

RECOVERY OF THE WEST FORK WHITE RIVER

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EXECUTIVE SUMMARY

- In December 1999, a fish kill devastated the West Fork White River starting at the outfall of the Anderson Waste Water Treatment Plant in Anderson, Indiana. Fish were completely removed from an estimated 43 mi of river. A five-year summary of the recovery of 55 miles of the West Fork White River in Madison, Hamilton, and Marion Counties is presented, covering the fall 2004 fisheries survey in detail and including a summary of the 2002 and 2004 recreational surveys.
- The fish-kill segment stretches 55 river miles from Anderson to the 16th St. Bridge in Indianapolis. This segment is broken into two zones, the Upper River Zone from the Anderson wastewater treatment plant to top of Broad Ripple Impoundment (43 river miles) and the Lower River Zone from end of the upper zone to 16th St. Bridge. Also, a Reference Zone was included, which covers 7 miles from Mounds State Park Canoe Launch downstream to the top of the upper zone.
- The average number of fish species per station increased dramatically by the fall 2001 survey, just 21 months after the fish kill event. The average number of fish species per station leveled off and continued to be near pre-kill levels.
- Average sizes and ages of fishes in the fish-kill zones have shown progressive improvement through 2004. One prime example was how the size structure of smallmouth bass improved over the last four years.
- The IDNR stocked 13 species totaling nearly 1.15 million fish throughout the area of the WFWR affected by the fish kill. The IDNR stocked fish that were present in the river before the fish kill, such as channel catfish, bluegill, and largemouth and smallmouth bass. The IDNR also sought to establish four species that had not been collected in surveys within two years of the fish kill: sauger, shorthead redhorse, bigmouth buffalo, and freshwater drum. To date, no age-0 shorthead redhorse, bigmouth buffalo, or freshwater drum have been collected in fishery surveys. This is a preliminary indication of no natural reproduction of these species in the fish kill area. Age-0 sauger have been collected, but since sauger have been stocked through 2004, natural reproduction could not be verified.
- Recreational use of the river increased substantially from 2002 to 2004, partly in response to better weather and river conditions in 2004. Larger fish available to anglers in 2004 and a greater time interval since the event also may have contributed.
- Recommendations are to conduct a recreational survey in 2010, conduct fisheries surveys in 2007 and 2010 to track recovery of the fish populations, and to use this river as an example of what can be done in river recovery, noting the importance of including private, nonprofit groups in the effort.

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INTRODUCTION

In December 1999, a fish kill devastated the West Fork White River (WFWR) starting at the outfall of the Anderson Waste Water Treatment Plant in Anderson, Indiana. Fish were completely removed from an estimated 43 mi of river from Anderson down to the upper portion of the Broad Ripple Impoundment (river mile 246.6; Keller 2000). A partial fish kill extended another 12 miles to the Lake Indy Dam. Dead fish were collected as far downstream as the Stout Generating Plant in Marion County. An estimated 4.3 million fish weighing 180 tons were lost (Ball 2002a). The party responsible for the fish kill was ordered to pay nearly \$14 million, of which \$6 million was for Natural Resource Damage Recovery (U.S. Department of Interior et al. 2003). The \$6 million was used for restoration activities, such as habitat restoration, improving or acquiring public access, and restocking fish. Over 50 projects have been funded to date by the recovery money (Indiana Department of Environmental Management).

Recovery of the fish populations throughout the WFWR has been monitored since January 6, 2000 when initial stream surveys were conducted to assess the extent of the fish kill (Keller 2000). Since the fish kill, the Indiana Department of Natural Resources (IDNR) has completed four annual fall surveys (2001-2004) and two recreational use surveys (2002 and 2004). Fish were stocked into the fish kill area because of the extensive loss of fish and because numerous dams would potentially limit recolonization (Ball 2002c). The IDNR stocked fish that were present in the river before the fish kill, such as channel catfish, bluegill, and largemouth and smallmouth bass (Table 1). The IDNR also stocked two species, bigmouth buffalo and shorthead redhorse, which had been collected prior to the fish kill, but had not been collected after the fish kill. Sauger and freshwater drum had not been collected in fisheries surveys before the fish kill, but are native to the drainage. These species were collected from the East Fork White River and stocked into to the WFWR from 2002 to 2004.

Fish loss was extensive in 1999, but that was not the only impact; recreational activities were also impacted as a result of the fish kill. Many methods have been developed to estimate angler use and other recreational activities, but the WFWR required a design that was different from traditional access site or roving creel surveys. There were multiple dams and low water areas along the study area that made a traditional roving creel survey difficult. There were also multiple private and public access sites that made a traditional access site creel survey impractical. A bus-route method, which is a modified access site creel survey, was chosen to estimate angler and other recreational activities. The bus-route method was developed for fisheries with multiple access sites over a large geographic area (Jones et al. 1990). Estimates of angler effort and catch are obtained with the bus-route method. Also, an estimate of the local

economic impact of the fishery can be calculated by using the number of visits estimated in the current survey multiplied by average expenditures per day by individual anglers, which is reported by the U.S. Fish and Wildlife Service (U.S. Department of the Interior 2002). One creel survey was completed in 1989 on a 20-mile stretch of the WFWR that lies within Marion County (Kiley and Keller 1990), which was represented in part by Sector 1 in the current survey.

This report includes data from the fall 2004 fishery survey and also summarizes the other fishery and recreational survey data collected on the West Fork White River that was affected by the fish kill in December 1999. To date, there have been nine reports compiled since the fish kill, five of which were interim reports for a work plan that was implemented in the fall of 2001. A list of the entire collection of reports is located in the literature cited of this document and should be referenced if more data are needed.

METHODS

Fishery surveys

Initial sampling after the fish kill was conducted in January 2000 (Keller 2000). Additional sampling was conducted in March and July 2000 (Ball 2000, 2002b). Monitoring was continued each fall from 2001 to 2004, using 17 sampling stations (Figure 1). For the fall fisheries surveys, the river was divided into a Reference Zone (RZ; above the kill zone, 7 river miles), an Upper River Zone (URZ; total kill zone, 43 river miles), and a Lower River Zone (LRZ; partial kill zone, 12 river miles). All 17 stations were sampled in the fall surveys (see Appendix), except for the 2003 fall survey when no riffle stations were sampled and in 2004 when Station 11 could not be sampled. Boat-mounted electrofishing gear was used to sample run stations for up to 1 h. Impoundments were sampled with boat-mounted electrofishing gear, gill nets, and trap nets. Three gill nets and three trap nets were used in each impoundment, except for Landings Pit where two gill nets were used. Electrofishing sampling time in impoundments was 1 h, except in Landings Pit, where sampling was one complete circuit of the shoreline.

All fish were measured, identified, and most of the fish were weighed. For fish that were not measured in the field, weights were estimated using length-weight regressions. Any fish that could not be identified in the field were preserved in 10% formalin and later identified.

Body condition and size-structure were evaluated using relative weights and stock indices for selected species. Selected species were separated into size groups according to length categories presented in Anderson and Neumann (1996). Relative weights were only calculated for fish that were weighed in the field. Percent composition by weight was simply the ratio of the total weight for an individual species divided by the total weight of all fish and was calculated for

each station and for each habitat type. Scale samples were collected from selected species and lengths-at-age were back-calculated using FishBC© (Doll and Lauer 2002).

Bigmouth buffalo, freshwater drum, and shorthead redhorse were collected in the East Fork White River and stocked into the West Fork White River from August to October, in 2002 through 2004 (Table 1). Sauger needed for hatchery production were also collected in the East Fork White River.

Recreational use surveys

Surveys were conducted from April 1 to October 31, 2002 and 2004. The surveys were not comprehensive because of the number of access points available, but attempted to cover all public access points. The 62 mi study area was split into two sectors and one creel clerk was responsible for each sector (Ball 2005; Hoffman 2005). Each sector was additionally divided into two sections and the creel clerk worked in one section per day (Figure 2). Sector 1 was from the 16th St. dam to Town Run Park near 96th St., Indianapolis; 13 sites were established in Sector 1 (see Appendix). Sector 2 was from a county park near 106th St. to a canoe launch at Mounds State Park in Anderson; 11 sites were established in Sector 2.

Probabilities were assigned to each site in a section so the total of the probabilities was equal to one for a section. Total drive time for each section was determined and subtracted from the 7.5 h day. The remaining time was proportioned to each site based on its assigned probability. The season was stratified by month and kind-of-day (weekend and weekdays). A two-stage sampling design (Pollock et al. 1994) was used to assign days (primary sampling unit, PSU) and the shift/section combination (secondary sampling unit, SSU). Clerks worked three of four weekend days and seven of ten weekdays per two-week pay period. The starting site for each work day was randomized and the remaining sites were in consecutive order. The creel clerk arrived at the scheduled site, waited at each site for the allotted time, and recorded start and end times for each party observed. The time interval count method (Pollock et al. 1994) was used to estimate effort and catch because a minimal number of interviews were expected. Not all vehicles could be attributed to respective recreational activities; therefore, activities such as angling and recreational boaters may have been underestimated, but consistent between surveys.

RESULTS

Fishery surveys

Fall 2004 - All sampling efforts yielded 5,505 fish representing 53 species. The number of species per station averaged 18.5 for the Reference Zone, 18.9 for the URZ, and 18.8 for the LRZ. Bluegill (12.1%), northern hog sucker (10.4%), smallmouth bass (10.1%), stoneroller (8.7%) and gizzard shad (8.2%) were among the most abundant species collected. Carp (27.2%), quillback (14.0%), channel catfish (9.0%), and gizzard shad (7.0%) comprised the majority of the total weight of fish collected. Sportfish comprised approximately 31% of the total catch by number and 25% by weight. Eleven sauger were caught ranging from 4.8 to 14.4 in TL and one shorthead redhorse was caught (20 in TL). No freshwater drum or bigmouth buffalo were collected.

All surveys - The number of species collected per station in the URZ increased through the fall survey in 2002 (Table 2) and has since stabilized. For the LRZ, average species richness increased to a high of 23.2 in 2002, dropping slightly in 2003 and 2004.

Bluegill was the most abundant species in the 2004 survey. The PSD for this species was within the acceptable range at 27 (Table 3). Bluegill growth in the LRZ declined slightly from 5.3 in TL at age 3 in 2003 to 5.0 in TL in 2004 (Table 4). However, this change was not significant. Growth for this species was similar between the URZ and the LRZ, and also similar to District 5 averages. Relative weights were good for quality- and preferred-sized fish, but low for stock-sized fish (Table 5).

