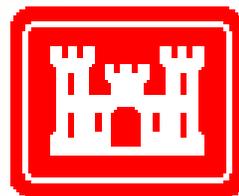


Fish Community Structure & Composition Assessment

FINAL REPORT TASK 2 ENVIRONMENTAL DATA FOR THE ARKANSAS RIVER CORRIDOR PROJECT, TULSA, OKLAHOMA W912BV-06-P-0303



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Introduction

“The Arkansas River is the fourth largest river in the United States, spanning 1,450 miles. It begins in Colorado, flows through Kansas, Oklahoma and Arkansas, and eventually empties into the Mississippi River” (Johnny Mclean 2005). The proposed Arkansas River Corridor (ARC)(part of the Vision 2025 Plan) is a plan that incorporates the establishment of numerous low-water dams along a 42 mile stretch of the Arkansas River throughout Tulsa County for the purpose of enhancing aesthetic quality and development opportunities. This stretch of the Arkansas River is typical of diminishing Prairie Rivers in that it is relatively shallow with braided channels and exposed sandbars. Additionally, stochastic floodwater and hydropower releases from Lake Keystone significantly contribute to this rivers flow regimen.

Tulsa County’s Vision 2025 plan included money for low water dams. As Part of the ARC’s “Phase II Master Plan and Pre-Reconnaissance Study (October 2005), Cherokee CRC, LLC (CCRC) was awarded the report of Environmental Data for the “Arkansas River Corridor” contract from the Tulsa District United States Corps of Engineers. As a result of that award, task two of the Arkansas River Corridor program was sub-contracted to the Oklahoma Department of Wildlife Conservation (ODWC) to study Fish Community Structure and Composition Assessment at five sites along the Tulsa Arkansas River Corridor (Figure 1). The five sites: 2TR1, 2TR2, 2TR3, 2TR4, and 2TR5, will be referred to as Site 1, Site 2, Site 3, Site 4, and Site 5 respectively from this point forward (See Appendix I).

Objectives

- 1) Provide a checklist of fish species occurring within the 42-mile reach.
- 2) Provide spatial and temporal community dynamics.

Method

The fish community structure and composition assessment was conducted by the ODWC field sampling team for each transect for the five (5) ARC segments along the 42-mile river stretch (Figure 1). All sampling would generally follow accepted Bioassessment protocols meeting the “*Rapid Bioassessment Protocols For Sampling Fish in Non-Wadeable Rivers in Oklahoma*” (Utrup & Fisher, 2004).

The ODWC used a three person team to conduct hoop netting, seining, and electro-fishing along each transect and for each of the five segments quarterly. The sites were determined to be partially boat-able or boat-able. Partially boat-able rivers are defined as “...a continuous flow of water in the channel, but over half of the reach cannot be safely sampled from boat following non-wade-able protocols and the reach is inaccessible to wade-able sampling due to barriers or water velocity/depth” (Utrup & Fisher, 2004). All five sites for the fall quarterly sample fell into this definition.

In the winter quarterly sample, only one site sample fell into this definition (Site 2). The remaining four sites were samples under the protocol designated for boat-able rivers. Boat-able rivers are defined as rivers that "...can be sampled by boat following non-wade-able river protocols" (Utrup & Fisher, 2004). All sites in the spring sample were classified as boat-able. All sites except Site 3 during the summer sample were classified as boat-able. Site 3 during the summer sample period fell into the partially boat-able. The total numbers of fish by species were recorded for each site for the fall, winter, spring and summer quarterly samples (Table 1, Table 2, Table 3, and Table 4).

Sampling protocol in the field was as follows for partially boat-able rivers. Once the sites were determined, the varying habitat types in a 1000 m section of the river were mapped through the laying out of 11 transects across the river distanced 100 m apart. The sample allocation form (See Appendices) provides information on depth, velocity, and channel features to aid in identifying habitat types. After habitat types were mapped, shallow water habitats and deep water habitats were randomly selected for sampling. Approximately seven shallow water habitats and three deep water habitats in the reach were sampled. All backwater habitats in the reach were sampled. The total number of samples per habitat type was adjusted according to the occurrence and accessibility of each type in the reach under the prevailing flow conditions.

Hoop nets were set in deep water (i.e. > 0.75m) throughout the reach. Placement of hoop nets were at the discretion of the biologists, but as a rule was placed according to the following criteria:

- Placed nets near in-stream structure (e.g. woody debris, boulders, and undercut banks).
- The opening of the net was placed facing the center point of the structure and extended parallel (underneath if possible) to the structure.
- When possible, the front of the net was secured to the structure and tied to the cod end to a t-post (or log if available). Made sure the net was secure. The opening of the net was always faced downstream.
- Placed a zip tie or tied a string on the cod end to ensure the fish cannot escape.
- For best results we used both large (0.91 m diameter, 50.8 mm mesh) and small (0.61 m diameter, 25.4 mm mesh) sized hoop nets.
- Set a minimum of two hoop nets per deep water habitat, one large net and one small net. If deep water habitats were common, there was a setting of proportionately more large nets than small nets.
- Allowed nets to fish for a minimum of 12 hours and a maximum of 24 hours and allowed nets to fish over night.

(Utrup & Fisher, 2004)

The seining of shallow water and backwater habitats throughout the reach used the following guidelines:

- Used a 6.1 x 1.2 m seine with 4.8 mm mesh (non-treated and no bag) attached to 1.5 m brails.
- Sampled a minimum of eight shallow water habitats and sampled all backwater habitats.

- Conducted two seine hauls at each selected habitat with a minimum of 20 seine hauls over the entire reach. Each seine haul was done parallel to the shoreline and covered approximately 10 m. Used the river bank to trap the fish when possible.
 - All backwater habitats were sampled regardless if they were mapped or not.
 - Always seined with the current.
 - Tried to seine near unique microhabitat (e.g. cobble, bedrock) and structure (e.g. woody debris, boulder, undercut bank) and was careful not to hang up the seine.
- (Utrup & Fisher, 2004)

Using this protocol each sample site for each quarter was completed in a two-day period. The first day consisted of in-stream habitat classification and mapping followed by setting hoop nets in appropriate sites. The second day, hoop nets were pulled and all shallow water and backwater habitats were seined.

Site 2 during the winter sample, all of the spring sample, and four sites of the summer sample were determined to be boat-able (non-wade-able) with a mean wetted width greater than 100 meters. The following electro-fishing procedures and protocols were used for all the fore-mentioned samples:

- The most representative river bank was selected for the side for the first profile. Using the laser rangefinder, determine the down stream point that is 200 m distant (this is the profile length) and record this distance.
- Checked all electrical connections and placed all electrodes in the water.
- Started generator and was sure the pulsator is switched to pulsed DD, a frequency of 30pps, low range and 40%. Increase % (volts) as needed to roll fish. If success was poor, reduced % (volts) as needed to roll fish. If success was still poor, reduced %, switch to high range, and again increased % as needed. If effectiveness was still low, switched to 60 pps and repeated the process. If the current (amperage needle) was reduced, switched back to low range to avoid overloading the generator. Switching always occurred when power was off. Verified that fish were rolled and relaxed but not rigid. Recorded settings on the field data sheet.
- Cleared (start) clocks.
- Once system was activated, began fishing downstream along the selected shoreline. Maneuvered the boat to cover a swath two to three meters wide and an oars length from shore, near cover, and at depths less than three meters wherever possible. Did not proceed if sampling became unsafe.
- Placed fish in live well immediately and tried to net as many fish as possible. Did not chase fish or lean out away from boat to net fish.
- Ceased sampling at the end of the profile. Processed the fish quickly and carefully. Returned all un-vouched fish to the water as soon as processed. Recorded total shock time, total fishing time, and shock distance.
- Switched to the opposite bank for the next profile (so that each adjacent profile is on an opposite bank). Alternated in this manner until the entire site was fished (2000 m) unless hazards prevented it. Did not sample the side if it was too hazardous.
- Repeated steps for nine more profiles (a total of 10 profiles). Began downstream from where fish were released. (Utrup, Fisher 2004)

Results and Discussion

This portion of the report will give a short summary of temporal and community dynamics followed by a specific discussion comparing collections at each of the five sample locations. Comprehensive characterization for the aquatic habitats was provided for baseline conditions. Relative abundance of individual species was summarized. Quantitative relationships between fish and habitat conditions were developed to recommend potential measures of impact prediction. In addition, a complete list of fish species and their distribution within the Arkansas River Tulsa Corridor were noted.

Fall

All five sites were collectively sampled in the fall beginning on October 9, 2006 and ending October 25, 2006 (Appendix I). Each site was characterized by varied structure and bathymetry. Substrate type and amount varied between sites, but was mainly dominated by sand. Water temperatures were recorded between 16°C and 23.2°C (Appendix II). The mean wetted widths from all sites ranged from near 100 m to 200 m (Figure 2) during this sample period, and all sites were sampled by seine and hoop nets. Species richness was greater at Site 5 (Wagoner/Tulsa County line). A total of 13 species derived from 8 families were identified at this sample site (Table 5). Four families were represented at sites one and two, and five families were represented at sites three and four (Table 5). Species found at all five sites were: Brook Silversides (Atherinopsidae), Bluegill sunfish (Centrarchidae) and Western Mosquitofish (Poeciliidae) (Tables 1.1, 1.2). Brook Silversides, Western Mosquitofish and Red shiners yielded the highest percent (96.48%) of abundance in the total fish collected for the fall sample in which 6,200 fish were collected (Table 6.1). This percentage is expected due to the collection diversity comprising mainly shoaling fish. Such percentages were reflected throughout most samples.

Winter

All five sites were collectively sampled in the winter beginning on January 9, 2007 and ending January 31, 2007 (Appendix I). Each site was characterized by varied structure and bathymetry. Substrate type and amount varied between sites, but was mainly dominated by sand. Water temperatures were recorded between 0.83°C and 11.59°C (Appendix III). The mean wetted widths from all sites ranged from near 100 m to 362m (Figure 2) during this sample period. Sites one, three, four, and five were sampled by seine and hoop nets, while Site 2 was sampled by stream-bank electro-fishing. Species richness was greater at Site 2 (Zink Lake). A total of 12 species derived from seven families were identified at this sample site (Table 5). Three families were represented at Site 1 and Site 3. Two families were represented at Site 4 and four families represented at Site 5 (Table 5). No single family or species was found at all five sites. Red shiners composed 93.8% of the total fish collected for the winter sample in which 10,165 fish were collected (Tables 6.2). Sampling method coupled with temporal dynamics may have had a negative influence on the abundance and richness found at Site 5 for the winter sample.

Spring

All five sites were collectively sampled in the spring beginning on April 11, 2007 and ending April 24, 2007 (Appendix I). Each site was characterized by varied structure and bathymetry. Substrate type and amount varied between sites, but was mainly dominated by sand. Water temperatures were recorded between 14.6°C and 13.5°C (Appendix IV). The mean wetted widths from all sites ranged

from near 362m to 663.27m (Figure 1) during this sample period. All samples at all sites were sampled by stream-bank electro-fishing. Species richness was greater at Site 4 (Jenks). A total of 25 species derived from ten families were identified at this sample site (Table 5). Eight families were represented at Site 1 and Site 2. Nine families were represented at Site 3 and seven families represented at Site 5 (Table 5). Species abundance and richness increased from the winter sample. The spring sample yielded a walleye at Site 4 (Jenks). Species richness and abundance was lower at Site 5 than the other sites.

Summer

All five sites were collectively sampled in the summer beginning on August 17, 2007 and ending September 13, 2007 (Appendix I). Each site was characterized by varied structure and bathymetry. Substrate type and amount varied between sites, but was mainly dominated by sand. Water temperatures were recorded between 25.96°C and 30.38°C (Appendix III). The mean wetted widths from all sites ranged from near 361.09 m to 663.27m (Figure 2) during this sample period. Sites one, two, four, and five were sampled by electrofishing, while Site 3 was sampled by seine and hoop-netting. Ten families were represented at Sites 4 (Jenks) and 5 (County Line). A total of nine families were represented at Site 1 and Site 2. While only five families were represented at Site 3 (Table 5). Although species richness was similar at Site 4 and Site 5, abundance was greater at Site 4. A total of 23 species derived from ten families were identified at this sample site (Table 5).

Site 1

Bluegill sunfish, Longear sunfish and Spotted bass were observed at Site 1 during the fall sample, but were not observed in the winter sample (Tables 1.1, 2.1). Hoop nets were placed in the same general locations around log and rock structures, and mean wetted widths were relatively the same. Because hoop nets only sample fish actively moving/feeding, it is expected not to observe many of these species in the winter as they have abbreviated feeding frequencies. Seining in backwaters was most productive where the majority of the fish caught were Brook Silversides and Western Mosquito fish (Tables 1.1, 2.1).

This site was electro-fished in the spring due to the velocity and amount of water flowing in the river. There was a large increase in species collected in the spring sample including those species, such as white bass and white crappie which begin moving up in rivers with spring rains (Tables 3.1). Eighteen species were collected at this site in the spring. A nuisance species to Oklahoma waters, the white perch, was identified at Site 1 in the spring. Community structure looked similar between the spring and summer samples at Site one with few changes in species. Striped bass were seen in the spring sample, but were not collected during the summer sample at this site. White bass numbers decreased in the summer samples, while there was an increase in common carp abundance. Again, this may be attributed to temporal changes.

Site 2

In the winter, sample Site 2 (Zink Lake), was electro-fished, and therefore cannot be directly compared to the fall sample at Site 2 due to differences in sampling methods and protocols. A total of 12 species derived from seven families were identified during the winter sample at Site 2 (Table 5). During the winter sample at Site 2 the Cyprinidae family is represented solely by the Common Carp, unlike in the fall sample where the Cyprinidae family was represented by the slim minnow, which prefers a stream with fast moving water (Miller & Robison, 2004). Again, sampling methods

will have an impact on the abundance and species fish observed in samples. Gizzard shad, an important forage fish, was observed at Site 2 during the winter sample and embodied over half of the total fish collected for this sample (Table 2.1). The majority of the shad were large and not utilizable by fish or fowl (such as terns). River Carpsuckers also represented a large portion of the total fish collected (70) during the winter sample (Table 2.1). Habitat preferences for these two fish are similar in which they prefer large quiet pools (Pflieger, 1975). During the fall sample at Site 2, Brook Silversides, Western Mosquito fish and Bluegill sunfish dominated the taxonomy and were collected by seine typically in backwaters (Table 1.1). As in the winter sample, this site was electro-fished in spring. Although there was an increase in abundance from the winter sample, the species found remain relatively the same, with the addition of young of the year striped bass and a few white bass (Table 3.2). The nuisance species, white perch, was also identified at Site 2 in the spring. The summer sample at Site 2 was again sampled by electrofishing. In the summer, two grass carp, one mirror carp, and a bigmouth buffalo were noted. There was an increase in the brook silversides from the spring sample. Overall, there was an increase in the type of species found at Site 2 in the summer sample (Table 5).

Site 3

A total of 53 fish were collected at Site 3 during the fall sample (Table 1.1). A variety of sunfish were collected at this site. This site is characterized by large rock structures which provided suitable habitat for smaller members of the sunfish family to find refuge during release periods and from predators. Backwaters at this site yielded Brook Silversides and Western Mosquitofish (Table 1.1). The reduction of species and lower abundance results at Site 3 during the winter can be attributed to a decline of fish movements in the winter in association with sampling techniques. A release from Keystone Lake of 1,017cfs (cubic feet/second) during the winter sample may have also been a contributing factor at this site by displacing those individuals out of the habitat that the nets were set within (Figure 4). This site was electro-fished during the spring sample, and a broad range of species was collected. A total of 962 fish were collected representing 24 species and nine families (Table 5). The releases from Keystone dam subsided during the summer sample so that Site 3 was sampled by seine and hoop nets (Table 4.3). This restricted the sampling to those individuals actively moving in habitat where nets were placed or in those habitats that were seined. A single central stoneroller was seined at this site during the summer sample. Other species were common to the site in previous samples.

Site 4

The backwaters at Site 4 near Jenks contain more vegetation than other sites which make it more difficult to seine; however, 672 Western Mosquito fish were collected out of these backwaters during the fall sample (Table 1.2). Also during the fall sample, hoop nets at this site collected Spotted bass, Channel catfish, Bluegill sunfish and Green sunfish around large concrete structures (Table 1). Red shiners were collected at shallow slow water habitats. Western Mosquito fish and Channel catfish were the only species collected during the winter sample with Mosquito fish collection numbers dropping from 672 (fall sample) to 79 (winter sample) (Tables 1 & 2). Site 4 was electro-fished in the spring and summer samples. A total of 25 species from ten families were represented both during the spring and summer samples (Table 5). The only notable differences between the spring and summer samples was the decrease in some of the abundances in the minnow and sunfish families in the summer sample. This could be attributed to the spawning times of these species in regard to the temporal aspect of this site. However, no drastic community dynamics

occurred between the two samples. It is highly likely that the increase in species and the abundances of the species from the winter into the spring and summer samples was driven by the increase in water temperature and increased flows from extended spring and summer rains in combination with spawning activities normally associated with a large prairie rivers during this time of year (Figures 3,5).

Site 5

A total of 13 species derived from eight families were identified at Site 5 during the fall sample (Table 5). One striped bass was collected by seine at this site in a shallow slow habitat during the fall sample. Bluntnose Minnows and Red Shiners dominated abundance at Site 5 during the winter sample (Tables 1.2, 2.2). The decline in fish movements during colder temperatures is most likely the main factor in the reduction of larger species collected from the fall sample. It is also important to note that a small winter event occurred during the winter sample at this site. During the winter sample at Site 5, ice had to be broken in order to seine backwater areas but still yielded fish. Water temperature in the channel was 0.83°C (Figure 3). Spring and summer samples at Site 5 were sampled by electro-fishing (Tables 3.5, 4.5). The flows during the spring sample (April 24th) were approximately 28,400 cubic feet per second near Haskell, Oklahoma (Figure 5). Sampling during such high flows in this area may have attributed to lower numbers in at this site. It would have been expected to have seen at the least a list and abundance of species comparable to that of Site 4 (Table 3.4). The flows on April 16th (Date of Site 4 sample) were approximately 14,600 cubic feet per second. The summer sample at Site 5 was more liken to what one would have expected to have seen in the spring sample. There were a total of 24 species collected in the summer samples representing twelve families at this site (Table 5).

Summary

Flow regimen of the Arkansas River below Keystone Dam is contingent upon flood control releases and hydro-power demands. It is expected for species richness and diversity to increase down a latitudinal gradient as the order of a stream or river increases (Kohler & Hubert, 1999). Although the natural gradient is displaced by the Keystone Dam and Zink Dam, a gradient can be seen in the fall collective sample. In this collective sample the family diversity increases further down the river. There is an overall increase in mean wetted width from Site 1 to Site 5 (Figure 2). Above Zink Dam during the fall sample, there was no difference in the species found at sites one and two, only variances in numbers collected (Table 1.1). Below Zink Dam there are no drastic changes or constraints in the stream gradient, habitat type, or substrate between sites to have a major impact on overall fish passage; however, because areas along the 42 mile stretch between Keystone Dam and the Tulsa/Wagoner County line become wide and shallow, periods of no flow will limit passage of some species. At low flow periods small shoaling fish, such as fish Brook Silversides, Western Mosquitofish and Red Shiners are trapped in small shallow backwater environments. Red shiners and Western Mosquitofish, which can cope with extreme environmental changes and stochastic water levels, represent a large percentage of the total fish caught in these habitats (Miller and Robison, 2004)(Table 3). The spatial distribution of the Brook Silverside and Western Mosquito fish extended from Site 1 through Site 5. Though found at all five sites during the fall, samples of each were limited during the winter sample. Spring samples yielded zero of the Western Mosquito fish and only 46 in the summer at Site 5 (Table 4.5). Brook Silversides were collected at all five sites in the spring, but only collected at 4 sites in the summer. These two fish share a common habitat

preference of slow pools and backwaters. If given the preference Brook Silversides would be more inclined to use the mid-waters of slow moving pools and larger backwaters (Miller & Robison, 2004). All samples of these two species were found in backwaters and shallow slow moving habitat during the fall and winter samples. The distribution of the Red Shiner was confined to Site 5 in the fall; one fish was collected at Site 3 during the winter sample, but was found in sites three, four, and five in the spring (Tables 6.1-6.4). The distribution was confined back to Site 5 in the summer sample. The increase in species such as White bass, White Crappie, and Sauger in the spring can be attributed to a result of temporal changes and spawning activities. The community structure at all five sites represents the available habitat at each site. For example at Site 2 (Zink Lake) for the fall sample there were only six species collected (Table 1.1). These species were minnow types and smaller sunfish. There were no Western Mosquito fish observed in the summer sample at Site 2, but there was an increase in the sunfish populations and the overall community structure. The electro-fishing system is also not as discriminate against certain individuals (i.e., those individuals who are not actively moving). Due to drought conditions in the fall and early winter, usable habitat in this area was log structures, bedrock, small boulder, riprap and sand with little depth. In the summer sample the following year, the drought had ceased and abundant rain within the watershed had allowed for Zink Lake to become wet from bank to bank (Figure 2). Increased and sustained flows allowed for multiple fish to take advantage of newly inundated littoral growth and other enhanced habitat types. With this said it is important to note that the river wet from bank to bank is not the sole key to a balanced community within the river. Water quality degrades quickly in those areas where residence time is extended and water depth is minimal. Having a constant flow of water as opposed to drastic fluctuations brings in fresh nutrients, keeps water from heating too quickly, holds more oxygen, and provides some stability during spawns. A sudden shift in the habitat such as will also cause a sudden shift of the species within the area. This shift originates from Keystone Dam releases and is compounded by environmental events. A shift of this type happened during 2007 (Figure 5.)

Conclusion

The Arkansas River is a large prairie river which has a primary function in nature to carry sediment and allow drainage for the local watershed. Alterations to the rivers gradient and/or barriers create negative interruptions to fish habitat and fish assemblages. Many variables such as water temperature, flow regimen, substrate type, and bathymetry dictate overall fish community structure surrounding said habitat. The drought conditions, the unusual abundance of rain in the spring and summer, and the releases from Keystone dam all combined to make it difficult to obtain a comparable sample from season to season as well as site to site.

As expected the deterioration in water temperatures in the winter resulted in the decline of fish movement; this in turn reduced the effectiveness of the hoop-nets, which sample active fish. Electro-fishing provided the capability of sampling those species such as bass and sunfish which become less active during the winter as well as providing the opportunity to sample a broad range of habitats along a reach within a reasonable amount of time and in periods when other sampling methods are ineffective. The fall sample reiterates literature findings that there is an increase in species and diversity further away from barriers such as Zink Dam, as these habitats are reduced and are pushed further down river. Although not as distinct as the fall, other indications within the spring

and summer samples show a slight increase in the richness and diversity further down stream (Refer to Table 5).

Through the four collective samples, a total of 41 species representing 12 families were identified and are listed in Table 7. This list should not be used as the definitive for the fisheries in the 42 miles stretch below Keystone Dam. Other fish such as Skipjack Herring *Alosa chrysochloris* have also been physically identified by ODWC personnel while doing other studies within the study area during the time frame of this survey; however, none were collected during any of the samples. Only one paddlefish was seen at Site 5 during the summer sample; however, it is likely that this fish is utilizing a more open water environment when available and electrofishing isn't a productive method of sampling this species. Pre-impoundment studies of the Arkansas River and Cimarron River in the now Keystone Lake Reservoir, identified Black Crappie *Pomoxis nigromaculatus* (Linton, 1961). There are many native Cyprinidae species that may have also evaded a sample by a missed habitat or due to high water velocities or temporal differences coupled with sampling method. However, it is likely that species, such as the Shovelnose Sturgeon *Scaphirhynchus platyrhynchus*, once recorded historically may be extirpated from the area. The Shovelnose Sturgeon has been placed on the state Special Concern Category II list. Recent records are lacking from the Arkansas River in this area. It is likely the Keystone and Zink Dams limit the westward distribution of the Shovelnose (Miller, Robison, 2004). Nevertheless, this list shows that a fish community is sustaining within the questioned area and is affected by stochastic flows. At times these flows have a negative impact shifting habitat on unsuspecting individuals, which disrupt spawning and/or feeding habits, but as in the summer sample, increased flows kept Zink Lake (Site 2) moving during a period in which the water quality would normally be deteriorating. During this year long survey, the water levels reached a point possible for fish to pass above Zink Dam. Much is still unknown about the migration movements in this area and to what extent Zink Dam has restricted normal migration patterns. A second year of study looking at Striped bass is currently underway to find out what part of the river this species are utilizing. Movement across the dam of any tagged fish has not been noted as of this report. There are still many questions as to how the tail-waters from Keystone dam to Zink Dam rely on fish stocking from the reservoir itself.

