



Missouri  
Department of  
Natural Resources

Use Attainability Analysis

for

WBID 1471 Bear 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): Bear Creek
Missouri Water Body Identification (WBID) Number: 1471
8-digit HUC: 10290201
County(ies), Listed Upstream to Downstream: Pulaski
Upstream Legal Description (from Table H): 22, 35N, 15
Downstream Legal Description (from Table H): Mouth
Number of sites evaluated: 8
List all site numbers, <u>consecutively upstream to downstream</u> : 1, 2, 3, 4, 5, 6, 7, 8
<b>Include a Site Location Map(s).</b> 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).

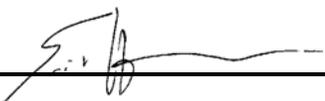
**II. Facility Information** (list all permitted discharges to this water body segment)

Facility Name(s) and Permit Number(s):  Countryside Home                      MO-0125270
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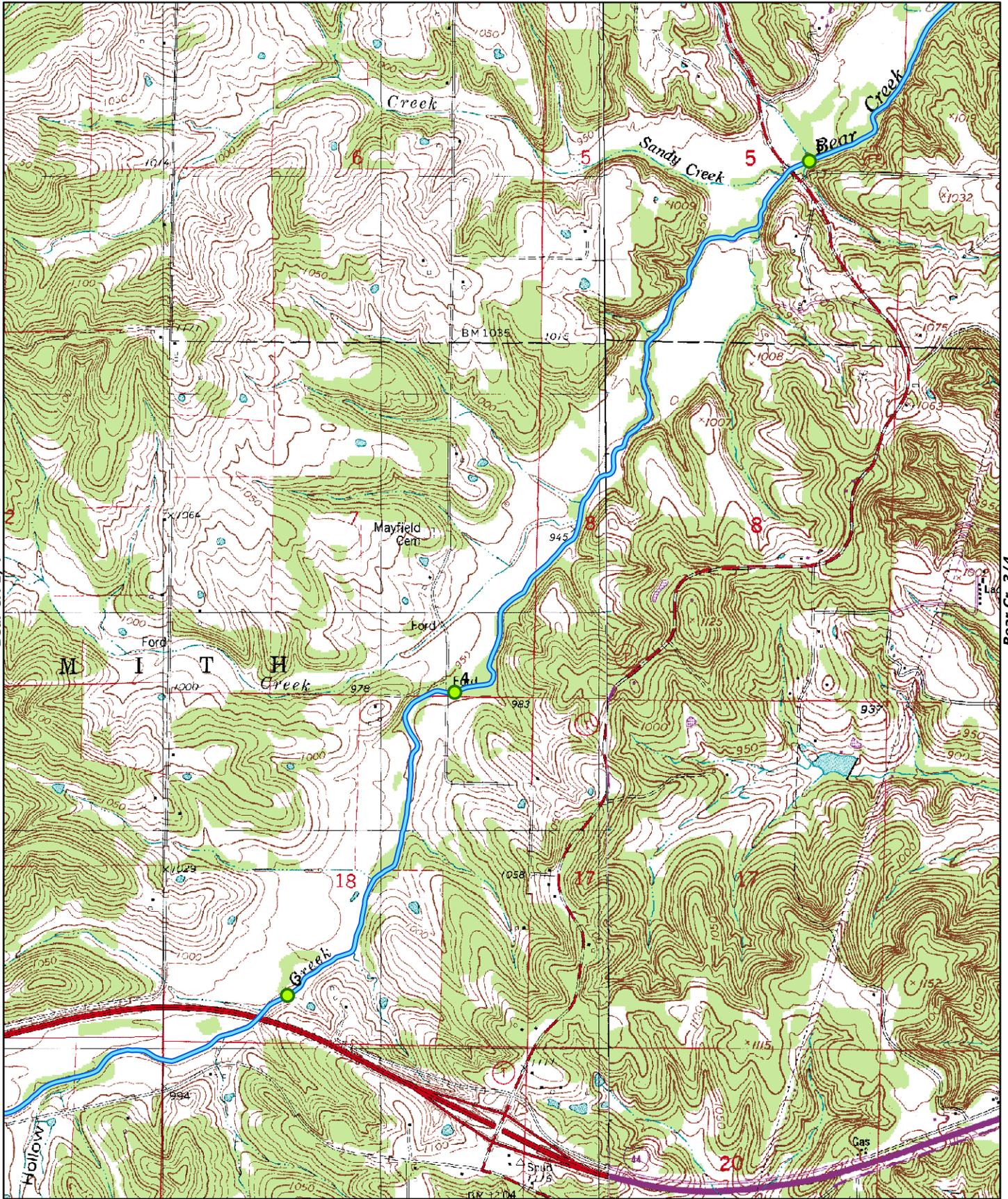
**III. UAA Surveyor** (please **PRINT** legibly)

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

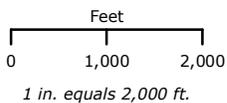
**Please verify that you have completed all sections of all data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.**