A strong year-class of smallmouth bass was produced in 2004 (Figure 3). No riffle stations were sampled in 2003, which accounts for what appears to be a missing age-0 year-class. Smallmouth bass (mean TL = 1.75 in) were stocked in 2001 and 2002, which corresponds to the strong mode in the length-frequency graphs between 2 and 4 in TL. However, no smallmouth bass were stocked in 2004; therefore, the strong mode between 2 and 4 in TL should be due to natural production. Smallmouth bass represented 5.9% of the total weight of fish collected and fish ranged from 1.6 to 17.5 in. The PSD was 35 in 2004, which was within the accepted range (30 to 60) for balanced populations (Anderson and Weithman 1978; Willis et al. 1993) and similar to 2003 (Table 3). Smallmouth bass grew faster in the URZ than in the LRZ from age 3 to age 5. For example, smallmouth bass were 13.4 in TL at age 5 in the URZ, but only 11.4 in TL in the LRZ (Table 6).

Largemouth bass represented 2.9% of the total catch by number and 3.3% of the total catch by weight. This species was found throughout the river, but larger individuals were much more common in the LRZ, where more lacustrine habitat is available. Largemouth bass ranged

from 2.9 to 19.2 inches and the oldest fish aged was 6 years old (Table 7). Fish grew slower than average for District 5 largemouth bass, taking 5.6 years to reach 14 in TL. In 2004, fish grew slower in the LRZ than in 2003, when they averaged 15.1 in at age 5. From 2001 to 2004, largemouth bass PSDs ranged from 37 to 54, which were within the accepted range for balanced populations.

Rock bass made up 2.4% of the sample in 2004. The PSD for this species was 35 in 2004 and ranged from 14 to 52 between the 2001 and 2004 samples. Growth in the URZ, where this species was most common, averaged 7.3 in TL at age 4 (Table 8). This was above District 5 averages, but below the 2003 average of 7.6 in TL. Rock bass as long as 9.5 inches were collected in the survey.

In 2004, channel catfish accounted for 1.2% by number and 9.0% by weight. Channel catfish ranged from 6.4 to 26.3 in TL. The PSD was 88 following a previous high of 80 from 2003. One immature flathead catfish (5.2 in) was collected. One or more immature flatheads have been found each year in the surveys, showing that recruitment is occurring, although in small numbers.

Recreational use surveys

2002 - Total recreational effort was 125,653 h or 2,027 h/mi. Angling ranked highest among the recreational activities, accounting for 26% (33,059 h) of the total recreational effort (Figure 4). Biking was second with 25,346 h, followed by parking and sightseeing at 23,528 h and boating at 23,526 h. Hiking, walking, and jogging totaled 15,503 h and picnicking totaled 4,691 h.

Anglers caught a total of 35,172 fish or 567 fish/mi, of which 76% was released. Anglers caught more fish in the LRZ (22,378) than in the URZ (12,184). A total of 8,124 fish was harvested and 58% were bluegill; only 7% were black bass. Smallmouth bass accounted for 39% of the number of fish caught, but only 4% of the number harvested (Table 9). Only 6% of the rock bass caught were harvested. Anglers harvested 39% (1,400) of the 3,592 channel catfish they caught. Of the black bass that were caught-and-released, 29% were harvestable size.

2004 - This year was much better in terms of spring and summer weather compared to 2002. Rainfall was moderate in spring and summer temperatures were mild. Total recreational effort was an estimated 180,447 h or 2,910 h/mi. Angling accounted for the greatest amount of recreational effort (47,596 h); followed by picnicking (38,841 h), parking (27,126 h), biking (19,503 h), and boating (18,117 h). Other recreational activities, such as jogging, sightseeing, and walking, were less than 15,000 h each.

Anglers caught a total of 59,482 fish, releasing nearly 89% of what they caught. Anglers caught 33,216 smallmouth bass, which accounted for over 55% of the total catch by number. Rock bass and bluegill ranked next with just over 8,800 fish each. Largemouth bass (2,365) ranked fourth in total catch, followed by channel catfish (1,921), crappie (794), and carp (784). All other species represented less than 700 fish each. Anglers harvested an estimated 6,586 fish for an overall yield of 6,038 lbs. Bluegill accounted for the majority of the harvested fish by number. Over 25% of the smallmouth that anglers released were greater than 12 in TL and approximately 46% of the largemouth bass released were greater than 14 in TL.

Anglers in the LRZ preferred to fish for black bass, catfish, and bluegill. Anglers in the URZ fished primarily for black bass (55%), while approximately 37% of the anglers did not claim a preference for any species group. More fish were caught in the LRZ (1,318 fish/mi) than in the URZ (801 fish/mi). Nearly all (96%) of the 2004 harvest by number occurred in the LRZ and bluegill comprised the majority of the total harvest of all species by number. Anglers that fished in the URZ harvested only 232 fish, representing two species (bluegill and channel catfish). The majority (85%) of the largemouth bass were caught in the LRZ, while the majority (78%) of the rock bass were caught in the URZ. Anglers caught similar numbers of smallmouth bass between the LRZ (550 fish/mi) and URZ (518 fish/mi). Anglers caught relatively low numbers of other fish that IDNR stocked since the fish kill, such as flathead catfish (8 fish/mi), freshwater drum (11 fish/mi), and sauger (5 fish/mi).

The estimate of localized expenditures by anglers utilizing the WFWR fishery in the current survey was intermediate to the surveys in 1989 and 2002. Anglers in the current survey made approximately 16,412 trips to the study area from April to October 2004. According to the 2001 U.S. Fish and Wildlife Survey, Indiana anglers spent an average \$37/d on total trip expenditures (U.S. Department of Interior 2002). Assuming that anglers made only one trip per day, anglers spent an estimated \$607,244 (\$9,794/mi) in the 2004 survey. For comparison, anglers in Marion County spent an estimated \$19,330/mi in 2004, \$14,377/mi in 2002, and \$17,556/mi in 1989.

In both years, people that used the LRZ (Marion County) participated mostly in activities such as angling, picnicking, biking, and sightseeing. People that used the URZ (Hamilton and Madison Counties) participated mostly in activities such as angling, picnicking, parking, and boating.

DISCUSSION

In terms of species richness, the fish community rebounded to near pre-kill levels by the fall 2002 fisheries survey. An average of 5.3 species was collected per station in the complete kill zone in January 2000 compared to 20.9 species in the fall 2002 survey (Hoffman 2004). In terms of relative abundance, most species have also rebounded to pre-kill levels. Some of the increase in relative abundance of species may be due to intensive stocking by the IDNR. Since 2000, 13 species totaling nearly 1.15 million fish were stocked throughout the area of the WFWR affected by the fish kill. Freshwater drum were observed in angler catches in 2004, but small drum from natural spawns have not been collected in the fishery surveys. Neither have young shorthead redhorse or any sizes of bigmouth buffalo. A few shorthead redhorse adults were observed in the 2002 and 2004 fishery surveys and they were suspected to be individuals stocked by the IDNR. Sauger have been reported in the 2004 creel and anglers reported catching them frequently. However, evidence of sauger natural reproduction within the WFWR has not been verified.

Although there were only three years of creel survey data for comparison, some general trends seem evident. Angling pressure, yield, and expenditures were greater before the fish kill, based on data from 1989 (Kiley and Keller 1990). There was a 70% increase in total recreational effort from 2002 to 2004 and a 69% increase in angler effort (Figure 4). Probably most important was the better weather in 2004 compared to 2002. Major flooding occurred in June of 2002, topping off a very wet spring, definitely reducing angling activity. A second factor was that the 2002 season followed the 1999 fish kill by only three years. Consequently, there may have been a reduction in angling in 2002 related to the proximity in time of this event. Angling, catch-and-release, and recreational use increased from 2002 to 2004, while harvest was down slightly. A new canoe rental business began operation at Anderson early in 2004 that may have increased use. The sampling plan for 2004 was improved by combining two of the minor stations with other neighboring stations, likely improving coverage.

There are many positive observations about the fishery in the WFWR, especially concerning smallmouth bass populations. Smallmouth bass populations improved in size structure each year and angler catches increased. Smallmouth bass growth declined somewhat in 2004, but this is probably normal for a population recovering from a fish kill. Size distributions of other species, particularly largemouth bass, also improved since the fish kill.

Large PSDs of channel catfish may indicate a low level of recruitment; however, there is no recommended PSD range for this species. There was also a reduction in the harvest of channel catfish from 2002 to 2004 of 29% and a reduction in the catch-and-release numbers of 57%. This

is disappointing, and should be followed closely in the future. The habitat seems to be present for adults. Hubert (1999) notes that channel catfish spawn in secluded areas that are protected from the current by woody debris, boulders, or other cover. Some of the impounded areas, such as Sand and Landings Pits in the Broad Ripple area have this type of cover in abundance, although most of the deep river channel is swept clear of woody debris by the current. There is a scarcity of woody cover compared to the East Fork White River, as the number of bridges, dams, and possibly waterfront homes leads to its removal.

Flathead catfish inhabit deep, long, sluggish pools of streams where the gradient is low (Trautman 1981). Woody debris is also important in the habitat of this species (Smith 1979; Pflieger 1997). From these descriptions, the habitat for the flathead appears to be limited in this portion of the WFWR. Only three flathead catfish were taken in the 2004 survey, and none of the earlier surveys had netted more than a few individuals. Anglers have reported catching them consistently in the Clare area; however, so more time is needed to see what level of abundance will be maintained by this species.

The study area included access to the river such as public parks, bridges, homes, apartments or condominiums, and others. Many of the river access points were popular points for lunch breaks or picnicking, as well as for angling. Several access sites included biking and walking trails that were on the river bank. The LRZ contained three connected gravel pits and two impounded stretches, compared to the URZ, which has only one impounded stretch and no connected gravel pits. The result is that the LRZ tends to be a deeper, wider river that is more suited to boats with outboard motors. The portion of the WFWR affected by the fish kill has been given increased attention because of the recovery money from the lawsuit. The river has good scenic, angling, and canoeing potential. Non-profit groups, such as White River Rescue and White River Watchers, have taken an interest in the river by coordinating multiple clean-up projects. Three new public access sites are being added in the URZ at Anderson, Strawtown, and Perkinsville (Indiana Department of Environmental Management 2005).

