

OTTER CREEK  
VIGO COUNTY  
2006 Fish Management Report

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## EXECUTIVE SUMMARY

- Otter Creek originates in Clay County near the Town of Carbon. From there, it flows approximately 24 mi through Clay and Vigo Counties to its confluence with the Wabash River north of Terre Haute.
- A general stream survey was conducted on September 20 and 21, 2006. Historic sampling sites were used at RM 4.0, 6.0, 10.3, and 14.5, and there was one additional site at RM 18.0. Fish habitat at each station was subjectively evaluated using the Qualitative Habitat Evaluation Index (QHEI). The Index of Biotic Integrity (IBI) was also used to assess stream health based upon the fish community. Water chemistry parameters were measured at all stations.
- A total of 1,760 fish was collected that weighed 186 lbs. Fifty-one species representing 11 families were collected.
- River mile 4.0 had the highest species richness with 32 species sampled, whereas RM 18.0 had the lowest richness with 22.
- Habitat scores averaged 62.
- River miles 4.0, 10.3, and 14.5 had IBI scores that classify these stream reaches as “good to excellent”. River mile 18.0 was classified as “good”.
- The best fishing opportunities are at Markle Dam. At this site there is good shoreline access and abundant game fish.

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## INTRODUCTION

Otter Creek originates in Clay County near the Town of Carbon. From there, it flows approximately 24 mi through Clay and Vigo Counties to its confluence with the Wabash River north of Terre Haute. Otter Creek's watershed is approximately 125 mi<sup>2</sup>.

The fish population at RM 6.0 was sampled repeatedly between 1962 and 1974 with seines. A general stream survey was conducted in 1995 at RMs 4.0, 6.0, 10.3, and 14.5. The 1995 survey revealed a diverse fish community with both river and small stream species. Fishing was considered fair to good in the lower 10 mi of river for spotted, smallmouth, largemouth, and rock bass.

## METHODS

A general stream survey was conducted on September 20 and 21, 2006. Fish sampling was conducted at historic sites located on Otter Creek at RMs 4.0, 6.0, 10.3, and 14.5, and one additional site at RM 18.0 (Figure 1). Sampling sites were labeled according to their approximate RM as determined by Hoggatt (1975). Station length ranged from 405 to 834 ft. The sample area at RM 6.0 consisted of the face of Markle Dam and therefore no QHEI or IBI scores were determined. Water chemistry parameters were measured according to standard survey guidelines (Indiana Division of Fish and Wildlife 2001).

Stream width was measured at five transects per station with the exception of the station at RM 6.0. Across each transect three water depths were measured. Fish habitat at each station was subjectively evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA (Rankin 1989).

Fish were collected using a pulsed DC barge electrofisher with a crew of two dippers and one barge operator. Sampling effort consisted of approximately 0.5 h at each station. All fish were identified to species level. Game species were measured to the nearest 0.1 in and weighed to the nearest 0.01 lb. Scale samples were taken from game fish for age and growth analysis. Non-game species were counted, bulk weighed, and a length range was determined. Fish that could not be identified in the field were preserved in 10% formalin and taken to the laboratory for later identification.

The Index of Biotic Integrity (IBI) was calculated to assess stream health. The Interior River Lowland Ecoregion IBI was used (Dufour 2002). The overall IBI score is based on 12 metrics which rate the stream's health into one of six categories: excellent, good, fair, poor, very poor, and no fish (Appendix 1).

A simple regression analysis was used to determine if any significant relationships existed among stream factors and fish community factors.

## RESULTS

### Water chemistry and fish habitat

The dissolved oxygen concentrations ranged from 8 to 9 ppm. Secchi disk depths ranged from 18 in to 32 in. Water temperature ranged from 57 to 60 °F. The pH ranged from 9.0 to 9.5. Conductivity ranged from 360 to 500  $\mu$ S (Appendix 2).

The highest QHEI score was 71 at RM 18, followed by 67 (RM 14.5), 58 (RM 4.0), and 51 (RM 10.3). The average QHEI score was 62.

### Fish survey data

A total of 1,760 fish was collected that weighed 186 lbs. Fifty-one species representing 11 families were collected (Appendix 3). Northern hogsucker was most abundant by number (10%), followed by longear sunfish (10%), and bluegill (8%). Black redhorse was most abundant by weight (20%), followed by gizzard shad (12%), and golden redhorse (12%). River mile 4.0 demonstrated the greatest species richness with 32 species sampled, whereas RM 18.0 had the lowest richness with 22. As RM increased, species richness significantly decreased ( $R^2 = 0.90$ ,  $df = 4$ ,  $P < 0.01$ ) (Figure 2). The IBI scores ranged from 50 (RM 18.0) to 56 (RM 4.0, RM 10.3).

### Carp and Minnow Family (*Cyprinidae*)

Thirteen minnow species were collected that comprised 30% of the total catch by number and 7% by weight. Silverjaw minnow comprised 22% of the minnow total, followed by creek chub (20%), and spotfin shiner (15%). Other species collected were bluntnose minnow, central stoneroller, redbfin shiner, sand shiner, emerald shiner, common carp, Mississippi silvery minnow, blacknose dace, rosyface shiner, and striped shiner.

### Sunfish Family (*Centrarchidae*)

Ten species and one hybrid were collected that comprised 25% of the total catch by number and 23% by weight. Longear sunfish comprised 39% of the sunfish total, followed by bluegill (30%), and spotted bass (13%).

A total of 60 spotted bass was collected that weighed 12 lbs. They ranged in length from 2.3 to 18.6 in. The CPUE was 24.0/h including age-0 bass. Age-0 bass made up 38% of the total catch. Only two spotted bass were longer than 12.0 in. The majority of spotted bass were caught at RM 6.0. Growth and size structure was similar to 1995 with an age-2 bass averaging 8.2 versus 8.7 in 1995 (Appendix 4).

A total of 33 largemouth bass was collected that weighed 7 lbs. They ranged in length from 2.9 to 15.7 in and only three were at least 12.0 in. The CPUE was 13.2/h. Largemouth bass averaged 6.6 in at age 1 and 7.3 in at age 2.

A total of 22 smallmouth bass was collected that weighed 7 lbs. They ranged in length from 1.8 to 12.0 in and only one was greater than 12.0 in. The CPUE was 8.8/h. No smallmouth over age 3 were collected. Smallmouth averaged 6.0 at age 1 and 10.8 in at age 3.

Other species collected included green sunfish, redear sunfish, rock bass, warmouth, black crappie, and hybrid sunfish.

### Sucker Family (*Catostomidae*)

Nine sucker species were collected that comprised 22% of the total catch by number and 54% by weight. Northern hogsucker comprised 46% of the sucker catch, followed by white sucker (21%), and black redhorse (16%). Other species collected were golden redhorse, shorthead redhorse, highfin carpsucker, spotted sucker, river carpsucker, bigmouth buffalo, and silver redhorse.

### Perch family (*Percidae*)

Nine species of this family were collected that comprised 10% of the total catch by number and 1% by weight. Johnny darter comprised 43% of the family's catch, followed by orangethroat darter (23%), and fantail darter (10%). Three sauger were collected; one at RM 4.0

and two at RM 6.0. They ranged in length from 12.3 to 13.1 in and all were age 1. Other species collected were greenside darter, blackside darter, slough darter, and dusky darter.

#### Herring Family (*Clupeidae*)

Gizzard shad was the only species from the family collected. A total of 106 shad was collected that ranged in length from 5.4 to 10.2 in. They comprised 6% of the collection by number.

#### Livebearer Family (*Poeciliidae*)

A total of 34 western mosquitofish was collected. They ranged in length from 0.8 to 2.0 in and comprised less than 2% of the sample.

#### Killifish Family (*Fundulidae*)

A total of 22 blackstripe topminnow was collected. They ranged in length from 1.3 to 2.9 in and comprised less than 2% of the sample.

#### Catfish Family (*Ictaluridae*)

A total of eight yellow bullhead and three channel catfish was sampled. The channel catfish were all under 9.0 in.

#### Silverside Family (*Atherinidae*)

A total of 11 brook silversides was collected. They comprised less than 1% of the sample by both number and weight.

#### Drum Family (*Sciaenidae*)

Six freshwater drum were collected ranging in length from 8.4 to 14.1 in. They accounted for less than 1% of the collection by number.

#### Pike Family (*Esocidae*)

A total of four redbfin pickerel was collected. The largest was 6.5 in.

## DISCUSSION

Fifty-one species of fish were collected at Otter Creek. The number of fish species significantly decreased as RM increased. This is likely due to the “large river” species from the Wabash River migrating in and out of Otter Creek. River mile 4.0, 10.3, and 14.5 had IBI scores that classify these stream reaches as “good to excellent”. River mile 18.0 was classified as “good”.

The QHEI scores averaged 62. Scores greater than 60 are generally classified as acceptable habitat for warmwater species of fish (Shipman 1997). Generally, QHEI scores and IBI scores are known to be positively correlated (Rankin 1989, Sullivan et al. 2004, Lau et al. 2006, Weinman 2006). However, Otter Creek IBI scores increased as QHEI scores decreased due to the increased species richness in the lower river.

The best fishing opportunities are at Markle Dam. At this site there is good shoreline access and game fish are abundant. The stream narrows in the upper reaches limiting the number and size of many game fish. Therefore, the lower 10 mi of Otter Creek provides better fishing opportunities.