Unlike the impoundment of the Arkansas and Cimarron Rivers by Keystone Dam, in which the flooding and increase of water also increased productivity thereby allowing for greater growth in Paddlefish and other species of the river, the building of low-head dams will not provide enough surface area/volume, habitat or nutrients to have a lasting positive impact on an impounded portion of the river. These areas will quickly degrade through sedimentation and low residence times. The use of low-head dams consistently has a negative impact on stream dwelling fish resulting in a decline in richness near these types of barriers (Porto, 1999). Multiple low-head dams (15) encompassing 171 km river miles of the Fox River through Illinois have altered almost one-third of its fish distribution (Santucci, et al, 2005). As in most studies, our samples show an overall increase in abundance and diversity of intolerant species further away from Keystone and Zink Dams. Some species do not re-colonize well. The Arkansas River Shiner has been historically noted in the 42-mile stretch of the Arkansas River below Keystone Dam (Pigg, 1991). However, no specimens were collected during any portion of this survey.

Various sampling techniques were used to conduct this sample in multiple habitats over a 12 month period. This survey should serve as a historical reference (not a definitive list) of the fisheries

present within the area from Keystone Dam to the Tulsa/Wagoner County line. As urban development along the Arkansas River expands, a delicate balance of water usage among waterfront projects will be complicated. Although not as great as a retail outlets or other entertainment venues, the Arkansas River throughout the Sand Springs, Tulsa, Bixby and Broken Arrow corridor provides some economic value from anglers of Oklahoma as well as anglers from adjoining states, and is important to some state hatchery operations. On the biological side, the river is not only important to those species in which reside in the river, but is also to those species that rely on its food chain. Disruptions to the fisheries may complicate the complex food web within and surrounding the river. Consideration for angling and for the overall fisheries within the development area should remain a high priority.

Documentation and References

- Mclean, Johnny, et al.. (2005). Arkansas River Navigation Project Aquatic Evaluation. Department of the Army, Engineer Research and Development Center Waterways Experiment Station, Vicksburg, Mississippi. U.S. Army Engineer District, Little Rock: Little Rock, Arkansas
- Utrup, Nicholas J., Fisher, William L. (2004). Rapid Bioassessment Protocols for Sampling Fish in Non-Wadeable Rivers in Oklahoma. Oklahoma: Oklahoma Cooperative Fish and Wildlife Research Unit.
- Miller, Rudolph J. and Robison, Henry w. (2004). Fishes of Oklahoma. Oklahoma: University of Oklahoma Press.
- Pflieger, William L. (1975). The Fishes of Missouri. Missouri Department of Conservation
- Sheehan, Robert J. and Rasmussen, Jerry L. (1999). Large Rivers. Pages 529-557 *in* C.C. Kohler and W.A. Hubert, editors. Inland fisheries management North America, 2nd edition. American Fisheries Society, Bethesda, Maryland
- Linton, Thomas L. (1961). A study of fishes of the Arkansas and Cimarron Rivers in the Area of the Proposed Keystone Reservoir. Report Number 81. Oklahoma Fishery Research Laboratory. Norman, Oklahoma.
- Porto, L.M. (1999). Low-Head Barrier Dams Restrict the Movements of Fishes in Two Lake Ontario Streams. North American Journal of Fisheries Management 19:1028-1036.
- Santucci, Jr. (2005). Effects of Multiple Low-Head Dams on Fish, Macroinvertebrates, Habitat, and Water Quality in the Fox River, Illinois. North American Journal of Fisheries Management 25:975-992, 2005.

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Figure 1. Task 2- Fish Community Structure & Composition Assessment Study Area, Arkansas Corridor Through Tulsa County.

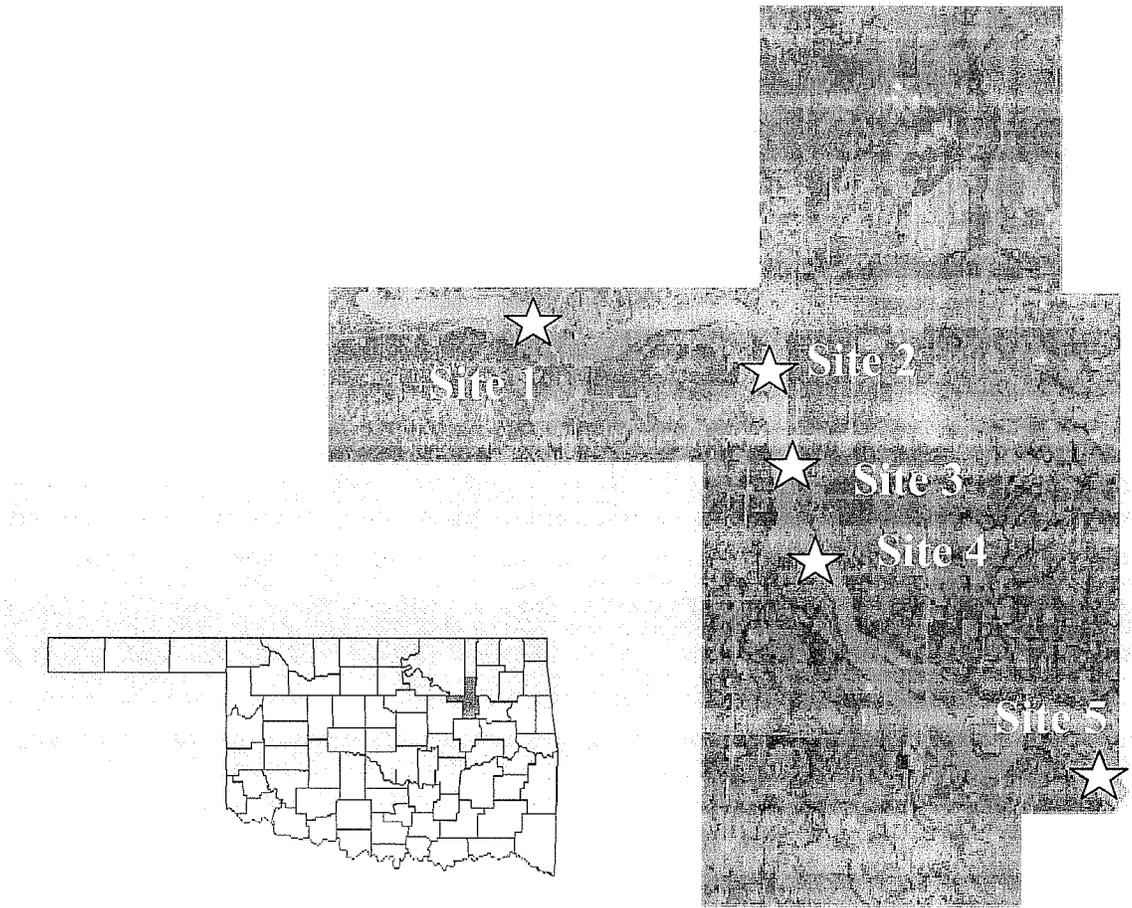


Figure 2. Mean Wetted Width by Site



Table 1.1 Fall Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	Site	Collection ID	Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
		1	2TR1F										
Longear Sunfish	<i>Lepomis megalotis</i>			0	0	1	1	0	0	0	0	NA	1
Spotted Bass	<i>Micropterus punctulatus</i>			0	0	1	1	0	0	0	0	NA	1
Brook Silverside	<i>Labidesthes sicculus</i>		Fall Sample	403	0	0	0	0	403	0	0	NA	403
Western Mosquitofish	<i>Gambusia affinis</i>		N 36° 08'32.393	1601	0	0	1	0	1600	0	0	NA	1601
Slim Minnow	<i>Pimephales tenellus</i>		W 96° 09'00.464	40	0	0	0	0	40	0	0	NA	40
Bluegill	<i>Lepomis macrochirus</i>			39	0	0	0	0	39	0	0	NA	39
Gear and Habitat Totals				2083	0	2	3	0	2082	0	0	NA	2085

Common Name	Scientific Name	Site	Collection ID	Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
		2	2TR2F										
Longear Sunfish	<i>Lepomis megalotis</i>			2	0	4	0	0	2	0	0	NA	6
Spotted Bass	<i>Micropterus punctulatus</i>			0	0	1	0	0	1	0	0	NA	1
Brook Silverside	<i>Labidesthes sicculus</i>		Fall Sample	32	0	0	8	1	23	0	0	NA	32
Western Mosquitofish	<i>Gambusia affinis</i>		N 36° 07'49.570	13	0	0	0	0	13	0	0	NA	13
Slim Minnow	<i>Pimephales tenellus</i>		W 95° 59'31.280	1	0	0	0	0	1	0	0	NA	1
Bluegill	<i>Lepomis macrochirus</i>			19	0	0	0	0	19	0	0	NA	19
Gear and Habitat Totals				67	0	5	8	1	59	0	0	NA	72

Common Name	Scientific Name	Site	Collection ID	Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
		3	2TR3F										
Longear Sunfish	<i>Lepomis megalotis</i>			0	0	13	10	1	0	2	0	NA	13
Brook Silverside	<i>Labidesthes sicculus</i>			22	0	0	0	1	21	0	0	NA	22
Western Mosquitofish	<i>Gambusia affinis</i>			10	0	0	0	0	10	0	0	NA	10
Bluegill	<i>Lepomis macrochirus</i>		Fall Sample	0	0	1	0	0	0	1	0	NA	1
Redear Sunfish	<i>Lepomis microlophus</i>		N 36° 04'12.482	0	0	1	0	0	0	1	0	NA	1
Smallmouth Buffalo	<i>Ictiobus bubalus</i>		W 95° 59'02.859	0	0	1	0	0	0	1	0	NA	1
Green Sunfish	<i>Lepomis cyanellus</i>			0	0	4	4	0	0	0	0	NA	4
River Shiner	<i>Notropis biennis</i>			1	0	0	0	0	1	0	0	NA	1
Gear and Habitat Totals				33	0	20	14	2	32	5	0	NA	53

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 1.2 Fall Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	4	2TR4F	Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Spotted Bass	<i>Micropterus punctulatus</i>	1		1	0	0	0	1	0	1	0	NA	2
Brook Silverside	<i>Labidesthes sicculus</i>	5		5	0	0	5	0	0	0	0	NA	5
Western Mosquitofish	<i>Gambusia affinis</i>	672		672	0	0	0	0	672	0	0	NA	672
Bluegill	<i>Lepomis macrochirus</i>	0	Fall Sample	0	0	8	0	0	0	8	0	NA	8
Green Sunfish	<i>Lepomis cyanellus</i>	0	N 36° 01'57.449	0	0	1	0	0	0	1	0	NA	1
River Shiner	<i>Notropis blennioides</i>	4	W 95° 57'38.431	4	0	0	4	0	0	0	0	NA	4
Channel Catfish	<i>Ictalurus punctatus</i>	0		0	1	0	0	0	0	1	0	NA	1
Gear and Habitat Totals		682		2	9	9	9	1	672	11	0	NA	693

Common Name	Scientific Name	5	2TR5F	Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Longear Sunfish	<i>Lepomis megalotis</i>	0		0	0	4	0	0	0	3	1	NA	4
Brook Silverside	<i>Labidesthes sicculus</i>	89		89	0	0	75	0	4	0	0	NA	89
Western Mosquitofish	<i>Gambusia affinis</i>	5		5	0	0	0	2	0	0	0	NA	5
Slim Minnow	<i>Pimephales tenellus</i>	40		40	0	0	2	4	31	0	0	NA	40
Bluegill	<i>Lepomis macrochirus</i>	0		0	0	4	0	0	0	4	0	NA	4
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	2		2	4	0	2	0	0	0	4	NA	6
River Shiner	<i>Notropis blennioides</i>	2	Fall Sample	2	0	0	0	0	0	0	0	NA	2
Channel Catfish	<i>Ictalurus punctatus</i>	0	N 35° 55'23.238	0	4	3	0	0	0	6	1	NA	7
Longnose Gar	<i>Lepisosteus osseus</i>	0	W 95° 45'50.052	0	3	0	0	0	0	2	1	NA	3
Flathead Catfish	<i>Pylodictis olivaris</i>	0		0	1	0	0	0	0	0	1	NA	1
Red Shiner	<i>Cyprinella lutrensis</i>	3130		3130	0	0	683	221	1291	0	0	NA	3130
Striped Bass	<i>Morone saxatilis</i>	1		1	0	0	1	0	0	0	0	NA	1
River Carpsucker	<i>Carpodacus carpio</i>	5		5	0	0	0	0	3	0	0	NA	5
Gear and Habitat Totals		3274		12	11	11	763	227	1329	15	8	NA	3297

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 2.1 Winter Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	Site	Collection		Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
			Site ID	Collection										
		1	2TR1W											
Brook Silverside	<i>Labidesthes sicculus</i>	Winter Sample			40	0	0	0	0	40	0	0	NA	40
Western Mosquitofish	<i>Gambusia affinis</i>	N 36° 08'32.393			4	0	0	1	0	3	0	0	NA	4
Gizzard shad	<i>Dorsoma cepedianum</i>	W 96° 09'00.464			3	0	0	0	0	3	0	0	NA	3
Gear and Habitat Totals					47	0	0	1	0	46	0	0	NA	47

Common Name	Scientific Name	2	2TR2W		Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
			2	2TR2W										
Brook Silverside	<i>Labidesthes sicculus</i>				NA	NA	NA	NA	NA	NA	NA	NA	8	8
Common Carp	<i>Cyprinus carpio</i>				NA	NA	NA	NA	NA	NA	NA	NA	32	32
Channel Catfish	<i>Ictalurus punctatus</i>				NA	NA	NA	NA	NA	NA	NA	NA	1	1
Green Sunfish	<i>Lepomis cyanellus</i>				NA	NA	NA	NA	NA	NA	NA	NA	7	7
Longear Sunfish	<i>Lepomis megalotis</i>				NA	NA	NA	NA	NA	NA	NA	NA	30	30
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	Winter Sample			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Bluegill Sunfish	<i>Lepomis macrochirus</i>	N 36° 07'24.658			NA	NA	NA	NA	NA	NA	NA	NA	4	4
River Carpsucker	<i>Carpodes carpio</i>	W 95° 59'12.420			NA	NA	NA	NA	NA	NA	NA	NA	70	70
Gizzard shad	<i>Dorsoma cepedianum</i>				NA	NA	NA	NA	NA	NA	NA	NA	230	230
Freshwater Drum	<i>Aplodinotus grunniens</i>				NA	NA	NA	NA	NA	NA	NA	NA	1	1
Spottted Bass	<i>Micropterus punctulatus</i>				NA	NA	NA	NA	NA	NA	NA	NA	11	11
Largemouth Bass	<i>Micropterus salmoides</i>				NA	NA	NA	NA	NA	NA	NA	NA	1	1
Green/Bluegill Sunfish Hybrid	<i>L. macrochirus</i> x <i>L. cyanellus</i>				NA	NA	NA	NA	NA	NA	NA	NA	1	1
Gear and Habitat Totals					NA	NA	NA	NA	NA	NA	NA	NA	400	400

Common Name	Scientific Name	3	2TR3W		Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
			3	2TR3W										
Western Mosquitofish	<i>Gambusia affinis</i>				2	0	0	0	0	2	0	0	NA	2
Red Shiner	<i>Cyprinella lutrensis</i>	Winter Sample			1	0	0	0	0	1	0	0	NA	1
Green Sunfish	<i>Lepomis cyanellus</i>	N 36° 04'12.559			1	0	0	0	0	1	0	0	NA	1
River Shiner	<i>Notropis biennis</i>	W 95° 59'02.734			1	0	0	0	0	1	0	0	NA	1
Gear and Habitat Totals					5	0	0	0	0	5	0	0	NA	5

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 2.2 Winter Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	4		Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
		2TR4W	Winter Sample										
Western Mosquitofish	<i>Gambusia affinis</i>		N 36° 01'57.449	79	0	0	3	0	79	0	0	NA	82
Channel Catfish	<i>Ictalurus punctatus</i>		W 95° 57'38.431	0	2	0	2	0	0	0	0	NA	2
Gear and Habitat Totals				79	2	0	3	0	79	0	0	NA	84

Common Name	Scientific Name	5		Seine	L. Hoop	S. Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
		2TR5W	Winter Sample										
Brook Silverside	<i>Labidesthes sicculus</i>			2	0	0	2	0	0	0	0	NA	2
Western Mosquitofish	<i>Gambusia affinis</i>			2	0	0	0	0	2	0	0	NA	2
Slim Minnow	<i>Pimephales tenellus</i>			12	0	0	0	0	12	0	0	NA	12
Bluegill	<i>Lepomis macrochirus</i>		Winter Sample	1	0	0	0	0	1	0	0	NA	1
Longnose Gar	<i>Lepisosteus osseus</i>		N 35° 55'24.800	0	1	0	0	0	0	0	1	NA	1
Red Shiner	<i>Cyprinella lutrensis</i>		W 95° 45'50.812	9532	0	0	2	0	9530	0	0	NA	9532
Shoal Chub	<i>Macrhybopsis hyostoma</i>			1	0	0	1	0	0	0	0	NA	1
Bluntnose Minnow	<i>Pimephales notatus</i>			78	0	0	0	0	78	0	0	NA	78
Gear and Habitat Totals				9628	1	0	5	0	9623	0	1	NA	9629

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 3.1 Spring Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	1	2TR1S	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Blue Catfish	<i>Ictalurus furcatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	7	7
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	17	17
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Gizzard shad	<i>Dorosoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	812	812
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	5	5
Orangespotted Sunfish	<i>Lepomis humilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	40	40
Redear Sunfish	<i>Lepomis microlophus</i>		Spring Sample	NA	NA	NA	NA	NA	NA	NA	NA	1	1
River Carpsucker	<i>Carpionodes carpio</i>		N36°08'26.693 W96°08'48.481	NA	NA	NA	NA	NA	NA	NA	NA	14	14
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	7	7
Spotted Gar	<i>Lepisosteus oculatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Warmouth Sunfish	<i>Lepomis gulosus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	60	60
White Crappie	<i>Pomoxis annularis</i>			NA	NA	NA	NA	NA	NA	NA	NA	39	39
White Perch	<i>Morone americana</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Gear and Habitat Totals				NA	NA	NA	NA	NA	NA	NA	NA	1022	1022

Comments: The striped bass lengths were 175 and 218

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 3.2 Spring Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	2	2TR2S	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	28	28
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	14	14
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Gizzard shad	<i>Dorsoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	454	454
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	38	38
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	12	12
River Carpsucker	<i>Carpododes carpio</i>	Spring Sample N36-134150 W95-994939		NA	NA	NA	NA	NA	NA	NA	NA	193	193
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	20	20
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
White Perch	<i>Morone americana</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Gear and Habitat Totals				NA	NA	NA	NA	NA	NA	NA	NA	790	790

Comments: The striped bass lengths for two of the specimens were 115 and 93, all were Young of the Year
EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 3.3 Spring Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	3	2TR3S	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Black Redhorse	<i>Moxostoma duquesnei</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Bluntnose Minnow	<i>Pimephales notatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	22	22
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	5	5
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	10	10
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	28	28
Gizzard shad	<i>Dorosoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	294	294
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Highfin Carpsucker	<i>Carpionodes velifer</i>			NA	NA	NA	NA	NA	NA	NA	NA	95	95
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	23	23
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Red Shiner	<i>Cyprinella lutrensis</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
River Carpsucker	<i>Carpionodes carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	304	304
River Redhorse	<i>Moxostoma carinatum</i>			NA	NA	NA	NA	NA	NA	NA	NA	28	28
River Shiner	<i>Notropis bienniuis</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	21	21
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	16	16
Spotted Gar	<i>Lepisosteus oculatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	17	17
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Warmouth Sunfish	<i>Lepomis gulosus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	72	72
White Crappie	<i>Pomoxis annularis</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Gear and Habitat Totals				NA	NA	NA	NA	NA	NA	NA	NA	962	962

Comments: One striped bass length was 240

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 3.4 Spring Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	4	2TR4S	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	21	21
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	65	65
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	NA	NA	NA	NA	NA	NA	NA	6	6
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Gizzard shad	<i>Dorsoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	805	805
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	46	46
Highfin Carpsucker	<i>Carpionodes velifer</i>		Spring Sample	NA	NA	NA	NA	NA	NA	NA	NA	21	21
Largemouth Bass	<i>Micropterus salmoides</i>		N36° 01'37.981	NA	NA	NA	NA	NA	NA	NA	NA	8	8
Longear Sunfish	<i>Lepomis megalotis</i>		W95° 57'25.273	NA	NA	NA	NA	NA	NA	NA	NA	14	14
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	13	13
Red Shiner	<i>Cyprinella lutrensis</i>			NA	NA	NA	NA	NA	NA	NA	NA	74	74
Redear Sunfish	<i>Lepomis microlophus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
River Carpsucker	<i>Carpionodes carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	67	67
River Redhorse	<i>Moxostoma carinatum</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Sauger	<i>Sander canadensis</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Shortnose Gar	<i>Lepisosteus platostomus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	12	12
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	28	28
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	13	13
Walleye	<i>Stizostedion vitreum</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Warmouth Sunfish	<i>Lepomis gulosus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	56	56
White Crappie	<i>Pomoxis annularis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Gear and Habitat Totals				NA	NA	NA	NA	NA	NA	NA	NA	1277	1277

Comments: Two lengths of striped bass 105 and 95

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 3.5 Spring Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	5	2TR5S	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	31	31
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Gizzard shad	<i>Dorsoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	188	188
Highfin Carpsucker	<i>Carpionodes velifer</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	19	19
Red Shiner	<i>Cyprinella lutrensis</i>			NA	NA	NA	NA	NA	NA	NA	NA	30	30
River Carpsucker	<i>Carpionodes carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	32	32
River Redhorse	<i>Moxostoma carinatum</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Shorthead Gar	<i>Lepisosteus platostomus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	16	16
Spotted Gar	<i>Lepisosteus oculiatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Gear and Habitat Totals				NA	NA	NA	NA	NA	NA	NA	NA	336	336

Comments: One striped bass length was 480

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 4.1 Summer Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	1	2TR1SM	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	20	20
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Redear Sunfish	<i>Lepomis microlophus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	16	16
Common Carp	<i>Cyprinus carpio</i>	Summer Sample		NA	NA	NA	NA	NA	NA	NA	NA	26	26
Mirror Carp	<i>Cyprinus carpio</i>	N36° 08'33.057		NA	NA	NA	NA	NA	NA	NA	NA	1	1
Grass Carp	<i>Ctenopharyngodon idella</i>	W96° 09'01.077		NA	NA	NA	NA	NA	NA	NA	NA	1	1
Gizzard shad	<i>Dorsoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	807	807
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Highfin Carpsucker	<i>Carpodes velifer</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	5	5
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
River Carpsucker	<i>Carpodes carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	36	36
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	11	11
Slim Minnow	<i>Pimephales tenellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	63	63
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	6	6
White Crappie	<i>Pomoxis annularis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Gear and Habitat Totals													1029

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 4.2 Summer Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	2	2TR2SM	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	20	20
Redear Sunfish	<i>Lepomis microlophus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	5052	5052
Common Carp	<i>Cyprinus carpio</i>		Summer Sample	NA	NA	NA	NA	NA	NA	NA	NA	36	36
Grass Carp	<i>Ctenopharyngodon idella</i>		N36° 08'01.004	NA	NA	NA	NA	NA	NA	NA	NA	2	2
Mirror Carp	<i>Cyprinus carpio</i>		W96° 59'40.050	NA	NA	NA	NA	NA	NA	NA	NA	1	1
Gizzard shad	<i>Dorsoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	168	168
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	14	14
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	8	8
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	10	10
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	32	32
River Carpsucker	<i>Carploides carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	154	154
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	19	19
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	26	26
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Golden Redhorse	<i>Moxostoma erythrurum</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Gear and Habitat Totals												5554	5554

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 4.3 Summer Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	3	2TR3SM	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	15	NA	NA	NA	NA	3	12	NA	30
Green Sunfish	<i>Lepomis cyanellus</i>			NA	1	NA	NA	NA	NA	NA	1	NA	2
Brook Silverside	<i>Labidesthes sicculus</i>			11	NA	NA	1	2	2	NA	6	NA	22
Central Stone Roller	<i>Campostoma anomalum</i>			1	NA	NA	NA	1	NA	NA	NA	NA	2
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	4	NA	NA	NA	NA	1	3	NA	8
Channel Catfish	<i>Ictalurus punctatus</i>			NA	3	NA	NA	NA	NA	NA	3	NA	6
Longear Sunfish	<i>Lepomis megalotis</i>			NA	10	NA	NA	NA	NA	3	7	NA	20
River Shiner	<i>Notropis biennis</i>			541	NA	NA	138	125	125	NA	153	NA	1082
River Carpsucker	<i>Carploides carpio</i>			NA	1	NA	NA	NA	NA	NA	1	NA	2
Spotted Bass	<i>Micropterus punctulatus</i>			NA	2	NA	NA	NA	NA	NA	2	NA	4
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	1	NA	NA	NA	NA	NA	1	NA	2
Gear and Habitat Totals				553	37	NA	139	128	127	7	189	NA	1180

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 4.4 Summer Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	4	2TR4SM	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	69	69
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	17	17
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	384	384
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	12	12
Gizzard shad	<i>Dorosoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	297	297
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Highfin Carpsucker	<i>Carploides velifer</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	4	4
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	13	13
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	11	11
River Shiner	<i>Notropis bienniuis</i>			NA	NA	NA	NA	NA	NA	NA	NA	50	50
River Carpsucker	<i>Carploides carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	31	31
River Redhorse	<i>Moxostoma carinatum</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	14	14
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	9	9
Slim minnows	<i>Pimephales tenellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1237	1237
Sauger	<i>Stizostedion canadense</i>			NA	NA	NA	NA	NA	NA	NA	NA	6	6
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	8	8
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	7	7
Golden Redhorse	<i>Moxostoma erythrurum</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Gear and Habitat Totals												2186	2186

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 4.5 Summer Sample: Total number of fish by species for each sampling method, habitat type, and sampling site.