RECOMMENDATIONS

- Conduct a recreational user survey in 2010, which will be 10 years after the fish kill, allowing time for the fish populations to stabilize.

- Conduct fishery surveys in 2007 and 2010 to follow recovery and to check on success of stockings of sauger, shorthead redhorse, freshwater drum, bigmouth buffalo, and catfishes. Repeat fishery surveys on a regular basis after 2010.
- Use this portion of the WFWR as an emphasis in river recovery for Indiana. One way to do this is to encourage public interest and recreational use of this river. Continue to encourage nonprofit groups such as Friends of White River and White River Rescue.

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Table 1. Summary of the species and numbers of each stocked in the West Fork White River since the fish kill in 1999.

Common name	2000	2001	2002	2003	2004
Bigmouth buffalo	-	-	34	29	28
Bluegill	204,743	-	-	-	-
Black crappie	-	10	-	-	-
Channel catfish	202,304	57,748	68,377	-	-
Crappie	108	18	-	-	-
Flathead catfish	111	961	1,280	-	-
Freshwater drum	-	-	139	67	68
Largemouth bass	79,887	31,051	13,050	-	-
Rock bass	22,176	9,800	9,697	-	-
Redear sunfish	23	-	-	-	-
Sauger fingerlings	-	-	49,395	12,549	32,304
Sauger fry	-	-	149,650	139,400	-
Smallmouth bass	32,626	22,074	3,771	-	-
Shorthead redhorse	-	-	86	102	83
White crappie	3,820	-	-	-	-
				Total	1,147,569

Table 2. Average number of species per station for the reference, upper river, and lower river zones, West Fork White River, 2000 to 2004.

Sample	Reference zone	Upper river zone	Lower river zone
January 2000	18.0	5.3	10.3
March 2000	21.5	6.0	17.8
July 2000	18.5	14.2	16.5
Fall 2001	21.0	18.0	22.8
Fall 2002	22.0	20.9	23.2
Fall 2003	---	20.2	17.8
Fall 2004	18.5	18.9	18.8

Table 3. Proportional stock density values of selected species from fall sampling of the West Fork White River, 2001 to 2004.

Species	Index	2001	2002	2003	2004
Channel catfish	PSD	28	39	80	88
	RSD-P	-	4	6	4
	RSD-M	-	1	0	0
Bluegill	PSD	36	20	27	27
	RSD-P	-	0	0	1
	RSD-M	-	0	0	0
Rock bass	PSD	14	22	52	35
	RSD-P	-	0	2	1
	RSD-M	-	0	0	0
Largemouth bass	PSD	37	52	54	40
	RSD-P	16	24	20	8
	RSD-M	5	2	2	0
Smallmouth bass	PSD	13	20	37	35
	RSD-P	5	5	5	9
	RSD-M	0	0	0	1

Table 4. Back-calculated lengths-at-age of bluegill in the West Fork White River, fall 2004.

Year Class	Number Aged	1	2	3	4	5
UPPER						
1999	1	2.5	4.0	5.2	6.1	7.5
2000	0	0	0	0	0	
2001	17	1.9	3.6	5.5		
2002	20	1.8	3.6			
2003	14	2.0				
	Average	1.9	3.6	5.4		
LOWER						
2000	4	1.8	3.2	5.2	6.3	
2001	17	1.6	3.2	4.9		
2002	15	1.5	2.9			
2003	17	1.5				
	Average	1.6	3.1	5.0	6.3	
	D5 Average	1.7	3.6	5.3	6.4	

Table 5. Relative weights of selected species from the West Fork White River, fall 2004.

Common name	Stock	Quality	Preferred	Memorable
Bluegill	92	94	105	-
Channel catfish	127	115	104	-
Largemouth bass	95	97	110	-
Rock bass	104	103	110	-
Smallmouth bass	92	85	86	85

Table 6. Back-calculated lengths-at-age of smallmouth bass in the West Fork White River, fall 2004.

Year Class	Number Aged	1	2	3	4	5	6	7	8
UPPER									
1996	1	3.1	7.4	11.5	12.1	13.4	14.4	15.4	15.7
1997	0								
1998	0								
1999	9	4.4	6.8	9.8	11.8	13.4			
2000	22	4.1	7.0	9.9	11.6				
2001	22	3.8	6.3	8.4					
2002	23	3.5	5.4						
2003	13	3.0							
	Average	3.7	6.3	9.3	11.7	13.4			
LOWER									
1997	2	4.1	6.1	7.8	9.4	11.0	12.7	14.0	
1998	2	4.0	5.5	7.2	8.8	10.4	11.5		
1999	6	3.8	5.8	7.9	9.5	11.4			
2000	9	4.0	6.0	7.9	9.8				
2001	4	3.9	6.3	7.8					
2002	3	3.5	5.5						
2003	4	3.2							
	Average	3.8	5.9	7.8	9.6	11.4			
	D5 Average	3.6	6.4	8.9	10.9	12.7			

Table 7. Back-calculated lengths-at-age of largemouth bass in the West Fork White River, fall 2004.

Year Class	Number Aged	1	2	3	4	5	6
UPPER							
1998	1	2.5	5.3	8.5	11.1	11.9	13.3
1999	0	0.0	0.0	0.0	0.0	0.0	
2000	4	3.5	6.6	10.0	12.1		
2001	2	2.6	5.7	8.7			
2002	3	2.2	4.3				
2003	14	2.5					
	Average	2.7	5.5	9.3	12.1		
LOWER							
1999	3	4.0	6.9	9.7	11.8	13.0	
2000	10	3.6	6.6	9.2	11.6		
2001	14	3.7	6.9	9.3			
2002	12	3.3	6.1				
2003	20	3.2					
	Average	3.5	6.6	9.3	11.7	13.0	
	D5 Average	4.4	8.2	10.9	13.0	14.6	

Table 8. Back-calculated lengths-at-age of rock bass in the West Fork White River, fall 2004.

Year Class	Number Aged	1	2	3	4	5	6
UPPER							
1998	4	2.2	4.0	5.3	6.7	7.7	8.1
1999	2	2.1	4.1	5.3	7.6	8.0	
2000	12	2.1	4.3	6.4	7.4		
2001	9	2.2	4.1	5.9			
2002	16	2.1	3.8				
2003	15	2.0					
	Average	2.1	4.0	6.0	7.3	7.8	8.1
LOWER							
2000	3	2.2	3.7	4.9	6.2		
2001	14	2.3	4.1	5.9			
2002	11	2.2	4.2				
2003	20	2.2					
	Average	2.2	4.1	5.7	6.2		
	D5 Average	2.0	3.5	5.2	6.4	7.1	7.6

Table 9. Estimated number of fish harvested and released by anglers during a bus-route, creel survey on the West Fork White River, 2002 and 2004.

Common name	<u>2002</u>		<u>2004</u>	
	Harvested	Released	Harvested	Released
Bluegill	4,707	NA	3,430	5,423
Channel catfish	1,401	2,191	988	933
Flathead catfish	26	NA	169	335
Largemouth bass	108	5,020	19	2,346
Rock bass	235	3,850	185	8,637
Smallmouth bass	425	10,378	495	32,721

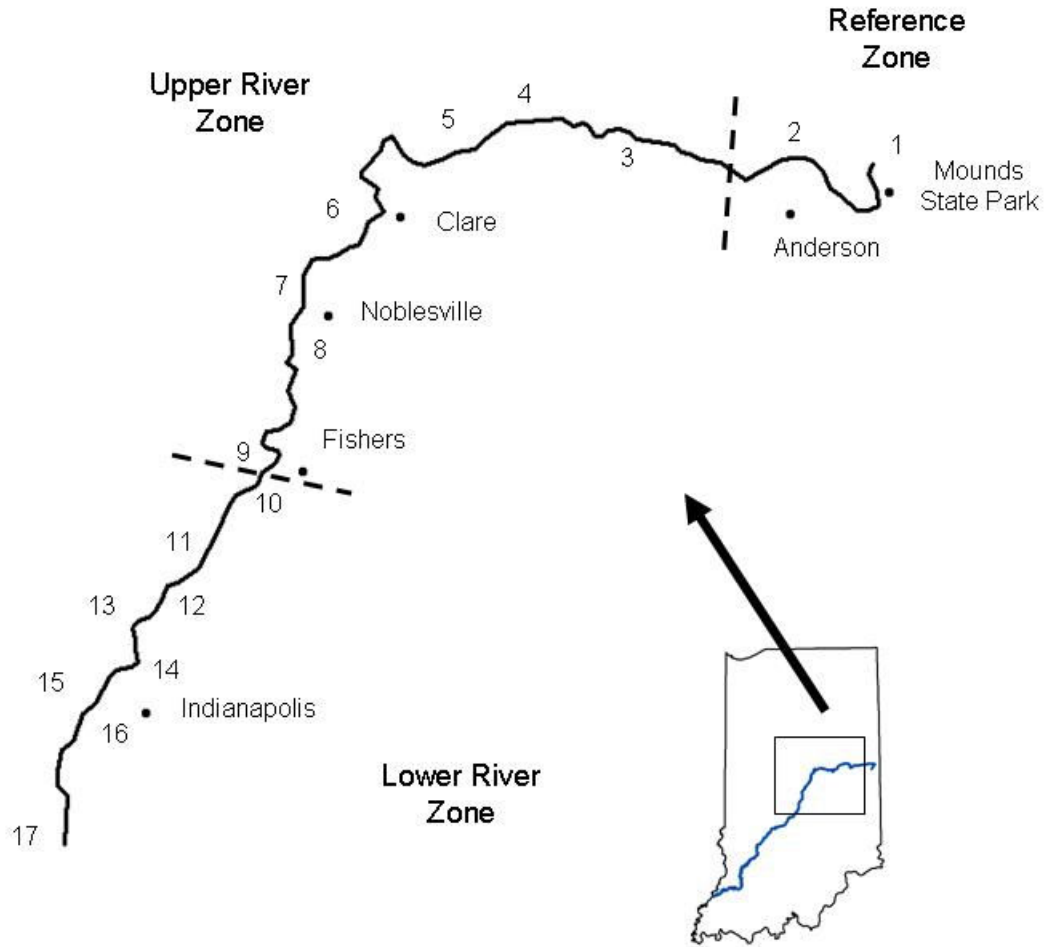


Figure 1. Fall fishery sampling stations for the West Fork White River, 2001 to 2004.

