



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 0650 Shoal Creek

Submitted by

Pickett Ray & Silver Inc.

to

Missouri Department of Natural Resources
Water Protection Program

Date received: October 31, 2007



Missouri Department of Natural Resources
 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): Shoal Creek	
Missouri Water Body Identification (WBID) Number: 650	
8-digit HUC: 10280201	County: Putnam
Upstream Legal Description (from Table H): 5,66N, 17W	
Downstream Legal Description (from Table H): Mouth	
Number of sites evaluated: 9 sites	
List all sites numbers, listed consequently upstream to downstream: 650-1, 650-2, 650-3, 650-5, 650-6, 650-4, 650-7, 650-8, 650-9	

Site Locations Map(s): Attach a map of the entire segment with assessment sites clearly labeled. Mark any other items that may be of interest.

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

Facility Name(s) and Permit Number(s): PSF, Whitetail Finishing, MO 0117421

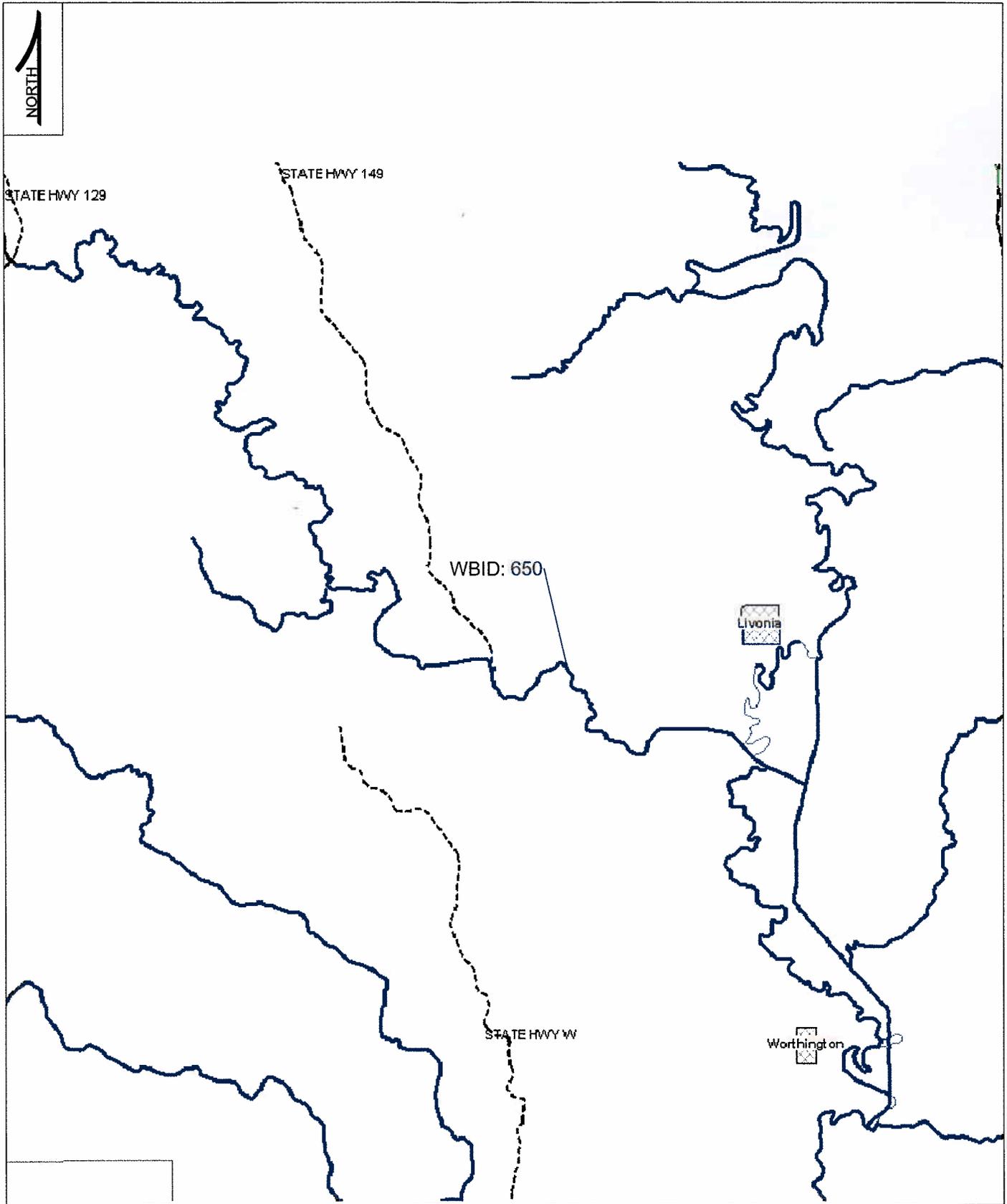
III. UAA Surveyor (please print legibly)

Name of Surveyor: Matt Cosby	Telephone Number: 636 397-1211
Organization/Employer: Pickett Ray Silver	

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

Signed: Matt Cosby Date: 9/24/07

\\3servers\Projects\07031\dwg\07031_MODN_01E\0650 Shoal Creek.dwg, 10/29/2007 8:33:48 AM, 1:2000, MAIT COSBY