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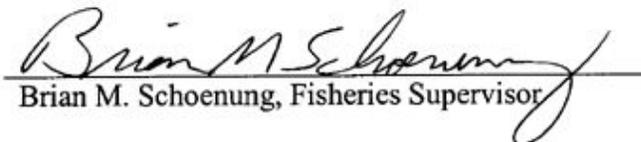
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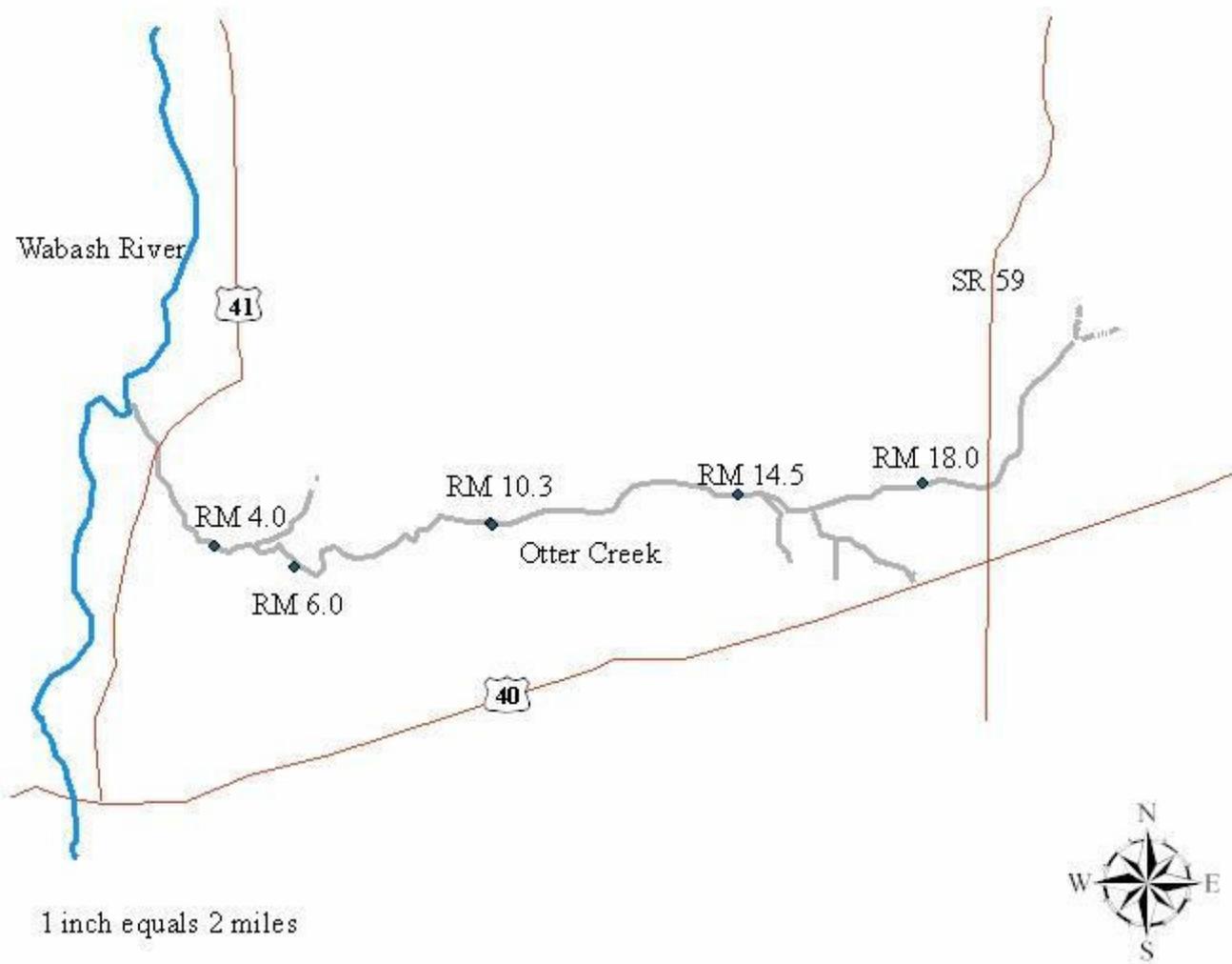


Figure 1. Otter Creek sampling locations by river mile (RM), 2006.

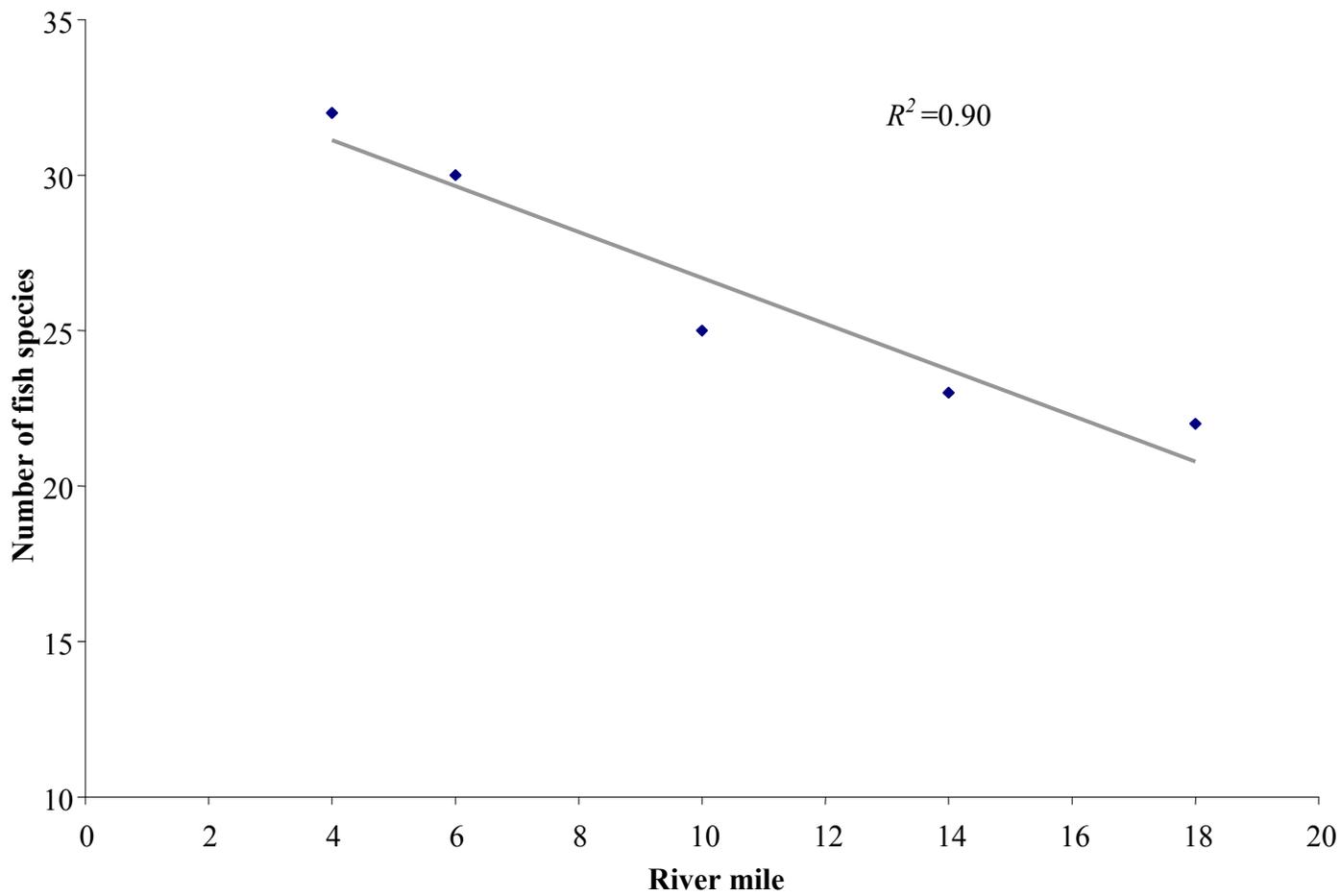


Figure 2. Number of fish species per river mile, Otter Creek, 2006.

Appendix 1. Attributes of Index of Biotic Integrity (IBI) classification, total IBI scores, and integrity classes from Karr et al. (1986).

Total IBI score	Integrity class	Attributes
58-60	Excellent	Comparable to the best situation without human disturbance; all regionally expected species for the habitat and stream size including the most tolerant forms, are present with a full array of age classes; balanced trophic structure.
48-52	Good	Species richness somewhat below expectations. Especially due to the loss of the most intolerant forms; some species are present with less than optimal abundances or size distributions; trophic structure shows some signs of stress.
40-44	Fair	Signs of additional deterioration include loss of intolerant forms, fewer species, highly skewed trophic structure (e.g. increasing frequency of omnivores and other tolerant species); older age classes of top predators may be rare.
28-34	Poor	Dominated by omnivores; tolerant forms, and habitat generalists; few top carnivores; growth rates and condition factors commonly depressed; hybrids and diseased fish often present.
12-22	Very Poor	Few fish present; mostly introduced or tolerant forms; hybrids common; disease, parasites, fin damage, and other anomalies regular.
0	No fish	Repeated sampling finds no fish.

Appendix 2  
Water quality, QHEI scores, and fisheries data by site.

**INDIANA DIVISION OF FISH AND WILDLIFE  
STREAM HABITAT EVALUATION FORM**

STREAM: Otter Creek RIVER MILE: 4.0

NEAREST TOWN: North Terre Haute COUNTY: Vigo

QUADRANGLE: Rosedale TWP: 13N RNG: 9W SEC: 36

LATITUDE: downstream N 39.52967 LONGITUDE: W 87.36966

LATITUDE: upstream N 39.52864 LONGITUDE: W87.36874

U.S.G.S. GAUGING STATION LOCATION: USGS partial gauge station RM 10.3 AVG. DISCHARGE (cfs): ~125

IS REACH REPRESENTATIVE OF STREAM (Y/N) Y IF NOT, WHY? \_\_\_\_\_

DESCRIPTION OF SAMPLE SITE (Access, length, direction sampled): Accessed stream behind REMC Utility Comp.

Started at bridge and shocked upstream.