**Signed:**  **Date:** 8-11-08





**MISSOURI RECREATIONAL  
USE ATTAINABILITY ANALYSIS**



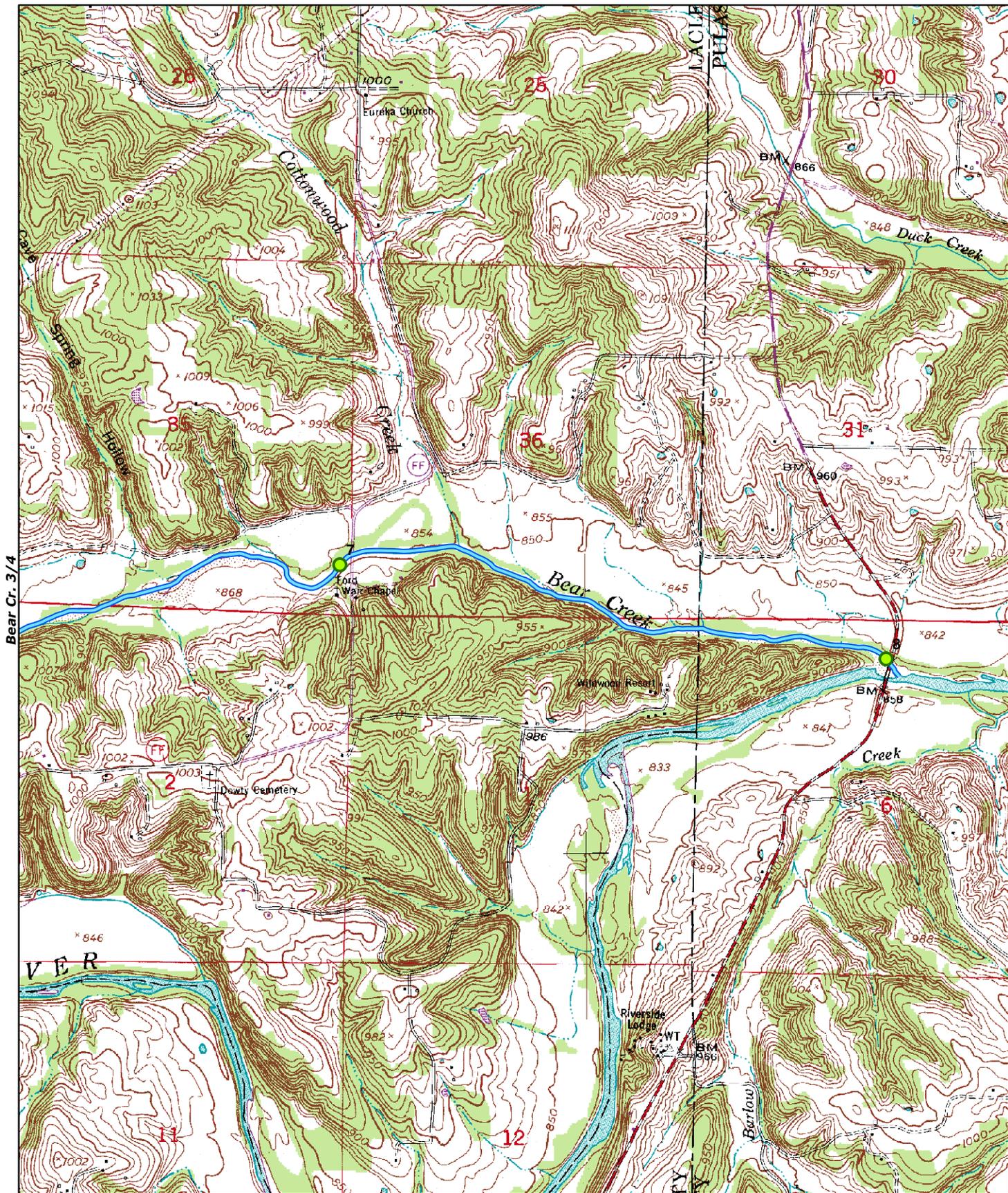
**Stream:** Bear Cr.  
**WBID:**1471

**Map Sheet:**2/4  
**County:** Pulaski



Project No. 008-1298





Bear Cr. 3/4

**MISSOURI RECREATIONAL  
USE ATTAINABILITY ANALYSIS**



Feet  
0 1,000 2,000  
1 in. equals 2,000 ft.

**Stream:** Bear Cr.  
**WBID:** 1471

**Map Sheet:** 4/4  
**County:** Laclede/Pulaski



Project No. 008-1298

WBID # 1471

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)

<b>Date &amp; Time:</b> 8-11-08                      9:25 a.m.	Location Description (e.g., road crossing): Route 66 & Redwood Lane Bridge Crossing
<b>Stream Name:</b> Bear Creek	
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 537837	Northing (UTM Y): 4178239	Horizontal Accuracy: (EPE / FOM / PDOP)	144 ft. <del>Meters</del>
Site 11	Easting (UTM X): 538476	Northing (UTM Y): 4178384	Horizontal Accuracy: (EPE / FOM / PDOP)	177 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-1-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-1-B	Bridge crossing and pool (Road closed)				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-1-C	Downstream looking up				

**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 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 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	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 rocks
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**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 type="checkbox"/> Clear	<input checked="" 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 # 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)
Pool	1	8	10	.5	+1

**Comments:** (Please record any additional comments here.)

Pool under Redwood LN Bridge crossing (road no longer used) that is over 1 meter in depth. Pool in very near the upstream end of our transect area. See photo 1471-1-B