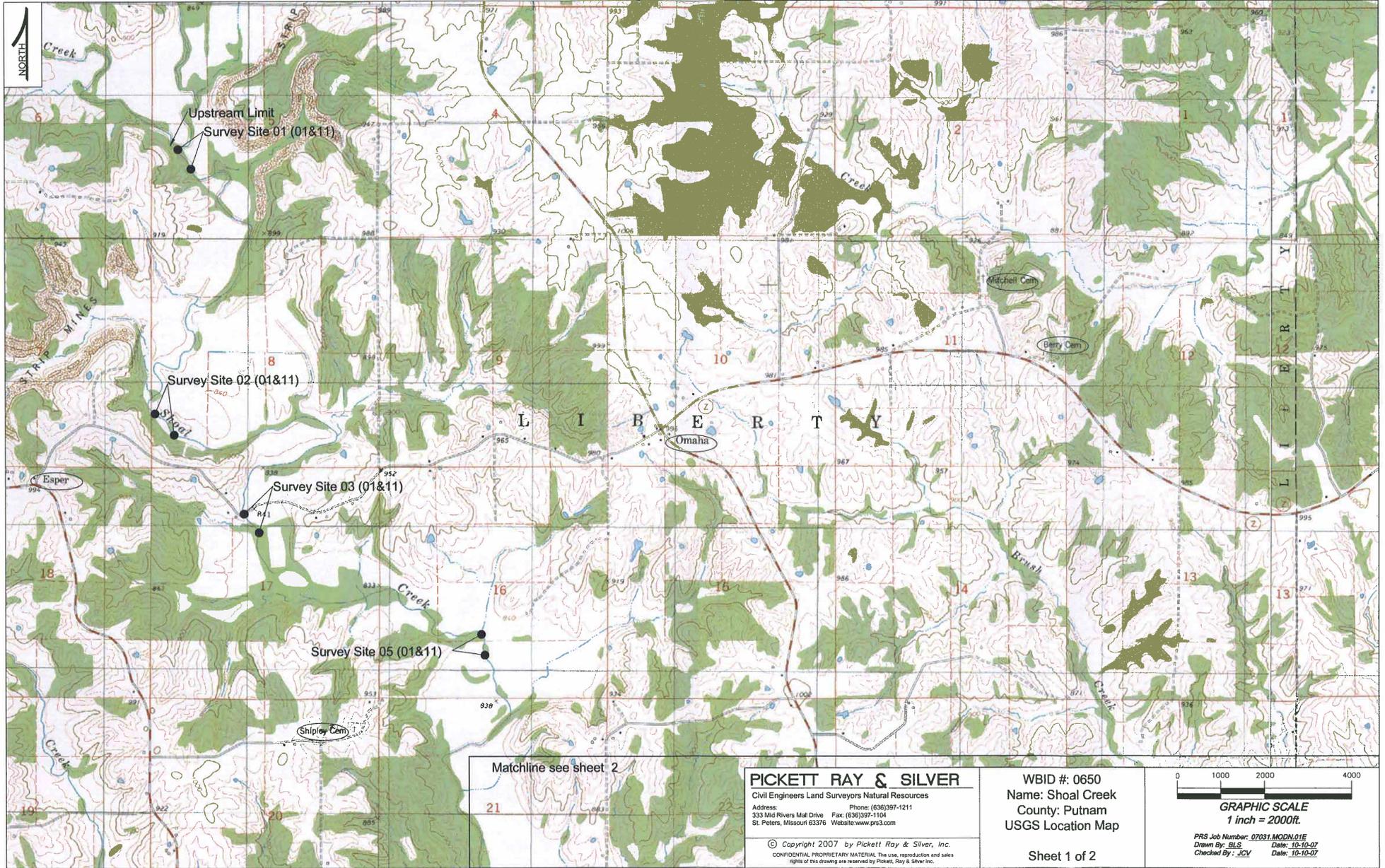
PICKETT RAY & SILVER
 Civil Engineers Land Surveyors Natural Resources
 Address: 333 Mid Rivers Mall Drive St. Peters, Missouri 63376
 Phone: (636)397-1211 Fax: (636)397-1104
 Website: www.prs3.com

WBID #: 0650
 Name: Shoal Creek
 County: Putnam
 GIS Location Map

PRs Job Number: 07031.MODN.01E
 Drawn By: BLS Date: 10-11-07
 Checked By: JCV Date: 10-11-07

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Matchline see sheet 2

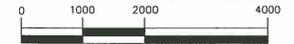
PICKETT RAY & SILVER

Civil Engineers Land Surveyors Natural Resources
Address: 333 Mid Rivers Mall Drive St. Peters, Missouri 63376
Phone: (636)397-1211 Fax: (636)397-1104
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WBID #: 0650
Name: Shoal Creek
County: Putnam
USGS Location Map