**COLLECTION SUMMARY**

DATE: 9/21/2006 GEAR: Tote Barge EFFORT: 30 min

CREW: Kittaka, King, Weinman, Bartley

OTHER GEAR/EFFORT: None WATER STAGE: Normal

CANOPY (%OPEN): 70 PHOTOS (Y/N): Y SECCHI DISK (inches): 32

AIR TEMP (F): \_\_\_\_\_ WATER TEMP (F): 60 D.O. (ppm): 9

CONDUCTIVITY: 480  $\mu$ S pH: 9 ALKALINITY: 34.2 ppm

TDS: 240 ppm

STREAM MEASUREMENTS AVG. WIDTH: 55.6 ft AVG. DEPTH: 18.4 in MAX DEPTH: 5.0 ft

STATION LENGTH: (1st date) 498.0 ft (2nd date) \_\_\_\_\_

WIDTH (ft)	DEPTH (in)		
63	12	18	8
63	53	36	6
52	24	22	3
49	22	26	20
51	11	10	6


  
 SUBJECTIVE      AESTHETIC  
 RATING            RATING  
 (1-10)            (1-10)

ADDITIONAL COMMENTS/POLLUTION IMPACTS: \_\_\_\_\_

STREAM: Otter Creek RIVER MILE 4.0 DATE: 9/21/2006 QHEI SCORE **58**

1) SUBSTRATE: (Check ONLY Two Substrate Type Boxes: Check all types present)(20) SUBSTRATE SCORE **14.5**

TYPE		POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE ORIGIN (all)		SILT COVER (one)					
<input type="checkbox"/>	BLDER/SLAB(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LIMESTONE(1)	<input type="checkbox"/>	SILT-HEAVY(-2)	<input type="checkbox"/>	SILT-MOD(-1)		
<input type="checkbox"/>	BOULDER(9)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TILLS(1)	<input type="checkbox"/>	HARDPAN(0)	<input checked="" type="checkbox"/>	SILT-NORM(0)	<input type="checkbox"/>	SILT-FREE(1)
<input type="checkbox"/>	COBBLE(8)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SANDSTONE(0)	Extent of Embeddedness (check one)					
<input type="checkbox"/>	HARDPAN(4)	<input type="checkbox"/>	SHALE(-1)	<input type="checkbox"/>	EXTENSIVE(-2)	<input type="checkbox"/>	MODERATE(-1)						
<input checked="" type="checkbox"/>	MUCK/SILT(2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	COAL FINES(-2)	<input checked="" type="checkbox"/>	LOW(0)	<input type="checkbox"/>	NONE(1)		

TOTAL NUMBER OF SUBSTRATE TYPES:  >4(2)  <4(0)

NOTE: (Ignore sludge that originates from point sources: score is based on natural substrates)

COMMENTS: \_\_\_\_\_

2) INSTREAM COVER: (20) COVER SCORE **10**

TYPE (Check all that apply)		AMOUNT (Check only one or Check 2 and AVERAGE)			
<input type="checkbox"/>	UNDERCUT BANKS(1)	<input checked="" type="checkbox"/> DEEP POOLS(2)	<input type="checkbox"/> OXBOWS(1)	<input type="checkbox"/>	EXTENSIVE >75%(11)
<input checked="" type="checkbox"/>	OVERHANGING VEGETATION(1)	<input type="checkbox"/> ROOTWADS(1)	<input checked="" type="checkbox"/> AQUATIC MACROPHYTES(1)	<input type="checkbox"/>	MODERATE 25-75%(7)
<input checked="" type="checkbox"/>	SHALLOWS (IN SLOW WATER)(1)	<input checked="" type="checkbox"/> BOULDERS(1)	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS(1)	<input checked="" type="checkbox"/>	SPARSE 5-25%(3)
				<input type="checkbox"/>	NEARLY ABSENT <5%(1)

COMMENTS: \_\_\_\_\_

3) CHANNEL MORPHOLOGY: (Check ONLY ONE per Category or Check 2 and AVERAGE)(20) **11**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATION/OTHER	
<input type="checkbox"/> HIGH(4)	<input type="checkbox"/> EXCELLENT(7)	<input type="checkbox"/> NONE(6)	<input type="checkbox"/> HIGH(3)	<input type="checkbox"/>	<input type="checkbox"/> IMPOUND
<input type="checkbox"/> MODERATE(3)	<input type="checkbox"/> GOOD(5)	<input checked="" type="checkbox"/> RECOVERED(4)	<input checked="" type="checkbox"/> MODERATE(2)	<input type="checkbox"/>	<input type="checkbox"/> ISLAND
<input checked="" type="checkbox"/> LOW(2)	<input checked="" type="checkbox"/> FAIR(3)	<input type="checkbox"/> RECOVERING(3)	<input type="checkbox"/> LOW(1)	<input type="checkbox"/>	<input type="checkbox"/> LEVEED
<input type="checkbox"/> NONE(1)	<input type="checkbox"/> POOR(1)	<input type="checkbox"/> RECENT OR NO RECOVERY(1)		<input type="checkbox"/>	<input checked="" type="checkbox"/> BANK SHAPING
				<input type="checkbox"/>	<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATION

COMMENTS: RIP RAP

4) RIPARIAN ZONE AND BANK EROSION: (Check ONE box or Check 2 and AVERAGE per bank) (10) RIPARIAN SCORE **4.25**

River Right Looking Downstream

RIPARIAN WIDTH (per bank)		EROSION/RUNOFF-FLOODPLAIN QUALITY				BANK EROSION	
L	R (per bank)	L	R (most predominant per bank)	L	R (per bank)	L	R (per bank)
<input type="checkbox"/>	WIDE >150ft.(4)	<input type="checkbox"/>	FOREST, SWAMP(3)	<input checked="" type="checkbox"/>	URBAN OR INDUSTRIAL(0)	<input type="checkbox"/>	<input checked="" type="checkbox"/> NONE OR LITTLE(3)
<input type="checkbox"/>	MODERATE 30-150 ft.(3)	<input type="checkbox"/>	OPEN PASTURE/ROW CROP(0)	<input type="checkbox"/>	SHURB OR OLD FIELD(2)	<input checked="" type="checkbox"/>	MODERATE(2)
<input type="checkbox"/>	NARROW 15-30 ft.(2)	<input checked="" type="checkbox"/>	RESID.,PARK,NEW FIELD(1)	<input type="checkbox"/>	CONSERV. TILLAGE(1)	<input type="checkbox"/>	HEAVY OR SEVERE(1)
<input checked="" type="checkbox"/>	VERY NARROW 3-15 ft.(1)	<input type="checkbox"/>	FENCED PASTURE(1)	<input type="checkbox"/>	MINING/CONSTRUCTION(0)		
<input type="checkbox"/>	NONE(0)						

COMMENTS: \_\_\_\_\_

5) POOL/GLIDE AND RIFFLE/RUN QUALITY (12) **NO POOL = 0** POOL SCORE **8**

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check all that Apply)			
<input checked="" type="checkbox"/> >4 ft.(6)	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH(2)	<input type="checkbox"/>	TORRENTIAL(-1)	<input type="checkbox"/>	EDDIES(1)
<input type="checkbox"/> 2.4-4 ft.(4)	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH(1)	<input type="checkbox"/>	FAST(1)	<input type="checkbox"/>	INTERSTITIAL(-1)
<input type="checkbox"/> 1.2-2.4 ft.(2)	<input checked="" type="checkbox"/> POOL WIDTH < RIFFLE WIDTH(0)	<input checked="" type="checkbox"/>	MODERATE(1)	<input type="checkbox"/>	INTERMITTENT(-2)
<input type="checkbox"/> <1.2 ft.(1)		<input checked="" type="checkbox"/>	SLOW(1)		
<input type="checkbox"/> <0.6 ft.(Pool=0)(0)					

COMMENTS: \_\_\_\_\_

RIFFLE SCORE **6**

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS			
<input type="checkbox"/> GENERALLY >4 in. MAX.>20 in.(4)	<input checked="" type="checkbox"/> STABLE (e.g., Cobble,Boulder)(2)	<input type="checkbox"/>	EXTENSIVE(-1)	<input type="checkbox"/>	NONE(2)
<input checked="" type="checkbox"/> GENERALLY >4 in. MAX.<20 in.(3)	<input type="checkbox"/> MOD. STABLE (e.g., Gravel)(1)	<input checked="" type="checkbox"/>	MODERATE(0)	<input type="checkbox"/>	NO RIFFLE(0)
<input type="checkbox"/> GENERALLY 2-4 in.(1)	<input type="checkbox"/> UNSTABLE (Pea Gravel, Sand)(0)	<input checked="" type="checkbox"/>	LOW(1)		
<input type="checkbox"/> GENERALLY <2 in.(Riffle=0)(0)	<input type="checkbox"/> NO RIFFLE(0)				

COMMENTS: \_\_\_\_\_

6) GRADIENT (FEET/MILE)(10) 2.19 % POOL 15 % RIFFLE 8 % RUN 77 GRADIENT SCORE **4**

DATE: 9-21-06

STATION: RM 4.0

NAME OF STREAM: Otter Creek

## NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES COLLECTED

COMMON NAME	NUMBER	PERCENT	SIZE RANGE (In)	TOTAL WEIGHT (lbs)	PERCENT
Gizzard shad	52	27.5	5.4 - 10.2	13.00	57.1
Longear sunfish	48	25.4	2.9 - 6.0	2.03	8.9
Spotfin shiner	45	23.8	1.9 - 3.3	2.00	8.8
Northern hogsucker	26	13.8	3.7 - 9.3	2.34	10.3
Silverjaw minnow	25	13.2	1.8 - 3.1	0.10	0.4
Spotted bass	23	12.2	2.3 - 9.6	1.82	8.0
Sand shiner	21	11.1	1.9 - 3.0	0.12	0.5
Golden redhorse	20	10.6	6.1 - 15.2	12.00	52.7
Emerald shiner	17	9.0	2.5 - 3.5	0.08	0.4
Central stoneroller	16	8.5	2.1 - 4.1	0.11	0.5
Rainbow darter	14	7.4	1.6 - 2.5	0.07	0.3
Bluegill	12	6.3	1.3 - 3.7	0.24	1.1
Black redhorse	11	5.8	5.8 - 12.6	2.90	12.7
Bluntnose minnow	8	4.2	1.3 - 2.5	0.02	0.1
Highfin carpsucker	7	3.7	7.5 - 9.4	1.70	7.5
Blackside darter	7	3.7	2.2 - 3.0	0.05	0.2
Brook silverside	5	2.6	1.4 - 2.8	0.01	<0.1
Blackstripe topminnow	4	2.1	1.5 - 1.8	0.01	<0.1
Greenside darter	4	2.1	2.5 - 3.1	0.03	0.1
Fantail darter	4	2.1	1.9 - 2.4	0.02	0.1
Rock bass	3	1.6	3.2 - 8.6	0.86	3.8
Smallmouth bass	2	1.1	9.2 - 9.9	0.66	2.9
Mississippi silvery minnow	2	1.1	4.0 - 4.1	0.04	0.2
Sauger	1	0.5	13.1	0.70	3.1
Redfin pickerel	1	0.5	6.5	0.07	0.3
Freshwater drum	1	0.5	11.9	0.68	3.0
Shorthead redhorse	1	0.5	10.3	0.39	1.7
Johnny darter	1	0.5	1.9	<0.01	<0.1
Creek chub	1	0.5	2.2	<0.01	<0.1
Striped shiner	1	0.5	5.5	0.06	0.3
Silver redhorse	1	0.5	7.2	0.14	0.6
Rosyface shiner	1	0.5	2.1	< 0.01	<0.1
Totals	189			22.78	

