | | |
| 11. | <u>SOLIDAGO SPP.</u> | <u>5</u> | | <u>—</u> | | |
| | | | | _____ = Total Cover | | |
| 50% of total cover: <u>48</u> | | | | 20% of total cover: <u>19</u> | | |

| Woody Vine Stratum (Plot size: _____) | | | | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|--|--|--|---------------------------|-------------------|------------------|
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| | | | | _____ = Total Cover | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

| | |
|--------------------------|--------------|
| Total % Cover of: | Multiply by: |
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

— 3 - Prevalence Index is ≤3.0¹

— 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

✓ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

* 8/19/00 Photo 1 (SOLIDAGO, JUNCUS, STACHYS)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|---|------------------|-------------------|------------------|---|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: _____ (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| 11. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | Hydrophytic Vegetation Present? Yes _____ No _____ |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | |

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) (LRR N)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (MLRA 147, 148)
- ___ Thin Dark Surface (S9) (MLRA 147, 148)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- ___ Umbric Surface (F13) (MLRA 136, 122)
- ___ Piedmont Floodplain Soils (F19) (MLRA 148)
- ___ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- ___ 2 cm Muck (A10) (MLRA 147)
- ___ Coast Prairie Redox (A16)
(MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No

Remarks:

* DENSE & VERY ROCKY SOIL

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

375+50

Project/Site: KY30 City/County: JACKSON Sampling Date: _____
 Applicant/Owner: BTC State: NY Sampling Point: W07*
 Investigator(s): MTG, ICL Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 1
 Subregion (LRR or MLRA): _____ Lat: 37.400664 Long: -83.84129 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: Fd1A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |

Remarks:

*WETLAND FORMER AROUND POND

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☒ Aquatic Fauna (B13)

- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

| | | |
|--|--|----------------------------|
| Surface Water Present? | Yes <input checked="" type="checkbox"/> No _____ | Depth (inches): <u>5"</u> |
| Water Table Present? | Yes <input checked="" type="checkbox"/> No _____ | Depth (inches): <u>10"</u> |
| Saturation Present? (includes capillary fringe) | Yes <input checked="" type="checkbox"/> No _____ | Depth (inches): <u>8"</u> |

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: _____)

| | | | |
|------------------------------------|-------|-------|-------|
| 1. <i>Juncus effusus</i> | 25 | ✓ | FACW |
| 2. <i>Carex vulpinoidea</i> | 20 | ✓ | OBL |
| 3. <i>Eupatorium perfoliatum</i> | 15 | ✓ | FACW |
| 4. <i>Eutrochium purpureum</i> | 15 | | FAC |
| 5. <i>Impatiens capensis</i> | 10 | | FACW |
| 6. <i>Urtica dioica</i> | 5 | | FACW |
| 7. <i>Dicranthium clandestinum</i> | 5 | | FAC |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: 48 20% of total cover: 19

Woody Vine Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

| Sapling Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

| Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

| Herb Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |
| Prevalence Index = B/A = _____ | |

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0¹
- ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
Hydric Soil Indicators

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| ___ Histosol (A1) | ___ Dark Surface (S7) |
| ___ Histic Epipedon (A2) | ___ Polyvalue Below Surface (S8) (MLRA 147, 148) |
| ___ Black Histic (A3) | ___ Thin Dark Surface (S9) (MLRA 147, 148) |
| ___ Hydrogen Sulfide (A4) | ___ Loamy Gleyed Matrix (F2) |
| ___ Stratified Layers (A5) | ___ Depleted Matrix (F3) |
| ___ 2 cm Muck (A10) (LRR N) | ___ Redox Dark Surface (F6) |
| ___ Depleted Below Dark Surface (A11) | ___ Depleted Dark Surface (F7) |
| ___ Thick Dark Surface (A12) | ___ Redox Depressions (F8) |
| ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| ___ Sandy Gleyed Matrix (S4) | ___ Umbric Surface (F13) (MLRA 136, 122) |
| ___ Sandy Redox (S5) | ___ Piedmont Floodplain Soils (F19) (MLRA 148) |
| ___ Stripped Matrix (S6) | ___ Red Parent Material (F21) (MLRA 127, 147) |
| Restrictive Layer (if observed): | |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16)
(MLRA 147, 148)
- ☐ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Remarks:

Hydric Soil Present? Yes ☒ No

* ROCKY SOIL

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

405700

Project/Site: KY30 City/County: TALSON Sampling Date: 9/18/17
 Applicant/Owner: KYTC State: KY Sampling Point: W06
 Investigator(s): MJH, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 1
 Subregion (LRR or MLRA): _____ Lat: 37.467093 Long: -83.835735 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: WUBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: <u>WETLAND FRINGE AROUND POND</u> | |

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☒ Aquatic Fauna (B13)

- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No _____ Depth (inches): 4"
 Water Table Present? Yes ☒ No _____ Depth (inches): -6"
 Saturation Present? Yes ☒ No _____ Depth (inches): -4"
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: <u>30'</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------------------------|------------------|
| 1. <u>ACER LUCIDUM</u> | <u>10</u> | <input checked="" type="checkbox"/> | <u>FAC</u> |
| 2. <u>LIRIODENDRON TULIPIFERA</u> | <u>5</u> | <input checked="" type="checkbox"/> | <u>FACU</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |

50% of total cover: 8 20% of total cover: 3
✓ = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15'</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------------------------|------------------|
| 1. <u>ACER LUCIDUM</u> | <u>15</u> | <input checked="" type="checkbox"/> | <u>FAC</u> |
| 2. <u>ACER NEGUNDO</u> | <u>5</u> | <input checked="" type="checkbox"/> | <u>FAC</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |

50% of total cover: 10 20% of total cover: 4
20 = Total Cover

| Herb Stratum (Plot size: <u>5'</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------------------------|------------------|
| 1. <u>TIPIA ANAETHETICA</u> | <u>35</u> | <input checked="" type="checkbox"/> | <u>DBL</u> |
| 2. <u>URTICA DIOICA</u> | <u>10</u> | _____ | <u>FACU</u> |
| 3. <u>RUBUS ALBIFOLIUS</u> | <u>5</u> | _____ | <u>FACU</u> |
| 4. <u>IMPATIENS CAPEXSI</u> | <u>3</u> | _____ | <u>FACW</u> |
| 5. <u>CORELIA CALDENALIS</u> | <u>2</u> | _____ | <u>FACW</u> |
| 6. <u>CAREX SAP.</u> | <u>10</u> | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

50% of total cover: 33 20% of total cover: 13
65 = Total Cover

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ☒ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Sapling Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Herb Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------|--------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is $\leq 3.0^1$
- ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 406

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

| Depth | Matrix | Indicator | Notes |
|-------|--------|-----------|-------|
| | | | |

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|--|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-2 | 7.5Y 4/2 | 45 | 7.5YR 5/6 | 5 | C | M | 50% clay / 20% organic matter / 30% sand | |
| | 5Y 5/2 | 30 | | | | | | |
| 2-5 | 2.5Y 5/1 | 89 | 10YR 5/6 | 1 | C | M | 10% organic matter / 90% sand | |
| | | | | | | | | |
| 5-12 | 5Y 6/1 | 90 | 5YR 5/8 | 10 | C | PL | clay | |
| | | | | | | | | |
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| 2-10 | 2.5YR 3/2 | 100 | | | | | | |
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¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) (LRR N)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (MLRA 147, 148)
- ___ Thin Dark Surface (S9) (MLRA 147, 148)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- ___ Umbric Surface (F13) (MLRA 136, 122)
- ___ Piedmont Floodplain Soils (F19) (MLRA 148)
- ___ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- ___ 2 cm Muck (A10) (MLRA 147)
- ___ Coast Prairie Redox (A16)
(MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Remarks:

Hydric Soil Present? Yes ☒ No ☐

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

490+00

Project/Site: KY 30 City/County: OWSLEY Sampling Date: 9/7/17
 Applicant/Owner: KYTC State: KY Sampling Point: W05
 Investigator(s): MTM, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 41
 Subregion (LRR or MLRA): _____ Lat: 37.424356 Long: -83.814593 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: <u>IN FIELD, SIMILAR APPEARANCE TO 2015 SURVEY FOR WETLANDS; CATTLE MAY USE FIELD (SEE OLD MAPS)</u> | |

HYDROLOGY

| Wetland Hydrology Indicators: | |
|---|---|
| Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>21"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>26"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0"</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: <u>30'</u>) | | | | Dominance Test worksheet: | |
|--|------------------|-------------------------------------|------------------|---|-------|
| | Absolute % Cover | Dominant Species? | Indicator Status | | |
| 1. <u>SALIX NIGRA</u> | <u>75</u> | <input checked="" type="checkbox"/> | <u>OBL</u> | Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> | (A) |
| 2. <u>ACER RUBRUM</u> | <u>10</u> | <input checked="" type="checkbox"/> | <u>FAC</u> | Total Number of Dominant Species Across All Strata: <u>7</u> | (B) |
| 3. <u>PLATANUS OCCIDENTALIS</u> | <u>5</u> | | <u>FACU</u> | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> | (A/B) |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| <u>40</u> = Total Cover 50% of total cover: <u>20</u> 20% of total cover: <u>8</u> | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ | |
| Sapling/Shrub Stratum (Plot size: <u>15'</u>) | | | | Hydrophytic Vegetation Indicators: | |
| | Absolute % Cover | Dominant Species? | Indicator Status | | |
| 1. <u>ACER RUBRUM</u> | <u>10</u> | <input checked="" type="checkbox"/> | <u>FAC</u> | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | |
| 2. <u>SALIX NIGRA</u> | <u>5</u> | <input checked="" type="checkbox"/> | <u>OBL</u> | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| <u>15</u> = Total Cover 50% of total cover: <u>8</u> 20% of total cover: <u>3</u> | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | |
| Herb Stratum (Plot size: <u>5'</u>) | | | | Definitions of Four Vegetation Strata: | |
| | Absolute % Cover | Dominant Species? | Indicator Status | | |
| 1. <u>SUNNEL ESTIVUS</u> | <u>20</u> | <input checked="" type="checkbox"/> | <u>FACW</u> | Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. | |
| 2. <u>EUPATORIUM PERFORIATUM</u> | <u>10</u> | <input checked="" type="checkbox"/> | <u>FACU</u> | Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. | |
| 3. <u>SOLIDAGO SPP.</u> | <u>5</u> | | | Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. | |
| 4. <u>CICUTA MACULATA</u> | <u>15</u> | <input checked="" type="checkbox"/> | <u>OBL</u> | Woody vine – All woody vines greater than 3.28 ft in height. | |
| 5. <u>ELEOCHARIS OBTUSA</u> | <u>5</u> | | <u>OBL</u> | | |
| 6. <u>SOLIDAGO GIGANTEA</u> | <u>10</u> | | <u>FACW</u> | | |
| 7. <u>EUPHOCYLLUM PURPUREUM</u> | <u>5</u> | | <u>FAC</u> | | |
| 8. <u>CAREX VULPINOIDEA</u> | <u>5</u> | | <u>OBL</u> | | |
| 9. <u>CAREX SPP.</u> | <u>10</u> | | | | |
| 10. <u>FESTUCA SPP.</u> | <u>5</u> | | | | |
| 11. <u>HICKOSTEBLUM VIMINEUM</u> | <u>5</u> | | <u>FACW</u> | | |
| <u>95</u> = Total Cover 50% of total cover: <u>48</u> 20% of total cover: <u>19</u> | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Woody Vine Stratum (Plot size: _____) | | | | | |
| 1. _____ | | | | | |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| _____ = Total Cover 50% of total cover: _____ 20% of total cover: _____ | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | |
|---|---------------------|----------------------|---------------------|--|
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------|--------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |
| Prevalence Index = B/A = _____ | |

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No _____

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|---------|------------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-2 | 5Y 4/1 | 90 | 2.5Y 4/1 | 5 | | PL | | Rocky |
| 0-2 | | | 10YR 3/2 | 5 | | PL | Clay | |
| 2-17 | 5Y 5/2 | 90 | 5YR 4/6 | 10 | | PL | Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 0-10 | 10YR 4/3 | 100 | | | | | | outpoint |
| | | | | | | | | (37.424233, -83.81484) |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| — Histosol (A1) | — Dark Surface (S7) |
| — Histic Epipedon (A2) | — Polyvalue Below Surface (S8) (MLRA 147, 148) |
| — Black Histic (A3) | — Thin Dark Surface (S9) (MLRA 147, 148) |
| — Hydrogen Sulfide (A4) | — Loamy Gleyed Matrix (F2) |
| — Stratified Layers (A5) | — Depleted Matrix (F3) |
| — 2 cm Muck (A10) (LRR N) | — Redox Dark Surface (F6) |
| — Depleted Below Dark Surface (A11) | — Depleted Dark Surface (F7) |
| — Thick Dark Surface (A12) | — Redox Depressions (F8) |
| — Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | — Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| — Sandy Gleyed Matrix (S4) | — Umbric Surface (F13) (MLRA 136, 122) |
| — Sandy Redox (S5) | — Piedmont Floodplain Soils (F19) (MLRA 148) |
| — Stripped Matrix (S6) | — Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- ___ 2 cm Muck (A10) (MLRA 147)
- ___ Coast Prairie Redox (A16)
(MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Remarks:

Hydric Soil Present? Yes / No

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

530+00

Project/Site: KY30 City/County: OWSLEY Sampling Date: 9/4/17
 Applicant/Owner: KYTC State: _____ Sampling Point: W04
 Investigator(s): MJB, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): <1
 Subregion (LRR or MLRA): _____ Lat: 37.433504 Long: -83.808617 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: <u>POND w/ WETLAND FRINGE</u> | |

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

Secondary Indicators (minimum of two required)

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> True Aquatic Plants (B14) | <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Moss Trim Lines (B16) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Thin Muck Surface (C7) | <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Other (Explain in Remarks) | <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Iron Deposits (B5) | | <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | <input type="checkbox"/> Geomorphic Position (D2) |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9) | | <input checked="" type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Aquatic Fauna (B13) | | <input type="checkbox"/> Microtopographic Relief (D4) |
| | | <input type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

| | |
|---|---|
| Surface Water Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>6"</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
| Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | |
| Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

| Sapling/Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

| Herb Stratum (Plot size: <u>5</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|-------------------------------------|------------------|-------------------|------------------|
| 1. <u>TYPA ANGLUSTROLOIA</u> | <u>45</u> | <u>✓</u> | <u>OBL</u> |
| 2. <u>TYNCUS EFFUSUS</u> | <u>10</u> | _____ | <u>FACW</u> |
| 3. <u>SALIX NIGRA</u> | <u>10</u> | _____ | <u>OBL</u> |
| 4. <u>CAREX VULPINODEA</u> | <u>10</u> | _____ | <u>OBL</u> |
| 5. <u>SOLIDAGO GIGANTEA</u> | <u>10</u> | _____ | <u>FACW</u> |
| 6. <u>CAREX SAR.</u> | <u>5</u> | _____ | <u>O</u> |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: 45 20% of total cover: 18

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: _____)

| | | | |
|-----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: _____)

| | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|---------|--------------------------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | Texture | |
| 0-3 | 5Y 5/1 | 99 | 2.5 Y 4/8 | 1 | C | PL | SILT | ROCKY |
| 3-12 | 5Y 6/2 | 95 | 2.5 Y 4/6 | .5 | C | PL | CLAY | ROCKY |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 0-10 | 2.5 Y 5/3 | 100 | | | | | | OUTPOINT 7 (37.433735, -83.80856) |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) (LRR N)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (MLRA 147, 148)
- ___ Thin Dark Surface (S9) (MLRA 147, 148)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- ___ Umbric Surface (F13) (MLRA 136, 122)
- ___ Piedmont Floodplain Soils (F19) (MLRA 148)
- ___ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16)
(MLRA 147, 148)
- Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

563100

Project/Site: KV30 City/County: OWSLEY Sampling Date: 9/6/17
 Applicant/Owner: KYTC State: KY Sampling Point: W03
 Investigator(s): MJH, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): <1
 Subregion (LRR or MLRA): _____ Lat: 37.439314 Long: -83.800521 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: Pu03H4

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Yes _____ No ☒
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? Yes _____ No _____
 (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: * VEG. LOOKS SIMILAR TO SOIL SOIL SURFACE | |

HYDROLOGY

| Wetland Hydrology Indicators: | |
|--|---|
| Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input checked="" type="checkbox"/> Drift Deposits (B3) <input checked="" type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>-3"</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0"</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

Tree Stratum (Plot size: 30')

Absolute % Cover Dominant Species? Indicator Status

| | | | |
|----------------------------------|-----------|----------|-------------|
| 1. <u>ACER RUBRUM</u> | <u>15</u> | <u>✓</u> | <u>FAC</u> |
| 2. <u>PLATANUS OCCIDENTALIS</u> | <u>10</u> | <u>✓</u> | <u>FACW</u> |
| 3. <u>SALIX ALBA</u> | <u>10</u> | <u>✓</u> | <u>OBL</u> |
| 4. <u>LIRIODENDRON TULIPFERA</u> | <u>5</u> | | <u>FACU</u> |
| 5. <u>PINUS VIRGINIANA</u> | <u>5</u> | | <u>-</u> |
| 6. _____ | | | |
| 7. _____ | | | |

45 = Total Cover

50% of total cover: 23 20% of total cover: 9

Sapling/Shrub Stratum (Plot size: 15')

| | | | |
|----------------------------------|-----------|----------|-------------|
| 1. <u>SALIX ALBA</u> | <u>15</u> | <u>✓</u> | <u>OBL</u> |
| 2. <u>PLATANUS OCCIDENTALIS</u> | <u>10</u> | <u>✓</u> | <u>FACW</u> |
| 3. <u>ACER RUBRUM</u> | <u>5</u> | | <u>FAC</u> |
| 4. <u>LIRIODENDRON TULIPFERA</u> | <u>5</u> | | <u>FACU</u> |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |

35 = Total Cover

50% of total cover: 18 20% of total cover: 7

Herb Stratum (Plot size: 5')

| | | | |
|----------------------------------|-----------|----------|-------------|
| 1. <u>TYPHA ANGSTROFOLIA</u> | <u>15</u> | <u>✓</u> | <u>OBL</u> |
| 2. <u>DICHAETHALIA CLAUDIUM</u> | <u>20</u> | <u>✓</u> | <u>FAC</u> |
| 3. <u>MICROSTEGIUM VINIVITUM</u> | <u>10</u> | <u>✓</u> | <u>FAC</u> |
| 4. <u>JUNCUS EFFLUSUS</u> | <u>10</u> | | <u>FACW</u> |
| 5. <u>CAREX SP.</u> | <u>5</u> | | <u>-</u> |
| 6. <u>CAREX VULPINOIDEA</u> | <u>5</u> | | <u>OBL</u> |
| 7. <u>SOLIDAGO GIGANTEA</u> | <u>3</u> | | <u>FACW</u> |
| 8. <u>ENTROCHITUM PURPUREUM</u> | <u>10</u> | | <u>FAC</u> |
| 9. <u>ACER RUBRUM</u> | <u>5</u> | | <u>FAC</u> |
| 10. <u>LOBELIA CARDINALIS</u> | <u>5</u> | | <u>FACW</u> |
| 11. <u>IMATIENS CAPENSIS</u> | <u>2</u> | | <u>FACW</u> |

90 = Total Cover

50% of total cover: 45 20% of total cover: 18

Woody Vine Stratum (Plot size: _____)

| | | | |
|----------|--|--|--|
| 1. _____ | | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | |
|---|---------------------|----------------------|---------------------|---|-------------------|--------------|-------------------|-------------|--------------------|-------------|-------------------|-------------|--------------------|-------------|-------------------|-------------|----------------------|---------------------|
| Tree Stratum (Plot size: _____) | | | | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) | | | | | | | | | | | | | | |
| 1. _____ | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | |
| _____ = Total Cover | | | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> </table> Prevalence Index = B/A = _____ | Total % Cover of: | Multiply by: | OBL species _____ | x 1 = _____ | FACW species _____ | x 2 = _____ | FAC species _____ | x 3 = _____ | FACU species _____ | x 4 = _____ | UPL species _____ | x 5 = _____ | Column Totals: _____ | (A) _____ (B) _____ |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | |
| OBL species _____ | x 1 = _____ | | | | | | | | | | | | | | | | | |
| FACW species _____ | x 2 = _____ | | | | | | | | | | | | | | | | | |
| FAC species _____ | x 3 = _____ | | | | | | | | | | | | | | | | | |
| FACU species _____ | x 4 = _____ | | | | | | | | | | | | | | | | | |
| UPL species _____ | x 5 = _____ | | | | | | | | | | | | | | | | | |
| Column Totals: _____ | (A) _____ (B) _____ | | | | | | | | | | | | | | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | | | | | | | | | | | | | | | |
| Sapling Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | |
| 1. _____ | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | |
| _____ = Total Cover | | | | | | | | | | | | | | | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | | | | | | | | | | | | | | | |
| Shrub Stratum (Plot size: _____) | | | | Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. | | | | | | | | | | | | | | |
| 1. _____ | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | |
| _____ = Total Cover | | | | | | | | | | | | | | | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? Yes _____ No _____ | | | | | | | | | | | | | | |
| 1. _____ | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | |
| 10. _____ | | | | | | | | | | | | | | | | | | |
| 11. _____ | | | | | | | | | | | | | | | | | | |
| _____ = Total Cover | | | | | | | | | | | | | | | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | |
| 1. _____ | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | |
| _____ = Total Cover | | | | | | | | | | | | | | | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | | | | | | | | | | | | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | | | | | | | | | | | | | | | |

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
Hydric Soil Indicators:

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- ✓ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- ___ 2 cm Muck (A10) (MLRA 147)
 ___ Coast Prairie Redox (A16)
 (MLRA 147, 148)
 ___ Piedmont Floodplain Soils (F19)
 (MLRA 136, 147)
 ___ Very Shallow Dark Surface (TF12)
 ___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

570+00

Project/Site: KY 30 City/County: OWSLEY Sampling Date: 9/6/17
 Applicant/Owner: KYTC State: KY Sampling Point: W02
 Investigator(s): MTM, PLS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CONCAVE Slope (%): 21
 Subregion (LRR or MLRA): _____ Lat: 37.440777 Long: -83.798734 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---------------------------------|--|--|
| Hydrophytic Vegetation Present? | Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: | | |

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☒ Water Marks (B1)
- ☒ Sediment Deposits (B2)
- ☒ Drift Deposits (B3)
- ☒ Algal Mat or Crust (B4)
- ☒ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☒ Aquatic Fauna (B13)

- ☐ True Aquatic Plants (B14)
- ☒ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No _____ Depth (inches): 1"
 Water Table Present? Yes ☒ No _____ Depth (inches): 4"
 Saturation Present? Yes ☒ No _____ Depth (inches): 0"
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: <u>30'</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------------------------|------------------|
| 1. <u>SALIX NIGRA</u> | <u>10</u> | <input checked="" type="checkbox"/> | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: 2

| Sapling/Shrub Stratum (Plot size: <u>15'</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------------------------|------------------|
| 1. <u>SALIX NIGRA</u> | <u>15</u> | <input checked="" type="checkbox"/> | <u>OBL</u> |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

| Herb Stratum (Plot size: <u>5'</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------------------------|------------------|
| 1. <u>SALIX NIGRA</u> | <u>10</u> | | <u>OBL</u> |
| 2. <u>TYPHA ANGSTROFOLIA</u> | <u>20</u> | <input checked="" type="checkbox"/> | <u>FACW</u> |
| 3. <u>SOLIDAGO SPP.</u> | <u>15</u> | | |
| 4. <u>TUNCUS EFFUSUS</u> | <u>15</u> | <input checked="" type="checkbox"/> | <u>FACW</u> |
| 5. <u>DIANTHUS CLAUDIUM</u> | <u>20</u> | | <u>FAC</u> |
| 6. <u>SOLIDAGO VIRIDULA</u> | <u>5</u> | | <u>FACW</u> |
| 7. <u>CICUTA MACULATA</u> | <u>5</u> | | <u>OBL</u> |
| 8. <u>MICROSTEGIUM VIMINEUM</u> | <u>5</u> | | <u>FAC</u> |
| 9. <u>CAREX SPP.</u> | <u>5</u> | | |
| 10. _____ | | | |
| 11. _____ | | | |

_____ = Total Cover
50% of total cover: 50 20% of total cover: 20

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:
OBL species _____ x 1 = _____
FACW species _____ x 2 = _____
FAC species _____ x 3 = _____
FACU species _____ x 4 = _____
UPL species _____ x 5 = _____
Column Totals: _____ (A) _____ (B)
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ☒ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling Point:

Eastern Mountains and Piedmont – Version 2.0

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------|-----------------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-2 | 2.5 Y2.5/1 | | | | | | | |
| 2-9 | Gley 1 4/10Y | 100 | | | | | Silt/Clay | organic matter |
| 9-12 | Gley 1 5/10Y | 100 | | | | | Silt/Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 0-8 | 10YR 4/3 | 100 | | | | | | OUTPOINT |
| | | | | | | | | (37.440886 N, -83.798269 W) |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) |
| <input checked="" type="checkbox"/> Hydrogen Sulfide (A4) | <input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147, 148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydrogen Sulfide odor