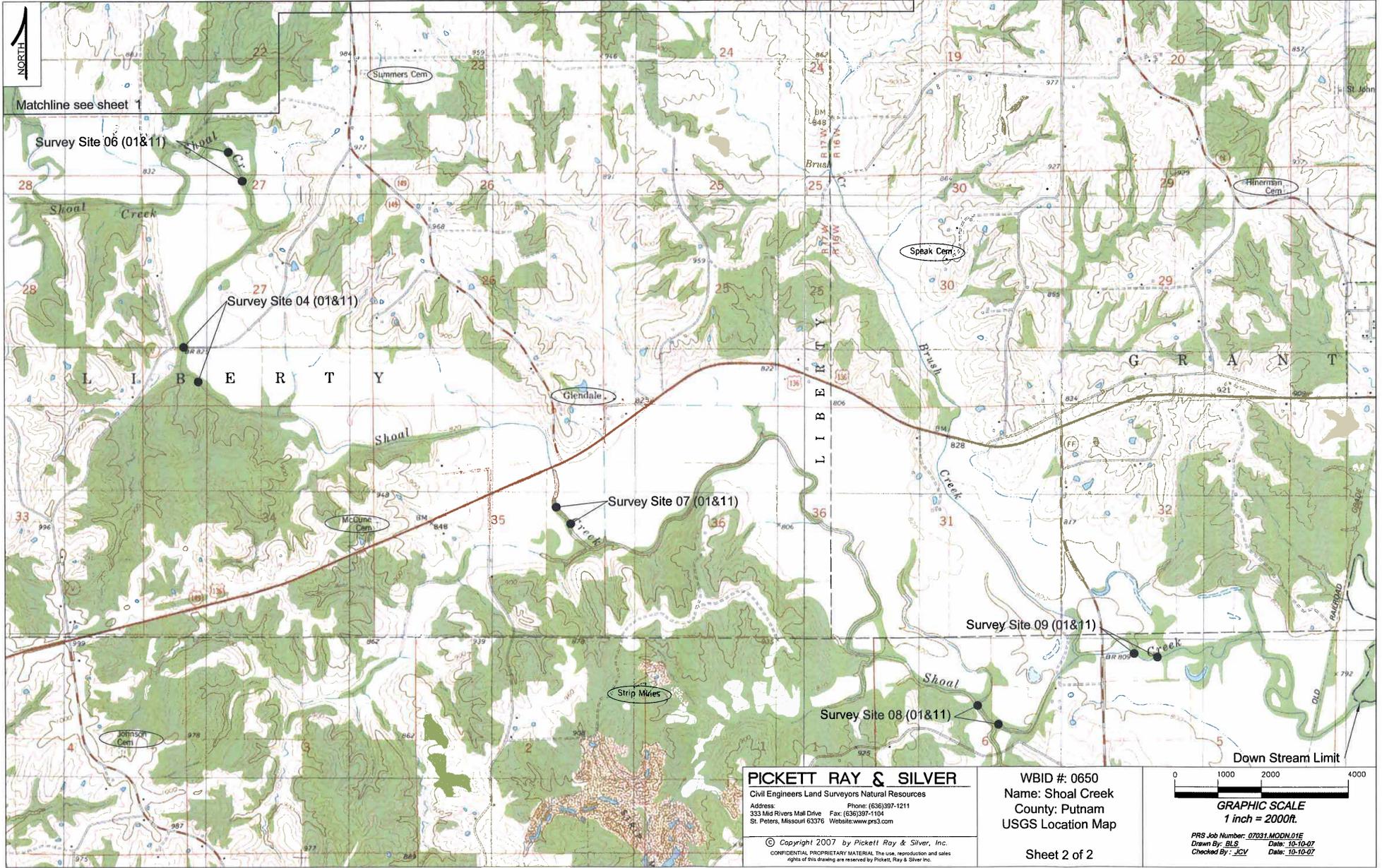
Sheet 1 of 2



GRAPHIC SCALE
1 inch = 2000ft.

PRS Job Number: 07031.MODN.01E
Drawn By: BLS Date: 10-10-07
Checked By: JCY Date: 10-10-07

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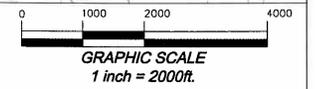


PICKETT RAY & SILVER
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 Address: 333 Mid Rivers Mall Drive St. Peters, Missouri 63376
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WBID #: 0650
 Name: Shoal Creek
 County: Putnam
 USGS Location Map

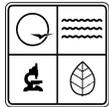
Sheet 2 of 2



PRS Job Number: 07031_MODN_01E
 Drawn By: BLS Date: 10-10-07
 Checked By: JCV Date: 10-10-07

WBID # 650

Site # 01



Field Data Sheets for Recreational Use Stream Surveys

Missouri Department of Natural Resources
Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/12/07 4:00pm</u>	Site Location Description (e.g., road crossing): <u>Downstream of confluence w/ 651</u>
Personnel (Data Collectors): <u>Mc & LS</u>	Facility Name: <u>PSF, White tail Farming</u>
Current Weather Conditions: <u>Sunny, 70°F</u>	Permit Number: <u>MO 0117421</u>
Weather Conditions for Past 10 days: <u>1.08 inches of rain</u>	
Drought Conditions?: 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): <u>513494m</u>	Northing (UTM Y): <u>4488821m</u>	Horizontal Accuracy: <u>0.6</u> Meters (EPE / FOM / PDOP)
Site 11	Easting (UTM X): <u>513592m</u>	Northing (UTM Y): <u>4488698m</u>	Horizontal Accuracy: <u>0.3</u> Meters (EPE / FOM / PDOP)

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See Attached photos and descriptions.</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

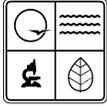
Uses Observed*: (Uses actually observed at time of survey.)

<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 Data Sheet D- Recreational Use Interview when conducting interviews.)

WBID # 650

Site # 1



Missouri **Field Data Sheets for Recreational Use Stream Surveys**
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

% Cobble	<u>25</u> % Gravel	<u>50</u> % Sand	<u>25</u> % Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

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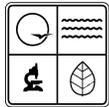
Water Characteristics*: (Mark all that apply.)

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 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 checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # 050

Site # 1



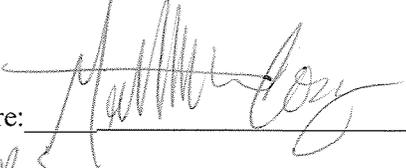
Missouri Department of Natural Resources
Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B – Site Characterization (continued)

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)

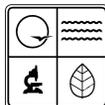
Comments: (Please record any additional comments here.)

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

Surveyor's Signature:  Date of Survey: 9/12/07
Organization: PRS Position: Field Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 1
 Missouri Department of Natural Resources
 Elevation (m) (height between low bank width and water): 5

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)
 01 UTM X: 513494 m UTM Y: 4488821 m +/- 0.4 (meters)
 11 UTM X: 513592 m UTM Y: 4488698 m +/- 0.3 (meters)

Average Stream Width: 7 (meters) Length of Survey Segment: 150 (meters)
 (To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

Dissolved Oxygen

Date: 9/12/07 Time: 4:00 pm
 Dissolved Oxygen: 8.54 (mg/L)
 Dissolved Oxygen: _____ (% sat)
 Specific Cond: _____ (µS/cm)
 Water Temperature: 17.7 (°C)

Transect Cross-Section

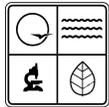
		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		>		>		.48	.03	.78	.03	.82	.01	.59	.05	.33	.15	.36	.04	.70	.02	.49	.05	.65	.05
2						1.0	.02	1.6	.08	1.6	.05	1.2	.01	.66	.02	.72	.57	1.4	.03	1.0	.02	1.3	.18
3						1.5	.29	2.4	.01	2.4	.02	1.8	.01	1.0	.25	1.1	.66	2.1	.51	1.5	.19	2.0	.18
4						2.0	.34	3.2	.13	3.2	.01	2.4	.13	1.3	.24	1.4	.65	2.8	.45	2.0	.02	2.6	.01
5						2.5	.24	4.0	.15	4.0	.05	3.0	.14	1.6	.19	1.7	.05	3.5	.43	2.5	.22	3.3	.05
6						3.0	.10	4.8	.17	4.8	.07	3.6	.15	2.0	.15	2.1	.04	4.2	.03	3.0	.19	4.0	.03
7						3.5	.13	5.6	.15	5.6	.05	4.2	.15	2.3	.01	2.4	.23	4.9	.14	3.5	.15	4.6	.14
8						4.0	.11	6.4	.01	6.4	.01	4.8	.01	2.6	.06	2.8	.24	5.6	.01	4.0	.01	5.2	.17
9						4.5	.05	7.2	.01	7.2	.01	5.4	.05	3.0	.05	3.2	.15	6.3	.09	4.5	.05	6.0	.04
Right Bank		0	0	0	0	4.8	0	7.8	0	8.2	0	5.9	0	3.3	0	3.6	0	7.0	0	4.9	0	6.5	0
Feature Type		Pool	Pool	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 0.01 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Signed: _____