**INDIANA DIVISION OF FISH AND WILDLIFE  
STREAM HABITAT EVALUATION FORM**

STREAM: Otter Creek RIVER MILE: 6.0

NEAREST TOWN: North Terre Haute COUNTY: Vigo

QUADRANGLE: Rosedale TWP: 13N RNG: 9W SEC: 31

LATITUDE: N 39.52798 LONGITUDE: W 87.34609

LATITUDE: \_\_\_\_\_ LONGITUDE: \_\_\_\_\_

U.S.G.S. GAUGING STATION LOCATION: USGS partial gauge RM 10.30 AVG. DISCHARGE (cfs): 115

IS REACH REPRESENTATIVE OF STREAM (Y/N) N IF NOT, WHY? Site of old mill dam.

DESCRIPTION OF SAMPLE SITE (Access, length, direction sampled): Sampled pool along face of dam.

Careful for sharp drops 5 ft from dam face.

**COLLECTION SUMMARY**

DATE: 9/21/2006 GEAR: Tote Barge EFFORT: 30 min

CREW: Kittaka, King, Weinman, Bartley

OTHER GEAR/EFFORT: None WATER STAGE: Normal

CANOPY (%OPEN): 100 PHOTOS (Y/N): Y SECCHI DISK (inches): 18

AIR TEMP (F): \_\_\_\_\_ WATER TEMP (F): 59 D.O. (ppm): 8

CONDUCTIVITY: 500  $\mu$ S pH: 9.5 ALKALINITY: 68.4 ppm

TDS: 250 ppm

STREAM MEASUREMENTS AVG. WIDTH: \_\_\_\_\_ AVG. DEPTH: 24 in MAX DEPTH: 56 in

STATION LENGTH: (1st date) 25 yards downstream, along dam face (2nd date) \_\_\_\_\_

WIDTH (ft)	DEPTH (in)		
	21	24	26

SUBJECTIVE RATING (1-10)       AESTHETIC RATING (1-10)

ADDITIONAL COMMENTS/POLLUTION IMPACTS: Station Length ~25 yards down from face of dam.

The substrate consisted of slab rock or concrete dam structure. Scattered boulders/concrete.

Occasional drops in slab.

DATE:9-21-06

STATION: RM 6.0

NAME OF STREAM: Otter Creek

## NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES COLLECTED

COMMON NAME	NUMBER	PERCENT	SIZE RANGE (In)	TOTAL WEIGHT (lbs)	PERCENT
Gizzard shad	54	22.3	7.5 - 7.8	9.00	9.8
Black redhorse	54	22.3	3.6 - 16.0	34.00	36.9
Bluegill	30	12.4	1.3 - 7.4	1.42	1.5
Spotted bass	29	12.0	2.8 - 18.6	10.06	10.9
Longear sunfish	27	11.2	2.9 - 6.1	1.33	1.4
Golden redhorse	17	7.0	4.6 - 14.0	9.50	10.3
Spotfin shiner	13	5.4	1.9 - 3.0	0.06	0.1
Largemouth bass	10	4.1	5.3 - 15.7	5.36	5.8
Shorthead redhorse	8	3.3	7.8 - 10.7	1.74	1.9
Brook silverside	6	2.5	2.0 - 3.6	0.02	<0.1
Freshwater drum	5	2.1	8.4 - 14.1	1.99	2.2
Northern hogsucker	5	2.1	3.4 - 7.7	0.49	0.5
Emerald shiner	5	2.1	3.0 - 3.5	0.04	0.0
Smallmouth bass	4	1.7	3.0 - 11.8	6.89	7.5
Blackstripe topminnow	4	1.7	1.3 - 1.8	0.01	<0.1
Channel catfish	3	1.2	7.8 - 8.5	0.41	0.4
Common carp	3	1.2	14.9 - 18.4	6.77	7.3
Bluntnose minnow	3	1.2	2.3 - 2.9	0.02	<0.1
Green sunfish	3	1.2	4.0 - 5.4	0.20	0.2
Sauger	2	0.8	12.3 - 12.5	1.06	1.1
River carpsucker	2	0.8	7.3 - 7.8	0.40	0.4
Black crappie	1	0.4	7.0	0.15	0.2
Bigmouth buffalo	1	0.4	10.7	0.62	0.7
Highfin carpsucker	1	0.4	8.0	0.24	0.3
White sucker	1	0.4	10.2	0.41	0.4
Greenside darter	1	0.4	2.5	<0.01	<0.1
Dusky darter	1	0.4	3.4	<0.01	<0.1
Orangethroat darter	1	0.4	2.2	<0.01	<0.1
Western mosquitofish	1	0.4	1.6	<0.01	<0.1
Redear sunfish	1	0.4	4.5	0.05	0.1
Totals	242			92.24	



STREAM: Otter Creek RIVER MILE 10.3 DATE: 9/20/2006 QHEI SCORE **51**

1) SUBSTRATE: (Check ONLY Two Substrate Type Boxes: Check all types present)(20) SUBSTRATE SCORE **11.5**

TYPE		POOL	RIFFLE			POOL	RIFFLE	SUBSTRATE ORIGIN (all)		SILT COVER (one)					
<input type="checkbox"/>	BLDER/SLAB(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LIMESTONE(1)	<input type="checkbox"/>	RIP/RAP(0)	<input type="checkbox"/>	SILT-HEAVY(-2)	<input type="checkbox"/>	SILT-MOD(-1)
<input type="checkbox"/>	BOULDER(9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	TILLS(1)	<input type="checkbox"/>	HARDPAN(0)	<input checked="" type="checkbox"/>	SILT-NORM(0)	<input type="checkbox"/>	SILT-FREE(1)
<input type="checkbox"/>	COBBLE(8)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SANDSTONE(0)	<u>Extent of Embeddedness (check one)</u>					
<input type="checkbox"/>	HARDPAN(4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SHALE(-1)	<input checked="" type="checkbox"/>	EXTENSIVE(-2)	<input checked="" type="checkbox"/>	MODERATE(-1)		
<input type="checkbox"/>	MUCK/SILT(2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COAL FINES(-2)	<input type="checkbox"/>	LOW(0)	<input type="checkbox"/>	NONE(1)		

TOTAL NUMBER OF SUBSTRATE TYPES:  >4(2)  <4(0)

NOTE: (Ignore sludge that originates from point sources: score is based on natural substrates)

COMMENTS: All sand substrate

2) INSTREAM COVER: (20) COVER SCORE **9**

TYPE (Check all that apply)				AMOUNT (Check only one or Check 2 and AVERAGE)	
<input type="checkbox"/>	UNDERCUT BANKS(1)	<input checked="" type="checkbox"/>	DEEP POOLS(2)	<input type="checkbox"/>	EXTENSIVE >75%(11)
<input checked="" type="checkbox"/>	OVERHANGING VEGETATION(1)	<input checked="" type="checkbox"/>	ROOTWADS(1)	<input type="checkbox"/>	MODERATE 25-75%(7)
<input checked="" type="checkbox"/>	SHALLOWS (IN SLOW WATER)(1)	<input type="checkbox"/>	BOULDERS(1)	<input checked="" type="checkbox"/>	SPARSE 5-25%(3)
		<input type="checkbox"/>	OXBOWS(1)	<input type="checkbox"/>	NEARLY ABSENT <5%(1)
		<input type="checkbox"/>	AQUATIC MACROPHYTES(1)		
		<input checked="" type="checkbox"/>	LOGS OR WOODY DEBRIS(1)		

COMMENTS: \_\_\_\_\_

3) CHANNEL MORPHOLOGY: (Check ONLY ONE per Category or Check 2 and AVERAGE)(20) **13**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATION/OTHER			
<input type="checkbox"/>	HIGH(4)	<input checked="" type="checkbox"/>	NONE(6)	<input type="checkbox"/>	SNAGGING	<input type="checkbox"/>	IMPOUND
<input checked="" type="checkbox"/>	MODERATE(3)	<input checked="" type="checkbox"/>	RECOVERED(4)	<input type="checkbox"/>	RELOCATION	<input type="checkbox"/>	ISLAND
<input type="checkbox"/>	LOW(2)	<input type="checkbox"/>	RECOVERING(3)	<input checked="" type="checkbox"/>	CANOPY REMOVAL	<input type="checkbox"/>	LEVEED
<input type="checkbox"/>	NONE(1)	<input type="checkbox"/>	RECENT OR NO RECOVERY(1)	<input type="checkbox"/>	DREDGING	<input checked="" type="checkbox"/>	BANK SHAPING
				<input type="checkbox"/>	ONE SIDE CHANNEL MODIFICATION		

COMMENTS: \_\_\_\_\_

4) RIPARIAN ZONE AND BANK EROSION: (Check ONE box or Check 2 and AVERAGE per bank) (10) RIPARIAN SCORE **4.75**