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

595470

Project/Site: _____ City/County: Owsley Sampling Date: 11-15-17
 Applicant/Owner: _____ State: _____ Sampling Point: W14
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---------------------------------|--|--|
| Hydrophytic Vegetation Present? | Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes _____ No _____ |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: | | |

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Iron Deposits (B5) | |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| <input type="checkbox"/> Aquatic Fauna (B13) | |

Secondary Indicators (minimum of two required)

- | |
|---|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Moss Trim Lines (B16) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Crayfish Burrows (C8) |
| <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Microtopographic Relief (D4) |
| <input type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

| | | |
|--|--|--------------------------------|
| Surface Water Present? | Yes <input checked="" type="checkbox"/> No _____ | Depth (inches): <u>< 1"</u> |
| Water Table Present? | Yes <input checked="" type="checkbox"/> No _____ | Depth (inches): <u>~ 6"</u> |
| Saturation Present? (includes capillary fringe) | Yes <input checked="" type="checkbox"/> No _____ | Depth (inches): <u>~ 1"</u> |

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Pool

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>Black willow</u> | <u>2</u> | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |
| Sapling/Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Black willow</u> | <u>10</u> | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |
| Herb Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Cat tails</u> | <u>20</u> | | |
| 2. <u>Sage sp</u> | <u>5</u> | | |
| 3. <u>Barn set</u> | <u>5</u> | | |
| 4. <u>Golden rod</u> | <u>5</u> | | |
| 5. <u>Fireweed</u> | <u>10</u> | | |
| 6. <u>1</u> | <u>5</u> | | |
| 7. <u>2</u> | <u>5</u> | | |
| 8. _____ | | | |
| 9. _____ | | | |
| 10. _____ | | | |
| 11. _____ | | | |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |
| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Rubus</u> | <u>10</u> | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| | |
|--------------------------------|---------------------|
| Total % Cover of: | Multiply by: |
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |
| Prevalence Index = B/A = _____ | |

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

| Sapling Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

| Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

| Herb Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| | |
|-------------------|--------------|
| Total % Cover of: | Multiply by: |
|-------------------|--------------|

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

 ___ 3 - Prevalence Index is ≤3.0¹

 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes _____ No _____

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| — Histosol (A1) | — Dark Surface (S7) |
| — Histic Epipedon (A2) | — Polyvalue Below Surface (S8) (MLRA 147, 148) |
| — Black Histic (A3) | — Thin Dark Surface (S9) (MLRA 147, 148) |
| — Hydrogen Sulfide (A4) | — Loamy Gleyed Matrix (F2) |
| — Stratified Layers (A5) | ✓ Depleted Matrix (F3) |
| — 2 cm Muck (A10) (LRR N) | — Redox Dark Surface (F6) |
| — Depleted Below Dark Surface (A11) | — Depleted Dark Surface (F7) |
| — Thick Dark Surface (A12) | — Redox Depressions (F8) |
| — Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | — Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| — Sandy Gleyed Matrix (S4) | — Umbric Surface (F13) (MLRA 136, 122) |
| — Sandy Redox (S5) | — Piedmont Floodplain Soils (F19) (MLRA 148) |
| — Stripped Matrix (S6) | — Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (MLRA 147)
☐ Coast Prairie Redox (A16)
 (MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
 (MLRA 136, 147)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

$S_{\text{open}} = 5 \text{ WTC/room} = 1$

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

600+00

Project/Site: KY 30 City/County: OWSLEY Sampling Date: 9/6/17
 Applicant/Owner: KITC State: KY Sampling Point: W01
 Investigator(s): MJG, ELS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): NONE Slope (%): <1
 Subregion (LRR or MLRA): _____ Lat: 37.446859 Long: -83.791727 Datum: NAD83
 Soil Map Unit Name: _____ NWI classification: W1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation ☒ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No _____
 Hydric Soil Present? Yes ☒ No _____
 Wetland Hydrology Present? Yes ☒ No _____

Is the Sampled Area within a Wetland? Yes ☒ No _____

Remarks:

X SITUATED IN FIELD THAT IS MOWED REGULARLY, DIFFICULT TO PROPERLY IDENTIFY SEDGES, GRASSES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
 _____ Water Marks (B1)
 _____ Sediment Deposits (B2)
☒ Drift Deposits (B3)
 _____ Algal Mat or Crust (B4)
 _____ Iron Deposits (B5)
 _____ Inundation Visible on Aerial Imagery (B7)
 _____ Water-Stained Leaves (B9)
 _____ Aquatic Fauna (B13)

_____ True Aquatic Plants (B14)
 _____ Hydrogen Sulfide Odor (C1)
☒ Oxidized Rhizospheres on Living Roots (C3)
 _____ Presence of Reduced Iron (C4)
 _____ Recent Iron Reduction in Tilled Soils (C6)
 _____ Thin Muck Surface (C7)
 _____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

_____ Surface Soil Cracks (B6)
 _____ Sparsely Vegetated Concave Surface (B8)
 _____ Drainage Patterns (B10)
 _____ Moss Trim Lines (B16)
 _____ Dry-Season Water Table (C2)
 _____ Crayfish Burrows (C8)
 _____ Saturation Visible on Aerial Imagery (C9)
 _____ Stunted or Stressed Plants (D1)
 _____ Geomorphic Position (D2)
 _____ Shallow Aquitard (D3)
 _____ Microtopographic Relief (D4)
 _____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No _____ Depth (inches): 61"
 Water Table Present? Yes ☒ No _____ Depth (inches): -10"
 Saturation Present? Yes ☒ No _____ Depth (inches): -8"
 (Includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: <u>30'</u>) | | | | Absolute % Cover | Dominant Species? | Indicator Status |
|--|---------------------------|-----------|----------|-------------------------------|----------------------|---------------------|
| 1. | <u>N/A</u> | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| _____ = Total Cover | | | | | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ | | |
| Sapling/Shrub Stratum (Plot size: <u>15'</u>) | | | | | | |
| 1. | <u>N/A</u> | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| _____ = Total Cover | | | | | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ | | |
| Herb Stratum (Plot size: <u>5'</u>) | | | | | | |
| 1. | <u>* CAREX SPP.</u> | <u>25</u> | <u>✓</u> | <u>—</u> | | |
| 2. | <u>ALOPECURUS SPP.</u> | <u>10</u> | | | | |
| 3. | <u>JUNCUS ROSTROSUS</u> | <u>20</u> | <u>✓</u> | <u>FACW</u> | | |
| 4. | <u>ALPHEGIA OBTUSA</u> | <u>10</u> | | <u>OBL</u> | | |
| 5. | <u>CAREX VULPINOIDEA</u> | <u>15</u> | | <u>OBL</u> | | |
| 6. | <u>TRIFOLIUM PRATENSE</u> | <u>5</u> | | <u>FACW</u> | | |
| 7. | <u>SOLIDAGO GIGANTEA</u> | <u>5</u> | | <u>FACW</u> | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| 11. | | | | | | |
| _____ = Total Cover | | | | | | |
| 50% of total cover: <u>48</u> | | | | 20% of total cover: <u>19</u> | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | |
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| _____ = Total Cover | | | | | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|-------------------|---------------------|
| OBL species | x 1 = _____ |
| FACW species | x 2 = _____ |
| FAC species | x 3 = _____ |
| FACU species | x 4 = _____ |
| UPL species | x 5 = _____ |
| Column Totals: | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

* FIELD MONITORING

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|---------------------|----------------------|---------------------|--|
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Sapling Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | |

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

 Total Number of Dominant Species Across All Strata: _____ (B)

 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

| | |
|--------------------------------|--------------|
| Total % Cover of: | Multiply by: |
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |
| Prevalence Index = B/A = _____ | |

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

| | |
|---------------------------------|--------------------|
| Hydrophytic Vegetation Present? | Yes _____ No _____ |
|---------------------------------|--------------------|

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|------------|----------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-3 | 5Y 5/2 | 93 | 10YR 4/4 | 7 | C | PL | Silty/Clay | |
| 3-12 | 5Y 6/2 | 90 | 10YR 5/6 | 10 | C | PL | Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 0-12 | 2.5Y 5/3 | 100 | | | | | Silty | outpoint |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
Hydric Soil Indicators:

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) |

Indicators for Problematic Hydric Soils³:

- ___ 2 cm Muck (A10) (MLRA 147)
- ___ Coast Prairie Redox (A16)
(MLRA 147, 148)
- ___ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

*ROCKY SOIL

Preliminary Jurisdictional Determination Forms

[illegible]

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- ☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: _____.
- ☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report. Rationale: _____.
- ☐ Data sheets prepared by the Corps: _____.
- ☐ Corps navigable waters' study: _____.
- ☐ U.S. Geological Survey Hydrologic Atlas: _____.
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:24,000 Sturgeon, Tyner, Maulden.
- ☐ Natural Resources Conservation Service Soil Survey. Citation: _____.
- ☒ National wetlands inventory map(s). Cite name: National Wetland Inventory Polygons-GIS coverage.
- ☐ State/local wetland inventory map(s): _____.
- ☐ FEMA/FIRM maps: _____.
- ☐ 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date): NAIP Color Imagery 2012 – 1 meter coverage.
or ☐ Other (Name & Date): _____.
- ☐ Previous determination(s). File no. and date of response letter: _____.
- ☐ Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory staff member
completing PJD

Signature and date of
person requesting PJD
(REQUIRED, unless obtaining
the signature is impracticable)¹

¹ Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

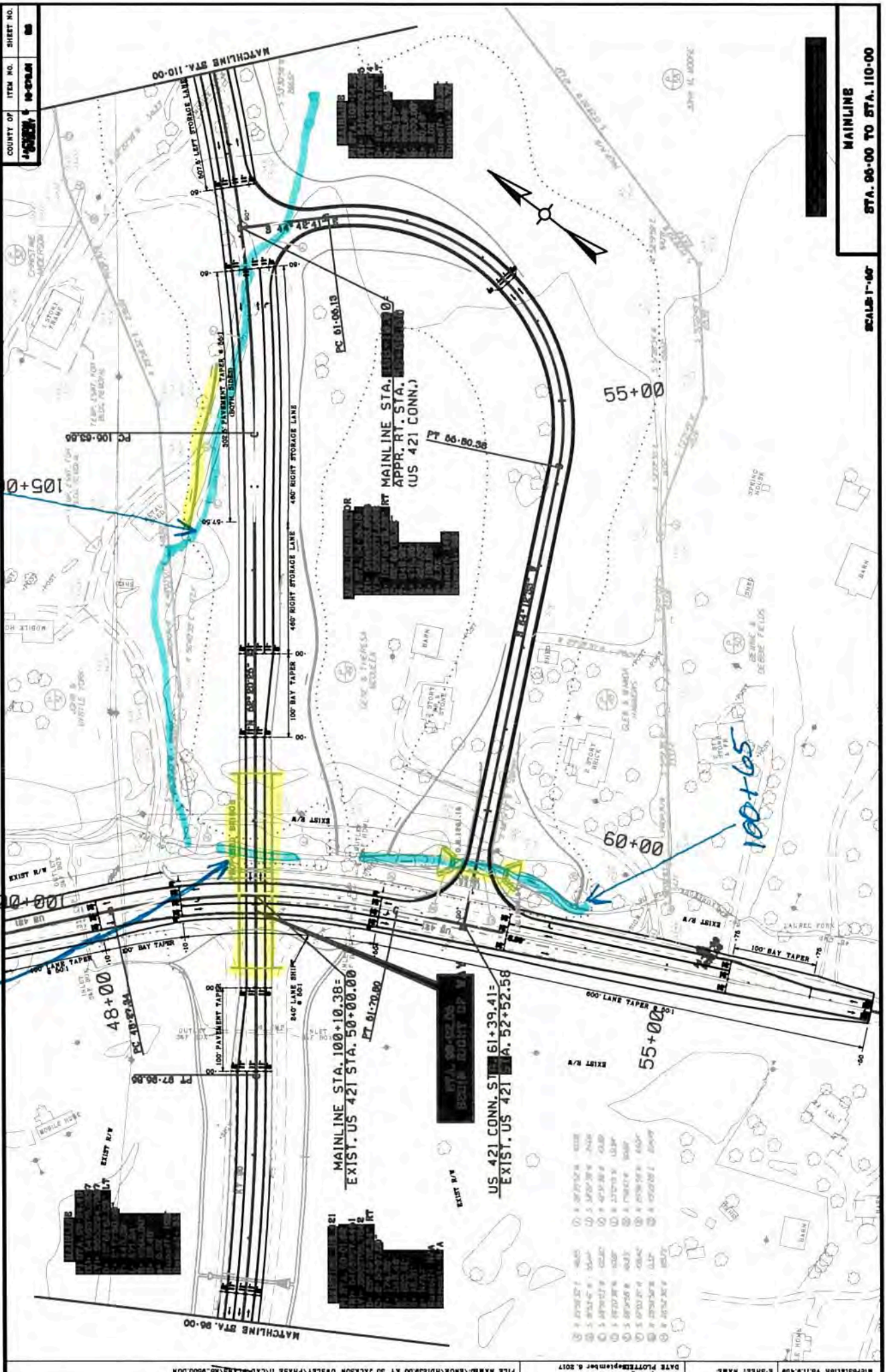
| Site number | Latitude | Longitude | Estimated amount of aquatic resource in review area (acreage & linear feet) | Type of aquatic resource | Geographic authority to which the aquatic resource "may be" subject |
|--------------------|-----------------|------------------|--|---------------------------------|--|
| 100+60 | 37.342652 | -83.900162 | 0.00 ac; 00 ft | non-wetland | Section 404 |
| 100+65 | 37.342268 | -83.899803 | 0.034 ac; 300 ft | non-wetland | Section 404 |
| 105+00 | 37.343801 | -83.898646 | 0.013 ac; 561 ft | non-wetland | Section 404 |
| 113+55 | 37.345256 | -83.896992 | 0.006 ac; 121 ft | non-wetland | Section 404 |
| 119+00 | 37.347125 | -83.895914 | 0.071 ac; 777 ft | non-wetland | Section 404 |
| 125+00 | 37.348418 | -83.893765 | 0.056 ac; 1224 ft | non-wetland | Section 404 |
| 134+00 | 37.349313 | -83.892198 | 0.092 ac | wetland | Section 404 |
| 150+00 | 37.353729 | -83.886931 | 0.024 ac; 514 ft | non-wetland | Section 404 |
| 154+50 | 37.353518 | -83.887400 | 0.003 ac; 90 ft | non-wetland | Section 404 |
| 157+50 | 37.354480 | -83.886972 | 0.011 ac; 463 ft | non-wetland | Section 404 |
| 157+75 | 37.353812 | -83.885552 | 0.008 ac; 118 ft | non-wetland | Section 404 |
| 172+00 | 37.358475 | -83.885571 | 0.007 ac; 303 ft | non-wetland | Section 404 |
| 174+00 | 37.359213 | -83.885596 | 0.003 ac; 146 ft | non-wetland | Section 404 |
| 175+00 | 37.359213 | -83.885596 | 0.089 ac | wetland | Section 404 |
| 190+00 | 37.361535 | -83.881209 | 0.020 ac; 593 ft | non-wetland | Section 404 |
| 208+20 | 37.365205 | -83.876700 | 0.002 ac; 25 ft | non-wetland | Section 404 |
| 209+00 | 37.364742 | -83.876020 | 0.139 ac; 505 ft | non-wetland | Section 404 |
| 210+00 | 37.365573 | -83.876693 | 0.04 ac; 218 ft | non-wetland | Section 404 |
| 217+00 | 37.366648 | -83.873227 | 0.019 ac; 270 ft | non-wetland | Section 404 |
| 219+00 | 37.366648 | -83.873227 | 0.225 ac | wetland | Section 404 |
| 230+00 | 37.369517 | -83.870871 | 0.029 ac; 417 ft | non-wetland | Section 404 |
| 231+00 | 37.369517 | -83.870871 | 0.147 ac | wetland | Section 404 |
| 248+00 | 37.374435 | -83.868151 | 0.028 ac; 601 ft | non-wetland | Section 404 |
| 258+00 | 37.376005 | -83.866220 | 0.008 ac; 184 ft | non-wetland | Section 404 |
| 260+00 | 37.376181 | -83.865983 | 0.01 ac; 214 ft | non-wetland | Section 404 |
| 273+00 | 37.379245 | -83.863429 | 0.057 ac; 224 ft | non-wetland | Section 404 |
| 274+00 | 37.379191 | -83.863335 | 0.052 ac | wetland | Section 404 |
| 275+00 | 37.379580 | -83.862088 | 0.563 ac | wetland | Section 404 |
| 277+00 | 37.380158 | -83.862287 | 0.168 ac; 664 ft | non-wetland | Section 404 |
| 286+00 | 37.380905 | -83.859290 | 0.015 ac; 333 ft | non-wetland | Section 404 |
| 295+00 | 37.382589 | -83.857663 | 0.064 ac; 936 ft | non-wetland | Section 404 |
| 325+00 | 37.390222 | -83.850220 | 0.053 ac; 1535 ft | non-wetland | Section 404 |
| 332+00 | 37.390868 | -83.849417 | 0.018 ac; 386 ft | non-wetland | Section 404 |
| 333+00 | 37.390931 | -83.849289 | 0.004 ac; 113 ft | non-wetland | Section 404 |
| 338+00 | 37.392996 | -83.849335 | 0.035 ac; 381 ft | non-wetland | Section 404 |
| 346+00 | 37.394964 | -83.846667 | 0.057 ac; 415 ft | non-wetland | Section 404 |
| 349+00 | 37.394975 | -83.846829 | 0.004 ac; 192 ft | non-wetland | Section 404 |
| 351+50 | 37.395272 | -83.846337 | 0.005 ac; 227 ft | non-wetland | Section 404 |
| 352+50 | 37.396044 | -83.845607 | 0.032 ac; 703 ft | non-wetland | Section 404 |
| 355+75 | 37.396296 | -83.845292 | 0.0 ac; 0 ft | non-wetland | Section 404 |

| | | | | | |
|--------|-----------|------------|-------------------|-------------|-------------|
| 358+00 | 37.396965 | -83.844991 | 0.002 ac; 48 ft | non-wetland | Section 404 |
| 358+50 | 37.396947 | -83.844823 | 0.006 ac; 127 ft | non-wetland | Section 404 |
| 367+00 | 37.398682 | -83.843064 | 0.012 ac; 260 ft | non-wetland | Section 404 |
| 375+00 | 37.400598 | -83.841543 | 0.003 ac; 121 ft | non-wetland | Section 404 |
| 375+40 | 37.400699 | -83.841242 | 0.001 ac; 55 ft | non-wetland | Section 404 |
| 375+50 | 37.400699 | -83.841242 | 0.01 ac | wetland | Section 404 |
| 386+00 | 37.403316 | -83.839083 | 0.019 ac; 420 ft | non-wetland | Section 404 |
| 394+00 | 37.404964 | -83.837658 | 0.018 ac; 537 ft | non-wetland | Section 404 |
| 405+00 | 37.407722 | -83.835586 | 0.049 ac | wetland | Section 404 |
| 405+50 | 37.407722 | -83.835586 | 0.005 ac; 153 ft | non-wetland | Section 404 |
| 418+00 | 37.411960 | -83.830193 | 0.718 ac; 328 ft | non-wetland | Section 404 |
| 442+00 | 37.415132 | -83.826276 | 0.103 ac; 745 ft | non-wetland | Section 404 |
| 445+00 | 37.414951 | -83.826246 | 0.006 ac; 276 ft | non-wetland | Section 404 |
| 465+00 | 37.419970 | -83.821663 | 0.019 ac; 410 ft | non-wetland | Section 404 |
| 474+00 | 37.420614 | -83.818527 | 0.028 ac; 619 ft | non-wetland | Section 404 |
| 489+00 | 37.424085 | -83.815651 | 0.006 ac; 182 ft | non-wetland | Section 404 |
| 490+00 | 37.424100 | -83.814946 | 0.483 ac | wetland | Section 404 |
| 503+50 | 37.427251 | -83.813038 | 0.004 ac; 123 ft | non-wetland | Section 404 |
| 508+00 | 37.428349 | -83.812409 | 0.051 ac; 553 ft | non-wetland | Section 404 |
| 512+50 | 37.429044 | -83.809838 | 0.002 ac; 28 ft | non-wetland | Section 404 |
| 513+50 | 37.429395 | -83.810654 | 0.035 ac; 754 ft | non-wetland | Section 404 |
| 529+50 | 37.433508 | -83.808810 | 0.003 ac; 119 ft | non-wetland | Section 404 |
| 530+00 | 37.433508 | -83.808810 | 0.061 ac | wetland | Section 404 |
| 534+20 | 37.435460 | -83.806516 | 0.002 ac; 80 ft | non-wetland | Section 404 |
| 541+00 | 37.436621 | -83.806409 | 0.012 ac; 354 ft | non-wetland | Section 404 |
| 542+50 | 37.437990 | -83.804493 | 0.085 ac; 1237 ft | non-wetland | Section 404 |
| 547+00 | 37.437204 | -83.804983 | 0.004 ac; 180 ft | non-wetland | Section 404 |
| 553+50 | 37.438294 | -83.802565 | 0.140 ac; 765 ft | non-wetland | Section 404 |
| 554+00 | 37.438773 | -83.803438 | 0.006 ac; 85 ft | non-wetland | Section 404 |
| 562+00 | 37.439597 | -83.800425 | 0.008 ac; 347 ft | non-wetland | Section 404 |
| 563+00 | 37.439266 | -83.800536 | 0.208 ac | wetland | Section 404 |
| 570+00 | 37.440779 | -83.798727 | 0.227 ac | wetland | Section 404 |
| 579+00 | 37.442588 | -83.796396 | 0.012 ac; 339 ft | non-wetland | Section 404 |
| 587+50 | 37.444444 | -83.794641 | 0.005 ac; 155 ft | non-wetland | Section 404 |
| 595+00 | 37.445716 | -83.792514 | 0.032 ac; 467 ft | non-wetland | Section 404 |
| 595+50 | 37.446075 | -83.792857 | 0.017 ac; 249 ft | non-wetland | Section 404 |
| 595+70 | 37.446453 | -83.793091 | 0.062 ac | wetland | Section 404 |
| 596+00 | 37.446453 | -83.793091 | 0.001 ac; 28 ft | non-wetland | Section 404 |
| 600+00 | 37.446845 | -83.791683 | 0.317 ac | wetland | Section 404 |
| 603+50 | 37.447615 | -83.790933 | 0.003 ac; 115 ft | non-wetland | Section 404 |

Plan Sheets

105+00

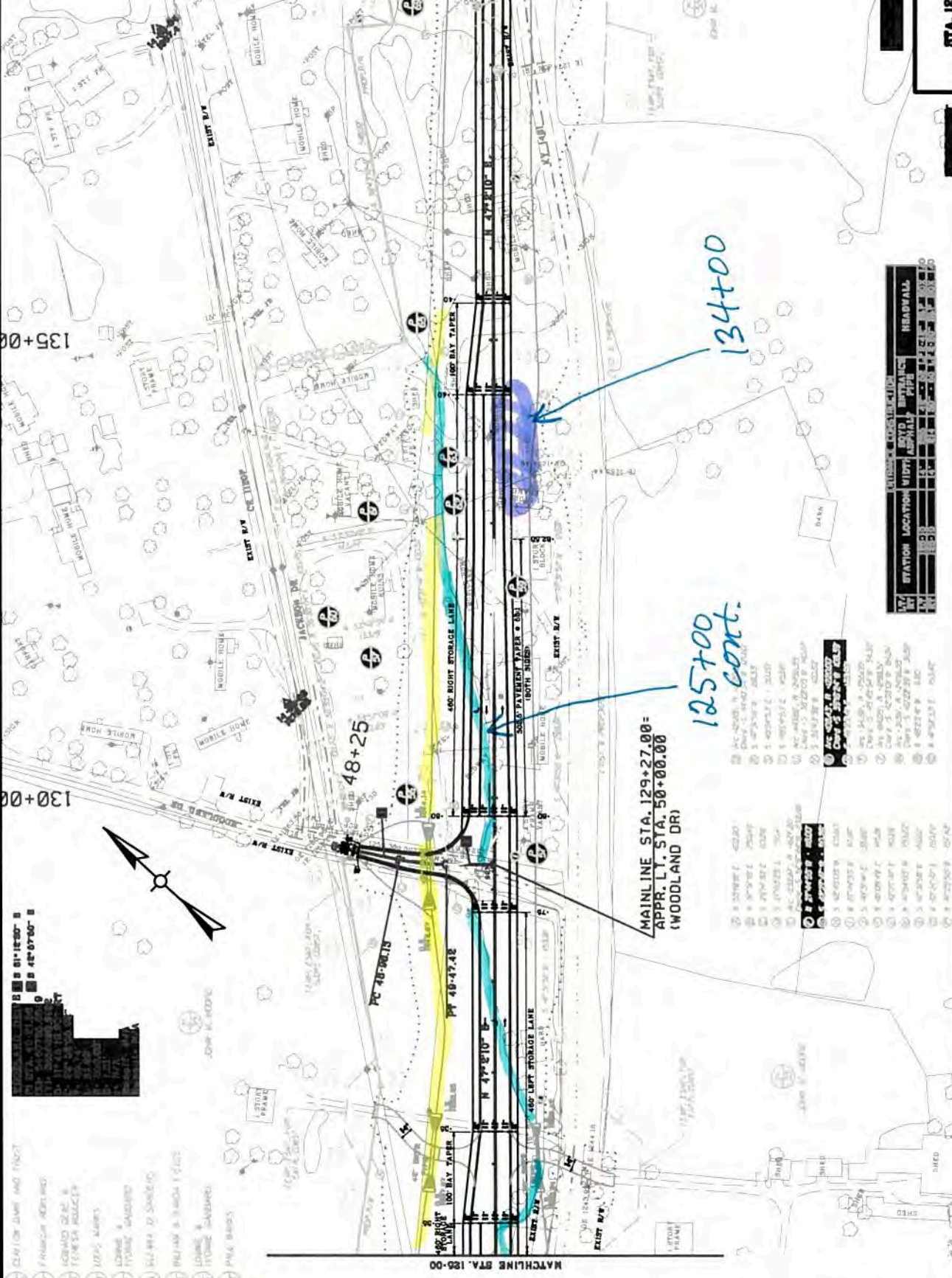
100+60



| COUNTY OF | ITEM NO. | SHEET NO. |
|-----------|----------|-----------|
| JACKSON | 10-001 | 10 |

MAINLINE
STA. 95-00 TO STA. 110-00
SCALE 1"=50'

| COUNTY OF | ITEM NO. | SHEET NO. |
|-----------|-----------|-----------|
| CLATSOP | 10-000.00 | 001 |



| STATION | LOCATION | WIDTH | DEPTH | ENTRANCE | HEADWALL |
|---------|----------|-------|-------|----------|----------|
| 125+00 | 125+00 | 12 | 12 | 12 | 12 |
| 126+00 | 126+00 | 12 | 12 | 12 | 12 |
| 127+00 | 127+00 | 12 | 12 | 12 | 12 |
| 128+00 | 128+00 | 12 | 12 | 12 | 12 |
| 129+00 | 129+00 | 12 | 12 | 12 | 12 |
| 130+00 | 130+00 | 12 | 12 | 12 | 12 |
| 131+00 | 131+00 | 12 | 12 | 12 | 12 |
| 132+00 | 132+00 | 12 | 12 | 12 | 12 |
| 133+00 | 133+00 | 12 | 12 | 12 | 12 |
| 134+00 | 134+00 | 12 | 12 | 12 | 12 |
| 135+00 | 135+00 | 12 | 12 | 12 | 12 |

MAINLINE
STA. 125-00 TO STA. 140-00

MAINLINE STA. 129+27.00 =
APPR. LT. STA. 50+00.00
(WOODLAND DR)

125+00
cont.