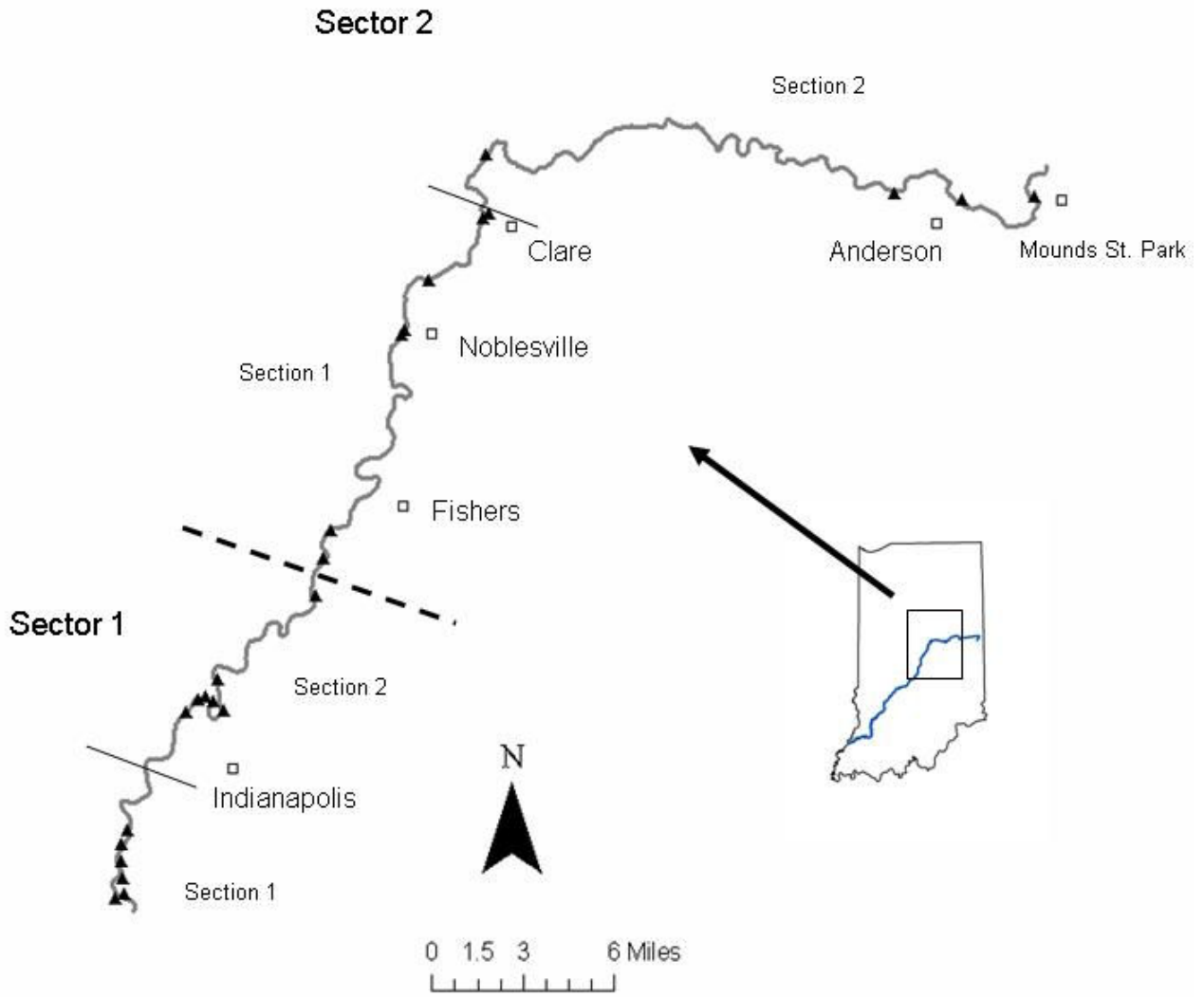


Figure 2. Bus-route stations for a recreational use survey, West Fork White River, 2002 and 2004.

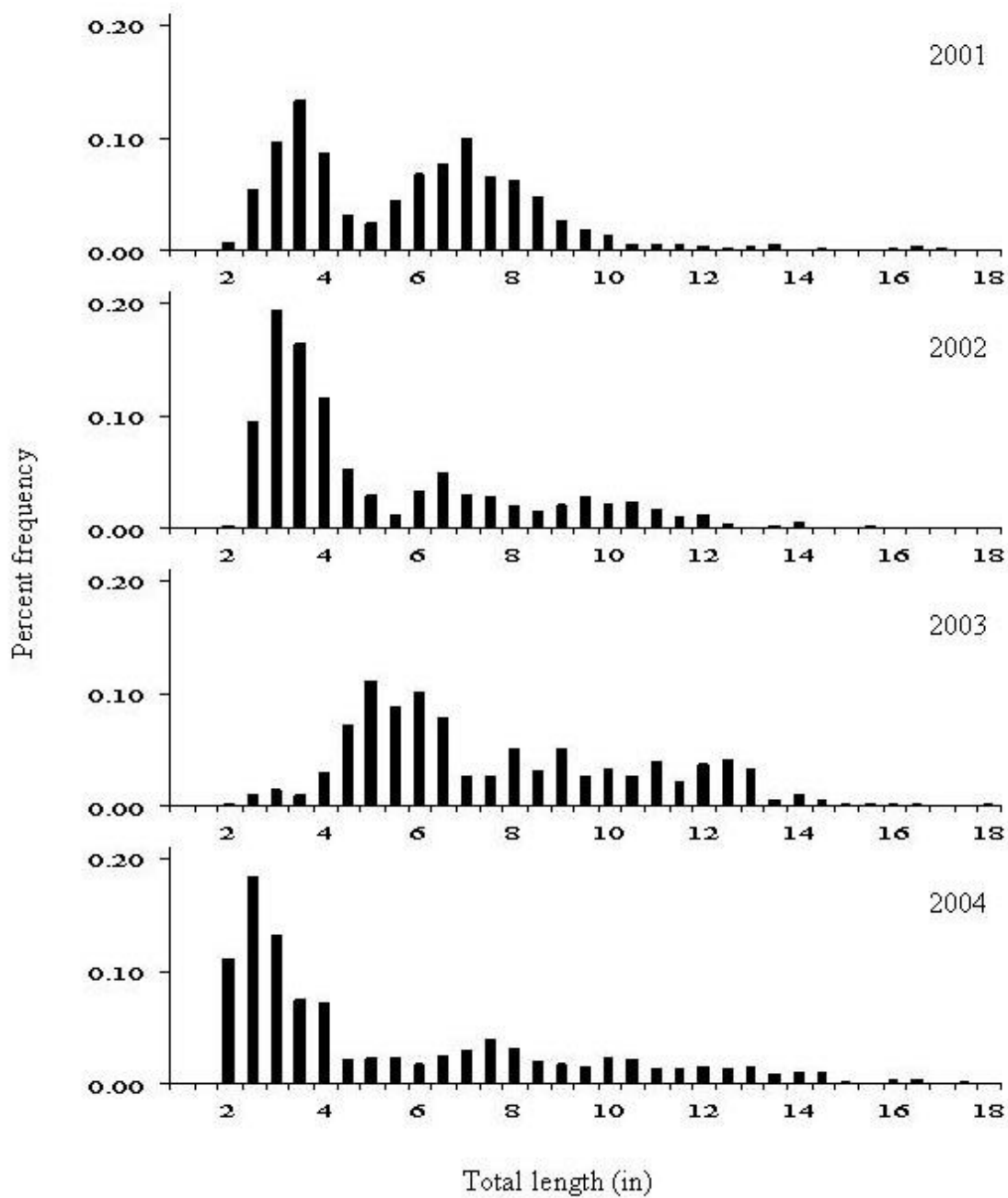


Figure 3. Length-frequency distributions of smallmouth bass from fall surveys, West Fork White River, 2001 to 2004.

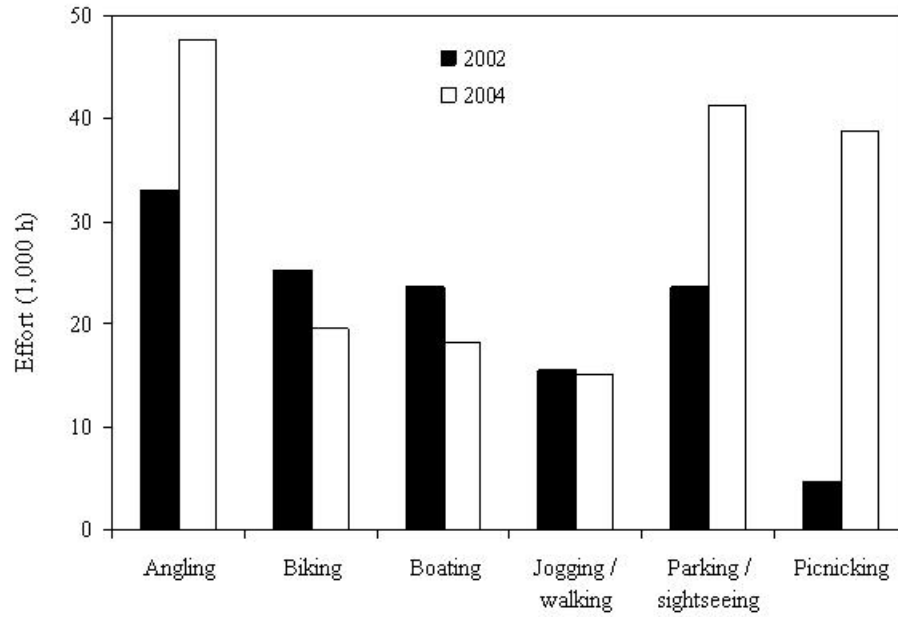


Figure 4. Recreational use from bus-route surveys, West Fork White River, 2002 and 2004.

APPENDIX A.

STATIONS USED IN THE FISHERY SURVEYS AND BUS-ROUTE CREEL ON
THE WEST FORK WHITE RIVER, 2001 to 2004

Appendix A1. Stations used in fall fishery surveys on the West Fork White River, 2001 to 2004.