Common Name	Scientific Name	5	2TR5SM	Seine	Large Hoop	Small Hoop	SS	SF	BW	DS	DF	EF	Number of fish per species
Bluegill Sunfish	<i>Lepomis macrochirus</i>			NA	NA	NA	NA	NA	NA	NA	NA	21	21
Green Sunfish	<i>Lepomis cyanellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Brook Silverside	<i>Labidesthes sicculus</i>			NA	NA	NA	NA	NA	NA	NA	NA	18	18
Common Carp	<i>Cyprinus carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	6	6
Gizzard shad	<i>Dorosoma cepedianum</i>			NA	NA	NA	NA	NA	NA	NA	NA	88	88
Threadfin shad	<i>Dorosoma petenense</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Flathead Catfish	<i>Pylodictis olivaris</i>			NA	NA	NA	NA	NA	NA	NA	NA	12	12
Channel Catfish	<i>Ictalurus punctatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Largemouth Bass	<i>Micropterus salmoides</i>			NA	NA	NA	NA	NA	NA	NA	NA	15	15
Longear Sunfish	<i>Lepomis megalotis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Longnose Gar	<i>Lepisosteus osseus</i>			NA	NA	NA	NA	NA	NA	NA	NA	10	10
Red Shiner	<i>Cyprinella lutrensis</i>			NA	NA	NA	NA	NA	NA	NA	NA	49	49
River Shiners	<i>Notropis biennis</i>			NA	NA	NA	NA	NA	NA	NA	NA	101	101
River Carpsucker	<i>Carpodes carpio</i>			NA	NA	NA	NA	NA	NA	NA	NA	21	21
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			NA	NA	NA	NA	NA	NA	NA	NA	16	16
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Spotted Bass	<i>Micropterus punctulatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
White Bass	<i>Morone chrysops</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Freshwater Drum	<i>Aplodinotus grunniens</i>			NA	NA	NA	NA	NA	NA	NA	NA	6	6
Slim Minnows	<i>Pimephales tenellus</i>			NA	NA	NA	NA	NA	NA	NA	NA	191	191
Mosquito Fish	<i>Gambusia affinis</i>			NA	NA	NA	NA	NA	NA	NA	NA	46	46
White Crappie	<i>Pomoxis nigromaculatus</i>			NA	NA	NA	NA	NA	NA	NA	NA	3	3
Paddlefish	<i>Polyodon Spathula</i>			NA	NA	NA	NA	NA	NA	NA	NA	1	1
Striped Bass	<i>Morone saxatilis</i>			NA	NA	NA	NA	NA	NA	NA	NA	2	2
Gear and Habitat Totals												618	618

EF = Electrofishing, SS = Shallow Slow, SF = Shallow Fast, BW = Backwater, DS = Deep Slow, DF = Deep Fast

Table 5. Families Observed by Sample and Site

Fall	Site				
	1	2	3	4	5
Atherinopsidae	X	X	X	X	X
Catastomidae			X		X
Centrarchidae	X	X	X	X	X
Clupeidae					
Cyprinidae	X	X	X	X	X
Ictaluridae				X	X
Lepisostidae					X
Moronidae					X
Poeciliidae	X	X	X	X	X
Sciaenidae					

Spring	Site				
	1	2	3	4	5
Atherinopsidae	X	X	X	X	X
Catastomidae	X	X	X	X	X
Centrarchidae	X	X	X	X	X
Clupeidae	X	X	X	X	X
Cyprinidae	X	X	X	X	X
Ictaluridae	X	X	X	X	
Lepisostidae	X		X	X	X
Moronidae	X	X	X	X	X
Poeciliidae					
Percidae				X	
Sciaenidae		X	X	X	

Winter	Site				
	1	2	3	4	5
Atherinopsidae	X	X			
Catastomidae		X			
Centrarchidae		X	X		X
Clupeidae	X	X			
Cyprinidae		X	X		X
Ictaluridae		X		X	
Lepisostidae					X
Moronidae					
Poeciliidae	X		X	X	X
Sciaenidae		X			

Summer	Site				
	1	2	3	4	5
Atherinopsidae	X	X		X	X
Catastomidae	X	X	X	X	X
Centrarchidae	X	X	X	X	X
Clupeidae	X	X		X	X
Cyprinidae	X	X	X	X	X
Ictaluridae	X	X	X	X	X
Lepisostidae	X	X		X	X
Moronidae	X	X		X	X
Poeciliidae					X
Percidae				X	
Sciaenidae	X	X	X	X	X
Polyodontidae					X

Table 6.1 Percent of Total Seasonal Catch by Species

Fall Species: Common Name	Site					Total	% of Total Seasonal Catch
	1	2	3	4	5		
Flathead Catfish	0	0	0	0	1	1	0.02%
Readear Sunfish	0	0	1	0	0	1	0.02%
Striped Bass	0	0	0	0	1	1	0.02%
Longnose Gar	0	0	0	0	3	3	0.05%
Spotted Bass	1	1	0	2	0	4	0.06%
Green Sunfish	0	0	4	1	0	5	0.08%
River Carpsucker	0	0	0	0	5	5	0.08%
River Shiner	0	0	1	4	2	7	0.11%
Smallmouth Buffalo	0	0	1	0	6	7	0.11%
Channel Catfish	0	0	0	1	7	8	0.13%
Longear Sunfish	1	6	13	0	4	24	0.39%
Bluegill Sunfish	39	19	1	8	4	71	1.15%
Slim Minnow	40	1	0	0	40	81	1.31%
Brook Silverside	403	32	22	5	89	551	8.89%
Western Mosquitofish	1601	13	10	672	5	2301	37.11%
Red Shiner	0	0	0	0	3130	3130	50.48%
Total	2085	72	53	693	3297	6200	100%

Table 6.2 Percent of Total Seasonal Catch by Species

Winter Species: Common Name	Site					Total	% of Total Seasonal Catch
	1	2	3	4	5		
Freshwater Drum	0	1	0	0	0	1	0.01%
Green/Bluegill Hybrid	0	1	0	0	0	1	0.01%
Largemouth Bass	0	1	0	0	0	1	0.01%
Longnose Gar	0	0	0	0	1	1	0.01%
River Shiner	0	0	1	0	0	1	0.01%
Shoal Chub	0	0	0	0	1	1	0.01%
Channel Catfish	0	1	0	2	0	3	0.03%
Smallmouth Buffalo	0	4	0	0	0	4	0.04%
Bluegill Sunfish	0	4	0	0	1	5	0.05%
Green Sunfish	0	7	1	0	0	8	0.08%
Spotted Bass	0	11	0	0	0	11	0.11%
Slim Minnow	0	0	0	0	12	12	0.12%
Longear Sunfish	0	30	0	0	0	30	0.23%
Common Carp	0	32	0	0	0	32	0.31%
Brook Silverside	40	8	0	0	2	50	0.49%
River Carpsucker	0	70	0	0	0	70	0.69%
Bluntnose Minnow	0	0	0	0	78	78	0.77%
Western Mosquitofish	4	0	2	82	2	90	0.89%
Gizzard Shad	3	230	0	0	0	233	2.29%
Red Shiner	0	0	1	0	9532	9533	93.78%
Totals	47	400	5	84	9629	10165	100%

Table 6.3 Percent of Total Seasonal Catch by Species

Spring Species: Common Name	Site					Total	% of Total Seasonal Catch
	1	2	3	4	5		
Black Redhorse	0	0	2	0	0	2	0.05%
Blue Catfish	2	0	0	0	0	2	0.05%
Bluegill Sunfish	7	3	0	21	1	32	0.73%
Bluntnose Minnow	0	0	1	0	0	1	0.02%
Brook Silverside	17	28	22	65	31	163	3.72%
Channel Catfish	3	14	5	3	0	25	0.57%
Common Carp	9	9	10	9	3	40	0.91%
Gizzard Shad	812	454	294	805	188	2553	58.19%
Green Sunfish	0	2	9	46	0	57	1.30%
Highfin Carpsucker	0	0	95	21	1	117	2.67%
Flathead Catfish	0	4	2	6	0	12	0.27%
Freshwater Drum	0	4	28	4	0	36	0.82%
Largemouth Bass	5	0	1	8	1	15	0.34%
Longnose Gar	0	0	1	13	19	33	0.75%
Longear Sunfish	0	38	23	14	2	77	1.76%
Orangespotted Sunfish	1	0	0	0	0	1	0.02%
Redear Sunfish	1	0	0	3	0	4	0.09%
Red Shiner	0	0	3	74	30	107	2.44%
River Carpsucker	14	193	304	67	32	610	13.90%
River Redhorse	0	0	28	1	2	31	0.71%
River Shiner	0	0	1	0	0	1	0.02%
Sauger	0	0	0	3	0	3	0.07%
Shortnose Gar	0	0	0	1	1	2	0.05%
Smallmouth Buffalo	40	12	21	12	4	89	2.03%
Spotted Bass	7	20	16	28	16	87	1.98%
Spotted Gar	1	0	17	0	3	21	0.48%
Striped Bass	2	4	2	13	2	23	0.52%
Walleye	0	0	0	1	0	1	0.02%
Warmouth Sunfish	1	0	1	1	0	3	0.07%
White Bass	60	3	72	56	0	191	4.35%
White Perch	1	2	0	0	0	3	0.07%
White Crappie	39	0	4	2	0	45	1.03%
Totals	1022	790	962	1277	336	4387	100.00%

Table 6.4 Percent of Total Seasonal Catch by Species

Summer Species: Common Name	Site					Total	% of Total Seasonal Catch
	1	2	3	4	5		
Bigmouth Buffalo	0	2	0	1	1	4	0.04%
Bluegill Sunfish	20	20	15	69	21	145	1.45%
Brook Silverside	16	5052	11	384	18	5481	54.94%
Central Stone Roller	0	0	1	0	0	1	0.01%
Channel Catfish	4	14	3	3	3	27	0.27%
Common Carp	26	36	0	12	6	80	0.80%
Flathead Catfish	0	3	4	4	12	23	0.23%
Freshwater Drum	6	1	1	7	6	21	0.21%
Gizzard Shad	807	168	0	297	88	1360	13.63%
Golden Redhorse	0	2	0	3	0	5	0.05%
Grass Carp	1	2	0	0	0	3	0.03%
Green Sunfish	3	1	1	17	2	24	0.24%
Highfin Carpsucker	1	0	0	2	0	3	0.03%
Largemouth Bass	5	8	0	4	15	32	0.32%
Longear Sunfish	9	10	10	13	2	44	0.44%
Longnose Gar	4	32	0	11	10	57	0.57%
Mirror Carp	1	1	0	0	0	2	0.02%
Paddlefish	0	0	0	0	1	1	0.01%
Red Shiner	0	0	0	0	49	49	0.49%
Redear Sunfish	1	1	0	0	0	2	0.02%
River Carpsucker	36	154	1	31	21	243	2.44%
River Redhorse	0	0	0	2	0	2	0.02%
River Shiner	0	0	541	50	101	692	6.94%
Sauger	0	0	0	6	0	6	0.06%
Slim Minnow	63	0	0	1237	191	1491	14.94%
Smallmouth Buffalo	9	19	0	14	16	58	0.58%
Spotted Bass	11	26	2	9	1	49	0.49%
Striped Bass	0	0	0	2	2	4	0.04%
Threadfin Shad	0	0	0	0	2	2	0.02%
Western Mosquitofish	0	0	0	0	46	46	0.46%
White Bass	4	2	0	8	1	15	0.15%
White Crappie	2	0	0	0	3	5	0.05%
Totals	1029	5554	590	2186	618	9977	100.00%

Figure 3. Daily Maximum, Daily Minimum, and Daily Mean Temperature of the Arkansas River at Tulsa, OK October 01, 2006 through October 01, 2007.

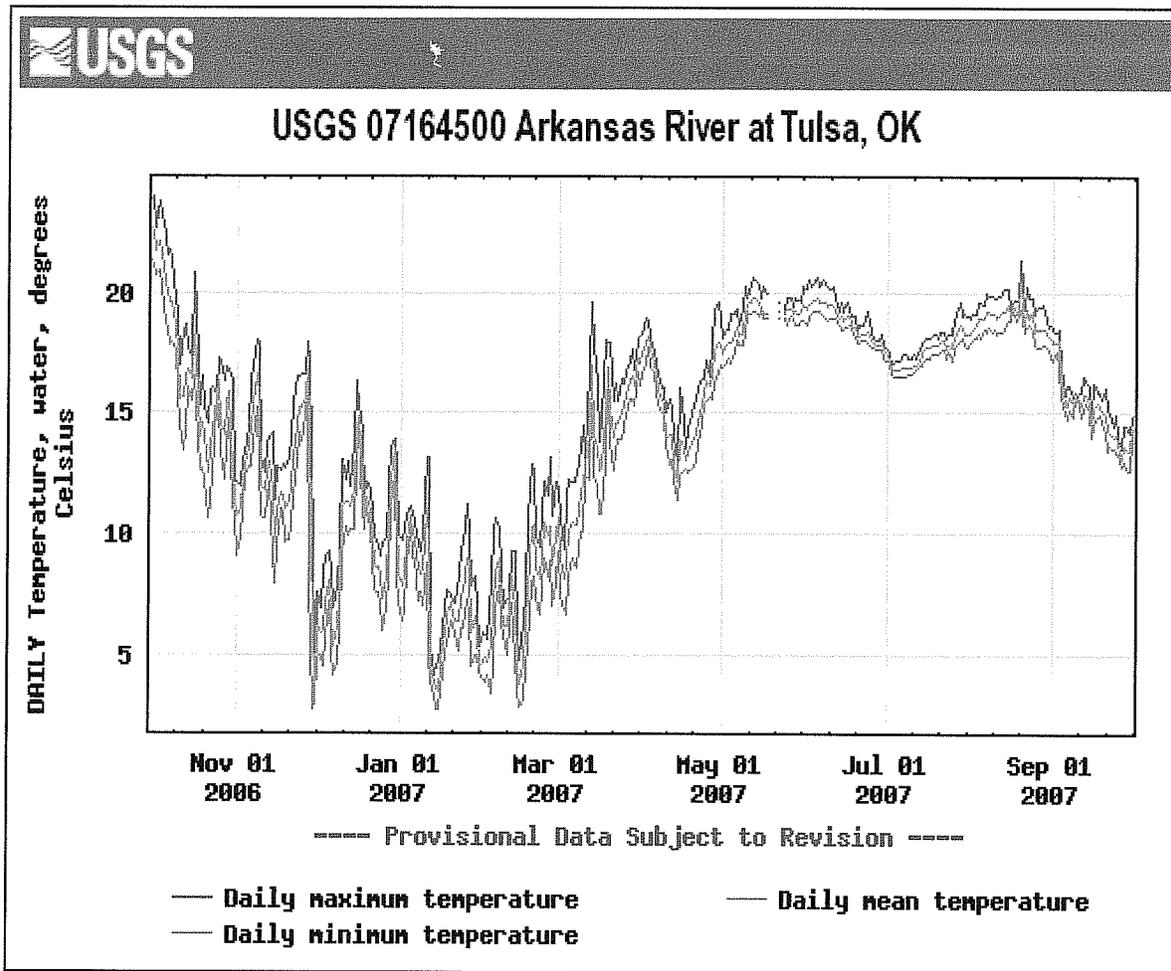


Figure 4. Daily Mean Discharge of the Arkansas River at Tulsa, OK, January 01, 2007 through January 31, 2007.

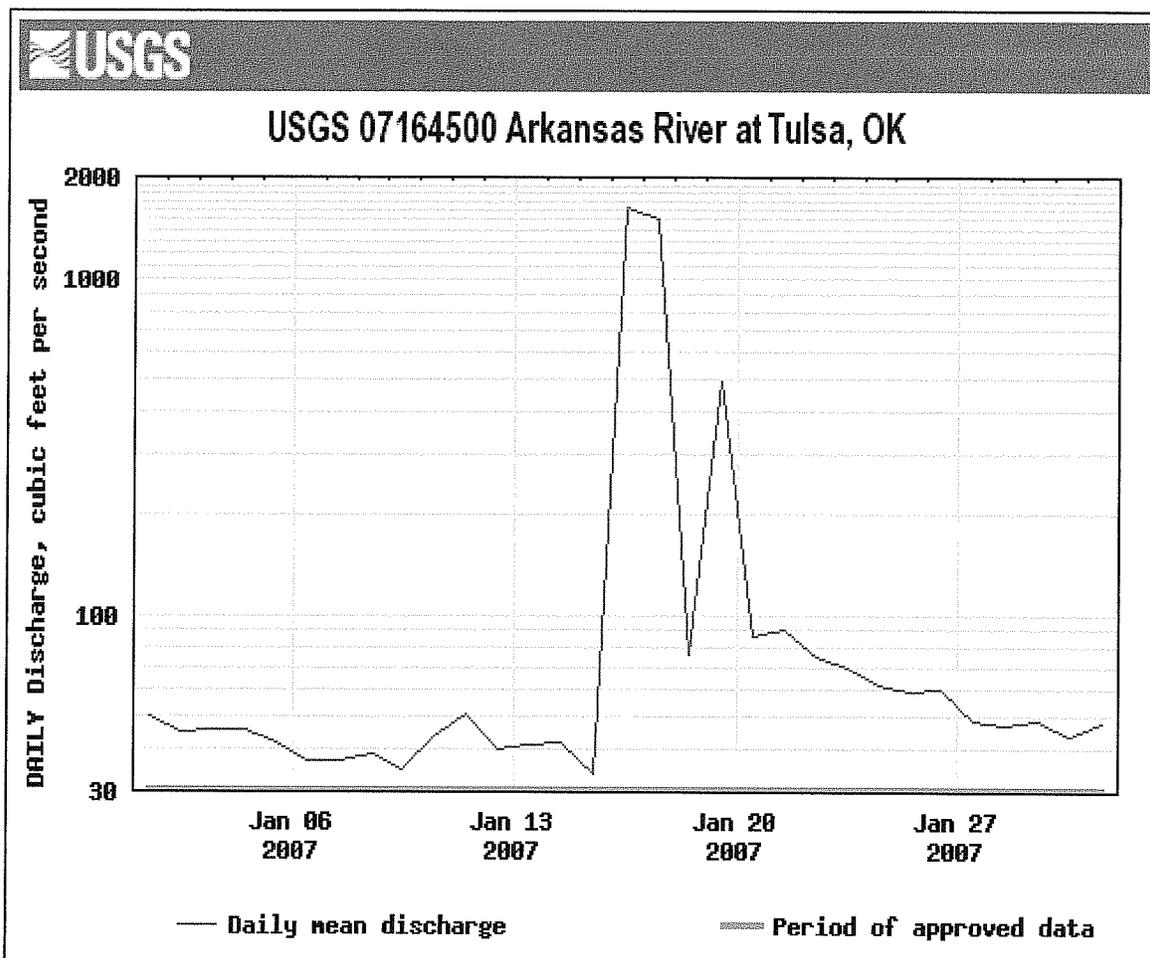


Figure 5. Daily Mean Discharge of the Arkansas River at Tulsa, OK, October 01, 2006 through October 01, 2007.

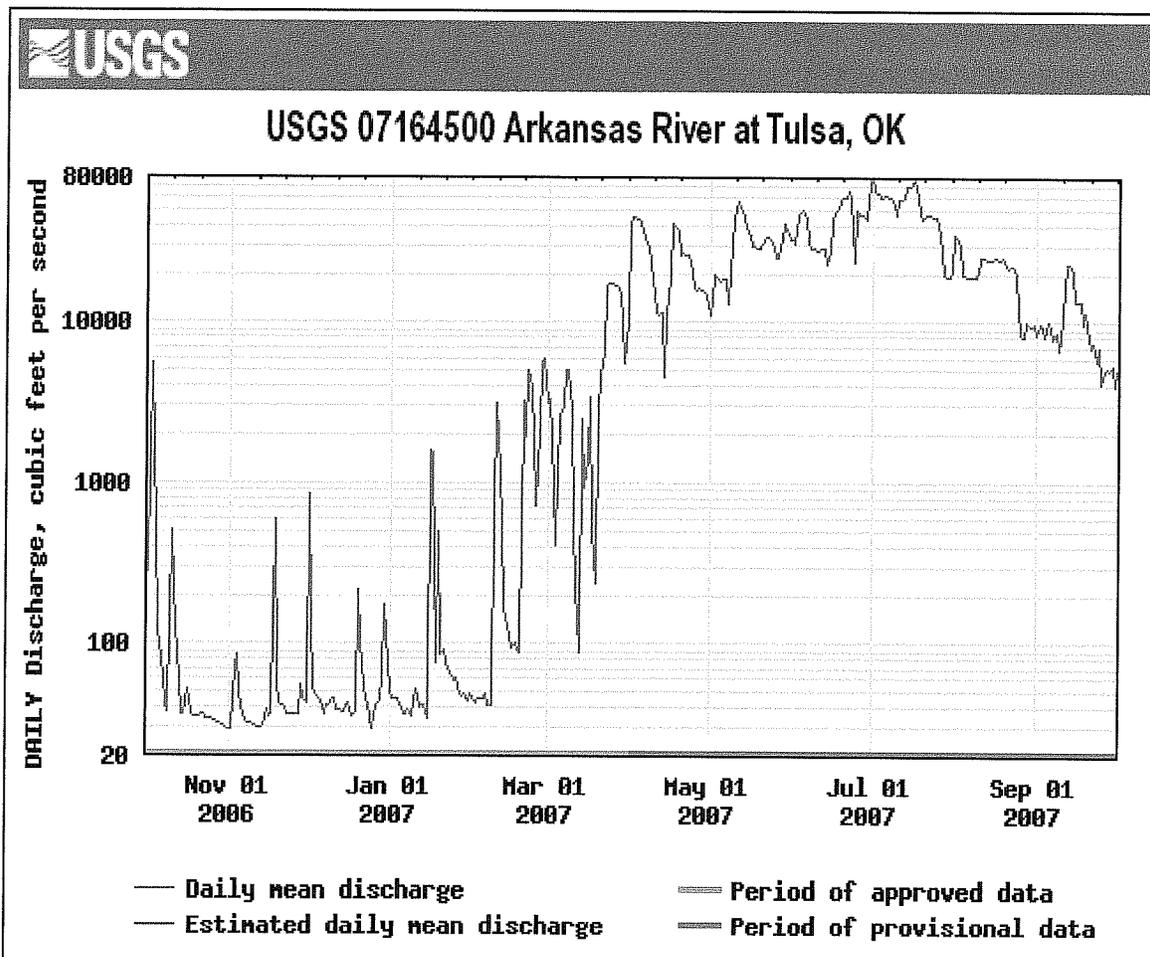


Table 7. List of those species collected from Arkansas River between Keystone Dam and the Tulsa/Wagoner County line at five reaches throughout one year.