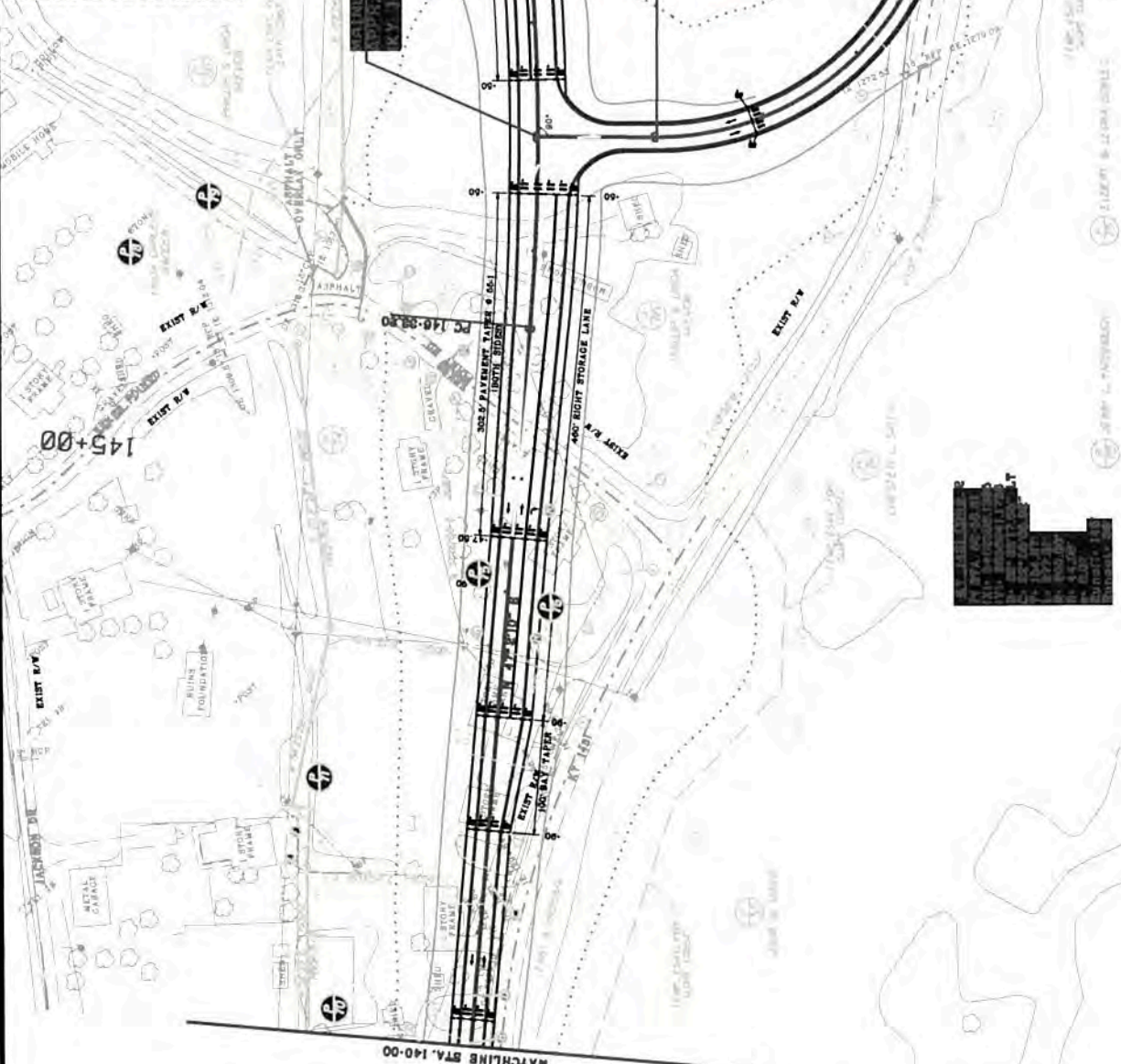
134+00

- 1. 125+00 TO 126+00
- 2. 126+00 TO 127+00
- 3. 127+00 TO 128+00
- 4. 128+00 TO 129+00
- 5. 129+00 TO 130+00
- 6. 130+00 TO 131+00
- 7. 131+00 TO 132+00
- 8. 132+00 TO 133+00
- 9. 133+00 TO 134+00
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- 14. 138+00 TO 139+00
- 15. 139+00 TO 140+00

- 1. 125+00 TO 126+00
- 2. 126+00 TO 127+00
- 3. 127+00 TO 128+00
- 4. 128+00 TO 129+00
- 5. 129+00 TO 130+00
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- 9. 133+00 TO 134+00
- 10. 134+00 TO 135+00
- 11. 135+00 TO 136+00
- 12. 136+00 TO 137+00
- 13. 137+00 TO 138+00
- 14. 138+00 TO 139+00
- 15. 139+00 TO 140+00

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | PRICE | TOTAL |
|----------|-------------|----------|-------|--------|--------|
| 1 | CONCRETE | 1.00 | CU YD | 120.00 | 120.00 |
| 2 | CEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 3 | GRAVEL | 1.00 | CU YD | 120.00 | 120.00 |
| 4 | ASPHALT | 1.00 | CU YD | 120.00 | 120.00 |
| 5 | PAVEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 6 | STREET | 1.00 | CU YD | 120.00 | 120.00 |
| 7 | WATER | 1.00 | CU YD | 120.00 | 120.00 |
| 8 | SEWER | 1.00 | CU YD | 120.00 | 120.00 |
| 9 | LANDSCAPE | 1.00 | CU YD | 120.00 | 120.00 |
| 10 | UTILITIES | 1.00 | CU YD | 120.00 | 120.00 |
| 11 | CONCRETE | 1.00 | CU YD | 120.00 | 120.00 |
| 12 | CEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 13 | GRAVEL | 1.00 | CU YD | 120.00 | 120.00 |
| 14 | ASPHALT | 1.00 | CU YD | 120.00 | 120.00 |
| 15 | PAVEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 16 | STREET | 1.00 | CU YD | 120.00 | 120.00 |
| 17 | WATER | 1.00 | CU YD | 120.00 | 120.00 |
| 18 | SEWER | 1.00 | CU YD | 120.00 | 120.00 |
| 19 | LANDSCAPE | 1.00 | CU YD | 120.00 | 120.00 |
| 20 | UTILITIES | 1.00 | CU YD | 120.00 | 120.00 |

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | PRICE | TOTAL |
|----------|-------------|----------|-------|--------|--------|
| 21 | CONCRETE | 1.00 | CU YD | 120.00 | 120.00 |
| 22 | CEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 23 | GRAVEL | 1.00 | CU YD | 120.00 | 120.00 |
| 24 | ASPHALT | 1.00 | CU YD | 120.00 | 120.00 |
| 25 | PAVEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 26 | STREET | 1.00 | CU YD | 120.00 | 120.00 |
| 27 | WATER | 1.00 | CU YD | 120.00 | 120.00 |
| 28 | SEWER | 1.00 | CU YD | 120.00 | 120.00 |
| 29 | LANDSCAPE | 1.00 | CU YD | 120.00 | 120.00 |
| 30 | UTILITIES | 1.00 | CU YD | 120.00 | 120.00 |
| 31 | CONCRETE | 1.00 | CU YD | 120.00 | 120.00 |
| 32 | CEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 33 | GRAVEL | 1.00 | CU YD | 120.00 | 120.00 |
| 34 | ASPHALT | 1.00 | CU YD | 120.00 | 120.00 |
| 35 | PAVEMENT | 1.00 | CU YD | 120.00 | 120.00 |
| 36 | STREET | 1.00 | CU YD | 120.00 | 120.00 |
| 37 | WATER | 1.00 | CU YD | 120.00 | 120.00 |
| 38 | SEWER | 1.00 | CU YD | 120.00 | 120.00 |
| 39 | LANDSCAPE | 1.00 | CU YD | 120.00 | 120.00 |
| 40 | UTILITIES | 1.00 | CU YD | 120.00 | 120.00 |



| COUNTY OF | ITEM NO. | SHEET NO. |
|-----------|-----------|-----------|
| CLATSOP | 10-000-00 | 000 |



165+00

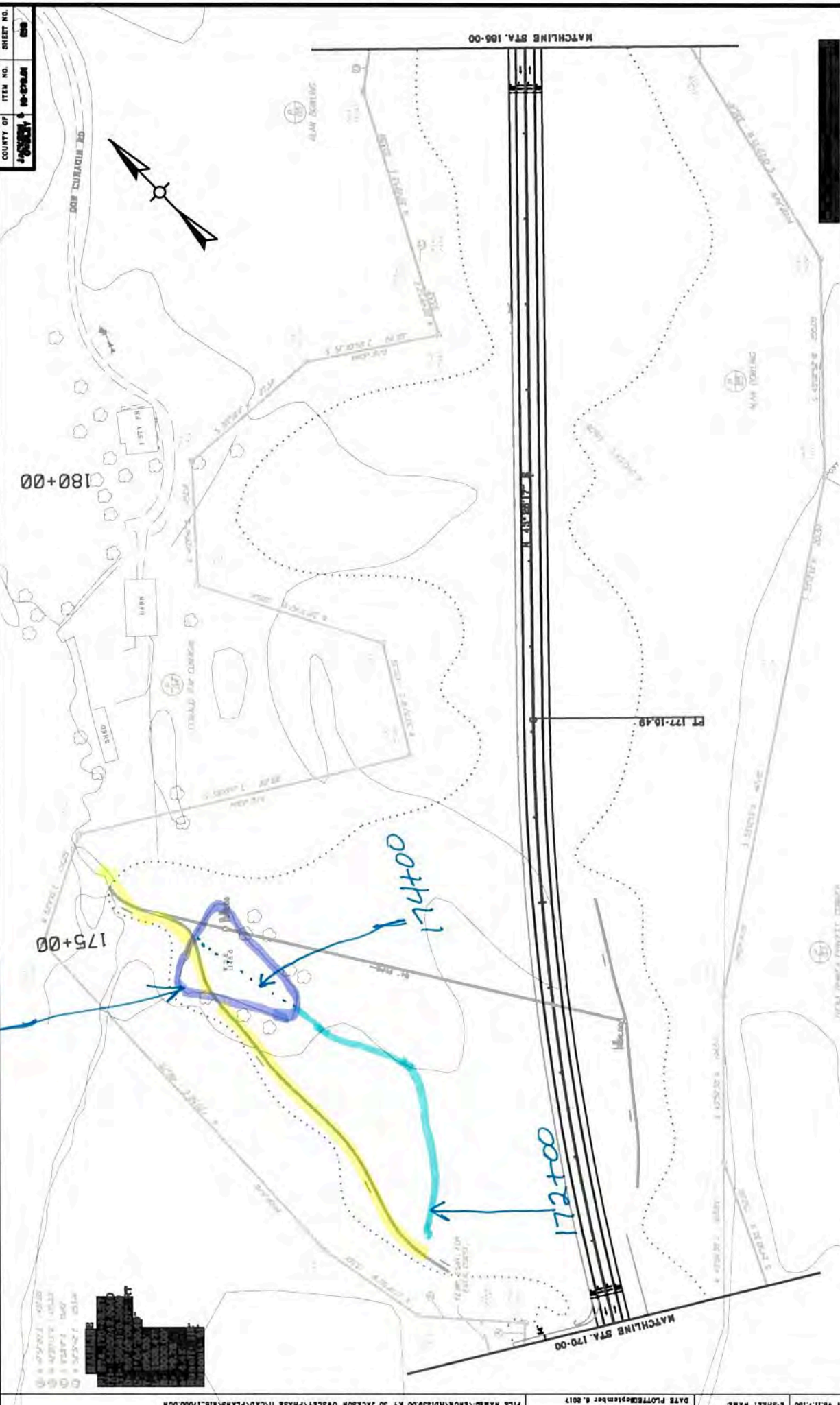
157+50

160+00

- 1. 1/4" = 100'
- 2. 1/8" = 50'
- 3. 1/16" = 25'
- 4. 1/32" = 12.5'
- 5. 1/64" = 6.25'
- 6. 1/128" = 3.125'
- 7. 1/256" = 1.5625'
- 8. 1/512" = 0.78125'
- 9. 1/1024" = 0.390625'
- 10. 1/2048" = 0.1953125'
- 11. 1/4096" = 0.09765625'
- 12. 1/8192" = 0.048828125'
- 13. 1/16384" = 0.0244140625'
- 14. 1/32768" = 0.01220703125'
- 15. 1/65536" = 0.006103515625'
- 16. 1/131072" = 0.0030517578125'
- 17. 1/262144" = 0.00152587890625'
- 18. 1/524288" = 0.000762939453125'
- 19. 1/1048576" = 0.0003814697265625'
- 20. 1/2097152" = 0.00019073486328125'
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- 22. 1/8388608" = 4.76837158203125E-05'
- 23. 1/16777216" = 2.384185791015625E-05'
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- 26. 1/134217728" = 2.98023223876953125E-06'
- 27. 1/268435456" = 1.4901161193847656E-06'
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- 29. 1/1073741824" = 3.725290298461914E-07'
- 30. 1/2147483648" = 1.862645149230957E-07'
- 31. 1/4294967296" = 9.313225746154785E-08'
- 32. 1/8589934592" = 4.656612873077392E-08'
- 33. 1/17179869184" = 2.328306436538696E-08'
- 34. 1/34359738368" = 1.164153218269348E-08'
- 35. 1/68719476736" = 5.82076609134674E-09'
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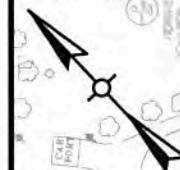
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| JACKSON | 10-03-01 | 100 |

MAINLINE
STA. 170-00 TO STA. 185-00



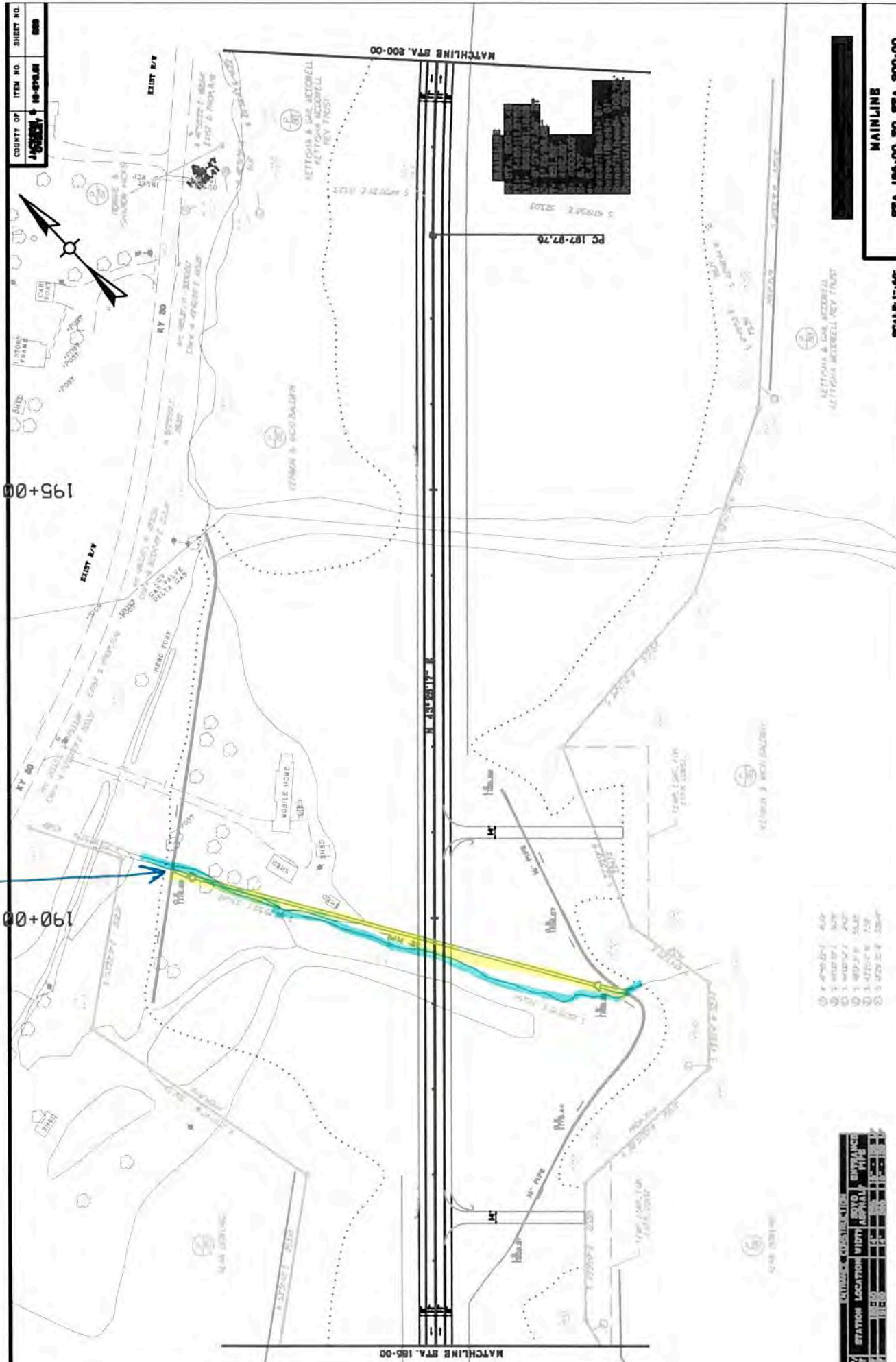
90+00

| COUNTY OF | ITEM NO. | SHEET NO. |
|-----------|----------|-----------|
| JACKSON | 10-07-08 | 100 |



195+00

190+00



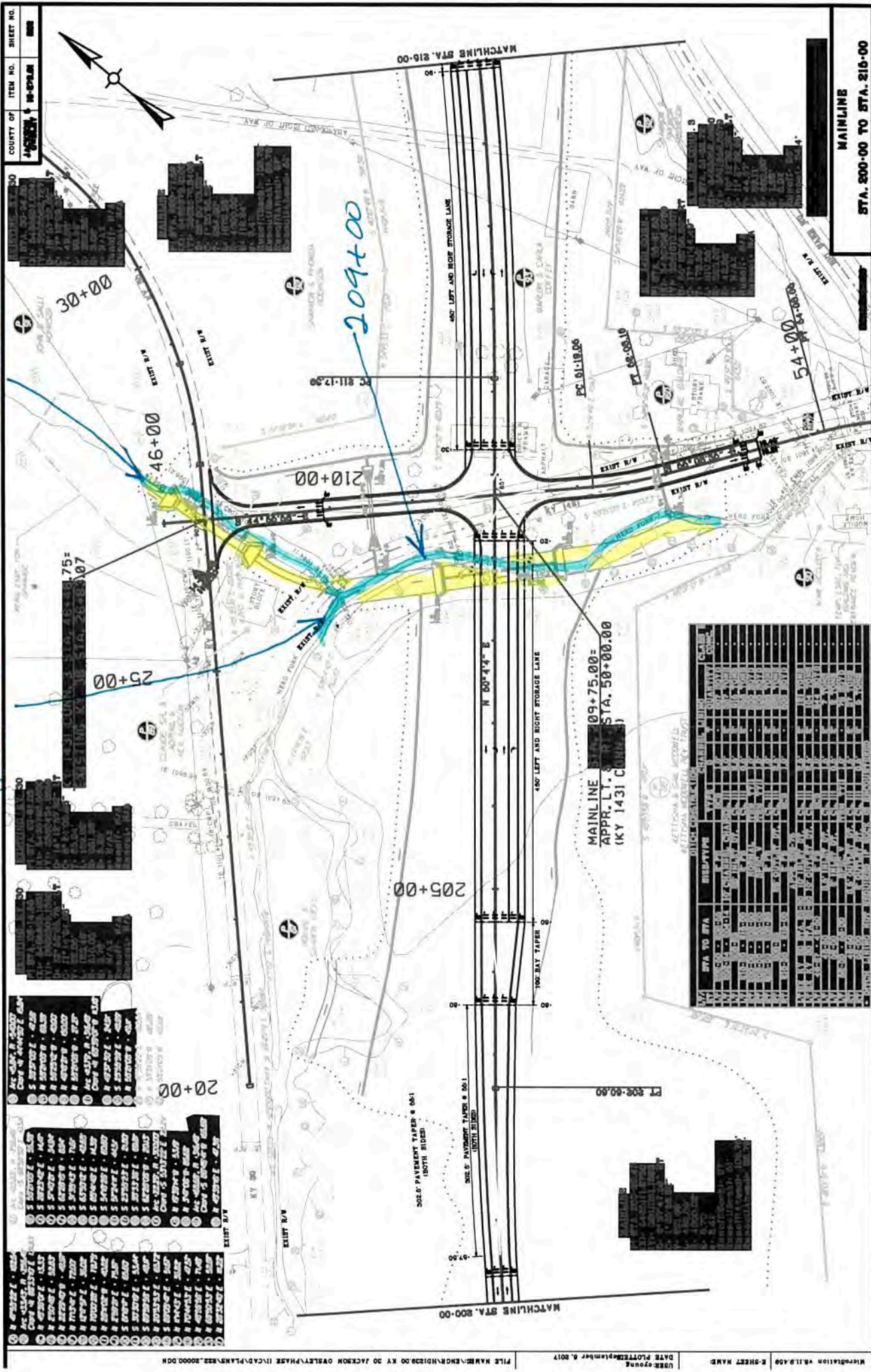
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|---------|----------|----------|-----|----------|
| 190+00 | 190+00 | 10-07-08 | 100 | 1 |

- 1. 100+00
- 2. 100+00
- 3. 100+00
- 4. 100+00
- 5. 100+00

MAINLINE
STA. 190+00 TO STA. 200+00
SCALE 1"=40'