Zone	Site No.	Station Location	Station Type	River Mile
Upper	1	Mounds State Park Canoe Launch	riffle	296.9
Reference Zone	2	Raible Ave. Bridge, Anderson	run	290.1
	3	Madison County Rd 600W Bridge	run	284.4
	4	St. Rd. 13 bridge, Perkinsville	riffle	279.0
	5	Coffey Grounds, near Strawtown	run	275.9
Upper	6	Clare Impoundment	lacustrine	269.4
River Zone	7	Noblesville Public Access Site	run	263.6
	8	St. Rd. 32 Bridge, Noblesville	riffle	263.5
	9	Above 116 th St. Bridge	riffle	253.5
	10	Below 116 th St. Bridge	run	253.3
	11	Allisonville Rd. Bridge ²	riffle	247.9
	12	Upper Broad Ripple Impoundment	lacustrine	246.6
	13	Landings Pit	lacustrine	247.3
Lower	14	Lower Broad Ripple Impoundment	lacustrine	244.2
River Zone	15	Meridian Street Bridge	riffle	241.3
	16	53 rd Street, Indianapolis	riffle	238.5
	17	Lake Indy	lacustrine	235.1

¹The riffle stations were not sampled in 2003.²Station 11 could not be accessed in 2004.

Appendix A2. Sectors, sections, and station used in a bus-route, recreational use survey of the West Fork White River, 2002 and 2004.

Section	Station	Station description	Probability
<u>Sector 1</u>			
1	1	16 th St. Dam, east side of river	0.18
	2	16 th St. Dam, west side of river	0.17
	3	Riverside Park, parking area, bank fishing	0.11
	4	Riverside Park, public boat ramp	0.20
	5	30 th St., restaurant on west side of river	0.14
	6	I-65 overpass, shore access under overpass	0.19
2	7	Holliday Park, handicap ramp	0.12
	8	College Ave. Bridge, shore access at bridge	0.12
	9	Marott Park, canoe portage at park	0.23
	10	Broad Ripple Park, public boat ramp	0.20
	11	73 rd St., Ravenswood Beach	0.16
	12	86 th St. Bridge ¹ , parking lot at NW side bridge	0.16
	13	96 th St., Town Run Park	0.16
<u>Sector 2</u>			
1	1	106 th St. Park, county park, west side of river	0.24
	2	116 th St., Fishers public boat ramp	0.20
	3	Schwartz's Bait and Tackle, fishing pier at shop	0.13
	4	Public boat ramp, upstream of St. Rd. 38 bridge	0.17
	5	Golf Course ¹ , Noblesville near St Rd 19	0.10
	6	Potters Bridge, county park	0.17
2	7	Clare Dam ² , At Riverwood, west side of river	0.01
	8	Riverwood Boat Ramp, upstream of Clare Dam	0.13
	9	Riverbend Campground, private boat ramp	0.26
	10	White River Campground, county campground	0.24
	11	Raible Ave. Bridge ³ , shoreline access	0.17
	12	Edgewater Park, Anderson	0.17
	13	Mounds State Park, canoe launch, shore access	0.19

¹Included as part of Station 4 in 2004.

²Not used in 2004.

³Location of new canoe rental business in 2004.

APPENDIX B

NAME, NUMBER, PERCENTAGE, SIZE, WEIGHT AND OCCURRENCE INDEX OF
FISHES BY RIVER ZONE AND HABITAT COLLECTED FROM THE WEST FORK WHITE
RIVER, FALL 2004

Appendix B1. Abundance and total weight of all species collected in fall 2004 sampling.

Species	n	%	Min	Max	Weight (lbs)	%
Gizzard shad	453	8.2	4.7	12.9	135.72	7.0
Grass pickerel	7	0.1	4.2	9.1	0.58	0.0
Carp	110	2.0	10.3	28.2	530.18	27.2
Bluntnose minnow	59	1.1	1	3.7	0.38	0.0
Creek chub	11	0.2	2.5	3.4	0.09	0.0
Common stoneroller	481	8.7	1.7	6.4	9.14	0.5
Fathead minnow	5	0.1	1.7	2.4	0.02	0.0
Golden shiner	2	0.0	6.4	6.8	0.25	0.0
Rosyface shiner	22	0.4	1.9	3	0.12	0.0
Sand shiner	179	3.3	1.2	3.1	0.59	0.0
Silver shiner	72	1.3	2.8	5.7	1.75	0.1
Silverjaw minnow	1	0.0	3.4	3.4	0.01	0.0
Spotfin shiner	200	3.6	0.9	4.2	2.12	0.1
Striped shiner	12	0.2	2.4	6	0.51	0.0
Suckermouth minnow	21	0.4	2.4	3.9	0.40	0.0
White sucker	115	2.1	3.1	16.5	93.27	4.8
Northern hog sucker	575	10.4	2.4	15.7	121.27	6.2
Spotted sucker	119	2.2	2.7	19.6	92.95	4.8
Quillback	47	0.9	12.5	19.6	273.77	14.0
River carpsucker	3	0.1	17	17.8	6.76	0.3
Black redbhorse	31	0.6	2.8	15.4	14.83	0.8
Golden redbhorse	53	1.0	2.4	17	42.21	2.2
Shorthead redbhorse	1	0.0	20	20	3.20	0.2
Silver redbhorse	29	0.5	2.6	20.6	66.34	3.4
Channel catfish	67	1.2	6.4	26.3	175.77	9.0
Flathead catfish	4	0.1	5.2	27.7	15.28	0.8
Stonecat	1	0.0	5.5	5.5	0.04	0.0
Yellow bullhead	4	0.1	6	9.4	1.14	0.1
Blackstripe topminnow	1	0.0	1.5	1.5	0.05	0.0
Brook silverside	4	0.1	1.6	2.9	0.02	0.0
Mottled sculpin	111	2.0	1.7	3.8	1.21	0.1
White bass	2	0.0	7.7	7.9	0.37	0.0
Hybrid striped bass	1	0.0	8.9	8.9	0.25	0.0
Yellow bass	29	0.5	3.7	9.3	6.11	0.3
Bluegill	664	12.1	1.3	8.2	58.62	3.0
Green sunfish	194	3.5	1.5	6.1	5.81	0.3
Longear sunfish	304	5.5	1.2	7.1	24.95	1.3
Redear sunfish	19	0.3	3.5	10.5	6.42	0.3
Warmouth	1	0.0	4.3	4.3	0.05	0.0
Hybrid sunfish	8	0.1	3.3	6.7	1.23	0.1
Rock bass	212	3.9	1.5	9.5	46.77	2.4
Smallmouth bass	554	10.1	1.6	17.5	114.74	5.9
Largemouth bass	159	2.9	2.3	19.2	64.37	3.3
Black crappie	17	0.3	4	9.2	11.47	0.6
White crappie	23	0.4	4.4	9.5	5.16	0.3
Sauger	11	0.2	4.8	14.4	11.90	0.6
Yellow perch	2	0.0	3.6	6.4	0.11	0.0

Appendix B1. Abundance and total weight of all species collected in fall 2004 sampling (continued).

Blackside darter	3	0.1	2.3	2.7	0.02	0.0
Greenside darter	258	4.7	1.8	3.7	2.04	0.1
Johnny darter	55	1.0	1.7	2.6	0.17	0.0
Logperch	63	1.1	3	6.7	0.26	0.0
Orangethroat darter	32	0.6	1.5	2.1	0.09	0.0
Rainbow darter	92	1.7	1.2	2.5	0.33	0.0
Slenderhead darter	2	0.0	2.7	3.3	0.01	0.0
Total - 52 species	5505				1951.22	

Appendix B2. Species relative abundance and total weight collected for the Reference Zone, West Fork White River, 2004.

	n	% by number	Min	Max	Weight (lbs)	% by weight
Bluegill	5	0.5	1.6	4.6	0.17	0.1
Bluntnose minnow	14	1.4	1.6	3.3	0.10	0.1
Black redhorse	1	0.1	11.7	11.7	0.51	0.4
Creek chub	11	1.1	2.5	3.4	0.09	0.1
Carp	7	0.7	22.7	28.2	59.50	45.9
Golden redhorse	2	0.2	2.6	3.0	0.01	0.0
Greenside darter	56	5.5	1.8	3.7	0.35	0.3
Green sunfish	29	2.8	2.1	6.1	1.51	1.2
Johnny darter	8	0.8	1.8	2.6	0.03	0.0
Longear sunfish	23	2.2	2.8	6.7	2.65	2.0
Largemouth bass	8	0.8	2.3	5.5	0.22	0.2
Logperch	3	0.3	3.5	5.4	0.09	0.1
Mottled sculpin	100	9.7	1.8	3.8	1.11	0.9
Northern hog sucker	131	12.8	2.4	13.5	36.6	28.3
Orangethroat darter	1	0.1	1.8	1.8	0.01	0.0
Rainbow darter	36	3.5	1.2	2.2	0.10	0.1
Redear sunfish	14	1.4	2.2	3.0	0.09	0.1
Rock bass	26	2.5	1.5	9.5	6.19	4.8
Sand shiner	10	1.0	1.2	3.1	0.04	0.0
Spotfin shiner	24	2.3	1.3	4.2	0.36	0.3
Silverjaw minnow	1	0.1	3.4	3.4	0.01	0.0
Smallmouth bass	188	18.3	1.6	14.8	13.51	10.4
Spotted sucker	1	0.1	3.0	3.0	0.01	0.0
Silver shiner	43	4.2	2.8	5.0	0.96	0.7
Stoneroller	242	23.6	1.7	6.4	4.13	3.2
Striped shiner	12	1.2	2.4	6.0	0.51	0.4
Suckermouth minnow	12	1.2	2.4	3.9	0.21	0.2
White sucker	19	1.9	3.1	4.9	0.44	0.3
Total	1,027				129.51	

Appendix B3. Species relative abundance and total weight collected for the Upper River Zone, West Fork White River, 2004.