**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 / Austin Lohkamp

Surveyor's Signature:  Date of Survey: 8-11-08

Organization: Olsson Associates Position: Field Service

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>1</u>  Estimated Channel Incision: <u>0.3</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>537837</u> UTM Y: <u>4178239</u> +/- <u>144</u> ft. (meters) <b>11</b> UTM X: <u>538476</u> UTM Y: <u>4178384</u> +/- <u>177</u> ft. (meters)  Average Stream Width: <u>4</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>8-11-08</u> Time: <u>9:30 a.m.</u>  Dissolved Oxygen: <u>2.45</u> (mg/L)  Dissolved Oxygen: <u>27.6</u> (% sat)  Specific Cond: <u>342</u> (µS/cm)  Water Temperature: <u>22.4</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)																				
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0.55	0.44	0.23	0.16	0.12	<.05	0.21	0.00	0.41	0.00	0.25	<.05	0.26	<.05	0.43	0.00	0.42	0.14	0.51	0.23	0.60	<.05
	2	1.10	0.57	0.46	0.22	0.24	<.05	0.42	0.00	0.82	0.00	0.50	<.05	0.52	0.14	0.86	0.00	0.84	0.26	1.02	0.27	1.20	0.12
	3	1.65	0.56	0.69	0.24	0.36	0.13	0.63	0.00	1.23	0.00	0.75	0.07	0.78	0.09	1.29	0.00	1.26	0.31	1.53	0.29	1.80	0.12
	4	2.20	0.53	0.92	0.10	0.48	0.10	0.84	0.00	1.64	0.00	1.00	0.11	1.04	0.14	1.72	0.00	1.68	0.22	2.04	0.37	2.40	0.15
	5	2.75	0.44	1.15	0.17	0.60	0.11	1.05	0.00	2.05	0.00	1.25	0.12	1.30	0.22	2.15	0.00	2.10	0.31	2.55	0.41	3.00	0.14
	6	3.30	0.28	1.38	0.15	0.72	0.11	1.26	0.00	2.46	0.00	1.50	0.13	1.56	0.33	2.58	0.00	2.52	0.33	3.06	0.30	3.60	0.17
	7	3.85	0.24	1.61	0.13	0.84	0.09	1.47	0.00	2.87	0.00	1.75	0.17	1.82	0.21	3.01	0.00	2.94	0.15	3.57	0.43	4.20	0.20
	8	4.40	0.16	1.84	0.07	0.96	0.07	1.68	0.00	3.28	0.00	2.00	0.14	2.08	0.17	3.44	0.00	3.36	0.34	4.08	0.35	4.80	0.25
	9	4.95	0.06	2.07	<.05	1.08	<.05	1.89	0.00	3.69	0.00	2.25	0.09	2.34	0.09	3.87	0.00	3.78	0.35	4.59	0.07	5.40	0.21
<b>Right Bank</b>	5.50	0.00	2.30	0.00	1.20	0.00	2.10	0.00	4.10	0.00	2.50	0.00	2.60	0.00	4.30	0.00	4.20	0.00	5.10	0.00	6.00	0.00	
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Pool	Pool	Pool	Pool	Pool	Dry	Dry	Dry	Dry	Pool	Pool	Pool	Pool	Pool	Dry	Dry	Dry	Pool	Pool	Pool	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:



WBID # 1471

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)

<b>Date &amp; Time:</b> 8-11-08                      10:21 a.m.	Location Description (e.g., road crossing): East of Route 66 thru gate
<b>Stream Name:</b> Bear Creek	
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .:73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 541087	Northing (UTM Y): 4178853	Horizontal Accuracy: (EPE / FOM / PDOP)	41 ft. <del>Meters</del>
Site 11	Easting (UTM X): 541197	Northing (UTM Y): 4178908	Horizontal Accuracy: (EPE / FOM / PDOP)	274 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-2-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-2-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-2-C	Road Crossing				

**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.)				

**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: Gate on property to access stream.				

**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	60% Gravel	20% Sand	% Silt	% Mud/Clay	20% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site.)

Moss on rocks
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**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 type="checkbox"/> Clear	<input checked="" 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.

**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.)

Farm Road crossing just 1 meter downstream of lower end of our transect. See photo 1471-2-C

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>2</u>  Estimated Channel Incision: <u>0.2</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>541087</u> UTM Y: <u>4178853</u> +/- <u>41</u> ft. (meters) <b>11</b> UTM X: <u>541197</u> UTM Y: <u>4178908</u> +/- <u>274</u> ft. (meters)  Average Stream Width: <u>10</u> (meters)      Length of Survey Segment: <u>200</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>8-11-08</u> Time: <u>10:24 a.m.</u>  Dissolved Oxygen: <u>6.8</u> (mg/L)  Dissolved Oxygen: <u>75.5</u> (% sat)  Specific Cond: <u>351</u> (µS/cm)  Water Temperature: <u>22.1</u> (°C)
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#### Transect Cross-Section