210+00

208+20



MAINLINE
STA. 200-00 TO STA. 215-00

Table with 2 columns: Station, Elevation

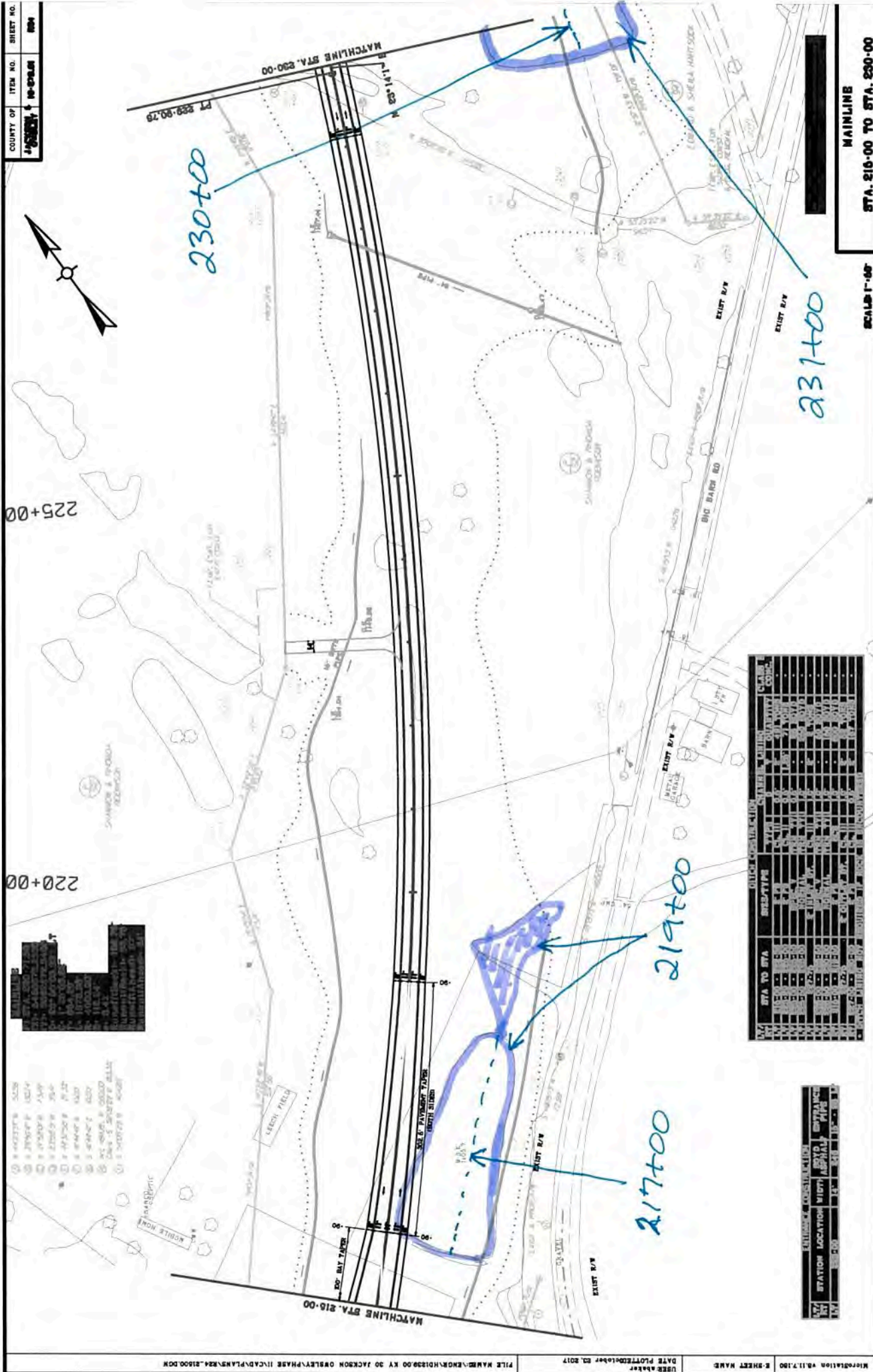
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| 20+20 | 42.50 |
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| 20+50 | 42.50 |
| 20+60 | 42.50 |
| 20+70 | 42.50 |
| 20+80 | 42.50 |
| 20+90 | 42.50 |
| 21+00 | 42.50 |
| 21+10 | 42.50 |
| 21+20 | 42.50 |
| 21+30 | 42.50 |
| 21+40 | 42.50 |
| 21+50 | 42.50 |
| 21+60 | 42.50 |
| 21+70 | 42.50 |
| 21+80 | 42.50 |
| 21+90 | 42.50 |
| 22+00 | 42.50 |

Table with 2 columns: Station, Elevation

| Station | Elevation |
|---------|-----------|
| 22+00 | 42.50 |
| 22+10 | 42.50 |
| 22+20 | 42.50 |
| 22+30 | 42.50 |
| 22+40 | 42.50 |
| 22+50 | 42.50 |
| 22+60 | 42.50 |
| 22+70 | 42.50 |
| 22+80 | 42.50 |
| 22+90 | 42.50 |
| 23+00 | 42.50 |

Table with 2 columns: Station, Elevation

| Station | Elevation |
|---------|-----------|
| 23+00 | 42.50 |
| 23+10 | 42.50 |
| 23+20 | 42.50 |
| 23+30 | 42.50 |
| 23+40 | 42.50 |
| 23+50 | 42.50 |
| 23+60 | 42.50 |
| 23+70 | 42.50 |
| 23+80 | 42.50 |
| 23+90 | 42.50 |
| 24+00 | 42.50 |

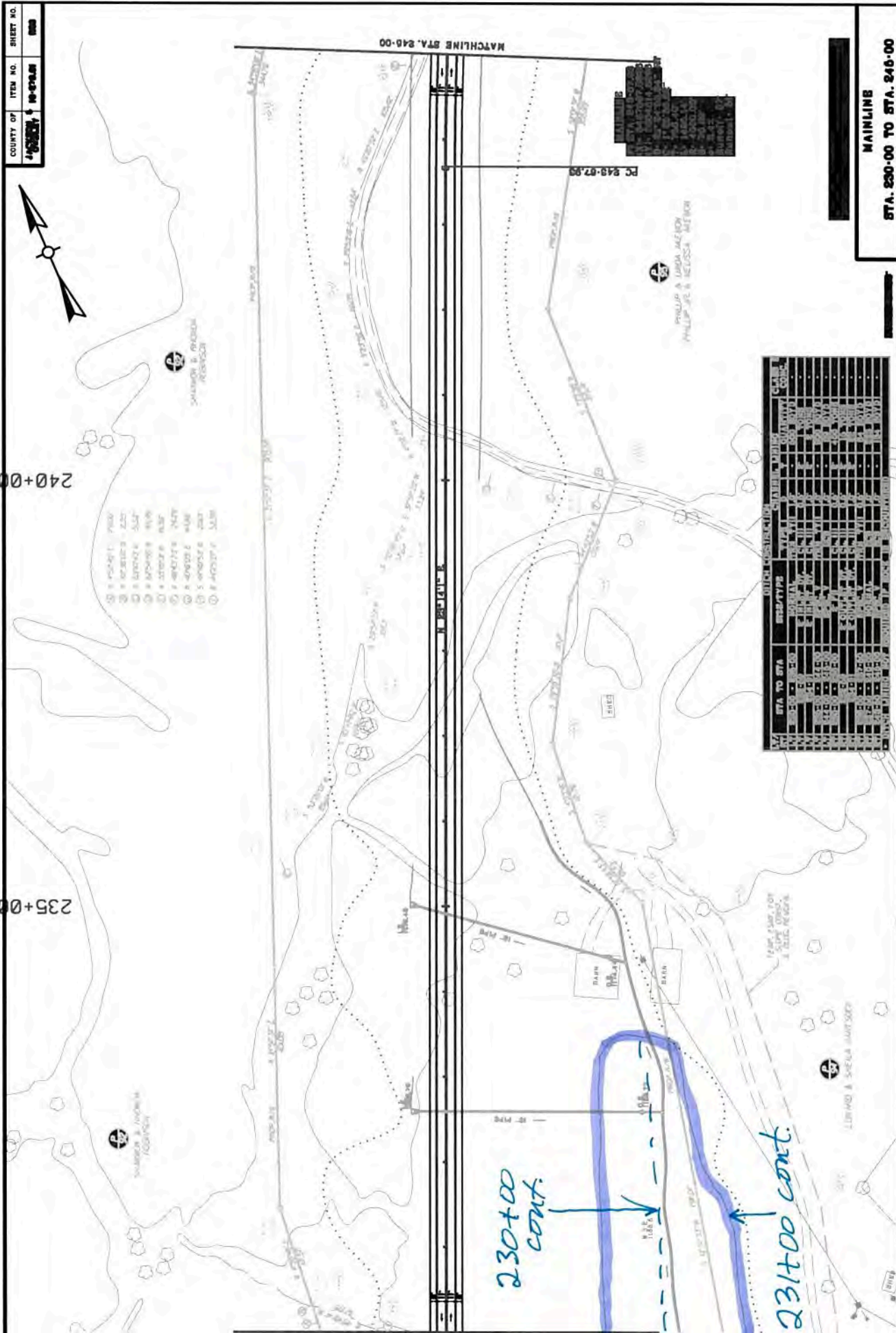


99 E-SHEET NAME:

DATE PLOTTED _____
 DEPT. OF _____

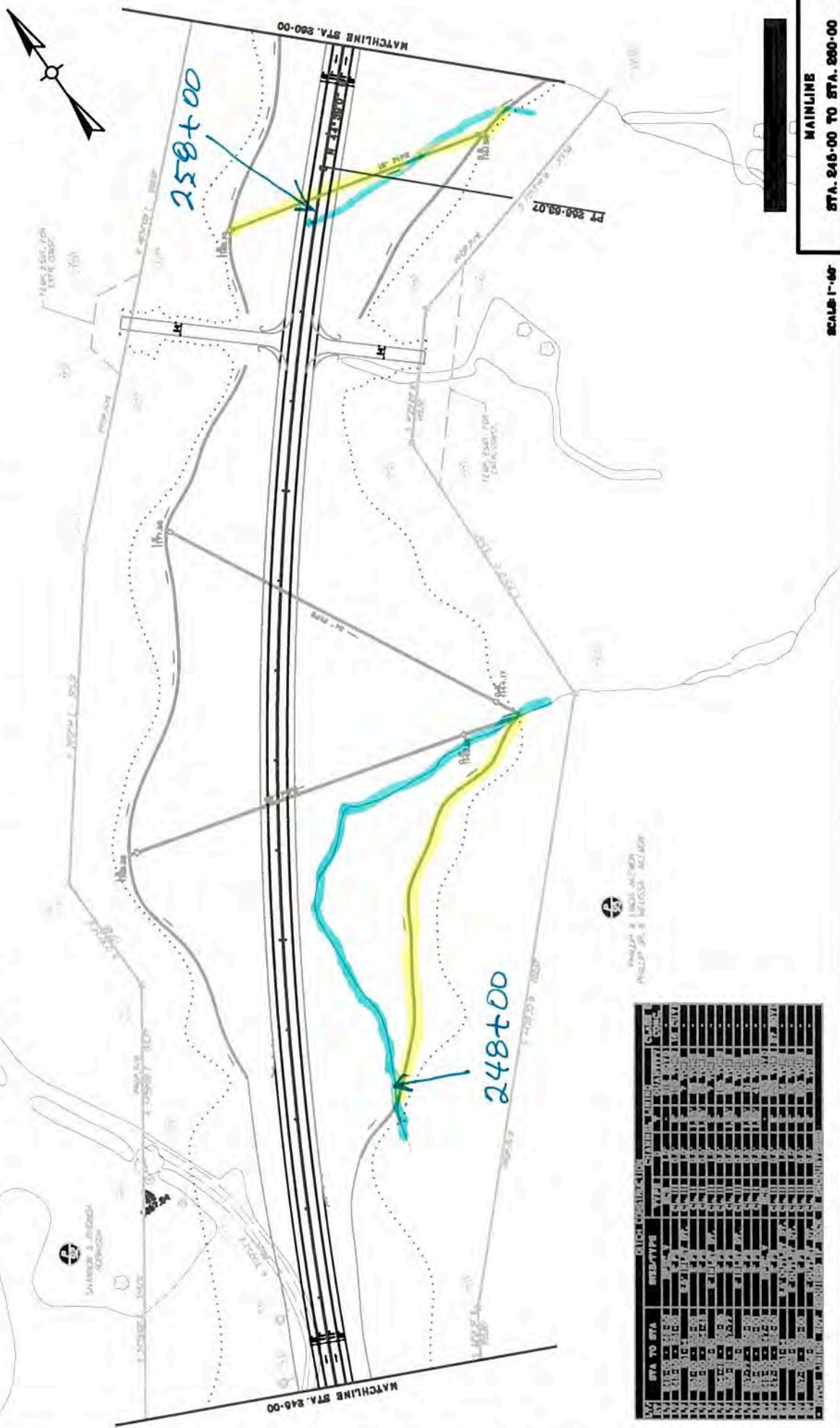
September 8, 2017

FILE NAME



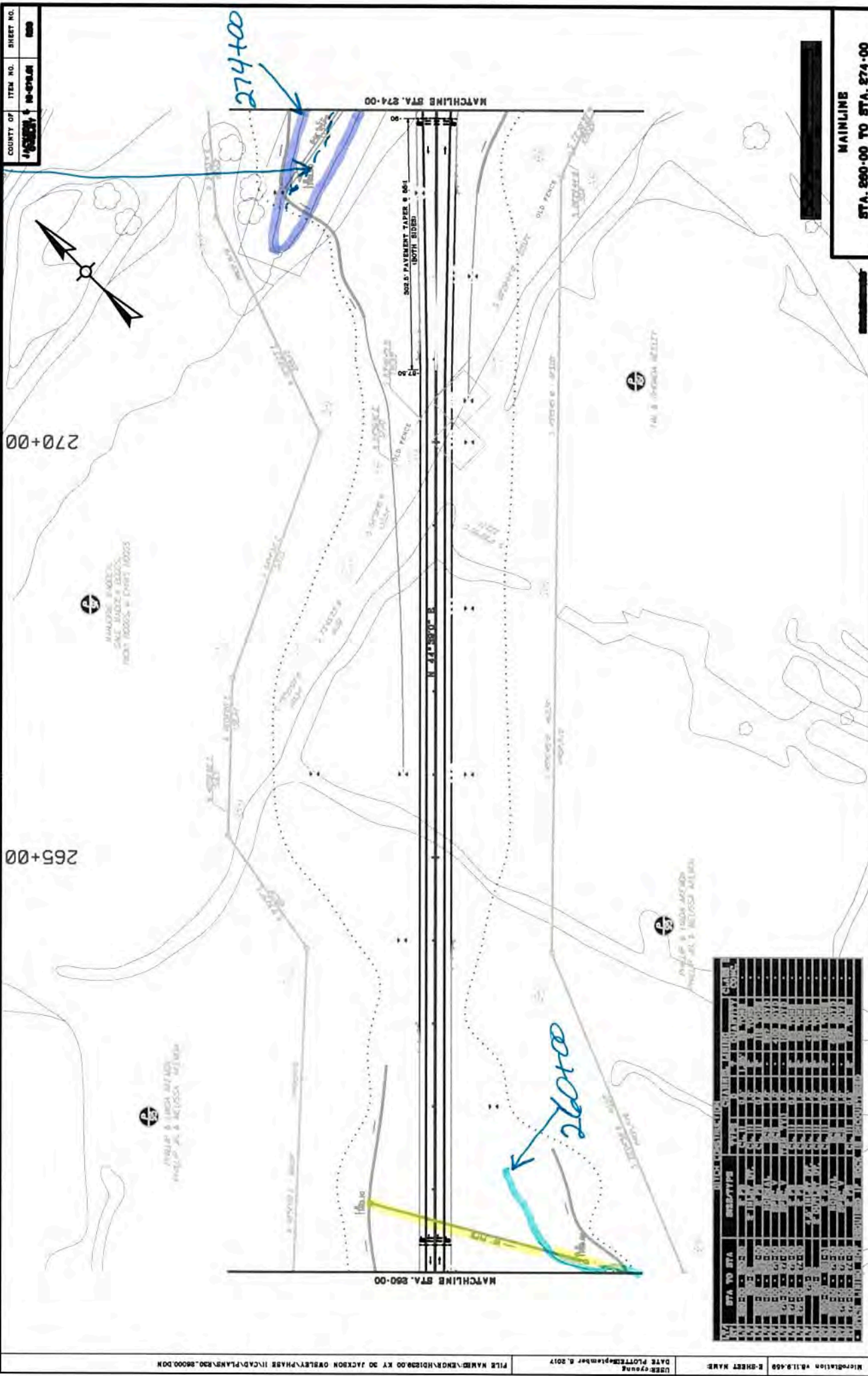
MAINLINE
STA. 230+00 TO STA. 246+00

| STA ET | STATION | LOCATION | WIDTH APPROX | SOVD APPROX | ENTRANCE PIPE |
|-----------|---------|----------|-----------------|----------------|------------------|
| 1+00 | ME | ME | 4' | 4' | 4" |
| 1+10 | ME | ME | 4' | 4' | 4" |

[illegible]

| COUNTY OF | ITEM NO. | SHEET NO. |
|-----------|----------|-----------|
| JACKSON | 10-00000 | 000 |

273+00

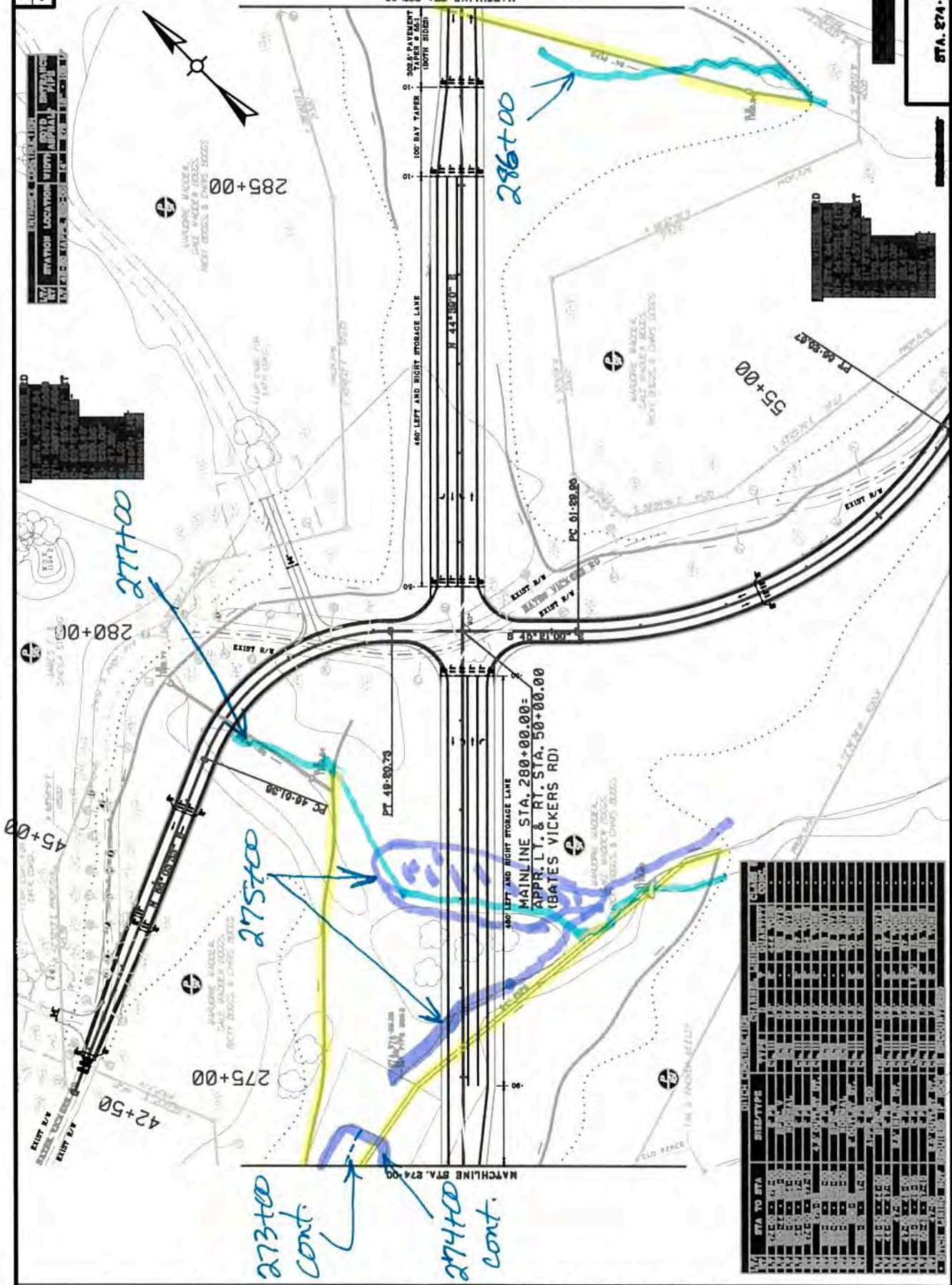


MAINLINE

STA. 260+00 TO STA. 274+00

| STA TO STA | DESCRIPTION | DATE | BY | CHKD | APPD |
|------------|-------------|------|----|------|------|
| 260+00 | 260+00 | | | | |
| 261+00 | 261+00 | | | | |
| 262+00 | 262+00 | | | | |
| 263+00 | 263+00 | | | | |
| 264+00 | 264+00 | | | | |
| 265+00 | 265+00 | | | | |
| 266+00 | 266+00 | | | | |
| 267+00 | 267+00 | | | | |
| 268+00 | 268+00 | | | | |
| 269+00 | 269+00 | | | | |
| 270+00 | 270+00 | | | | |
| 271+00 | 271+00 | | | | |
| 272+00 | 272+00 | | | | |
| 273+00 | 273+00 | | | | |
| 274+00 | 274+00 | | | | |

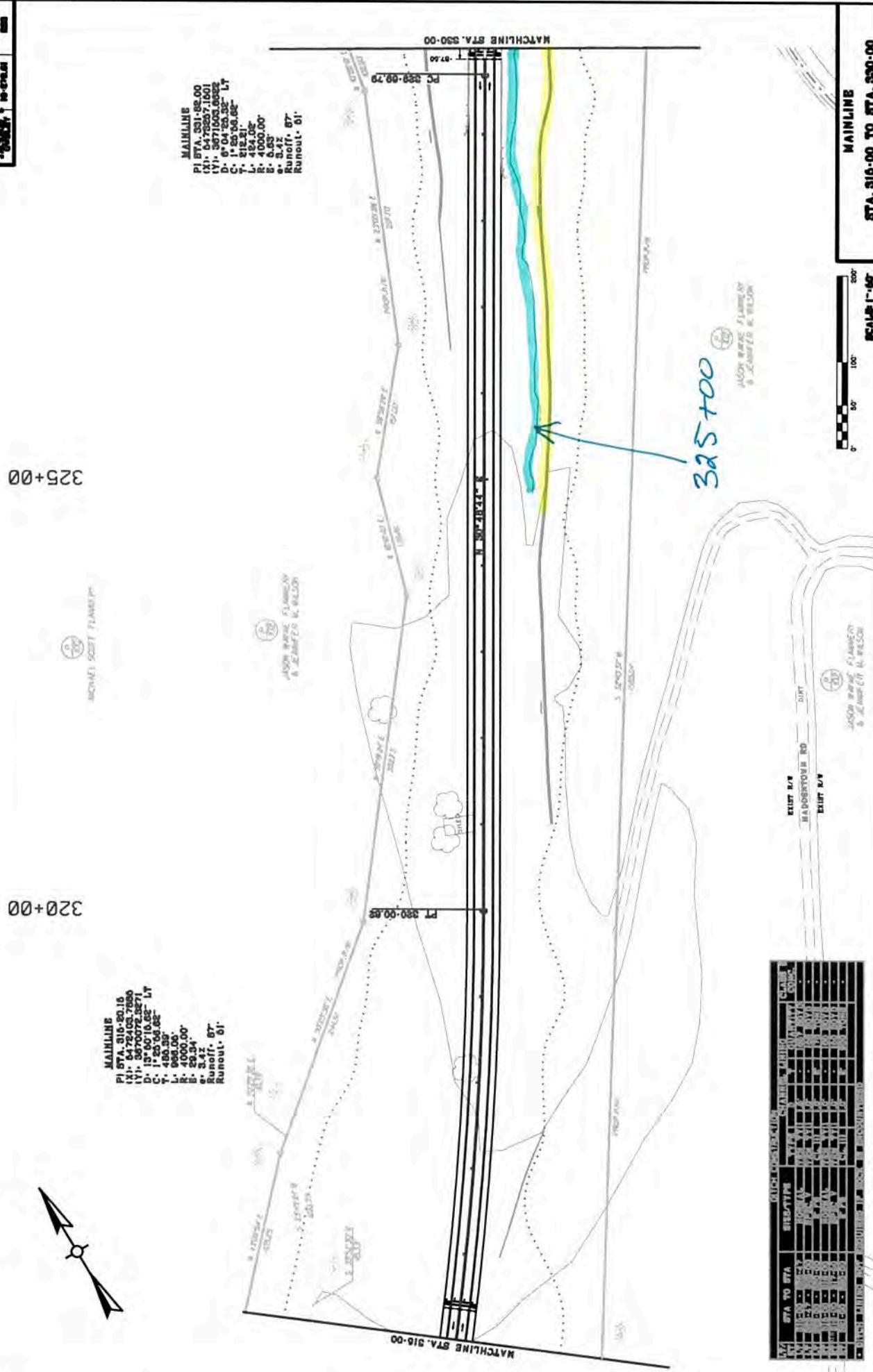
STATION LOCATION WITH ADJACENT MAP
 1/4 SECTION 10, T10N, R10E, S10W
 1/4 SECTION 11, T10N, R10E, S10W
 1/4 SECTION 12, T10N, R10E, S10W
 1/4 SECTION 13, T10N, R10E, S10W