	n	% by number	Min	Max	Weight	% by weight
Black crappie	7	0.3	8.0	9.2	2.17	0.3
Bluegill	249	10.4	1.3	7.9	20.60	2.7
Bluntnose minnow	20	0.8	1.0	3.4	0.08	0.0
Black redhorse	19	0.8	3.3	15.4	13.00	1.7
Blackside darter	3	0.1	2.3	2.7	0.02	0.0
Brook silverside	4	0.2	1.6	2.9	0.02	0.0
Blackstripe topminnow	1	0.0	1.5	1.5	0.01	0.0
Channel catfish	19	0.8	8.0	23.3	51.28	6.6
Carp	61	2.6	10.3	26.0	237.15	30.6
Flathead catfish	1	0.0	27.7	27.7	9.50	1.2
Fathead minnow	5	0.2	1.7	2.4	0.02	0.0
Golden redhorse	39	1.6	2.4	16.6	34.34	4.4
Grass pickerel	7	0.3	4.2	9.1	0.58	0.1
Greenside darter	119	5.0	1.9	3.5	1.00	0.1
Green sunfish	149	6.2	1.5	5.5	3.42	0.4
Golden shiner	2	0.1	6.4	6.8	0.25	0.0
Gizzard shad	148	6.2	6.4	11.9	37.03	4.8
Hybrid sunfish	1	0.0	4.9	4.9	0.07	0.0
Johnny darter	29	1.2	1.8	2.6	0.09	0.0
Longear sunfish	182	7.6	1.2	7.1	15.02	1.9
Largemouth bass	63	2.6	2.3	14.1	10.82	1.4
Logperch	50	2.1	3.0	6.7	2.34	0.3
Mottled sculpin	4	0.2	2.0	2.8	0.07	0.0
Northern hog sucker	357	14.9	2.5	15.7	80.34	10.4
Orangethroat darter	22	0.9	1.5	2.1	0.06	0.0
Rainbow darter	12	0.5	1.4	2.5	0.07	0.0
Redear sunfish	5	0.2	3.5	8.0	0.94	0.1
Rosyface shiner	1	0.0	2.2	2.2	0.01	0.0
Rock bass	120	5.0	3.4	8.9	26.12	3.4
Sand shiner	26	1.1	1.4	14.4	1.30	0.2
Spotfin shiner	51	2.1	0.9	4.0	0.17	0.0
Slenderhead darter	2	0.1	2.7	3.3	0.01	0.0
Smallmouth bass	282	11.8	1.8	17.5	79.23	10.2
Spotted sucker	59	2.5	2.7	17.2	47.58	6.1
Silver shiner	24	1.0	3.0	5.7	0.67	0.1
Stonecat	1	0.0	5.5	5.5	0.04	0.0
Stoneroller	133	5.6	1.8	5.4	2.91	0.4
Warmouth	1	0.0	4.3	4.3	0.05	0.0
White crappie	9	0.4	7.8	9.5	2.37	0.3
White bass	1	0.0	7.9	7.9	0.22	0.0
White sucker	95	4.0	3.1	16.5	91.13	11.8
Yellow bullhead	1	0.0	6.0	6.0	0.08	0.0
Yellow bass	6	0.3	7.4	9.4	1.72	0.2
Total	2,390				773.9	

Appendix B4. Species relative abundance and total weight collected for the Lower River Zone, West Fork White River, 2004.

	n	% by number	Min	Max	TW	% by weight
Black crappie	10	0.5	4.0	8.2	9.3	0.9
Bluegill	410	19.7	1.4	8.2	37.85	3.6
Bluntnose minnow	25	1.2	1.2	3.7	0.2	0.0
Black redhorse	11	0.5	2.8	14.2	1.32	0.1
Blackstripe topminnow	1	0.0	1.5	1.5	0.05	0.0
Channel catfish	48	2.3	6.4	26.3	124.49	11.9
Carp	42	2.0	12.7	27.0	233.53	22.2
Flathead catfish	3	0.1	5.2	22.1	5.78	0.6
Golden redhorse	12	0.6	3.0	17.0	7.85	0.7
Greenside darter	81	3.9	2.1	3.6	0.69	0.1
Green sunfish	16	0.8	2.8	5.7	0.91	0.1
Gizzard shad	305	14.7	4.7	12.9	98.69	9.4
Hybrid striped bass	1	0.0	8.9	8.9	0.25	0.0
Hybrid sunfish	7	0.3	3.3	6.7	1.16	0.1
Johnny darter	18	0.9	1.7	2.3	0.05	0.0
Longear sunfish	99	4.8	2.3	6.3	7.28	0.7
Largemouth bass	88	4.2	2.3	19.2	53.33	5.1
Logperch	8	0.4	3.5	5.5	0.35	0.0
Mottled sculpin	3	0.1	1.7	2.9	0.03	0.0
Northern hog sucker	86	4.1	3.3	8.7	4.33	0.4
Orangethroat darter	9	0.4	1.3	2.1	0.02	0.0
Quillback	47	2.3	12.5	19.6	273.77	26.1
Rainbow darter	44	2.1	1.4	2.3	0.16	0.0
River carpsucker	3	0.1	17.0	17.8	6.76	0.6
Redear sunfish	14	0.7	5.6	10.5	5.48	0.5
Rosyface shiner	7	0.3	1.9	2.8	0.02	0.0
Rock bass	66	3.2	3.4	8.4	14.45	1.4
Sauger	8	0.4	6.6	14.3	10.72	1.0
Sand shiner	146	7.0	1.3	2.8	0.43	0.0
Spotfin shiner	125	6.0	1.4	4.1	1.59	0.2
Shorthead redhorse	1	0.0	20.0	20.0	3.2	0.3
Smallmouth bass	84	4.0	1.9	16.3	22	2.1
Spotted sucker	59	2.8	4.3	19.6	45.46	4.3
Silver redhorse	29	1.4	2.6	20.6	66.34	6.3
Silver shiner	5	0.2	3.9	5.0	0.12	0.0
Stoneroller	106	5.1	2.3	6.2	2.1	0.2
Suckermouth minnow	9	0.4	3.4	3.9	0.19	0.0
White crappie	14	0.7	4.4	9.5	2.79	0.3
White bass	1	0.0	7.7	7.7	0.15	0.0
White sucker	1	0.0	16.1	16.1	1.7	0.2
Yellow bullhead	26	1.3	3.7	9.3	5.45	0.5
Yellow perch	2	0.1	3.6	6.4	0.11	0.0
Total	2,080				1,050.45	

APPENDIX C

NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES
COLLECTED BY STATION

Date: 10/04/04

Station 1
 River mile 296.9
 Stream West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black redhorse	1	0.1	11.7	-	11.7	0.51	0.6
Bluegill	3	0.4	1.6	-	4.6	0.08	0.1
Bluntnose minnow	14	1.6	1.6	-	3.3	0.10	0.1
Carp	7	0.8	22.7	-	28.2	59.50	67.1
Creek chub	11	1.3	2.5	-	3.4	0.09	0.1
Golden redhorse	2	0.2	2.6	-	3	0.01	0.0
Green sunfish	10	1.2	2.3	-	5	0.41	0.5
Greenside darter	52	6.1	1.8	-	3.7	0.29	0.3
Johnny darter	8	0.9	1.8	-	2.6	0.03	0.0
Largemouth bass	5	0.6	3.3	-	5.5	0.18	0.2
Mottled sculpin	99	11.6	1.8	-	3.8	1.08	1.2
Northern hog sucker	83	9.7	2.4	-	12.7	13.56	15.3
Orangethroat darter	1	0.1	1.8	-	1.8	0.01	0.0
Rainbow darter	36	4.2	1.2	-	2.2	0.10	0.1
Rock bass	4	0.5	1.5	-	8	0.83	0.9
Rosyface shiner	14	1.6	2.2	-	3	0.09	0.1
Sand shiner	10	1.2	1.2	-	3.1	0.04	0.0
Silver shiner	43	5.0	2.8	-	5	0.96	1.1
Silverjaw minnow	1	0.1	3.4	-	3.4	0.01	0.0
Smallmouth bass	143	16.7	1.6	-	14.8	5.18	5.8
Spotfin shiner	21	2.5	1.3	-	4.2	0.34	0.4
Spotted sucker	1	0.1	3	-	3	0.01	0.0
Stoneroller	242	28.3	1.7	-	6.4	4.13	4.7
Striped shiner	12	1.4	2.4	-	6	0.51	0.6
Suckermouth minnow	12	1.4	2.4	-	3.9	0.21	0.2
White sucker	19	2.2	3.1	-	4.9	0.44	0.5
Total - 26 Species	854					88.70	

Date: 9/30/04	Station	2
	River mile	290.1
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)	%
Bluegill	2	1.2	4.2	- 4.5	0.09	0.2
Green sunfish	19	11.0	2.1	- 6.1	1.07	2.6
Greenside darter	4	2.3	2.3	- 3.2	0.06	0.1
Largemouth bass	3	1.7	2.3	- 2.9	0.04	0.1
Logperch	3	1.7	3.5	- 5.4	0.09	0.2
Longear sunfish	23	13.3	2.8	- 6.7	2.65	6.5
Mottled sculpin	1	0.6	3.7	- 3.7	0.03	0.1
Northern hog sucker	48	27.7	3.5	- 13.5	22.96	56.4
Rock bass	22	12.7	3.1	- 9.5	5.36	13.2
Smallmouth bass	45	26.0	2.3	- 11.3	8.33	20.5
Spotfin shiner	3	1.7	3.2	- 3.7	0.02	0.0
Total - 11 Species	173				40.70	

Date: 9/29/04	Station	3
	River mile	284.4
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)	%
Black crappie	1	0.6	9.2	- 9.2	0.43	0.3
Black redhorse	11	6.8	9.4	- 14.7	5.84	3.9
Bluegill	3	1.9	4.9	- 6.8	0.41	0.3
Carp	10	6.2	16.6	- 23.5	40.95	27.0
Channel catfish	4	2.5	16	- 18.5	7.85	5.2
Golden redhorse	22	13.6	9.7	- 14.8	19.96	13.2
Green sunfish	1	0.6	4.1	- 4.1	0.04	0.0
Greenside darter	1	0.6	3.4	- 3.4	0.01	0.0
Logperch	3	1.9	5.3	- 5.9	0.16	0.1
Longear sunfish	10	6.2	3.7	- 5.2	0.74	0.5
Northern hog sucker	34	21.0	5.9	- 14.1	21.61	14.2
Rock bass	3	1.9	8	- 8.4	1.3	0.9
Smallmouth bass	28	17.3	1.8	- 17.5	18.32	12.1
Spotted sucker	2	1.2	13.7	- 17.2	3.34	2.2
White sucker	29	17.9	11.1	- 16.5	30.72	20.3
Total - 15 Species	162				151.68	

