



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 1120 Little Deer Creek

Submitted by
Olsson Associates

To
Missouri Department of Natural Resources
Water Protection Program

On
October 14, 2008

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A – Water Body Identification

I. Water Body Information (for water body being surveyed)

Water Body Name (from USGS 7.5' quad): L. Deer Cr.
Missouri Water Body Identification (WBID) Number: 1120
8-digit HUC: 10290109
County(ies), Listed Upstream to Downstream: Benton
Upstream Legal Description (from Table H): 01, 38N, 21
Downstream Legal Description (from Table H): Mouth
Number of sites evaluated: 4
List all site numbers, <u>consecutively upstream to downstream</u> : 1, 2, 3, 4
Include a Site Location Map(s). The map must include all requirements detailed in the <i>Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol</i> (Section IV.D.8.a).

II. Facility Information (list all permitted discharges to this water body segment)

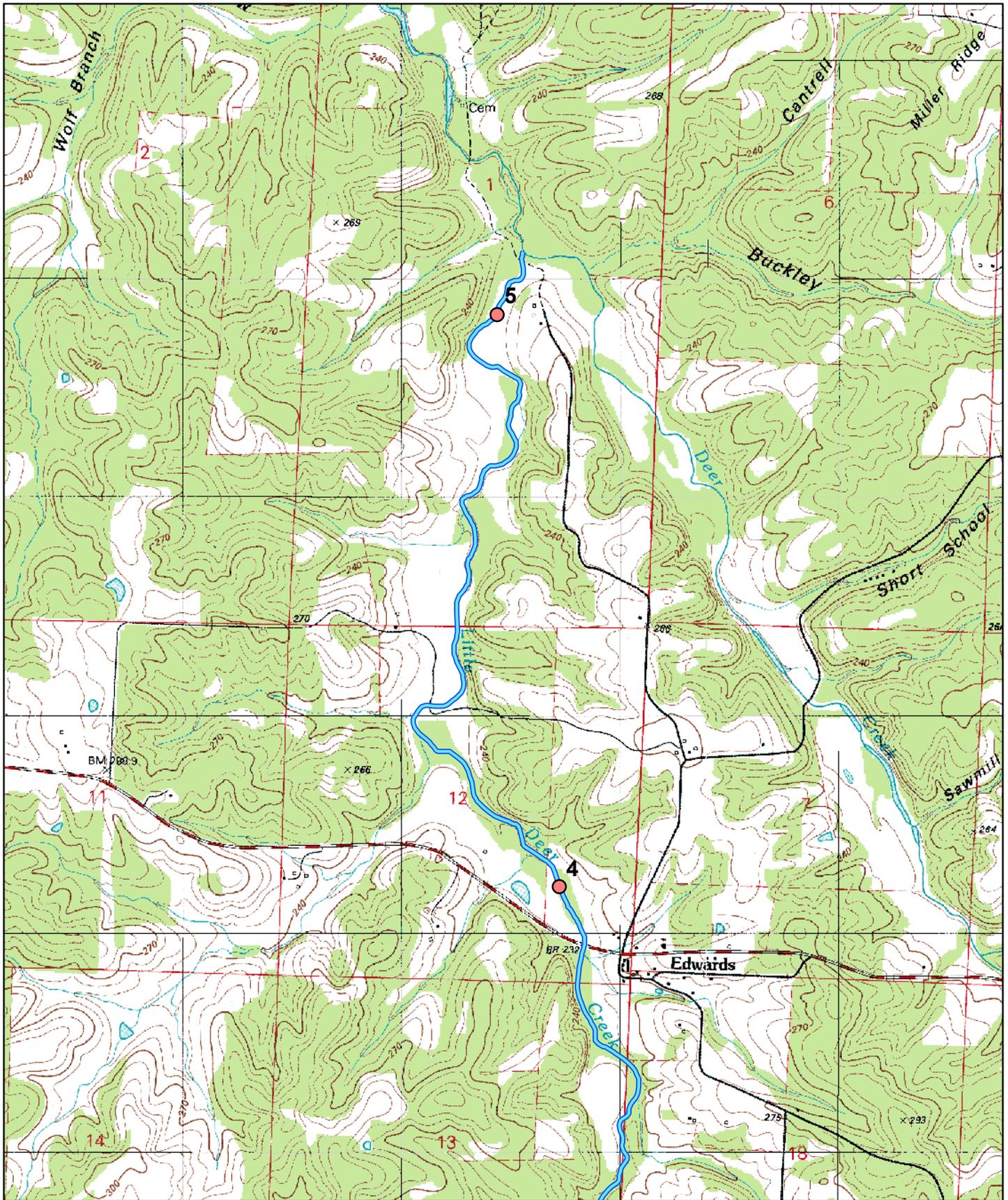
Facility Name(s) and Permit Number(s): The Ranch MO 0131202
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III. UAA Surveyor (please **PRINT** legibly)

Name of Surveyor: Eric Hertzler	Telephone Number: 417-890-8802
Organization/Employer: Olsson Associates	

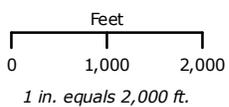
Please verify that you have completed all sections of all data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.