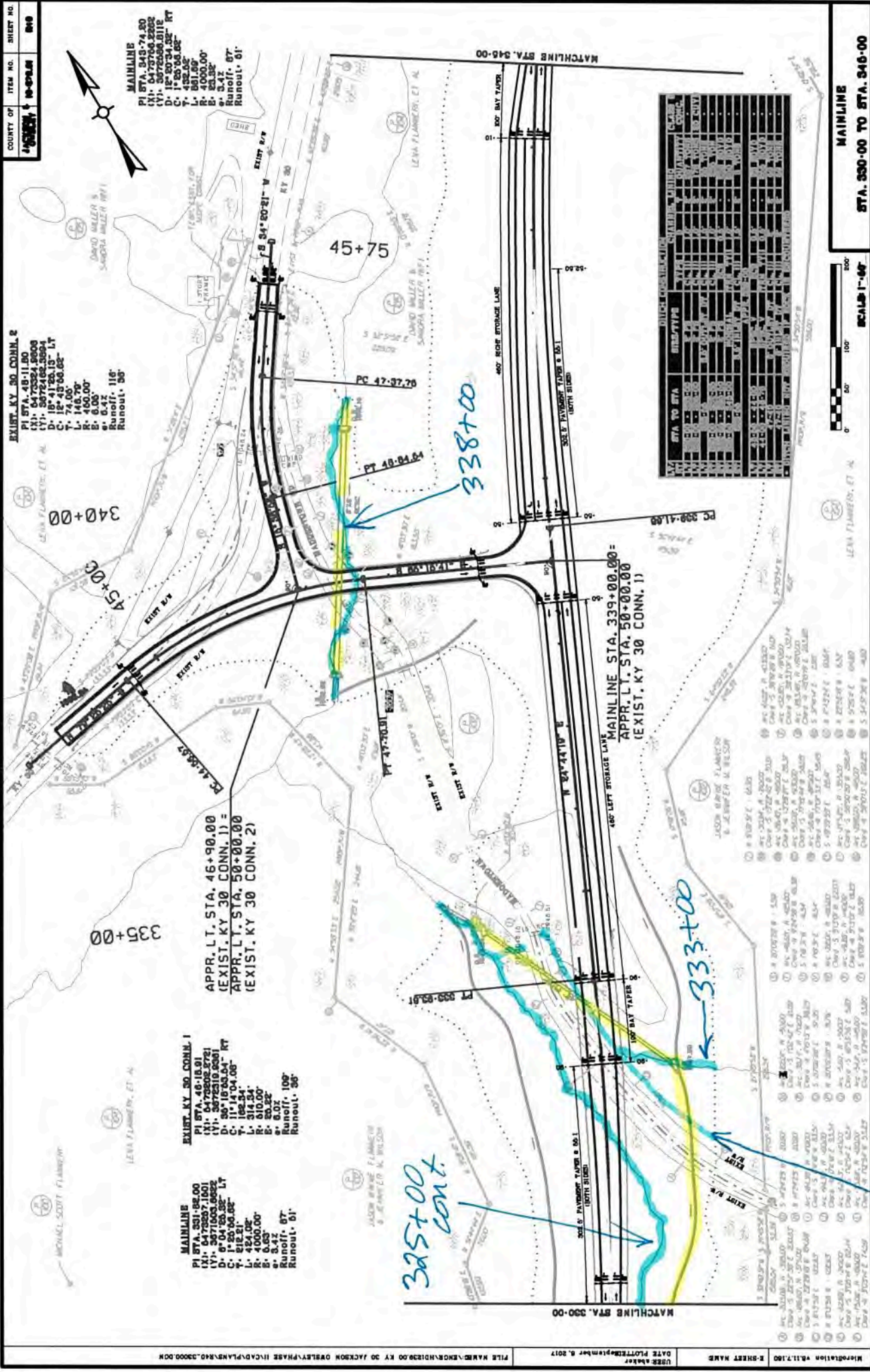
MAINLINE
 STA. 274+00 TO STA. 287+00

| STA TO STA | REMARKS | DATE | BY | CHECKED | APPROVED |
|------------------|------------------|----------|----------|----------|----------|
| 273+00 TO 274+00 | 273+00 TO 274+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 274+00 TO 275+00 | 274+00 TO 275+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 275+00 TO 276+00 | 275+00 TO 276+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 276+00 TO 277+00 | 276+00 TO 277+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 277+00 TO 278+00 | 277+00 TO 278+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 278+00 TO 279+00 | 278+00 TO 279+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 279+00 TO 280+00 | 279+00 TO 280+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 280+00 TO 281+00 | 280+00 TO 281+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 281+00 TO 282+00 | 281+00 TO 282+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 282+00 TO 283+00 | 282+00 TO 283+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 283+00 TO 284+00 | 283+00 TO 284+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 284+00 TO 285+00 | 284+00 TO 285+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 285+00 TO 286+00 | 285+00 TO 286+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |
| 286+00 TO 287+00 | 286+00 TO 287+00 | 10/10/10 | J. L. L. | J. L. L. | J. L. L. |

STA. 287+00 TO STA. 300+00



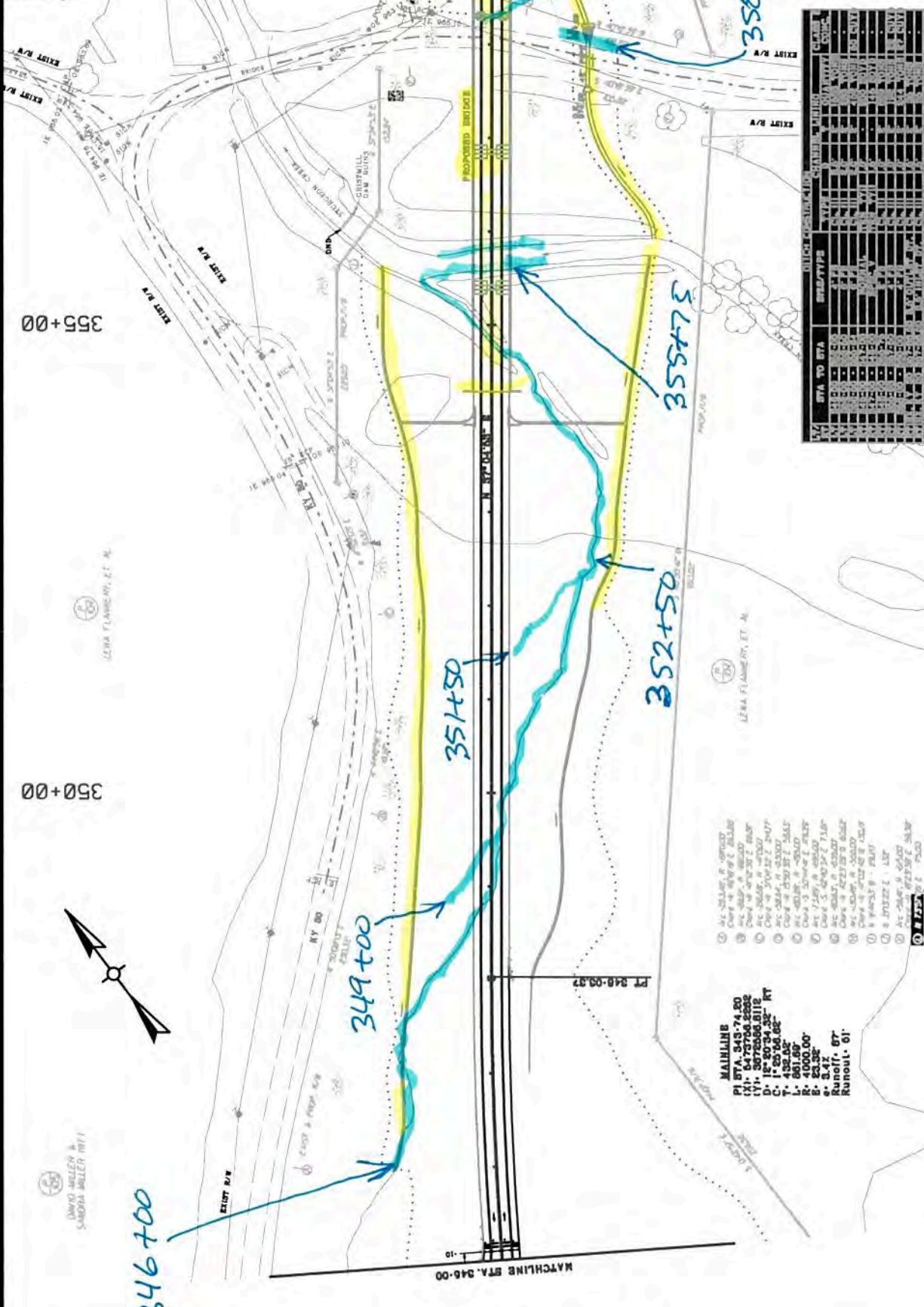
EXIST. KY 30 COMM. 2
PI STA. 48+11.80



SCALE 1"=60'

MAINLINE
STA. 330+00 TO STA.

332+00



MAINLINE
 STA. 346-00 TO STA. 360-00

SCALE 1"=40'

| ITEM | STATION | LOCATION | WIDTH | DEPTH | PIPE |
|------|---------|----------|-------|-------|------|
| 1 | 385+00 | 10' DIA | 12" | 12" | 12" |
| 2 | 386+00 | 10' DIA | 12" | 12" | 12" |
| 3 | 387+00 | 10' DIA | 12" | 12" | 12" |
| 4 | 388+00 | 10' DIA | 12" | 12" | 12" |

EXISTING BRIDGE & CEMENT BRIDGE (10' DIA)

385+00

380+00



375+00 Cont.

375+50

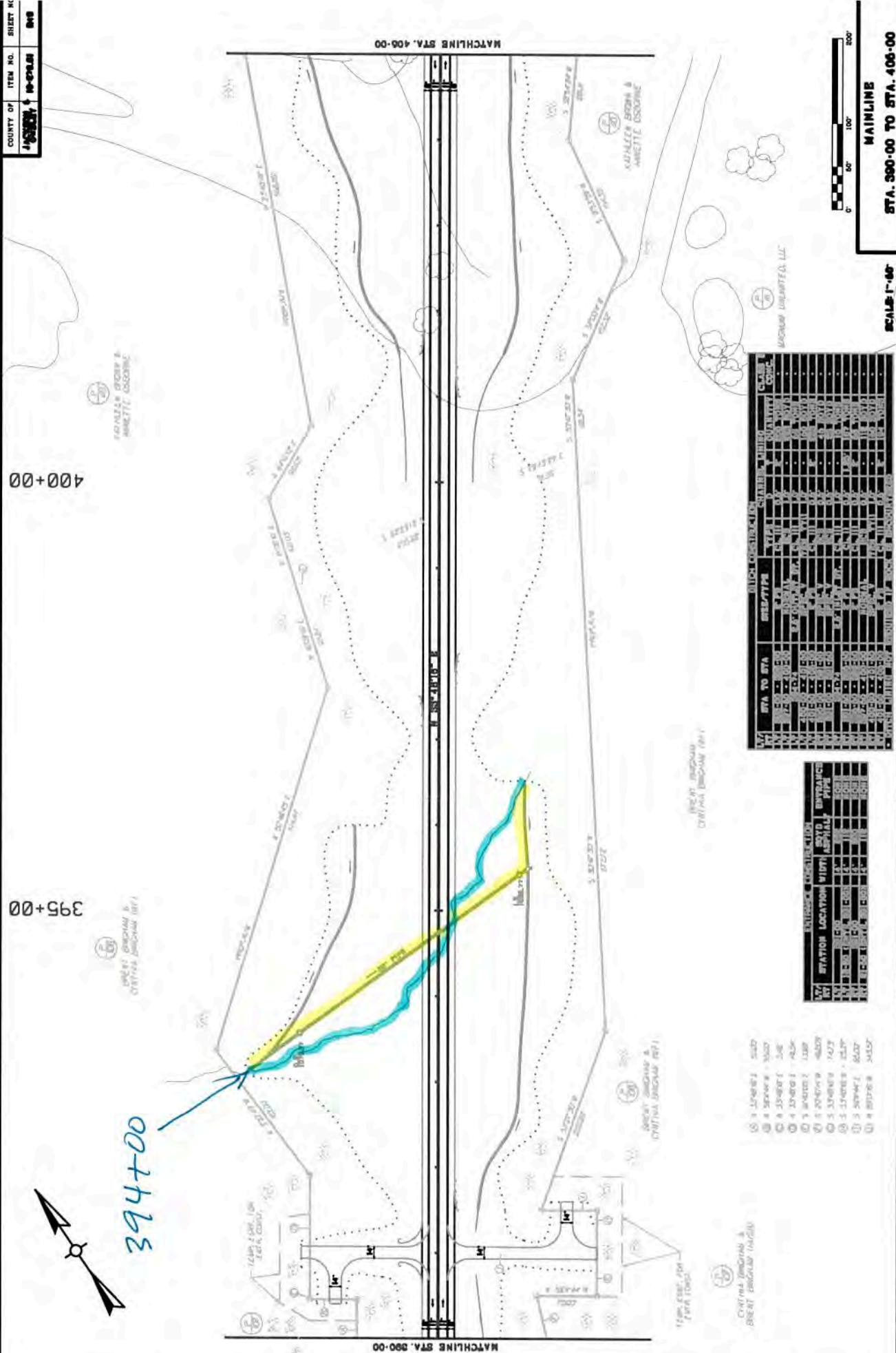
386+00

MATCHLINE STA. 390+00

MATCHLINE STA. 370+00

375+40

| | | | | | |
|-----|-----------------------|-----|-----------------------|-----|-----------------------|
| 1 | AC 5-12.75, R=40000 | 1 | AC 5-12.75, R=40000 | 1 | AC 5-12.75, R=40000 |
| 2 | CH=5, P=1000, S=12.50 | 2 | CH=5, P=1000, S=12.50 | 2 | CH=5, P=1000, S=12.50 |
| 3 | S 12.50, L=1000 | 3 | S 12.50, L=1000 | 3 | S 12.50, L=1000 |
| 4 | AC 5-12.75, R=40000 | 4 | AC 5-12.75, R=40000 | 4 | AC 5-12.75, R=40000 |
| 5 | CH=5, P=1000, S=12.50 | 5 | CH=5, P=1000, S=12.50 | 5 | CH=5, P=1000, S=12.50 |
| 6 | S 12.50, L=1000 | 6 | S 12.50, L=1000 | 6 | S 12.50, L=1000 |
| 7 | AC 5-12.75, R=40000 | 7 | AC 5-12.75, R=40000 | 7 | AC 5-12.75, R=40000 |
| 8 | CH=5, P=1000, S=12.50 | 8 | CH=5, P=1000, S=12.50 | 8 | CH=5, P=1000, S=12.50 |
| 9 | S 12.50, L=1000 | 9 | S 12.50, L=1000 | 9 | S 12.50, L=1000 |
| 10 | AC 5-12.75, R=40000 | 10 | AC 5-12.75, R=40000 | 10 | AC 5-12.75, R=40000 |
| 11 | CH=5, P=1000, S=12.50 | 11 | CH=5, P=1000, S=12.50 | 11 | CH=5, P=1000, S=12.50 |
| 12 | S 12.50, L=1000 | 12 | S 12.50, L=1000 | 12 | S 12.50, L=1000 |
| 13 | AC 5-12.75, R=40000 | 13 | AC 5-12.75, R=40000 | 13 | AC 5-12.75, R=40000 |
| 14 | CH=5, P=1000, S=12.50 | 14 | CH=5, P=1000, S=12.50 | 14 | CH=5, P=1000, S=12.50 |
| 15 | S 12.50, L=1000 | 15 | S 12.50, L=1000 | 15 | S 12.50, L=1000 |
| 16 | AC 5-12.75, R=40000 | 16 | AC 5-12.75, R=40000 | 16 | AC 5-12.75, R=40000 |
| 17 | CH=5, P=1000, S=12.50 | 17 | CH=5, P=1000, S=12.50 | 17 | CH=5, P=1000, S=12.50 |
| 18 | S 12.50, L=1000 | 18 | S 12.50, L=1000 | 18 | S 12.50, L=1000 |
| 19 | AC 5-12.75, R=40000 | 19 | AC 5-12.75, R=40000 | 19 | AC 5-12.75, R=40000 |
| 20 | CH=5, P=1000, S=12.50 | 20 | CH=5, P=1000, S=12.50 | 20 | CH=5, P=1000, S=12.50 |
| 21 | S 12.50, L=1000 | 21 | S 12.50, L=1000 | 21 | S 12.50, L=1000 |
| 22 | AC 5-12.75, R=40000 | 22 | AC 5-12.75, R=40000 | 22 | AC 5-12.75, R=40000 |
| 23 | CH=5, P=1000, S=12.50 | 23 | CH=5, P=1000, S=12.50 | 23 | CH=5, P=1000, S=12.50 |
| 24 | S 12.50, L=1000 | 24 | S 12.50, L=1000 | 24 | S 12.50, L=1000 |
| 25 | AC 5-12.75, R=40000 | 25 | AC 5-12.75, R=40000 | 25 | AC 5-12.75, R=40000 |
| 26 | CH=5, P=1000, S=12.50 | 26 | CH=5, P=1000, S=12.50 | 26 | CH=5, P=1000, S=12.50 |
| 27 | S 12.50, L=1000 | 27 | S 12.50, L=1000 | 27 | S 12.50, L=1000 |
| 28 | AC 5-12.75, R=40000 | 28 | AC 5-12.75, R=40000 | 28 | AC 5-12.75, R=40000 |
| 29 | CH=5, P=1000, S=12.50 | 29 | CH=5, P=1000, S=12.50 | 29 | CH=5, P=1000, S=12.50 |
| 30 | S 12.50, L=1000 | 30 | S 12.50, L=1000 | 30 | S 12.50, L=1000 |
| 31 | AC 5-12.75, R=40000 | 31 | AC 5-12.75, R=40000 | 31 | AC 5-12.75, R=40000 |
| 32 | CH=5, P=1000, S=12.50 | 32 | CH=5, P=1000, S=12.50 | 32 | CH=5, P=1000, S=12.50 |
| 33 | S 12.50, L=1000 | 33 | S 12.50, L=1000 | 33 | S 12.50, L=1000 |
| 34 | AC 5-12.75, R=40000 | 34 | AC 5-12.75, R=40000 | 34 | AC 5-12.75, R=40000 |
| 35 | CH=5, P=1000, S=12.50 | 35 | CH=5, P=1000, S=12.50 | 35 | CH=5, P=1000, S=12.50 |
| 36 | S 12.50, L=1000 | 36 | S 12.50, L=1000 | 36 | S 12.50, L=1000 |
| 37 | AC 5-12.75, R=40000 | 37 | AC 5-12.75, R=40000 | 37 | AC 5-12.75, R=40000 |
| 38 | CH=5, P=1000, S=12.50 | 38 | CH=5, P=1000, S=12.50 | 38 | CH=5, P=1000, S=12.50 |
| 39 | S 12.50, L=1000 | 39 | S 12.50, L=1000 | 39 | S 12.50, L=1000 |
| 40 | AC 5-12.75, R=40000 | 40 | AC 5-12.75, R=40000 | 40 | AC 5-12.75, R=40000 |
| 41 | CH=5, P=1000, S=12.50 | 41 | CH=5, P=1000, S=12.50 | 41 | CH=5, P=1000, S=12.50 |
| 42 | S 12.50, L=1000 | 42 | S 12.50, L=1000 | 42 | S 12.50, L=1000 |
| 43 | AC 5-12.75, R=40000 | 43 | AC 5-12.75, R=40000 | 43 | AC 5-12.75, R=40000 |
| 44 | CH=5, P=1000, S=12.50 | 44 | CH=5, P=1000, S=12.50 | 44 | CH=5, P=1000, S=12.50 |
| 45 | S 12.50, L=1000 | 45 | S 12.50, L=1000 | 45 | S 12.50, L=1000 |
| 46 | AC 5-12.75, R=40000 | 46 | AC 5-12.75, R=40000 | 46 | AC 5-12.75, R=40000 |
| 47 | CH=5, P=1000, S=12.50 | 47 | CH=5, P=1000, S=12.50 | 47 | CH=5, P=1000, S=12.50 |
| 48 | S 12.50, L=1000 | 48 | S 12.50, L=1000 | 48 | S 12.50, L=1000 |
| 49 | AC 5-12.75, R=40000 | 49 | AC 5-12.75, R=40000 | 49 | AC 5-12.75, R=40000 |
| 50 | CH=5, P=1000, S=12.50 | 50 | CH=5, P=1000, S=12.50 | 50 | CH=5, P=1000, S=12.50 |
| 51 | S 12.50, L=1000 | 51 | S 12.50, L=1000 | 51 | S 12.50, L=1000 |
| 52 | AC 5-12.75, R=40000 | 52 | AC 5-12.75, R=40000 | 52 | AC 5-12.75, R=40000 |
| 53 | CH=5, P=1000, S=12.50 | 53 | CH=5, P=1000, S=12.50 | 53 | CH=5, P=1000, S=12.50 |
| 54 | S 12.50, L=1000 | 54 | S 12.50, L=1000 | 54 | S 12.50, L=1000 |
| 55 | AC 5-12.75, R=40000 | 55 | AC 5-12.75, R=40000 | 55 | AC 5-12.75, R=40000 |
| 56 | CH=5, P=1000, S=12.50 | 56 | CH=5, P=1000, S=12.50 | 56 | CH=5, P=1000, S=12.50 |
| 57 | S 12.50, L=1000 | 57 | S 12.50, L=1000 | 57 | S 12.50, L=1000 |
| 58 | AC 5-12.75, R=40000 | 58 | AC 5-12.75, R=40000 | 58 | AC 5-12.75, R=40000 |
| 59 | CH=5, P=1000, S=12.50 | 59 | CH=5, P=1000, S=12.50 | 59 | CH=5, P=1000, S=12.50 |
| 60 | S 12.50, L=1000 | 60 | S 12.50, L=1000 | 60 | S 12.50, L=1000 |
| 61 | AC 5-12.75, R=40000 | 61 | AC 5-12.75, R=40000 | 61 | AC 5-12.75, R=40000 |
| 62 | CH=5, P=1000, S=12.50 | 62 | CH=5, P=1000, S=12.50 | 62 | CH=5, P=1000, S=12.50 |
| 63 | S 12.50, L=1000 | 63 | S 12.50, L=1000 | 63 | S 12.50, L=1000 |
| 64 | AC 5-12.75, R=40000 | 64 | AC 5-12.75, R=40000 | 64 | AC 5-12.75, R=40000 |
| 65 | CH=5, P=1000, S=12.50 | 65 | CH=5, P=1000, S=12.50 | 65 | CH=5, P=1000, S=12.50 |
| 66 | S 12.50, L=1000 | 66 | S 12.50, L=1000 | 66 | S 12.50, L=1000 |
| 67 | AC 5-12.75, R=40000 | 67 | AC 5-12.75, R=40000 | 67 | AC 5-12.75, R=40000 |
| 68 | CH=5, P=1000, S=12.50 | 68 | CH=5, P=1000, S=12.50 | 68 | CH=5, P=1000, S=12.50 |
| 69 | S 12.50, L=1000 | 69 | S 12.50, L=1000 | 69 | S 12.50, L=1000 |
| 70 | AC 5-12.75, R=40000 | 70 | AC 5-12.75, R=40000 | 70 | AC 5-12.75, R=40000 |
| 71 | CH=5, P=1000, S=12.50 | 71 | CH=5, P=1000, S=12.50 | 71 | CH=5, P=1000, S=12.50 |
| 72 | S 12.50, L=1000 | 72 | S 12.50, L=1000 | 72 | S 12.50, L=1000 |
| 73 | AC 5-12.75, R=40000 | 73 | AC 5-12.75, R=40000 | 73 | AC 5-12.75, R=40000 |
| 74 | CH=5, P=1000, S=12.50 | 74 | CH=5, P=1000, S=12.50 | 74 | CH=5, P=1000, S=12.50 |
| 75 | S 12.50, L=1000 | 75 | S 12.50, L=1000 | 75 | S 12.50, L=1000 |
| 76 | AC 5-12.75, R=40000 | 76 | AC 5-12.75, R=40000 | 76 | AC 5-12.75, R=40000 |
| 77 | CH=5, P=1000, S=12.50 | 77 | CH=5, P=1000, S=12.50 | 77 | CH=5, P=1000, S=12.50 |
| 78 | S 12.50, L=1000 | 78 | S 12.50, L=1000 | 78 | S 12.50, L=1000 |
| 79 | AC 5-12.75, R=40000 | 79 | AC 5-12.75, R=40000 | 79 | AC 5-12.75, R=40000 |
| 80 | CH=5, P=1000, S=12.50 | 80 | CH=5, P=1000, S=12.50 | 80 | CH=5, P=1000, S=12.50 |
| 81 | S 12.50, L=1000 | 81 | S 12.50, L=1000 | 81 | S 12.50, L=1000 |
| 82 | AC 5-12.75, R=40000 | 82 | AC 5-12.75, R=40000 | 82 | AC 5-12.75, R=40000 |
| 83 | CH=5, P=1000, S=12.50 | 83 | CH=5, P=1000, S=12.50 | 83 | CH=5, P=1000, S=12.50 |
| 84 | S 12.50, L=1000 | 84 | S 12.50, L=1000 | 84 | S 12.50, L=1000 |
| 85 | AC 5-12.75, R=40000 | 85 | AC 5-12.75, R=40000 | 85 | AC 5-12.75, R=40000 |
| 86 | CH=5, P=1000, S=12.50 | 86 | CH=5, P=1000, S=12.50 | 86 | CH=5, P=1000, S=12.50 |
| 87 | S 12.50, L=1000 | 87 | S 12.50, L=1000 | 87 | S 12.50, L=1000 |
| 88 | AC 5-12.75, R=40000 | 88 | AC 5-12.75, R=40000 | 88 | AC 5-12.75, R=40000 |
| 89 | CH=5, P=1000, S=12.50 | 89 | CH=5, P=1000, S=12.50 | 89 | CH=5, P=1000, S=12.50 |
| 90 | S 12.50, L=1000 | 90 | S 12.50, L=1000 | 90 | S 12.50, L=1000 |
| 91 | AC 5-12.75, R=40000 | 91 | AC 5-12.75, R=40000 | 91 | AC 5-12.75, R=40000 |
| 92 | CH=5, P=1000, S=12.50 | 92 | CH=5, P=1000, S=12.50 | 92 | CH=5, P=1000, S=12.50 |
| 93 | S 12.50, L=1000 | 93 | S 12.50, L=1000 | 93 | S 12.50, L=1000 |
| 94 | AC 5-12.75, R=40000 | 94 | AC 5-12.75, R=40000 | 94 | AC 5-12.75, R=40000 |
| 95 | CH=5, P=1000, S=12.50 | 95 | CH=5, P=1000, S=12.50 | 95 | CH=5, P=1000, S=12.50 |
| 96 | S 12.50, L=1000 | 96 | S 12.50, L=1000 | 96 | S 12.50, L=1000 |
| 97 | AC 5-12.75, R=40000 | 97 | AC 5-12.75, R=40000 | 97 | AC 5-12.75, R=40000 |
| 98 | CH=5, P=1000, S=12.50 | 98 | CH=5, P=1000, S=12.50 | 98 | CH=5, P=1000, S=12.50 |
| 99 | S 12.50, L=1000 | 99 | S 12.50, L=1000 | 99 | S 12.50, L=1000 |
| 100 | AC 5-12.75, R=40000 | 100 | AC 5-12.75, R=40000 | 100 | AC 5-12.75, R=40000 |





