



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 0172 Shady Creek

Submitted by

MEC Water Resources

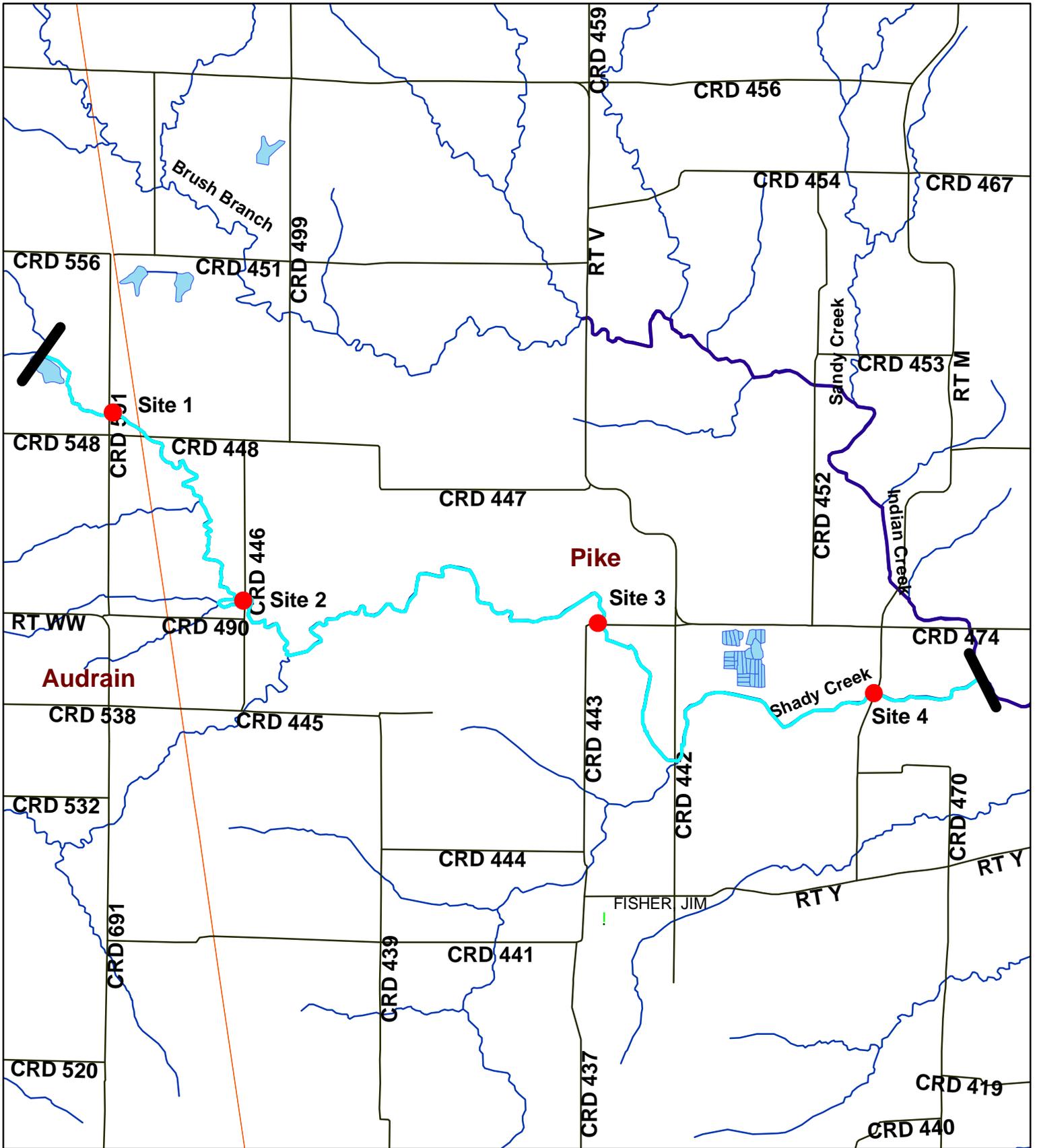
To

Missouri Department of Natural Resources

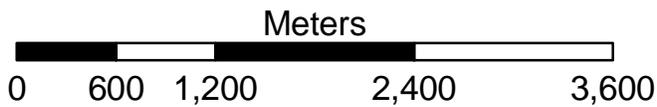
Water Protection Program

On

May 29, 2008



**Shady Creek
WBID 0172
Pike County**



Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

| | |
|---|---|
| Date & Time: 5/19/08 16:20 | Location Description (e.g., road crossing): |
| Stream Name: Shady Creek | County Rd. 591 crossing |
| Current Weather Conditions: sunny and clear | Facility Name(s): Harbison-Walker Refractor |
| Weather Conditions for Past 10 days: 1.15" precipitation | Permit Number(s): MO 0000710 |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--------------------------|---------------------------|---|
| Site 01 | Easting (UTM X): 0635092 | Northing (UTM Y): 4348671 | Horizontal Accuracy: (EPE / FOM / PDOP) 22 feet |
| Site 11 | Easting (UTM X): 0635222 | Northing (UTM Y): 4348579 | Horizontal Accuracy: (EPE / FOM / PDOP) 23 feet |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|---------------|-----------|---------------|-----------|---------------|
| 3074 | upstream | 3075 | downstream | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site # 01

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|--------------------------------------|---|--|--|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: Private property- fields | | | | |

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

| | | | | |
|--|--|--|---|---|
| <input checked="" type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|-----------|-----------|----------|---------|-------------|------------|
| -% Cobble | 5% Gravel | 95% Sand | -% Silt | -% Mud/Clay | -% Bedrock |
|-----------|-----------|----------|---------|-------------|------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|--|
| Abundant benthic algae Sparse grasses |
|--|

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---|--|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input checked="" type="checkbox"/> Scum ¹ | <input type="checkbox"/> Foam | <input type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Shady Creek</u> Waterbody ID: <u>0172</u> Site #: <u>0172_01</u> Estimated Channel Incision: <u>0.10</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>635092</u> UTM Y: <u>4348671</u> +/- <u>22</u> (feet) 11 UTM X: <u>635222</u> UTM Y: <u>4348579</u> +/- <u>23</u> (feet) Average Stream Width: <u>4.0</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>J. Hrabik and R. Martin</u> | Dissolved Oxygen |