Signed:  **Date:** 08-22-8



L. Deer Cr. 2/3

**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**

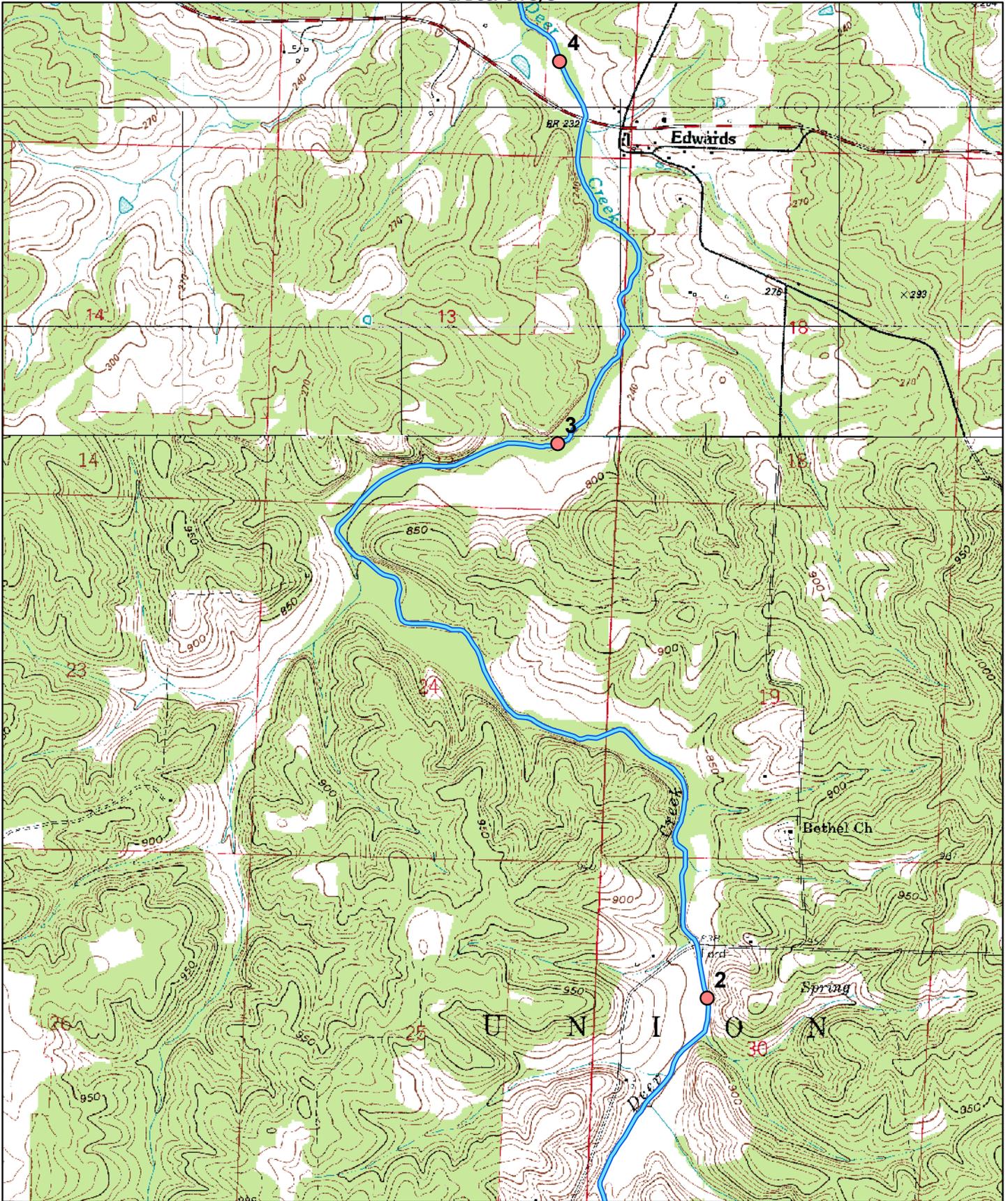


Stream: L. Deer Cr.
WBID: 1120

Map Sheet: 3/3
County: Benton



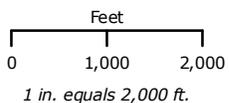
Project No. 008-1298



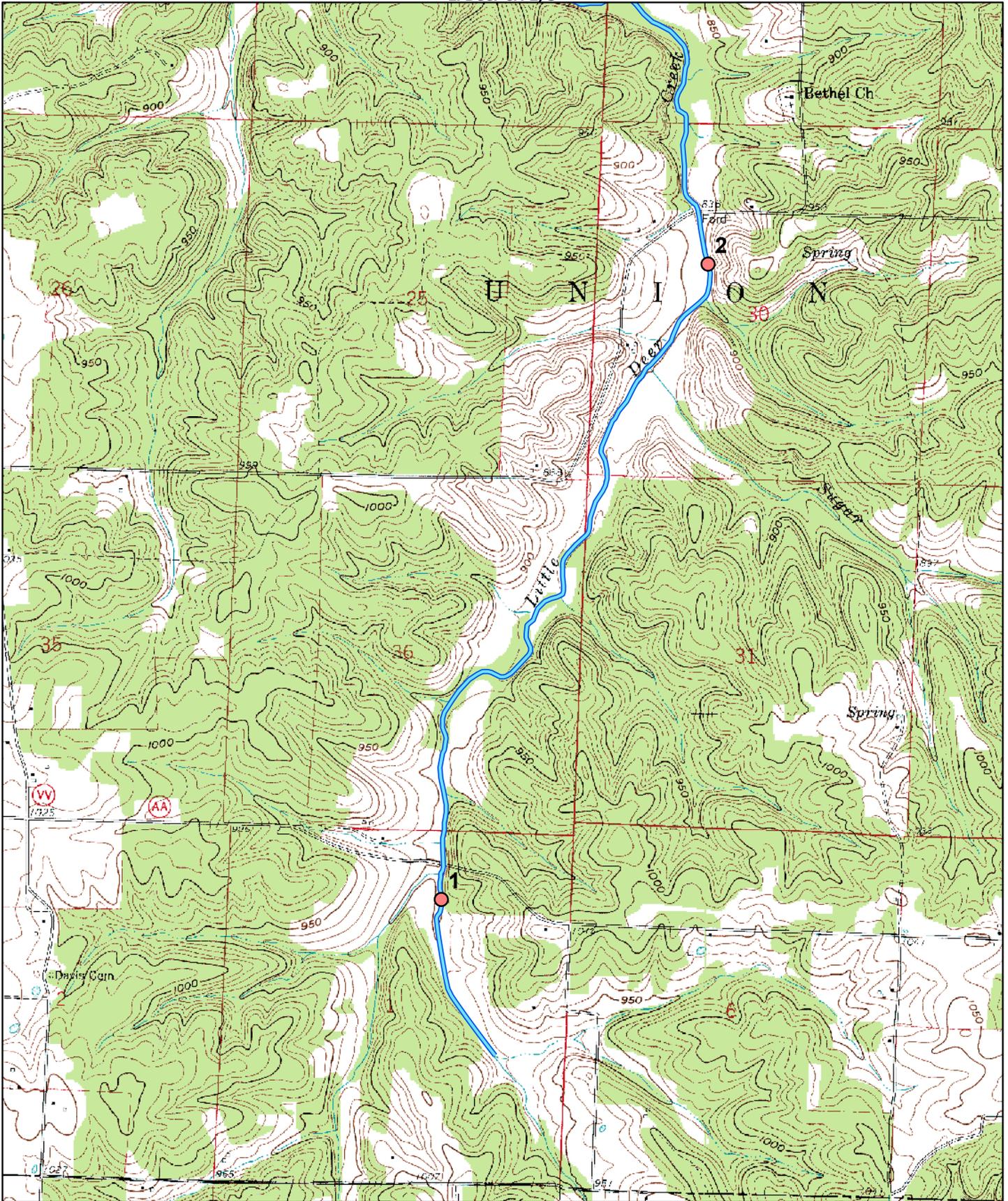
MISSOURI RECREATIONAL USE ATTAINABILITY ANALYSIS

Stream: L. Deer Cr.
WBID: 1120

Map Sheet: 2/3
County: Benton



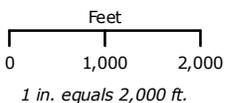
Project No. 008-1298



**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**

Stream: L. Deer Cr.
WBID: 1120

Map Sheet: 1/3
County: Benton



Project No. 008-1298

WBID # 1120

Site # 1

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: 08-20-08 3:02 p.m.	Location Description (e.g., road crossing):
Stream Name: L. Deer Cr.	Upstream of Hwy AA Bridge
Current Weather Conditions: cloudy	Facility Name(s): The Ranch
Weather Conditions for Past 10 days: 0.17" @ Osage Beach	Permit Number(s): MO:0131202
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): 484164	Northing (UTM Y): 4214230	Horizontal Accuracy: (EPE / FOM / PDOP)	58 ft. Meters
Site 11	Easting (UTM X): 484166	Northing (UTM Y): 4214371	Horizontal Accuracy: (EPE / FOM / PDOP)	52 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-1-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-1-B	Downstream looking up				
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 # 1

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 checked="" 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				

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:			
Hwy AA Bridge @ downstream end of transect.				

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

NONE

Water Characteristics*: (Mark all that apply.)