EXTENSIVE CONSTRUCTION

| STA | STATION | LOCATION | W/TH | BY | DATE | REVISION |
|-----|---------|----------|----------|----------|----------|----------|
| 1 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 2 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 3 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 4 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 5 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 6 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 7 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 8 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 9 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |
| 10 | 410+00 | START | 10/10/17 | 10/10/17 | 10/10/17 | 10/10/17 |

MAINLINE
PI STA. 420+87.00
XI. 0478000.9446
VI. 3079000.2870
D. 15.49' 19.00" RT
C. 15.49' 19.00" RT
T. 1897.46'
L. 671.60'
R. 10000.00'
B. 136.43'
S. N.C.

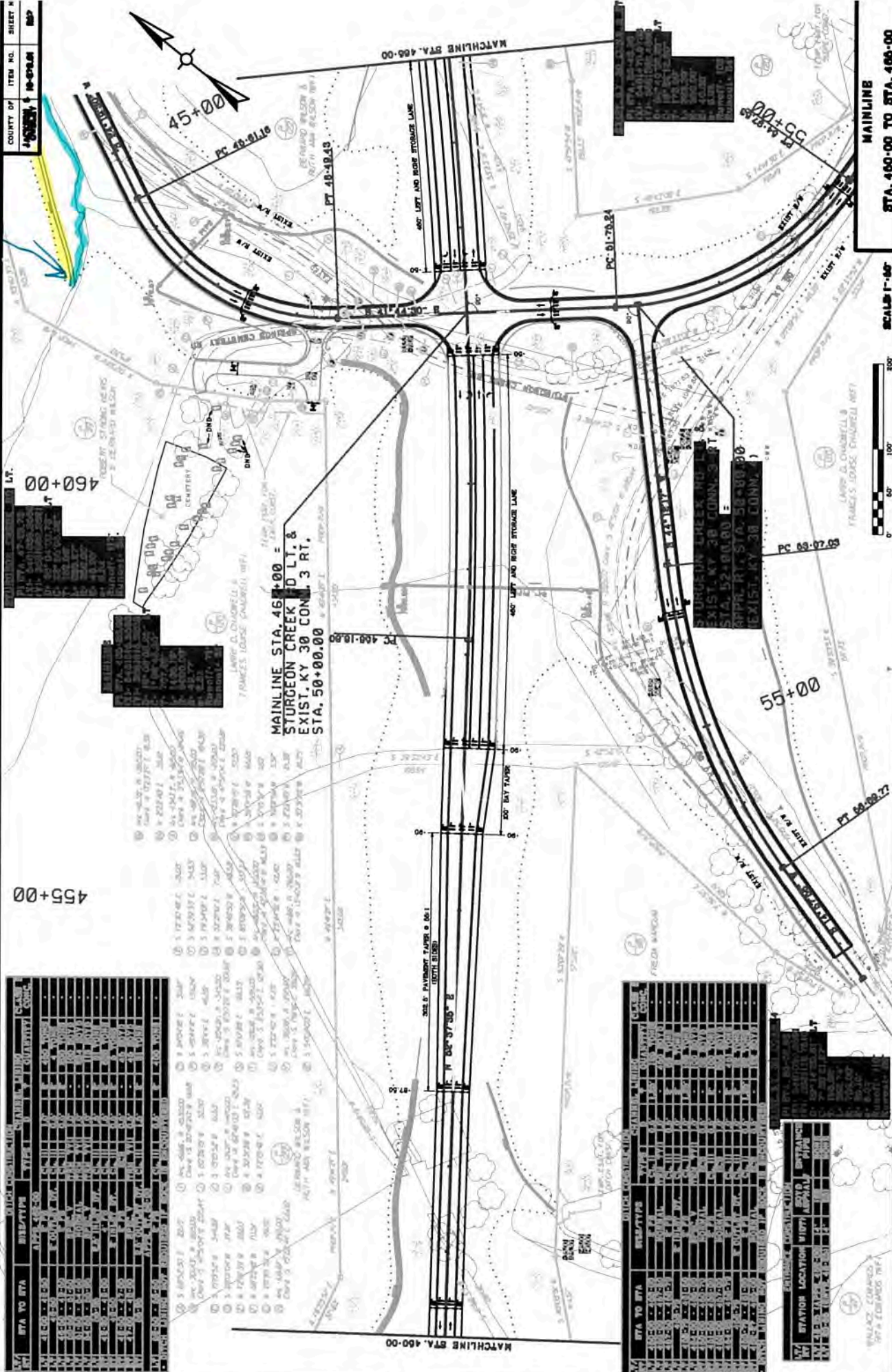
| STA | TO STA | BY | DATE | REVISION |
|--------|--------|----------|----------|----------|
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |
| 410+00 | 410+00 | 10/10/17 | 10/10/17 | 10/10/17 |

SCALE: 1"=60'
MAINLINE
STA. 400-00 TO STA. 420-00

[illegible][illegible][illegible][illegible][illegible]

WALLACE EDWARDS
1978 EDWARDS 79A

7-20-82
RUBIN, J.L.



MAINLINE
STA-460-00 TO STA-

09-151738

1

00.37

V

10

1

Union, 1910

—

7. $\frac{1}{2}$ and $\frac{1}{3}$

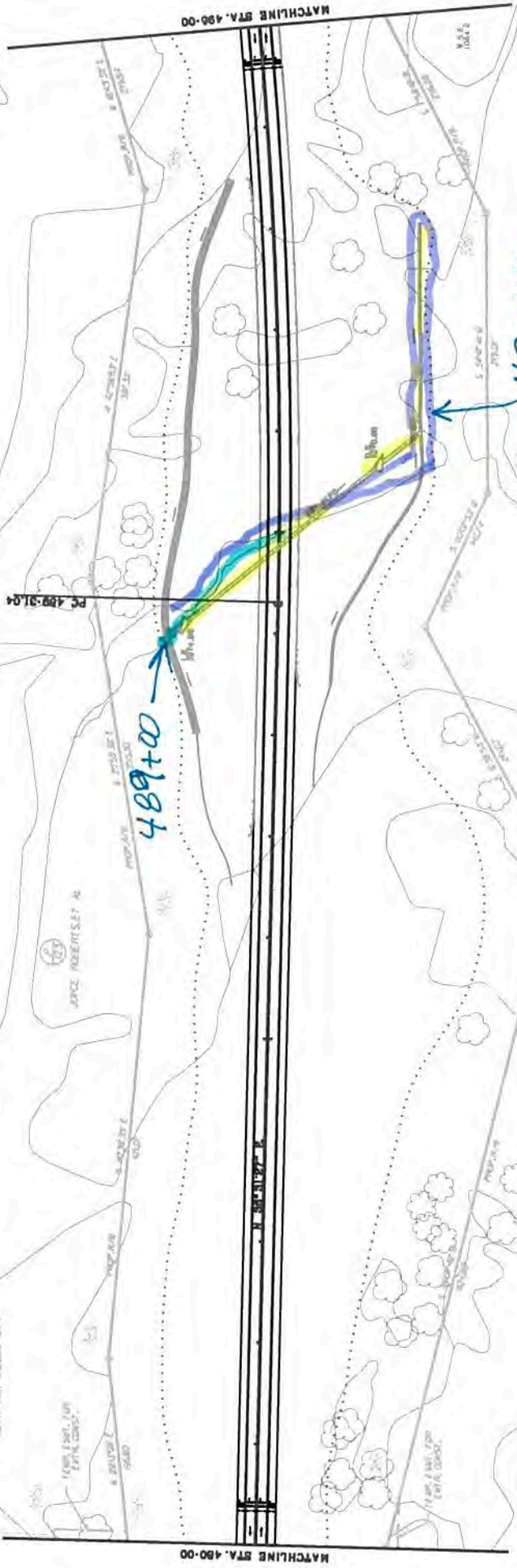
Micro

| | | |
|-----------|----------|---------|
| COUNTY OF | ITEM NO. | SHEET N |
| | | |

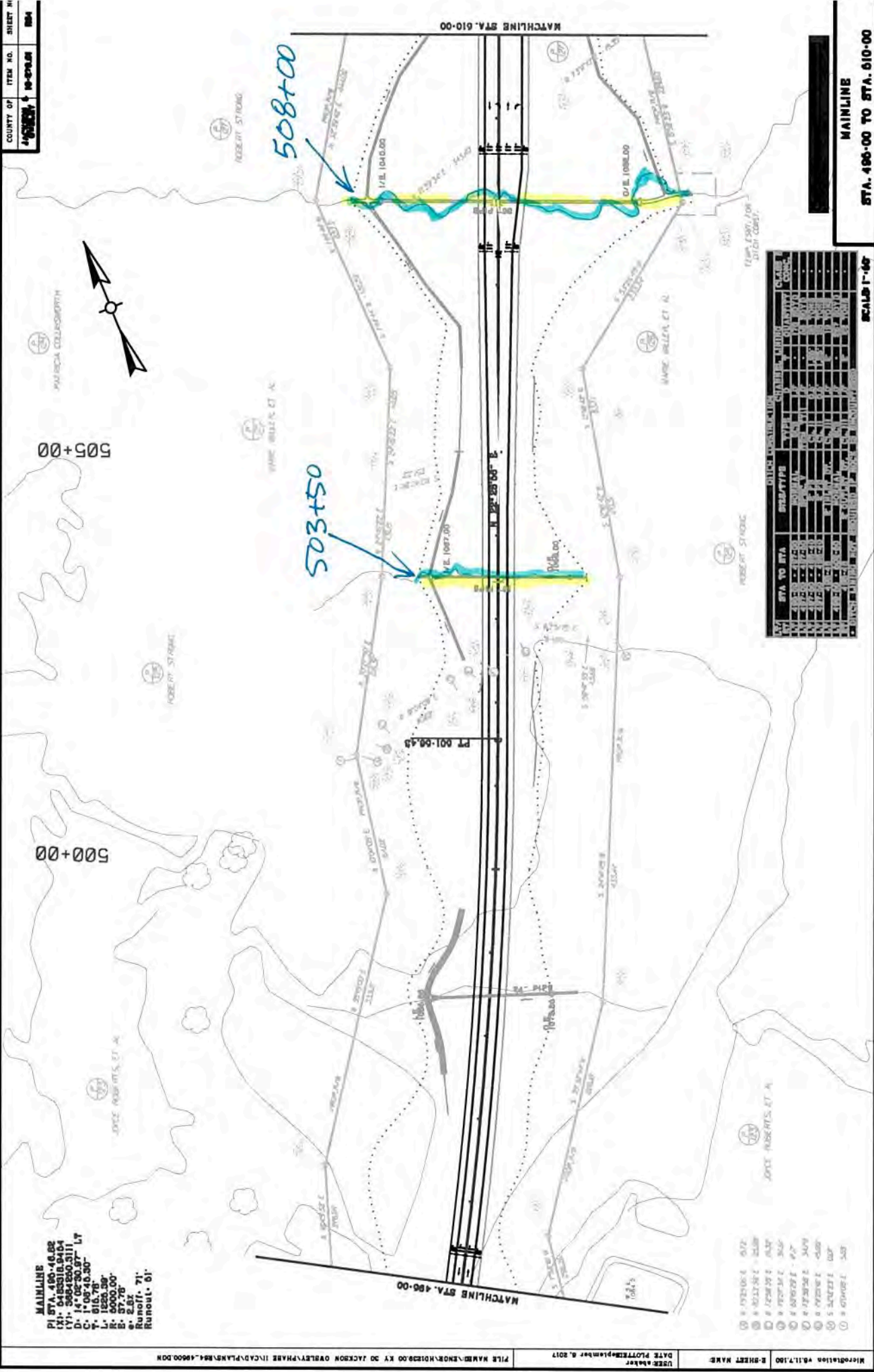
**STA. 466+00 TO STA. 480+00**

SCALE: 1"=60'

| | | |
|-----------|----------|---------|
| COUNTY OF | ITEM NO. | SHEET # |
| ALBANY | 10-2-01 | 100 |



800-1-871-6028



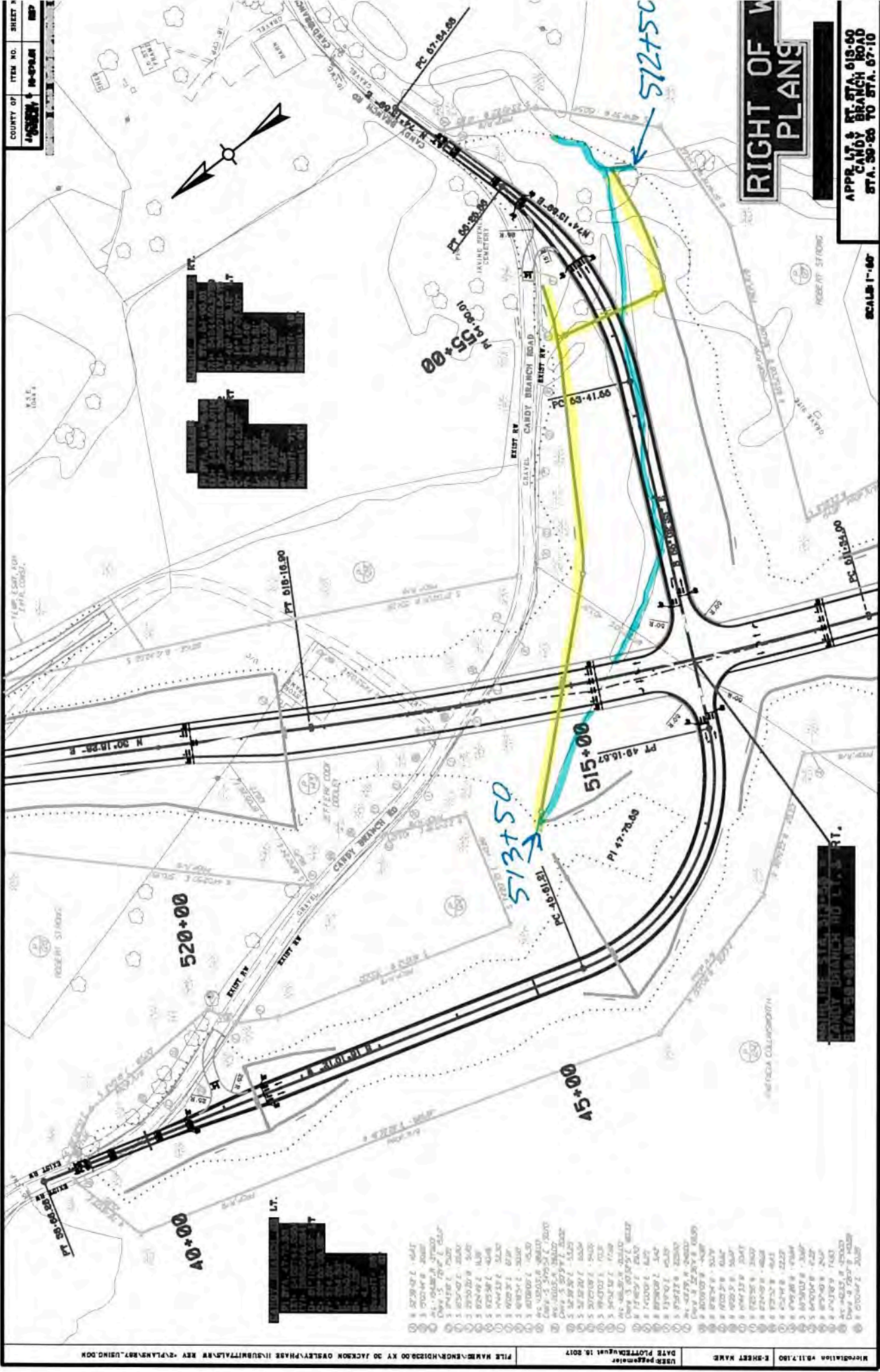
MAINLINE
PI STA. 490+46.82
LX: 0483318.9404
LY: 5984500.3111
D: 14° 06' 50.97" LY
C: 010940.30"
L: 1250.59'
R: 5000.00'
E: 97.76'
e: 2.82
Runout: 71'
Runout: 0'

1. 0.00
2. 0.00
3. 0.00
4. 0.00
5. 0.00
6. 0.00
7. 0.00
8. 0.00
9. 0.00
10. 0.00
11. 0.00
12. 0.00
13. 0.00
14. 0.00
15. 0.00
16. 0.00
17. 0.00
18. 0.00
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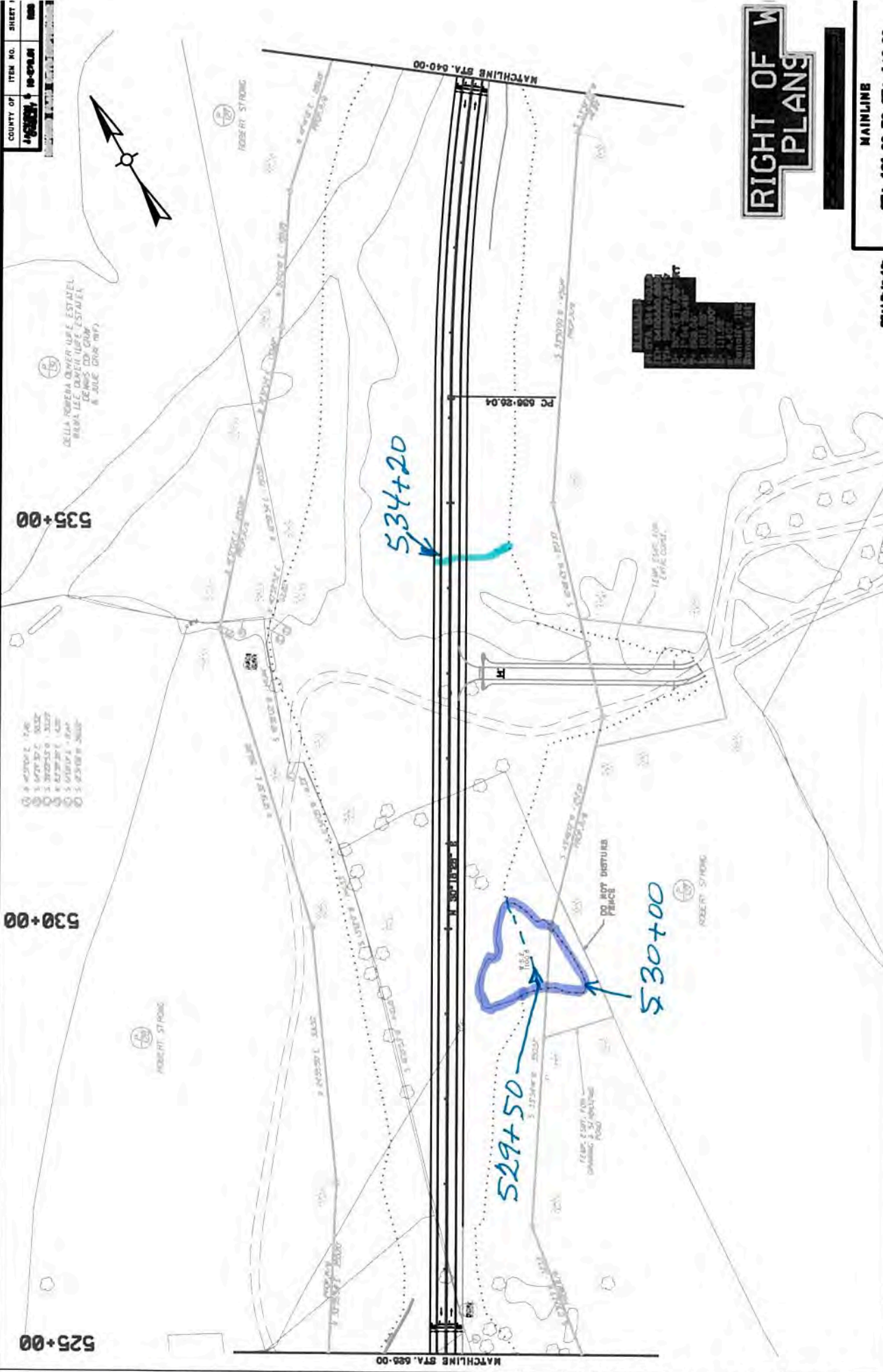
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SCALE 1"=40'



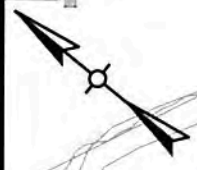
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**RIGHT OF WAY
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STA. 525+00 TO STA. 540+00**

SCALE: 1"=40'



