



Missouri  
Department of  
Natural Resources

Use Attainability Analysis

for

WBID 3691 Ketchum Hollow

Submitted by  
Olsson Associates

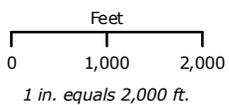
To  
Missouri Department of Natural Resources  
Water Protection Program

On  
June 3, 2008





**MISSOURI RECREATIONAL  
USE ATTAINABILITY ANALYSIS**



**Stream:** Ketchum Hollow  
**WBID:** 3691

**Map Sheet:** 1/1  
**County:** Barry



WBID # 3691

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> 04/03/2008 11:30 AM	Location Description (e.g., road crossing):
<b>Stream Name:</b> Ketchum Hollow	100m downstream of Start of Stream
Current Weather Conditions: Cloudy	Facility Name(s): None
Weather Conditions for Past 10 days: 2.72" rain @ Cassville	Permit Number(s): None
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): 427596	Northing (UTM Y): 4050925	Horizontal Accuracy: (EPE / FOM / PDOP)	107 ft <del>Meters</del>
Site 11	Easting (UTM X): 427634	Northing (UTM Y): 4050788	Horizontal Accuracy: (EPE / FOM / PDOP)	113 ft <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-1-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-2-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 # 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 checked="" 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:				

**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 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 # 1

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

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

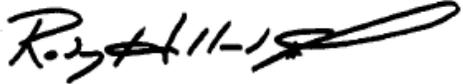
**Additional Stream Morphology:** (Record isolated pools or other features identified during the survey that may support recreational uses.)

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: Rodney Holland, Christopher Park

Surveyor's Signature:  Date of Survey: 04/03/2008

Organization: Olsson Associates Position: Field Team Leader & Field Team Member

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Stream Name: <u>    Ketchum Hollow    </u> Waterbody ID: <u>    3691    </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>    427596    </u> UTM Y: <u>    4050925    </u> +/- <u>    107    </u> ft (meters) <b>11</b> UTM X: <u>    427634    </u> UTM Y: <u>    4050788    </u> +/- <u>    113    </u> ft (meters)  Average Stream Width: <u>    2.45    </u> (meters)      Length of Survey Segment: <u>    150    </u> (meters) (To determine Length of Reach)      (20x average stream width)  Field Staff: <u>    Rodney Holland and Christopher Parks    </u>	<b>Dissolved Oxygen</b>  Date: <u>    4/3/2008    </u> Time: <u>    11:30 AM    </u>  Dissolved Oxygen: <u>    10.53    </u> (mg/L)  Dissolved Oxygen: <u>    96.8    </u> (% sat)  Specific Cond: <u>    268    </u> (µS/cm)  Water Temperature: <u>    12    </u> (°C)
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		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		0.40	0.08	0.20	0.05	0.18	0.13	0.33	0.06	0.18	0.05	0.20	0.09	0.25	0.05	0.20	0.05	0.17	0.06	0.32	0.05	0.27	0.05
2		0.80	0.10	0.40	0.08	0.36	0.17	0.66	0.09	0.36	0.05	0.40	0.10	0.50	0.31	0.40	0.05	0.34	0.08	0.64	0.05	0.54	0.05
3		1.20	0.07	0.60	0.10	0.54	0.15	0.99	0.05	0.54	0.07	0.60	0.11	0.75	0.27	0.60	0.05	0.51	0.07	0.96	0.07	0.81	0.06
4		1.60	0.05	0.80	0.14	0.72	0.16	1.32	0.05	0.72	0.07	0.80	0.06	1.00	0.21	0.80	0.06	0.68	0.06	1.28	0.07	1.08	0.05
5		2.00	0.05	1.00	0.15	0.90	0.13	1.65	0.05	0.90	0.11	1.00	0.08	1.25	0.24	1.00	0.05	0.85	0.07	1.60	0.09	1.35	0.05
6		2.40	0.05	1.20	0.15	1.08	0.10	1.98	0.05	1.08	0.05	1.20	0.05	1.50	0.17	1.20	0.10	1.02	0.07	1.92	0.09	1.62	0.06
7		2.80	0.08	1.40	0.14	1.26	0.05	2.31	0.05	1.26	0.05	1.40	0.08	1.75	0.08	1.40	0.06	1.19	0.06	2.24	0.09	1.89	0.07
8		3.20	0.05	1.60	0.21	1.44	0.05	2.64	0.05	1.44	0.05	1.60	0.05	2.00	0.14	1.60	0.08	1.36	0.05	2.56	0.08	2.16	0.05
9		3.60	0.05	1.80	0.20	1.62	0.05	2.97	0.05	1.62	0.05	1.80	0.05	2.25	0.13	1.80	0.05	1.53	0.05	2.88	0.07	2.43	0.05
<b>Right Bank</b>		4.00	0.00	2.00	0.00	1.80	0.00	3.30	0.00	1.80	0.00	2.00	0.00	2.50	0.00	2.00	0.00	1.70	0.00	3.20	0.00	2.70	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Riffle		Run		Riffle		Riffle		Riffle		Riffle		Run		Riffle		Riffle		Riffle		Riffle	

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

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM      0.31

MEDIAN        0.06

Surveyor's Signature: \_\_\_\_\_

Date:     4/3/2008

WBID # 3691

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> 04/03/2008 12:35 PM	Location Description (e.g., road crossing): 0.91 miles downstream of Site 1
<b>Stream Name:</b> Ketchum Hollow	
Current Weather Conditions: Cloudy	Facility Name(s): None
Weather Conditions for Past 10 days: 2.72" rain @ Cassville	Permit Number(s): None
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): 427894	Northing (UTM Y): 4049414	Horizontal Accuracy: (EPE / FOM / PDOP) 99 ft <del>Meters</del>
Site 11	Easting (UTM X): 427919	Northing (UTM Y): 4049276	Horizontal Accuracy: (EPE / FOM / PDOP) 55 ft <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-2-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-2-B	Trail				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-2-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 # \_\_\_\_\_ 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 type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input checked="" type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input checked="" 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:				

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

<input 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.)

None

**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)

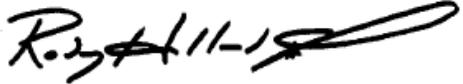
**Additional Stream Morphology:** (Record isolated pools or other features identified during the survey that may support recreational uses.)

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: \_\_\_\_\_ Rodney Holland, Christopher Park \_\_\_\_\_

Surveyor's Signature:  Date of Survey: \_\_\_\_\_ 04/03/2008 \_\_\_\_\_

Organization: \_\_\_\_\_ Olsson Associates \_\_\_\_\_ Position: Field Team Leader & Field Team Member



WBID # 3691

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> 04/03/2008	1:30 PM	Location Description (e.g., road crossing):
<b>Stream Name:</b> Ketchum Hollow		0.49 miles downstream of Site 2
Current Weather Conditions: Cloudy		Facility Name(s): None
Weather Conditions for Past 10 days: 2.72" rain @ Cassville		Permit Number(s): None
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): 428139	Northing (UTM Y): 4048453	Horizontal Accuracy: (EPE / FOM / PDOP) 77 ft <del>Meters</del>
Site 11	Easting (UTM X): 428238	Northing (UTM Y): 4048313	Horizontal Accuracy: (EPE / FOM / PDOP) 58 ft <del>Meters</del>

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-3-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-3-B	Trail				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
3691-3-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 # \_\_\_\_\_ 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 type="checkbox"/> Rural Residential
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<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:				

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

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

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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:

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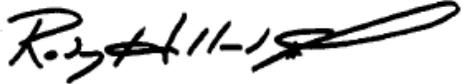
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**Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.**

Printed Names of Personnel Collecting Data: \_\_\_\_\_ Rodney Holland, Christopher Park \_\_\_\_\_

Surveyor's Signature:  Date of Survey: \_\_\_\_\_ 04/03/2008 \_\_\_\_\_

Organization: \_\_\_\_\_ Olsson Associates \_\_\_\_\_ Position: Field Team Leader & Field Team Member