River Right Looking Downstream

RIPARIAN WIDTH (per bank)		EROSION/RUNOFF-FLOODPLAIN QUALITY				BANK EROSION	
L	R (per bank)	L	R (most predominant per bank)	L	R (per bank)	L	R (per bank)
<input type="checkbox"/>	WIDE>150ft.(4)	<input type="checkbox"/>	FOREST, SWAMP(3)	<input type="checkbox"/>	URBAN OR INDUSTRIAL(0)	<input type="checkbox"/>	NONE OR LITTLE(3)
<input type="checkbox"/>	<input checked="" type="checkbox"/> MODERATE 30-150 ft.(3)	<input type="checkbox"/>	<input checked="" type="checkbox"/> OPEN PASTURE/ROW CROP(0)	<input type="checkbox"/>	SHURB OR OLD FIELD(2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> MODERATE(2)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> NARROW 15-30 ft.(2)	<input checked="" type="checkbox"/>	RESID.,PARK,NEW FIELD(1)	<input type="checkbox"/>	CONSERV. TILLAGE(1)	<input type="checkbox"/>	<input type="checkbox"/> HEAVY OR SEVERE(1)
<input type="checkbox"/>	VERY NARROW 3-15 ft.(1)	<input type="checkbox"/>	FENCED PASTURE(1)	<input type="checkbox"/>	MINING/CONSTRUCTION(0)		
<input type="checkbox"/>	NONE(0)						

COMMENTS: \_\_\_\_\_

5) POOL/GLIDE AND RIFFLE/RUN QUALITY (12) **NO POOL = 0** POOL SCORE **5**

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check all that Apply)			
<input type="checkbox"/>	>4 ft.(6)	<input type="checkbox"/>	TORRENTIAL(-1)	<input type="checkbox"/>	EDDIES(1)
<input checked="" type="checkbox"/>	2.4-4 ft.(4)	<input type="checkbox"/>	FAST(1)	<input type="checkbox"/>	INTERSTITIAL(-1)
<input type="checkbox"/>	1.2-2.4 ft.(2)	<input checked="" type="checkbox"/>	MODERATE(1)	<input type="checkbox"/>	INTERMITTENT(-2)
<input type="checkbox"/>	<1.2 ft.(1)	<input type="checkbox"/>	SLOW(1)		
<input type="checkbox"/>	<0.6 ft.(Pool=0)(0)				

COMMENTS: \_\_\_\_\_

RIFFLE SCORE **0**

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS			
<input type="checkbox"/>	STABLE (e.g., Cobble,Boulder)(2)	<input type="checkbox"/>	EXTENSIVE(-1)	<input type="checkbox"/>	NONE(2)
<input type="checkbox"/>	MOD. STABLE (e.g. Gravel)(1)	<input type="checkbox"/>	MODERATE(0)	<input checked="" type="checkbox"/>	NO RIFFLE(0)
<input type="checkbox"/>	UNSTABLE ( Pea Gravel, Sand)(0)	<input type="checkbox"/>	LOW(1)		
<input checked="" type="checkbox"/>	NO RIFFLE(0)				

COMMENTS: \_\_\_\_\_

6) GRADIENT (FEET/MILE)(10); 6.1 % POOL 5 % RIFFLE 0 % RUN 95 GRADIENT SCORE **8**

DATE:9-20-06

STATION: RM 10.3NAME OF STREAM: Otter Creek

## NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES COLLECTED

COMMON NAME	NUMBER	PERCENT	SIZE RANGE (ln)	TOTAL WEIGHT (lbs)	PERCENT
Northern hogsucker	73	23.1	1.8 - 7.8	1.55	26.8
Silverjaw minnow	73	23.1	1.4 - 2.8	0.27	4.7
Creek chub	67	21.2	1.3 - 6.0	0.88	15.2
Central stoneroller	25	7.9	2.4 - 4.6	0.40	6.9
Bluegill	24	7.6	1.1 - 4.8	0.50	8.6
Longear sunfish	23	7.3	2.5 - 5.8	1.03	17.8
Spotfin shiner	22	7.0	2.1 - 3.5	0.12	2.1
Bluntnose minnow	14	4.4	1.7 - 3.2	0.06	1.0
Johnny darter	9	2.8	1.5 - 2.2	0.01	0.2
Orangethroat darter	9	2.8	1.6 - 2.1	0.02	0.3
Sand shiner	9	2.8	1.8 - 2.6	0.04	0.7
Fantail darter	6	1.9	1.3 - 2.5	0.03	0.5
Smallmouth bass	6	1.9	2.1 - 12.0	0.98	16.9
Greenside darter	5	1.6	2.1 - 2.7	0.02	0.3
Slough darter	4	1.3	1.3 - 1.9	0.01	0.2
Redfin pickerel	3	0.9	4.3 - 5.2	0.06	1.0
Largemouth bass	3	0.9	2.9 - 7.2	0.20	3.5
Redfin shiner	3	0.9	2.2 - 2.4	0.01	0.2
Yellow bullhead	3	0.9	6.6 - 10.1	1.04	18.0
Green sunfish	2	0.6	3.0 - 3.1	0.03	0.5
Spotted sucker	2	0.6	2.5 - 3.1	0.02	0.3
Blacknose dace	1	0.3	1.6	<0.01	<0.1
Blackside darter	1	0.3	2.7	0.01	0.2
Blackstripe topminnow	1	0.3	2.4	0.01	0.2
Rock bass	1	0.3	6.2	0.04	0.7
Totals	316			5.79	

**INDIANA DIVISION OF FISH AND WILDLIFE  
STREAM HABITAT EVALUATION FORM**

STREAM: Otter Creek RIVER MILE: 14.5  
 NEAREST TOWN: Burnett COUNTY: Vigo  
 QUADRANGLE: Brazil West TWP: 13N RNG: 7W SEC: 29  
 LATITUDE: downstream N 39.54265 LONGITUDE: W 87.21343  
 LATITUDE: upstream N 39.54317 LONGITUDE: W 87.21240  
 U.S.G.S. GAUGING STATION LOCATION: Partial gauge RM 10.30 AVG. DISCHARGE (cfs): ~25  
 IS REACH REPRESENTATIVE OF STREAM (Y/N) Y IF NOT, WHY? \_\_\_\_\_

DESCRIPTION OF SAMPLE SITE (Access, length, direction sampled): Sampled upstream from bridge at corner of  
Eppert and Auk Ave.

**COLLECTION SUMMARY**

DATE: 9/20/2006 GEAR: Tote Barge EFFORT: 30 min  
 CREW: Kittaka, King, Weinman, Bartley  
 OTHER GEAR/EFFORT: \_\_\_\_\_ WATER STAGE: Nrml to slty above  
 CANOPY (%OPEN): 50 PHOTOS (Y/N): 3 (2us 1ds) SECCHI DISK (inches): 18  
 AIR TEMP (F): 63 WATER TEMP ( F): 59 D.O. (ppm): 9  
 CONDUCTIVITY: 380 µS pH: 9.25 ALKALINITY: 51.3 ppm  
 TDS: 190 ppm  
 STREAM MEASUREMENTS AVG. WIDTH: 45.0 ft AVG. DEPTH: 8.3 in MAX DEPTH: 18.0 in  
 STATION LENGTH: (1st date) 472.0 ft (2nd date) \_\_\_\_\_

WIDTH (ft)	DEPTH (in)		
45	6	15	11
43	0	2	12
43	3	18	18
49	0	3	12


  
 SUBJECTIVE RATING (1-10)      AESTHETIC RATING (1-10)

ADDITIONAL COMMENTS/POLLUTION IMPACTS: \_\_\_\_\_

STREAM: Otter Creek RIVER MILE 14.5 DATE: 9/20/2006 QHEI SCORE **67**

1) SUBSTRATE: (Check ONLY Two Substrate Type Boxes: Check all types present)(20) SUBSTRATE SCORE **13.5**

TYPE		POOL	RIFFLE	POOL		RIFFLE	SUBSTRATE ORIGIN (all)		SILT COVER (one)				
<input type="checkbox"/>	BLDER/SLAB(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	BOULDER(9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	COBBLE(8)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	HARDPAN(4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	MUCK/SILT(2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL NUMBER OF SUBSTRATE TYPES:		<input checked="" type="checkbox"/> >4(2)		<input type="checkbox"/> <4(0)									

NOTE: (Ignore sludge that originates from point sources: score is based on natural substrates)

COMMENTS: \_\_\_\_\_

2) INSTREAM COVER: (20) COVER SCORE **16**

TYPE (Check all that apply)		AMOUNT (Check only one or Check 2 and AVERAGE)	
<input type="checkbox"/>	UNDERCUT BANKS(1)	<input checked="" type="checkbox"/>	EXTENSIVE >75%(11)
<input checked="" type="checkbox"/>	OVERHANGING VEGETATION(1)	<input type="checkbox"/>	MODERATE 25-75%(7)
<input checked="" type="checkbox"/>	SHALLOWS (IN SLOW WATER)(1)	<input checked="" type="checkbox"/>	SPARSE 5-25%(3)
<input checked="" type="checkbox"/>	DEEP POOLS(2)	<input type="checkbox"/>	NEARLY ABSENT <5%(1)
<input type="checkbox"/>	ROOTWADS(1)	<input type="checkbox"/>	
<input type="checkbox"/>	BOULDERS(1)	<input type="checkbox"/>	
<input type="checkbox"/>	OXBOWS(1)	<input type="checkbox"/>	
<input type="checkbox"/>	AQUATIC MACROPHYTES(1)	<input type="checkbox"/>	
<input type="checkbox"/>	LOGS OR WOODY DEBRIS(1)	<input type="checkbox"/>	