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

*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 # 1

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.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-20-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u> L. Deer Cr. </u> Waterbody ID: <u> 1120 </u> Site #: <u> 1 </u> Estimated Channel Incision: <u> 0.4 </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> 484164 </u> UTM Y: <u> 4214230 </u> +/- <u> 58 </u> ft. (meters) 11 UTM X: <u> 484166 </u> UTM Y: <u> 4214371 </u> +/- <u> 52 </u> ft. (meters) Average Stream Width: <u> 6 </u> (meters) Length of Survey Segment: <u> 150 </u> meters (To determine Length of Reach) (20x average stream width) Field Staff: <u> Eric Hertzler / Austin Lohkamp </u>	<p align="center">Dissolved Oxygen</p> Date: <u> 8/20/2008 </u> Time: <u> 3:05 p.m. </u> Dissolved Oxygen: <u> 0 </u> (mg/L) Dissolved Oxygen: <u> 0 </u> (% sat) Specific Cond: <u> 0 </u> (µS/cm) Water Temperature: <u> 0 </u> (°C) <p align="center">DRY*</p>
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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	0.71	0.00	0.56	0.00	0.46	0.00	0.40	0.00	0.82	0.00	0.63	0.00	0.78	0.00	0.52	0.00	0.47	0.00	0.52	0.00	0.84	0.00
2	1.42	0.00	1.12	0.00	0.92	0.00	0.80	0.00	1.64	0.00	1.26	0.00	1.56	0.00	1.04	0.00	0.94	0.00	1.04	0.00	1.68	0.00
3	2.13	0.00	1.68	0.00	1.38	0.00	1.20	0.00	2.46	0.00	1.89	0.00	2.34	0.00	1.56	0.00	1.41	0.00	1.56	0.00	2.52	0.00
4	2.84	0.00	2.24	0.00	1.84	0.00	1.60	0.00	3.28	0.00	2.52	0.00	3.12	0.00	2.08	0.00	1.88	0.00	2.08	0.00	3.36	0.00
5	3.55	0.00	2.80	0.00	2.30	0.00	2.00	0.00	4.10	0.00	3.15	0.00	3.90	0.00	2.60	0.00	2.35	0.00	2.60	0.00	4.20	0.00
6	4.26	0.00	3.36	0.00	2.76	0.00	2.40	0.00	4.92	0.00	3.78	0.00	4.68	0.00	3.12	0.00	2.82	0.00	3.12	0.00	5.04	0.00
7	4.97	0.00	3.92	0.00	3.22	0.00	2.80	0.00	5.74	0.00	4.41	0.00	5.46	0.00	3.64	0.00	3.29	0.00	3.64	0.00	5.88	0.00
8	5.68	0.00	4.48	0.00	3.68	0.00	3.20	0.00	6.56	0.00	5.04	0.00	6.24	0.00	4.16	0.00	3.76	0.00	4.16	0.00	6.72	0.00
9	6.39	0.00	5.04	0.00	4.14	0.00	3.60	0.00	7.38	0.00	5.67	0.00	7.02	0.00	4.68	0.00	4.23	0.00	4.68	0.00	7.56	0.00
Right Bank	7.10	0.00	5.60	0.00	4.60	0.00	4.00	0.00	8.20	0.00	6.30	0.00	7.80	0.00	5.20	0.00	4.70	0.00	5.20	0.00	8.40	0.00
Feature Type <small>(riffle, run, or pool)</small>	DRY																					

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.

MAXIMUM 0.00
MEDIAN 0.00

Surveyor's Signature:



WBID # 1120

Site # 2

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: 08-20-08 1:45 p.m.	Location Description (e.g., road crossing): Indian Creek Road Bridge Crossing
Stream Name: L. Deer Cr.	
Current Weather Conditions: cloudy	Facility Name(s): The Ranch
Weather Conditions for Past 10 days: 0.17" @ Osage Beach	Permit Number(s): MO 0131202
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): 485371	Northing (UTM Y): 4217131	Horizontal Accuracy: (EPE / FOM / PDOP) 76 ft. Meters
Site 11	Easting (UTM X): 485345	Northing (UTM Y): 4217372	Horizontal Accuracy: (EPE / FOM / PDOP) 60 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-2-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-2-B	Downstream looking up				
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 # 2

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 checked="" 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				

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: Bridge @downstream end of transect			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Very little moss on rocks

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 type="checkbox"/> Fine sediments	<input checked="" 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 # 2

Field Data Sheets for Recreational Use Stream Surveys

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

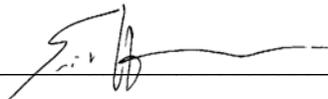
Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