Date: _____

WBID # 650
 Site # 2



Missouri Department of Natural Resources
Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/13/07 12:10 p.m.</u>	Site Location Description (e.g., road crossing): <u>Adjacent to road</u>
Personnel (Data Collectors): <u>LS + MC</u>	
Current Weather Conditions: <u>Sunny, 70°F</u>	Facility Name: <u>PSF, Whitetail Finishing</u>
Weather Conditions for Past 10 days: <u>1.08" of rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>513372m</u>	Northing (UTM Y): <u>4487011m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>3</u> Meters		
Site 11	Easting (UTM X): <u>513480m</u>	Northing (UTM Y): <u>4486875m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>1</u> Meters		

Photos:

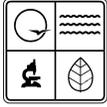
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # 650

Site # 2



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

<u>10</u> % Cobble	<u>40</u> % Gravel	<u>40</u> % Sand	% Silt	<u>10</u> % Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

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 checked="" type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # 650

Site # 2



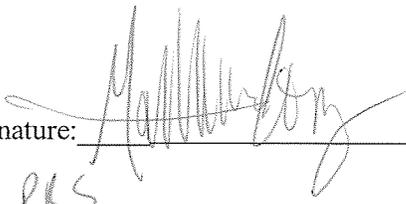
Missouri Department of Natural Resources
Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B – Site Characterization (continued)

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)

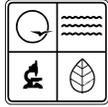
Comments: (Please record any additional comments here.)

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

Surveyor's Signature:  Date of Survey: 9/13/07
Organization: PKS Position: Field Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 656 Site #: 2

Missouri Department of Natural Resources

Estimated Channel Incision: 8 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 513372 m UTM Y: 4487011 m +/- 3 (meters)

11 UTM X: 513480 m UTM Y: 4486875 m +/- 1 (meters)

Average Stream Width: 8 (meters) Length of Survey Segment: 160 (meters)
(To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

Dissolved Oxygen	
Date: <u>9/13/07</u>	Time: <u>12:10</u>
Dissolved Oxygen: <u>10.31</u> (mg/L)	
Dissolved Oxygen: _____ (% sat)	
Specific Cond: _____ (µS/cm)	
Water Temperature: <u>17.6</u> (°C)	

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	.52	.1	.72	.39	.56	.2	.69	.35	1.0	.15	1.2	.45	1.4	.22	.96	.12	1.05	.25	.78	>1	.75	.11
2	1.0	.23	1.4	.56	1.1	.35	1.4	.5	2.0	.13	2.4	.48	2.8	.26	2.0	.1	2.1	.31	1.6		1.5	.23
3	1.5	.3	2.2	.55	1.7	.31	2.1	.5	3.0	.26	3.6	.63	4.2	.23	3.0	.17	3.1	.33	2.4		2.3	.38
4	2.0	.44	3.0	.54	2.2	.25	2.8	.35	4.0	.3	4.8	.55	5.6	.23	4.0	.18	4.1	.34	3.2		3.0	.52
5	2.5	.45	3.6	.46	2.8	.21	3.5	.33	5.0	.33	6.0	.49	7.0	.2	5.0	.30	5.1	.36	4.0		2.8	.51
6	3.0	.4	4.3	.41	3.4	.2	4.2	.34	6.0	.24	7.2	.5	8.4	.36	6.0	.26	6.1	.34	4.8		4.5	.5
7	3.5	.33	5.0	.43	4.0	.17	4.9	.19	7.0	.12	8.4	.49	10.0	.21	7.0	.30	7.1	.42	5.6		5.3	.44
8	4.0	.14	5.6	.51	4.6	.15	5.6	.16	8.0	.11	9.6	.45	11.2	.18	8.0	.32	8.1	.44	6.4		6.0	.39
9	4.5	.14	6.5	.28	5.1	.13	6.3	.11	9.0	.11	10.8	.4	12.6	.13	9.0	.36	9.1	.31	7.2		6.8	.24
Right Bank	5.2	0	7.2	0	5.6	0	6.9	0	10.2	0	12.1	0	13.5	0	9.6	0	10.5	0	7.8	0	7.5	0
Feature Type (riffle, run, or pool)	Run		Pool		Run																	

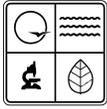
Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
Depth measurements taken at 10 equally spaced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

Signed: _____

Date: _____

WBID # 650

Site # 3



Missouri Department of Natural Resources
Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/13/07 2:00pm</u>	Site Location Description (e.g., road crossing): <u>Downstream of road crossing</u>
Personnel (Data Collectors): <u>LS & MC</u>	
Current Weather Conditions: <u>Sunny 70°F</u>	Facility Name: <u>PSF, White tail Finishing</u>
Weather Conditions for Past 10 days: <u>1.08 inches of rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>513965m</u>	Northing (UTM Y): <u>4486283m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>1.2</u> Meters
Site 11	Easting (UTM X): <u>514067m</u>	Northing (UTM Y): <u>4486168m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>1.6</u> Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # _____

Site # _____



Field Data Sheets for Recreational Use Stream Surveys
Missouri Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

5 % Cobble	40 % Gravel	40 % Sand	15 % Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

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 checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # _____

Site # _____



Missouri Department of Natural Resources
Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B – Site Characterization (continued)

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.)