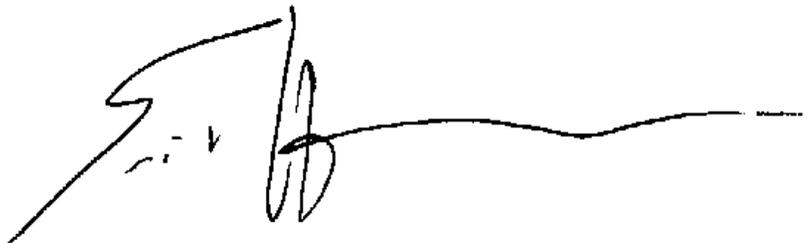
Station		01		02		03		04		05		06		07		08		09		10		11		
		Distance (m)	Depth (m)																					
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.65	0.13	1.20	0.51	1.10	0.34	1.25	0.48	1.40	0.47	0.60	0.22	0.75	0.15	1.05	0.43	1.10	0.72	1.05	0.31	0.55	0.09	
	2	1.30	0.33	2.40	0.35	2.20	0.33	2.50	0.52	2.80	0.45	1.20	0.21	1.50	0.19	2.10	0.52	2.20	0.67	2.10	0.32	1.10	0.25	
	3	1.95	0.37	3.60	0.17	3.30	0.35	3.75	0.47	4.20	0.47	1.80	0.25	2.25	0.38	3.15	0.57	3.30	0.59	3.15	0.37	1.65	0.23	
	4	2.60	0.47	4.80	0.36	4.40	0.38	5.00	0.37	5.60	0.49	2.40	0.28	3.00	0.44	4.20	0.63	4.40	0.65	4.20	0.46	2.20	0.31	
	5	3.25	0.38	6.00	0.42	5.50	0.43	6.25	0.39	7.00	0.39	3.00	0.31	3.75	0.50	5.25	0.69	5.50	0.78	5.25	0.54	2.75	0.27	
	6	3.90	0.29	7.20	0.33	6.60	0.51	7.50	0.37	8.40	0.33	3.60	0.39	4.50	0.52	6.30	0.70	6.60	0.71	6.30	0.64	3.30	0.18	
	7	4.55	0.18	8.40	0.37	7.70	0.52	8.75	0.38	9.80	0.42	4.20	0.41	5.25	0.37	7.35	0.61	7.70	0.65	7.35	0.58	3.85	0.11	
	8	5.20	0.05	9.60	0.15	8.80	0.53	10.00	0.49	11.20	0.37	4.80	0.45	6.00	0.31	8.40	0.46	8.80	0.40	8.40	0.39	4.40	0.05	
9	5.85	0.05	10.80	0.18	9.90	0.38	11.25	0.21	12.60	0.29	5.40	0.47	6.75	0.14	9.45	0.27	9.90	0.29	9.45	0.29	4.95	0.05		
<b>Right Bank</b>	6.50	0.00	12.00	0.00	11.00	0.00	12.50	0.00	14.00	0.00	6.00	0.00	7.50	0.00	10.50	0.00	11.00	0.00	10.50	0.00	5.50	0.00		
<b>Feature Type</b> <small>(riffle, run, or pool)</small>	Run		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      0.78

MEDIAN      0.37

Surveyor's Signature:



WBID # 1471

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)

<b>Date &amp; Time:</b> 8-11-08	3:27 p.m.	Location Description (e.g., road crossing):
<b>Stream Name:</b> Bear Creek		I-44 @ Bear Creek Bridge
Current Weather Conditions: Sunny		Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .73" @ Ft. Leonard Wood		Permit Number(s): MO-0125270
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): 542639	Northing (UTM Y): 4179507	Horizontal Accuracy: (EPE / FOM / PDOP)	33 ft. <del>Meters</del>
Site 11	Easting (UTM X): 542587	Northing (UTM Y): 4179482	Horizontal Accuracy: (EPE / FOM / PDOP)	156 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-3-A	Upstream looking down	1471-3-D	Pool Beaver Dam #2 Downstream looking up		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-3-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-3-C	Pool Beaver Dam #1 Downstream looking up				

**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.)				

**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 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 (I-44) over creek.			

**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 and some algae
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**Water Characteristics\*:** (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input checked="" 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.

**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)
Pool #1	10	20	300m	.75	+ 1m
Pool #2	200m	12	25	.50	+ 1m

**Comments:** (Please record any additional comments here.)

Pool #1 – created by Beaver Dam photo #1471-3-C  
 Pool #2 - created by Beaver Dam photo #1471-3-D

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet C - Field Survey Results**

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>3</u>  Estimated Channel Incision: <u>0.25</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>542639</u> UTM Y: <u>4179507</u> +/- <u>33 ft.</u> (meters) <b>11</b> UTM X: <u>542587</u> UTM Y: <u>4179482</u> +/- <u>156 ft.</u> (meters)  Average Stream Width: <u>7</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"><b>Dissolved Oxygen</b></p> Date: <u>8-11-08</u> Time: <u>3:35 p.m.</u>  Dissolved Oxygen: <u>6.17</u> (mg/L)  Dissolved Oxygen: <u>78.2</u> (% sat)  Specific Cond: <u>337</u> (µS/cm)  Water Temperature: <u>27.2</u> (°C)
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**Transect Cross-Section**

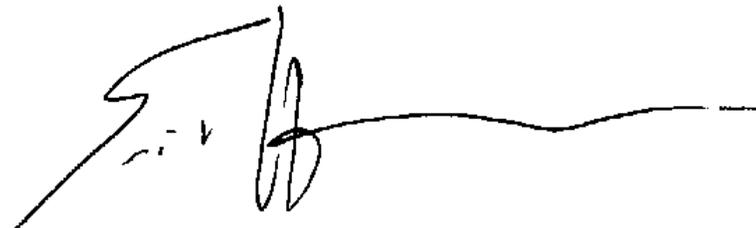
Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.31	0.11	0.70	0.05	0.35	0.05	0.23	0.13	0.39	0.13	0.35	0.05	0.80	0.07	1.19	0.13	0.85	0.12	1.03	0.30	1.11	0.46
2	0.62	0.19	1.40	0.05	0.70	0.06	0.46	0.18	0.78	0.15	0.70	0.12	1.60	0.21	2.38	0.21	1.70	0.26	2.06	0.41	2.22	0.44
3	0.93	0.21	2.10	0.05	1.05	0.07	0.69	0.14	1.17	0.19	1.05	0.22	2.40	0.33	3.57	0.37	2.55	0.28	3.09	0.35	3.33	0.38
4	1.24	0.22	2.80	0.06	1.40	0.05	0.92	0.21	1.56	0.23	1.40	0.29	3.20	0.35	4.76	0.46	3.40	0.24	4.12	0.25	4.44	0.25
5	1.55	0.22	3.50	0.07	1.75	0.07	1.15	0.19	1.95	0.21	1.75	0.25	4.00	0.27	5.95	0.39	4.25	0.24	5.15	0.08	5.55	0.17
6	1.86	0.17	4.20	0.05	2.10	0.09	1.38	0.14	2.34	0.28	2.10	0.16	4.80	0.19	7.14	0.21	5.10	0.27	6.18	0.05	6.66	0.08
7	2.17	0.12	4.90	0.05	2.45	0.13	1.61	0.08	2.73	0.26	2.45	0.14	5.60	0.18	8.33	0.25	5.95	0.23	7.21	0.05	7.77	0.12
8	2.48	0.05	5.60	0.08	2.80	0.14	1.84	0.05	3.12	0.17	2.80	0.17	6.40	0.18	9.52	0.25	6.80	0.24	8.24	0.05	8.88	0.07
9	2.79	0.05	6.30	0.13	3.15	0.05	2.07	0.05	3.51	0.17	3.15	0.11	7.20	0.17	10.71	0.15	7.65	0.18	9.27	0.09	9.99	0.06
<b>Right Bank</b>	3.10	0.00	7.00	0.00	3.50	0.00	2.30	0.00	3.90	0.00	3.50	0.00	8.00	0.00	11.90	0.00	8.50	0.00	10.30	0.00	11.10	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>	Riffle		Riffle		Riffle		Riffle		Run		Run		Pool		Pool		Pool		Riffle		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.