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

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-20-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u> L. Deer Cr. </u> Waterbody ID: <u> 1120 </u> Site #: <u> 2 </u> Estimated Channel Incision: <u> 0.15 </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> 485371 </u> UTM Y: <u> 4217131 </u> +/- <u> 76 ft. </u> (meters) 11 UTM X: <u> 485345 </u> UTM Y: <u> 4217372 </u> +/- <u> 66 ft. </u> (meters) Average Stream Width: <u> 4.5 </u> (meters) Length of Survey Segment: <u> 150 </u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u> Eric Hertzler / Austin Lohkamp </u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u> 8/20/2008 </u> Time: <u> 1:47 p.m. </u> Dissolved Oxygen: <u> 6.62 </u> (mg/L) Dissolved Oxygen: <u> 76.1 </u> (% sat) Specific Cond: <u> 438 </u> (µS/cm) Water Temperature: <u> 23.2 </u> (°C)
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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	
	1	0.53	0.09	0.39	0.05	0.37	0.05	0.53	0.05	0.51	0.05	0.23	0.05	0.33	0.05	0.42	0.05	0.19	0.09	0.26	0.05	0.38	0.05
	2	1.06	0.20	0.78	0.05	0.74	0.05	1.06	0.05	1.02	0.05	0.46	0.05	0.66	0.05	0.84	0.05	0.38	0.16	0.52	0.05	0.76	0.09
	3	1.59	0.25	1.17	0.05	1.11	0.07	1.59	0.05	1.53	0.06	0.69	0.05	0.99	0.05	1.26	0.05	0.57	0.23	0.78	0.05	1.14	0.16
	4	2.12	0.15	1.56	0.06	1.48	0.15	2.12	0.05	2.04	0.17	0.92	0.05	1.32	0.06	1.68	0.09	0.76	0.20	1.04	0.05	1.52	0.25
	5	2.65	0.27	1.95	0.08	1.85	0.22	2.65	0.05	2.55	0.20	1.15	0.05	1.65	0.08	2.10	0.13	0.95	0.18	1.30	0.05	1.90	0.21
	6	3.18	0.23	2.34	0.05	2.22	0.19	3.18	0.18	3.06	0.22	1.38	0.05	1.98	0.05	2.52	0.14	1.14	0.13	1.56	0.05	2.28	0.20
	7	3.71	0.20	2.73	0.05	2.59	0.20	3.71	0.12	3.57	0.20	1.61	0.11	2.31	0.05	2.94	0.12	1.33	0.09	1.82	0.05	2.66	0.13
	8	4.24	0.19	3.12	0.05	2.96	0.13	4.24	0.09	4.08	0.15	1.84	0.07	2.64	0.05	3.36	0.07	1.52	0.05	2.08	0.05	3.04	0.09
	9	4.77	0.08	3.51	0.05	3.33	0.05	4.77	0.05	4.59	0.05	2.07	0.05	2.97	0.05	3.78	0.05	1.71	0.05	2.34	0.05	3.42	0.05
Right Bank		5.30	0.00	3.90	0.00	3.70	0.00	5.30	0.00	5.10	0.00	2.30	0.00	3.30	0.00	4.20	0.00	1.90	0.00	2.60	0.00	3.80	0.00
Feature Type <small>(riffle, run, or pool)</small>		Run		Run		Run		Run		Run		Run		Run		Run		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.

MAXIMUM 0.27

MEDIAN 0.06

Surveyor's Signature: _____

Date: 8/20/2008

WBID # 1120

Site # 3

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: 08-21-08 9:30 a.m.	Location Description (e.g., road crossing):
Stream Name: L. Deer Cr.	Downstream from Indian Creek Bridge crossing
Current Weather Conditions: sunny	Facility Name(s): The Ranch
Weather Conditions for Past 10 days: 0.17" @ Osage Beach	Permit Number(s): MO: 0131202
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): 485296	Northing (UTM Y): 4217802	Horizontal Accuracy: (EPE / FOM / PDOP)	56 ft. Meters
Site 11	Easting (UTM X): 485235	Northing (UTM Y): 4217896	Horizontal Accuracy: (EPE / FOM / PDOP)	127 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-3-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-3-B	Downstream looking up				
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 # 3

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: NONE				

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

<input 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 checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Very little moss on rocks

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 type="checkbox"/> Fine sediments	<input checked="" 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 # 3