550+00

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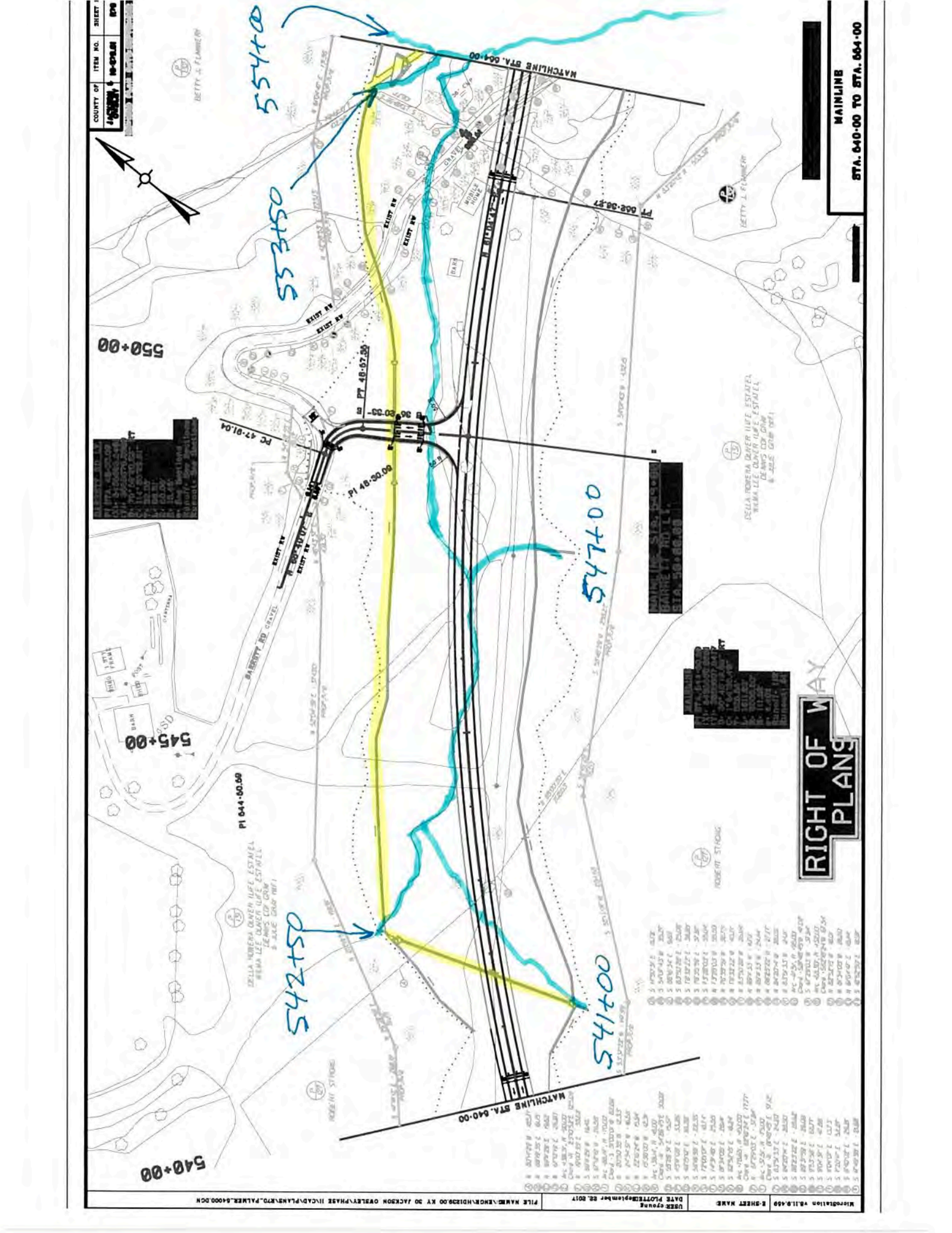
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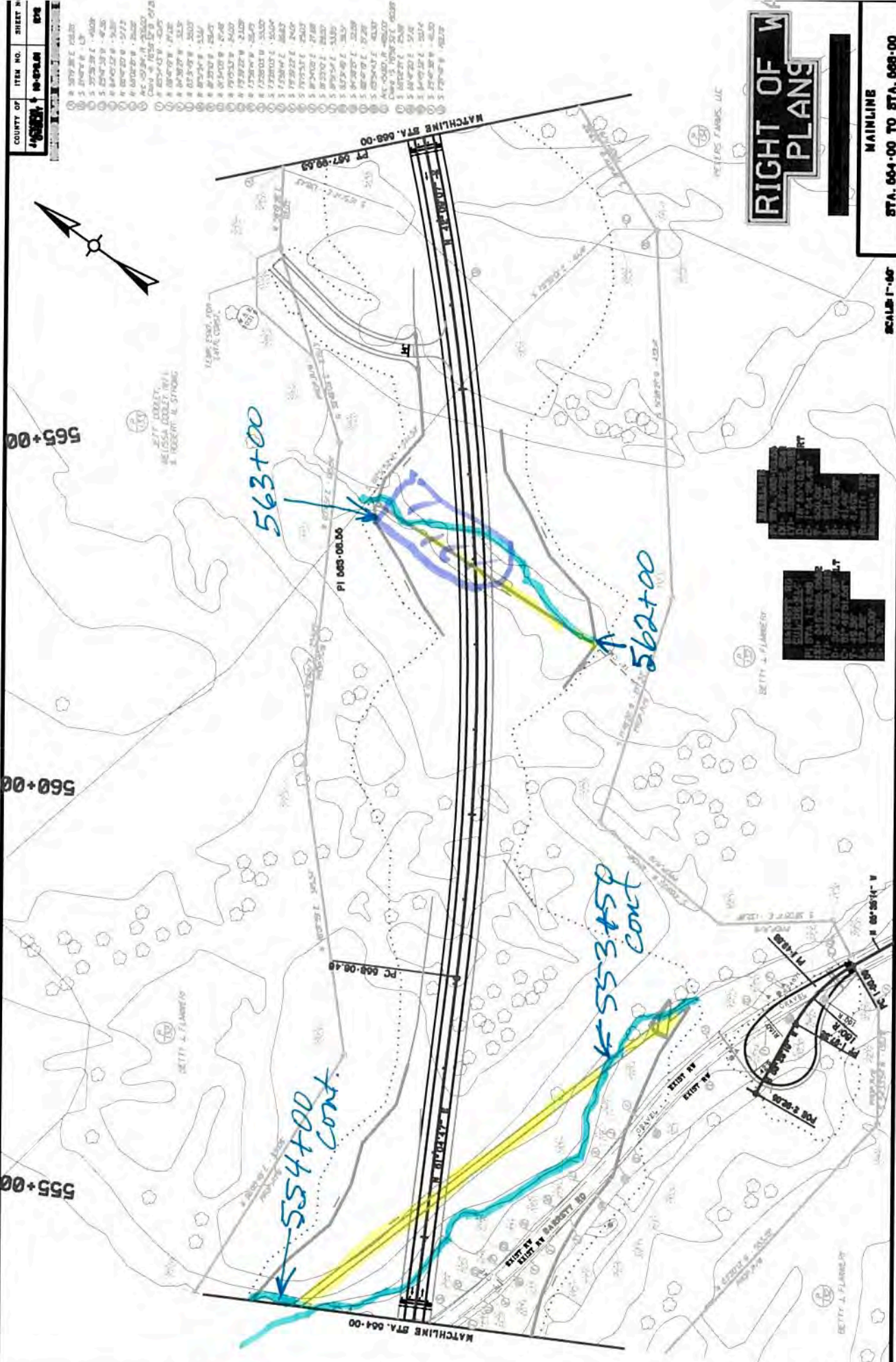


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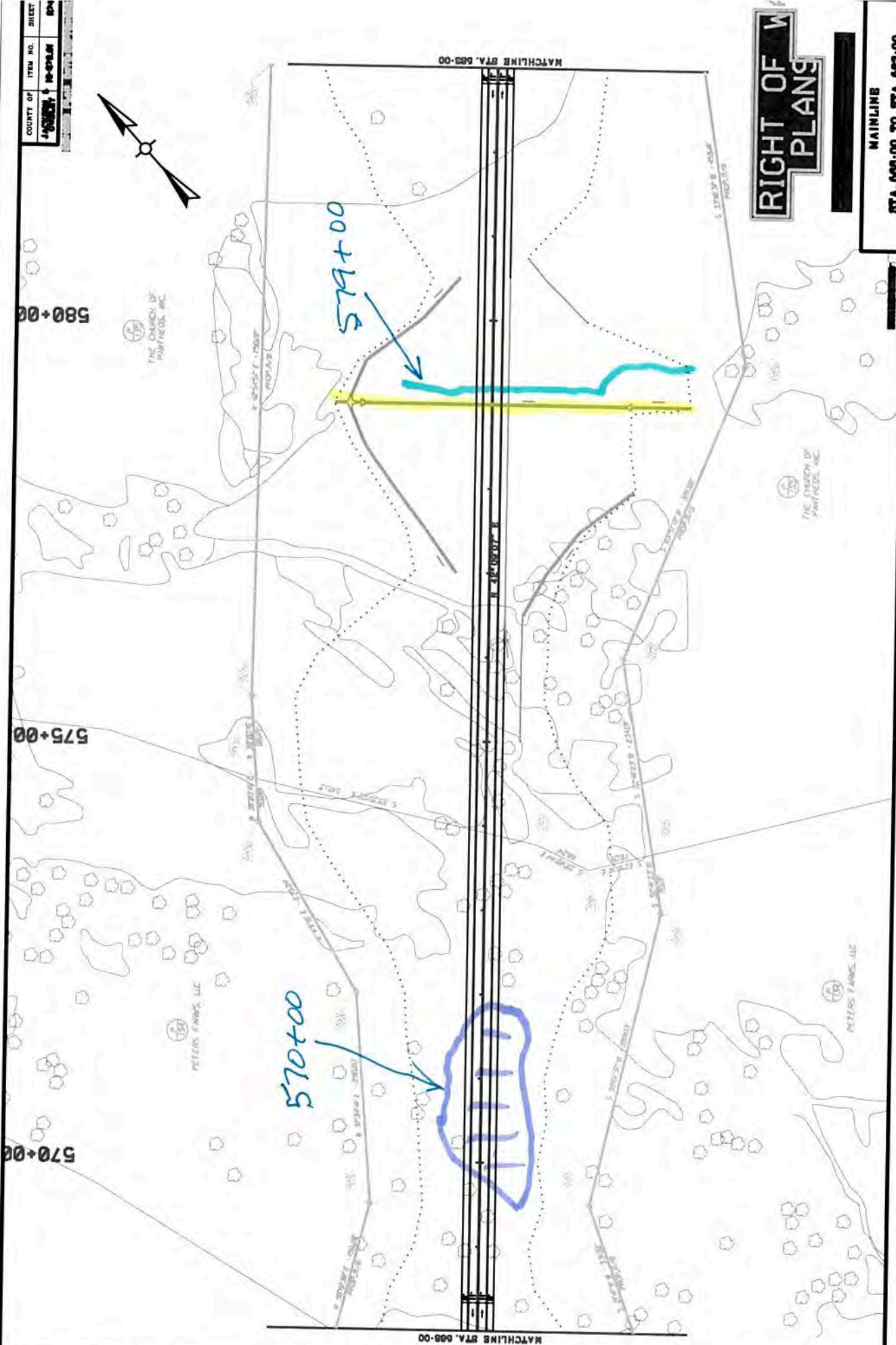


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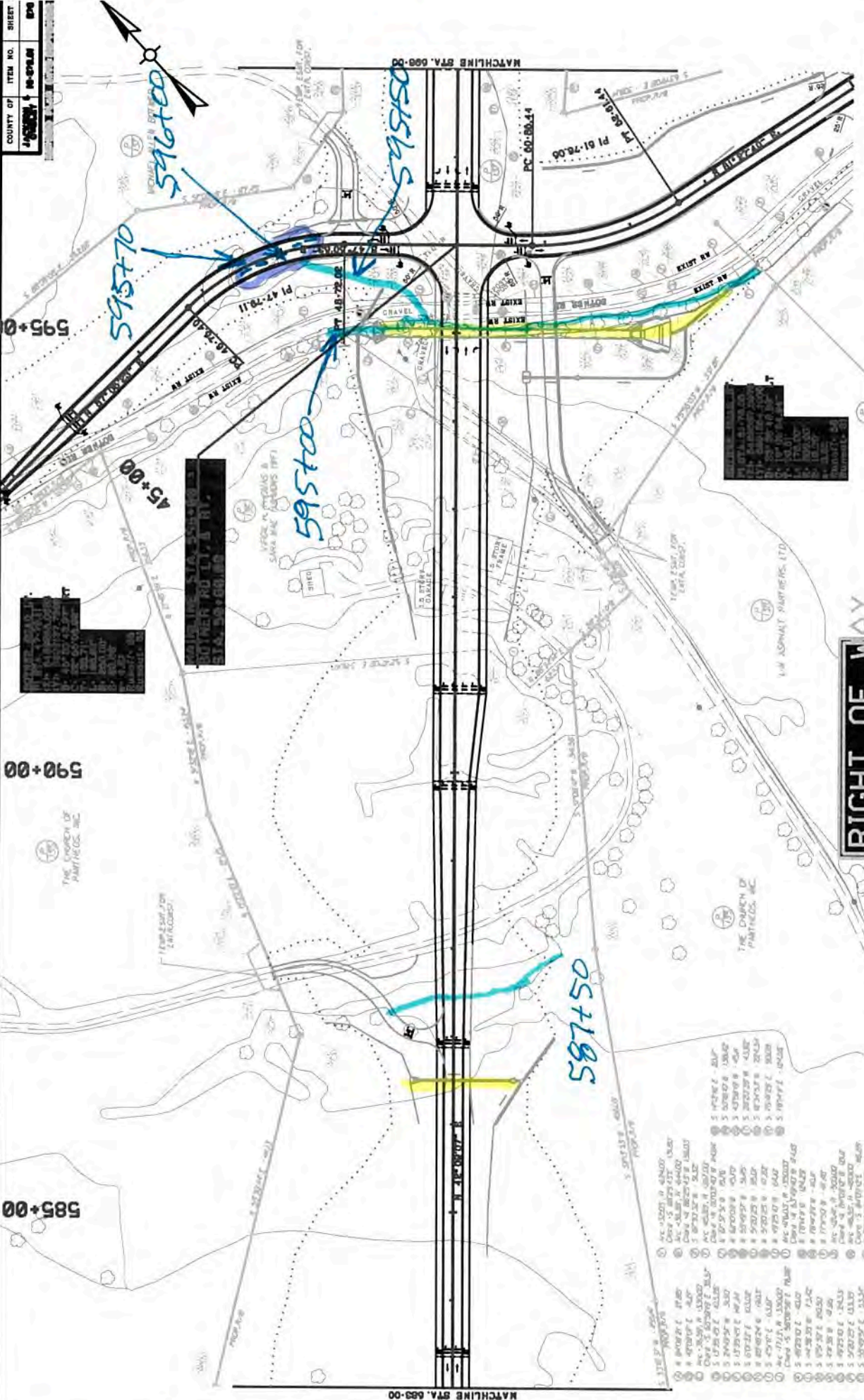


RIGHT OF WAY PLANS

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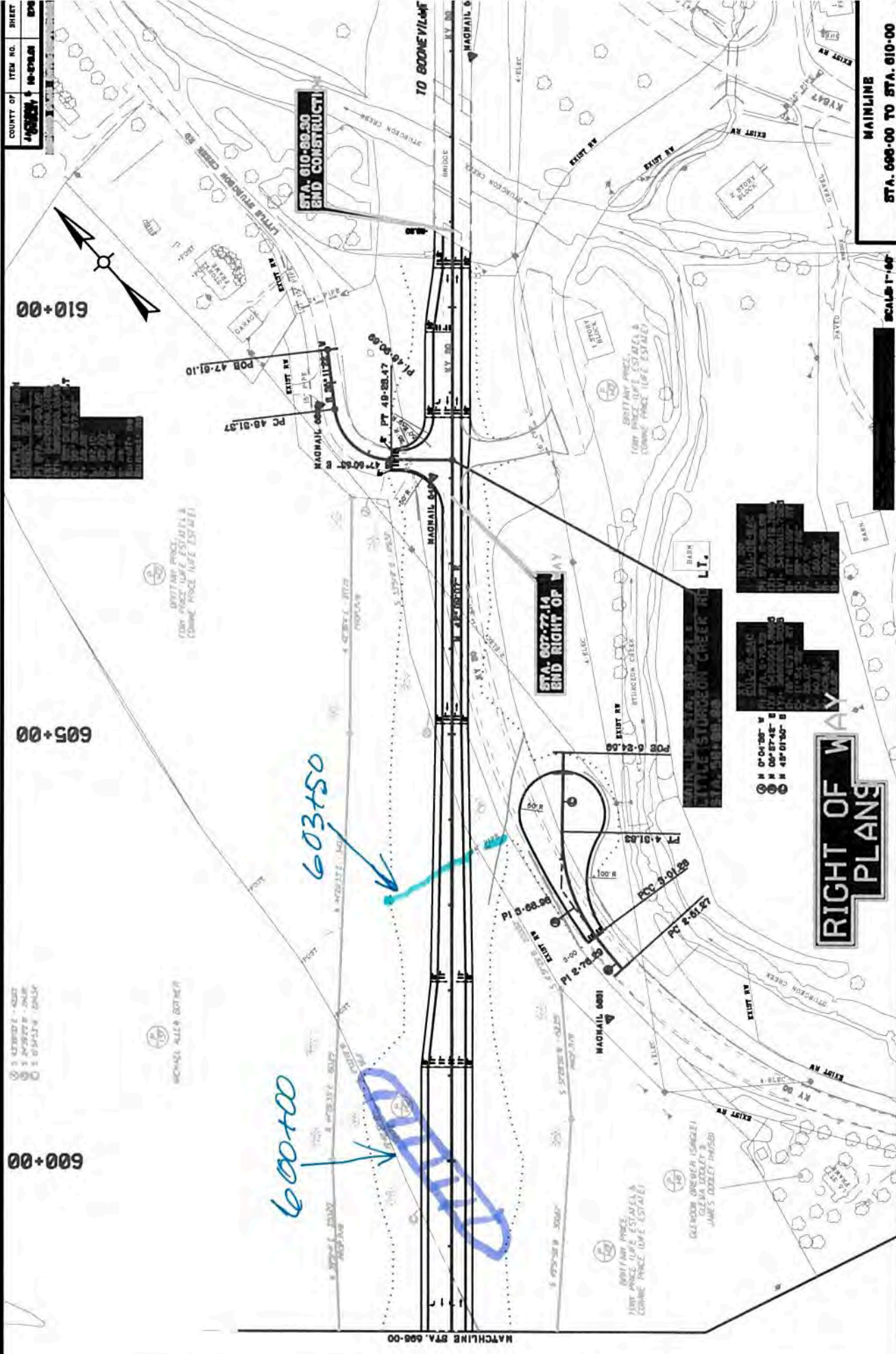


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SCALE 1"=40'

SPOT ELEVATIONS
TOTAL PRICE (LIFE ESTATE)
CONVEYANCE PRICE (LIFE ESTATE)

RIGHT OF WAY
PLANS



MAINLINE
 STA. 600+00 TO STA. 610+00

SCALE: 1"=40'

RIGHT OF WAY PLANS

603+50

600+00

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STA. 610-80.30
END CONSTRUCTION

STA. 607-77.14
END RIGHT OF WAY

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LOP Assessment of Environmental, Social and Other Factors

KY 30 Reconstruction from US 421 at Tyner to KY 847 at Travellers Rest
Jackson and Owsley Counties
KYTC Item No. 10-279.61

LOP ASSESSMENT OF ENVIRONMENTAL, SOCIAL, AND OTHER FACTORS

Threatened and Endangered Species: Proper consultation with the US Fish and Wildlife Service (USFWS) has occurred to satisfy the requirements of Section 7 of the Endangered Species Act. USFWS provided KYTC with a county-based list of Endangered Species. KYTC also considered species lists maintained by the Kentucky Nature Preserves Commission and the Kentucky Department of Fish and Wildlife Resources. KYTC addressed the federally protected and listed species by conducting a Habitat Assessment and determining that habitat did not exist for any of the species that may potentially occur in the project area (see attachment.)

Economics: No indirect or cumulative impacts to the regional economy or businesses are anticipated, other than the overall enhancement to travel efficiency in the region because the proposed project does not include additional capacity, nor does it create travel opportunities outside of the project corridor.

Aesthetics: The project corridor is rural and predominately features light residential land uses, wooded areas, and pasture. The Preferred Alternative will convert some wooded and residential areas to transportation right-of-way; however, the views of and from the new KY 30 are expected to be similar to the current views of and from existing KY 30.

Special Aquatic Sites: This project will not affect Special Aquatic Sites (SAS).

Historical Properties: The KYTC has addressed Cultural and Historic Resources in accordance with Section 106 of the National Historic Preservation Act. Identification of historic properties within the area of potential effect has been conducted. There were no above ground resources, on or eligible for the National Register of Historic Places, located within project vicinity that would be adversely affected by the project. Concurrence with this conclusion was rendered by the Kentucky Heritage Council, State Historic Preservation Officer (SHPO) by letter dated February 3, 2016. The potential for impact to archaeological sites was also considered within the project limits. No archaeological sites eligible for listing on the National Register of Historic Places were identified in the project area. Concurrence with this conclusion was provided by the SHPO by letter dated December 8, 2016.

Fish and Wildlife Values: Habitat for fish and wildlife will be affected by the project. The project will result in the permanent conversion of approximately 74.57 acres of Potential Habitat 10.59 acres of Known summer 2 + Summer 1 Habitat and, 220.13 acres of Known Swarming Habitat 1 and 16.08 acres of Riparian Habitat for listed bats to roadway right-of-way. All of the converted land is currently in residential, farm, or forested land uses.

Flood Hazards: The KYTC minimizes, whenever possible, encroachment upon the flood plain. Water control structures within the flood plain are designed and then analyzed using HEC-RAS to assure that these do not adversely effect flood elevations.

Flood Plain Values: The KYTC complies with the state floodplain regulations and the National Insurance Act. KYTC projects minimize the placement of fill material into flood plains and

include features such as flood plain compensation and storm water detention basins. Thus, KYTC projects have minimal impacts to floodplain values and functions.

Land Use Classification: Land use in the project area is agricultural and rural residential. The project will affect land use by conversion of forested/agricultural/rural residential (100 percent), to impervious surface and right-of-way land use for transportation purposes. Approximately 97 acres will be converted to pavement and ROW. No further land development or land use conversion is expected because of the project. However, these secondary affects on land use cannot be controlled or predicted by the project. Thus, land use would not be significantly altered as a result of this project.

Navigation: Navigation is not a factor associated with this proposal.

Shore Erosion and Accretion Patterns: Shore erosion and accretion patterns would not be affected by this project as it is not located on a lake or a major tributary.

Recreation: The project would not affect existing recreational opportunities.

Existing and Potential Water Supplies; Conservation: The project would not affect existing water supplies. No construction activities occur within the vicinity of existing water supplies.

Water Quality: This project would have temporary impacts to water quality during the construction phase. This project will minimize those impacts via compliance with the KPDES General Storm Water Permit for Construction, achievement and compliance with a 401 Water Quality Certification and compliance with SMS4 requirements and local ordinances, where appropriate. Compliance is generally achieved through structural BMPs (silt fence, silt checks, detention basins etc) or non-structural BMPs such as mulching, seeding, grading, etc. Post construction water quality would be protected in karst or other sensitive areas through implementation of KYTC's Karst Policy. Thus, the project would have minimal impact to water quality.

Energy Needs: This project would result in a short-term increase in energy consumption during construction. Overall, the project would have minimum impact on the energy consumption and will not impact the long-term energy consumption.

Safety: Safety is a large factor motivating the project, and is a part of the project's purpose and need. Between 2010 and 2014, there were 34 crashes on KY 30 in the project corridor in Jackson County, which included one fatality and 15 injuries.

The existing geometric characteristics of KY 30 do not meet the design criteria for a 55-mph design speed. From US 421 at Tyner to KY 846 near Sturgeon, there are approximately 40 substandard vertical curves and 60 substandard horizontal curves, and another 27 substandard horizontal curves between KY 846 and KY 11.

Food and Fiber Production: The project would have a negligible impact on food and fiber production due to the minimal impact created by this linear transportation project. Approximately 71.1 acres of active agricultural land (pastureland and cropland) and approximately 20.5 acres of prime farmland (as determined by the local Natural Resource Conservation Service field offices) will be converted to ROW by the project. Relative to the quantity of land currently used in the area for agricultural purposes, this project would impact such a small percentage of that used for food and fiber production that the impact is negligible.

Mineral Needs: This project would have no impact on mineral needs.

Consideration of Property Ownership: Seventeen residences (seven mobile homes and 10 conventional homes) and one business (Tyner Game Room) will be taken by the project. To minimize the unavoidable affects of Right of Way acquisition and residential and business displacements, the KYTC must comply with *Uniform Relocation Assistance and Real Property Acquisition Policies Act, the Title 6 of the Civil Rights Act and Executive Order 12898-Federal Actions to Address Environmental Justice in Low Income and Minority Populations*. Thus, in association with this project, property ownership has been considered and addressed by KYTC.

Noise: It has been determined that no noise walls or other mitigation are warranted.

Wild and Scenic Rivers: According to the Kentucky Environmental and Public Protection Cabinet – Division of Water, no wild and scenic rivers are located in the project area and the project will not impact any wild and scenic rivers.

UST Hazardous Material: No potential hazardous materials sites have been identified in the project area and the project is not expected to impact any hazardous materials sites.

Environmental Justice: No specific environmental justice issues were raised during the Public Hearing or Public Hearing comment period. An Environmental Justice analysis was conducted in accordance with Executive Order 12898 and FHWA/KYTC Environmental Justice guidance. Based on the results of the analysis, the project is not expected to disproportionately impact minority or low-income populations.