Date: 10/04/04

Station 4
 River mile 279
 Stream West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black redhorse	3	1.4	3.3	-	11.6	1.05	4.1
Blackside darter	2	1.0	2.3	-	2.7	0.01	0.0
Bluegill	5	2.4	2.7	-	3.6	0.13	0.5
Bluntnose minnow	1	0.5	1.6	-	1.6	0.01	0.0
Golden redhorse	2	1.0	2.4	-	3	0.02	0.1
Green sunfish	8	3.9	3	-	4.6	0.34	1.3
Greenside darter	11	5.3	1.9	-	3.3	0.12	0.5
Johnny darter	3	1.4	1.8	-	2.4	0.01	0.0
Largemouth bass	11	5.3	2.3	-	4.8	0.23	0.9
Logperch	6	2.9	3.7	-	6.6	0.32	1.3
Longear sunfish	6	2.9	1.2	-	5	0.13	0.5
Northern hog sucker	37	17.9	2.9	-	13.7	8.78	34.7
Rainbow darter	6	2.9	2.3	-	2.5	0.05	0.2
Rock bass	23	11.1	3.4	-	8.5	5.05	20.0
Rosyface shiner	1	0.5	2.2	-	2.2	0.01	0.0
Silver shiner	3	1.4	3	-	5.1	0.07	0.3
Smallmouth bass	63	30.4	2.1	-	13.8	6.62	26.2
Spotfin shiner	12	5.8	1.2	-	4	0.09	0.4
White sucker	1	0.5	14.1	-	14.1	1.21	4.8
Yellow bullhead	3	1.4	7.4	-	9.4	1.06	4.2
Total - 20 Species	207					25.31	

Date: 11/05/04

Station 5
 River mile 275.9
 Stream West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Bluntnose minnow	5	4.6	1.4	-	2.9	0.03	0.1
Brook silverside	1	0.9	2.9	-	2.9	0.01	0.0
Golden redhorse	3	2.8	3.5	-	14.3	2.41	10.4
Greenside darter	1	0.9	2.2	-	2.2	0.01	0.0
Johnny darter	1	0.9	2.6	-	2.6	0.00	0.0
Sand shiner	6	5.6	2	-	2.5	0.02	0.1
Silver shiner	17	15.7	4.4	-	5.7	0.50	2.2
Smallmouth bass	56	51.9	2.1	-	14.3	20.08	86.3
Spotted sucker	18	16.7	2.7	-	4.2	0.20	0.9
Total - 9 Species	108					23.26	

Date: 9/29/04	Station	6
	River mile	269.4
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)	%	
Black crappie	1	0.4	8.9	-	8.9	0.35	0.2
Bluegill	4	1.6	2.7	-	5.4	0.24	0.1
Carp	12	4.8	16.3	-	23.5	45.93	26.6
Channel catfish	3	1.2	8	-	20.2	5.91	3.4
Golden redhorse	12	4.8	9.8	-	16.6	11.95	6.9
Golden shiner	2	0.8	6.4	-	6.8	0.25	0.1
Grass pickerel	3	1.2	8.3	-	9.1	0.44	0.3
Green sunfish	1	0.4	5.5	-	5.5	0.12	0.1
Largemouth bass	12	4.8	2.7	-	13.4	3.70	2.1
Logperch	4	1.6	3	-	6.4	0.11	0.1
Longear sunfish	57	23.0	2.5	-	7.1	4.75	2.8
Redear sunfish	3	1.2	3.5	-	6.9	0.34	0.2
Rock bass	30	12.1	3.4	-	8.9	6.03	3.5
Sauger	3	1.2	4.8	-	14.4	1.18	0.7
Silver shiner	2	0.8	4.5	-	4.8	0.07	0.0
Smallmouth bass	7	2.8	5.5	-	14.2	3.27	1.9
Spotted sucker	24	9.7	12.9	-	15.3	27.90	16.2
Warmouth	1	0.4	4.3	-	4.3	0.05	0.0
White crappie	1	0.4	9.1	-	9.1	0.35	0.2
White sucker	64	25.8	5.5	-	16.3	59.19	34.3
Yellow bass	1	0.4	8.1	-	8.1	0.23	0.1
Yellow bullhead	1	0.4	6	-	6	0.08	0.0
Total - 22 Species	248					172.44	

Date: 9/28/04	Station	7
	River mile	263.6
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black crappie	3	1.0	8	-	8.8	0.88	0.5
Black redhorse	5	1.7	13.2	-	15.4	6.11	3.1
Bluegill	22	7.4	2.7	-	7.5	3.12	1.6
Carp	23	7.7	10.3	-	26	106.34	54.5
Channel catfish	3	1.0	17.7	-	19.7	7.51	3.8
Flathead catfish	1	0.3	27.7	-	27.7	9.50	4.9
Gizzard shad	103	34.7	6.4	-	11.9	24.33	12.5
Green sunfish	6	2.0	3.2	-	5.3	0.40	0.2
Largemouth bass	3	1.0	3.8	-	13.4	1.43	0.7
Logperch	20	6.7	4.9	-	6.3	0.95	0.5
Longear sunfish	33	11.1	3.3	-	6.5	3.74	1.9
Northern hog sucker	10	3.4	8.7	-	13.3	7.44	3.8
Rock bass	24	8.1	5.3	-	8.6	6.40	3.3
Smallmouth bass	25	8.4	2.9	-	13	8.77	4.5
Spotfin shiner	1	0.3	4	-	4	0.03	0.0
Spotted sucker	7	2.4	12.1	-	14.8	6.54	3.3
Stonecat	1	0.3	5.5	-	5.5	0.04	0.0
White bass	1	0.3	7.9	-	7.9	0.22	0.1
White crappie	5	1.7	7.8	-	9.5	1.31	0.7
Yellow bass	1	0.3	7.6	-	7.6	0.20	0.1
Total - 20 Species	297					195.26	

Date: 10/05/04	Station	8
	River mile	263.5
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%		Size range (in)		Total weight (lbs)	%
Black crappie	2	0.5	8	-	8.1	0.51	2.1
Blackstripe topminnow	1	0.2	1.5	-	1.5	0.01	0.0
Bluegill	3	0.7	2.5	-	6.2	0.2	0.8
Bluntnose minnow	9	2.2	1	-	2.1	0.01	0.0
Brook silverside	3	0.7	1.6	-	2.3	0.01	0.0
Fathead minnow	4	1.0	1.7	-	2.1	0.01	0.0
Gizzard shad	16	3.9	7.4	-	10.6	3.53	14.2
Grass pickerel	3	0.7	4.2	-	4.8	0.06	0.2
Green sunfish	94	22.7	1.5	-	5.3	1.53	6.2
Greenside darter	34	8.2	2.2	-	3.5	0.28	1.1
Hybrid sunfish	1	0.2	4.9	-	4.9	0.07	0.3
Johnny darter	19	4.6	1.8	-	2.2	0.05	0.2
Largemouth bass	14	3.4	2.8	-	4.5	0.26	1.0
Longear sunfish	19	4.6	1.2	-	6.1	1.47	5.9
Mottled sculpin	4	1.0	2	-	2.8	0.04	0.2
Northern hog sucker	73	17.6	3	-	13.7	10.06	40.6
Orangethroat darter	20	4.8	1.5	-	2.1	0.05	0.2
Rainbow darter	4	1.0	1.4	-	2.1	0.01	0.0
Rock bass	12	2.9	3.5	-	7.8	2.32	9.4
Sand shiner	1	0.2	1.5	-	1.5	0.01	0.0
Smallmouth bass	42	10.1	1.8	-	10.5	3.75	15.1
Spotfin shiner	34	8.2	0.9	-	2.1	0.04	0.2
Stoneroller	1	0.2	3.7	-	3.7	0.02	0.1
White crappie	2	0.5	8.1	-	8.3	0.48	1.9
Total - 23 Species	415					24.78	

Date: 10/05/04	Station	9
	River mile	253.5
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Blackside darter	1	0.2	2.6	-	2.6	0.01	0.0
Bluegill	85	13.6	1.4	-	5.7	3.05	7.4
Bluntnose minnow	5	0.8	1.5	-	3.4	0.03	0.1
Carp	1	0.2	16.4	-	16.4	2.2	5.4
Fathead minnow	1	0.2	2.4	-	2.4	0.01	0.0
Green sunfish	33	5.3	2.3	-	4.7	0.75	1.8
Greenside darter	72	11.5	2.2	-	3.1	0.56	1.4
Johnny darter	5	0.8	2	-	2.5	0.02	0.0
Largemouth bass	14	2.2	2.9	-	4.6	0.25	0.6
Logperch	2	0.3	3.5	-	5.5	0.06	0.1
Longear sunfish	11	1.8	2.5	-	4.1	0.32	0.8
Mottled sculpin	4	0.6	2	-	2.8	0.03	0.1
Northern hog sucker	193	30.8	2.5	-	15.2	22.84	55.7
Orangethroat darter	2	0.3	1.7	-	1.8	0.01	0.0
Rainbow darter	2	0.3	1.8	-	1.9	0.01	0.0
Rock bass	15	2.4	3.6	-	8.1	2.52	6.1
Sand shiner	16	2.6	1.4	-	3.1	0.09	0.2
Silver shiner	2	0.3	4	-	4.1	0.03	0.1
Smallmouth bass	25	4.0	2.4	-	11.6	5.3	12.9
Spotfin shiner	4	0.6	1.3	-	1.4	0.01	0.0
Stoneroller	132	21.1	1.8	-	5.4	2.89	7.0
White sucker	1	0.2	3.1	-	3.1	0.01	0.0
Total - 22 Species	626					41.00	

Date: 9/28/04	Station	10
	River mile	253.3
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Bluegill	127	38.1	1.3	- 7.9	13.45	9.6	
Carp	15	4.5	13.9	- 21.4	41.73	29.8	
Channel catfish	9	2.7	18.7	- 23.3	30.01	21.4	
Gizzard shad	29	8.7	7.9	- 11.8	9.18	6.6	
Grass pickerel	1	0.3	7.4	- 7.4	0.08	0.1	
Green sunfish	6	1.8	2.1	- 5.1	0.24	0.2	
Greenside darter	2	0.6	2.3	- 2.9	0.02	0.0	
Johnny darter	1	0.3	2.2	- 2.2	0	0.0	
Largemouth bass	9	2.7	5.9	- 14.1	4.94	3.5	
Logperch	15	4.5	3.6	- 6.7	0.67	0.5	
Longear sunfish	46	13.8	2.8	- 5.9	3.88	2.8	
Northern hog sucker	10	3.0	7.6	- 15.7	9.61	6.9	
Redear sunfish	2	0.6	6.4	- 8	0.6	0.4	
Rock bass	13	3.9	3.6	- 7.5	2.5	1.8	
Slender head darter	2	0.6	2.7	- 3.3	0.01	0.0	
Smallmouth bass	36	10.8	2.3	- 16.1	13.13	9.4	
Spotted sucker	8	2.4	13.1	- 15.2	9.6	6.9	
White crappie	1	0.3	8.3	- 8.3	0.23	0.2	
Yellow bass	1	0.3	7.9	- 7.9	0.23	0.2	
Total - 19 Species	333				140.11		