MAXIMUM      0.46

MEDIAN        0.15

Surveyor's Signature:



WBID # 1471

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)

<b>Date &amp; Time:</b> 8-11-08 11:25 a.m.	Location Description (e.g., road crossing) :
<b>Stream Name:</b> Bear Creek	Bridge crossing @ Shady Lane
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 543318	Northing (UTM Y): 4180853	Horizontal Accuracy: (EPE / FOM / PDOP) 202 ft. <del>Meters</del>
Site 11	Easting (UTM X): 543449	Northing (UTM Y): 4180872	Horizontal Accuracy: (EPE / FOM / PDOP) 82 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-4-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-4-B	Bridge and pool				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-4-C	Downstream looking up				

**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 checked="" type="checkbox"/> Roads	<input checked="" 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	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 rocks
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**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 type="checkbox"/> Clear	<input checked="" 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 checked="" 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.

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.)

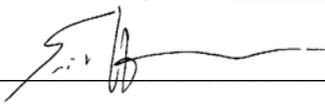
Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)
Pool	1	20	20	.5	+1

**Comments:** (Please record any additional comments here.)

Bridge crossing (Shady Lane) over a pool that is a +1 meter in depth. Some spray paint on bridge + 2 bags of trash found.

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>4</u>  Estimated Channel Incision: <u>0.5</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>543318</u> UTM Y: <u>4180853</u> +/- <u>202</u> ft. (meters) <b>11</b> UTM X: <u>543449</u> UTM Y: <u>4180872</u> +/- <u>82</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>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>8-11-08</u> Time: <u>11:26 a.m.</u>  Dissolved Oxygen: <u>6.43</u> (mg/L)  Dissolved Oxygen: <u>86.7</u> (% sat)  Specific Cond: <u>383</u> (µS/cm)  Water Temperature: <u>24.7</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)																				
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0.75	0.06	0.72	0.05	0.77	0.08	0.88	0.05	0.35	0.05	0.28	0.05	0.38	0.05	0.45	0.05	0.56	0.21	0.64	0.10	0.51	0.27
	2	1.50	0.08	1.44	0.13	1.54	0.11	1.76	0.05	0.70	0.05	0.56	0.05	0.76	0.08	0.90	0.05	1.12	0.43	1.28	0.11	1.02	0.31
	3	2.25	0.05	2.16	0.15	2.31	0.18	2.64	0.17	1.05	0.08	0.84	0.05	1.14	0.11	1.35	0.08	1.68	0.56	1.92	0.17	1.53	0.27
	4	3.00	0.05	2.88	0.21	3.08	0.19	3.52	0.14	1.40	0.09	1.12	0.05	1.52	0.14	1.80	0.11	2.24	0.46	2.56	0.20	2.04	0.22
	5	3.75	0.05	3.60	0.27	3.85	0.20	4.40	0.18	1.75	0.12	1.40	0.08	1.90	0.13	2.25	0.09	2.80	0.37	3.20	0.17	2.55	0.22
	6	4.50	0.05	4.32	0.22	4.62	0.29	5.28	0.21	2.10	0.09	1.68	0.07	2.28	0.14	2.70	0.21	3.36	0.19	3.84	0.11	3.06	0.18
	7	5.25	0.13	5.04	0.29	5.39	0.21	6.16	0.31	2.45	0.06	1.96	0.08	2.66	0.16	3.15	0.17	3.92	0.14	4.48	0.19	3.57	0.19
	8	6.00	0.12	5.76	0.26	6.16	0.14	7.04	0.38	2.80	0.05	2.24	0.11	3.04	0.17	3.60	0.14	4.48	0.17	5.12	0.18	4.08	0.21
9	6.75	0.07	6.48	0.18	6.93	0.07	7.92	0.24	3.15	0.05	2.52	0.05	3.42	0.15	4.05	0.09	5.04	0.19	5.76	0.17	4.59	0.16	
<b>Right Bank</b>	7.50	0.00	7.20	0.00	7.70	0.00	8.80	0.00	3.50	0.00	2.80	0.00	3.80	0.00	4.50	0.00	5.60	0.00	6.40	0.00	5.10	0.00	
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Riffle	Run	Pool	Pool	Riffle	Riffle	Riffle	Riffle	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.