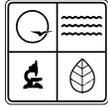
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 3
 Missouri Department of Natural Resources
 Department of Conservation: 7 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 513965 m UTM Y: 4486283 m +/- 1.2 (meters)
 11 UTM X: 514067 m UTM Y: 4486168 m +/- 1.6 (meters)

Average Stream Width: 8 (meters) Length of Survey Segment: 160 (meters)
 (To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

Dissolved Oxygen

Date: 9/13/07 Time: 2:00p
 Dissolved Oxygen: 9.27 (mg/L)
 Dissolved Oxygen: _____ (% sat)
 Specific Cond: _____ (µS/cm)
 Water Temperature: 17.9 (°C)

Transect Cross-Section

Station		Transect Cross-Section																				
		01		02		03		04		05		06		07		08		09		10		11
		Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	.62	.16	1.0	.18	.81	.1	.70	.32	>1	>1	1.3	.2	.75	.29	>1	>1	>1	1.4	.53		
	2	1.2	.23	2.0	.23	1.6	.1	1.4	.5			2.6	.24	1.5	.3				2.8	.59		
	3	1.8	.30	3.0	.24	2.4	.05	2.1	.5			3.9	.13	2.3	.24				4.2	.52		
	4	2.4	.36	4.0	.19	3.2	.05	2.8	.5			5.3	.24	3.0	.23				5.6	.34		
	5	3.0	.42	5.0	.17	4.0	.09	3.5	.46			6.6	.48	3.8	.22				7.0	.29		
	6	3.6	.34	6.0	.13	4.8	.05	4.2	.56			8.0	.5	4.5	.25				8.4	.25		
	7	4.2	.4	7.0	.15	5.6	0	4.9	.32			9.3	.26	5.3	.31				10.0	.23		
	8	4.8	.41	8.0	.26	6.4	0	5.6	.45			10.6	.13	6.0	.2				11.2	.26		
9	5.4	.3	9.0	.23	7.2	.15	6.3	.34			12.0	.11	6.8	.04				12.6	.31			
Right Bank	6.2	0	10.6	0	8.1	0	7	0	4.0	0	4.2	0	12.5	0	7.5	0	4.8	0	4.8	0	13.5	0
Feature Type (riffle, run, or pool)	Run		Run		Riffle		Run		Pool		Pool		Run		Run		Pool		Pool		Run	

GPS
22
11a

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 0.01 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Signed: _____

Date: _____

WBID # 650

Site # 4



Missouri Field Data Sheets for Recreational Use Stream Surveys

Department of Natural Resources
Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/24/07 11:00 AM</u>	Site Location Description (e.g., road crossing): <u>(Plum Trail)</u>
Personnel (Data Collectors): <u>MC + LS</u>	<u>Downstream of Road Crossing</u>
Current Weather Conditions: <u>Cloudy</u>	Facility Name: <u>PSF, Whitetail Finishing</u>
Weather Conditions for Past 10 days: <u>No rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>516792 m</u>	Northing (UTM Y): <u>4482137 m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>0.5</u> Meters
Site 11	Easting (UTM X): <u>516912 m</u>	Northing (UTM Y): <u>4481965 m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>3.2</u> Meters

Photos:

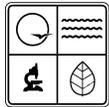
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # 650

Site # 4



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

<u>10</u> % Cobble	<u>40</u> % Gravel	<u>50</u> % Sand	% Silt	% Mud/Clay	% Bedrock
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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 checked="" type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # _____

Site # _____



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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.)

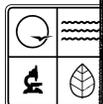
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 4

Missouri Department of Natural Resources

Elevation: 0.2 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 516792 m UTM Y: 4482137 m +/- 0.5 (meters)

11 UTM X: 516912 m UTM Y: 4481965 m +/- _____ (meters) PDOP: 3.2

Average Stream Width: 14 (meters) Length of Survey Segment: 280 (meters)
(To determine Length of Reach) (20x average stream width)

Field Staff: LS + mc

Dissolved Oxygen	
Date: <u>9/24/07</u>	Time: <u>11am</u>
Dissolved Oxygen: <u>9.07</u> (mg/L)	
Dissolved Oxygen: _____ (% sat)	
Specific Cond: _____ (µS/cm)	
Water Temperature: <u>19.2</u> (°C)	

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1.4	.30	>1		>1		>1		>1		.91	.03	.35	.08	1.1	.15	1.2	.26	>1		>1	
2	2.8	.50									1.8	.05	.70	.15	2.2	.18	2.4	.06				2.0
3	4.2	.50									2.7	.10	1.1	.30	3.3	.15	3.6	0				3.0
4	5.6	.49									3.6	.13	1.4	.31	4.4	.16	4.8	0				4.0
5	7	.45									4.5	.18	1.8	.34	5.5	.21	6.0	0				5.0
6	8.4	.41									5.4	.19	2.1	.45	6.4	.12	7.2	0				6.0
7	9.8	.29									6.3	.22	2.5	.46	7.7	.07	8.4	.05				7.0
8	11.2	.22									7.2	.21	2.8	.35	8.8	.05	9.6	.18				8.0
9	12.6	.15									8.1	.09	3.2	.22	9.9	.02	10.8	.17				9.0
Right Bank	14.2	0	~14	0	~12	0	~12	0	~12	0	9.1	0	3.5	0	10.6	0	11.8	0	~16.5	0	~10.0	0
Feature Type	Run		Rough		Pool		Pool		Pool		Run		Riffle		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 0.01 meter unless depth is too deep to measure (then record as > 1)

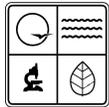
All measurements to be taken to the nearest 0.01 meter.

Signed:

Date:

WBID # 650

Site # 5



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources

Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/14/07 10:00 A</u>	Site Location Description (e.g., road crossing): <u>Adjacent to cornfield off Betty Mill Rd</u>
Personnel (Data Collectors): <u>LS & MC</u>	Facility Name: <u>PSF, Whitetail Finishing</u>
Current Weather Conditions: <u>Sunny, 60°F</u>	Permit Number: <u>MO 0117421</u>
Weather Conditions for Past 10 days: <u>1.0% meluogram</u>	
Drought Conditions?: 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): <u>515656m</u>	Northing (UTM Y): <u>4485458m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>0.6</u> Meters
Site 11	Easting (UTM X): <u>515665m</u>	Northing (UTM Y): <u>4485313m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>0.3</u> Meters

Photos:

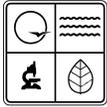
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # 650

Site # 5



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

% Cobble	<u>30</u> % Gravel	<u>30</u> % Sand	% Silt	<u>40</u> % Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

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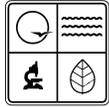
Water Characteristics*: (Mark all that apply.)