| | Date: <u>5/19/2008</u> Time: <u>16:20</u> |
| | Dissolved Oxygen: <u>7.65</u> (mg/L) |
| | Dissolved Oxygen: <u>82.0</u> (% sat) |
| | Specific Cond: <u>417.0</u> (µS/cm) |
| | Water Temperature: <u>18.2</u> (°C) |

Transect Cross-Section

| Station | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.70 | 0.13 | 0.50 | 0.13 | 0.20 | 0.01 | 0.20 | 0.02 | 0.35 | 0.16 | 0.56 | 0.24 | 0.48 | 0.13 | 0.44 | 0.17 | 0.26 | 0.26 | 0.40 | 0.03 | 0.44 | 0.01 |
| 2 | 1.40 | 0.19 | 1.00 | 0.25 | 0.40 | 0.06 | 0.40 | 0.04 | 0.70 | 0.20 | 1.12 | 0.33 | 0.96 | 0.26 | 0.88 | 0.15 | 0.52 | 0.28 | 0.80 | 0.04 | 0.88 | 0.05 |
| 3 | 2.10 | 0.19 | 1.50 | 0.27 | 0.60 | 0.06 | 0.60 | 0.07 | 1.05 | 0.26 | 1.68 | 0.51 | 1.44 | 0.37 | 1.32 | 0.12 | 0.78 | 0.28 | 1.20 | 0.04 | 1.32 | 0.09 |
| 4 | 2.80 | 0.16 | 2.00 | 0.31 | 0.80 | 0.07 | 0.80 | 0.12 | 1.40 | 0.31 | 2.24 | 0.54 | 1.92 | 0.40 | 1.76 | 0.08 | 1.04 | 0.25 | 1.60 | 0.03 | 1.76 | 0.07 |
| 5 | 3.50 | 0.18 | 2.50 | 0.34 | 1.00 | 0.08 | 1.00 | 0.18 | 1.75 | 0.34 | 2.80 | 0.54 | 2.40 | 0.42 | 2.20 | 0.26 | 1.30 | 0.21 | 2.00 | 0.12 | 2.20 | 0.24 |
| 6 | 4.20 | 0.18 | 3.00 | 0.32 | 1.20 | 0.10 | 1.20 | 0.19 | 2.10 | 0.38 | 3.36 | 0.44 | 2.88 | 0.41 | 2.64 | 0.23 | 1.56 | 0.20 | 2.40 | 0.20 | 2.64 | 0.21 |
| 7 | 4.90 | 0.16 | 3.50 | 0.21 | 1.40 | 0.12 | 1.40 | 0.21 | 2.45 | 0.34 | 3.92 | 0.38 | 3.36 | 0.40 | 3.08 | 0.16 | 1.82 | 0.15 | 2.80 | 0.26 | 3.08 | 0.27 |
| 8 | 5.60 | 0.12 | 4.00 | 0.18 | 1.60 | 0.15 | 1.60 | 0.20 | 2.80 | 0.24 | 4.48 | 0.32 | 3.84 | 0.34 | 3.52 | 0.15 | 2.08 | 0.12 | 3.20 | 0.27 | 3.52 | 0.21 |
| 9 | 6.30 | 0.01 | 4.50 | 0.20 | 1.80 | 0.09 | 1.80 | 0.27 | 3.15 | 0.18 | 5.04 | 0.25 | 4.32 | 0.24 | 3.96 | 0.12 | 2.34 | 0.02 | 3.60 | 0.26 | 3.96 | 0.20 |
| Right Bank | 7.00 | 0.00 | 5.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 3.50 | 0.00 | 5.60 | 0.00 | 4.80 | 0.00 | 4.40 | 0.00 | 2.60 | 0.00 | 4.00 | 0.00 | 4.40 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Run | | Run | | Run | | Run | | Pool | | Pool | | Pool | | Pool | | Run | | Run | | Run | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