MAXIMUM      0.56  
MEDIAN          0.14

Surveyor's Signature:



WBID # 1471

Site # 5

**Field Data Sheets for Recreational Use Stream Surveys**

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

(must be completed for each site)

<b>Date &amp; Time:</b> 8-11-08      12:08 p.m.	Location Description (e.g., road crossing):
<b>Stream Name:</b> Bear Creek	HWY T & F Bridge Crossing
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 544918	Northing (UTM Y): 4183256	Horizontal Accuracy: (EPE / FOM / PDOP)	48 ft. <del>Meters</del>
Site 11	Easting (UTM X): 545035	Northing (UTM Y): 4183308	Horizontal Accuracy: (EPE / FOM / PDOP)	60 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-5-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-5-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 # 5

**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 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	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
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**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 type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: Stream dry
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 # 5

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>5</u>  Estimated Channel Incision: <u>N/A</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>544918</u> UTM Y: <u>4183256</u> +/- <u>48 ft.</u> (meters) <b>11</b> UTM X: <u>545035</u> UTM Y: <u>4183308</u> +/- <u>60 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>8-11-08</u> Time: <u>12:14 p.m.</u>  Dissolved Oxygen: <u>N/A</u> (mg/L)  Dissolved Oxygen: <u>N/A</u> (% sat)  Specific Cond: <u>N/A</u> (µS/cm)  Water Temperature: <u>N/A</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)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.46	0.00	0.43	0.00	0.52	0.00	0.41	0.00	0.87	0.00	0.91	0.00	0.30	0.00	0.43	0.00	0.56	0.00	0.87	0.00	0.91	0.00
	2	0.92	0.00	0.86	0.00	1.04	0.00	0.82	0.00	1.74	0.00	1.82	0.00	0.60	0.00	0.86	0.00	1.12	0.00	1.74	0.00	1.82	0.00
	3	1.38	0.00	1.29	0.00	1.56	0.00	1.23	0.00	2.61	0.00	2.73	0.00	0.90	0.00	1.29	0.00	1.68	0.00	2.61	0.00	2.73	0.00
	4	1.84	0.00	1.72	0.00	2.08	0.00	1.64	0.00	3.48	0.00	3.64	0.00	1.20	0.00	1.72	0.00	2.24	0.00	3.48	0.00	3.64	0.00
	5	2.30	0.00	2.15	0.00	2.60	0.00	2.05	0.00	4.35	0.00	4.55	0.00	1.50	0.00	2.15	0.00	2.80	0.00	4.35	0.00	4.55	0.00
	6	2.76	0.00	2.58	0.00	3.12	0.00	2.46	0.00	5.22	0.00	5.46	0.00	1.80	0.00	2.58	0.00	3.36	0.00	5.22	0.00	5.46	0.00
	7	3.22	0.00	3.01	0.00	3.64	0.00	2.87	0.00	6.09	0.00	6.37	0.00	2.10	0.00	3.01	0.00	3.92	0.00	6.09	0.00	6.37	0.00
	8	3.68	0.00	3.44	0.00	4.16	0.00	3.28	0.00	6.96	0.00	7.28	0.00	2.40	0.00	3.44	0.00	4.48	0.00	6.96	0.00	7.28	0.00
9	4.14	0.00	3.87	0.00	4.68	0.00	3.69	0.00	7.83	0.00	8.19	0.00	2.70	0.00	3.87	0.00	5.04	0.00	7.83	0.00	8.19	0.00	
<b>Right Bank</b>		4.60	0.00	4.30	0.00	5.20	0.00	4.10	0.00	8.70	0.00	9.10	0.00	3.00	0.00	4.30	0.00	5.60	0.00	8.70	0.00	9.10	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Dry		Dry		Dry		Dry		Dry		Dry		Dry		Dry		Dry		Dry		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 # 1471

Site # 6

**Field Data Sheets for Recreational Use Stream Surveys**

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

(must be completed for each site)

<b>Date &amp; Time:</b> 8-11-08                      1:30 p.m.	Location Description (e.g., road crossing): 30 meters east of dry creek crossing on Kennedy Rd.
<b>Stream Name:</b> <b>Bear Creek</b>	
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 547645	Northing (UTM Y): 4184658	Horizontal Accuracy: (EPE / FOM / PDOP)	121 ft. <del>Meters</del>
Site 11	Easting (UTM X): 547794	Northing (UTM Y): 4184459	Horizontal Accuracy: (EPE / FOM / PDOP)	42 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-6-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-6-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 # 6

**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.)

NONE
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**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 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 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 # 6

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet C - Field Survey Results**

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>6</u>  Estimated Channel Incision: <u>0.14</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>547645</u> UTM Y: <u>4184658</u> +/- <u>121</u> ft. (meters) <b>11</b> UTM X: <u>547794</u> UTM Y: <u>4184459</u> +/- <u>42</u> ft. (meters)  Average Stream Width: <u>25.5</u> (meters)      Length of Survey Segment: <u>300</u> (meters) (To determine Length of Reach)      (20x average stream width)  Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<p align="center"><b>Dissolved Oxygen</b></p> Date: <u>8-11-08</u> Time: <u>1:35 p.m.</u>  Dissolved Oxygen: <u>N/A</u> (mg/L)  Dissolved Oxygen: <u>N/A</u> (% sat)  Specific Cond: <u>N/A</u> (µS/cm)  Water Temperature: <u>N/A</u> (°C)
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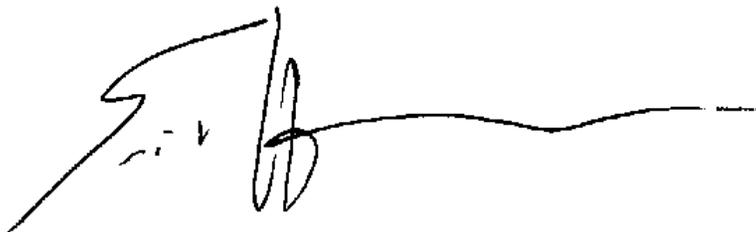
**Transect Cross-Section**