COMMENTS: \_\_\_\_\_

3) CHANNEL MORPHOLOGY: (Check ONLY ONE per Category or Check 2 and AVERAGE)(20) **15**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATION/OTHER	
<input type="checkbox"/> HIGH(4)	<input checked="" type="checkbox"/> EXCELLENT(7)	<input checked="" type="checkbox"/> NONE(6)	<input type="checkbox"/> HIGH(3)	<input type="checkbox"/> SNAGGING	<input type="checkbox"/> IMPOUND
<input checked="" type="checkbox"/> MODERATE(3)	<input checked="" type="checkbox"/> GOOD(5)	<input type="checkbox"/> RECOVERED(4)	<input checked="" type="checkbox"/> MODERATE(2)	<input type="checkbox"/> RELOCATION	<input type="checkbox"/> ISLAND
<input type="checkbox"/> LOW(2)	<input checked="" type="checkbox"/> FAIR(3)	<input type="checkbox"/> RECOVERING(3)	<input type="checkbox"/> LOW(1)	<input type="checkbox"/> CANOPY REMOVAL	<input type="checkbox"/> LEVEED
<input type="checkbox"/> NONE(1)	<input type="checkbox"/> POOR(1)	<input type="checkbox"/> RECENT OR NO RECOVERY(1)		<input type="checkbox"/> DREDGING	<input type="checkbox"/> BANK SHAPING
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATION	

COMMENTS: \_\_\_\_\_

4) RIPARIAN ZONE AND BANK EROSION: (Check ONE box or Check 2 and AVERAGE per bank) (10) RIPARIAN SCORE **6.5**

River Right Looking Downstream

RIPARIAN WIDTH (per bank)		EROSION/RUNOFF-FLOODPLAIN QUALITY				BANK EROSION	
L	R (per bank)	L	R (most predominant per bank)	L	R (per bank)	L	R (per bank)
<input type="checkbox"/>	WIDE >150ft.(4)	<input checked="" type="checkbox"/>	FOREST, SWAMP(3)	<input type="checkbox"/>	URBAN OR INDUSTRIAL(0)	<input type="checkbox"/>	NONE OR LITTLE(3)
<input checked="" type="checkbox"/>	MODERATE 30-150 ft.(3)	<input checked="" type="checkbox"/>	OPEN PASTURE/ROW CROP(0)	<input type="checkbox"/>	SHURB OR OLD FIELD(2)	<input checked="" type="checkbox"/>	MODERATE(2)
<input type="checkbox"/>	NARROW 15-30 ft.(2)	<input type="checkbox"/>	RESID.,PARK,NEW FIELD(1)	<input type="checkbox"/>	CONSERV. TILLAGE(1)	<input type="checkbox"/>	HEAVY OR SEVERE(1)
<input type="checkbox"/>	VERY NARROW 3-15 ft.(1)	<input type="checkbox"/>	FENCED PASTURE(1)	<input type="checkbox"/>	MINING/CONSTRUCTION(0)		
<input type="checkbox"/>	NONE(0)						

COMMENTS: \_\_\_\_\_

5) POOL/GLIDE AND RIFFLE/RUN QUALITY (12) **NO POOL = 0** POOL SCORE **8**

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check all that Apply)	
<input type="checkbox"/> >4 ft.(6)	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH(2)	<input type="checkbox"/> TORRENTIAL(-1)	<input type="checkbox"/> EDDIES(1)
<input checked="" type="checkbox"/> 2.4-4 ft.(4)	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH(1)	<input type="checkbox"/> FAST(1)	<input type="checkbox"/> INTERSTITIAL(-1)
<input type="checkbox"/> 1.2-2.4 ft.(2)	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH(0)	<input checked="" type="checkbox"/> MODERATE(1)	<input type="checkbox"/> INTERMITTENT(-2)
<input type="checkbox"/> <1.2 ft.(1)		<input checked="" type="checkbox"/> SLOW(1)	
<input type="checkbox"/> <0.6 ft.(Pool=0)(0)			

COMMENTS: \_\_\_\_\_

RIFFLE SCORE **0**

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
<input type="checkbox"/> GENERALLY >4 in. MAX.>20 in.(4)	<input type="checkbox"/> STABLE (e.g., Cobble,Boulder)(2)	<input type="checkbox"/> EXTENSIVE(-1)
<input type="checkbox"/> GENERALLY >4 in. MAX.<20 in.(3)	<input type="checkbox"/> MOD. STABLE (e.g.,Gravel)(1)	<input type="checkbox"/> NONE(2)
<input type="checkbox"/> GENERALLY 2-4 in.(1)	<input type="checkbox"/> UNSTABLE (Pea Gravel, Sand)(0)	<input checked="" type="checkbox"/> NO RIFFLE(0)
<input checked="" type="checkbox"/> GENERALLY <2 in.(Riffle=0)(0)	<input checked="" type="checkbox"/> NO RIFFLE(0)	<input type="checkbox"/> MODERATE(0)
		<input type="checkbox"/> LOW(1)

COMMENTS: \_\_\_\_\_

6) GRADIENT (FEET/MILE)(10): 5.2 % POOL 20 % RIFFLE 0 % RUN 80 GRADIENT SCORE **8**

DATE: 9/20/2006

STATION: 14.5

NAME OF STREAM: Otter Creek

## NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES COLLECTED

COMMON NAME	NUMBER	PERCENT	SIZE RANGE (In)	TOTAL WEIGHT (lbs)	PERCENT
Longear sunfish	72	20.6	2.8 - 6.2	4.20	18.5
Northern hogsucker	64	18.3	4.8 - 9.0	8.00	35.3
Bluegill	50	14.3	0.9 - 4.4	0.65	2.9
Johnny darter	28	8.0	1.6 - 2.5	0.03	0.1
White sucker	27	7.7	4.8 - 12.0	6.00	26.5
Largemouth bass	19	5.4	2.9 - 6.8	0.90	4.0
Creek chub	15	4.3	2.2 - 5.7	0.25	1.1
Blackstripe topminnow	11	3.1	1.8 - 2.9	0.06	0.3
Bluntnose minnow	10	2.9	1.9 - 2.9	0.01	<0.1
Smallmouth bass	9	2.6	1.8 - 6.4	0.34	1.5
Green sunfish	6	1.7	4.1 - 5.6	0.56	2.5
Silverjaw minnow	6	1.7	1.6 - 2.2	0.02	0.1
Fantail darter	6	1.7	1.6 - 2.3	<0.01	<0.1
Redfin shiner	5	1.4	2.5 - 3.2	0.01	<0.1
Yellow bullhead	5	1.4	6.5 - 10.1	0.33	1.5
Warmouth	3	0.9	4.2 - 6.4	0.38	1.7
Spotted sucker	3	0.9	5.6 - 11.8	0.80	3.5
Orangethroat darter	3	0.9	1.8 - 2.2	<0.01	<0.1
Greenside darter	2	0.6	2.8 - 3.0	0.01	<0.1
Central stoneroller	2	0.6	4.5 - 5.7	0.08	0.4
Blackside darter	2	0.6	2.8 - 3.0	0.01	<0.1
Redear sunfish	1	0.3	3.0	0.02	0.1
Western mosquitofish	1	0.3	1.4	<0.01	<0.1
Totals	350			22.66	

**INDIANA DIVISION OF FISH AND WILDLIFE  
STREAM HABITAT EVALUATION FORM**

STREAM: Otter Creek RIVER MILE: 18.0  
 NEAREST TOWN: Brazil COUNTY: Clay  
 QUADRANGLE: Brazil West TWP: 13N RNG: 7W SEC: 26  
 LATITUDE: downstream N 39.54745 LONGITUDE: W 87.14571  
 LATITUDE: upstream N 39.54805 LONGITUDE: W 87.14452  
 U.S.G.S. GAUGING STATION LOCATION: Partial gauge RM 10.30 AVG. DISCHARGE (cfs): NA  
 IS REACH REPRESENTATIVE OF STREAM (Y/N) Y IF NOT, WHY? \_\_\_\_\_

DESCRIPTION OF SAMPLE SITE (Access, length, direction sampled): Access from northeast side of bridge.  
Started before bridge.

**COLLECTION SUMMARY**

DATE: 9/20/2006 GEAR: Tote barge EFFORT: 30 min  
 CREW: Kittaka, King, Weinman, Bartley  
 OTHER GEAR/EFFORT: None WATER STAGE: \_\_\_\_\_  
 CANOPY (%OPEN): \_\_\_\_\_ PHOTOS (Y/N): Y SECCHI DISK (inches): 25  
 AIR TEMP (F): 63 WATER TEMP (F): 57 D.O. (ppm): 8  
 CONDUCTIVITY: 500 µS pH: 9.5 ALKALINITY: 68.4 ppm  
 TDS: \_\_\_\_\_  
 STREAM MEASUREMENTS AVG. WIDTH: 27.4 ft AVG. DEPTH: 12.6 in MAX DEPTH: 25.0 in  
 STATION LENGTH: (1st date) 405 ft (2nd date) \_\_\_\_\_

WIDTH (ft)	DEPTH (in)		
31.6	2	7	1
27.6	12	13	25
20.5	16	22	25
28.5	7	8	23
29	6	9	13


  
 SUBJECTIVE RATING (1-10)      AESTHETIC RATING (1-10)

ADDITIONAL COMMENTS/POLLUTION IMPACTS: \_\_\_\_\_

STREAM: Otter Creek RIVER MILE 18.0 DATE: 9/20/2006 QHEI SCORE **71**

1) SUBSTRATE: (Check ONLY Two Substrate Type Boxes: Check all types present)(20) SUBSTRATE SCORE **15**

TYPE		POOL	RIFFLE			POOL	RIFFLE	SUBSTRATE ORIGIN (all)		SILT COVER (one)						
<input type="checkbox"/>	<input type="checkbox"/>	BLDER/SLAB(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	GRAVEL(7)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LIMESTONE(1)	<input type="checkbox"/>	RIP/RAP(0)	<input type="checkbox"/>	SILT-HEAVY(-2)	<input type="checkbox"/>	SILT-MOD(-1)
<input type="checkbox"/>	<input type="checkbox"/>	BOULDER(9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	SAND(6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TILLS(1)	<input type="checkbox"/>	HARDPAN(0)	<input checked="" type="checkbox"/>	SILT-NORM(0)	<input type="checkbox"/>	SILT-FREE(1)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	COBBLE(8)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BEDROCK(5)	<input type="checkbox"/>	<input type="checkbox"/>	SANDSTONE(0)	Extent of Embeddedness (check one)					
<input type="checkbox"/>	<input type="checkbox"/>	HARDPAN(4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DETRITUS(3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SHALE(-1)	<input type="checkbox"/>	EXTENSIVE(-2)	<input checked="" type="checkbox"/>	MODERATE(-1)		
<input type="checkbox"/>	<input type="checkbox"/>	MUCK/SILT(2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ARTIFIC(0)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	COAL FINES(-2)	<input checked="" type="checkbox"/>	LOW(0)	<input type="checkbox"/>	NONE(1)		

TOTAL NUMBER OF SUBSTRATE TYPES:  >4(2)  <4(0)

NOTE: (Ignore sludge that originates from point sources: score is based on natural substrates)

COMMENTS: \_\_\_\_\_

2) INSTREAM COVER: (20) COVER SCORE **9**

TYPE (Check all that apply)			AMOUNT (Check only one or Check 2 and AVERAGE)		
<input checked="" type="checkbox"/>	UNDERCUT BANKS(1)	<input checked="" type="checkbox"/>	DEEP POOLS(2)	<input type="checkbox"/>	EXTENSIVE >75%(11)
<input checked="" type="checkbox"/>	OVERHANGING VEGETATION(1)	<input type="checkbox"/>	ROOTWADS(1)	<input type="checkbox"/>	MODERATE 25-75%(7)
<input checked="" type="checkbox"/>	SHALLOWS (IN SLOW WATER)(1)	<input type="checkbox"/>	BOULDERS(1)	<input checked="" type="checkbox"/>	SPARSE 5-25%(3)
		<input type="checkbox"/>	OXBOWS(1)	<input type="checkbox"/>	NEARLY ABSENT <5%(1)
		<input type="checkbox"/>	AQUATIC MACROPHYTES(1)		
		<input checked="" type="checkbox"/>	LOGS OR WOODY DEBRIS(1)		

COMMENTS: \_\_\_\_\_

3) CHANNEL MORPHOLOGY: (Check ONLY ONE per Category or Check 2 and AVERAGE)(20) **14**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATION/OTHER			
<input type="checkbox"/>	EXCELLENT(7)	<input type="checkbox"/>	HIGH(3)	<input type="checkbox"/>	SNAGGING	<input type="checkbox"/>	IMPOUND
<input checked="" type="checkbox"/>	GOOD(5)	<input checked="" type="checkbox"/>	MODERATE(2)	<input type="checkbox"/>	RELOCATION	<input type="checkbox"/>	ISLAND
<input type="checkbox"/>	FAIR(3)	<input type="checkbox"/>	LOW(1)	<input type="checkbox"/>	CANOPY REMOVAL	<input type="checkbox"/>	LEVEED
<input type="checkbox"/>	POOR(1)	<input type="checkbox"/>		<input type="checkbox"/>	DREDGING	<input checked="" type="checkbox"/>	BANK SHAPING
		<input type="checkbox"/>		<input checked="" type="checkbox"/>	ONE SIDE CHANNEL MODIFICATION		

COMMENTS: \_\_\_\_\_

4) RIPARIAN ZONE AND BANK EROSION: (Check ONE box or Check 2 and AVERAGE per bank) (10) RIPARIAN SCORE **8.25**

River Right Looking Downstream

RIPARIAN WIDTH (per bank)		EROSION/RUNOFF-FLOODPLAIN QUALITY				BANK EROSION	
L	R (per bank)	L	R (most predominant per bank)	L	R (per bank)	L	R (per bank)
<input checked="" type="checkbox"/>	WIDE>150ft.(4)	<input checked="" type="checkbox"/>	FOREST, SWAMP(3)	<input type="checkbox"/>	URBAN OR INDUSTRIAL(0)	<input type="checkbox"/>	NONE OR LITTLE(3)
<input type="checkbox"/>	MODERATE 30-150 ft.(3)	<input type="checkbox"/>	OPEN PASTURE/ROW CROP(0)	<input type="checkbox"/>	SHURB OR OLD FIELD(2)	<input checked="" type="checkbox"/>	MODERATE(2)
<input type="checkbox"/>	NARROW 15-30 ft.(2)	<input type="checkbox"/>	RESID.,PARK,NEW FIELD(1)	<input type="checkbox"/>	CONSERV. TILLAGE(1)	<input type="checkbox"/>	HEAVY OR SEVERE(1)
<input type="checkbox"/>	VERY NARROW 3-15 ft.(1)	<input type="checkbox"/>	FENCED PASTURE(1)	<input type="checkbox"/>	MINING/CONSTRUCTION(0)		
<input type="checkbox"/>	NONE(0)						

COMMENTS: \_\_\_\_\_

5) POOL/GLIDE AND RIFFLE/RUN QUALITY (12) **NO POOL = 0** POOL SCORE **9**

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check all that Apply)			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TORRENTIAL(-1)	<input checked="" type="checkbox"/>	EDDIES(1)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FAST(1)	<input type="checkbox"/>	INTERSTITIAL(-1)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MODERATE(1)	<input type="checkbox"/>	INTERMITTENT(-2)
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SLOW(1)		

COMMENTS: \_\_\_\_\_

RIFFLE SCORE **6**

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EXTENSIVE(-1)	<input type="checkbox"/>	NONE(2)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MODERATE(0)	<input checked="" type="checkbox"/>	NO RIFFLE(0)
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	LOW(1)		

COMMENTS: \_\_\_\_\_

6) GRADIENT (FEET/MILE)(10) 8.8 % POOL 20 % RIFFLE 10 % RUN 70 GRADIENT SCORE **10**

DATE: 9-20-06

STATION: RM 18.0NAME OF STREAM: Otter Creek

## NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES COLLECTED

COMMON NAME	NUMBER	PERCENT	SIZE RANGE (In)	TOTAL WEIGHT (lbs)	PERCENT
White sucker	57	16.8	3.6 - 13.4	14.00	65.8
Johnny darter	42	12.4	1.3 - 2.3	0.07	0.3
Redfin shiner	34	10.0	0.7 - 2.7	0.05	0.2
Western mosquitofish	32	9.4	0.8 - 2.0	0.06	0.3
Orangethroat darter	30	8.8	1.1 - 2.3	0.06	0.3
Bluntnose minnow	27	7.9	1.0 - 3.3	0.10	0.5
Creek chub	24	7.1	1.9 - 8.9	1.14	5.4
Bluegill	20	5.9	1.0 - 5.1	0.68	3.2
Central stoneroller	19	5.6	2.1 - 5.7	0.94	4.4
Northern hogsucker	14	4.1	5.6 - 9.3	1.83	8.6
Silverjaw minnow	13	3.8	2.1 - 3.1	0.06	0.3
Spotted bass	8	2.4	2.4 - 5.2	0.21	1.0
Longear sunfish	7	2.1	3.9 - 4.5	0.36	1.7
Redear sunfish	2	0.6	2.4 - 4.4	0.09	0.4
Spotted sucker	2	0.6	11.3 - 11.4	1.04	4.9
Fantail darter	2	0.6	2.3	0.02	0.1
Blackstripe topminnow	2	0.6	1.4 - 2.5	0.02	0.1
Hybrid sunfish	1	0.3	5.1	0.08	0.4
Blackside darter	1	0.3	3.0	0.02	0.1
Smallmouth bass	1	0.3	6.9	0.15	0.7
Largemouth bass	1	0.3	7.6	0.18	0.8
Black crappie	1	0.3	6.8	0.13	0.6
Totals	340			21.29	

Appendix 3. Fish species collected, Otter Creek, 2006.

Species	Scientific name	Number	Percent	Size range	Total weight	Percent	Occurrence index
Northern hogsucker	<i>Hypentelium nigricans</i>	182	10.3	1.8 - 9.3	14.21	7.6	5
Longear sunfish	<i>Lepomis megalotis</i>	177	10.1	2.5 - 6.2	8.95	4.8	5
Bluegill	<i>Lepomis macrochirus</i>	136	7.7	0.9 - 7.4	3.49	1.9	5
Silverjaw minnow	<i>Ericymba buccata</i>	117	6.6	1.4 - 3.1	0.45	0.2	4
Creek chub	<i>Semotilus atromaculatus</i>	107	6.1	1.3 - 8.9	2.27	1.2	4
Gizzard shad	<i>Dorsoma cepedianum</i>	106	6.0	5.4 - 10.2	22.00	11.8	2
White sucker	<i>Catostomus commersoni</i>	85	4.8	3.6 - 13.4	20.41	11.0	3
Johnny darter	<i>Etheostoma niger</i>	80	4.5	1.3 - 2.5	0.11	0.1	4
Spotfin shiner	<i>Cyprinella spiloptera</i>	80	4.5	1.9 - 3.5	2.18	1.2	3
Black redhorse	<i>Moxotoma duquesnei</i>	65	3.7	3.6 - 16.0	36.90	19.8	2
Bluntnose minnow	<i>Pimephales notatus</i>	62	3.5	1.0 - 3.3	0.21	0.1	5
Central stoneroller	<i>Campostoma anomalum</i>	62	3.5	2.1 - 5.7	1.53	0.8	4
Spotted bass	<i>Micropeterus punctulatus</i>	60	3.4	2.3 - 18.6	12.09	6.5	3
Orangethroat darter	<i>Etheostoma spectabile</i>	43	2.4	1.1 - 2.3	0.08	<0.1	4
Redfin shiner	<i>Lythrurus umbratilis</i>	42	2.4	0.7 - 3.2	0.07	<0.1	3
Golden redhorse	<i>Moxotoma erythrurum</i>	37	2.1	4.6 - 15.2	21.50	11.6	2
Western mosquitofish	<i>Gambusia affinis</i>	34	1.9	0.8 - 2.0	0.07	0.0	3
Largemouth bass	<i>Micropeterus salmoides</i>	33	1.9	2.9 - 15.7	6.64	3.6	4
Sand shiner	<i>Notropis stramineus</i>	30	1.7	1.8 - 3.0	0.16	0.1	2
Blackstripe topminnow	<i>Fundulus olivaceus</i>	22	1.3	1.3 - 2.9	0.35	0.2	5
Emerald shiner	<i>Notropis atherinoides</i>	22	1.3	2.5 - 3.5	0.12	0.1	2
Smallmouth bass	<i>Micropeterus dolomieu</i>	22	1.3	1.8 - 12.0	9.02	4.9	5
Fantail darter	<i>Etheostoma flabellare</i>	18	1.0	1.3 - 2.5	0.07	<0.1	3
Rainbow darter	<i>Etheostoma caeruleum</i>	14	0.8	1.6 - 2.5	0.07	<0.1	1
Greenside darter	<i>Etheostoma blennioides</i>	12	0.7	2.1 - 3.1	0.06	<0.1	4
Blackside darter	<i>Percina maculata</i>	11	0.6	2.2 - 3.0	0.09	<0.1	4
Brook silverside	<i>Labidesthes sicculus</i>	11	0.6	1.4 - 3.6	0.03	<0.1	2
Green sunfish	<i>Lepomis cyanellus</i>	11	0.6	3.0 - 5.6	0.79	0.4	3
Shorthead redhorse	<i>Moxotoma macrolepidotum</i>	9	0.5	7.8 - 10.7	2.13	1.1	2
Highfin carpsucker	<i>Carpionodes velifer</i>	8	0.5	7.5 - 9.4	1.94	1.0	2
Yellow bullhead	<i>Ameiurus natalis</i>	8	0.5	6.5 - 10.1	1.37	0.7	2
Spotted sucker	<i>Minytrema melanops</i>	7	0.4	2.5 - 11.8	1.86	1.0	3
Freshwater drum	<i>Aplodinotus grunniens</i>	6	0.3	8.4 - 14.1	2.67	1.4	2
Redfin pickerel	<i>Esox americanus</i>	4	0.2	4.3 - 6.5	0.13	0.1	2
Redear sunfish	<i>Lepomis microlophus</i>	4	0.2	2.4 - 4.5	0.16	0.1	3
Rock bass	<i>Ambloplites rupestris</i>	4	0.2	3.2 - 8.6	0.90	0.5	2
Slough darter	<i>Etheostoma gracile</i>	4	0.2	1.3 - 1.9	0.01	<0.1	1
Channel catfish	<i>Ictalurus punctatus</i>	3	0.2	7.8 - 8.5	0.41	0.2	1
Common carp	<i>Cyprinella carpo</i>	3	0.2	14.9 - 18.4	6.77	3.6	1
Sauger	<i>Sander canadensis</i>	3	0.2	12.3 - 13.1	1.76	0.9	2
Warmouth	<i>Lepomis gulosus</i>	3	0.2	4.2 - 6.4	0.38	0.2	1
Black crappie	<i>Pomoxis nigromaculatus</i>	2	0.1	6.8 - 7.0	0.15	0.1	2
Mississippi silvery minnow	<i>Hybognathus nuchalis</i>	2	0.1	4.0 - 4.1	0.04	<0.1	1
River carpsucker	<i>Carpionodes carpio</i>	2	0.1	7.3 - 7.8	0.40	0.2	1
Bigmouth buffalo	<i>Ictiobus cyprinellus</i>	1	0.1	10.7	0.62	0.3	1
Blacknose dace	<i>Rhinichthys atratulus</i>	1	0.1	1.6	<0.01	<0.1	1
Dusky darter	<i>Percina sciera</i>	1	0.1	3.4	<0.01	<0.1	1
Hybrid sunfish	<i>Lepomis spp</i>	1	0.1	5.1	0.08	<0.1	1
Roseyface shiner	<i>Notropis rubellus</i>	1	0.1	2.1	<0.01	<0.1	1
Silver redhorse	<i>Moxotoma anisurum</i>	1	0.1	7.2	0.14	0.1	1
Striped shiner	<i>Luxilus chrysocephalus</i>	1	0.1	5.5	0.06	<0.1	1
Totals		1,760			185.90		

Appendix 4  
Game fish number, age, and growth.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF SPOTTED BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0	2	3.3	0.01	0	20.0				
2.5	12	20.0	0.01	0	20.5				
3.0	10	16.7	0.02	0, 1	21.0				
3.5	2	3.3	0.02	Not aged	21.5				
4.0					22.0				
4.5	2	3.3	0.04	1	22.5				
5.0	1	1.7	0.06	1	23.0				
5.5	2	3.3	0.07	1	23.5				
6.0	4	6.7	0.09	1	24.0				
6.5	2	3.3	0.12	1	24.5				
7.0	3	5.0	0.15	2, 3	25.0				
7.5	5	8.3	0.20	2, 3	25.5				
8.0	4	6.7	0.22	2	26.0				
8.5	2	3.3	0.30	1, 2	TOTAL	60			
9.0	1	1.7	0.38	2					
9.5	1	1.7	0.36	3					
10.0	1	1.7	0.46	3					
10.5	2	3.3	0.61	3					
11.0	1	1.7	0.56	4					
11.5	1	1.7	0.69	3					
12.0									
12.5	1	1.7	0.92	4					
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5	1	1.7	3.40	8					

ELECTROFISHING CATCH	24.0/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5	3	9.1	0.02	0	20.5				
3.0	9	27.3	0.02	0	21.0				
3.5	2	6.1	0.16	0	21.5				
4.0	5	15.2	0.04	0	22.0				
4.5	1	3.0	0.04	0	22.5				
5.0	1	3.0	0.06	1	23.0				
5.5					23.5				
6.0					24.0				
6.5	2	6.1	0.15	1, 2	24.5				
7.0	4	12.1	0.17	1, 2	25.0				
7.5	2	6.1	0.21	2, 3	25.5				
8.0					26.0				
8.5	1	3.0	0.30	3	TOTAL	33			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0	2	6.1	0.98	4, 7					
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5	1	3.0	2.15	8					
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	13.2/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF SMALLMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	2	9.1	0.00	0	19.5				
2.0	4	18.2	0.00	0	20.0				
2.5	1	4.5	0.01	0	20.5				
3.0	2	9.1	0.02	0	21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0	1	4.5	0.07	1	23.0				
5.5	3	13.6	0.08	1	23.5				
6.0	2	9.1	0.12	1	24.0				
6.5	1	4.5	0.15	1	24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	22			
9.0	1	4.5	0.30	3					
9.5	2	9.1	0.37	2, 3					
10.0									
10.5	1	4.5	0.50	3					
11.0									
11.5	1	4.5	6.00	3					
12.0	1	4.5	0.74	3					
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	8.8/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A
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**SPOTTED BASS AGE-LENGTH KEY**

Length group (in)	Total number	Sub-sample	AGE								
			1	2	3	4	5	6	7	8	
2.0	2	1									
2.5	12	3									
3.0	10	3	3								
3.5	2										
4.0											
4.5	2	2	2								
5.0	1	1	1								
5.5	2	2	2								
6.0	4	4	4								
6.5	2	2	2								
7.0	3	3	1	1	1						
7.5	5	5		3	2						
8.0	4	4		4							
8.5	2	2	1	1							
9.0	1	1		1							
9.5	1	1			1						
10.0	1	1			1						
10.5	2	2			2						
11.0	1	1				1					
11.5	1	1			1						
12.0											
12.5	1	1				1					
13.0											
13.5											
14.0											
14.5											
15.0											
15.5											
16.0											
16.5											
17.0											
17.5											
18.0											
18.5	1	1									1
Totals	60	41	16	10	8	2	0	0	0	0	1

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower 95%CI	Upper 95%CI
		TL	Var	SE		
1	16	5.6	2.41	0.38	4.8	6.4
2	10	8.2	0.32	0.18	7.8	8.5
3	8	9.5	2.86	0.60	8.3	10.7
4	2	12.0	1.13	0.75	10.5	13.5
5						
6						
7						
8	1	18.8				

**LARGEMOUTH BASS AGE-LENGTH KEY**

Length group (in)	Total number	Sub-sample	AGE							
			1	2	3	4	5	6	7	8
2.5	3	1								
3.0	9	2								
3.5	2	2								
4.0	5	4								
4.5	1	2								
5.0	1	1	1							
5.5										
6.0										
6.5	2	2	1	1						
7.0	4	4	2	2						
7.5	2	2		1	1					
8.0										
8.5	1	1			1					
9.0										
9.5										
10.0										
10.5										
11.0										
11.5										
12.0	2	2				1			1	
12.5										
13.0										
13.5										
14.0										
14.5										
15.0										
15.5	1	1								1
Totals	33	24	4	4	2	1	0	0	1	1

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower	Upper
		TL	Var	SE	95%CI	95%CI
1	4	6.6	0.90	0.47	5.7	7.6
2	4	7.3	0.17	0.20	6.8	7.7
3	2	8.3	0.50	0.50	7.3	9.3
4	1	12.3				
5						
6						
7	1	12.3				
8	1	15.8				

**SMALLMOUTH BASS AGE-LENGTH KEY**

Length group (in)	Total number	Sub-sample	AGE		
			1	2	3
1.5	2				
2.0	4	2			
2.5	1	1			
3.0	2	2			
3.5					
4.0					
4.5					
5.0	1	1	1		
5.5	3	3	3		
6.0	2	2	2		
6.5	1	1	1		
7.0					
7.5					
8.0					
8.5					
9.0	1	1			1
9.5	2	2		1	1
10.0					
10.5	1	1			1
11.0					
11.5	1	1			1
12.0	1	1			1
Totals	22	18	7	1	5

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower 95%CI	Upper 95%CI
		TL	Var	SE		
1	7	6.0	0.24	0.18	5.6	6.3
2	1	9.8				
3	5	10.8	1.63	0.57	9.6	11.9