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 checked="" type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input checked="" type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # _____

Site # _____



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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.)

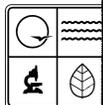
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 5

Missouri Department of Natural Resources

Estimated Channel Incision: 1.5 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 515656 m UTM Y: 4485458 m +/- 0.6 (meters)

11 UTM X: 515665 m UTM Y: 4485313 m +/- 0.3 (meters)

Average Stream Width: 5 (meters) Length of Survey Segment: 150 (meters)
(To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

Dissolved Oxygen	
Date: <u>9/14/07</u>	Time: <u>10:00A</u>
Dissolved Oxygen: <u>8.22</u> (mg/L)	
Dissolved Oxygen: _____ (% sat)	
Specific Cond: _____ (µS/cm)	
Water Temperature: <u>16.4</u> (°C)	

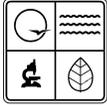
Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	.47	.2	.57	.2	.54	.09	.68	.15	.64	.05	.60	.65	.70	.24	>1m	>1	>1	>1	>1	>1	>1	>1
	2	1.0	.21	1.1	.12	1.1	.12	1.4	.15	1.3	.19	1.2	.69	1.4	.32								
	3	1.4	.23	1.7	.12	1.6	.16	2.1	.14	2.0	.26	1.8	.69	2.1	.36								
	4	2.0	.11	2.3	.1	2.1	.15	2.8	.19	2.6	.3	2.4	.6	2.8	.39								
	5	2.4	.09	3.0	.09	2.7	.14	3.0	.13	3.2	.14	3.0	.45	3.5	.38								
	6	2.8	.08	3.4	.12	3.2	.14	3.6	.1	3.8	.1	3.6	.35	4.2	.32								
	7	3.3	.40	4.0	.1	3.8	.12	4.2	0	4.5	.12	4.2	.24	4.9	.35								
	8	3.8	.1	4.6	.1	4.3	.06	4.8	0	5.1	.14	4.8	.15	5.6	.2								
	9	4.2	.06	5.1	.09	5.0	.04	5.4	.07	5.8	.06	5.4	.09	6.3	.15								
Right Bank		4.7	0	5.7	0	5.4	0	6.8	0	6.4	0	6.0	0	7.0	0	0	0	~10	0	~10	0	~10	0
Feature Type		Run		Run		Run		Run		Run		Pool		Pool		~8 Pool		Run		Run		Run	

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

WBID # 650

Site # 6



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources

Data Sheet B – Site Characterization

(must be completed for each site)

Date & Time: <u>9/14/07 11:30am</u>	Site Location Description (e.g., road crossing): <u>off pme trail, adjacent to agriculture fields</u>
Personnel (Data Collectors): <u>LS + MC</u>	
Current Weather Conditions: <u>sunny, 65°F</u>	Facility Name: <u>P5F, Whitetail Finishing</u>
Weather Conditions for Past 10 days: <u>1.08 inches rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>517158m</u>	Northing (UTM Y): <u>4483586m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>0.3</u> Meters
Site 11	Easting (UTM X): <u>517224</u>	Northing (UTM Y): <u>4483381m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>0.2</u> Meters

Photos:

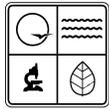
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions.</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # USO

Site # 6



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
 Data Sheet B – Site Characterization (continued)

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

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

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

% Cobble	<u>10</u>	% Gravel	<u>40</u>	% Sand	<u>40</u>	% Silt	<u>10</u>	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

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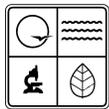
Water Characteristics*: (Mark all that apply.)

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 checked="" type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # _____

Site # _____



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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.)

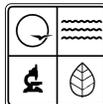
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 6

Missouri
Department of
Natural Resources

Bank-to-Bank Channel Elevation: .6 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 517158 m UTM Y: 4483586 m +/- 0.3 (meters)

11 UTM X: 517224 UTM Y: 4483381 m +/- 0.2 (meters)

Average Stream Width: 8 (meters) Length of Survey Segment: 160 (meters)
(To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

Dissolved Oxygen	
Date: <u>9/14/07</u>	Time: <u>11:30A</u>
Dissolved Oxygen: <u>10.19</u> (mg/L)	
Dissolved Oxygen: _____ (% sat)	
Specific Cond: _____ (µS/cm)	
Water Temperature: <u>17.8</u> (°C)	

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	.42	.16	.56	.32	.57	.15	>1		>1		.49	.28	>1		>1		>1		>1		>1	
2	.84	.3	1.1	.34	1.1	.25					1.0 .41											
3	1.3 .83	.03	1.7	.41	1.7	.39					1.5	.46										
4	1.7	.26	2.2	.45	2.3	.42					2	.35										
5	2.1	.28	2.8	.43	2.8	.39					2.5	.38										
6	2.5	.21	3.4	.33	3.4	.32					3	.35										
7	2.9	.17	3.9	.24	4.0	.21					3.5	.2										
8	3.1	.07	4.5	.11	4.5	.15					4	.11										
9	3.5	.08	5.0	.11	5.1	.09					4.5	.05										
Right Bank	4.2	0	5.6	0	5.7	0	~8	0	~10	0	4.9	0	~8	0	~9	0	~9	0	~10	0	~10	0
Feature Type (riffle, run, or pool)	Run		Run		Run		Pool		Pool		Run		Pool		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 0.01 meter unless depth is too deep to measure (then record as > 1)
All measurements to be taken to the nearest 0.01 meter.

Signed: _____

Date: _____

WBID # 650

Site # 7



Field Data Sheets for Recreational Use Stream Surveys
Missouri Department of Natural Resources
Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/24/07 12:30 pm</u>	Site Location Description (e.g., road crossing): <u>(Hwy 149)</u>
Personnel (Data Collectors): <u>LS + MC</u>	<u>Downstream of road crossing</u>
Current Weather Conditions: <u>cloudy</u>	Facility Name: <u>PSF, Whitetail Fishing</u>
Weather Conditions for Past 10 days: <u>No rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>519446 m</u>	Northing (UTM Y): <u>4481094 m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>4.3</u> Meters
Site 11	Easting (UTM X): <u>519528 m</u>	Northing (UTM Y): <u>4480969 m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>7.1</u> Meters

Photos:

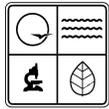
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # 650

Site # 7



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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:				

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 checked="" type="checkbox"/> Livestock Watering
Comments / Other:				

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

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

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: <u>Cow feces</u>
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 checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # _____

Site # _____



Missouri Department of Natural Resources
Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B – Site Characterization (continued)

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.)

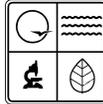
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 7

Missouri
Department of
Natural Resources

Elevation (Channel to river): 0.4 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 519446 m UTM Y: 4481094 m +/- _____ (meters) ADP: 4.3

11 UTM X: 519528 m UTM Y: 4480969 m +/- _____ (meters) PDOP: 7.1

Average Stream Width: 8 (meters) Length of Survey Segment: 160 (meters)
 (To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

Dissolved Oxygen

Date: 9/24/07 Time: 12:30p

Dissolved Oxygen: 9.70 (mg/L)

Dissolved Oxygen: _____ (% sat)

Specific Cond: _____ (µS/cm)

Water Temperature: 25.2 (°C)

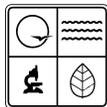
Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		.7	.41	0.8 .02	.02	.7	.06	1	.08	1.1	.04	1.1	.05	.9	.05	1.6	.38	1.6	.35	1.4	.26	1.7	.11
2		1.4	.15	1.3	.09	1.3	.12	2	.10	2.2	.06	2.2	.06	1.9	.05	3.2	.52	3.2	.37	2.8	.0	2.4	.01
3		2.8	.14	1.9	.10	2.0	.20	3	.05	3.3	.06	3.3	.05	2.8	.13	4.8	.45	4.8	.40	4.2	.21	3.1	0
4		3.8	.12	2.5	.10	2.7	.18	4	.06	4.4	.07	4.4	.02	3.7	.14	6.4	.26	6.4	.35	5.6	.19	4.8	0
5		3.5	.13	3.2	.11	3.4	.25	5	.05	5.5	.08	5.5	.01	4.6	.04	7.0	.26	7.0	.33	7.0	.17	6.5	.02
6		4.2	.10	3.8	.13	4.1	.18	6	.04	6.6	.10	6.6	.0	5.5	.05	8.6	.28	8.6	.41	8.4	.15	8.2	.06
7		4.9	.11	4.4	.10	4.8	.10	7	.02	7.7	.23	7.7	.11	6.5	.02	10.2	.13	10.2	.26	9.8	.10	9.9	.07
8		5.3	.09	5.0	.11	5.3	0	8	.05	8.8	.10	8.8	.05	7.4	.05	10.8	.11	11.8	.21	11.2	.10	11.6	.03
9		6.0	.03	5.7	.10	6.0	.10	9	.10	9.9	.05	9.9	.11	8.4	.02	13.4	.40	13.4	.32	12.6	.01	13.3	.02
Right Bank		6.9	0	6.3	0	6.7	0	10.0	0	11.1	0	11.4	0	9.4	0	15.6	0	15.7	0	13.8	0	15.0	0
Feature Type <small>(riffle, run, or pool)</small>		Run		Riffle		Riffle		Run		Riffle													

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

WBID # 650

Site # 8



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources

Data Sheet B – Site Characterization

(must be completed for each site)

Date & Time: <u>9/24/07 1:15pm</u>	Site Location Description (e.g., road crossing): <u>Near Flax Trail Road</u>
Personnel (Data Collectors): <u>CS + MC</u>	
Current Weather Conditions: <u>Cloudy, 80°F</u>	Facility Name: <u>PSF, Whitetail Finishing</u>
Weather Conditions for Past 10 days: <u>No rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>522430m</u>	Northing (UTM Y): <u>4479744m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>4.8</u> Meters
Site 11	Easting (UTM X): <u>522550m</u>	Northing (UTM Y): <u>4479596m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>2.4</u> Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos & descriptions.</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

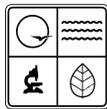
Uses Observed*: (Uses actually observed at time of survey.)

<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 Data Sheet D- Recreational Use Interview when conducting interviews.)

WBID # 650

Site # 8



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

<u>20</u> % Cobble	<u>30</u> % Gravel	<u>40</u> % Sand	% Silt	% Mud/Clay	<u>10</u> % Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

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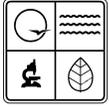
Water Characteristics*: (Mark all that apply.)

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

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

WBID # _____

Site # _____



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of
Natural Resources – Site Characterization (continued)

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.)

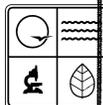
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 8

Missouri Department of Natural Resources

Estimated channel incision: 0.1 (m) (height between low bank width and water)

GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)

01 UTM X: 522430 m UTM Y: 4479744 m +/- _____ (meters) PDOP: 4.8

11 UTM X: 522550 m UTM Y: 4479526 m +/- _____ (meters) PDOP: 2.4

Average Stream Width: 10 (meters) Length of Survey Segment: 200 (meters)
(To determine Length of Reach) (20x average stream width)

Field Staff: LS + MC

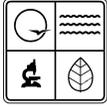
Dissolved Oxygen	
Date: <u>9/24/07</u>	Time: <u>1:15pm</u>
Dissolved Oxygen: <u>9.25</u> (mg/L)	
Dissolved Oxygen: <u>234</u> (% sat)	
Specific Cond: _____ (µS/cm)	
Water Temperature: <u>23.4</u> (°C)	

Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		.38		1	.26	2.1	.26		>1		>1		>1		2.1		>1		>1		>1		>1
2		2.1	.49	2	.31	4.2	.34																
3		3.1	.45	3	.27	6.4	.30																
4		4.0	.40	4	.34	8.8	.44																
5		5.0	.38	5	.33	10.9	.57																
6		6.0	.30	6	.33	13.0	.39																
7		7.1	.26	7	.35	15.1	0																
8		8.1	.23	8	.36	17.2	.05																
9		9	.25	9	.35	19.3	.10																
Right Bank		9.6	0	10.3	0	21.0	0	~14	0	~12	0	~12	0	~12	0	~12	0	~14	0	~14	0	~10	0
Feature Type (riffle, run, or pool)		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 0.01 meter unless depth is too deep to measure (then record as > 1)
All measurements to be taken to the nearest 0.01 meter.

WBID # 650
 Site # 9



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization
 (must be completed for each site)

Date & Time: <u>9/24/07 2:45 pm</u>	Site Location Description (e.g., road crossing): <u>Downstream of FF</u>
Personnel (Data Collectors): <u>LS + MC</u>	
Current Weather Conditions: <u>Sunny, 80°F</u>	Facility Name: <u>PSF, Whitetail Finishing</u>
Weather Conditions for Past 10 days: <u>no rain</u>	Permit Number: <u>MO 0117421</u>
Drought Conditions?: 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): <u>523536m</u>	Northing (UTM Y): <u>4480106m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>4.1</u> Meters
Site 11	Easting (UTM X): <u>523677m</u>	Northing (UTM Y): <u>4480058m</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>2.5</u> Meters

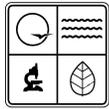
Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>See attached photos and descriptions</u>					
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)				

WBID # 650
 Site # 9



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
 Data Sheet B – Site Characterization (continued)

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 checked="" 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
Comments / Other:				

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

% Cobble	<u>40</u> % Gravel	<u>40</u> % Sand	<u>10</u> % Silt	<u>10</u> % Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site)

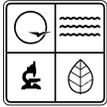
Water Characteristics*: (Mark all that apply.)

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 checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input checked="" type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input checked="" type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

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

WBID # 650

Site # 9



Missouri Field Data Sheets for Recreational Use Stream Surveys
Department of Natural Resources
Data Sheet B – Site Characterization (continued)

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.)

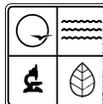
Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results



Waterbody ID: 650 Site #: 9
 Missouri Department of Natural Resources
 Elevation: 1.0 (m) (height between low bank width and water)
 GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)
 01 UTM X: 523536 m UTM Y: 4480106 m +/- (meters) PDOP: 4.1
 11 UTM X: 523677 m UTM Y: 4480058 m +/- (meters) PDOP: 2.5
 Average Stream Width: 7 (meters) Length of Survey Segment: 150 (meters)
 (To determine Length of Reach) (20x average stream width)
 Field Staff: LS & MC

Dissolved Oxygen

Date: 9/24/07 Time: 2:45 pm
 Dissolved Oxygen: 9.01 (mg/L)
 Dissolved Oxygen: _____ (% sat)
 Specific Cond: _____ (µS/cm)
 Water Temperature: 25.7 (°C)

Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1		.73	.5	.92	.25	1.0	.68	1.1	.64	1.4	.59	1.0	.35	>1	.75	.10	.63	.21	>1	>1	>1	>1	
2		1.4	.54	1.8	.35	2.0	.58	2.2	.63	2.8	.59	2.0	.29		1.5	.08	1.3	.34					
3		2.1	.53	2.7	.26	3.0	.44	3.3	.63	4.8	.55	3.0	.24		2.3	.11	2.0	.42					
4		2.8	.44	3.6	.41	4.0	.43	4.4	.53	5.6	.44	4.0	.23		3.0	.05	2.5	.51					
5		3.5	.49	4.5	.39	5.0	.42	5.5	.49	7.0	.32	5.0	.14		3.8	.15	3.2	.54					
6		4.2	.50	5.4	.54	6.0	.41	6.0	.52	8.4	.25	6.0	.10		4.5	.34	3.8	.45					
7		4.9	.41	6.3	.76	7.0	.44	7.7	.51	10.0	.18	8.0	.21		5.3	.33	4.4	.90					
8		5.6	.25	7.2	.73	8.0	.55	8.0	.80	11.2	.40	8.0	.23		6.0	.53	5.0	.30					
9		6.3	.10	8.1	.56	9.0	.52	10.1	.70	12.6	.29	9.0	.28	.26	6.8	.45	5.7	.25					
Right Bank		7.3	0	9.2	0	10.3	0	11.4	0	13.9	0	10	0	0	7.5	0	6.3	0	8	0	8	0	
Feature Type (riffle, run, or pool)		Riffle		Pool		Run		Run		Run		Run		Pool		Run		Run		Pool		Pool	

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

Signed: _____

Date: _____

WBID# 0650



Site# 1 Photo ID# Downstream T-1



Site# 1 Photo ID# Upstream T-1



Site# 1 Photo ID# Downstream T-11



Site# 1 Photo ID# Upstream T-11

WBID# 0650



Site# 2 Photo ID# Downstream T-1



Site# 2 Photo ID# Upstream T-1



Site# 2 Photo ID# Downstream T-11



Site# 2 Photo ID# Upstream T-11

WBID# 0650



Site# 3 Photo ID# Downstream T-1



Site# 3 Photo ID# Upstream T-1



Site# 3 Photo ID# Downstream T-11



Site# 3 Photo ID# Upstream T-11

WBID# 0650



Site# 4 Photo ID# Downstream T-1



Site# 4 Photo ID# Upstream T-1



Site# 4 Photo ID# Downstream T-11



Site# 5 Photo ID# Downstream T-1

WBID# 0650



Site# 5 Photo ID# Upstream T-1



Site# 5 Photo ID# Upstream T-11



Site# 5 Photo ID# Downstream T-11



Site# 6 Photo ID# Downstream T-1

WBID# 0650



Site# 6 Photo ID# Upstream T-1



Site# 6 Photo ID# Upstream T-11



Site# 6 Photo ID# Downstream T-11



Site# 7 Photo ID# Downstream T-1

WBID# 0650



Site# 7 Photo ID# Upstream T-1



Site# 7 Photo ID# Upstream T-11



Site# 7 Photo ID# Downstream T-11



Site# 8 Photo ID# Downstream T-1

WBID# 0650



Site# 8 Photo ID# Upstream T-1



Site# 8 Photo ID# Upstream T-11



Site# 8 Photo ID# Downstream T-11



Site# 9 Photo ID# Downstream T-1

WBID# 0650



Site# 9 Photo ID# Upstream T-1



Site# 9 Photo ID# Upstream T-11



Site# 9 Photo ID# Downstream T-11



Site# 9 Photo ID# Access denied