Common name	Scientific Name	Family Name
Brook Silverside	<i>Labidesthes sicculus</i>	Atherinopsidae
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>	Catastomidae
Black Redhorse	<i>Moxostoma duquesnei</i>	Catastomidae
Golden Redhorse	<i>Moxostoma erythrurum</i>	Catastomidae
Highfin Carpsucker	<i>Carpionodes velifer</i>	Catastomidae
River Carpsucker	<i>Carpionodes carpio</i>	Catastomidae
River Redhorse	<i>Moxostoma carinatum</i>	Catastomidae
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	Catastomidae
Bluegill Sunfish	<i>Lepomis macrochirus</i>	Centrarchidae
Green Sunfish	<i>Lepomis cyanellus</i>	Centrarchidae
Green/Bluegill Sunfish Hybrid	<i>L. macrochirus</i> x <i>L. cyanellus</i>	Centrarchidae
Largemouth Bass	<i>Micropterus salmoides</i>	Centrarchidae
Longear Sunfish	<i>Lepomis megalotis</i>	Centrarchidae
Redear Sunfish	<i>Lepomis microlophus</i>	Centrarchidae
Spotted Bass	<i>Micropterus punctulatus</i>	Centrarchidae
Warmouth Sunfish	<i>Lepomis gulosus</i>	Centrarchidae
White Crappie	<i>Pomoxis annularis</i>	Centrarchidae
Gizzard Shad	<i>Dorosoma cepedianum</i>	Clupeidae
Threadfin Shad	<i>Dorosoma petenense</i>	Clupeidae
Bluntnose Minnow	<i>Pimephales notatus</i>	Cyprinidae
Central Stone Roller	<i>Campostoma anomalum</i>	Cyprinidae
Common Carp	<i>Cyprinus carpio</i>	Cyprinidae
Grass Carp	<i>Ctenopharyngodon idella</i>	Cyprinidae
Red Shiner	<i>Cyprinella lutrensis</i>	Cyprinidae
River Shiner	<i>Notropis blennioides</i>	Cyprinidae
Shoal Chub	<i>Macrhybopsis hyostoma</i>	Cyprinidae
Slim Minnow	<i>Pimephales tenellus</i>	Cyprinidae
Blue Catfish	<i>Ictalurus furcatus</i>	Ictaluridae
Channel Catfish	<i>Ictalurus punctatus</i>	Ictaluridae
Flathead Catfish	<i>Pylodictis olivaris</i>	Ictaluridae
Longnose Gar	<i>Lepisosteus osseus</i>	Lepisostidae
Shortnose Gar	<i>Lepisosteus platostomus</i>	Lepisostidae
Spotted Gar	<i>Lepisosteus oculatus</i>	Lepisostidae
Striped Bass	<i>Morone saxatilis</i>	Moronidae
White Bass	<i>Morone chrysops</i>	Moronidae
White Perch	<i>Morone americana</i>	Moronidae
Sauger	<i>Sander canadensis</i>	Percidae
Walleye	<i>Stizostedion vitreum</i>	Percidae
Western Mosquitofish	<i>Gambusia affinis</i>	Poeciliidae
Paddlefish	<i>Polyodon spathula</i>	Polyodontidae
Freshwater Drum	<i>Aplodinotus grunniens</i>	Sciaenidae

Appendix I

Sample Locations and Dates

Sample Sites, Locations and Dates

Fall

2TR1F (Site 1)	Sand Springs near Shell Creek	10/20/06
2TR2F (Site 2)	Zink Lake, Tulsa	10/25/06
2TR3F (Site 3)	61 st & Riverside Drive, Tulsa	10/12/06
2TR4F (Site 4)	96 th & Riverside Drive, Jenks	10/09/06
2TR5F (Site 5)	Tulsa/Wagoner County Line	10/17/06

Winter

2TR1W (Site 1)	Sand Springs near Shell Creek	01/11/07
2TR2W (Site 2)	Zink Lake, Tulsa	01/26/07
2TR3W (Site 3)	61 st & Riverside Drive, Tulsa	01/19/07
2TR4W (Site 4)	96 th & Riverside Drive, Jenks	01/09/07
2TR5W (Site 5)	Tulsa/Wagoner County Line	01/31/07

Spring

2TR1S (Site 1)	Sand Springs near Shell Creek	04/17/07
2TR2S (Site 2)	Zink Lake, Tulsa	04/11/07
2TR3S (Site 3)	61 st & Riverside Drive, Tulsa	04/12/07
2TR4S (Site 4)	96 th & Riverside Drive, Jenks	04/16/07
2TR5S (Site 5)	Tulsa/Wagoner County Line	04/24/07

Summer

2TR1SM (Site 1)	Sand Springs near Shell Creek	09/12/07
2TR2SM (Site 2)	Zink Lake, Tulsa	08/17/07
2TR3SM (Site 3)	61 st & Riverside Drive, Tulsa	08/28/07
2TR4SM (Site 4)	96 th & Riverside Drive, Jenks	09/11/07
2TR5SM (Site 5)	Tulsa/Wagoner County Line	09/13/07

Appendix II

Fall Sample Field Log Sheets

FALL

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 1 - Sand Springs DATE: 10-20-06

COLLECTION ID: 2TRIF START TIME: 0841 TEAM: Brent, Amie Sparky, Annie

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	Transect <u>5</u> <input checked="" type="checkbox"/> Latitude North	Transect <u>5</u> <input checked="" type="checkbox"/> Longitude West
Map		
GPS	<u>36°08'32.393"</u>	<u>96°09'00.464"</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered - Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site: Shell Creek area above Sand Springs

STRIF
10/20/06

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

- One channel
- Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)
- Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)
- Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bankfull)
- Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)
- Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 101.27 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 75% Gravel 5% Cobble 20% Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	9.89	
Specific Conductance (µS/cm)	1751	
Temperature (°C)	12.72	
Time of day	11:56:33	

comments: GPS coordinates: 36° 08' 34.716" N 96° 09' 03.360" W for the in-situ measurements

WATERS

Appendix D - Sample Allocation Form

Site ID 1 Date 10-19-06 Data Tabulator Amie Reviewed By _____

X	1		2		3		4		5		6		7		8		9		10		
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	
0-351	NW ₁	NW ₃	0-200	NW ₆	0-188	NW ₁₁	0-293	NW ₁₄	0-223	NN ₆	0-162	NW ₆₀	0-144	NW ₂₄	0-17	BW ₁₂	0-69	NW ₁₂	0-59	NW ₂₈	
351-412	SS ₁	BW ₁	200-216	BW ₄	188-211	BW ₁	293-341	SS ₅	223-227	BW ₆	162-176	BW ₆	144-151	BW ₁₀	17-95	NW ₁₀	69-87	SS ₁₂	59-96	SF ₁	
412-433	DS ₁	NW ₄	216-367	NW ₄	211-304	NW ₁₂	341-426	NW ₁₅	227-279	NW ₁₁	176-188	NW ₂₁	151-159	NW ₂₅	75-118	SS ₁₀	87-227	SS ₁₂	96-191	SF ₁	
433-490	NW ₂	SS ₂	367-373	SS ₂	304-311	SS ₄			279-297	BW ₃	188-192	BW ₄	159-271	SS ₉	118-193	DS ₂	227-412	NW ₂₇	191-349	NW ₂₁	
		NW ₅	373-438	NW ₁₀	311-416	NW ₁₅			297-346	SS ₆	192-215	NW ₂₂	271-429	NW ₂₅	193-228	SS ₁₁			349-389	BW ₁₅	
		BW ₂							346-354	NW ₁₂	215-323	SS ₈	429-433	BW ₁₁	228-406	NW ₂₇					
		NW ₆							354-394	SS ₇	333-450	NW ₂₅									
		NW ₇							394-476	NW ₁₇											

Habitat Code	X	Sample Size										Total	Details
		1	2	3	4	5	6	7	8	9	10		
SS	1	1	1	1	2	1	1	1	2	1	0	12	
SF	0	0	0	0	0	0	0	0	0	0	1	1	
DS	1	0	0	0	0	0	0	1	0	0	0	2	
DF	0	0	0	0	0	0	0	0	0	0	0	0	
NW	2	5	3	2	4	4	3	2	2	2	2	32	
BW	0	3	1	1	2	2	2	1	0	0	1	13	

* NW on this sheet stands for No water or Dry areas

APPENDIX E - Fish Collection Form 36°08'30.155"N 96°09'05.785"W

River ID: Ark Date: 10-20-06 Collector(s): Brent, Amie Anne

Site ID: 1-Sand Springs Collection ID: 2TRIF-BW8 Stratum ID: BW8-T6 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>1013</u>		<u>162-176</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

NO FISH

APPENDIX E - Fish Collection Form 36°08'38.057"N 96°09'15.749"W

River ID: Ark Date: 10-20-06 Collector(s): Brent, Amie Anne

Site ID: <u>1-Sand Springs</u>	Collection ID: <u>2TRIF-SF1</u>	Stratum ID: <u>SF₁-T10</u>	Haul ID: <u>NA</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>1132</u>		<u>59-196</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

NO Fish

FALL

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 2-Zink Lake DATE: 10-25-06

COLLECTION ID: 2TR2F START TIME: 0827 TEAM: Brent Sparky, Amie, Anne

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	<u>Transsect 5</u> <input checked="" type="checkbox"/> Latitude North	<u>Transsect 5</u> <input checked="" type="checkbox"/> Longitude West
Map		
GPS	<u>36°07'49.570"</u>	<u>95°59'25.818"</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES IF YES, check one below	<input type="checkbox"/> NO IF NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered - Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site: Zink Lake @ Rowing Club ramp

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bankfull)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 181.91 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 90% Gravel Cobble Boulder Bedrock 10%

Water Properties		
In-situ measurements		Comments
Dissolved Oxygen (mg/L)	13.14	
Specific Conductance (µS/cm)	1632	
Temperature (°C)	16.03°C	
Time of day	1221	

comments: GPS coordinates 36° 08' 02.015" N 95° 59' 42.571" W for in-situ measurements

Appendix D - Sample Allocation form

3 of 48

Site ID 2 Date 10-24/25-06 Data Tabulator Annie Reviewed By _____

X	1		2		3		4		5		6		7		8		9		10	
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC
0-63	NW ₁	NW ₄	0-5	NW ₇	0-9	NW ₁₄	0-5	NW ₁₉	0-5	NW ₂₄	0-5	NW ₂₈	0-5	NW ₃₈	0-9	BW ₂₂	0-21	NW ₃₉	0-7	BW ₂₈
63-92	BW ₁	BW ₆	5-48	BW ₅	9-171	NW ₁₁	4-10	BW ₁₂	5-14	BW ₁₅	5-40	BW ₁₅	5-50	BW ₁₈	9-46	NW ₃₁	21-40	BW ₂₇	7-70	NW ₄₄
92-104	NW ₈	NW ₅	48-202	NW ₈	171-176	BW ₈	10-84	NW ₁₅	44-45	NW ₂₀	40-124	NW ₂₅	50-77	NW ₂₉	46-60	BW ₂₃	40-89	NW ₄₀	70-97	SF ₂
104-130	BW ₂	BW ₄	202-229	BW ₆	176-237	NW ₁₂	84-92	BW ₁₀	45-50	BW ₁₅	124-145	BW ₁₆	77-123	BW ₁₉	60-125	NW ₂₅	87-148	SS ₈	97-109	DF ₁
130-195	NW ₃	NW ₆	229-274	NW ₉	237-299	SS ₁₁	92-149	NW ₁₆	50-157	NW ₂₁	145-148	NW ₂₄	122-162	NW ₂₀	125-162	SF ₂	148-179	NW ₄₁	104-169	NW ₄₅
195-270	SS ₁	SS ₂	274-358	SS ₃	299-431	NW ₁₅	149-159	BW ₁₁	157-165	BW ₁₄	148-312	SS ₇	162-197	SF ₁	162-205	NW ₂₆	197-222	SS ₉	169-258	SS ₁₀
270-344	DS ₁		358-397	NW ₁₀			159-213	NW ₁₇	165-177	NW ₂₂	312-349	NW ₂₇	197-237	NW ₃₁	205-211	BW ₂₄	232-287	NW ₄₂	258-270	NW ₄₆
							213-370	SS ₅	177-331	SS ₆	349-366	BW ₁₇	237-293	BW ₂₁	211-218	NW ₃₇	287-298	BW ₂₈	276-294	BW ₂₈
							370-396	NW ₁₈	381-395	NW ₂₃			293-300	NW ₃₂	218-231	BW ₂₅	298-327	NW ₄₃	294-308	NW ₄₇

Habitat Code	X	Sample Size										Total	Details
		1	2	3	4	5	6	7	8	9	10		
SS	1	1	1	1	1	1	0	0	0	2	1	10	
SF	0	0	0	0	0	0	1	1	0	0	1	3	
DS	1	0	0	0	0	0	0	0	0	0	0	1	
DF	0	0	0	0	0	0	0	0	0	0	0	1	
NW	3	3	4	5	5	4	6	5	5	5	4	47	
BW	2	2	2	3	3	3	4	5	2	2	2	30	

* NW on this sheet stands for No water or Dry area

APPENDIX E - Fish Collection Form $36^{\circ}07'59.344''N$ $95^{\circ}59'43.210''W$

River ID: Ark Date: 10-25-06 Collector(s): Brent, Sparky

Site ID: 2-ZinkLake Collection ID: 2TR2F-BW23 Stratum ID: BW23-T8 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>0923</u>		<u>46-60</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

NO FISH

FALL

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 3-61st St. DATE: 10-12-06

COLLECTION ID: 2TR3F START TIME: 0800 TEAM: Brent, Sparky, Amie, Anne, Eric

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	Transect 5 <input checked="" type="checkbox"/> Latitude-North	Transect 5 <input checked="" type="checkbox"/> Longitude-West
Map		
GPS	<u>36°04'12.482" N</u>	<u>95°59'02.859" W</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered - Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site: 65th St. + Riverside Dr. @ emergency boat ramp on east side of the river.

10/18/06
 Transect #4
 JTB3F
 2 of 34

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bank full)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 152.09 m

Substrate type (check all that apply and give the % of each) Boulders Along West Bank of River.

Clay Silt Sand 92% Gravel Cobble 5% Boulder 3% Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	<u>13.36</u>	
Specific Conductance (µS/cm)	<u>1763</u>	
Temperature (°C)	<u>17.16 °C</u>	
Time of day	<u>5:10pm → 17:10</u>	

comments: GPS coordinates 36° 04' 09.045" N 75° 59' 03.056" W for in-situ measurements

Site ID 3 Date 10-12-06 Data Tabulator Amie Reviewed By Brent

X	1		2		3		4		5		6		7		8		9		10	
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC
	0-155	NW ₁	0-105	NW ₁	0-62	NW ₁₀	0-40	NW ₁₂	0-15	SS ₁	0-43	SS ₁₀	0-24	BW ₈	0-16	NW ₃₀	0-71	SS ₁₅	0-163	SS ₁₈
	155-239	SS ₁	105-175	SS ₃	62-113	DS ₁	40-64	DS ₂	15-23	DS ₃	43-60	NW ₂₂	24-56	NW ₂₇	16-28	BW ₉	71-97	NW ₃₁	163-391	NW ₃₈
	239-260	SF ₁	175-433	NW ₂	113-290	NW ₁₁	64-96	SS ₄	23-60	SS ₈	60-76	BW ₁	56-152	SS ₁₃	28-49	NW ₃₁	97-155	SS ₁₆	391-412	SS ₁₉
	260-271	NW ₂	433-495	SF ₄	290-385	SF ₅	96-265	NW ₁₃	60-107	NW ₁₈	76-107	NW ₂₃	152-339	NW ₂₈	49-97	SF ₈	155-182	NW ₃₅	412-451	NW ₃₉
	271-273	SS ₂	495-506	NW ₄			265-283	SS ₅	107-128	BW ₅	102-171	SS ₁₁	339-344	SF ₇	97-218	NW ₃₂	162-184	BW ₁₁	451-464	BW ₁₂
	273-287	NW ₃					283-314	NW ₁₄	128-174	NW ₁₉	171-336	NW ₂₄	344-442	NW ₂₉	348-376	SS ₁₄	184-371	NW ₃₆	464-475	NW ₄₀
	287-300	SF ₂					314-327	SS ₆	174-253	SF ₆	338-344	SS ₁₂			376-407	NW ₃₃	371-388	SS ₁₇		
	300-311	NW ₄					327-399	NW ₁₅	253-424	NW ₂₀	344-375	NW ₂₅			407-424	BW ₁₀	388-470	NW ₃₇		
	311-329	BW ₁					399-404	BW ₂	424-445	SS ₉	375-382	BW ₇								
	329-378	SF ₃					404-424	NW ₁₆	445-485	NW ₂₁	382-408	NW ₂₆								
	378-388	NW ₅					424-444	BW ₄												
	388-406	BW ₂					444-464	NW ₁₇												
	406-427	NW ₆																		

Habitat Code	Sample Size										Total	Details	
	X	1	2	3	4	5	6	7	8	9			10
SS	2	1	0	3	3	3	1	1	3	2	1	20	
SF	3	1	1	0	0	0	0	0	0	0	0	8	
DS	0	0	1	1	0	0	0	0	0	0	0	2	
DF	0	0	0	0	0	0	0	0	0	0	0	0	
NW	6	3	2	6	4	5	3	4	3	3	2	41	
BW	2	0	0	2	1	2	1	2	1	1	1	13	

* NW on this sheet stands for No Water or Dry areas

APPENDIX E - Fish Collection Form $36^{\circ}04'02.336''N$ $195^{\circ}59'06.177''W$

River ID: ACK Date: 10-12-06 Collector(s): Sparky, Amie

Site ID: 3-61554 Collection ID: 2TR3F-DS1SH Stratum ID: DS₁-T2 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input checked="" type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input checked="" type="checkbox"/> Small	13:50	1037 ⁽¹⁰⁻¹³⁾	62-113
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
longear sunfish	2					
redear sunfish	1					
bluegill	1					
smallmouth buffalo	1					

APPENDIX E - Fish Collection Form 36°03'55.283"N 95°59'00.729W

River ID: Ark Date: 10/12/06 Collector(s): Orent, Anne, Anne, 3 others

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR3F-SS1</u>	Stratum ID: <u>SB1-TX</u>	Haul ID: <u>NA</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>0926</u>	<u>0935</u>	<u>155-289</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
						<u>NO FISH</u>

APPENDIX E - Fish Collection Form 36°01'41.784"N 95°57'31.163"W

River ID: Ark Date: 10/12/00 Collector(s): Brent, Anne, Amie, Sparky

Site ID: <u>3-61st</u>	Collection ID: <u>2TR3F-BW2</u>	Stratum ID: <u>BW2-TX</u>	Haul ID: <u>NA</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>0907</u>	<u>0912</u>	<u>388-406</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
	<u>NO FISH</u>					

FALL

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: ACK SITE ID: 4-Jenks DATE: 10-9-06
 COLLECTION ID: 2TR4F START TIME: 1026 TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): not verified (explain in comments)

Coordinates	Transsect 5 X Latitude North	Transsect 5 X Longitude West
Map		
GPS	36°01'57.449" N	95°57'38.431" W

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
<p>Sampleable (choose method used)</p> <p>River Type:</p> <p><input type="checkbox"/> Wadeable</p> <p><input type="checkbox"/> Partially Boatable</p> <p><input type="checkbox"/> Boatable</p> <p><input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach</p> <p><input type="checkbox"/> Boatable interrupted - Not continuous water along reach</p> <p><input type="checkbox"/> Altered - Stream/River present but not as on map</p>	<p>Non-sampleable - Permanent</p> <p><input type="checkbox"/> Dry - Visited</p> <p><input type="checkbox"/> Dry - Not visited</p> <p><input type="checkbox"/> Wetland (No definable channel)</p> <p><input type="checkbox"/> Map error - No evidence of channel/waterbody ever present</p> <p><input type="checkbox"/> Impounded (Underneath lake or pond)</p> <p><input type="checkbox"/> Other (explain in comments)</p> <p>Non-sampleable - Temporary</p> <p><input type="checkbox"/> Not boatable - Need a different crew</p> <p><input type="checkbox"/> Not wadeable - Need a different crew</p> <p><input type="checkbox"/> Other (Explain in comments)</p> <p>No Access</p> <p><input type="checkbox"/> Access permission denied</p> <p><input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site)</p> <p><input type="checkbox"/> Temporarily inaccessible (Explain in comments)</p>

Description:

Directions To Site: Between 91st + 96th streets and Riverside Dr.

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bank full)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 119.09 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 100% Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	13.17	
Specific Conductance (µS/cm)	1516	
Temperature (°C)	19.43°C	
Time of day		

comments: GPS coordinates: 36° 01' 30.052" N 95° 57' 24.427" W for in-situ measurements

Site ID: 4 Date: 10-9-06 Data Tabulator: Amie Reviewed By: Brent

X	1		2		3		4		5		6		7		8		9		10			
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC		
0-31	SS ₁	0-8	NW ₄	0-67	NW ₈	0-60	NW ₁₀	0-153	DS ₁	0-82	DS ₂	0-36	DS ₃	0-84	DS ₄	0-13	DS ₅	0-54	SF ₆	0-70	SF ₅	
31-41	NW ₁	8-32	BW ₂	67-193	SS ₂	60-188	SS ₃	153-320	NW ₁₃	82-344	NW ₁₅	36-106	SS ₄	84-499	NW ₁₇	13-84	SS ₅	54-80	DS ₆	70-107	NW ₂₀	
41-53	BW ₃	32-88	NW ₅	193-433	NW ₉	188-338	NW ₁₁	320-331	BW ₁₄	344-403	BW ₁₅	106-534	NW ₁₆			84-475	NW ₁₈	80-154	NW ₁₉	107-126	BW ₁	
53-187	NW ₂	88-109	SF ₂			338-389	BW ₁₃	331-395	NW ₁₄			534-565	BW ₁₆								126-453	NW ₂₁
187-250	SF ₁	109-127	NW ₆			389-401	NW ₁₂															
250-435	NW ₃	127-202	SF ₃																			
		202-537	NW ₇																			

Habitat Code	X	1	2	3	4	5	6	7	8	9	10	Total	Sample Size	Details
SS	1	0	1	1	0	0	1	0	1	0	0	5		
SF	1	2	0	0	0	0	0	0	0	1	1	5		
DS	0	0	0	0	1	1	1	1	1	1	0	6		
DF	0	0	0	0	0	0	0	0	0	0	0	0		
NW	3	4	2	3	2	1	1	1	1	1	2	21		
BW	1	1	0	1	1	1	1	0	0	0	1	7		

* NW on this sheet stands for No Water or Dry areas

Form 2

APPENDIX E - Fish Collection Form 36°61'57.505"N 95°57'30.069"W

River ID: Ark River Date: 10/9/04 Collector(s): Dani, Annie, Anne, Sperry

Site ID: 4-Jenks Collection ID: 2TRYF-BW4 Stratum ID: BW4-T4 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	20 meters	18:25		320-334
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

NO FISH

APPENDIX E - Fish Collection Form 36°02'00.793"N 95°57'43.017"W

River ID: ARK River Date: 10/9/06 Collector(s): Brent, Anne, Amie, Sparky

Site ID: ~~200~~ F4-Jenks Collection ID: 2TR4F-SS4 Stratum ID: SS4-T6 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	20 meters	17:40		36-106
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

Site 5

1 of 24

FALL

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 5 - Wagoner County line DATE: 10-17-06

COLLECTION ID: 2TR5F START TIME: 0920 TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	Transsect 5 <input checked="" type="checkbox"/> Latitude North	Transsect 5 <input checked="" type="checkbox"/> Longitude West
Map		
GPS	35°55'23.238" N	95°45'50.052" W

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered - Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site: J&J sand plant @ Wagoner county line

JTRSF
10/17/06

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bank full)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 195.64 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 100% Gravel Cobble Boulder Bedrock

Water Properties		
In-situ measurements		Comments
Dissolved Oxygen (mg/L)	10.85	
Specific Conductance (µS/cm)	1240	
Temperature (°C)	23.20°C	
Time of day	14:26:11	

comments: GPS coordinates: 35° 55' 24.309" N 95° 45' 43.406" W for in-situ measurements.

Site ID 5 Date 10-16-06 Data Tabulator Amie Reviewed By Brent

X	1		2		3		4		5		6		7		8		9		10	
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC
	0-149	NW ₁	0-513	NW ₄	0-329	NW ₅	0-127	NW ₇	0-51	NW ₁₂	0-31	SF ₈	0-20	NW ₁₄	0-17	BW ₂	0-63	NW ₂₃	0-9	BW ₅
	149-166	BW ₁	513-661	DS ₃	329-346	SF ₁	127-144	SF ₃	51-72	SF ₆	31-217	NW ₁₆	20-43	SF ₁₁	11-57	NW ₂₃	63-90	SS ₇	1-14	NW ₃₁
	166-557	NW ₂			346-426	NW ₆	144-205	NW ₈	72-280	NW ₁₅	217-277	SS ₅	43-123	NW ₂₀	57-96	SF ₁₁	90-113	NW ₂₈	14-49	SS ₈
	557-608	SS ₁			426-519	SF ₂	205-223	SF ₄	280-291	SS ₃	277-481	NW ₁₇	123-156	SS ₆	96-728	NW ₂₄	113-134	SF ₁₄	49-190	NW ₃₂
	608-686	DS ₁			519-686	DS ₄	223-282	NW ₉	291-504	NW ₁₄	481-639	DF ₂	156-454	NW ₂₁	428-525	SF ₁₂	134-278	NW ₂₄	190-211	SF ₁₇
							282-311	SF ₅	504-587	SF ₇	639-657	NW ₁₈	454-503	SF ₁₀	525-536	NW ₂₅	178-322	SF ₁₅	211-238	NW ₃₃
							311-503	NW ₁₀	587-704	NW ₁₅	657-671	NW ₁₈	503-557	NW ₂₂	536-543	SF ₁₃	222-460	NW ₂₀	238-247	SF ₁₈
							503-624	DF ₁	704-721	SS ₄			557-633	DF ₃	543-571	NW ₁₆	460-590	SF ₁₆	247-440	NW ₃₄
							624-698	DS ₅	721-737				633-657		571-622	DF ₄	590-602	DS ₆	440-464	SF ₁₉
							698-737	NW ₁₁											464-480	DF ₅
																			480-523	SF ₂₀
																			523-545	NW ₃₅
																			545-566	SF ₂₁
																			566-570	NW ₃₆
																			570-578	SF ₂₂
																			578-590	NW ₃₇

* NW in this sheet indicates Dry or No Water areas

Habitat Code	X	1	2	3	4	5	6	7	8	9	10	Total	Sample Size	Details
SS	1	1	0	0	0	2	1	1	0	1	1	8		
SF	0	0	0	2	2	2	1	2	3	3	6	22		
DS	1	1	1	1	0	0	0	0	0	0	0	5		
DF	0	0	0	0	0	0	0	1	1	1	1	6		
NW	0	0	0	0	0	0	0	0	0	0	0	0		
BW	1	0	0	0	0	0	0	0	1	0	1	3		

* NW in this sheet stands for No Water or dry areas

APPENDIX E - Fish Collection Form 35° 55' 32.657" N 95° 45' 42.312" W

River ID: ARK Date: 10-17-06 Collector(s): Sparky, Brent

Site ID: <u>5-county line</u>	Collection ID: <u>2TR5F-DE34</u>	Stratum ID: <u>DF₃-T7</u>	Haul ID: <u>NA</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input checked="" type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input checked="" type="checkbox"/> Small	1200	1045	559-633
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

NO FISH

APPENDIX E - Fish Collection Form 35°55'34.782"N 95°45'43.792"W

River ID: Ark Date: 10-17-06 Collector(s): Sparky, Brent

Site ID: <u>5-county line</u>	Collection ID: <u>2TR5E-DF44</u>	Stratum ID: <u>DF4-T8</u>	Haul ID: <u>NA</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input checked="" type="checkbox"/> Hoop Net	<input checked="" type="checkbox"/> Large <input type="checkbox"/> Small	1130	1035	571-622
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Channel catfish	1					
Sm Buffalo	4					
Longnose croaker	1					

APPENDIX E - Fish Collection Form 35°55'25.440"N 95°45'44.298"W

River ID: Ark Date: 10-17-06 Collector(s): Brent, Amie, Anna

Site ID: 5-county line Collection ID: 2TR5F-SS4 Stratum ID: SS4-T5 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>1037</u>		<u>704-721</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gambusia</u>	<u>1</u>					
<u>brook silverside</u>	<u>70</u>					
<u>striped bass</u>	<u>1 (1/64)</u>					
<u>smallmouth buffalo</u>	<u>2</u>					
<u>slim minnow</u>	<u>1</u>					
<u>red shiner</u>	<u>56</u>					

Form 3

Revised 6-23-04 nju

on first seine haul
* collected 1 unidentified shiner + multiple on 2nd (black spot on tail) 38

APPENDIX E - Fish Collection Form 35°55'23.720"N 95°46'03.865"W

River ID: Ark Date: 10-17-06 Collector(s): Brent, Amie, Anne

Site ID: 5-county line Collection ID: 20R5F-SF8 Stratum ID: SF8-T6 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>1115</u>		<u>0-31</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>river shiner</u>	<u>2</u>					
<u>gambusia</u>	<u>2</u>					
<u>slim minnow</u>	<u>1</u>					
<u>brook silverside</u>	<u>2</u>					
<u>red shiner</u>	<u>385</u>					

APPENDIX E - Fish Collection Form 35°55'32.544"N 95°45'49.571"W

River ID: Ark Date: 10-17-06 Collector(s): Brent, Amie, Anne

Site ID: 5-county line Collection ID: 2TR5F-SF16 Stratum ID: SF16-T9 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>1241</u>		<u>460-590</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>NO FISH</u>						

APPENDIX E - Fish Collection Form 35°55'34.805"N 95°46'08.133"W

River ID: Ark Date: 10-17-06 Collector(s): Brent, Amie, Anne

Site ID: 5-county line Collection ID: 2TR5F-BW3 Stratum ID: BW₂-T10 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	20 meters	1315		0-9
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
river carpsucker	3					
brook silverside	4					
red shiner	1291					
slim minnow	31					

Appendix III

Winter Sample Field Log Sheets

Winter

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: <u>Ark</u>	SITE ID: <u>1-Sand Springs</u>	DATE: <u>1-11-07</u>
COLLECTION ID: <u>2TR1W</u>	START TIME: <u>0941</u>	TEAM: <u>Gordon</u>

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
other (describe here): not verified (explain in comments)

Coordinates	Transect <u>S</u> <input checked="" type="checkbox"/> Latitude North	Transect <u>S</u> <input checked="" type="checkbox"/> Longitude West
Map		
GPS	<u>36° 8' 31.675"</u>	<u>96° 9' 00.853"</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
<p>Sampleable (choose method used)</p> <p>River Type:</p> <p><input checked="" type="checkbox"/> Wadeable</p> <p><input type="checkbox"/> Partially Boatable</p> <p><input type="checkbox"/> Boatable</p> <p><input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach</p> <p><input type="checkbox"/> Boatable interrupted - Not continuous water along reach</p> <p><input type="checkbox"/> Altered - Stream/River present but not as on map</p>	<p>Non-sampleable - Permanent</p> <p><input type="checkbox"/> Dry - Visited</p> <p><input type="checkbox"/> Dry - Not visited</p> <p><input type="checkbox"/> Wetland (No definable channel)</p> <p><input type="checkbox"/> Map error - No evidence of channel/waterbody ever present</p> <p><input type="checkbox"/> Impounded (Underneath lake or pond)</p> <p><input type="checkbox"/> Other (explain in comments)</p> <p>Non-sampleable - Temporary</p> <p><input type="checkbox"/> Not boatable - Need a different crew</p> <p><input type="checkbox"/> Not wadeable - Need a different crew</p> <p><input type="checkbox"/> Other (Explain in comments)</p> <p>No Access</p> <p><input type="checkbox"/> Access permission denied</p> <p><input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site)</p> <p><input type="checkbox"/> Temporarily inaccessible (Explain in comments)</p>

Description: _____

Directions To Site: _____

APPENDIX C - Channel Properties Form

2TR1W

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<~10 x bank full)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 102.36 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 75% Gravel 5% Cobble 20% Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	3.93	
Specific Conductance (µS/cm)	1581	
Temperature (°C)	11.59	
Time of day	15:11:04	

comments: GPS coordinates: 36° 08' 49.552" N 96° 10' 14.218" W taken for in-situ measurements

WINTER

Appendix D - Sample Allocation Sheet

Site ID 1 Date 1-10-07 Data Tabulator Amie Reviewed By Brent

X	1		2		3		4		5		6		7		8		9		10	
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC
0-240	NW1	NW3	0-217	NW5	0-239	NW8	0-241	NW11	0-336	NW14	0-168	NW20	0-182	NW24	0-93	NW28	0-67	NW30	0-52	NW33
240-270	SS1	SS2	217-227	BW2	231-260	BW3	241-250	SS5	282-290	BW4	168-172	BW7	132-138	BW9	183-226	SS11	67-76	BW10	52-188	SS13
270-310	DS1	NW4	227-233	NW6	260-353	NW9	250-272	NW12	276-283	NW15	172-189	NW21	128-135	NW25	226-407	NW29	76-87	NW31	188-222	NW34
310-380	NW2	BW1	233-286	SS3	353-418	SS4	272-302	SS6	283-307	BW5	187-194	BW8	135-143	BW10	407-407		87-199	SS13	222-346	BW12
			386-455	NW7	418-481	NW10	302-374	NW13	307-315	NW16	171-217	NW22	141-143	NW26			197-376	NW32	346-376	NW35
									316-343	SS7										
									343-369	NW17										
									369-391	SS8										
									391-441	NW18										
									441-446	BW6										
									446-474	NW19										

Habitat Code	X	1	2	3	4	5	6	7	8	9	10	Total	Sample Size	Details
SS	1	1	1	1	2	2	1	1	1	1	1	13		
SF	0	0	0	0	0	0	0	0	0	0	0	0		
DS	1	0	0	0	0	0	0	0	0	0	0	1		
DF	0	0	0	0	0	0	0	0	0	0	0	0		
NW	2	2	3	3	6	4	4	4	2	3	3	35		
BW	0	1	1	1	3	2	2	0	0	1	2	13		

* NW on this sheet stands for No Water or Dry areas
 13 89ms
 8 40r

Winter

1 of 12

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 2-Zink Lake DATE: 1-26-07

COLLECTION ID: 2TR2W START TIME: 1018 TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	<u>Profile 5</u> <input checked="" type="checkbox"/> Latitude North	<u>Profile 5</u> <input checked="" type="checkbox"/> Longitude West
Map	<u>Winter</u> <u>36° 07' 24.658"</u>	<u>Winter</u> <u>95° 59' 12.420"</u>
GPS	<u>36° 07' 24.658"</u>	<u>95° 59' 12.420"</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input checked="" type="checkbox"/> Boatable <input type="checkbox"/> Wadeable interrupted - Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered - Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site:

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

- One channel
- Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)
- Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)
- Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<- 10 x bankfull)
- Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)
- Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 362 m 362

Substrate type (check all that apply and give the % of each)

- Clay
- Silt
- Sand 90%
- Gravel
- Cobble
- Boulder
- Bedrock 10%

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	5.09	
Specific Conductance (µS/cm)	1086	
Temperature (°C)	7.97	
Time of day	1350	

comments:
 in-situ GPS coordinates 36°08'02.250"N 95°59'47.107"W

APPENDIX E - Fish Collection Form 36°08'11.931"N 95°59'54.696"W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Annie, Lori

Site ID: 2-Zink Lake Collection ID: 2TRW- Stratum ID: P10/P9-W Haul ID: VA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1018</u>	<u>1027</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	411					
green sunfish	111					
longear sunfish	11					
largemouth	1					
bluegill/green	1					

Form 3

Revised 6-23-04 jtu

rocky shore line - rip rap

13 fish

APPENDIX E - Fish Collection Form 36°08'11.931"N 95°59'54.696"W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Amie, Lori

Site ID: 2-ZinkLake Collection ID: 2TR2W Stratum ID: P9/P8-E Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1037</u>	<u>1044</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	1					
river carp sucker	1111					
gizzard shad	444					
channel catfish	1					
longear sunfish	4441					
bluegill	1					

Form 3 Revised 6-23-04 jui

* started in sand substrate and ended in befrack
38 18 fish

APPENDIX E - Fish Collection Form 36°07'59.351"N 95°59'44.413"W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Amie, Lori

Site ID: 2-Zink Lake Collection ID: 2TR2W Stratum ID: P8/P7-W Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1058</u>	<u>1106</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	1					
longear	111					
spotted bass	11					
bluegill	1					

Form 3 Revised 6-23-04 jju

* started shocking about 30 meters from bank due to shallow depth

38 9 fish

APPENDIX E - Fish Collection Form 36°07'57.907"N 95°59'30.247"W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Amie, Lori

Site ID: 2-Zink Lake Collection ID: 2TR2W Stratum ID: P7/P6-E Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1130</u>	<u>1138</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	 = 23					
drum	1					
spotted bass	= 3					
river carpsucker	= 3					
longear	= 2					
silverside	= 4					

Form 3 Revised 6-23-04 jju

* around bridge pilings

36 fish

APPENDIX E - Fish Collection Form 36°07'47.323"N 95°59'37.652"W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Annie, Lori

Site ID: 2-ZinkLake Collection ID: 2TR2W Stratum ID: Pb/P5-W Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1147</u>	<u>1157</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
silverside						
spotted bass	1					
river carpsucker						
gizzard shad						
green sunfish	1					
longear sunfish						

Form 3

Revised 6-23-04 ajg

19 fish

APPENDIX E - Fish Collection Form 36°07'48.361"N 95°59'21.943"W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Amie, Lori

Site ID: 2-Zink Lake Collection ID: 2TR2W Stratum ID: P5/P4-E Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1211</u>	<u>1218</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
river carpsucker	1+2+1+1+4+7+7=59					
gizzard shad	1+4+5+4+4+1+1+1+6+29=68					
carp	11+4+11+3=29					
smallmouth buffalo	3+1=4					
longear	1					
spotted bass	1					

164 fish

APPENDIX E - Fish Collection Form 36° 07' 24.658" N 95° 59' 12.420" W

River ID: Ark Date: 1-26-07 Collector(s): Brent, Sparky, Amie, Lori

Site ID: 2-Zink Lake Collection ID: 2TR2W Stratum ID: P/PA-E Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1326</u>	<u>1332</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	2					
gizzard shad	2+3+2=7					
green sunfish	11					
bluegill	1					
spotted bass	1					
longear	1111					

Form 3

Revised 6-23-04 jju

17 fish

Winter

1 of 40

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 3-61st St. DATE: 1-19-07

COLLECTION ID: 2TR3W START TIME: _____ TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	Transsect S <input checked="" type="checkbox"/> Latitude North	Transsect S <input checked="" type="checkbox"/> Longitude West
Map	36° 04' 11.851	95° 59' 05.631
GPS	36° 04' 12.559	95° 59' 02.734

Did You Sample This Site?

<input checked="" type="checkbox"/> YES IF YES, check one below	<input type="checkbox"/> NO IF NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input checked="" type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input checked="" type="checkbox"/> Wadeable interrupted - Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered - Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site:

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bank full)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 178.64 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 92% Gravel Cobble 5% Boulder 3% Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	5.52	
Specific Conductance (µS/cm)	2308	
Temperature (°C)	5.57	
Time of day	1810	

comments:

GPS coordinates: 36° 04' 11.851" N
 take from 95° 59' 05.637" W
 in-situ location

APPENDIX E - Fish Collection Form 36°04'19.222"N 95°59'15.800"W

River ID: Ark Date: 1-19-07 Collector(s): Brent, Sparky

Site ID: 3-61st St Collection ID: 2123W-BW6 Stratum ID: BW16-78 Haul ID: NA

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	20 meters	1406		8-35
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gambusia</u>	<u>2</u>					
<u>river shiner</u>	<u>1</u>					

Winter

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: ARK SITE ID: 4-Junks DATE: 1-09-07

COLLECTION ID: 2TR4FF START TIME: 9:00 am TEAM: Brent Amie Don Ani

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
other (describe here): not verified (explain in comments)

Coordinates	Transsect <u>5</u> <input checked="" type="checkbox"/> Latitude North	Transsect <u>5</u> <input checked="" type="checkbox"/> Longitude West
Map		
GPS	<u>36°01'58.801"</u>	<u>95°57'34.589"</u>

Did You Sample This Site?

YES If YES, check one below

NO If NO, check one below

Sampleable (choose method used)

River Type:

- Wadeable
- Partially Boatable
- Boatable

- Wadeable interrupted - Not continuous water along reach
- Boatable interrupted - Not continuous water along reach
- Altered - Stream/River present but not as on map

Non-sampleable - Permanent

- Dry - Visited
- Dry - Not visited
- Wetland (No definable channel)
- Map error - No evidence of channel/waterbody ever present
- Impounded (Underneath lake or pond)
- Other (explain in comments)

Non-sampleable - Temporary

- Not boatable - Need a different crew
- Not wadeable - Need a different crew
- Other (Explain in comments)

No Access

- Access permission denied
- Permanently inaccessible (Unable/unsafe to reach site)
- Temporarily inaccessible (Explain in comments)

Description:

Junks Site up River from 96th St Bridge

Directions To Site:

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)

Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<= 10 x bank full)

Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 124.36 m

Substrate type (check all that apply and give the % of each)

Clay Silt 100% Sand 10% Gravel Cobble Boulder Bedrock

Water Properties		
In-situ measurements		Comments
Dissolved Oxygen (mg/L)	<u>10.20 / 3.28</u>	
Specific Conductance (µS/cm)	<u>872</u>	
Temperature (°C)	<u>17.00</u>	
Time of day	<u>10:02:43</u>	

comments:

Appendix D- Sample Allocation sheet

Winter

Site ID 4 Date 1-8-07 Data Tabulator Amie Reviewed By Brent

X	1		2		3		4		5		6		7		8		9		10	
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC
0-31	SS1	BW2	0-21	NW14	0-45	NW18	0-42	SS10	0-64	DS2	0-31	DS3	0-84	DS4	0-77	SS12	0-10	BSW15		
31-48	NW13	NW5	21-26	BW5	45-51	BW7	42-96	DS1	61-345	NW25	31-96	SS12	81-391	NW27	77-489	NW28	10-15	NW29		
48-56	BW1	BW3	26-72	NW12	51-61	NW19	96-126	SS11	315-380	BW11	76-370	NW26	391-408	BW13	187-499	BW14	10-15	NW29		
56-200	NW2	NN6	72-214	SS5	61-176	SS8	126-364	NW22												
200-250	SF1	SF2	211-313	NW15	71-330	NW20	301-307	BW9												
250-204	NW9	NW7	378-375	SS4	330-336	BW8	307-330	NW23												
204-231	SS2	SS3	375-460	NW14	336-384	NW21	330-355	BW10												
231-476	NW4	NW8	218-277	NW8	384-398	SS9	355-386	NW24												
			297-318	SS4																
			318-379	NW9																
			379-386	BW4																
			386-483	NW15																

Habitat Code	X	Total										Sample Size	Details
		1	2	3	4	5	6	7	8	9	10		
SS	2	2	2	1	2	2	0	1	0	1	2	15	
SF	1	1	0	0	0	0	0	0	0	0	0	2	
DS	0	0	0	0	1	1	1	1	1	0	0	4	
DF	0	0	0	0	0	0	0	0	0	0	0	0	
NW	4	6	4	3	3	1	1	1	1	1	3	31	
BW	1	3	1	2	2	1	1	1	1	1	1	15	

* NW on this sheet stands for No Water or Dry areas

Total 23 seine sites
2 SF
6 SS

APPENDIX E - Fish Collection Form 36°01'43.753"N 95°57'26.226"W

River ID: Ark Date: 1-9-07 Collector(s): Brent, Amie, Anne

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR4W-SF</u>	Stratum ID: <u>SF1-TX</u>	Haul ID: <u>NA</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>20 meters</u>	<u>0923</u>		<u>200-250</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

Form 3

Revised 6-23-04 jju

NO FISH

Winter

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 5-Wagoner County line DATE: 1-31-07

COLLECTION ID: 2TR5W START TIME: 0924 TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): not verified (explain in comments)

Coordinates	<input checked="" type="checkbox"/> Latitude North	<input checked="" type="checkbox"/> Longitude West
Map		
GPS	<u>T5 - 35°55'24.800"</u>	<u>95°45'50.812"</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES If YES, check one below	<input type="checkbox"/> NO If NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input checked="" type="checkbox"/> Wadeable interrupted -- Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered -- Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error -- No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable -- Need a different crew <input type="checkbox"/> Not wadeable -- Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description:

Directions To Site:

Appendix IV

Spring Sample Field Log Sheets

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Avk SITE ID: 1 - Sand Springs DATE: 4-17-07

COLLECTION ID: 2TRIS START TIME: 1053 TEAM: Ainc, Don

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
other (describe here): not verified (explain in comments)

Coordinates Center ~~x~~ Latitude North Center ~~x~~ Longitude West

Map

GPS

36°08'26.693"N

96°08'48.481"W

Did You Sample This Site?

YES IF YES, check one below

NO IF NO, check one below

Sampleable (choose method used)

River Type:

- Wadeable
- Partially Boatable
- Boatable

- Wadeable interrupted - Not continuous water along reach
- Boatable interrupted - Not continuous water along reach
- Altered - Stream/River present but not as on map

Non-sampleable - Permanent

- Dry - Visited
- Dry - Not visited
- Wetland (No definable channel)
- Map error - No evidence of channel/waterbody ever present
- Impounded (Underneath lake or pond)
- Other (explain in comments)

Non-sampleable - Temporary

- Not boatable - Need a different crew
- Not wadeable - Need a different crew
- Other (Explain in comments)

No Access

- Access permission denied
- Permanently inaccessible (Unable unsafe to reach site)
- Temporarily inaccessible (Explain in comments)

Description:

Shell Creek area

Directions To Site:

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

- One channel
- Anastomosing (complex) channel -- (Relatively long major and minor channels branching and rejoining)
- Braided channel -- (Multiple short channels branching and rejoining -- mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley -- (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)
- Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (< 10 x bank full)
- Channel is in broad valley and incised -- (flood flows do not commonly spread over valley floor or into multiple channels)
- Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 413 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 7% Gravel 5% Cobble 15% Boulder 5% Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)		meter faulty
Specific Conductance (µS/cm)	1415 1415	
Temperature (°C)	13.5	
Time of day	1404	

comments:

pH 8.14

3/12

APPENDIX E - Fish Collection Form

36°08'15.512"N 96°08'21.312"W

River ID: Ark Date: 4-17-07 Collector(s): Sparky, Amie

Site ID: 1-sand springs Collection ID: 2TR15 Stratum ID: P1/PX Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/100</u>	<u>1537</u>	<u>1550</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>15</u>					
<u>carp</u>						
<u>RCS</u>						
<u>smallmouth buff</u>	<u>11</u>					
<u>channel catfish</u>	<u>1</u>					
<u>white crappie</u>	<u>1</u>					

4/12

36°08'07.618"N 96°08'34.426"W

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-17-07 Collector(s): Sparky, Annie

Site ID: 1-Sand Springs Collection ID: 2TRIS Stratum ID: P2/P1 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1521</u>	<u>1531</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>19</u>					
white crappie						
silverside						
smallmouth buffalo						
<u>RCS</u>	<u>1</u>					
<u>carp</u>	<u>1</u>					
LMB						
white bass						
spotted bass						

Form 3

Revised 6-23-04 nju

5/12

APPENDIX E - Fish Collection Form 36° 08' 23.587" N 96° 08' 34.068" W

River ID: Ark Date: 4-17-07 Collector(s): Sparky, Annie

Site ID: 1-Sand Springs Collection ID: 2TR15 Stratum ID: P3/P2 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1500</u>	<u>1515</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>71+1</u>				<u>72</u>	
<u>white crappie</u>						
<u>silver side</u>	<u>11</u>				<u>11</u>	
<u>blue cat</u>	<u>1</u>					
<u>smallmouth buff</u>	<u>2+11</u>				<u>13</u>	
<u>carp</u>	<u>1</u>					
<u>LMB</u>						
<u>channel cat</u>	<u>11</u>				<u>2</u>	
<u>white bass</u>	<u>1111</u>				<u>4</u>	
<u>spotted bass</u>	<u>11</u>				<u>2</u>	
<u>RCS</u>	<u>4</u>					

Form 3

Revised 6-23-04 jju

6/12

APPENDIX E - Fish Collection Form

36°08'15.229"N 96°08'47.399"W

River ID: Ark

Date: 4-17-07

Collector(s): Sparky, Arnie

Site ID: <u>1-Sand Springs</u>	Collection ID: <u>2TRIS</u>	Stratum ID: <u>P4/B</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1450</u>	<u>1457</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp					#15	
gizzard shad	165+2				=167	
white crappie	1					
silverside	7					
RCS						
smallmouth buff						
white bass						
LMB						
bluegill						
spotted bass						

Form 3

Revised 6-23-04 nju

7/12

36°08'31.163"N 96°08'47.327"W

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-17-07 Collector(s): Sparly, Amie

Site ID: <u>1-Sand Springs</u>	Collection ID: <u>2FRIS</u>	Stratum ID: <u>P5/P4</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1416</u>	<u>1439</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	1				115	
gizzard shad	129+5+ 11 11 11				=149	
white crappie	11 11				=7	
silversides	1					
RCS						
smallmouth buff	3+1				=4	
white bass	2+1+ 11 11 11 11				=20	
spotted gar	1					
LMB	11				=2	
bluegill	1111				=4	
spotted bass	1111				=4	
blue catfish	1					
brangespotted	1					

Form 3

Revised 6-23-04 jju

8/12

APPENDIX E - Fish Collection Form

36°08'23.247"N 96°09'00.232"W

River ID: Ark

Date: 4-17-07

Collector(s): Sparky, Amie

Site ID: 1-Sand Springs Collection ID: 2TR15 Stratum ID: P6/P5 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1341</u>	<u>1357</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp						
gizzard shad	43+8+1				= 52	
white crappie	11				= 2	
silverside						
RCS	2+1				= 3	
smallmouth buff	7+111				= 10	
redear						
white bass	1111				= 6	
bluegill						
LMB						
spotted bass						
tongear						

9/12

APPENDIX E - Fish Collection Form 36° 08' 38.211" N 96° 09' 01.091" W

River ID: Ark Date: 4-17-07 Collector(s): Sparky, Annie

Site ID: 1 - Sand Springs Collection ID: 2TRIS Stratum ID: P7/P6 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1240</u>	<u>1257</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	1				#15 10/07	
gizzard shad	89+8				= 97	
white crappie	2+1				= 3	
silversides	3+					
RCS						
smallmouth buff					= 4	
redeer						
white bass	 				= 14	
bluegill	1					
LMB	1				= 2	
spotted bass						
tonacat						
striped bass	1 (175)					

Form 3

Revised 6-23-04 nju

10/12

APPENDIX E - Fish Collection Form 36°08'29.778"N 96°09'14.972"W

River ID: Ark Date: 4-17-07 Collector(s): Sparky, Amie

Site ID: 1- Sand Springs Collection ID: 2TR15 Stratum ID: P8/P7 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1215</u>	<u>1230</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	1			15 1		
smallmouth bass	11			= 2		
RCS	3+1			= 4		
Silversides	3					
gizzard shad	59					
white bass	411			= 6		
white crappie	11			= 3		
LMB	1					
striped bass	1 (218)					
spotted bass	1					

Form 3

Revised 6-23-04 jju

APPENDIX E - Fish Collection Form

36° 08' 44.602" N

96° 09' 15.446" W

11/12

River ID: Ark

Date: 4-17-07

Collector(s): Sparky, Amie

Site ID: 1-Sand Springs Collection ID: 2TR1S Stratum ID: P9/P8 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>4</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1138</u>	<u>1157</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	11			15 1 = 2		
gizzard shad	143+3+ 1111111111				= 163	
white crappie	11111111				= 9	
silversides	1					
RCS	1					
smallmouth buff	1111				= 4	
red ear						
white bass	111111				= 7	
bluegill	1					
warmouth	1					
white perch	1					

Form 3

Revised 6-23-04 jtu

APPENDIX E - Fish Collection Form

36° 08' 38.414" N 96° 09' 27.699" W 12/12

River ID: Ark Date: 4-17-07 Collector(s): Amie, Sparky

Site ID: <u>1 - Sand Springs</u>	Collection ID: <u>2TRIS</u>	Stratum ID: <u>P10/P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>8</u> pulse rate: <u>60/120</u>	<u>1109</u>	<u>1129</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	11			15 = 2		
gizzard shad	8 + IIII			= 19		
white crappie	IIII			= 13		
silversides	11			= 2		
RCS	1					
smallmouth buff	1					
redeer	1					
white bass	III			= 3		
bluegill	1					

Form 3

Revised 6-22-04 gju

1/12

36.134150 N

95.994939 W

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark

SITE ID: 2-Zink Lake

DATE: 4-11-07

COLLECTION ID: 2TR2S

START TIME: 0924

TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): not verified (explain in comments)

Coordinates

Latitude North

Longitude West

Map

GPS

36.134150 N

95.994939 W

Did You Sample This Site?

YES If YES, check one below

NO If NO, check one below

Sampleable (choose method used)

River Type:

- Wadeable
- Partially Boatable
- Boatable

- Wadeable interrupted - Not continuous water along reach
- Boatable interrupted - Not continuous water along reach
- Altered - Stream/River present but not as on map

Non-sampleable - Permanent

- Dry - Visited
- Dry - Not visited
- Wetland (No definable channel)
- Map error - No evidence of channel/waterbody ever present
- Impounded (Underneath lake or pond)
- Other (explain in comments)

Non-sampleable - Temporary

- Not boatable - Need a different crew
- Not wadeable - Need a different crew
- Other (Explain in comments)

No Access

- Access permission denied
- Permanently inaccessible (Unable/unsafe to reach site)
- Temporarily inaccessible (Explain in comments)

Description:

21st Area

Directions To Site:

36,130,750 N

95,991,900 W

2/12

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel -- (Relatively long major and minor channels branching and rejoining)

Braided channel -- (Multiple short channels branching and rejoining -- mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley -- (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (< 10 x bank full)

Channel is in broad valley and incised -- (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 432 m

Substrate type (check all that apply and give the % of each)

Clay

Silt

Sand 80%

Gravel

Cobble

Boulder

Bedrock 20%

Water Properties

In-situ measurements

Comments

Dissolved Oxygen (mg/L)

Specific Conductance (µS/cm)

Temperature (°C)

Time of day

1612

14.6

1210

main fault

comments:

Secchi 9 inches
ph 8.03

APPENDIX E - Fish Collection Form

36.125956 N

95.987569 W

3/12

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-2 in Lake</u>		Collection ID: <u>2TR2S</u>		Stratum ID: <u>PI/PX</u>		Haul ID: _____	
Gear Type (Check one)	Description	Effort					
		Start Time	End Time	Area			
<input type="checkbox"/> Seine							
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small						
<input type="checkbox"/> Gill Net							
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1152</u>	<u>1159</u>	<u>200m</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	1111					4
RCS	11					2
carp	1					1
silverside						
longear						
smallmouth biff	11					2
channel cat						
flathead						
bluegill						
spotted bass						
drum						
white bass						
white perch						
1 Fish found but not identified						

Form 3

Revised 6-23-04 nju

APPENDIX E - Fish Collection Form

36.125953 N

95.991053 W

4/12

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TR2S</u>	Stratum ID: <u>P2/P1</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1142</u>	<u>1148</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	1111	1111				14
RCS	1111	1111				9
cat						
silverside						
top gear						
smallmouth bass						
channel cat	1111					4
flathead						
bluegill	1					1
spotted bass	1					1
drum						
white bass						
white perch						

APPENDIX E - Fish Collection Form

36.128997 N

95.988347 W

5/12

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TRAS</u>	Stratum ID: <u>P3/P2</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1131</u>	<u>1137</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>111</u>	<u>1</u>			<u>6</u>	
<u>RCS</u>	<u>111111</u>	<u>111111</u>			<u>18</u>	
<u>carp</u>	<u>1</u>				<u>1</u>	
<u>siterside</u>						
<u>longear</u>	<u>111</u>				<u>3</u>	
<u>smallmouth buff</u>	<u>11</u>				<u>2</u>	
<u>channel cat</u>						
<u>flathead</u>						
<u>bluegill</u>						
<u>spotted bass</u>	<u>11</u>				<u>2</u>	
<u>drum</u>						
<u>CC</u>	<u>1</u>				<u>1</u>	
<u>white bass</u>	<u>1</u>				<u>1</u>	

Form 3

Revised 6-23-04 nju

APPENDIX E - Fish Collection Form

36.128897 N

95.992769 W 6/12

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TR25</u>	Stratum ID: <u>P4/P3</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1117</u>	<u>1125</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad				21	# total	
RCS				32		
carp	1			1		
silverside						
longear				5		
smallmouth bass						
channel cat						
flathead						
bluegill						
spotted bass				2		
drum	1			1		

Form 3

Revised 6-23-04 nju

36.131442 N

7/12

APPENDIX E - Fish Collection Form

95.990350 W

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: 2-ZinkLake Collection ID: 2TR2S Stratum ID: P5/P4 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1059</u>	<u>1110</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	7 1 1 1 1 1 1		111 111 111 111 111 111 111	111 111 111 111 111 111 111	34 34 34 34 34 34 34	
<u>RCS</u>	<u>11111111</u>				<u>10</u>	
<u>carp</u>						
<u>silversides</u>	<u>1</u>				<u>1</u>	
<u>longear</u>	<u>11</u>				<u>2</u>	
<u>small mouth buffalo</u>						
<u>channel catfish</u>						
<u>flathead</u>						
<u>bluegill</u>						

APPENDIX E - Fish Collection Form

36.131369 N

8/12

95.994431 W

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: 2-Zink Lake Collection ID: 2TR25 Stratum ID: P6/P5 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1048</u>	<u>1055</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Smallmouth bass	3					
RCS	27					
Silversides	12					
Gizzard shad	41+4=45					
Spotted bass	3					
channel cat	3					
-						

36.134233 N

9/12

APPENDIX E - Fish Collection Form

95.992578 W

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TR25</u>	Stratum ID: <u>P7/P6</u>	Haul ID: _____
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Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1030</u>	<u>1042</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
carp	6+					
gizzard	65+43+4+2+1=115					
RCS	9+7=16					
flathead	1					
channel	3+1=4					
drum	3					
longear	2					
spotted bass	1+1=2					

Form 3

Revised 6-23-04 nju

APPENDIX E - Fish Collection Form

36.134614 N

10/12

95.996800 W

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TR2S</u>	Stratum ID: <u>P8/P7</u>	Haul ID: _____
-----------------------------	-----------------------------	--------------------------	----------------

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1012</u>	<u>1019</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS	4+2=6					
Silverside	12					
Gizzard shad	35 ⁺ +23+1+1=60					
Spotted	3					
Channel	3					
Flathead	1+1=2					
Bluegill	1					
Spotted	1					
Longear	1+1=2					
White perch	1					
Striped bass	1 (NoY)					

Form 3

Revised 6-23-04 mju

36.137578 N

11/12

APPENDIX E - Fish Collection Form

95.995497 W

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TR25</u>	Stratum ID: <u>P9/P8</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>954</u>	<u>1061</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	$53^+ + 33 + 43 + 3 + 1 + 4 + 2 + 2 + 2 + 3 + 1 + 1 = 109$					
RCS	$14 + 12 + 3 + 4 + 3 = 36$					
silverside	3					
longear	$12 + 6 + 2 + 1 + 1 + 1 = 23$					
channel cat	2					
white crappie	1					
spotted bass	$1 + 2 + 1 + 1 = 5$					
flathead	1					
white bass	1					
white perch	1					
bluegill	1					

Form 3

Revised 6-23-04 nju

APPENDIX E - Fish Collection Form

36.137728 N

12/12

95.999867 V

River ID: Ark

Date: 4-11-07

Collector(s): Brent, Sparky, Lori, Amie

Site ID: <u>2-Zink Lake</u>	Collection ID: <u>2TR25</u>	Stratum ID: <u>P10/P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>0936</u>	<u>0948</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
smallmouth buffalo	4+1=5					
RCS	15+1+21=37					
white bass	1					
flathead	1					
spotted bass	2+1+1=4					
gizzard shad	8+4+27+7=46					
channel cat	1					
green sunfish	1					
striped bass	3 (YOY)		<u>15/93</u>			lengths: 115 mm, + 93 mm
longear	1					

Form 3

Revised 6-23-04 nju

1/12

APPENDIX B - Stream Verification Form

Reviewed By _____

RIVER ID: Ark SITE ID: 3-61st St DATE: 4-12-07

COLLECTION ID: 2TR35 START TIME: 9:24 TEAM: Gordon

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): not verified (explain in comments)

Coordinates	Center * Latitude North	Center * Longitude West
Map		
GPS	<u>36° 04' 33.926"</u>	<u>95° 59' 10.211"</u>

Did You Sample This Site?

YES If YES, check one below

NO If NO, check one below

Sampleable (choose method used)

River Type:

- Wadeable
- Partially Boatable
- Boatable

- Wadeable interrupted - Not continuous water along reach
- Boatable interrupted - Not continuous water along reach
- Altered - Stream/River present but not as on map

Non-sampleable - Permanent

- Dry - Visited
- Dry - Not visited
- Wetland (No definable channel)
- Map error - No evidence of channel/waterbody ever present
- Impounded (Underneath lake or pond)
- Other (explain in comments)

Non-sampleable - Temporary

- Not boatable - Need a different crew
- Not wadeable - Need a different crew
- Other (Explain in comments)

No Access

- Access permission denied
- Permanently inaccessible (Unable unsafe to reach site)
- Temporarily inaccessible (Explain in comments)

Description:

61st + Riverside area

Directions To Site:

2/12

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

- One channel
- Anastomosing (complex) channel – (Relatively long major and minor channels branching and rejoining)
- Braided channel – (Multiple short channels branching and rejoining – mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley – (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)
- Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<-10 x bankfull)
- Channel is in broad valley and incised – (flood flows do not commonly spread over valley floor or into multiple channels)
- Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 436 m

Substrate type (check all that apply and give the % of each)

- Clay Silt Sand 100% Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)		<i>meter faulty</i>
Specific Conductance (µS/cm)	1581	
Temperature (°C)	13.6	
Time of day	1249	

comments:

ph 8.14

3/12

APPENDIX E - Fish Collection Form

36° 04' 04.791"N 95° 58' 54.397"W

River ID: Ark Date: 4-12-07 Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR35</u>	Stratum ID: <u>P1/PX</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1246</u>	<u>1249</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad						=14
Res						=12
smallmouth buff	1					=1
white bass	1					=1
drum						
longear	1					=1
channel cat						
spotted gar						
spotted bass	1					=1
carp						
silverside	111					=3
green sunfish						
redhorse						
highfin						

Long nose head 1
 Red shiner 111 = 3
 bluntnose minnow
 Red shiner

Form 3

Revised 6-23-04 nju

4/12

APPENDIX E - Fish Collection Form

36° 04' 09.222'N 95° 59' 09.655'W

River ID: Ark

Date: 4-12-07

Collector(s): Brent, Sparky, Eric, Amie

Site ID: 3-61st St Collection ID: 2TR35 Stratum ID: P2/P1 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1229</u>	<u>1241</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>=52</u>
<u>RCS</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>=42</u>
smallmouth buff						
<u>white bass</u>	<u> </u>					<u>=9</u>
drum						
<u>longear</u>	<u> </u>					<u>=4</u>
channel cat						
<u>spotted gar</u>	<u> </u>					<u>=1</u>
<u>spotted bass</u>	<u> </u>					<u>=3</u>
<u>carp</u>	<u> </u>					<u>=1</u>
<u>silverside</u>	<u> </u>					<u>=4</u>
<u>green sunfish</u>	<u> </u>					<u>=1</u>
<u>river redhorse</u>	<u> </u>					<u>=6</u>
<u>nighth</u>	<u> </u>					<u>=4</u>

Striper
largemouth
head

Sage 1
black red horse
blue gill
flatt 1

Form 3

Revised 6-23-04 nju

5/12

36° 04' 17.302" N 95° 58' 57.720" W

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-12-07 Collector(s): Brent, Sparky, Eric, Amie

Site ID: 3-61st St Collection ID: 2TR3S Stratum ID: P3/P2 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1216</u>	<u>1224</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	+++++	++	+++	+++	11	= 37
RCS	+++19	+++	+++	+++		= 34
smallmouth buff	11					= 2
white bass	+++111					= 9
drum						
longear	1					= 1
channel cat						
spotted gar	11					= 2
spotted bass	111					= 3
carp						
silverside						
green sunfish	1					= 1
river redhorse	1					= 1
highfin	111					= 3

~~wh. crappie~~
 striped 1
 redear
 LMB 1
 redear 1

Dead grass carp ↓

Form 3

Revised 6-23-04 njm

6/12

36° 04' 21.766" N 95° 59' 15.658" W

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-12-07 Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR35</u>	Stratum ID: <u>P4/P3</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1200</u>	<u>1209</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad			11	= 22		
RCS			11	= 26		
smallmouth buff				= 2		
white bass				= 9		
drum				= 3		
longear				= 7		
channel cat						
spotted gar				= 3		
spotted bass				= 1		
carp				= 3		
silverside				= 1		
green sunfish				= 1		
river herring				= 1		
highfin				= 16		

large mouth
flathead
vh crappie 1
Stripper 1 ^{last} 240mm 38 = 1
Red ear 1 = 1

Form 3

Revised 6-23-04 njr

36° 04' 29.203" N 95° 59' 00.856" W

7/12

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-12-07 Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR35</u>	Stratum ID: <u>P5/A4</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1146</u>	<u>1152</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	 			<u>=25</u>		
<u>RCS</u>	 <u>1</u>			<u>=11</u>		
<u>smallmouth buff</u>	<u>11</u>			<u>=2</u>		
white bass						
<u>drum</u>	<u>1</u>			<u>=1</u>		
longear						
<u>channel cat</u>						
<u>spotted gar</u>	<u>2</u>			<u>=2</u>		
spotted bass						
<u>carp</u>	<u>11</u>			<u>=2</u>		
<u>silverside</u>	<u>11</u>			<u>=2</u>		
green sunfish						
<u>river red horse</u>	<u>111</u>			<u>=3</u>		
<u>highfin</u>	 			<u>=9</u>		

largemouth
flathead
crappie
~~sunfish~~
black redhorse

Form 3

Revised 6-23-04 nju

36° 04' 33.194" N 95° 59' 18.889" W 8/12

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-12-07 Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR35</u>	Stratum ID: <u>P6/P5</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1117</u>	<u>1128</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad						= 59
RCS						= 38
smallmouth buff						= 4
white bass						= 19
drum						= 3
longear						= 4
channel cat						= 3
spotted gar						= 1
spotted bass						
carp						= 1
silverside						= 2
green sunfish						= 2
river red horse						= 3
highfin						= 40

lar gemouth
 FIAThead 1
 WCRappie || = 3
 warmouth 1

Form 3

Revised 6-23-04 njt

36° 04' 39.899'N 95° 59' 04.786'W

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-12-07 Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR35</u>	Stratum ID: <u>77/P6</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1047</u>	<u>1055</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	 	 			 	=39
RCS						=15
smallmouth buck						=5
white bass		 				=13
drum						=3
long ear	1					
channel cat						
spotted gar						
Spotted bass						=7
carp	1					=1
Silverside	 					=5
green sunfish						=2
river redhorse						=4
highfin	 	 	 			=15

~~Longear~~
Longear with Bass 1
river shiner 1

Form 3

Revised 6-23-04 nju

11/12

APPENDIX E - Fish Collection Form

36° 04' 52.609" N 95° 59' 08.233" W

River ID: Ark

Date: 4-12-07

Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St.</u>	Collection ID: <u>2TR3S</u>	Stratum ID: <u>P9/P8</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1015</u>	<u>1022</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad			7			
KCS	x		4			
smallmouth buff			4			
white bass			1			
drum						
longear						
channel cat						
longnose gar						
spotted gar			2			
spotted bass						
Carp			1			
green sunfish						
Silver side			1			

Form 3

Revised 6-23-04 nju

36° 04' 54.700" N

95° 59' 24.972" W ^{12/12}

APPENDIX E - Fish Collection Form

River ID: Ark

Date: 4-12-07

Collector(s): Brent, Sparky, Eric, Amie

Site ID: <u>3-61st St</u>	Collection ID: <u>2TR3S</u>	Stratum ID: <u>P10/P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>946</u>	<u>955</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
spotted gar	2+2=4					
RCS	111+4+1=116					
drum	13					
spotted bass	1					
loggear	1					
white bass	7+1+1=9					
gizzard shad	17+1=18					
smallmouth buff	1					
green sunfish	1					
channel catfish	1					

Form 3

Revised 6-23-04 nju

APPENDIX B - Stream Verification Form

Reviewed By _____
 RIVER ID: Ark SITE ID: 4-Jenks DATE: 4-16-07
 COLLECTION ID: 2TR4S START TIME: 1030 TEAM: Brent, Aric, Don

Stream/River Verification Information

Stream/River verified by (X all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	X Latitude North	X Longitude West
Map		
GPS	<u>36°01'37.981"N</u>	<u>95°57'25.273"W</u>

Did You Sample This Site?

YES IF YES, check one below

NO IF NO, check one below

Sampleable (choose method used)

River Type:

- Wadeable
- Partially Boatable
- Boatable
- Wadeable interrupted -- Not continuous water along reach
- Boatable interrupted - Not continuous water along reach
- Altered -- Stream/River present but not as on map

Non-sampleable - Permanent

- Dry - Visited
- Dry - Not visited
- Wetland (No definable channel)
- Map error - No evidence of channel/waterbody ever present
- Impounded (Underneath lake or pond)
- Other (explain in comments)

Non-sampleable - Temporary

- Not boatable - Need a different crew
- Not wadeable - Need a different crew
- Other (Explain in comments)

No Access

- Access permission denied
- Permanently inaccessible (Unable unsafe to reach site)
- Temporarily inaccessible (Explain in comments)

Description:

River Crossing to Turnpike area

Directions To Site:

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

- One channel
- Anastomosing (complex) channel -- (Relatively long major and minor channels branching and rejoining)
- Braided channel -- (Multiple short channels branching and rejoining -- mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley -- (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)
- Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (<= 10 x bank full)
- Channel is in broad valley and incised -- (flood flows do not commonly spread over valley floor or into multiple channels)
- Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 362 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)		<i>meta fault</i>
Specific Conductance (µS/cm)	1485	
Temperature (°C)	14.6	
Time of day	12:41	

comments:

ph 8.06

3/12

36°01'16.897"N 95°57'04.834"W

APPENDIX E - Fish Collection Form

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR4S</u>	Stratum ID: <u>P1/PX</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1536</u>	<u>1548</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad					(10)	= 98
red shiner						
silversides						
RCS						= 5
highfin carpsucker						
smallmouth buff						= 6
carp						
drum						
striped bass						
spotted bass						= 8
white bass	1					= 2
LMB						
channel catfish						
flathead						= 4

bluegill 1
 green sunfish ||| ||| = 8
 longear sunfish 1
 spotted gar
 longnose gar 1
 white crappie 1
 white crappie 1

Form 3

Revised 6-23-04 jtu

4/12

Oregon State

APPENDIX E - Fish Collection Form 36°01'22.406"N 95°57'21.742"N

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR45</u>	Stratum ID: <u>P2/P1</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1513</u>	<u>1523</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	++++	+++ +	+++		= 31	
red shiner	+++ ++++	+++ + ++++	+++ +	+++ +	= 63	
silversides						
RCS	+++ +				= 10	
highfin carpsucker	+++				= 8	
smallmouth bfff						
carp					= 2	
drum						
striped bass						
spotted bass					= 3	
white bass	+++				= 12	
LMB						
channel catfish						
flathead						

bluegill ||
green sunfish +++ +
longear ||||
spotted gar
longnose gar |
Re

Form 3

Revised 6-23-04 ajm

= 10
= 4

5/12

APPENDIX E - Fish Collection Form 36°01'29.397"N 95°57'10.046"W

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Annie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR4S</u>	Stratum ID: <u>P3/P2</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>147</u>	<u>1501</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	 	 	 	 	 	= 81
RCS						= 9
silversides						
striped bass						
Spotted bass		(417, 410)	400			= 6
LMB		(295)				= 6
white bass						= 7
Smallmouth buff						
drum						
red shiner						
carp						
green sunfish						= 4
bluegill	 					= 12
high fin carpsucker						

Form 3

Revised 6-23-04 njt

flathead
channel cat 1
longear @ ||||| 1
sawger
longnose gar | |||
shortnose gar 1
Redear |||

38

= 6

= 4

41

= 3

6/12

APPENDIX E - Fish Collection Form 36° 01' 34.254" N 95° 57' 29.633" W

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR4S</u>	Stratum ID: <u>P4/P3</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>w</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1427</u>	<u>1442</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS						= 6
gizzard shad	 	 	 	 	 	
silversides						= 2
striped bass						= 6
white bass						= 5
spotted bass						= 8
LMB						
smallmouth buff						
drum						
red shiner						
carp						
green sunfish						= 5
bluegill						
highfin carpsucker						

||||
||||
= 145

flath ead |
channel catfish
Longear ||
Longnose gar |
Sawbel |
warble 1 (487)

Form 3

Revised 6-23-04 jtt

8/12

APPENDIX E - Fish Collection Form 36°01'42.445"N 95°57'33.475"W

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Amie

Site ID: 4-Jenks Collection ID: 2TR4S Stratum ID: P6/PS Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>?</u> pulse rate: <u>30</u>	<u>1220</u>	<u>1237</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS	1 1/1				= 3	
gizzard shad	1/1/1				= 4	
silversides	1/1				= 3	
striped bass						
white bass						
highfin carpsucker						
green sunfish	1/1/1/1/1				= 11	
spotted bass	1/1				= 2	
red shiner	1/1/1/1				= 6	
drum						
bluegill	1/1/1				= 3	
channel catfish						
carp						
LMB	1/1	320mm	375		= 2	

redhorse
longnose gar
~~Red shiner~~

Flatt head 1

Form 3

Revised 6-23-04 gju

38

Longnose 1
Bd FF 910
Sunfish (shortnose gar) 1/1/1 = 4

APPENDIX E - Fish Collection Form

36°01'54.602"N 95°57'24.783"W

9/12

River ID: Ark

Date: 4-16-07

Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenes</u>	Collection ID: <u>2TR45</u>	Stratum ID: <u>P7/P6</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1145</u>	<u>1207</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS	 	 	100	100	= 13	
gizzard shad			30	(100's)	= 340	
Silversides					= 19	
striped bass						
white bass					= 13	
highfin carpsucker					= 3	
green sunfish					= 5	
spotted bass						
sawger						
red shiner					= 3	
drum						
bluegill						
sawger						
channel catfish						

spotted gar

Form 3

Revised 6-23-04 aju

carp |||

= 5

LMB 1 447mm

38

Longnose Gar 11
Red Horse 1

= 2

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR4S</u>	Stratum ID: <u>P8/P7</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>n</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1120</u>	<u>1133</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS				= 8		
gizzard shad				= 19		
silversides				= 31		
striped bass	1					
white bass				= 8		
highfin carpucker	1					
spotted gar						
longnose gar						
channel catfish						
Golden sunfish				= 3		
High fin				= 2		
Sauger				= 2		
Red sunfish				= 2		
spotted bass	1					

bluesill 1
white catfish 1
Dum 1

Form 3

Revised 6-23-04 jtu

APPENDIX E - Fish Collection Form

36°02'04.144"N 95°57'39.662"W

11/12

River ID: Ark

Date: 4-16-07

Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR45</u>	Stratum ID: <u>P9/P8</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>30</u>	<u>1100</u>	<u>1113</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS	111			=3		
gizzard shad	111			=5		
sm allmouth buff						
silversides	111			=3		
striped bass	111			=5		
drum						
flathead catfish						
highfin carpsucker	1					
spotted bass						
white bass	1111			=7		
longear sunfish						
longnose gar	111			=3		
CC	1					

515
105 m
95 m

Form 3

Revised 6-23-04 jmu

Baged 1 Fish

APPENDIX E - Fish Collection Form

36°02'03.530"N 95°57'52.844"W

12/12

River ID: Ark Date: 4-16-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>4-Jenks</u>	Collection ID: <u>2TR4S</u>	Stratum ID: <u>P10/P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: <u>40%</u> ; watts: <u>h</u> ; amps: <u>7</u> pulse rate: <u>26</u>	<u>1047</u>	<u>1053</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
RCS	+++			= 5		
gizzard shad	++++	++ 16		= 35		
smallmouth buff	(11)			= 3		
green sunfish						
longear sunfish						
silversides				= 3		
channel catfish						
white bass						
LMB						
striped bass	1					
spotted gar						
highfin carp sucker						
carp						
drum	1					

warren
FIAThead

Form 3

Revised 6-23-04 jru

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: Ark SITE ID: 5-Wagoner County Line DATE: 4-24-07
 COLLECTION ID: 2TR55 START TIME: 0900 TEAM: Brent Am. Don

Stream/River Verification Information

Stream/River verified by (X all that apply): GPS local contact signs roads topo map
 other (describe here): not verified (explain in comments)

Coordinates	X Latitude North	X Longitude West
Map		
GPS	35°55'09.258"	95°45'40.863"

Did You Sample This Site?

YES IF YES, check one below

NO IF NO, check one below

Sampleable (choose method used)

River Type:

Wadeable
 Partially Boatable
 Boatable

Wadeable interrupted - Not continuous water along reach
 Boatable interrupted - Not continuous water along reach
 Altered - Stream/River present but not as on map

Non-sampleable - Permanent

Dry - Visited
 Dry - Not visited
 Wetland (No definable channel)
 Map error - No evidence of channel/waterbody ever present
 Impounded (Underneath lake or pond)
 Other (explain in comments)

Non-sampleable - Temporary

Not boatable - Need a different crew
 Not wadeable - Need a different crew
 Other (Explain in comments)

No Access

Access permission denied
 Permanently inaccessible (Unable unsafe to reach site)
 Temporarily inaccessible (Explain in comments)

Description: County Line. 1 sand plants

Directions To Site:

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

- One channel
 Anastomosing (complex) channel -- (Relatively long major and minor channels branching and rejoining)
 Braided channel -- (Multiple short channels branching and rejoining -- mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley -- (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)
 Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (5-10% bank full)
 Channel is in broad valley and incised -- (flood flows do not commonly spread over valley floor or into multiple channels)
 Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 663 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 100% Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)		<i>note fault</i>
Specific Conductance (µS/cm)	1406	
Temperature (°C)	14	
Time of day	11:05	

comments:

pH 8.23

APPENDIX E - Fish Collection Form

35° 54' 49.943" N 95° 45' 15.738" W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Annie

Site ID: <u>5-County Line</u>	Collection ID: <u>2TR55</u>	Stratum ID: <u>P1/PX</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	1155	1204	200m

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad			# ¹ / ₁₀	= 10		
RCS				= 5		
drum				= 2		
carp				= 2		
buffalo						
white bass	1					
striped bass						
spotted bass						
LMB	1					
bluegill	1					
longear	1					
spotted gar						
longnose gar				= 2		
shortnose gar						

red shiner |||| = 4
 silverside 10 = 2
 channel cat |||| = 5
 sa⁹ 1 (352) = 1
 crappie-white || = 2

Form 3

Revised 6-23-04 njr

38

APPENDIX E - Fish Collection Form

35° 54' 49.578" N 95° 45' 45.693" W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>5 County Line</u>	Collection ID: <u>2TR55</u>	Stratum ID: <u>P2/P1</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	<u>1137</u>	<u>1151</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	4441	4441	1111	1111	1111	46
RCS	1111					= 4
drum	11					= 2
carp	1					
buffalo						
white bass	11					= 2
striped bass						
spotted bass	11					= 3
LMB	1					
bluegill	111					= 3
longear	111					= 3
spotted gar						
longnose gar	1					
shortnose gar						

~~red shiner~~
~~sitterside~~
~~channel cat~~
~~whit crut~~

Form 3

Revised 6-23-04 nju

Dressing material in the way of
back area to shock

APPENDIX E - Fish Collection Form

35° 55' 01.585" N 95° 45' 24.009" W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>5-County Line</u>	Collection ID: <u>2TR55</u>	Stratum ID: <u>P3/P2</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	1127	1134	200m

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	111				= 1	
RCS	11				= 2	
drum	1					
carp	1					
buffalo	111				= 3	
white bass						
striped bass						
spotted bass						
LMB						
bluegill						
longear						
spotted gar						
longnose gar	111				= 3	
shortnose gar						

red shiner 1111
 silverside
 channel cat

Form 3

= 4

Revised 6-23-04 nju

APPENDIX E - Fish Collection Form 35°54'59.696"N 95°45'54.177"W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>5-County Line</u>	Collection ID: <u>JTR55</u>	Stratum ID: <u>P4/P3</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	1105	1114	200 m

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>117</u>				<u>3</u>	
<u>RCS</u>	<u>111</u>				<u>8</u>	
<u>drum</u>	<u>11</u>				<u>2</u>	
<u>catp</u>	<u>1111</u>				<u>4</u>	
<u>buffalo</u>	<u>11</u>				<u>2</u>	
white bass						
<u>striped Bass</u>	<u>111 (403)</u>				<u>3</u>	
spotted bass						
EMB						
<u>bluegill</u>	<u>1</u>					
<u>longear</u>	<u>1</u>					
spotted gar						
<u>longnose gar</u>	<u>1</u>					
shortnose gar						

red shiner (23) 1

Form 3

= 24

Revised 6-23-04 nju

~~silverside~~

~~channel cat~~

blue cat (201bst)

38

= 3

sauger 1

6/12

APPENDIX E - Fish Collection Form

35°55'12.436"N 95°45'33.354"W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Annie

Site ID: <u>5-County Line</u>	Collection ID: <u>2TRSS</u>	Stratum ID: <u>P5/P4</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	<u>1046</u>	<u>1054</u>	

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>HTT</u>					<u>= 5</u>
<u>RCS</u>	<u>111</u>					<u>= 3</u>
<u>drum</u>	<u>1</u>					
carp						
buffalo						
<u>white bass</u>	<u>1</u>					
striped bass						
spotted bass						
AMB						
bluegill						
longear						
spotted gar						
longnose gar						
<u>savager</u>	<u>11</u>		<u>(100)</u>	<u>(75)</u>	<u>(11)</u>	<u>(75)</u>

red shiner 11 (6)
 silverside 111 (10)
 channel cat 111 (19)
= 6
= 1158

Form 3

Revised 6-23-04

7/12

APPENDIX E - Fish Collection Form

35°55'10.408"N 95°46'02.579"W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>5-County Line</u>	Collection ID: <u>2TR58</u>	Stratum ID: <u>PL/PS</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	<u>091013</u>	<u>1023</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad					111	=23
RCS						=22
drum		1				=6
carp	1					
buffalo						
white bass			1			=11
striped bass		(260, 87, 225)				=3
spotted bass						=2
LMB						
Wriggill						
longear						=6
spotted gar						
longnose gar	1					
Sauger						

red shiner ||| = 3
 silverside || = 2
 channel cat ||| = 3
 high fin ||| = 5
~~gar~~
 snoutnose 1

Form 3

Revised 6-23-04 nju

8/12

APPENDIX E - Fish Collection Form 35° 55' 25.534" N 95° 45' 35.789" W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Annie

Site ID: <u>5-County Line</u>	Collection ID: <u>2TR55</u>	Stratum ID: <u>P7/P6</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	<u>0955</u>	<u>1007</u>	<u>200 m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u>HTT 11</u>	<u>11</u>				<u>= 9</u>
<u>RCS</u>	<u>71</u>					<u>= 2</u>
<u>drum</u>	<u>11</u>					<u>= 2</u>
<u>river redhorse</u>						
<u>highfin carpucker</u>						
<u>white bass</u>	<u>1</u>					
<u>striped bass</u>						
<u>spotted bass</u>	<u>11</u>					<u>= 2</u>
<u>LMB</u>						
<u>bluegill</u>						
<u>longear</u>						
<u>green sunfish</u>						
<u>spotted gar</u>						
<u>longnose gar</u>						
<u>Shad nose gar</u>						

Form 3

Revised 6-23-04 mjt

KORONA

Saver

Carp 111 = 3

buffalo 1

38

Red sturgeon 111 (12) (9) 1 (2-4) HTT (255) = 310

Silver shad 111 = 4

57

FAT head

Long nose gar 111 = 3

9/12

APPENDIX E - Fish Collection Form $35^{\circ}55'23.326''N$ $95^{\circ}46'03.587''W$

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Anise

Site ID: 5-County Line Collection ID: 2TR58 Stratum ID: P8/P7 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	0936	0946	200m

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
gizzard shad	111					= 3
RCS	 	 	 	 		= 30
drum	 	111				= 8
river herring						
high fin carp sucker						
white bass	111					= 3
striped bass	1 (157)					
spotted bass		111				= 13
LMB	1					= 2
bluegill						= 5
longear	111					= 4
green sunfish						
spotted gar						
longnose gar						

Form 3

Revised 6-23-04 nju

~~shortnose gar~~
 red shiner ~~||||~~ ~~|||||~~ 111 (300) (12) ~~||||~~ ~~||||~~ 1 = 336
 silverside ~~||||~~ 1 = 6
 carp 114 = 4
 buffalo
 c-l 111 = 3
 sauger 11 = 2
 38
 redear 1
 wh. crappie 1
 warmouth 1

10/12

APPENDIX E - Fish Collection Form

35° 55' 36.461" N 95° 45' 44.603" W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Annie

Site ID: <u>5-County Line</u>	Collection ID: <u>2TR55</u>	Stratum ID: <u>P9/P8</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	<u>0923</u>	<u>0929</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u> </u>	<u> </u>	<u>111</u>			<u>= 14</u>
<u>RCS</u>	<u>1 11</u>					<u>= 3</u>
<u>drum</u>						
river herring						
highfin shiner						
white bass						
<u>striped bass</u>	<u>1 1</u>					<u>= 2</u>
<u>spotted bass</u>	<u>1</u>					
LMB						
<u>bluegill</u>	<u>1</u>					
<u>longear</u>	<u> </u>					<u>= 4</u>
<u>green sunfish</u>	<u>1</u>					
spotted gar						
<u>longnose gar</u>	<u>1</u>					

Form 3

Revised 6-23-04 mju

shortnose gar

red shiner ||||

silverside ||||

carp || 38

bluegill 1

spotted bass 1

striped bass 1 1

gizzard shad ||||

RCS 1 11

longear ||||

green sunfish 1

longnose gar 1

= 4
= 7

11/12

APPENDIX E - Fish Collection Form 35° 55' 35.926" N 95° 46' 08.440" W

River ID: Ark Date: 4-24-07 Collector(s): Brent, Sparky, Amie

Site ID: <u>5- County Line</u>	Collection ID: <u>2TR55</u>	Stratum ID: <u>P10/P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____	<u>0908</u>	<u>0918</u>	<u>200m</u>

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>gizzard shad</u>	<u> </u>	<u> </u>				<u>=15</u>
<u>RCS</u>						
<u>drum</u>	<u> </u>					<u>=5</u>
<u>river redhorse</u>						
<u>high fin carpsucker</u>						
<u>white bass</u>	<u> </u>					<u>=2</u>
<u>striped bass</u>						
<u>spotted bass</u>	<u> </u>	<u> </u>				<u>=12</u>
<u>LMB</u>	<u> </u>	<u> </u>				<u>=10</u>
<u>bluegill</u>	<u> </u>	<u> </u>				<u>=8</u>
<u>longear</u>	<u> </u>					<u>=5</u>
<u>green sunfish</u>	<u> </u>					<u>=3</u>
<u>spotted gar</u>						
<u>longnose gar</u>	<u> </u>					<u>=3</u>
<u>shortnose gar</u>						

Form 3

Revised 6-23-04 njt

red shiner |||| |||| |||| |||| |||| ||| =33

silverside |||| =5

CROSS
Carp 1
Sauger 1
CC 1

Appendix V

Summer Sample Field Log Sheets

APPENDIX B - Stream Verification Form

site 1

RIVER ID: Ark. SITE ID: ZTRISM Reviewed By _____
 DATE: 9-12-07
 COLLECTION ID: ZTRISM START TIME: 10:25 TEAM: Brent, Daw, Kyle

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	<u>center</u> <input checked="" type="checkbox"/> Latitude North	<u>center</u> <input checked="" type="checkbox"/> Longitude West
Map		
GPS	<u>36° 08' 33.057</u>	<u>96° 09' 01.077</u>

Did You Sample This Site?

<input checked="" type="checkbox"/> YES IF YES, check one below	<input type="checkbox"/> NO IF NO, check one below
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input checked="" type="checkbox"/> Boatable <input type="checkbox"/> Wadeable interrupted -- Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered -- Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error - No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable - Need a different crew <input type="checkbox"/> Not wadeable - Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description: Sand Springs Shell Creek area.

Directions To Site:

2/12

APPENDIX C - Channel Properties Form

9/12/07

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel - (Relatively long major and minor channels branching and rejoining)

Braided channel - (Multiple short channels branching and rejoining - mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley - (i.e. during flood it can fill off-channel areas and side channels, spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (2-10 x bank full)

Channel is in broad valley and incised - (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 413 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 75% Gravel 5% Cobble 15% Boulder 5% Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	7.18	
Specific Conductance (µS/cm)	1,018	
Temperature (°C)	27.19	
Time of day		

comments:

36° 08' 36.455"

96 09' 15.361"

pH 7.84

0/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/12/07 Collector(s): Don, Kyle, Brent

Site ID: ZTRISM Collection ID: site 1 Stratum ID: P3-P2 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		1203	1210	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36° 08' 27.960" 96° 08' 42.236"			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill Sunfish	1					
Spotted Bass	4					
White Bass	1					
Common Carp	1					
River Carp Sucker	13					
Smallmouth Buffalo	5					
Gizzard Shad	82					
Slim Minnows	6					
Longnose Gar	2					
White Crappie	1					

Form 3

Revised 6-23-04 jg

6/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/12/07 Collector(s): Don, Kyle, Brent

Site ID: <u>ZTRISM</u>	Collection ID: <u>site 1</u>	Stratum ID: <u>P4-P3</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1145</u>	<u>1158</u>	<u>200 m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° 08' 23.216"</u> <u>96° 08' 59.929"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill Sunfish	3					
Longear Sunfish	1					
Largemouth Bass	1					
Spotted Bass	2					
White Bass	2					
Common Carp	2					
River Carp Sucker	3					
Gizzard Shad	97					
Silversides	2					

Form 3

Revised 6-21-04 jtu

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/12/07 Collector(s): Don, Kyle, Brent

Site ID: <u>2TRISM</u>	Collection ID: <u>site 1</u>	Stratum ID: <u>P5-P4</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		1130	1140	700 m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° 08' 36.269"</u> <u>96° 08' 58.075"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill Sunfish	5					
Longear Sunfish	1					
Spotted Bass	1					
Freshwater Drum	1					
Common Carp	2					
River Carp Sucker	3					
Gizzard Shad	141					
Slim Minnows	1					
High Fin	1					
Mirror Carp	1					

0/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/12/07 Collector(s): Don, Kyle, Brent

Site ID: 2TRISM Collection ID: Site 1 Stratum ID: P6-P5 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		1114	1120	200 m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36° 08' 29.455" 96° 09' 14.800"			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Largemouth Bass	2					
White Bass	5					
Freshwater Drum	3					
Common Carp	5					
River Carp Sucker	1					
Gizzard Shad	67					
Channel Catfish	1					

Form 3

Revised 6-22-04 jgc

7/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/12/07 Collector(s): Don, Kyle, Brent

Site ID: ZTRISM Collection ID: site1 Stratum ID: P7-P6 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		1101	1110	200 m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36°08'43.464" 96°09'13.346"			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill Sunfish	4					
Longear Sunfish	2					
Common Carp	2					
River Carp Sucker	6					
Smallmouth Buffalo	3					
Gizzard Shad	113					
Longnose Gar	1					

Form 3

Revised 6-23-04 jtt

14/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9-12-07 Collector(s): Kyle Brent, Dan

Site ID: RTRISM Collection ID: Site 1 Stratum ID: PB-P7 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		1047	10:59	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36°08' 37.958 W 96°09' 27.50 W			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Blue gill sunfish	1					
Green sunfish	1					
Largemouth Bass	1					
Common Carp	7					
Gizzard Shad	67					
Silversides	1					
Slim minnow	50					
Channel catfish	1					

Form 3

Revised 6-23-04 jg

12/12

APPENDIX E - Fish Collection Form

River ID: Ark Date: 9-12-07 Collector(s): Kyle, Brent, Dan

Site ID: <u>2TR 15M</u>	Collection ID: <u>Site 1</u>	Stratum ID: <u>P10-P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>10:25</u>	<u>10:32</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36°08' 39.747</u> <u>96°09' 41.878</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill sunfish	<u>4</u>					
Redear Sunfish	<u>1</u>					
Longear Sunfish	<u>5</u>					
Green sunfish	<u>3</u>					
Largemouth Bass	<u>1</u>					
Spotted bass	<u>1</u>					
White bass	<u>4</u>					
Freshwater Drumm	<u>1</u>					
Common Carp	<u>4</u>					
River Carp Sucker	<u>4</u>					
Smallmouth Buffalo	<u>1</u>					
Gizzard Shad	<u>30</u>					
Channel catfish	<u>2</u>					
White Crappie	<u>1</u>					

Form 3

Revised 6-23-04 jtt

APPENDIX B - Stream Verification Form

Site 2

1/2

Reviewed By

RIVER ID: <u>ARIC</u>	SITE ID: <u>Z-Zink Lake</u>	DATE: <u>8-17-07</u>
COLLECTION ID: <u>2TR 2SM</u>	START TIME: <u>10:10</u>	TEAM: <u>Kyle, Brent, Don</u>

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	^{prof. b} <u>5</u> <input checked="" type="checkbox"/> Latitude North	^{prof. b} <u>5</u> <input checked="" type="checkbox"/> Longitude West	
Map			
GPS	<u>36° 08' 01.004 N</u>	<u>75° 59' 40.050 W</u>	

Did You Sample This Site?

<input checked="" type="checkbox"/> YES IF YES, check one below	<input type="checkbox"/> NO IF NO, check one below
<p>Sampleable (choose method used)</p> <p>River Type:</p> <p><input type="checkbox"/> Wadeable</p> <p><input type="checkbox"/> Partially Boatable</p> <p><input checked="" type="checkbox"/> Boatable</p> <p><input type="checkbox"/> Wadeable interrupted -- Not continuous water along reach</p> <p><input type="checkbox"/> Boatable interrupted - Not continuous water along reach</p> <p><input type="checkbox"/> Altered -- Stream/River present but not as on map</p>	<p>Non-sampleable -- Permanent</p> <p><input type="checkbox"/> Dry -- Visited</p> <p><input type="checkbox"/> Dry -- Not visited</p> <p><input type="checkbox"/> Wetland (No definable channel)</p> <p><input type="checkbox"/> Map error -- No evidence of channel/waterbody ever present</p> <p><input type="checkbox"/> Impounded (Underneath lake or pond)</p> <p><input type="checkbox"/> Other (explain in comments)</p> <p>Non-sampleable -- Temporary</p> <p><input type="checkbox"/> Not boatable -- Need a different crew</p> <p><input type="checkbox"/> Not wadeable -- Need a different crew</p> <p><input type="checkbox"/> Other (Explain in comments)</p> <p>No Access</p> <p><input type="checkbox"/> Access permission denied</p> <p><input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site)</p> <p><input type="checkbox"/> Temporarily inaccessible (Explain in comments)</p>

Description: Zink Lake 23,878 CFS @ 10:00 am

Directions To Site: 21st Street + River Side

2/12

APPENDIX C - Channel Properties Form

8/17/07

Channel Pattern (Check one)

- One channel
- Anastomosing (complex) channel - (Relatively long major and minor channels branching and rejoining)
- Braided channel - (Multiple short channels branching and rejoining - mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

- Channel is unconstrained in broad valley - (i.e. during flood it can fill off-channel area and side channels, spread out over flood plain, or easily cut new channels by erosion)
- Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (i.e. bank full)
- Channel is in broad valley and incised - (flood flows do not commonly spread over valley floor or into multiple channels)
- Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 432 m

Substrate type (check all that apply and give the % of each)

Clay Silt 90% Sand ~~60%~~ Gravel 5% Cobble Boulder 5% Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	7.09	
Specific Conductance (µS/cm)	834	
Temperature (°C)	30.38 °C	
Time of day	12:14	

comments:

pH 7.83
 Taken at Site 5
 36° 08' 01" N 1004"
 95° 59' 40" W 1050"

3/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-17-07 Collector(s): Kyle, Brent, Don

Site ID: 2TR2SM Collection ID: 2TR2SM Stratum ID: P1-PX Haul ID:

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		1200	1210	200 ^{sqm}
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36° 07' 48.541" 95° 59' 22.234"			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> watts: <u> </u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	2					
Flathead	1					
Channel Cat.	2					
River Carp Sucker	17					
Common Carp	12					
Smallmouth Buffalo	2					
Bigmouth Buffalo	1					
Gizzard Shad	3					
Grass Carp	1					

Form 3

Revised 6-23-04 jtu

4/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-17-07 Collector(s): Kyle, Brent, Don

Site ID: <u>2TR2SM</u>	Collection ID: <u>2TR2SM</u>	Stratum ID: <u>P2 - P1</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1148</u>	<u>1155</u>	<u>200</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° 07' 46.750"</u> <u>95° 59' 36.821"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Bluegill</u>	<u>3</u>					
<u>Spotted Bass</u>	<u>2</u>					
<u>River carp sucker</u>	<u>2</u>					
<u>Smallmouth Buffalo</u>	<u>3</u>					
<u>Gizzard Shad</u>	<u>32</u>					
<u>Silversides</u>	<u>2,030+</u>					
<u>Largemouth Bass</u>	<u>1</u>					

Form 3

Revised 6-23-04 jjo

5/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-17-07 Collector(s): Kyle, Brent, Don

Site ID: <u>ZTRZSM</u>	Collection ID: <u>ZTRZSM</u>	Stratum ID: <u>P3-P2</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1135</u>	<u>1145</u>	<u>200 m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° 07' 55.920"</u> <u>95° 59' 27.409"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> ; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	4					
Longear	1					
Spotted Bass	6					
Channel Cat.	5					
River Carp Sucker	51					
Common Carp	5					
Smallmouth Buffalo	3					
Gizzard Shad	5					
Largemouth Bass	4					

Form 3

Revised 6-23-04 jtt

APPENDIX E - Fish Collection Form

6/12

River ID: ARK Date: 8-17-07 Collector(s): Kyle, Brent, Don

Site ID: <u>2TR2SM</u>	Collection ID: <u>2TR2SM</u>	Stratum ID: <u>P4-P3</u>	Haul ID: <u> </u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1125</u>	<u>1132</u>	<u>700m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36°07'53.993"</u> <u>95°59'41.322"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> ; watts: <u> </u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	6					
River Carp Sucker	7					
Common Carp	5					
Spotted Bass	2					
Gizzard Shad	1					
Silversides	1,060					

Form 3

Revised 6-22-04 jlu

APPENDIX E - Fish Collection Form

7/12

River ID: ARK

Date: 8-17-07

Collector(s): Kyle, Brent, Don

Site ID: <u>2TR2SM</u>	Collection ID: <u>2TR2SM</u>	Stratum ID: <u>P5-P4</u>	Haul ID: <u>/</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1117</u>	<u>1123</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36°08'03.493"</u> <u>95°59'33.737"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> ; watts: <u>/</u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Longear	1					
Spotted Bass	2					
Channel Cat.	3					
River Carp Sucker	16					
Common Carp	7					
Smallmouth Buffalo	2					
Silver Sides	1,000					
Largemouth Bass	1					

Form 3

Revised 6-21-04 jg

8/12

APPENDIX E - Fish Collection Form

River ID: Ark Date: 8-17-07 Collector(s): Kyle Brent Don

Site ID: 27R25M Collection ID: 27R25M Stratum ID: 16-PS Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		11:07	11:15	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36 08 01.225 25 59 45.579			
<input checked="" type="checkbox"/> Electrofisher	volts: 500 1000; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	1					
Longear	2					
Spotted bass	1					
White Bass	1					
River Carp Sucker	9					
Small mouth Buffalo	1					
Gizzard Shad	101					
Silver shad	10					

Form 3

Revised 6-23-04 jtt

9/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-17-07 Collector(s): Kyle Brent Sparks

Site ID: <u>2TR2SM</u>	Collection ID: <u>2TR2SM</u>	Stratum ID: <u>P7-P6</u>	Haul ID: <u>—</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>10:57</u>	<u>11:05</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>3608 N, 155 W</u> <u>9559 38.915 W</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> ; watts: <u>—</u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Bluegill</u>	<u>3</u>					
<u>Redear sunfish</u>	<u>1</u>					
<u>Longear Sunfish</u>	<u>4</u>					
<u>Spotted bass</u>	<u>1</u>					
<u>Flathead Catfish</u>	<u>1</u>					
<u>Channel Catfish</u>	<u>3</u>					
<u>Common Carp</u>	<u>4</u>					
<u>River Carp Suckers</u>	<u>10</u>					
<u>Smallmouth Bass</u>	<u>1</u>					
<u>Silverides</u>	<u>1</u>					
<u>Mudcat Carp</u>	<u>1</u>					

Form 3

Revised 6-23-04 jgg

11:25

10/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-17-07 Collector(s): Kyle Brent Doad

Site ID: <u>2TR2SM</u>	Collection ID: <u>2TR2SM</u>	Stratum ID: <u>P8-P7</u>	Haul ID: <u>1</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		10:50	10:56	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36° 08 08.413 N 95 59 52.069 W			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> ; watts: <u> </u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	1					
Longear	23					
Spotted bass	2					
White Bass	1					
Flat head catfish	1					
Common Carp	1					
River Carp sucker	9					
Gizzard Shad	20					
Silversides	51					
Large mouth Bass	2					

Form 3

Revised 6-21-04 jg

11/12

APPENDIX E - Fish Collection Form

River ID: ACK Date: 8-17-07 Collector(s): Brent, Kyle, Don

Site ID: 2TR2SM Collection ID: 2TR2SM Stratum ID: 19-P8 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		10:35	10:45	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36 08 19-168 R 95 59 47 310 W			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> ; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	1					
Spotted Bass	7					
channel catfish	3					
Drum	1					
Common Carp	1					
River Carp Sucker	26					
large mouth Buffalo	1					
small mouth Buffalo	2					
Gizzard shad	9					
Lognose Gar	1					

Form 3

Revised 6-23-04 jju

12/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-17-06 Collector(s): Kyle Brent, Don

Site ID: 27 Collection ID: 2TRZSM Stratum ID: 110-199 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		10:25	10:35	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	36° 08' 15.192N 95° 59' 58.690W			
<input checked="" type="checkbox"/> Electrofisher	volts: <u>500-1000</u> watts: <u>✓</u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Golden Redhorse</u>	<u>2</u>					
<u>River Carp sucker</u>	<u>7</u>					
<u>Small mouth Buffalo</u>	<u>5</u>					
<u>Spotted Bass</u>	<u>3</u>					
<u>Common Carp</u>	<u>2</u>					
<u>Longear Sunfish</u>	<u>2</u>					
<u>Green Sunfish</u>	<u>1</u>					

site 3

APPENDIX B - Stream Verification Form

Reviewed By

RIVER ID: <u>ARK</u>	SITE ID: <u>2TR35M</u>	DATE: <u>8-28-07</u>
COLLECTION ID: <u>2TR35M</u>	START TIME: _____	TEAM: _____

Stream/River Verification Information		
Stream/River verified by (x all that apply): <input type="checkbox"/> GPS <input type="checkbox"/> local contact <input type="checkbox"/> signs <input type="checkbox"/> roads <input type="checkbox"/> topo map <input type="checkbox"/> other (describe here): _____ <input type="checkbox"/> not verified (explain in comments)		
Coordinates	<u>S</u> <input checked="" type="checkbox"/> Latitude North	<u>S</u> <input checked="" type="checkbox"/> Longitude West
Map	<u>36° 4' 11.495" N</u>	<u>95° 05' 03.645" W</u>
GPS		

Did You Sample This Site?	
<input type="checkbox"/> YES <small>If YES, check one below</small>	<input type="checkbox"/> NO <small>If NO, check one below</small>
Sampleable (choose method used) River Type: <input type="checkbox"/> Wadeable <input type="checkbox"/> Partially Boatable <input type="checkbox"/> Boatable <input type="checkbox"/> Wadeable interrupted -- Not continuous water along reach <input type="checkbox"/> Boatable interrupted - Not continuous water along reach <input type="checkbox"/> Altered -- Stream/River present but not as on map	Non-sampleable - Permanent <input type="checkbox"/> Dry - Visited <input type="checkbox"/> Dry - Not visited <input type="checkbox"/> Wetland (No definable channel) <input type="checkbox"/> Map error -- No evidence of channel/waterbody ever present <input type="checkbox"/> Impounded (Underneath lake or pond) <input type="checkbox"/> Other (explain in comments) Non-sampleable - Temporary <input type="checkbox"/> Not boatable -- Need a different crew <input type="checkbox"/> Not wadeable -- Need a different crew <input type="checkbox"/> Other (Explain in comments) No Access <input type="checkbox"/> Access permission denied <input type="checkbox"/> Permanently inaccessible (Unable/unsafe to reach site) <input type="checkbox"/> Temporarily inaccessible (Explain in comments)

Description: <u>61st Area</u>
Directions To Site:

center
 36° 4' 11.495" N
 95° 05' 03.645" W

Form 1A

Revised 6-23-04 nju

9-7-06

APPENDIX C - Channel Properties Form

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel - (Relatively long major and minor channels branching and rejoining)

Braided channel - (Multiple short channels branching and rejoining - mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley - (i.e. during flood it can fill off-channel areas and side channels spread out over flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (so-flo is hard full)

Channel is in broad valley and incised - (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 348 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	7.68	
Specific Conductance (µS/cm)	1096	
Temperature (°C)	27.04	
Time of day	1135	

comments:

36° 04 13.605 N
95 58 57.011 W

Site ID 2 TR 3 SM Date 8-28-07

Data Tabulator Don

Reviewed By _____

X	1		2		3		4		5		6		7		8		9		10	
	Area	HC	Area	HC	Area	HC	Area	HC	Area	HC										
	0-354	DF 1	0-354	DF 1	0-208	DF 6	0-196	DF 8	0-49	SS 5	0-30	SF 4	0-40	SF 6	0-197	DF 2	0-116	DF 3	0-103	DF 4
	384-386	SS 1	305-356	SF 1	208-269	Dry	196-214	SF 2	49-193	DF 9	30-65	Dry	40-49	Dry	197-205	SS 12	116-142	SF 8	103-131	SF 9
	387-436	DF 2	356-358	Dry	269-307	SS 3	214-259	Dry	193-227	SF 3	45-164	DF 10	40-78	DF 11	205-318	Dry	142-163	Dry	131-155	Dry
			358-398	DS 1	307-363	DF 7	259-272	BW 1	277-318	SS 6	164-199	SF 5	70-106	SF 7	318-385	SS 13	123-128	BW 3	153-176	BW 5
							272-282	Dry	318-374	DS 3	199-246	Dry	106-250	Dry	385-436	Dry	175-182	Dry	178-273	Dry
							282-338	SS 4	374-391	SS 7	246-248	BW 2	250-308	SS 9	430-487	SS 14	182-189	BW 4	273-285	BW 6
							338-398	DS 2	391-397	Dry	248-301	Dry	308-331	DS 4			189-229	Dry	275-303	Dry
											301-420	SS 8	331-366	SS 10			329-428	SS 15	303-440	SS 16
													366-386	Dry						
													396-409	SS 11						

Habitat Code	X	Sample Size										Total	Details
		1	2	3	4	5	6	7	8	9	10		
SS	1	1	0	1	1	3	3	3	1	1	16		
SF	0	0	1	0	1	2	0	0	1	1	9		
DS	0	0	1	0	1	0	1	0	0	0	6		
DF	2	2	1	2	1	1	1	1	1	1	14		
NW	0	0	0	0	0	0	0	0	0	0	0		
BW	0	0	0	0	0	0	0	2	2	2	6		

0/01

APPENDIX E - Fish Collection Form

River ID: Ark Date: 8-29-07 Collector(s): Brent Don

Site ID: <u>S. 7-3</u>		Collection ID: <u>2TR3SM-DF₄</u>		Stratum ID: <u>DF4</u>		Haul ID: <u>T-1</u>	
Gear Type (Check one)	Description	Effort					
		Start Time	End Time	Area			
<input type="checkbox"/> Seine	<u>36°04.014 N</u> <u>95°58.873 W</u>	<u>10:21</u>	<u>3:46</u>	<u>384-433</u>			
<input checked="" type="checkbox"/> Hoop Net	<input checked="" type="checkbox"/> Large <input type="checkbox"/> Small						
<input type="checkbox"/> Gill Net							
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____						

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Common Carp</u>	<u>3</u>					
<u>Flathead Catfish</u>	<u>1</u>					
<u>Channel Catfish</u>	<u>2</u>					
<u>2 Turtles</u>						

Form 3

Revised 6-27-04

36°04.014 N
95°58.873 W

7/31

APPENDIX E - Fish Collection Form

River ID: ARK- Date: 8-29-07 Collector(s): Brent, Don

Site ID: sik 3 Collection ID: 2TR3SM-DF5 Stratum ID: DF5 Haul ID: T2

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	N 36° 04.077' N W 95° 59.146' W <i>Garmin</i>	11:30	3:14	0.305
<input checked="" type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input checked="" type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<i>Turtles</i>	2					<i>DF's</i>

Form 3

Revised 6-23-04 jtt

N 36 04.077
W 95 59.146

9/31

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-29-07 Collector(s): Brent, Don

Site ID: <u>Site 3</u>	Collection ID: <u>2TR3M-DF3</u>	Stratum ID: <u>DF5</u>	Haul ID: <u>T2</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	<u>N 36° 04.053</u> <u>W 95° 59.134'</u>	<u>11:15</u>	<u>3:20</u>	<u>0-305'</u>
<input checked="" type="checkbox"/> Hoop Net	<input checked="" type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Spotted Bass	<u>2</u>					
Channel catfish	<u>1</u>					
Bluegill	<u>9</u>					
Longear	<u>7</u>					
Freshwater Drum	<u>1</u>					
<u>2 Turtle</u>						

Form 3

Revised 6-22-04 jtu

N 36° 04' 09.3"
W 95° 59' 13.4"
38
Gammal

10/31

APPENDIX E - Fish Collection Form

River ID: Ark Date: 8-28-07 Collector(s): Brent, Dany, Kyle, Robert

Site ID: <u>Site 3</u>	Collection ID: <u>2TR3SM-SF1</u>	Stratum ID: <u>SF1</u>	Haul ID: <u>T2</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input checked="" type="checkbox"/> Seine	<u>36°04'03.055 N</u> <u>95°58'55.016 W</u>	<u>12:15</u>	<u>12:18</u>	<u>365-356</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Brook silversides</u>	<u>1</u>					
<u>River shiners</u>	<u>23</u>					

Form 3

Revised 6-23-04 ajg

36°04'03.055 N
95 58 55.016 W

13/31

APPENDIX E - Fish Collection Form

River ID: ARK Date: 8-29-07 Collector(s): Brent, Don

Site ID: <u>site 3</u>	Collection ID: <u>2TR35M-DF6</u>	Stratum ID: <u>DF6</u>	Haul ID: <u>T3</u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	<u>N 36° 04.083</u> <u>W 95° 59.168</u>	<u>11:45</u>	<u>3:05</u>	<u>0-208</u>
<input checked="" type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input checked="" type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: _____ pulse rate: _____			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Bluegill</u>	<u>3</u>					
<u>Longear</u>	<u>2</u>					
<u>Green Sun</u>	<u>1</u>					
<u>5 Twites</u>						

Form 3

Revised 6-23-04 jg

38

N 36° 04.083
W 95° 59.168
Garmin.

2/12

APPENDIX C - Channel Properties Form

9-11-07

Time 1400

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel -- (Relatively long major and minor channels branching and rejoining)

Braided channel -- (Multiple short channels branching and rejoining -- mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley -- (i.e. during flood it can fill off-channel areas and side channels, spread out or overflow plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (not too bank full)

Channel is in broad valley and incised -- (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 362 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements

Comments

Dissolved Oxygen (mg/L)

7.43

Specific Conductance (µS/cm)

1075 *µm/cm*

Temperature (°C)

25.96

Time of day

1400

comments:

pH 7.95

36° 01' 53.727" N

95° 57' 32.464" W

3/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9-11-07 Collector(s): Brent, Kyle Sparks

Site ID: <u>2TR4SM</u>	Collection ID: <u>Site 4</u>	Stratum ID: <u>PX-PX</u>	Haul ID: <u></u>	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>12:15</u>	<u>12:25</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input checked="" type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° 01' 29.1854"</u> <u>95° 57' 09.485"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: <u></u> ; watts: <u></u> ; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	10					
Longear	1					
Green	5					
Large mouth Bass	1					
Spotted Bass	3					
Common Carp	5					
River Carp Sucker	7					
Gizzard Shad	106					
Longnose Gar	4					
Channel Catfish	1					
Slim Minnows	4					
Sanger	3					
Bigmouth Buffalo	1					

Form 3

Revised 6-23-04 jg

4/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/11/07 Collector(s): Don, Kyle, Brent

Site ID: <u>2TR4SM</u>	Collection ID: <u>4</u>	Stratum ID: <u>P2-P1</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1202</u>	<u>1210</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° 01' 34.763"</u> <u>95° 57' 29.387"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	9					
Green	1					
Freshwater Drum	3					
River Carp Sucker	3					
Gizzard Shad	22					
Channel Catfish	1					
Smallmouth Buffalo	1					
Sauger	1					
Golden Redhorse	1					
River Shiner	50					

Form 3

Revised 6-21-04 jg

6/12

PENDIX E - Fish Collection Form

River ID: ARK Date: 9/11/07 Collector(s): Don, Kyle, Brent

Site ID: 2TR4SM Collection ID: 4 Stratum ID: P4-P3 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small	1143	1151	200m
<input type="checkbox"/> Gill Net	36° 01' 45.618" 95° 57' 36.084"			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	26					
Longear	1					
Green	2					
Largemouth Bass	1					
Spotted Bass	1					
Gizzard Shad	6					
Longnose Gar	2					
Flathead Catfish	3					
Channel Catfish	1					
Smallmouth Buffalo	3					
Slim Minnows	2					
Golden Redhorse	1					

Form 3

Revised 6-23-04 jtu

8/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9/11/07 Collector(s): Don, Kyle, Brent

Site ID: <u>2TR4SM</u>	Collection ID: <u>4</u>	Stratum ID: <u>P6-P5</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>1123</u>	<u>1132</u>	<u>200 m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36°01'56.875"</u> <u>95°57'42.981"</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	16					
Longear	1					
Green	2					
Spotted Bass	3					
White Bass	1					
Common Carp	1					
River Carp Sucker	5					
Gizzard Shad	13					
Silversides	4					
Longnose Gar	1					
Smallmouth Buffalo	2					
Slim Minnows	574					
Sauger	1					

Form 3

Revised 6-23-04 jju

10/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9-11-07 Collector(s): Brent, Kyle, Spunky

Site ID: ZTR4SM Collection ID: Site 4 Stratum ID: 68-17 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small	11:05	11:10	200 m
<input type="checkbox"/> Gill Net	36° 02 04, 425 95° 57 53, 312			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Largemouth Bass	1					
Striped bass	2					
White Bass	5					
Freshwater Drum	3					
Common Carp	2					
River Carp Suckers	1					
Gizzard Shad	17					
Slim shiner	24					
Smallmouth Bass	2					
Sanger	1					
River Redhorse	2					

Form 3

Revised 6-23-04 jtu

11/12

APPENDIX E - Fish Collection Form

River ID: ARK Date: 9-11-07 Collector(s): Brent Kyle Spade

Site ID: <u>2TR45M</u>	Collection ID: <u>Site 4</u>	Stratum ID: <u>P9-P8</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine		<u>10:50</u>	<u>11:00</u>	<u>200 m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net	<u>36° @ 2' 17.286</u> <u>95° 57' 50.003</u>			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Common Carp</u>	<u>3</u>					
<u>Long ear</u>	<u>1</u>					
<u>River Carp Snake</u>	<u>11</u>					
<u>Gizzard Shad</u>	<u>106</u>					
<u>Silversides</u>	<u>260</u>					
<u>Small mouth Buffalo</u>	<u>5</u>					
<u>Slim minnow</u>	<u>402</u>					
<u>Golden Redhorse</u>	<u>1</u>					
<u>Hill Sid</u>	<u>2</u>					

Form 3

Revised 6-23-04 ju

APPENDIX E - Fish Collection Form

12/12

River ID: ARK

Date: 9-11-07

Collector(s): Brent, Kyle, Specter

Site ID: 2TR4SM

Collection ID: Site 4

Stratum ID: P10-P9

Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine				
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small	10:41	10:48	200 m
<input type="checkbox"/> Gill Net	36° 02' 15.876 95° 58' 03.837			
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>8</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	8					
Long ear	9					
Green	7					
Largemouth Bass	1					
Spotted Bass	2					
White Bass	1					
Freshwater Drum	1					
River Carp Sucker	1					
Common Carp	1					
Gizzard Shad	26					
Silversides	124					
Longnose Gar	1					
Smallmouth Bass	1					
Flathead Catfish	1					
Slim minnows	213					

Form 3

Revised 6-23-04 jjo

1/12

APPENDIX B - Stream Verification Form

RIVER ID: Arv SITE ID: 2TRSSM Reviewed By _____
 DATE: 9-13-07
 COLLECTION ID: S, k 5 START TIME: 1030 TEAM: Brent, Kyle, Don

Stream/River Verification Information

Stream/River verified by (x all that apply): GPS local contact signs roads topo map
 other (describe here): _____ not verified (explain in comments)

Coordinates	<input checked="" type="checkbox"/> Center <input checked="" type="checkbox"/> Latitude North	<input type="checkbox"/> Center <input checked="" type="checkbox"/> Longitude West
Map GPS	<u>35°55'10.965"</u>	<u>95°45'30.477"</u>
GPS		

Did You Sample This Site?

YES IF YES, check one below

NO IF NO, check one below

- Sampleable (choose method used)
- River Type:
- Wadeable
 - Partially Boatable
 - Boatable
 - Wadeable interrupted - Not continuous water along reach
 - Boatable interrupted - Not continuous water along reach
 - Altered - Stream/River present but not as on map

- Non-sampleable - Permanent
- Dry - Visited
 - Dry - Not visited
 - Wetland (No definable channel)
 - Map error - No evidence of channel/waterbody ever present
 - Impounded (Underneath lake or pond)
 - Other (explain in comments)
- Non-sampleable - Temporary
- Not boatable - Need a different crew
 - Not wadeable - Need a different crew
 - Other (Explain in comments)
- No Access
- Access permission denied
 - Permanently inaccessible (Unable/unsafe to reach site)
 - Temporarily inaccessible (Explain in comments)

Description: _____

Directions To Site: _____

2/12

APPENDIX C - Channel Properties Form

9/13/07

Channel Pattern (Check one)

One channel

Anastomosing (complex) channel - (Relatively long major and minor channels branching and rejoining)

Braided channel - (Multiple short channels branching and rejoining - mainly one channel broken up by numerous mid-channel bars)

Channel Constraint (Check one)

Channel is unconstrained in broad valley - (i.e. during flood it can fill off-channel areas and side channels, spread out on flood plain, or easily cut new channels by erosion)

Channel is in narrow valley but is not very constrained, but limited in movement by relatively narrow valley floor (not too bare full)

Channel is in broad valley and incised - (flood flows do not commonly spread over valley floor or into multiple channels)

Channel is very constrained in V-shaped valley

Mean wetted width (approximately) 663 m

Substrate type (check all that apply and give the % of each)

Clay Silt Sand 100% Gravel Cobble Boulder Bedrock

Water Properties

In-situ measurements		Comments
Dissolved Oxygen (mg/L)	7.64	
Specific Conductance (µS/cm)	1,056	
Temperature (°C)	26.41	
Time of day	1355	

comments:

35° 55' 10.905"
95° 45' 39.477"

PH 7.82

3/12

APPENDIX E - Fish Collection Form

River ID: ARK

Date: 9-13-07

Collector(s): Brent Kyle Sparky

Site ID: 2TR5SM

Collection ID: 5.4.5

Stratum ID: P1 - P4

Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	35°55'12.449" N 95°45'33.664" W	1303	1327	200 m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	1					
Largemouth Bass	2					
Striped bass	1					
River Carp Sucker	4					
Smallmouth Buffalo	1					
Bigmouth Buffalo	1					
Gizzard shad	44					
Silversider	9					
Slim minnows	86					
Channel catfish	1					
Lognose Gar	2					
Redstingers	41					
Gambusia	3					
River stingers	30					

Form 3

Revised 6-23-04 jtu

4/12

APPENDIX E - Fish Collection Form

River ID: Ark Date: 9-13-07 Collector(s): Brent, Kyle, Dan

Site ID: ZTR5SM Collection ID: site Stratum ID: P2-P1 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	N 35° 55' 14" 800" W 45° 45' 41" 236"	1255	1300	200m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments

0 Fish

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APPENDIX E - Fish Collection Form

River ID: Ark Date: 9-17-07 Collector(s): Brent, Kyle, Don.

Site ID: <u>JTR55M</u>	Collection ID: <u>Site 5</u>	Stratum ID: <u>P4-P3</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	<u>N 35° 55' 22.43" W</u> <u>W 95° 46' 03.51" E</u>	<u>1125</u>	<u>11435</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Bluegill sunfish</u>	<u>9</u>					
<u>Largemouth bass</u>	<u>4</u>					
<u>Striped bass</u>	<u>1</u>					
<u>White bass</u>	<u>1</u>					
<u>Common Carp</u>	<u>2</u>					
<u>Gizzard Shad</u>	<u>9</u>					
<u>Slim minnows</u>	<u>31</u>					
<u>Channel catfish</u>	<u>1</u>					
<u>Long nose gar</u>	<u>1</u>					
<u>Gambusia</u>	<u>1</u>					
<u>River Shiner</u>	<u>9</u>					
<u>Red shiner</u>	<u>5</u>					

Form 3

Revised 6-23-04 njm

7/12

APPENDIX E - Fish Collection Form

River ID: Aik

Date: 9-13-07

Collector(s): Brant, Kyle, Dan

Site ID: 2TR5SM

Collection ID: site 5

Stratum ID: P5-P4

Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	N 35° 55' 31", 528" W 95° 45' 41", 288"	11:37	12:04	200 m
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Large mouth bass	1					
River carp sucker	1					
Smallmouth Buffalo	4					
Gizzard shad	4					
Slim minnow	1					
Flathead catfish	8					
River shiner	2					

Form 3

Revised 6-22-04 jgc

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APPENDIX E - Fish Collection Form

River ID: Ark Date: 9-13-07 Collector(s): Brent, Kyle, Dan

Site ID: <u>2TR5SM</u>	Collection ID: <u>Sink 5</u>	Stratum ID: <u>P6-P5</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	<u>N 35° 55' 33.834"</u> <u>W 95° 46' 07.761"</u>	<u>1110</u>	<u>11:24</u>	<u>200m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Bluegill</u>	<u>1</u>					
<u>Green sunfish</u>	<u>2</u>					
<u>Common Carp</u>	<u>4</u>					
<u>River Carp suckers</u>	<u>2</u>					
<u>Smallmouth Bass</u>	<u>1</u>					
<u>Gizzard Shad</u>	<u>8</u>					
<u>Silversides</u>	<u>3</u>					
<u>Stimminnow</u>	<u>29</u>					
<u>Longnose Gar</u>	<u>3</u>					
<u>Gambusia</u>	<u>34</u>					
<u>Red shiner</u>	<u>1</u>					
<u>River Shiner</u>	<u>55</u>					

Form 3

Revised 6-23-04 njt

10/12

APPENDIX E - Fish Collection Form

River ID: AIC Date: 9-13-07 Collector(s): Brent, Kyle, Spady

Site ID: ZTR5 SM Collection ID: s. 5 Stratum ID: P 8-P7 Haul ID: _____

Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	35° 55' 45.26" N 95° 46' 11.82" W	1056	11:08	700 m
<input type="checkbox"/> Hoop Net	____ Large _____ Small			
<input type="checkbox"/> Gill Net				
<input checked="" type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
Bluegill	4					
Largemouth Bass	4					
Spotted bass	1					
Freshwater Drumm	2					
River carp sucker	3					
Smallmouth Buffalo	2					
Gizzard shad	9					
Slim minnows	26					
Red shiners	2					
Gambusia	3					

Form 3

Revised 6-23-04 tju

12/12

APPENDIX E - Fish Collection Form

River ID: Ark

Date: 9-13-07

Collector(s): Brewer, Kyle, Spacky

Site ID: <u>2TR55M</u>	Collection ID: <u>Site 5</u>	Stratum ID: <u>P10-P9</u>	Haul ID: _____	
Gear Type (Check one)	Description	Effort		
		Start Time	End Time	Area
<input type="checkbox"/> Seine	<u>35° 55' 55" N, 754" W 95° 46' 15" W, 045" L</u>	<u>1043</u>	<u>1055</u>	<u>700m</u>
<input type="checkbox"/> Hoop Net	<input type="checkbox"/> Large <input type="checkbox"/> Small			
<input type="checkbox"/> Gill Net				
<input type="checkbox"/> Electrofisher	volts: _____; watts: _____; amps: <u>6</u> pulse rate: <u>60</u>			

Species	Total count	Voucher count	Length minimum (mm)	Length maximum (mm)	Group weight (g)	Comments
<u>Bluegills</u>	<u>6</u>					
<u>Longear</u>	<u>2</u>					
<u>Large mouth Bass</u>	<u>4</u>					
<u>Freshwater Drum</u>	<u>4</u>					
<u>River Carp Sucker</u>	<u>5</u>					
<u>Smallmouth Buffalo</u>	<u>3</u>					
<u>Silverides</u>	<u>18</u>					
<u>Slim minnow</u>	<u>14</u>					
<u>Flat Head Catfish</u>	<u>1</u>					
<u>Long nose Gar</u>	<u>2</u>					
<u>White Crappie</u>	<u>3</u>					
<u>Gambusia</u>	<u>5</u>					
<u>Puddlet fish</u>	<u>1</u>					
<u>Thread fin</u>	<u>1</u>					

Form 3

Revised 6-23-04 tju