Section 4(f)/6(f) Resources: No publicly-owned parks, recreation areas, wildlife preserves, or historic sites are located in the project area, and no recreational sites developed with Land and Water Conservation Funds are located in the project area. As a result, the project will not impact any Section 4(f) or 6(f) resources.

Alternative Analysis

Summary of Alternatives

KY 30 – Jackson & Owsley Counties

10-279.61

2.1 Alternatives Considered

Four build alternatives were analyzed during project development, as well as the No-Build Alternative, to provide a baseline for the potential impacts of the project if the proposed roadway facility is not constructed. Figures 2 depicts Alternatives 1 and 2, which are the mainline alternatives. Figure 3 depicts Alternatives 3 and 4, which incorporate elements of Alternatives 1 and 2 into crossover alternatives. Larger exhibits showing greater detail are available in Appendix A. The build alternatives, Alternatives 1, 2, 3, and 4, have been carried forward in the National Environmental Policy Act (NEPA) process. All of the build alternatives share the same termini, which are represented by Alternative 1 in Figure 2 and Alternative 4 in Figure 3.

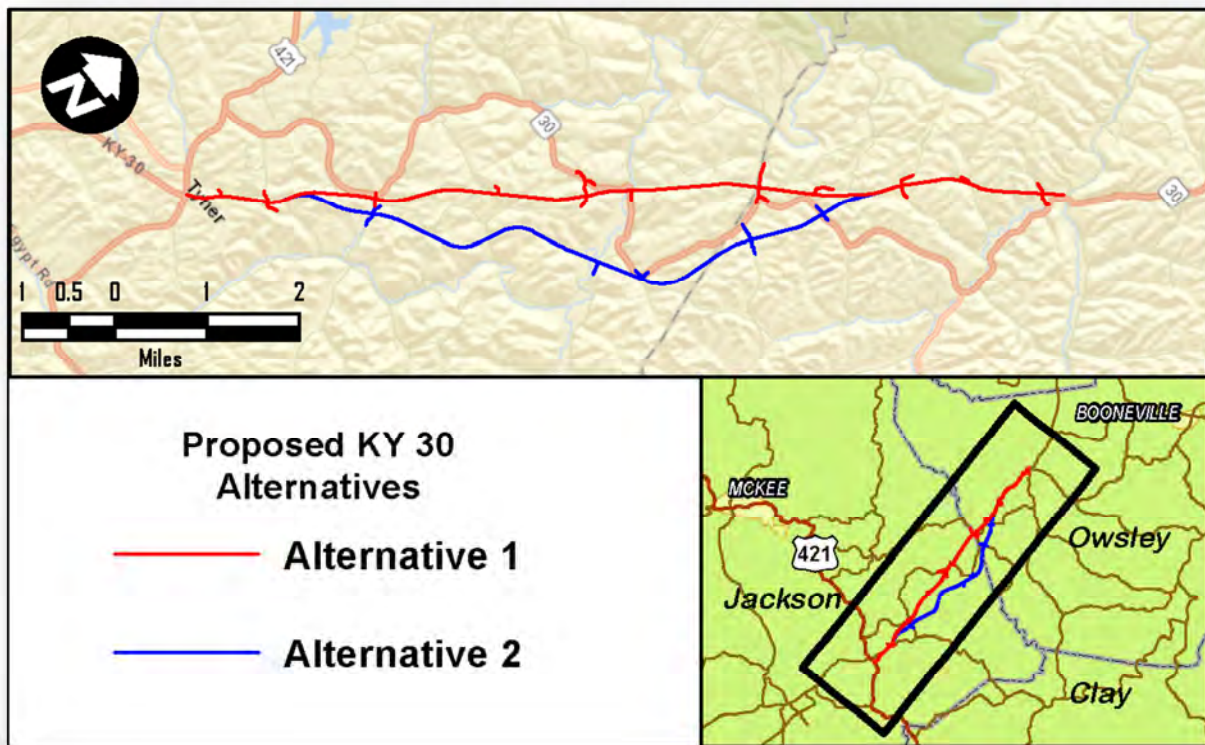


Figure 1: Alternatives 1 and 2

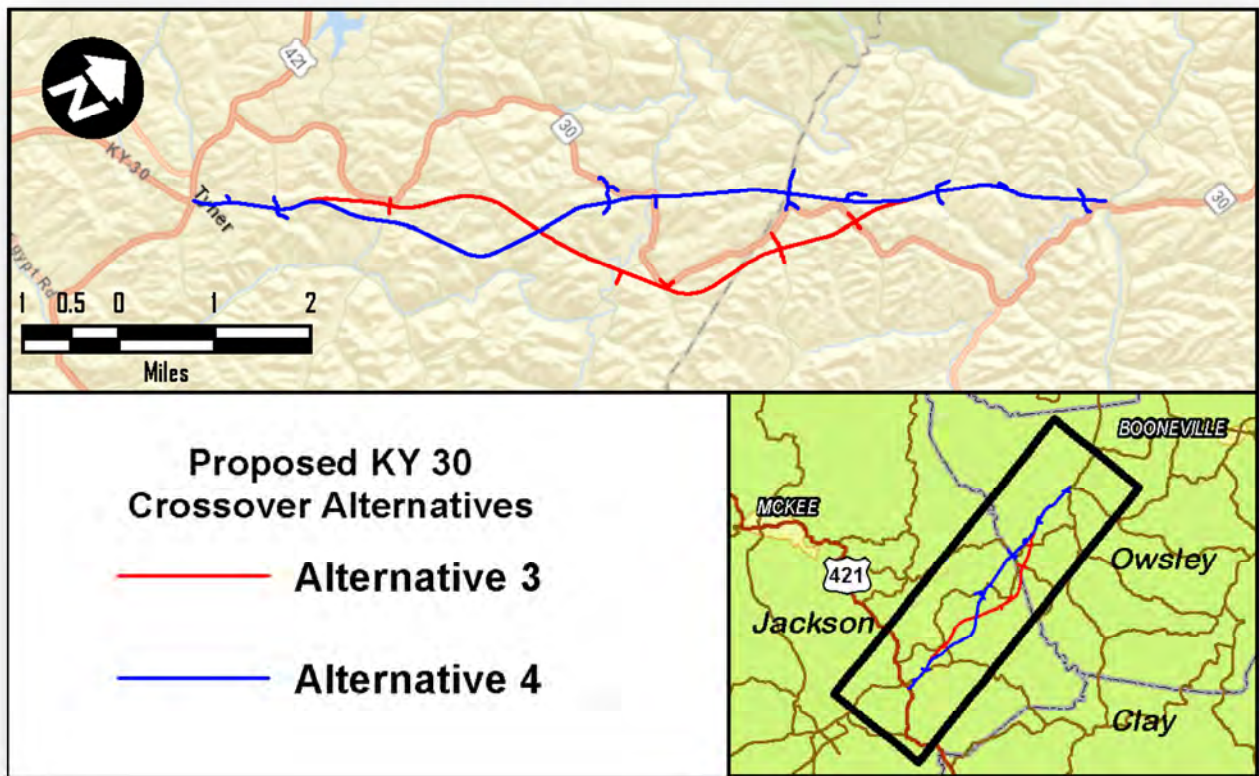


Figure 2: Alternatives 3 and 4

2.1.1 No-Build Alternative

The No-Build Alternative would leave the existing road as it currently is with maintenance activities, such as routine paving, striping, and drainage, performed when necessary. In comparison to the proposed build alternatives, short-term costs to maintain current roadway operations would be less expensive due to the lack of expenditures needed for right-of-way acquisition and residential displacements, utility relocations, or project construction. In addition, the No-Build Alternative would impose fewer direct construction impacts. However, implementation of the No-Build Alternative would leave the area with a deficient and poorly linked transportation network. The No-Build Alternative would not supply any of the transportation elements required to achieve the project's purpose and need and would not provide an solution for the concerns identified in the Section 1.3 (this document). The No-Build Alternative would not fulfill the purpose and need of the proposed project.

2.1.2 Alternative 1

Beginning at the new US 421/KY 30 Intersection near Tyner, KY, Alternative 1 follows an extension of the centerline from the previously constructed segments of KY 30 (from the west) and extends to the east. Approximately 0.5 miles from the beginning of the project, the proposed alignment shifts to the north and runs parallel to KY 1431. Approximately three-quarters of a mile before crossing KY 1431, the alignment would shift northwards to parallel KY 30, and a new approach would be constructed to connect the new alignment and the existing roadway. The new alignment would run approximately another four miles east until it crossed the existing KY 30. After another one and a half miles, it would cross KY 1071 and then

remain north of KY 30, paralleling it until it rejoined the adjacent construction segment of KY 30 midway between the towns of Sturgeon and Vincent.

2.1.3 Alternative 2

Beginning at the new US 421/KY 30 Intersection, Alternative 2 would follow the same alignment as Alternative 1 to a point about 0.5 miles past Zeke's Point Road, where it would turn south and parallel Alternative 1, about 0.15 miles south, for about a mile. Then, where Alternative 1 would turn north and stay closer to the existing alignment, Alternative 2 would remain straight for another mile until it passed two small lakes, where it would turn north to cross Big Barn Road at a perpendicular. It would then continue straight northeast until rejoining Alternative 1, about 0.5 miles southwest of the intersection of the existing KY 30 and Maddentown Road. From this point to the end of the project, Alternatives 1 and 2 follow the same alignment.

2.1.4 Alternative 3

This alternative would use the alignment presented by Alternative 1 until just before crossing Bates Vickers Road, where it would veer southwards to join the Alternative 2 alignment. It would then continue in the same way as Alternative 2.

2.1.5 Alternative 4

This alternative would use the alignment presented by Alternative 2 until just after crossing Big Barn Road, where it would veer northwards to join the Alternative 1 alignment. It would then continue in the same way.

2.1.6 Sub-Alternates

In addition to the four alternatives discussed above, the project team reviewed additional sub-alternates at two locations along the project corridor.

US 421/KY 30 Intersection/Interchange

All of the proposed alternatives were originally developed as a continuation of the existing at-grade US421/KY30 intersection. US 421 is a through movement and does not stop at the existing intersection, while the KY 30 approach from the west is stop controlled at the intersection. That western approach is at a 4.0% downhill slope, while all of the originally proposed alternatives to the east would have been at a 5.0% uphill slope. As the proposed KY 30 alignments were developed, it was assumed that US 421 would remain the through movement and KY 30 traffic would be stop controlled. US 421 carries slightly more traffic than KY 30 and remains unimproved to the north and south of the intersection. Existing eastbound KY 30 traffic must travel north along US 421 approximately one mile to continue along the northern US 421/KY 30 split. Due to the proposed improvements for KY 30 at the southern split, travel speeds will be increased as traffic approaches from both the east and west. The project team was concerned that an increase in speed may have resulted in decreased safety at the originally proposed US 421/KY 30 intersection.

To avoid this concern, the project team was presented two alternatives to raise the grade of KY 30, build a bridge over US 421 and Laurel Fork, then construct a "Jug Handle" type approach from KY 30 to US 421. One alternative would build an approach from the north, and the other from the south. Either of these alternatives would improve safety by separating the high speed through movements of each route.

The construction cost estimates either of these alternatives would add approximately \$3.2 million to the total cost of the project. The northern alternative would require one additional relocation while the southern two, but the southern approach would be able to take advantage of the widening in place for the existing northbound left turn lane onto KY 30. The project team chose to proceed into final design with the southern "Jug Handle." An at-grade intersection was also designed, in case additional funding was not available.

Eastern End

At the request of a property owner, a variation of all mainline alternates was developed for the east end of the project corridor. The property owner made this request at the Owsley County public meeting and through written correspondence. Beginning 0.6 miles west of Botner Road, the mainline KY 30 alignment would have been shifted to the south approximately 580'. This alternative would have reduced roadway excavation by approximately 65,000 cubic yards and reduced waste by approximately 400,000 cubic yards. These savings resulted from introducing additional curvature to reduce cut west of Botner Road. The project team chose not to pursue this alternative because of concerns that savings to excavation would be offset by impacts to the Little Sturgeon Creek floodplain and additional geotechnical requirements for embankment through unstable terrain.

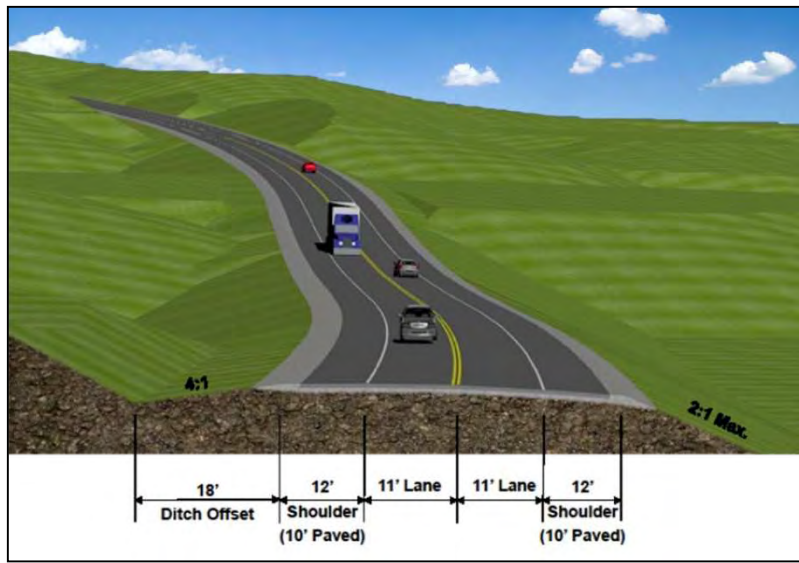


Figure 3: Typical Section

2.2 Typical Section

All proposed alternatives would use the same typical section. Like the existing KY 30, the proposed new roadway would have two travel lanes, but those would be wider (11' instead of 9') and much wider paved shoulders - 10' instead of 1-2' (Figure 3). It would also have conforming geometries, turn lanes at major intersections, and access would be permit controlled.

2.3 Identification of Preferred Alternative

Alternative 1 (with the added southern-approach-interchange at US421/KY30) was initially chosen as the Preferred Alternative due to its lower number of relocations and shorter project length, in comparison to Alternative 3. Alternatives 2 and 4 were eliminated due to their higher construction cost estimates. Alternative 1 has 6 fewer relocations than Alternative 3 and a lower preliminary right-of-way estimate. Alternative 3 also has longer box culverts and will require approximately 400,000 cubic yards more waste, which may increase permitting fees.

After the Preliminary Line and Grade (PL&G) meeting, the Preferred Alternative was shifted slightly to the north and the proposed bridge was extended to fly over KY 1071. No direct approaches will be constructed for KY 1071 at this location. Instead, access to KY 1071 and existing KY 30 will be provided approximately 0.5 miles east at Big Springs Road. This revision reduces the earthwork and drainage costs by eliminating the approaches at KY 1071. The cost to lengthen the bridge to cross KY 1071 was offset by the elimination of turn lane widening and the mainline shift to the north. This revision also resulted in three fewer relocations.

State or Federally Funded Statement

State or Federally Funded Statement

Jackson and Owsley Counties

KY 30

Item No. 10-279.61

The funding for the project is a mix of Federal and Commonwealth of Kentucky funds.

Section 106 Concurrence



18 DEC '16 AM 9:42

MATTHEW G. BEVIN
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE

REGINA STIVERS
DEPUTY SECRETARY

DON PARKINSON
SECRETARY

300 WASHINGTON STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

December 8, 2016

Mr. David M. Waldner, P.E.
Director, Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

Re: Intensive Archaeological Survey (Phase I) in Support of KY 30 Reconstruction from US 421 to KY 847, Jackson and Owsley Counties, Kentucky. Report submitted by Nicole Mills and Michael Creswell of Brockington and Associates, Inc.
Report dated November 2016.
KYTC Item Number 10-279.60

Dear Mr. Waldner:

Thank you for the letter regarding the above referenced project report, received November 30, 2016. This report represents revisions to an earlier draft of the report, entitled *Archaeological Site Detection (Phase I) Survey in Support of KY 30 Reconstruction from US 421 to KY 847, Jackson and Owsley Counties, Kentucky*, dated May 2016.

The report describes the intensive pedestrian survey of approximately 10.5 miles of KY 30 from US 421 in Jackson County to KY 847 in Owsley County. The survey area consisted of a 152 meter survey corridor following the centerline of the proposed new KY 30 alignment. During the survey, one previously identified archaeological sites and one non-site locality were revisited. Site 15Ow150 was a multicomponent indeterminate prehistoric and historic residential location. This site was previously determined to be not eligible for the National Register of Historic Places, and has since been heavily disturbed by road construction activities. The non-site locality was defined in 1999 as NSL-2, and is treated as CRL4670-004 in the report reviewed here. No additional artifacts were recovered during the site revisit, and the original determination that the site was not eligible for the National Register remains unchanged.

One previously identified site (15Ja474) was mapped in the Office of State Archaeology database within the APE. Review of the original report showed that this mapping was in error, that site 15Ja474 lies outside of the current APE, and that the proposed project will not affect this site.

The investigators defined two new archaeological sites during fieldwork. Both sites (15Ow158 and 15Ow159) are early twentieth Century cemeteries. The investigators recommended that both cemeteries were potentially eligible for listing on the National Register of Historic Places. Both cemeteries are located approximately 120 feet outside the current disturb limits for the project. The investigators recommended that both cemeteries be avoided by project activities. If the plans for the proposed project change, and impacts to either cemetery cannot be avoided, the investigators recommended that an archaeological assessment of proposed effects be conducted, and that any burial relocation be conducted in accordance with appropriate procedures and laws.

Additionally, the investigators defined four non-site localities. Non-site localities, referred to in the report as CRL 4670-001, 4670-002, 4670-003, and 4670-005, consist of relatively modern cultural remains that were not interpreted as being older than 50 years old. No site numbers were assigned to these remains, and the investigators recommended that these remains are not eligible for listing on the National Register.

**#Preservation50: Commemorating the 50th anniversary of the National Historic Preservation Act
and the Kentucky Heritage Council 1966-2016**

Finally, the investigators recorded the location of one modern cemetery. The report refers to this cemetery as the Irvine Spence Cemetery, and it contains interments from 1984-2007. Although this cemetery does not represent a cultural resource, the investigators recommended avoiding the cemetery.

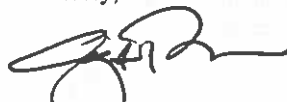
After review of this report, staff with the KYTC concurred with the investigator's recommendations. The KYTC found that the project would cause No Effect to 15Ja474, 15Ow150, and CRL 4670 001-005. KYTC also concurred that the two historic cemeteries identified during survey be avoided. For these two sites, 15Ow158 and 15Ow159, KYTC found that the proposed project, as currently planned, would cause No Adverse Effect to Historic Properties. Any modifications to the proposed plans that would cause impacts to these two cemeteries would necessitate archaeological assessment and relocation in accordance with cemetery relocation regulations. The modern cemetery was not considered a historic property.

After review of this report, we concur with the KYTC's findings of effects. We would like to reiterate that all of the cemeteries should be avoided by project impacts, and that any project design changes that cause impacts to these locations would result in additional archaeological investigation and relocation before project construction activities commence. We acknowledge receipt of one copy of the report and look forward to receipt of two additional copies for archival purposes.

If the project design or boundaries change, this office should be consulted to determine the nature and extent of additional documentation that may be needed. In the event of the unanticipated discovery of an archaeological site or object of antiquity, the discovery should be reported to the Kentucky Heritage Council and to the Kentucky Office of State Archaeology in the Anthropology Department at the University of Kentucky in accordance with KRS 164.730. In the event that human remains are encountered during project activities, all work should be immediately stopped in the area and the area cordoned off, and in accordance with KRS 72.020 the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to the Kentucky Heritage Council.

Should you have any questions, feel free to contact Chris Gunn of my staff at (502) 564-7005, extension 118.

Sincerely,



Craig A. Potts,
Executive Director and
State Historic Preservation Officer



5 FEB '16 AM 9:29

MATTHEW G. BEVIN
GOVERNOR

**TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL**

REGINA STIVERS
DEPUTY SECRETARY

DON PARKINSON
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE

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PHONE (502) 564-7005
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www.heritage.ky.gov

CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

February 3, 2016

Mr. David M. Waldner, P.E., Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor
Frankfort, KY 40622

Re: A Cultural Historic Eligibility Report for the Reconstruction of KY 30 from US 421 in Jackson County to KY 847 in Owsley County, Kentucky (Palmer Engineering, Jayne Goddard) Item No. 10-279.60

Dear Mr. Waldner:

Thank you for your submission of the above-listed report which was received by our office on January 26, 2016. Pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U. S. C. Sec. 470f) and implementing regulations at 36 C. F. R. Part 800, the Kentucky Heritage Council (SHPO) received for review and comment information regarding the above-referenced project. We understand that the project consists of the reconstruction of 10.46 miles of KY 30 in Jackson and Owsley Counties. The proposed project corridors have been narrowed down to two alternatives, a north corridor and a south corridor. We further understand that the report identified 33 total, resources which are fifty years or older, which is the minimum requirement for inclusion on the National Register of Historic Places (NRHP). One historic resource, site JA 414, was recommended as potentially eligible for inclusion on the NRHP. We concur with the authors' recommendations that site JA 414 appears to be eligible for inclusion on the NRHP and that the remaining 32 sites appear to not be eligible for inclusion on the NRHP.

We look forward to receiving the accompanying survey forms and an effects determination for the proposed project's alternatives. Should the project plans change, or should additional information become available regarding cultural resources or citizens' concerns regarding impacts to cultural resources, please submit that information to our office as additional consultation may be warranted. If you have any questions please contact Amanda Kincaid of my staff at (502)564.7005, ext. 147.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: agk
cc: A. Abner (KYTC-DEA)



U.S. Department
of Transportation
**Federal Highway
Administration**

Kentucky Division

December 13, 2016

330 West Broadway
Frankfort, KY 40601
PH (502) 223-6720
FAX (502) 223 6735
<http://www.fhwa.dot.gov/kydiv>

In Reply Refer To:
HDA-KY

Craig A. Potts, Executive Director
Kentucky Heritage Council and
State Historic Preservation Office
300 Washington Street
Frankfort, KY 40601

Subject: *De Minimis Impact* Determination
Reconstruction of KY 30 from US 421 in Jackson County to
KY 845 in Owsley County, Kentucky
JA-414: Moore Farm
KYTC Item No. 10-279.6

Dear Mr. Potts:

The Federal Highway Administration (FHWA) has reviewed the information provided to us by the Kentucky Transportation Cabinet (KYTC), including the enclosed correspondence from your office. It appears that the project will not adversely affect JA-414, Moore Farm, which is eligible for the National Register of Historic Places. The minimal impacts associated with the proposed project will not adversely affect the characteristics, activities, features, and attributes that qualify the resources for protection under Section 106 (36 CFR Part 800) and 4(f) (23 CFR 774).

We are making a *de minimis impact* determination under Section 4(f) (23 CFR 774) that is based upon your concurrence in the *No Adverse Effect* determination for this project under Section 106. Please return your concurrence with the *No Adverse Effect* determination. If you have questions, please contact Eric Rothermel at (502) 223-6742 or via e-mail at eric.rothermel@dot.gov at your earliest convenience. Thank you.

John Ballantyne
Program Delivery Team Leader
Federal Highway Administration

12-12-16

Concurrence by: Date:
Craig A. Potts
Executive Director
Kentucky Heritage Council
State Historic Preservation Office



MATTHEW G. BEVIN
GOVERNOR

**TOURISM, ARTS AND HERITAGE CABINET
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CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

December 1, 2016

Mr. David M. Waldner, P.E., Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor
Frankfort, KY 40622

Re: Request for No Adverse Effect and *de minimus* finding for Site 3 (Ja 414/ Moore Centennial Farm) determined eligible for the National Register. *A Cultural Historic Eligibility Report for the Reconstruction of KY 30 from US 421 in Jackson County to KY 847 in Owsley County, Kentucky.*
Item No. 10-279.60

Dear Mr. Waldner:

The purpose of this letter is to recognize that this office reviewed the above-listed report on February 3, 2016 where we concurred with your determination of **No Adverse Effect** for the overall project. Further we concur with the finding of **No Adverse Effect** and the *de minimus* finding for site Ja 414/ Moore Centennial Farm.

If you have any questions please contact Amanda Kincaid of my staff at (502)564.7005 Ext. 147.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: ak 47971
cc: Amanda Abner (KYTC-DEA)



5 FEB '16 AM 9:29

MATTHEW G. BEVIN
GOVERNOR

**TOURISM, ARTS AND HERITAGE CABINET
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CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

February 3, 2016

Mr. David M. Waldner, P.E., Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor
Frankfort, KY 40622

Re: A Cultural Historic Eligibility Report for the Reconstruction of KY 30 from US 421 in Jackson County to KY 847 in Owsley County, Kentucky (Palmer Engineering, Jayne Goddard) Item No. 10-279.60

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Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: agk
cc: A. Abner (KYTC-DEA)