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.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-21-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u> L. Deer Cr. </u> Waterbody ID: <u> 1120 </u> Site #: <u> 3 </u> Estimated Channel Incision: <u> 0.45 </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> 485296 </u> UTM Y: <u> 4217802 </u> +/- <u> 56 ft. </u> (meters) 11 UTM X: <u> 485235 </u> UTM Y: <u> 4217896 </u> +/- <u> 127 ft. </u> (meters) Average Stream Width: <u> 4.5 </u> (meters) Length of Survey Segment: <u> 150 </u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u> Eric Hertzler / Austin Lohkamp </u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u> 8/21/2008 </u> Time: <u> 9:32 a.m. </u> Dissolved Oxygen: <u> 4.08 </u> (mg/L) Dissolved Oxygen: <u> 40.2 </u> (% sat) Specific Cond: <u> 430 </u> (µS/cm) Water Temperature: <u> 22.2 </u> (°C)
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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	
	1	0.63	0.05	0.62	0.05	0.40	0.07	0.36	0.07	0.31	0.13	0.63	0.09	0.21	0.05	0.31	0.05	0.39	0.05	0.37	0.05	0.40	0.25
	2	1.26	0.05	1.24	0.13	0.80	0.12	0.72	0.31	0.62	0.26	1.26	0.25	0.42	0.05	0.62	0.05	0.78	0.05	0.74	0.05	0.80	0.22
	3	1.89	0.23	1.86	0.12	1.20	0.19	1.08	0.33	0.93	0.29	1.89	0.29	0.63	0.05	0.93	0.05	1.17	0.05	1.11	0.05	1.20	0.24
	4	2.52	0.17	2.48	0.17	1.60	0.13	1.44	0.38	1.24	0.31	2.52	0.28	0.84	0.05	1.24	0.05	1.56	0.05	1.48	0.06	1.60	0.16
	5	3.15	0.09	3.10	0.18	2.00	0.06	1.80	0.39	1.55	0.28	3.15	0.32	1.05	0.05	1.55	0.05	1.95	0.05	1.85	0.05	2.00	0.14
	6	3.78	0.06	3.72	0.14	2.40	0.07	2.16	0.41	1.86	0.27	3.78	0.31	1.26	0.05	1.86	0.05	2.34	0.05	2.22	0.08	2.40	0.10
	7	4.41	0.12	4.34	0.13	2.80	0.07	2.52	0.42	2.17	0.32	4.41	0.34	1.47	0.05	2.17	0.05	2.73	0.05	2.59	0.05	2.80	0.19
	8	5.04	0.21	4.96	0.05	3.20	0.11	2.88	0.36	2.48	0.24	5.04	0.32	1.68	0.05	2.48	0.05	3.12	0.05	2.96	0.05	3.20	0.11
9	5.67	0.26	5.58	0.05	3.60	0.05	3.24	0.31	2.79	0.21	5.67	0.30	1.89	0.05	2.79	0.05	3.51	0.05	3.33	0.05	3.60	0.05	
Right Bank		6.30	0.00	6.20	0.00	4.00	0.00	3.60	0.00	3.10	0.00	6.30	0.00	2.10	0.00	3.10	0.00	3.90	0.00	3.70	0.00	4.00	0.00
Feature Type		Run		Run		Run		Run		Run		Run		Riffle		Riffle		Riffle		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.

MAXIMUM 0.42

MEDIAN 0.07

Surveyor's Signature: _____



Date: 8/21/2008

WBID # 1120

Site # 4

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: 09-02-08 2:20 p.m.	Location Description (e.g., road crossing):
Stream Name: Little Deer Cr.	Upstream of Hwy 7 Bridge (1) Edwards
Current Weather Conditions: sunny	Facility Name(s): The Ranch
Weather Conditions for Past 10 days: 0.17" @ Osage Beach	Permit Number(s):10290109
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): 484871	Northing (UTM Y): 4220724	Horizontal Accuracy: (EPE / FOM / PDOP) 79 ft. Meters
Site 11	Easting (UTM X): 484842	Northing (UTM Y): 4220838	Horizontal Accuracy: (EPE / FOM / PDOP) 65 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-4-2-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1120-4-2-B	Downstream looking up				
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 # 4

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: None				

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

<input 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 checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss on gravels

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 type="checkbox"/> Fine sediments	<input checked="" 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 # 4

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.)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 09-02-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Little Deer Cr.</u> Waterbody ID: <u>1120</u> Site #: <u>4</u> Estimated Channel Incision: <u>0.17</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>484871</u> UTM Y: <u>4220724</u> +/- <u>79</u> ft. (meters) 11 UTM X: <u>484842</u> UTM Y: <u>4220838</u> +/- <u>65</u> ft. (meters) Average Stream Width: <u>4.5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>9/2/2008</u> Time: <u>2:22 p.m.</u> Dissolved Oxygen: <u>5.58</u> (mg/L) Dissolved Oxygen: <u>67.7</u> (% sat) Specific Cond: <u>553</u> (µS/cm) Water Temperature: <u>25.9</u> (°C)
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Transect Cross-Section

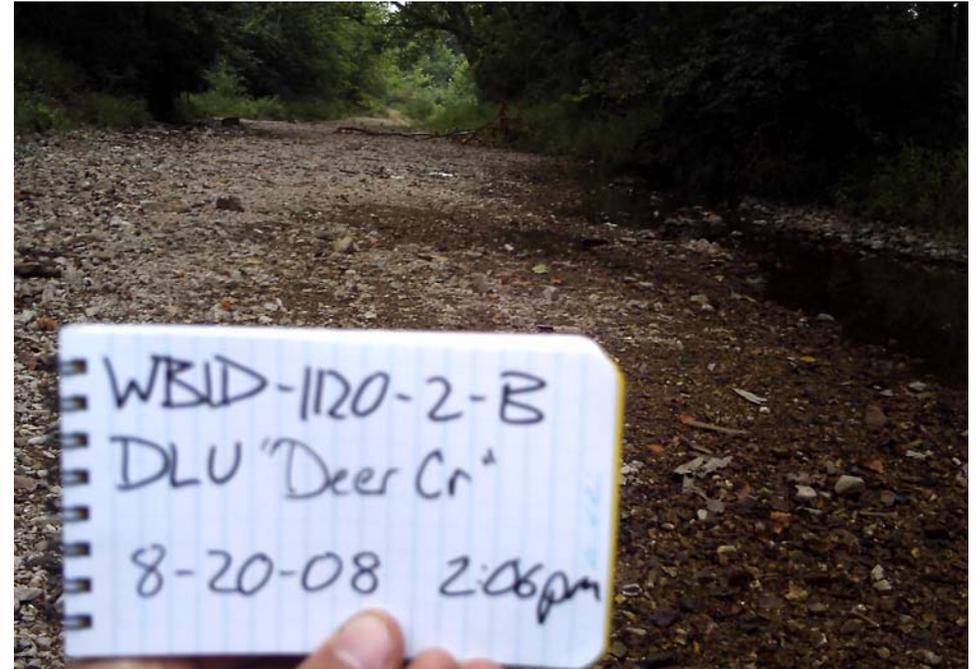
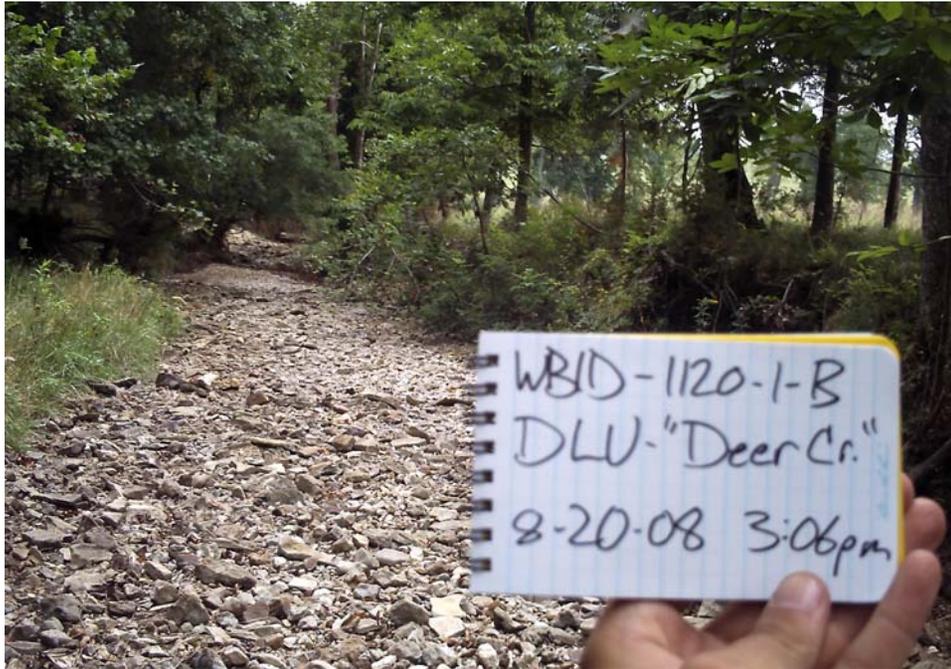
Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.62	0.11	0.48	0.05	0.43	0.05	0.54	0.00	0.29	0.05	0.32	0.05	0.44	0.11	0.47	0.05	0.39	0.05	0.11	0.05	0.39	0.06
	2	1.24	0.16	0.96	0.05	0.86	0.05	1.08	0.00	0.58	0.05	0.64	0.05	0.88	0.17	0.94	0.10	0.78	0.05	0.22	0.05	0.78	0.10
	3	1.86	0.17	1.44	0.10	1.29	0.15	1.62	0.00	0.87	0.05	0.96	0.08	1.32	0.23	1.41	0.10	1.17	0.05	0.33	0.05	1.17	0.21
	4	2.48	0.20	1.92	0.24	1.72	0.22	2.16	0.00	1.16	0.05	1.28	0.09	1.76	0.24	1.88	0.11	1.56	0.05	0.44	0.05	1.56	0.32
	5	3.10	0.18	2.40	0.30	2.15	0.21	2.70	0.00	1.45	0.05	1.60	0.14	2.20	0.28	2.35	0.13	1.95	0.05	0.55	0.05	1.95	0.30
	6	3.72	0.22	2.88	0.22	2.58	0.19	3.24	0.00	1.74	0.05	1.92	0.21	2.64	0.28	2.82	0.14	2.34	0.10	0.66	0.05	2.34	0.34
	7	4.34	0.17	3.36	0.21	3.01	0.15	3.78	0.00	2.03	0.05	2.24	0.18	3.08	0.23	3.29	0.09	2.73	0.08	0.77	0.05	2.73	0.35
	8	4.96	0.05	3.84	0.11	3.44	0.20	4.32	0.00	2.32	0.05	2.56	0.14	3.52	0.22	3.76	0.11	3.12	0.05	0.88	0.05	3.12	0.26
9	5.58	0.05	4.32	0.05	3.87	0.09	4.86	0.00	2.61	0.05	2.88	0.11	3.96	0.05	4.23	0.07	3.51	0.05	0.99	0.05	3.51	0.15	
Right Bank		6.20	0.00	4.80	0.00	4.30	0.00	5.40	0.00	2.90	0.00	3.20	0.00	4.40	0.00	4.70	0.00	3.90	0.00	1.10	0.00	3.90	0.00
Feature Type <small>(riffle, run, or pool)</small>		Pool		Pool		Pool		DRY		Riffle		Run		Run		Run		Riffle		Riffle		Run	

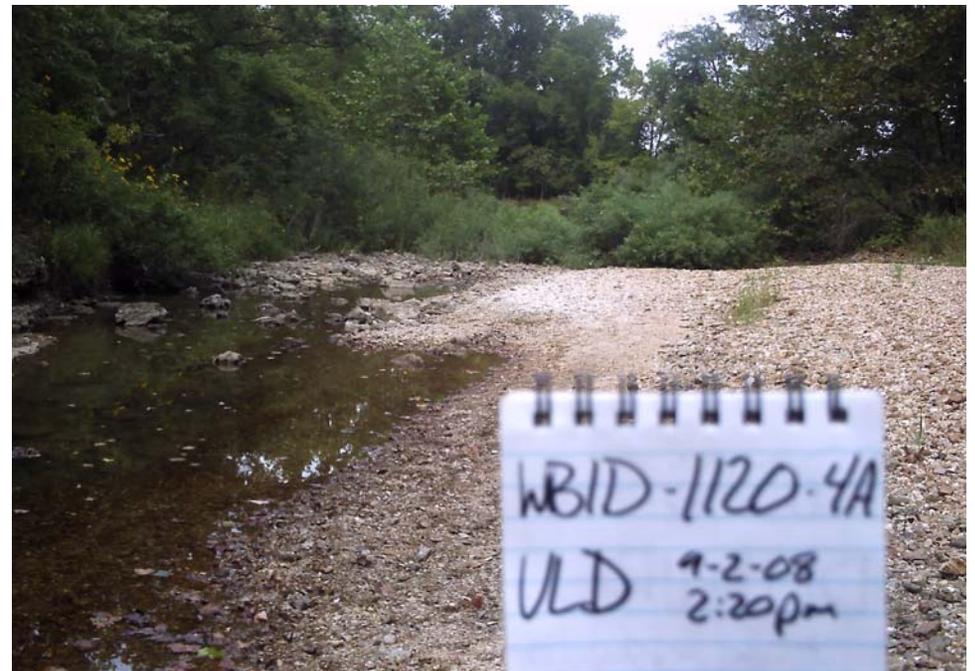
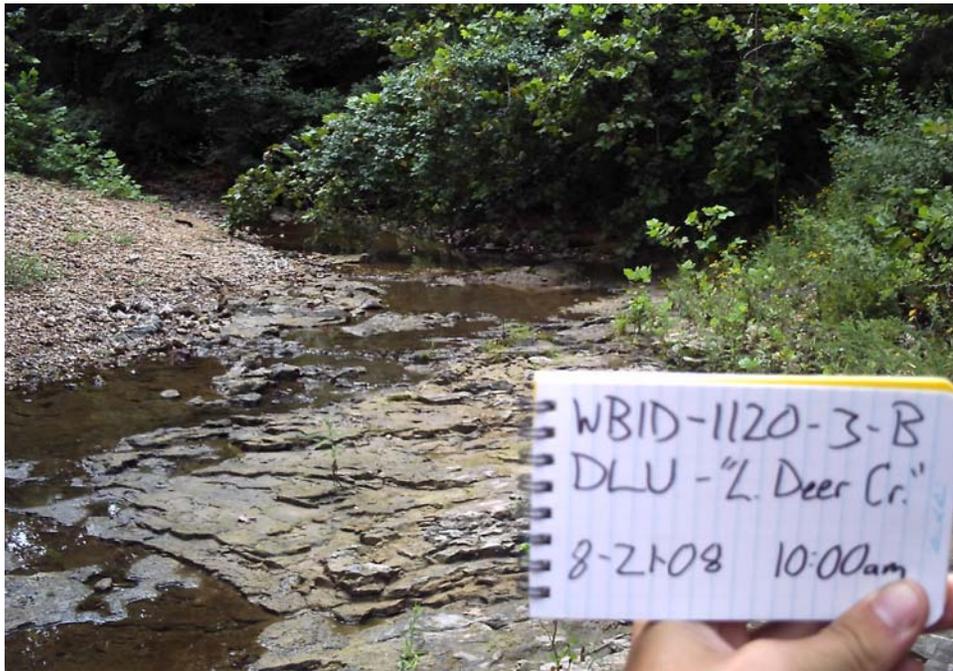
Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width.
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally 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.

MAXIMUM 0.35
 MEDIAN 0.09

Surveyor's Signature:









WBID-1120-4-C

DLU - 2. Deer Cr

9-20-08 11:45 am