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2.53	0.00	2.62	0.00	3.35	0.00	3.32	0.00	2.17	0.00	1.56	0.00	2.07	0.00	2.31	0.00	2.78	0.00	2.53	0.00	2.78	0.00
2	5.06	0.00	5.24	0.00	6.70	0.00	6.64	0.00	4.34	0.00	3.12	0.00	4.14	0.00	4.62	0.00	5.56	0.00	5.06	0.00	5.56	0.00
3	7.59	0.00	7.86	0.00	10.05	0.00	9.96	0.00	6.51	0.00	4.68	0.00	6.21	0.00	6.93	0.00	8.34	0.00	7.59	0.00	8.34	0.00
4	10.12	0.00	10.48	0.00	13.40	0.00	13.28	0.00	8.68	0.00	6.24	0.00	8.28	0.00	9.24	0.00	11.12	0.00	10.12	0.00	11.12	0.00
5	12.65	0.00	13.10	0.00	16.75	0.00	16.60	0.00	10.85	0.00	7.80	0.00	10.35	0.00	11.55	0.00	13.90	0.00	12.65	0.00	13.90	0.00
6	15.18	0.00	15.72	0.00	20.10	0.00	19.92	0.00	13.02	0.00	9.36	0.00	12.42	0.00	13.86	0.00	16.68	0.00	15.18	0.00	16.68	0.00
7	17.71	0.00	18.34	0.00	23.45	0.00	23.24	0.00	15.19	0.00	10.92	0.00	14.49	0.00	16.17	0.00	19.46	0.00	17.71	0.00	19.46	0.00
8	20.24	0.00	20.96	0.00	26.80	0.00	26.56	0.00	17.36	0.00	12.48	0.00	16.56	0.00	18.48	0.00	22.24	0.00	20.24	0.00	22.24	0.00
9	22.77	0.00	23.58	0.00	30.15	0.00	29.88	0.00	19.53	0.00	14.04	0.00	18.63	0.00	20.79	0.00	25.02	0.00	22.77	0.00	25.02	0.00
<b>Right Bank</b>	25.30	0.00	26.20	0.00	33.50	0.00	33.20	0.00	21.70	0.00	15.60	0.00	20.70	0.00	23.10	0.00	27.80	0.00	25.30	0.00	27.80	0.00
<b>Feature Type</b> <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 # 1471

Site # 7

**Field Data Sheets for Recreational Use Stream Surveys**

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

(must be completed for each site)

<b>Date &amp; Time:</b> 8-11-08      1:36 p.m.	Location Description (e.g., road crossing): Hwy FF Bridge Crossing
<b>Stream Name:</b> Bear Creek	
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 550214	Northing (UTM Y): 4184183	Horizontal Accuracy: (EPE / FOM / PDOP)      149 ft. <del>Meters</del>
Site 11	Easting (UTM X): 550295	Northing (UTM Y): 4184237	Horizontal Accuracy: (EPE / FOM / PDOP)      50 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-7-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-7-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 # 7

**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 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 crossing in transect. See photo 1471-7-A			

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

% Cobble	10% Gravel	10% Sand	% Silt	% Mud/Clay	80% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site.)

Moss on rocks
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**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 # 7

**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.)

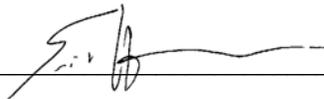
Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

**Comments:** (Please record any additional comments here.)

Bridge (Hwy FF) in transect. Water under bridge is .12m average. See photo 1471-7-A

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>7</u>  Estimated Channel Incision: <u>0.1</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>550214</u> UTM Y: <u>4184183</u> +/- <u>149</u> ft. (meters) <b>11</b> UTM X: <u>550295</u> UTM Y: <u>4184237</u> +/- <u>50</u> ft. (meters)  Average Stream Width: <u>7</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>8-11-08</u> Time: <u>1:36 p.m.</u>  Dissolved Oxygen: <u>9.73</u> (mg/L)  Dissolved Oxygen: <u>113.9</u> (% sat)  Specific Cond: <u>376</u> (µS/cm)  Water Temperature: <u>26.3</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)																				
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.51	0.05	0.59	0.05	0.53	0.05	0.61	0.05	0.92	0.07	0.90	0.16	0.84	0.05	1.01	0.12	0.72	0.06	0.49	0.07	0.44	0.12
	2	1.02	0.05	1.18	0.05	1.06	0.05	1.22	0.06	1.84	0.09	1.80	0.13	1.68	0.05	2.02	0.18	1.44	0.06	0.98	0.09	0.88	0.18
	3	1.53	0.05	1.77	0.05	1.59	0.05	1.83	0.05	2.76	0.05	2.70	0.14	2.52	0.05	3.03	0.24	2.16	0.14	1.47	0.11	1.32	0.17
	4	2.04	0.05	2.36	0.05	2.12	0.05	2.44	0.11	3.68	0.05	3.60	0.17	3.36	0.05	4.04	0.16	2.88	0.15	1.96	0.19	1.76	0.30
	5	2.55	0.05	2.95	0.05	2.65	0.05	3.05	0.13	4.60	0.06	4.50	0.10	4.20	0.05	5.05	0.11	3.60	0.11	2.45	0.11	2.20	0.29
	6	3.06	0.05	3.54	0.07	3.18	0.05	3.66	0.12	5.52	0.07	5.40	0.12	5.04	0.05	6.06	0.14	4.32	0.30	2.94	0.13	2.64	0.22
	7	3.57	0.06	4.13	0.05	3.71	0.05	4.27	0.13	6.44	0.05	6.30	0.07	5.88	0.05	7.07	0.17	5.04	0.27	3.43	0.05	3.08	0.14
	8	4.08	0.07	4.72	0.05	4.24	0.07	4.88	0.12	7.36	0.08	7.20	0.05	6.72	0.05	8.08	0.19	5.76	0.11	3.92	0.05	3.52	0.12
9	4.59	0.05	5.31	0.05	4.77	0.05	5.49	0.09	8.28	0.10	8.10	0.05	7.56	0.05	9.09	0.12	6.48	0.09	4.41	0.05	3.96	0.05	
<b>Right Bank</b>	5.10	0.00	5.90	0.00	5.30	0.00	6.10	0.00	9.20	0.00	9.00	0.00	8.40	0.00	10.10	0.00	7.20	0.00	4.90	0.00	4.40	0.00	
<b>Feature Type</b> <small>(riffle, run, or pool)</small>	Riffle		Riffle		Riffle		Run		Run		Run		Riffle		Pool		Pool		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.