| | |
|---|--|
| Date & Time: 5/19/08 15:40 | Location Description (e.g., road crossing): County Rd. 446 crossing |
| Stream Name: Shady Creek | |
| Current Weather Conditions: mostly sunny | Facility Name(s): Harbison-Walker Refractor |
| Weather Conditions for Past 10 days: 1.15" precipitation | Permit Number(s): MO 0000710 |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--------------------------|---------------------------|---|
| Site 01 | Easting (UTM X): 0636288 | Northing (UTM Y): 4347002 | Horizontal Accuracy: (EPE / FOM / PDOP) 35 feet |
| Site 11 | Easting (UTM X): 0636303 | Northing (UTM Y): 4346884 | Horizontal Accuracy: (EPE / FOM / PDOP) 21 feet |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|---------------|-----------|---------------|-----------|---------------|
| 3072 | downstream | 3073 | upstream | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site # 02

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|--------------------------------------|---|--|--|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: Private property- fields | | | | |

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

| | | | | |
|--|--|--|---|---|
| <input checked="" type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|-----------|-----------|----------|---------|-------------|------------|
| -% Cobble | 5% Gravel | 95% Sand | -% Silt | -% Mud/Clay | -% Bedrock |
|-----------|-----------|----------|---------|-------------|------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|---------------|
| Benthic algae |
| Grasses |
| Willows |

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---|--|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input checked="" type="checkbox"/> Scum ¹ | <input type="checkbox"/> Foam | <input type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|--|
| Stream Name: <u>Shady Creek</u> Waterbody ID: <u>0172</u> Site #: <u>0172_02</u> Estimated Channel Incision: <u>0.10</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>636288</u> UTM Y: <u>4347002</u> +/- <u>35</u> (feet) 11 UTM X: <u>636303</u> UTM Y: <u>4346884</u> +/- <u>21</u> (feet) Average Stream Width: <u>3.5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>J. Hrabik and R. Martin</u> | Dissolved Oxygen |
| | Date: <u>5/19/2008</u> Time: <u>15:40</u> Dissolved Oxygen: <u>8.72</u> (mg/L) Dissolved Oxygen: <u>94.0</u> (% sat) Specific Cond: <u>383.0</u> (µS/cm) Water Temperature: <u>18.5</u> (°C) |

Transect Cross-Section

| Station | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.30 | 0 | 0 |
| 1 | 0.28 | 0.08 | 0.40 | 0.04 | 0.20 | 0.16 | 0.10 | 0.16 | 0.20 | 0.01 | 0.35 | 0.25 | 0.60 | 0.19 | 0.28 | 0.08 | 0.35 | 0.16 | 0.48 | 0.52 | 0.54 | 0.04 |
| 2 | 0.56 | 0.15 | 0.80 | 0.10 | 0.40 | 0.25 | 0.20 | 0.24 | 0.40 | 0.02 | 0.70 | 0.44 | 1.20 | 0.36 | 0.56 | 0.18 | 0.70 | 0.24 | 0.96 | 0.54 | 1.08 | 0.04 |
| 3 | 0.84 | 0.21 | 1.20 | 0.21 | 0.60 | 0.31 | 0.30 | 0.25 | 0.60 | 0.07 | 1.05 | 0.48 | 1.80 | 0.50 | 0.84 | 0.21 | 1.05 | 0.31 | 1.44 | 0.59 | 1.62 | 0.09 |
| 4 | 1.12 | 0.24 | 1.60 | 0.23 | 0.80 | 0.34 | 0.40 | 0.23 | 0.80 | 0.09 | 1.40 | 0.48 | 2.40 | 0.62 | 1.12 | 0.21 | 1.40 | 0.33 | 1.92 | 0.65 | 2.16 | 0.26 |
| 5 | 1.40 | 0.26 | 2.00 | 0.25 | 1.00 | 0.34 | 0.50 | 0.20 | 1.00 | 0.12 | 1.75 | 0.51 | 3.00 | 0.69 | 1.40 | 0.25 | 1.75 | 0.34 | 2.40 | 0.62 | 2.70 | 0.27 |
| 6 | 1.68 | 0.26 | 2.40 | 0.31 | 1.20 | 0.34 | 0.60 | 0.18 | 1.20 | 0.15 | 2.10 | 0.51 | 3.60 | 0.64 | 1.68 | 0.21 | 2.10 | 0.34 | 2.88 | 0.56 | 3.24 | 0.27 |
| 7 | 1.96 | 0.31 | 2.80 | 0.36 | 1.40 | 0.32 | 0.70 | 0.13 | 1.40 | 0.16 | 2.45 | 0.52 | 4.20 | 0.52 | 1.96 | 0.18 | 2.45 | 0.32 | 3.36 | 0.46 | 3.78 | 0.22 |
| 8 | 2.24 | 0.31 | 3.20 | 0.40 | 1.60 | 0.27 | 0.80 | 0.07 | 1.60 | 0.19 | 2.80 | 0.46 | 4.80 | 0.33 | 2.24 | 0.11 | 2.80 | 0.28 | 3.84 | 0.28 | 4.32 | 0.19 |
| 9 | 2.52 | 0.30 | 3.60 | 0.21 | 1.80 | 0.18 | 0.90 | 0.02 | 1.80 | 0.10 | 3.15 | 0.37 | 5.40 | 0.25 | 2.52 | 0.01 | 3.15 | 0.23 | 4.32 | 0.21 | 4.86 | 0.08 |
| Right Bank | 2.80 | 0.00 | 4.00 | 0.00 | 2.00 | 0.00 | 1.00 | 0.00 | 2.00 | 0.00 | 3.50 | 0.00 | 6.00 | 0.00 | 2.80 | 0.00 | 3.50 | 0.00 | 4.80 | 0.00 | 5.40 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Pool | | Pool | | Run | | Run | | Riffle | | Pool | | Pool | | Run | | Run | | Pool | | Pool | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
(must be completed for each site)

| | |
|---|--|
| Date & Time: 5/19/08 13:45 | Location Description (e.g., road crossing): County Rd. 443 crossing |
| Stream Name: Shady Creek | |
| Current Weather Conditions: partly cloudy | Facility Name(s): Harbison-Walker Refractor |
| Weather Conditions for Past 10 days: 1.15" precipitation | Permit Number(s): MO 0000710 |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--------------------------|---------------------------|---|
| Site 01 | Easting (UTM X): 0639478 | Northing (UTM Y): 4346746 | Horizontal Accuracy: (EPE / FOM / PDOP) 16 feet |
| Site 11 | Easting (UTM X): 0639573 | Northing (UTM Y): 4346601 | Horizontal Accuracy: (EPE / FOM / PDOP) 15 feet |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|-------------------------------------|-----------|---------------|-----------|---------------|
| 3067 | Upstream- fence- low water crossing | 3068 | downstream | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site # 03

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|---|---|--|--|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input checked="" type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: Private property | | | | |

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

| | | | | |
|--|--|--|---|---|
| <input checked="" type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|------------|------------|----------|---------|-------------|-------------|
| 20% Cobble | 40% Gravel | 10% Sand | -% Silt | -% Mud/Clay | 30% Bedrock |
|------------|------------|----------|---------|-------------|-------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|---------------|
| Smartweed |
| Benthic algae |
| |

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---------------------------------|---|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input checked="" type="checkbox"/> Foam ¹ | <input type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 03

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Log jam between Transects 2 and 3

1- only by log jam

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: Jennifer Hrabik and Renee Martin

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Shady Creek</u> Waterbody ID: <u>0172</u> Site #: <u>0172_03</u> Estimated Channel Incision: <u>0.10</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>639478</u> UTM Y: <u>4346746</u> +/- <u>16</u> (feet) 11 UTM X: <u>639573</u> UTM Y: <u>4346601</u> +/- <u>15</u> (feet) Average Stream Width: <u>6.0</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>J. Hrabik and R. Martin</u> | Dissolved Oxygen Date: <u>5/19/2008</u> Time: <u>13:45</u> Dissolved Oxygen: <u>12.48</u> (mg/L) Dissolved Oxygen: <u>130.0</u> (% sat) Specific Cond: <u>348.0</u> (µS/cm) Water Temperature: <u>17.3</u> (°C) |
|---|---|

Transect Cross-Section

| Station | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.74 | 0.15 | 0.85 | 0.10 | 0.30 | 0.09 | 0.73 | 0.13 | 0.64 | 0.27 | 0.54 | 0.15 | 0.60 | 0.08 | 0.50 | 0.04 | 0.35 | 0.04 | 0.40 | 0.15 | 0.77 | 0.02 |
| 2 | 1.48 | 0.17 | 1.70 | 0.19 | 0.60 | 0.07 | 1.46 | 0.25 | 1.28 | 0.30 | 1.08 | 0.25 | 1.20 | 0.25 | 1.00 | 0.04 | 0.70 | 0.10 | 0.80 | 0.25 | 1.54 | 0.08 |
| 3 | 2.22 | 0.19 | 2.55 | 0.10 | 0.90 | 0.08 | 2.19 | 0.32 | 1.92 | 0.33 | 1.62 | 0.27 | 1.80 | 0.40 | 1.50 | 0.08 | 1.05 | 0.16 | 1.20 | 0.24 | 2.31 | 0.08 |
| 4 | 2.96 | 0.33 | 3.40 | 0.08 | 1.20 | 0.08 | 2.92 | 0.42 | 2.56 | 0.33 | 2.16 | 0.27 | 2.40 | 0.51 | 2.00 | 0.04 | 1.40 | 0.17 | 1.60 | 0.33 | 3.08 | 0.27 |
| 5 | 3.70 | 0.28 | 4.25 | 0.12 | 1.50 | 0.01 | 3.65 | 0.44 | 3.20 | 0.33 | 2.70 | 0.32 | 3.00 | 0.44 | 2.50 | 0.05 | 1.75 | 0.09 | 2.00 | 0.26 | 3.85 | 0.36 |
| 6 | 4.44 | 0.39 | 5.10 | 0.08 | 1.80 | 0.05 | 4.38 | 0.43 | 3.84 | 0.30 | 3.24 | 0.36 | 3.60 | 0.46 | 3.00 | 0.05 | 2.10 | 0.16 | 2.40 | 0.24 | 4.62 | 0.37 |
| 7 | 5.18 | 0.52 | 5.95 | 0.13 | 2.10 | 0.04 | 5.11 | 0.41 | 4.48 | 0.27 | 3.78 | 0.36 | 4.20 | 0.51 | 3.50 | 0.06 | 2.45 | 0.12 | 2.80 | 0.20 | 5.39 | 0.30 |
| 8 | 5.92 | 0.42 | 6.80 | 0.06 | 2.40 | 0.05 | 5.84 | 0.33 | 5.12 | 0.26 | 4.32 | 0.42 | 4.80 | 0.43 | 4.00 | 0.08 | 2.80 | 0.06 | 3.20 | 0.23 | 6.16 | 0.28 |
| 9 | 6.66 | 0.26 | 7.65 | 0.03 | 2.70 | 0.02 | 6.57 | 0.16 | 5.76 | 0.26 | 4.86 | 0.40 | 5.40 | 0.50 | 4.50 | 0.07 | 3.15 | 0.02 | 3.60 | 0.07 | 6.93 | 0.10 |
| Right Bank | 7.40 | 0.00 | 8.50 | 0.00 | 3.00 | 0.00 | 7.30 | 0.00 | 6.40 | 0.00 | 5.40 | 0.00 | 6.00 | 0.00 | 5.00 | 0.00 | 3.50 | 0.00 | 4.00 | 0.00 | 7.70 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Run | | Run | | Riffle | | Run | | Run | | Run | | Pool | | Riffle | | Riffle | | Run | | Run | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
(must be completed for each site)

| | |
|---|---|
| Date & Time: 5/19/08 14:40 | Location Description (e.g., road crossing): |
| Stream Name: Shady Creek | Rt. M crossing |
| Current Weather Conditions: mostly sunny | Facility Name(s): Harbison-Walker Refractor |
| Weather Conditions for Past 10 days: 1.15" precipitation | Permit Number(s): MO 0000710 |
| Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--------------------------|---------------------------|---|
| Site 01 | Easting (UTM X): 0641965 | Northing (UTM Y): 4346152 | Horizontal Accuracy: (EPE / FOM / PDOP) 20 feet |
| Site 11 | Easting (UTM X): 0642105 | Northing (UTM Y): 4346070 | Horizontal Accuracy: (EPE / FOM / PDOP) 18 feet |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|---------------|-----------|---------------|-----------|---------------|
| 3069 | downstream | 3070 | downstream | 3071 | upstream |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site # 04

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|---|---|---|--|--|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input checked="" type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: Private property- sheep farm on right side (south) of stream | | | | |

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

| | | | | |
|--|--|--|---|---|
| <input checked="" type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|-----------|------------|----------|---------|-------------|------------|
| 5% Cobble | 10% Gravel | 85% Sand | -% Silt | -% Mud/Clay | -% Bedrock |
|-----------|------------|----------|---------|-------------|------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|---------------|
| Benthic algae |
| |

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---------------------------------|--|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 04

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Sign on Rt. M states South Indian Creek on the south side of the stream and the sign on the north side of the stream says Indian Creek. According to the atlas, GPS, and ArcGIS this is Shady Creek.

Log jam at Transects 6 and 7

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: Jennifer Hrabik and Renee Martin

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Shady Creek</u> Waterbody ID: <u>0172</u> Site #: <u>0172_04</u> Estimated Channel Incision: <u>0.10</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>641965</u> UTM Y: <u>4346152</u> +/- <u>20</u> (feet) 11 UTM X: <u>642105</u> UTM Y: <u>4346070</u> +/- <u>18</u> (feet) Average Stream Width: <u>6.5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>J. Hrabik and R. Martin</u> | Dissolved Oxygen Date: <u>5/19/2008</u> Time: <u>14:40</u> Dissolved Oxygen: <u>12.50</u> (mg/L) Dissolved Oxygen: <u>134.6</u> (% sat) Specific Cond: <u>627.0</u> (µS/cm) Water Temperature: <u>18.8</u> (°C) |
|---|---|

Transect Cross-Section

| Station | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.48 | 0.03 | 0.45 | 0.08 | 0.40 | 0.12 | 0.48 | 0.20 | 1.00 | 0.04 | 1.20 | 0.56 | 0.68 | 0.13 | 0.90 | 0.27 | 0.74 | 0.41 | 0.45 | 0.23 | 0.41 | 0.01 |
| 2 | 0.96 | 0.06 | 0.90 | 0.08 | 0.80 | 0.16 | 0.96 | 0.28 | 2.00 | 0.19 | 2.40 | 0.43 | 1.36 | 0.18 | 1.80 | 0.32 | 1.48 | 0.47 | 0.90 | 0.34 | 0.82 | 0.02 |
| 3 | 1.44 | 0.02 | 1.35 | 0.12 | 1.20 | 0.12 | 1.44 | 0.27 | 3.00 | 0.24 | 3.60 | 0.24 | 2.04 | 0.18 | 2.70 | 0.36 | 2.22 | 0.44 | 1.35 | 0.44 | 1.23 | 0.08 |
| 4 | 1.92 | 0.06 | 1.80 | 0.17 | 1.60 | 0.09 | 1.92 | 0.34 | 4.00 | 0.21 | 4.80 | 0.12 | 2.72 | 0.19 | 3.60 | 0.46 | 2.96 | 0.55 | 1.80 | 0.46 | 1.64 | 0.09 |
| 5 | 2.40 | 0.06 | 2.25 | 0.16 | 2.00 | 0.03 | 2.40 | 0.27 | 5.00 | 0.21 | 6.00 | 0.04 | 3.40 | 0.24 | 4.50 | 0.64 | 3.70 | 0.51 | 2.25 | 0.51 | 2.05 | 0.09 |
| 6 | 2.88 | 0.07 | 2.70 | 0.22 | 2.40 | 0.01 | 2.88 | 0.24 | 6.00 | 0.18 | 7.20 | 0.01 | 4.08 | 0.25 | 5.40 | 0.58 | 4.44 | 0.41 | 2.70 | 0.43 | 2.46 | 0.10 |
| 7 | 3.36 | 0.04 | 3.15 | 0.37 | 2.80 | 0.03 | 3.36 | 0.17 | 7.00 | 0.18 | 8.40 | 0.15 | 4.76 | 0.12 | 6.30 | 0.64 | 5.18 | 0.39 | 3.15 | 0.32 | 2.87 | 0.08 |
| 8 | 3.84 | 0.06 | 3.60 | 0.36 | 3.20 | 0.03 | 3.84 | 0.17 | 8.00 | 0.20 | 9.60 | 0.25 | 5.44 | 0.10 | 7.20 | 0.60 | 5.92 | 0.27 | 3.60 | 0.30 | 3.28 | 0.06 |
| 9 | 4.32 | 0.09 | 4.05 | 0.19 | 3.60 | 0.03 | 4.32 | 0.10 | 9.00 | 0.20 | 10.80 | 0.19 | 6.12 | 0.14 | 8.10 | 0.42 | 6.66 | 0.21 | 4.05 | 0.21 | 3.69 | 0.02 |
| Right Bank | 4.80 | 0.00 | 4.50 | 0.00 | 4.00 | 0.00 | 4.80 | 0.00 | 10.00 | 0.00 | 12.00 | 0.00 | 6.80 | 0.00 | 9.00 | 0.00 | 7.40 | 0.00 | 4.50 | 0.00 | 4.10 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Riffle | | Run | | Riffle | | Run | | Pool | | Pool | | Pool | | Run | | Pool | | Run | | Riffle | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____



AES

WBID#0172

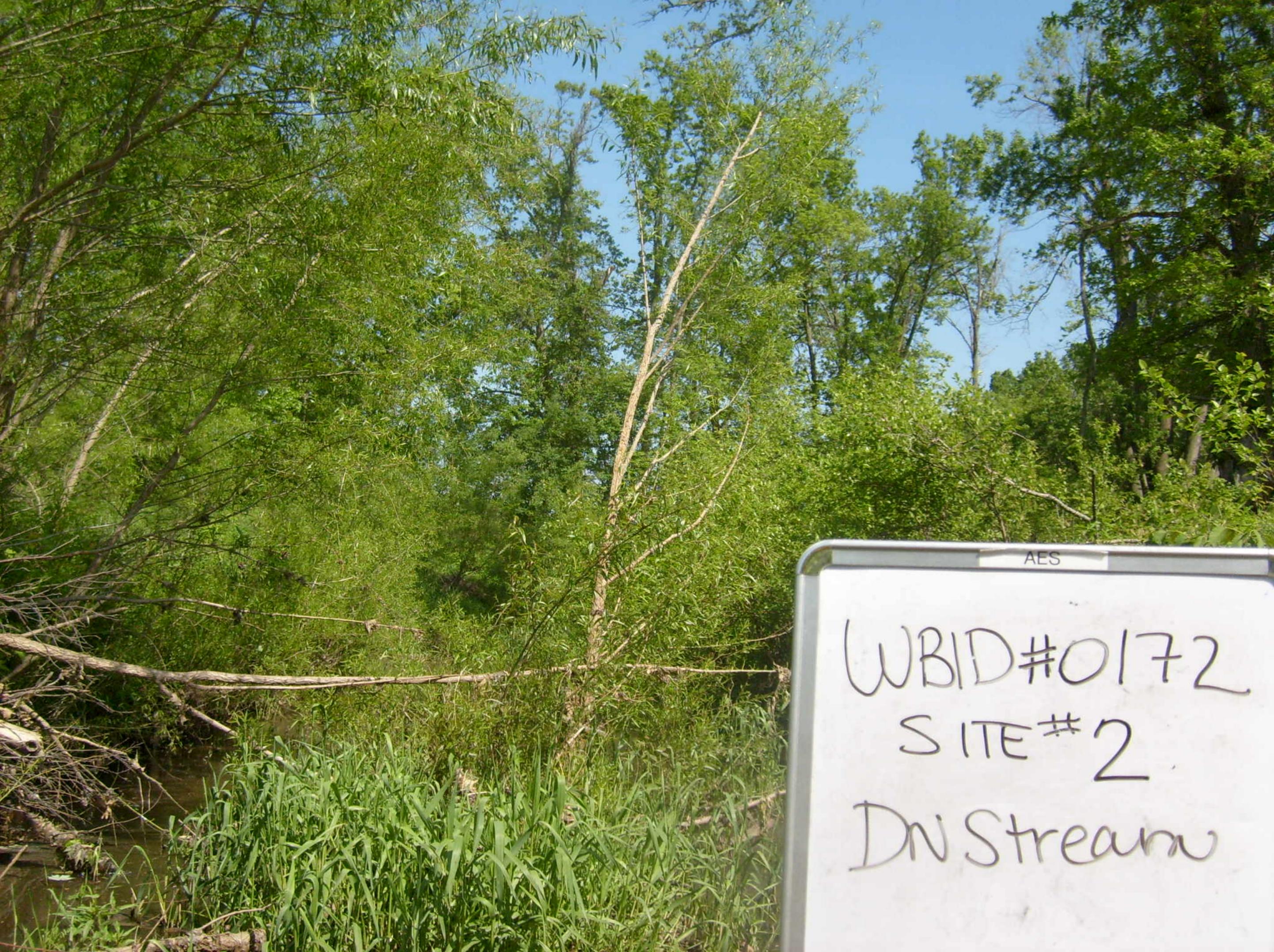
SITE#1

Upstream



AES

WBID#0172
SITE#1
DNStream



AES

WBID#0172

SITE#2

DN Stream

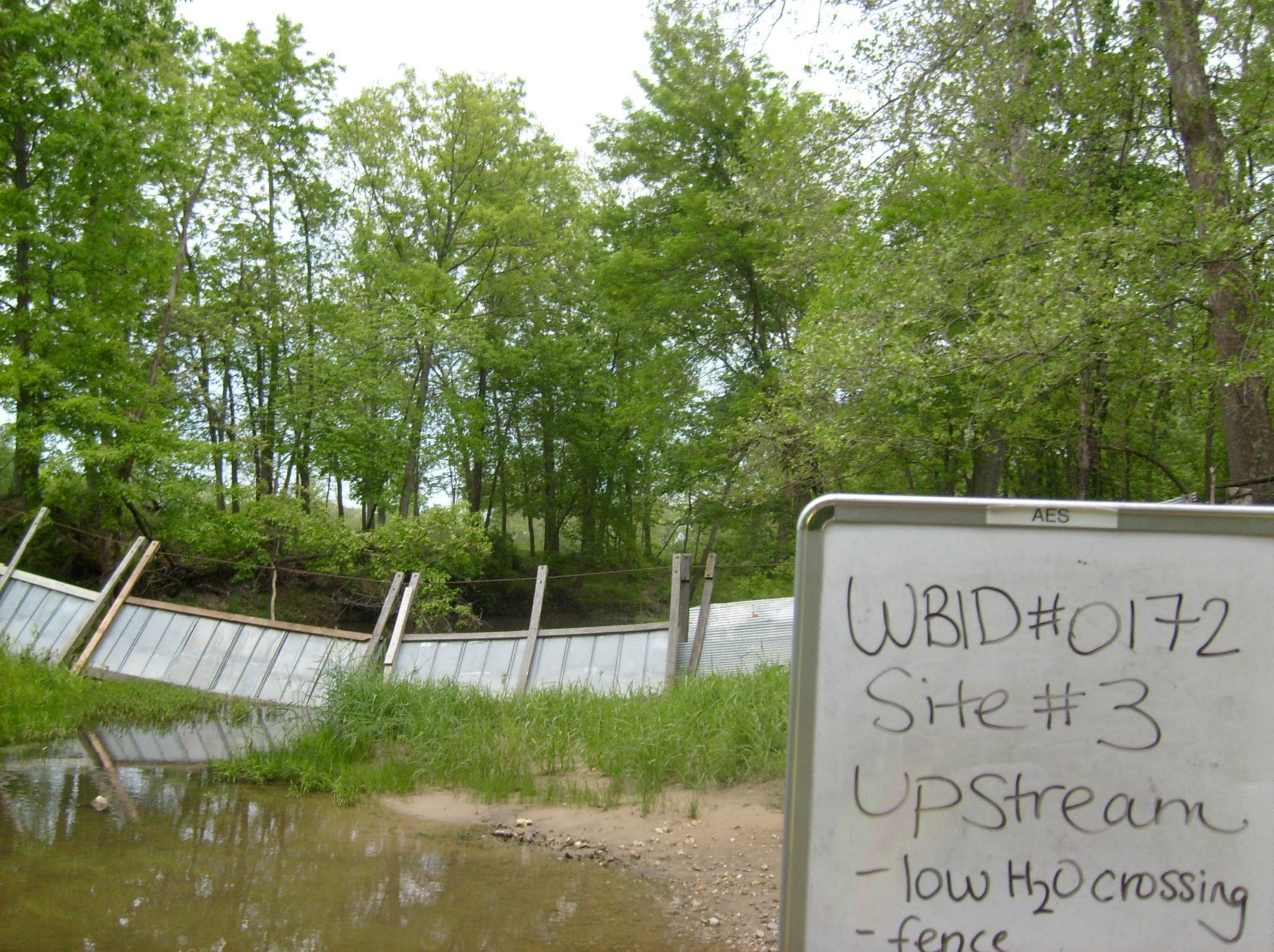
AES

WBID#0172

SITE#2

Up Stream





AES

WBID#0172

Site #3

Upstream

- low H₂O crossing

- fence

AES

WBID#0172

Site #3

DN Stream



AES

WBID#0172

SITE# 4

DN STREAM



AES

WBID#0172
SITE# 4
DN STREAM



AES

WBID#0172

SITE# 4

UP STREAM