Date: 9/29/04	Station	12
	River mile	246.6
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)	%
Bluegill	39	27.3	1.6	- 8.2	5.74	3.9
Carp	10	7.0	14	- 25.8	54.03	37.2
Channel catfish	14	9.8	15.2	- 24.5	37.17	25.6
Flathead catfish	1	0.7	14.7	- 14.7	1.25	0.9
Gizzard shad	4	2.8	8.9	- 12.3	1.77	1.2
Golden redhorse	3	2.1	7.7	- 16.2	3.61	2.5
Green sunfish	1	0.7	5.2	- 5.2	0.1	0.1
Hybrid sunfish	4	2.8	6.1	- 6.7	0.79	0.5
Largemouth bass	13	9.1	3.1	- 17	9.32	6.4
Logperch	11	7.7	2.9	- 6.2	1.09	0.7
Longear sunfish	1	0.7	5.3	- 5.3	0.05	0.0
Northern hog sucker	1	0.7	3.5	- 3.5	0.02	0.0
Quillback	1	0.7	16.8	- 16.8	2.15	1.5
Redear sunfish	8	5.6	5.6	- 9.8	2.82	1.9
River carpsucker	1	0.7	17.8	- 17.8	2.3	1.6
Rock bass	10	7.0	3.8	- 7.2	3.73	2.6
Sauger	1	0.7	12.6	- 12.6	0.52	0.4
Smallmouth bass	9	6.3	7.7	- 16.3	8.34	5.7
Spotted sucker	10	7.0	12.5	- 16.1	10.48	7.2
White crappie	1	0.7	6.3	- 6.3	0.09	0.1
Total - 19 Species	143				145.37	

Date: 9/21/04	Station	13
	River mile	247.3
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black crappie	8	1.5	4	-	8.2	1.55	0.4
Bluegill	119	22.9	1.4	-	7.8	11.25	2.7
Carp	2	0.4	14.1	-	24.9	9.55	2.3
Channel catfish	15	2.9	14.5	-	26.3	47.45	11.3
Gizzard shad	229	44.0	4.7	-	12.9	69.42	16.5
Green sunfish	3	0.6	4.7	-	5.7	0.26	0.1
Hybrid sunfish	2	0.4	5.7	-	6.3	0.35	0.1
Largemouth bass	58	11.2	2.7	-	19.2	26.93	6.4
Logperch	1	0.2	4.2	-	4.2	0.02	0.0
Quillback	13	2.5	15.1	-	19.6	224.88	53.4
Sauger	5	1.0	6.6	-	14.3	1.92	0.5
Smallmouth bass	1	0.2	14.2	-	14.2	1.44	0.3
Spotted sucker	33	6.3	4.3	-	13.8	19.93	4.7
White bass	10	1.9	4.4	-	9.5	2.21	0.5
White crappie	1	0.2	7.7	-	7.7	0.15	0.0
Yellow bass	20	3.8	3.7	-	8.5	3.44	0.8
Total - 15 Species	520					420.75	

Date: 9/23/04

Station 14

River mile 244.2

Stream West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black crappie	1	0.5	5.4	-	5.4	0.05	0.0
Black redhorse	1	0.5	14.2	-	14.2	1.17	0.6
Bluegill	60	31.1	2.2	-	7.6	7.47	4.0
Carp	17	8.8	12.7	-	26.2	96.8	51.8
Channel catfish	8	4.1	16.2	-	22.7	30.2	16.2
Gizzard shad	47	24.4	7.6	-	12	15.78	8.4
Hybrid striped bass	1	0.5	8.9	-	8.9	0.25	0.1
Hybrid sunfish	1	0.5	3.3	-	3.3	0.02	0.0
Largemouth bass	9	4.7	3.1	-	18.4	11.13	6.0
Logperch	1	0.5	5.3	-	5.3	0.05	0.0
Longear sunfish	10	5.2	3.2	-	6.3	1.05	0.6
Redear sunfish	6	3.1	7	-	10.5	2.66	1.4
Rock bass	5	2.6	4.8	-	7	0.85	0.5
Sauger	1	0.5	10.4	-	10.4	0.28	0.1
Shorthead redhorse	1	0.5	20	-	20	3.2	1.7
Spotfin shiner	3	1.6	3.3	-	4	0.07	0.0
Spotted sucker	12	6.2	7.2	-	19.6	12.02	6.4
White crappie	2	1.0	6.1	-	9.2	0.4	0.2
White sucker	1	0.5	16.1	-	16.1	1.7	0.9
Yellow bass	5	2.6	7.7	-	9.3	1.7	0.9
Yellow perch	1	0.5	3.6	-	3.6	0.02	0.0
Total - 20 Species	193					186.87	

Date: 10/05/04	Station	15
	River mile	241.3
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Bluegill	9	2.7	2.7	-	6.4	0.71	4.0
Bluntnose minnow	1	0.3	3.1	-	3.1	0.01	0.1
Green sunfish	3	0.9	3.1	-	3.3	0.06	0.3
Greenside darter	27	8.2	2.1	-	3.6	0.29	1.6
Johnny darter	5	1.5	1.9	-	2.3	0.02	0.1
Logperch	2	0.6	5.4	-	5.5	0.09	0.5
Longear sunfish	20	6.1	3	-	5.9	2.18	12.1
Mottled sculpin	1	0.3	2.4	-	2.4	0.01	0.1
Northern hog sucker	85	25.9	3.3	-	8.7	4.31	24.0
Orangethroat darter	5	1.5	1.3	-	2.1	0.01	0.1
Rainbow darter	32	9.8	1.6	-	2.3	0.13	0.7
Rock bass	14	4.3	4	-	6.8	2.03	11.3
Rosyface shiner	2	0.6	2.7	-	2.8	0.01	0.1
Silver shiner	5	1.5	3.9	-	5	0.12	0.7
Smallmouth bass	39	11.9	2.7	-	12.9	6.32	35.2
Spotfin shiner	64	19.5	2.6	-	4	0.9	5.0
Stoneroller	14	4.3	3.8	-	6	0.77	4.3
Total - 17 Species	328					17.97	

Date: 10/15/04	Station	16
	River mile	238.5
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black redhorse	10	1.8	2.8	-	3.9	0.15	1.1
Bluegill	66	11.8	1.8	-	6	3.08	22.8
Bluntnose minnow	23	4.1	1.2	-	3.7	0.18	1.3
Golden redhorse	6	1.1	3	-	3.6	0.08	0.6
Greenside darter	54	9.7	2.1	-	3.5	0.4	3.0
Johnny darter	13	2.3	1.7	-	2.3	0.03	0.2
Largemouth bass	3	0.5	2.3	-	3.2	0.05	0.4
Logperch	4	0.7	3.5	-	5.5	0.11	0.8
Mottled sculpin	2	0.4	1.7	-	2.9	0.02	0.1
Orangethroat darter	4	0.7	1.8	-	2.1	0.01	0.1
Rainbow darter	12	2.2	1.4	-	1.9	0.03	0.2
Rock bass	15	2.7	4.2	-	8	3.1	22.9
Rosyface shiner	5	0.9	1.9	-	2.6	0.01	0.1
Sand shiner	146	26.2	1.3	-	2.8	0.43	3.2
Silver redhorse	4	0.7	2.6	-	4	0.07	0.5
Smallmouth bass	32	5.7	1.9	-	13.7	3.62	26.8
Spotfin shiner	58	10.4	1.4	-	4.1	0.62	4.6
Stoneroller	92	16.5	2.3	-	6.2	1.33	9.8
Suckermouth minnow	9	1.6	3.4	-	3.9	0.19	1.4
Total - 19 Species	558					13.51	

Date: 9/30/04	Station	17
	River mile	235.1
	Stream	West Fork White River

Name, number, percentage, size, and weight of fish collected

Common Name	Number	%	Size range (in)		Total weight (lbs)		%
Black crappie	1	0.3	7.7	-	7.7	7.7	2.9
Blackstripe topminnow	1	0.3	1.5	-	1.5	0.05	0.0
Bluegill	116	34.2	2.2	-	7.6	8.19	3.1
Bluntnose minnow	1	0.3	2.8	-	2.8	0.01	0.0
Carp	13	3.8	18.4	-	27	73.15	27.6
Channel catfish	11	3.2	6.4	-	23.8	9.67	3.7
Flathead catfish	2	0.6	5.2	-	22.1	4.53	1.7
Gizzard shad	25	7.4	8.7	-	12.2	11.72	4.4
Golden redhorse	3	0.9	12.7	-	17	4.16	1.6
Green sunfish	9	2.7	2.8	-	5.5	0.49	0.2
Largemouth bass	5	1.5	4.4	-	18.1	5.9	2.2
Logperch	1	0.3	4.9	-	4.9	0.03	0.0
Longear sunfish	58	17.1	2.3	-	5.4	2.96	1.1
Quillback	33	9.7	12.5	-	18.1	46.74	17.7
River carpsucker	2	0.6	17	-	17.5	4.46	1.7
Rock bass	22	6.5	3.4	-	8.4	4.75	1.8
Sauger	1	0.3	8	-	8	8	3.0
Silver redhorse	25	7.4	3.8	-	20.6	66.27	25.0
Smallmouth bass	3	0.9	10.9	-	12.2	2.28	0.9
Spotted sucker	4	1.2	11.3	-	13	3.03	1.1
White crappie	1	0.3	6.2	-	6.2	0.09	0.0
Yellow bass	1	0.3	8.6	-	8.6	0.31	0.1
Yellow perch	1	0.3	6.4	-	6.4	0.09	0.0
Total - 23 Species	339					264.58	