MAXIMUM      0.30  
MEDIAN          0.05

Surveyor's Signature:



WBID # 1471

Site # 8

**Field Data Sheets for Recreational Use Stream Surveys**

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

(must be completed for each site)

<b>Date &amp; Time:</b> 8-11-08                      2:25 p.m.	Location Description (e.g., road crossing): 133 Bridge over Bear Creek
<b>Stream Name:</b> Bear Creek	
Current Weather Conditions: Sunny	Facility Name(s): Countryside Home
Weather Conditions for Past 10 days: .:73" @ Ft. Leonard Wood	Permit Number(s): MO-0125270
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): 552734	Northing (UTM Y): 4183756	Horizontal Accuracy: (EPE / FOM / PDOP)	63 ft. <del>Meters</del>
Site 11	Easting (UTM X): 552455	Northing (UTM Y): 4183826	Horizontal Accuracy: (EPE / FOM / PDOP)	171 ft. <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-8-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-8-B	Pool +1 meter				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1471-8-C	Downstream looking up				

**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 # 8

**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 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 133 Bridge in 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.)

Some algae and moss on rocks
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**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 # 8

**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)
Pool 1	200 meters	10	15	.25	+1

**Comments:** (Please record any additional comments here.)

1. Hwy 133 Bridge in transect area. Water depth under bridge is a .20 average. See photo 1471-8-A

2. Pool within transect area (but no cross section) over 1 m deep. See photo 1471-8-B

**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: 8-11-08

Organization: Olsson Associates Position: Field Service

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>Bear Creek</u> Waterbody ID: <u>1471</u> Site #: <u>8</u>  Estimated Channel Incision: <u>0.08</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>552734</u> UTM Y: <u>4183756</u> +/- <u>63</u> ft. (meters) <b>11</b> UTM X: <u>552455</u> UTM Y: <u>4183826</u> +/- <u>171</u> ft. (meters)  Average Stream Width: <u>7</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>8-11-08</u> Time: <u>2:28 p.m.</u>  Dissolved Oxygen: <u>91.2</u> (mg/L)  Dissolved Oxygen: <u>114.6</u> (% sat)  Specific Cond: <u>355</u> (µS/cm)  Water Temperature: <u>32.2</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)																					
<b>Left Bank</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	1.41	0.11	0.59	0.13	0.63	0.05	0.37	0.05	0.45	0.15	0.71	0.35	1.02	0.30	0.95	0.19	0.96	0.21	0.64	0.05	0.21	0.18	
	2	2.82	0.14	1.18	0.15	1.26	0.05	0.74	0.05	0.90	0.17	1.42	0.36	2.04	0.45	1.90	0.23	1.92	0.18	1.28	0.07	0.42	0.19	
	3	4.23	0.13	1.77	0.14	1.89	0.05	1.11	0.06	1.35	0.20	2.13	0.31	3.06	0.79	2.85	0.27	2.88	0.19	1.92	0.05	0.63	0.29	
	4	5.64	0.21	2.36	0.12	2.52	0.05	1.48	0.07	1.80	0.14	2.84	0.30	4.08	0.81	3.80	0.25	3.84	0.18	2.56	0.05	0.84	0.31	
	5	7.05	0.23	2.95	0.09	3.15	0.06	1.85	0.05	2.25	0.13	3.55	0.09	5.10	0.82	4.75	0.25	4.80	0.14	3.20	0.05	1.05	0.17	
	6	8.46	0.21	3.54	0.05	3.78	0.05	2.22	0.05	2.70	0.17	4.26	0.06	6.12	0.63	5.70	0.27	5.76	0.17	3.84	0.05	1.26	0.11	
	7	9.87	0.22	4.13	0.05	4.41	0.05	2.59	0.05	3.15	0.12	4.97	0.05	7.14	0.49	6.65	0.21	6.72	0.18	4.48	0.05	1.47	0.05	
	8	11.28	0.16	4.72	0.05	5.04	0.05	2.96	0.05	3.60	0.07	5.68	0.05	8.16	0.41	7.60	0.19	7.68	0.15	5.12	0.05	1.68	0.05	
9	12.69	0.07	5.31	0.05	5.67	0.05	3.33	0.05	4.05	0.05	6.39	0.05	9.18	0.24	8.55	0.10	8.64	0.08	5.76	0.05	1.89	0.05		
<b>Right Bank</b>	14.10	0.00	5.90	0.00	6.30	0.00	3.70	0.00	4.50	0.00	7.10	0.00	10.20	0.00	9.50	0.00	9.60	0.00	6.40	0.00	2.10	0.00		
<b>Feature Type</b> <small>(riffle, run, or pool)</small>	Run		Run		Run		Riffle		Run		Run		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.

MAXIMUM      0.82

MEDIAN      0.07

Surveyor's Signature:









