

# ***BIOTIC COMMUNITY***

## **Fish Community Data**

Limited sampling of the lower Crooked River mainstem was done in 1941. The area was altered by channelization in the early 1970's, and the fish assemblage has probably changed since 1941 due to these modifications. The middle portion of the Crooked River basin and the tributaries in the eastern part of the basin have been minimally sampled. Most efforts appear to have been concentrated in the Rocky Fork, upper reaches of the East Fork Crooked River, West Fork Crooked River and mainstem Crooked River. Some new areas that were sampled for the first time in 1998 were Brushy Creek, Fire Branch, Cottonwood Branch, West Fork Crooked River below Richmond, and Unnamed Tributary # 5.

Twenty-one sites scattered throughout the Crooked River basin were scheduled for sampling during 1998 (Figure 7). Five sites on the mainstem Crooked River were inadequately sampled or not sampled for various reasons. Hazardous weather (RAH98-7) and difficult sampling conditions (steep slick mud banks and deep water; RAH98-1, RAH98-5) reduced sampling efforts at three sites. Two other sites were dropped, one due to steep mud banks and deep water (RAH98-6) and the creek bed was dry at the other site (RAH 98-15).

There were 39 species of fish collected in the Crooked River basin in 1998 (Table 5). Fish species captured for the first time in the basin in 1998 were paddlefish, goldfish, grass carp, bighead carp, silver chub, bigmouth buffalo, western mosquitofish, white bass and freshwater drum. Fish captured in 1995 and 1998 but not previously included: Golden shiner, black crappie and logperch. All of the fish collected for the first time in 1998 were captured in the lower Crooked River near or in the Missouri River floodplain. The grass carp and bighead carp are introduced species that have become established since 1941 when this area was last sampled.

Western mosquitofish have probably arrived by natural range expansion and/or inadvertent introduction. Goldfish have probably been introduced by bait bucket releases of anglers. The paddlefish, bigmouth buffalo, white bass and freshwater drum were likely present but not sampled in 1941 because seining was the only collection gear used. These species were collected using a boat mounted electrofisher in 1998. Silver chubs were historically found in large prairie streams and the Missouri River in Northwest Missouri. The single specimen captured in 1998 in the lower Crooked River may have been a migrant from the Missouri River as it is regularly found there. The three species of fish captured since 1995, golden shiner, logperch and black crappie, were found over a large area of the basin including headwater areas. The logperch were captured primarily in the middle section of the Crooked River basin. They may have been present in the Crooked River basin for quite some time, but lack of sampling in the middle section of the basin may have been the reason they have only recently been captured. Golden shiner has probably been introduced through bait bucket releases of anglers. Black crappie probably have been introduced via farm pond stocking or lake overflows. Species that were widespread and commonly encountered in the basin included central stoneroller, red shiner, common shiner, sand shiner, creek chub, black bullhead, green sunfish and bluegill. A list of species collected by site is found in Appendix E.

The only species collected previously in the Crooked River basin that was not collected in 1998 was the Topeka shiner. This species was collected in the upper Crooked River in 1965 but was not captured in intensive collecting in headwater areas in 1995 (including the historic collection site, Gelwicks and Bruenderman 1996) or 1998. Apparently, the Topeka shiner has disappeared from the Crooked River

basin. Creel survey records for the Crooked River basin include rock bass, smallmouth bass, and flathead catfish. None of these species were collected in recent sampling, although flathead catfish undoubtedly occur in the basin. There are no other records for smallmouth bass and rock bass in the Crooked River basin. These fish may have been identified incorrectly by untrained creel personnel.

## **Aquatic Invertebrates**

Steve Eder (MDC) collected aquatic invertebrate information on the mainstem Crooked River in September 1987. There were 2,227 invertebrates collected representing 13 different orders. Detailed information is presented in Appendix F. Sampling of adult dragonflies in the Crooked River basin in Missouri was conducted in July and September, 1997 by Linden Trial (MDC, personal communication). These results are also found in Appendix F.

Four crayfish have ranges that include part or all of the Crooked River basin (Table 6). Very little collecting has been conducted to confirm or document their occurrence in the basin. The devil crayfish spend most of their lives underground and are difficult to collect and document. The grassland crayfish is also a burrowing crayfish that can be difficult to collect (Pfleiger 1996). The only species of crayfish collected in 1998 were northern crayfish (Table 6).

There are several mussels whose range includes the Crooked River watershed, but very little sampling has been conducted to determine their presence. Mussels in general are declining in Missouri primarily due to habitat loss. Weathered shells from the Crooked River were collected in July and September 1997 by Linden Trial (Table 7). The collection is the only documented record of mussels in the Crooked River system that could be found. Several weathered shells were collected during sampling in May and June of 1998.

## **Amphibians and Reptiles**

Table 8 lists the amphibians found in the Crooked River basin. Three species, the plains spadefoot, great plains toad and great plains narrowmouth toad, are restricted to the area of the Missouri River floodplain. Due to their secretive nature and life history habits, these three species are difficult to study and document through collection. Table 9 lists the reptiles found in the Crooked River basin.

## **Threatened and Endangered Species**

The Topeka shiner was last collected in the Crooked River basin in 1965. An intensive effort to collect Topeka shiners was carried out in the basin in 1995 (Gelwicks and Bruenderman 1996). None were collected in sampling in 1995 or 1998. It appears that the Topeka shiner has been extirpated from the Crooked River basin. A remnant population of greater prairie-chickens was found by Ray County senior conservation agent George Hiser in 1990 and confirmed with follow up observations by other MDC personnel. A rare plant, auriculate false foxglove, is found on the Foxglove CA.

Rare or unusual species reported from the Crooked River basin include scorpions, Bell's vireo, armadillos and badgers. Pheasants, an introduced game bird, are observed occasionally in the Crooked River basin (G. Hiser, MDC Conservation Agent, pers. comm.). (Table 10).

## **Fish Stocking**

Fish stocking has been carried out in the Crooked River basin by the MDC and private individuals. The basin's public lakes are stocked and managed by the MDC. A complete list of fish stocked in

state-managed waters can be found in Table 11. The MDC offers a stocking program for private impoundments that meet the eligibility requirements. The MDC supplies largemouth bass, bluegill and channel catfish to eligible impoundment owners for initial stocking.

Private impoundments are often supplementally stocked by their owners with fish purchased from commercial fish producers. Black and white crappie (probably native to the basin) have been stocked in private impoundments and appear throughout the basin. Grass carp have been stocked in private impoundments throughout the basin to control aquatic vegetation, and escapement has occurred. Immigration from the Missouri River may be occurring as natural reproduction has been documented in the lower Missouri River (Brown and Coon 1994). Common carp are also an introduced species that are present in the basin and provide angling opportunity. Bighead carp, another introduced species, was captured during basin sampling in 1998 and are probably immigrating from the Missouri River where they have become established.

### **Creel Survey**

A statewide creel survey by Funk (1968) indicated common carp, bullheads, and channel catfish were the most frequently harvested fish in the Crooked River basin. Other fish in the Crooked River, creelied by anglers, included bluegill, crappie, green sunfish, largemouth bass, smallmouth bass, rock bass, and flathead catfish. Some of these records (smallmouth bass and rock bass in particular) may be erroneous as information was collected by personnel with minimal training in fish identification.

### **Present Regulations**

Statewide creel and fish size limits apply to the streams and rivers in the Crooked River basin. Special size restrictions, creel limits or other regulations apply to public impoundments in the basin.

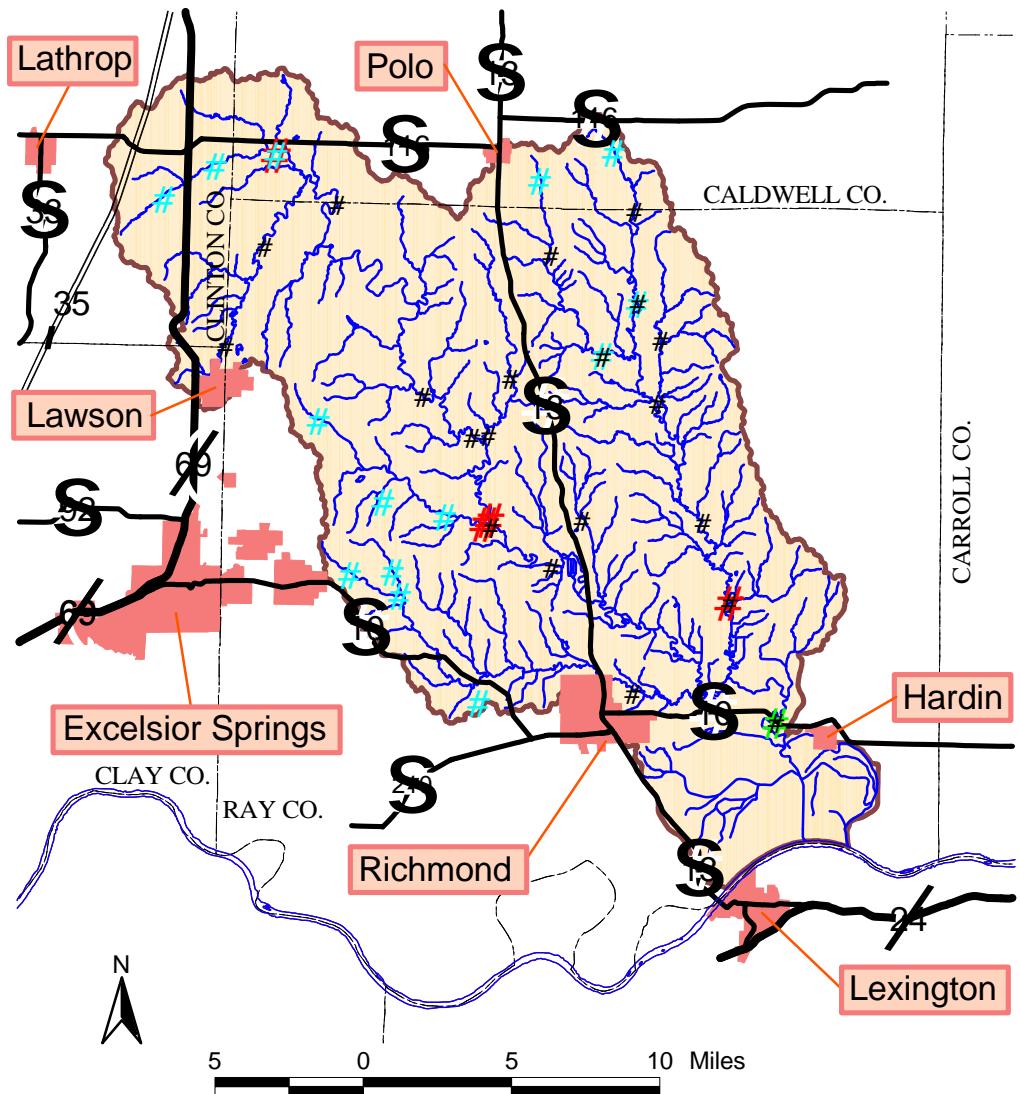


Figure 7. Fish sample locations in the Crooked River basin.

Table 5. Fish collected in the Crooked River basin (MDC files)

Common Name	Scientific name	1941	1965	1995	1998
Paddlefish	<i>Polyodon spathula</i>				X
Shortnose Gar	<i>Lepisosteus platostomus</i>	X			X
Gizzard Shad	<i>Dorosoma cepedianum</i>	X	X		X
Central Stoneroller	<i>Campostoma pullum</i>		X	X	X
Goldfish	<i>Carassius auratus</i>				X
Grass Carp	<i>Ctenopharyngodon idella</i>				X
Red Shiner	<i>Cyprinella lutrensis</i>	X	X	X	X
Common Carp	<i>Cyprinus carpio</i>	X	X		X
Bighead Carp	<i>Hypophthalmichthys nobilis</i>				X
Common Shiner	<i>Luxilus cornutus</i>		X	X	X
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>		X	X	X
Silver Chub	<i>Macrhybopsis storeriana</i>				X
Golden Shiner	<i>Notemigonus crysoleucas</i>			X	X
Emerald Shiner	<i>Notropis atherinoides</i>	X			X
Bigmouth Shiner	<i>Notropis dorsalis</i>		X	X	X
Sand Shiner	<i>Notropis ludibundus</i>		X	X	X
Topeka Shiner	<i>Notropis topeka</i>		X		
Suckermouth Minnow	<i>Phenacobius mirabilis</i>		X	X	X
Bluntnose Minnow	<i>Pimephales notatus</i>		X	X	X
Fathead Minnow	<i>Pimephales promelas</i>	X	X	X	X
Creek Chub	<i>Semotilus atromaculatus</i>		X	X	X
River Carpsucker	<i>Carpiodes carpio</i>		X	X	X
White Sucker	<i>Catostomus commersoni</i>		X	X	X
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	X			X
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>				X

Common Name	Scientific name	1941	1965	1995	1998
Black Bullhead	<i>Ameiurus melas</i>	X	X	X	X
Yellow Bullhead	<i>Ameiurus natalis</i>	X		X	X
Channel Catfish	<i>Ictalurus punctatus</i>		X	X	X
Western Mosquitofish	<i>Gambusia affinis</i>				X
White Bass	<i>Morone chrysops</i>				X
Green Sunfish	<i>Lepomis cyanellus</i>		X	X	X
Orangespotted Sunfish	<i>Lepomis humilis</i>	X	X	X	X
Bluegill	<i>Lepomis macrochirus</i>		X	X	X
Largemouth Bass	<i>Micropterus salmoides</i>		X	X	X
White Crappie	<i>Pomoxis annularis</i>		X	X	X
Black Crappie	<i>Pomoxis nigromaculatus</i>			X	X
Johnny Darter	<i>Etheostoma nigrum</i>		X	X	X
Orangethroat Darter	<i>Etheostoma spectabile</i>		X	X	X
Logperch	<i>Percina caprodes</i>			X	X
Freshwater Drum	<i>Aplodinotus grunniens</i>				X

## Appendix E. Fish samples from the Crooked River basin.

Table E - 1. Fish sampled from the mainstem Crooked River (site MRW98-9) in the Crooked River basin on May 5, 1998.

Common Name	Scientific Name	Number Collected
Paddlefish	<i>Polyodon spathula</i>	1
Shortnose Gar	<i>Lepisosteus platostomus</i>	16
Gizzard Shad	<i>Dorosoma cepedianum</i>	42
Red Shiner	<i>Cyprinella lutrensis</i>	46
Golden Shiner	<i>Notemigonus crysoleucas</i>	1
Sand Shiner	<i>Notropis ludibundus</i>	3
Emerald Shiner	<i>Notropis atherinoides</i>	24
Bluntnose Minnow	<i>Pimephales notatus</i>	5
Silver Chub	<i>Macrhybopsis storeriana</i>	1
Creek Chub	<i>Semotilus atromaculatus</i>	1
Goldfish	<i>Carassius auratus</i>	2
Common Carp	<i>Cyprinus carpio</i>	22
Grass Carp	<i>Ctenopharyngodon idella</i>	1
Bighead Carp	<i>Hypophthalmichthys nobilis</i>	1
River Carpsucker	<i>Carpoides carpio</i>	17
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	4
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>	15
Channel Catfish	<i>Ictalurus punctatus</i>	14
Western Mosquitofish	<i>Gambusia affinis</i>	4
White Bass	<i>Morone chrysops</i>	3
Largemouth Bass	<i>Micropterus salmoides</i>	6
Bluegill	<i>Lepomis macrochirus</i>	8
Green Sunfish	<i>Lepomis cyanellus</i>	9
White Crappie	<i>Pomoxis annularis</i>	2
Black Crappie	<i>Pomoxis nigromaculatus</i>	1
Freshwater Drum	<i>Aplodinotus grunniens</i>	8

Table E - 2. Fish sampled from the East Fork Crooked River (site RAH 98-1) in the Crooked River basin on May 14, 1998.

Common Name	Scientific Name	Number Collected
Yellow Bullhead	<i>Ameiurus natalis</i>	1
Bluegill	<i>Lepomis macrochirus</i>	4

Table E - 3. Fish sampled from the East Fork Crooked River (site RAH 98-2) in the Crooked River basin on May 14, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	1
Red Shiner	<i>Cyprinella lutrensis</i>	48
Common Shiner	<i>Luxilus cornutus</i>	25
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>	2
Golden Shiner	<i>Notemigonus crysoleucas</i>	1
Sand Shiner	<i>Notropis ludibundus</i>	4
Bluntnose Minnow	<i>Pimephales notatus</i>	7
Black Bullhead	<i>Ameiurus melas</i>	1
Yellow Bullhead	<i>Ameiurus natalis</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	11
Bluegill	<i>Lepomis macrochirus</i>	1
Ozark Logperch	<i>Percina caprodes</i>	2

Table E - 4. Fish sampled from the West Fork Crooked River (site RAH 98-3) in the Crooked River basin on May 14,1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	2
Red Shiner	<i>Cyprinella lutrensis</i>	
Common Shiner	<i>Luxilus cornutus</i>	17
Sand Shiner	<i>Notropis ludibundus</i>	1
Bluntnose Minnow	<i>Pimephales notatus</i>	6
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	3
Creek Chub	<i>Semotilus atromaculatus</i>	18
White Sucker	<i>Catostomus commersoni</i>	2
Black Bullhead	<i>Ameiurus melas</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	4
Bluegill	<i>Lepomis macrochirus</i>	3
Largemouth Bass	<i>Micropterus salmoides</i>	1
Orangethroat Darter	<i>Etheostoma spectabile</i>	1
Ozark Logperch	<i>Percina caprodes</i>	1

Table E - 5. Fish sampled from the Cottonwood Branch (site RAH 98-4) in the Crooked River basin on May 14, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	3
Red Shiner	<i>Cyprinella lutrensis</i>	2
Fathead Minnow	<i>Pimephales promelas</i>	12
Creek Chub	<i>Semotilus atromaculatus</i>	20
Green Sunfish	<i>Lepomis cyanellus</i>	1

Table E - 6. Fish sampled from the mainstem Crooked River (site RAH 98-5) in the Crooked River basin on May 14, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	1
Creek Chub	<i>Semotilus atromaculatus</i>	3
Black Bullhead	<i>Ameiurus melas</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	4

Table E - 7. Fish sampled from the mainstem Crooked River (site RAH 98-7) in the Crooked River basin on May 14, 1998.

Common Name	Scientific Name	Number Collected
Red Shiner	<i>Cyprinella lutrensis</i>	23
Bluntnose Minnow	<i>Pimephales notatus</i>	3
Common Shiner	<i>Luxilus cornutus</i>	1
Golden Shiner	<i>Notemigonus crysoleucas</i>	1
Creek Chub	<i>Semotilus atromaculatus</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	3
Bluegill	<i>Lepomis macrochirus</i>	1
Ozark Logperch	<i>Percina caprodes</i>	5

Table E - 8. Fish sampled from the East Fork Crooked River (site RAH 98-8) in the Crooked River basin on May 21, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	43
Red Shiner	<i>Cyprinella lutrensis</i>	12
Common Shiner	<i>Luxilus cornutus</i>	60
Bigmouth Shiner	<i>Notropis dorsalis</i>	41
Sand Shiner	<i>Notropis ludibundus</i>	16
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	6
Bluntnose Minnow	<i>Pimephales notatus</i>	11
Creek Chub	<i>Semotilus atromaculatus</i>	20
White Sucker	<i>Catostomus commersoni</i>	1
Yellow Bullhead	<i>Ameiurus natalis</i>	4
Green Sunfish	<i>Lepomis cyanellus</i>	23
Orangethroat Darter	<i>Etheostoma spectabile</i>	2

Table E - 9. Fish sampled from Unnamed Tributary #8 (site RAH 98-9) in the Crooked River basin on May 21, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	72
Red Shiner	<i>Cyprinella lutrensis</i>	132
Common Shiner	<i>Luxilus cornutus</i>	70
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>	5
Bigmouth Shiner	<i>Notropis dorsalis</i>	125
Sand Shiner	<i>Notropis ludibundus</i>	29
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	2
Bluntnose Minnow	<i>Pimephales notatus</i>	61
Fathead Minnow	<i>Pimephales promelas</i>	14
Creek Chub	<i>Semotilus atromaculatus</i>	19
White Sucker	<i>Catostomus commersoni</i>	5
Yellow Bullhead	<i>Ameiurus natalis</i>	2
Green Sunfish	<i>Lepomis cyanellus</i>	14
Largemouth Bass	<i>Micropterus salmoides</i>	1
Johnny Darter	<i>Etheostoma nigrum</i>	7
Orangethroat Darter	<i>Etheostoma spectabile</i>	23

Table E - 10. Fish sampled from the Fire Branch (site RAH 98-10) in the Crooked River basin on May 21, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	24
Common Shiner	<i>Luxilus cornutus</i>	7
Bigmouth Shiner	<i>Notropis dorsalis</i>	36
Creek Chub	<i>Semotilus atromaculatus</i>	33
White Sucker	<i>Catostomus commersoni</i>	1
Black Bullhead	<i>Ameiurus melas</i>	7
Green Sunfish	<i>Lepomis cyanellus</i>	9
Bluegill	<i>Lepomis macrochirus</i>	2
Orangethroat Darter	<i>Etheostoma spectabile</i>	4

Table E - 11. Fish sampled from the Fire Branch (site RAH 98-11) in the Crooked River basin on May 21, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	6
Red Shiner	<i>Cyprinella lutrensis</i>	78
Common Carp	<i>Cyprinus carpio</i>	1
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>	13
Common Shiner	<i>Luxilus cornutus</i>	65
Golden Shiner	<i>Notemigonus crysoleucas</i>	17
Bigmouth Shiner	<i>Notropis dorsalis</i>	6
Sand Shiner	<i>Notropis ludibundus</i>	15
Bluntnose Shiner	<i>Pimephales notatus</i>	48
Fathead Minnow	<i>Pimephales promelas</i>	5
Creek Chub	<i>Semotilus atromaculatus</i>	17
White Sucker	<i>Catostomus commersoni</i>	3
Green Sunfish	<i>Lepomis cyanellus</i>	2
Bluegill	<i>Lepomis macrochirus</i>	3

Table E-12. Fish sampled from the mainstem Crooked River (site RAH 98-12) in the Crooked River basin on May 21, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	3
Red Shiner	<i>Cyprinella lutrensis</i>	34
Common Shiner	<i>Luxilus cornutus</i>	2
Bigmouth Shiner	<i>Notropis ludibundus</i>	3
Bluntnose Minnow	<i>Pimephales notatus</i>	5
Channel Catfish	<i>Ictalurus punctatus</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	2
Orangethroat Darter	<i>Etheostoma spectabile</i>	6
Ozark Logperch	<i>Percina caprodes</i>	2

Table E - 13. Fish sampled from the mainstem Crooked River (site RAH 98-13) in the Crooked River basin on May 21, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	2
Red Shiner	<i>Cyprinella lutrensis</i>	263
Common Shiner	<i>Luxilus cornutus</i>	9
Bigmouth Shiner	<i>Notropis dorsalis</i>	15
Sand Shiner	<i>Notropis ludibundus</i>	26
Bluntnose Shiner	<i>Pimephales notatus</i>	105
Creek Chub	<i>Semotilus atromaculatus</i>	14
White Sucker	<i>Catostomus commersoni</i>	1
Yellow Bullhead	<i>Ameiurus natalis</i>	2
Green Sunfish	<i>Lepomis cyanellus</i>	4

Table E - 14. Fish sampled from Unnamed Tributary #5 (site RAH 98-14) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	54
Common Shiner	<i>Luxilus cornutus</i>	84
Bigmouth Shiner	<i>Notropis dorsalis</i>	122
Sand Shiner	<i>Notropis ludibundus</i>	37
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	1
Bluntnose Minnow	<i>Pimephales notatus</i>	31
Creek Chub	<i>Semotilus atromaculatus</i>	43
White Sucker	<i>Catostomus commersoni</i>	2
Green Sunfish	<i>Lepomis cyanellus</i>	7
Johnny Darter	<i>Etheostoma nigrum</i>	3
Orangethroat Darter	<i>Etheostoma spectabile</i>	5

Table E - 15. Fish sampled from East Fork Crooked River (site RAH 98-16) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	34
Red Shiner	<i>Cyprinella lutrensis</i>	172
Common Shiner	<i>Luxilus cornutus</i>	56
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>	91
Bigmouth Shiner	<i>Notropis dorsalis</i>	9
Sand Shiner	<i>Notropis ludibundus</i>	3
Bluntnose Minnow	<i>Pimephales notatus</i>	25
Fathead Minnow	<i>Pimephales promelas</i>	2
Creek Chub	<i>Semotilus atromaculatus</i>	25
White Sucker	<i>Catostomus commersoni</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	1
Johnny Darter	<i>Etheostoma nigrum</i>	5
Orangethroat Darter	<i>Etheostoma spectabile</i>	22

Table E - 16. Fish sampled from East Fork Crooked River (site RAH 98-17) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	67
Red Shiner	<i>Cyprinella lutrensis</i>	22
Common Shiner	<i>Luxilus cornutus</i>	50
Bigmouth Shiner	<i>Notropis dorsalis</i>	7
Bluntnose Minnow	<i>Pimephales notatus</i>	18
Fathead Minnow	<i>Pimephales promelas</i>	4
Creek Chub	<i>Semotilus atromaculatus</i>	23
White Sucker	<i>Catostomus commersoni</i>	16
Green Sunfish	<i>Lepomis cyanellus</i>	11
Bluegill	<i>Lepomis macrochirus</i>	8
Johnny Darter	<i>Etheostoma nigrum</i>	10
Orangethroat Darter	<i>Etheostoma spectabile</i>	7

Table E - 17. Fish sampled from Unnamed Tributary #8 (site RAH 98-18) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	49
Red Shiner	<i>Cyprinella lutrensis</i>	86
Bigmouth Shiner	<i>Notropis dorsalis</i>	3
Sand Shiner	<i>Notropis ludibundus</i>	2
Creek Chub	<i>Semotilus atromaculatus</i>	31
White Sucker	<i>Catostomus commersoni</i>	2
Black Bullhead	<i>Ameiurus melas</i>	1
Green Sunfish	<i>Lepomis cyanellus</i>	16
Bluegill	<i>Lepomis macrochirus</i>	1
Black Crappie	<i>Pomoxis nigromaculatus</i>	1

Table E - 18. Fish sampled from Crooked River (site RAH 98-19) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	11
Red Shiner	<i>Cyprinella lutrensis</i>	333
Common Shiner	<i>Luxilus cornutus</i>	58
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>	72
Bigmouth Shiner	<i>Notropis dorsalis</i>	25
Sand Shiner	<i>Notropis ludibundus</i>	18
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	18
Bluntnose Minnow	<i>Pimephales notatus</i>	9
Creek Chub	<i>Semotilus atromaculatus</i>	10
White Sucker	<i>Catostomus commersoni</i>	4
Green Sunfish	<i>Lepomis cyanellus</i>	5
Orangespotted Sunfish	<i>Lepomis humilis</i>	2
Johnny Darter	<i>Etheostoma nigrum</i>	22
Orangethroat Darter	<i>Etheostoma spectabile</i>	22

Table E - 19. Fish sampled from Brushy Creek (site RAH 98-20) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Central Stoneroller	<i>Campostoma pullum</i>	79
Red Shiner	<i>Cyprinella lutrensis</i>	254
Common Shiner	<i>Luxilus cornutus</i>	123
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>	39
Bigmouth Shiner	<i>Notropis dorsalis</i>	102
Sand Shiner	<i>Notropis ludibundus</i>	49
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	29
Bluntnose Minnow	<i>Pimephales notatus</i>	76
Fathead Minnow	<i>Pimephales promelas</i>	1
Creek Chub	<i>Semotilus atromaculatus</i>	38
White Sucker	<i>Catostomus commersoni</i>	18
Yellow Bullhead	<i>Ameiurus natalis</i>	2
Green Sunfish	<i>Lepomis cyanellus</i>	7
Orangespotted Sunfish	<i>Lepomis humilis</i>	1
Bluegill	<i>Lepomis macrochirus</i>	2
Johnny Darter	<i>Etheostoma nigrum</i>	2
Orangethroat Darter	<i>Etheostoma spectabile</i>	7
Ozark Logperch	<i>Percina caprodes</i>	1

Table E - 20. Fish sampled from Brushy Creek (site RAH 98-21) in the Crooked River basin on June 4, 1998.

Common Name	Scientific Name	Number Collected
Red Shiner	<i>Cyprinella lutrensis</i>	211
Common Shiner	<i>Luxilus cornutus</i>	34
Bigmouth Shiner	<i>Notropis dorsalis</i>	10
Bluntnose Minnow	<i>Pimephales notatus</i>	1
Creek Chub	<i>Semotilus atromaculatus</i>	10
Black Bullhead	<i>Ameiurus melas</i>	3
Green Sunfish	<i>Lepomis cyanellus</i>	16

Table E - 21. Fish sampled in the Crooked River, 6 miles upstream of the Missouri River, August 1941, Location: 0942A, UTM x - 425700/y - 4347500 (MDC Files).

Common Name	Scientific Name
Shortnose Gar	<i>Lepisosteus platostomus</i>
Gizzard Shad	<i>Dorosoma cepedianum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Carp	<i>Cyprinus carpio</i>
Emerald Shiner	<i>Notropis atherinoides</i>
Fathead Minnow	<i>Pimephales promelas</i>
Smallmouth Buffalo	<i>Ictiobus bubalus</i>
Black Bullhead	<i>Ameiurus melas</i>
Yellow Bullhead	<i>Ameiurus natalis</i>
Orangespotted Sunfish	<i>Lepomis humilis</i>

Table E - 22. Fish sampled in the Crooked River, 29 miles upstream of Missouri River,  
August 1965, Location: 1364B, UTM x - 410200/y - 4358500 (MDC Files).

Common Name	Scientific Name
Red Shiner	<i>Cyprinella lutrensis</i>
Common Carp	<i>Cyprinus carpio</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Black Bullhead	<i>Ameiurus melas</i>
Channel Catfish	<i>Ictalurus punctatus</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orangespotted Sunfish	<i>Lepomis humilis</i>
White Crappie	<i>Pomoxis annularis</i>

Table E - 23. Fish sampled in the Crooked River, 59 miles upstream of Missouri River,  
September 1965, Location: 1363B, UTM x - 398600/y - 4378300 (MDC Files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Topeka Shiner	<i>Notropis topeka</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
River Carpsucker	<i>Carpiodes carpio</i>
Black Bullhead	<i>Ameiurus melas</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orangespotted Sunfish	<i>Lepomis humilis</i>
Bluegill	<i>Lepomis macrochirus</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 24. Fish sampled in the East Fork Crooked River, 5 miles upstream of its confluence with Crooked River, August 1965 Location: 1366B, UTM x - 423200/y - 4354000 (MDC Files).

Common Name	Scientific Name
Gizzard Shad	<i>Dorosoma cepedianum</i>
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Carp	<i>Cyprinus carpio</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
River Carpsucker	<i>Carpiodes carpio</i>
White Sucker	<i>Catostomus commersoni</i>
Black Bullhead	<i>Ameiurus melas</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth Bass	<i>Micropterus salmoides</i>
White Crappie	<i>Pomoxis annularis</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 25. Fish sampled in the Rocky Fork, one mile upstream of its confluence with the Crooked River, August 1965 Location: 1365B, UTM x - 409900 / y - 4358300 (MDC Files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 26. Fish sampled in the Crooked River, 59 miles upstream of Missouri River, June 1995, Location: 1363G, UTM x - 398600/y - 4378300 (MDC Files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Creek Chub	<i>Semotilus atromaculatus</i>
River Carpsucker	<i>Carpoides carpio</i>
White Sucker	<i>Catostomus commersoni</i>
Channel Catfish	<i>Ictalurus punctatus</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth Bass	<i>Micropterus salmoides</i>
White Crappie	<i>Pomoxis annularis</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 27. Fish sampled in a Tributary to the East Fork Crooked River, June 1995,  
Location: 2397G, UTM x - 412900/y - 4376900 (MDC Files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Golden Shiner	<i>Notemigonus crysoleucas</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Black Crappie	<i>Pomoxis nigromaculatus</i>

Table E - 28. Fish sampled in the East Fork Crooked River 30 miles upstream of its confluence  
with the Crooked River, June 1995, Location: 2398G, UTM x - 416900/y - 4378400  
(MDCfiles).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 29. Fish sampled in the Crooked River, 63 miles upstream of its confluence with the Missouri River, June 1995, Location: 2407G, UTM x - 395300/y - 4377700 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 30. Fish sampled in the Crooked River, 65 miles upstream of its confluence with the Missouri River, June 1995, Location: 2408G, UTM x - 392500/y - 4375900 (MDC files).

Common Name	Scientific Name
White Sucker	<i>Catostomus commersoni</i>
Black Bullhead	<i>Ameiurus melas</i>

Table E - 31. Fish sampled in Unnamed #08, a tributary of the East Fork Crooked River,  
June 1995, Location: 2413G, UTM x - 416300/y - 4367400 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 32. Fish sampled in East Fork Crooked River, 22 miles upstream of its confluence with Crooked River, June 1995, Location: 2414G, UTM x - 418200/y - 4370200 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>
Ozark Logperch	<i>Percina caprodes</i>

Table E - 33. Fish sampled in the West Fork Crooked River, 11 miles upstream of its confluence with the Crooked River, June 1995, Location: 2415G, UTM x - 409600/y - 4348600 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Suckermouth Minnow	<i>Phenacobius mirabilis</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 34. Fish sampled in a tributary of the West Fork Crooked River, June 1995, Location: 2416G, UTM x - 402600/y - 4355500 (MDC Files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Golden Shiner	<i>Notemigonus crysoleucas</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E -35. Fish sampled in the West Fork Crooked River, 18 miles upstream of its confluence with the Crooked River, June 1995, Location: 2417G, UTM x - 404900/y - 4355700 (MDC files).

Common Name	Scientific Name
Bluntnose Minnow	<i>Pimephales notatus</i>

Table E - 36. Fish sampled in the West Fork Crooked River, 17 miles upstream of its confluence with the Crooked River, June 1995, Location: 2418G, UTM x - 405300/y - 4354400 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Golden Shiner	<i>Notemigonus crysoleucas</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Black Bullhead	<i>Ameiurus melas</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 37. Fish sampled in the Rocky Fork, 3 miles upstream of its confluence with the Crooked River, July 1995, Location: 2419G, UTM x - 507700/y - 4358700 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Common Shiner	<i>Luxilus cornutus</i>
Western Redfin Shiner	<i>Lythrurus u. umbratilis</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Sand Shiner	<i>Notropis ludibundus</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Creek Chub	<i>Semotilus atromaculatus</i>
White Sucker	<i>Catostomus commersoni</i>
Black Bullhead	<i>Ameiurus melas</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>

Table E - 38. Fish sampled in the Rocky Fork, 7 miles upstream of its confluence with the Crooked River, June 1995, Location: 2420G, UTM x - 404400/y - 4359500 (MDC files).

Common Name	Scientific Name
Green Sunfish	<i>Lepomis cyanellus</i>

Table E - 39. Fish sampled in the Rocky Fork, 10 miles upstream of its confluence with the Crooked River, June 1995, Location: 2421G, UTM x - 400900/y - 4363900 (MDC files).

Common Name	Scientific Name
Central Stoneroller	<i>Campostoma pullum</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Bluegill	<i>Lepomis macrochirus</i>

## Appendix F. Aquatic invertebrates collected in the Crooked River basin.

Table F-1 . Stream: Crooked River at MDC Morton Bridge Access, Ray County, Missouri. Location: UTM-X 422800 UTM-Y 4349700. Date: September 21, 1987. Samples collected using three Hester Dendy samplers. (Steve Eder, MDC files).

Phylum	Class	Order	Family	Scientific Name	Number
Annelida					23
	Oligochaeta				27
	Hirudinea				2
Mollusca	Gastropoda	Lymnophila	Physidae	<i>Physella</i> sp.	4
	Bivalvia	Pelecypoda			1
			Sphaeriidae		13
Arthropoda	Insecta	Ephemeroptera	Baetidae	<i>Stenacron</i> sp.	24
			Caenidae	<i>Caenis</i> sp.	6
			Ephemeridae	<i>Hexagenia</i> sp.	3
		Odonata	Coenagrionidae	<i>Argia</i> sp.	83
			Coenagrionidae	<i>Enallagma</i> sp.	1
		Hemiptera	Corixidae		1
			Corixidae	<i>Palmocorixa buenoi</i>	1
		Megaloptera	Sialidae	<i>Sialis</i> sp.	2
		Coleoptera	Elmidae	<i>Dubiraphia</i> sp.	18
		Trichoptera	Psychomyiidae/ Polycentropodidae	<i>Polycentropus</i> sp.	7
			Polycentropodinae	<i>Nyctiophylax</i> sp.	4
			Hydropsychidae	<i>Cheumatopsyche</i> sp.	4
		Diptera	Chironomidae		64
			Ceratopogonidae		1
			Chaoboridae	<i>Chaoborus</i> sp.	1

Table F-2. Stream: Crooked River near Elmira, Ray County Missouri.

Location: UTM-X 401300 UTM-Y 4373800. Date: September 21, 1987. Samples collected using three Hester Dendy samplers. (Steve Eder, MDC files).

Phylum	Class	Order	Family	Scientific Name	Number
Annelida					3
Mollusca	Gastropoda	Lymnophila	Physidae	<i>Physella</i> sp.	22
	Bivalvia	Pelecypoda	Sphaeriidae		1
Arthropoda	Crustacea	Decapoda	Astacidae	<i>Orconectes virilis</i>	4
	Insecta	Ephemeroptera	Heptageniidae	<i>Stenacron</i> sp.	78
			Heptageniidae	<i>Stenonema</i> sp.	14
			Heptageniidae	<i>Stenonema femoratum</i>	5
			Caenidae	<i>Caenis</i> sp.	137
			Tricorythidae	<i>Tricorythodes</i> sp.	1
			Ephemeridae	<i>Hexagenia</i> sp.	12
		Odonata	Coenagrionidae	<i>Argia</i> sp.	147
			Coenagrionidae	<i>Enallagma</i> sp.	3
		Coleoptera	Hydrophilidae	<i>Berosus</i> sp.	1
			Elmidae	<i>Dubiraphia</i> sp.	4
			Elmidae	<i>Stenelmis beameri</i>	1
		Trichoptera	Psychomyiidae/ Polycentropodidae	<i>Polycentropus</i> sp.	6
			Polycentropodinae	<i>Nyctiophylax</i> sp.	6
		Diptera	Chironomidae		165
			Ceratopogonidae		1

Table F - 3. Stream: Crooked River near Elmira, Missouri (Ray County)

Location: UTM-X 401300 UTM-Y 4373800 Date: September 21, 1987 Samples collected using a Surber Sampler (three samples combined). (Steve Eder, MDC files).

Phylum	Class	Order	Family	Scientific Name	Number
Mollusca	Gastropoda	Lymnophila	Physidae	<i>Physella</i> sp.	2
	Bivalvia	Pelecypoda	Sphaeriidae		1
Arthropoda	Insecta	Ephemeroptera	Siphlonuridae	<i>Isonychia</i> sp.	1
			Baetidae	<i>Acentrella</i> sp.	1
			Baetidae	<i>Baetis</i> sp.	5
			Heptageniidae	<i>Stenonema femoratum</i>	22
			Caenidae	<i>Caenis</i> sp.	92
	Odonata	Coenagrionidae		<i>Argia</i> sp.	6
	Megaloptera	Corydalidae		<i>Corydalis</i> sp.	1
	Coleoptera	Hydrophilidae		<i>Berosus</i> sp.	1
		Elmidae		<i>Stenelmis</i> sp.	19
		Elmidae		<i>Stenelmis crenata</i>	5
		Elmidae		<i>Stenelmis sexlineata</i>	7
	Trichoptera	Hydropsychidae		<i>Cheumatopsyche</i> sp.	15
	Diptera	Chironomidae			30
		Tabanidae		<i>Chrysops</i> sp.	3

Table F - 4. Stream: Crooked River at Crooked River Conservation Area, Ray County, Missouri. Location: UTM-X 408900 UTM-Y 4362800 Date: September 21, 1987. Samples collected using three Hester Dendy samplers. (Steve Eder, MDC files).

Phylum	Class	Order	Family	Scientific Name	Number
Annelida					12
	Oligochaeta				92
Mollusca	Gastropoda	Lymnophila	Lymnaeidae	<i>Lymnaea</i> sp.	2
			Physidae	<i>Physella</i> sp.	14
			Planorbidae		9
	Bivalvia	Pelecypoda			1
			Sphaeriidae		5
Arthropoda	Insecta	Ephemeroptera	Baetidae	<i>Stenacron</i> sp.	50
			Caenidae	<i>Caenis</i> sp.	15
			Ephemeridae	<i>Hexagenia</i> sp.	3
		Odonata	Coenagrionidae	<i>Argia</i> sp.	312
			Coenagrionidae	<i>Enallagma</i> sp.	1
		Hemiptera	Corixidae		2
		Megaloptera	Sialidae	<i>Sialis</i> sp.	22
			Corydalidae	<i>Corydalus</i> sp.	2
		Coleoptera	Elmidae	<i>Dubiraphia</i> sp.	26
		Trichoptera	Psychomyiidae/ Polycentropodidae	<i>Polycentropus</i> sp.	1
			Polycentropodinae	<i>Nyctiophylax</i> sp.	1
			Hydropsychidae	<i>Cheumatopsyche</i> sp.	5
		Diptera	Chironomidae		131
			Ceratopogonidae		1

Table F -5. Stream: Crooked River at Crooked River Conservation Area, Ray County, Missouri.  
 Location: UTM-X 408900 UTM-Y 4362800 Date: September 21, 1987 Sample collected using a Surber Sampler. (Steve Eder, MDC files).

Phylum	Class	Order	Family	Scientific Name	Number
Annelida					12
	Oligochaeta				1
Mollusca	Gastropoda	Lymnophila	Lymnaeidae	<i>Lymnaea</i> sp.	1
			Planorbidae		2
	Bivalvia	Pelecypoda	Sphaeriidae		62
Arthropoda	Insecta	Ephemeroptera	Baetidae	<i>Baetis</i> sp.	9
			Heptageniidae	<i>Stenacron</i> sp.	5
			Heptageniidae	<i>Stenonema</i> sp.	1
			Caenidae	<i>Caenis</i> sp.	11
			Tricorythidae	<i>Tricorythodes</i> sp.	13
		Odonata	Coenagrionidae	<i>Argia</i> sp.	1
		Megaloptera	Corydalidae	<i>Corydalis cornutus</i>	2
		Coleoptera	Dryopidae	<i>Helichus lithophilus</i>	3
			Elmidae	<i>Dubiraphia</i> sp.	2
			Elmidae	<i>Stenelmis</i> sp. ( <i>larvae</i> )	33
			Elmidae	<i>Stenelmis crenata?</i>	3
			Elmidae	<i>Stenelmis sexlineata</i>	9
		Trichoptera	Philopotamidae	<i>Chimarra obscura</i>	1
			Hydropsychidae	<i>Cheumatopsyche</i> sp.	195
		Diptera	Chironomidae		26
			Simuliidae		3
			Tabanidae	<i>Chrysops</i> sp.	1

Table F - 6. Dragonflies found in the Crooked River basin (Linden Trial, MDC Files).

Area Name	Location (T-R-Sec)	Common Name	Scientific Name	Date (M-Y)
Taylor Roadside Park	52N-28W- 1	Clubtail	Gomphidae	July 1997
Foxglove CA	53N-29W-23	Halloween Pennant	<i>Celithemis eponina</i>	July 1997
		Calico Pennant	<i>Celithemis elisa</i>	
		Eastern Amberwing	<i>Perithemis tenera</i>	
		Pied Skimmer	<i>Libellula luctuosa</i>	
		Twelve Spotted Skimmer	<i>Libellula pulchella</i>	
		Darner	Aeshnidae	
		Green Darner	<i>Anax junius</i>	
		Glider	<i>Tramea</i> sp.	
Blue Jay Trail Access	54N-29W-25	Ebony Jewelwing	<i>Calopteryx maculata</i>	July 1997
		American Rubyspot	<i>Hetaerina americana</i>	
		Common Whitetail	<i>Libellula lydia</i>	
		Pied Skimmer	<i>Libellula luctuosa</i>	
		Twelve Spotted Skimmer	<i>Libellula pulchella</i>	
		Eastern Pondhawk	<i>Erythemus simplicicollis</i>	
		Clubtail	Gomphidae	
Blue Jay Trail Access	54N-29W-25	River Cruiser	<i>Macromia</i> sp.	Sep. 1997
Crooked River CA	53N-28W-16	Ebony Jewelwing	<i>Calopteryx maculata</i>	July 1997
		Eastern Pondhawk	<i>Erythemus simplicicollis</i>	
		Common Whitetail	<i>Libellula lydia</i>	
		Pied Skimmer	<i>Libellula luctuosa</i>	
		Twelve Spotted Skimmer	<i>Libellula pulchella</i>	
		Blue Dasher	<i>Pachydiplax longipennis</i>	
		Sanddragon	<i>Progomphus</i> sp.	
		Violet-masked Glider	<i>Tramea carolina</i>	
		Black Mantled Glider	<i>Tramea lacerata</i>	

Area Name	Location (T-R-Sec)	Common Name	Scientific Name	Date (M-Y)
		Darner	Aeshnidae	
Crooked River CA	53N-28W-16	Clubtail	Gomphidae	July 1997
Crooked River CA	53N-28W-16	Green Darner	<i>Anax junius</i>	Sep.1997
		Globe Glider	<i>Pantala flavescens</i>	
		Black Mantled Glider	<i>Tramea lacerata</i>	
	53N-28W- 8	Green Darner	<i>Anax junius</i>	Sep. 1997
		Pied Skimmer	<i>Libellula luctuosa</i>	
		Meadowfly	<i>Sympetrum</i> sp.	
		Black Mantled Glider	<i>Tramea lacerata</i>	

Table 6. Crayfish whose range includes the Crooked River basin (Pflieger 1996).

Common Name	Scientific Name	Collection
Devil Crayfish	<i>Cambarus diogenes</i>	Not documented
Papershell Crayfish	<i>Orconectes immunis</i>	Not Documented
Northern Crayfish	<i>Orconectes virilis</i>	1987 and 1998
Grassland Crayfish	<i>Procambarus gracilis</i>	Not documented

Table 7. Mussels collected in the Crooked River basin in 1997(MDC files).

Common Name	Scientific Name
Giant Floater	<i>Pyganodon grandis</i>
White Heelsplitter	<i>Lasmigona complanata</i>
Fragile Papershell	<i>Leptodea fragilis</i>
Pond Mussel	<i>Ligumia subrostrata</i>
Maple Leaf	<i>Quadrula quadrula</i>
Pondhorn	<i>Uniomerus tetralasmus</i>

Table 8. Amphibians found in the Crooked River basin (Johnson 1987).

Common Name	Scientific Name	Range
Smallmouth Salamander	<i>Ambystoma texanum</i>	basinwide
Eastern Tiger Salamander	<i>Ambystoma tigrinum tigrinum</i>	basinwide
Central Newt	<i>Notophthalmus viridescens louisianensis</i>	basinwide
Mudpuppy	<i>Necturus maculosus</i>	basinwide
Plains Spadefoot	<i>Scaphiopus bombifrons</i>	Missouri River floodplain
Eastern American Toad	<i>Bufo americanus</i>	basinwide
Great Plains Toad	<i>Bufo cognatus</i>	Missouri River floodplain
Woodhouse's Toad	<i>Bufo woodhousei woodhousei</i>	basinwide
Blanchard's Cricket Frog	<i>Acris crepitans blanchardi</i>	basinwide
Northern Spring Peeper	<i>Hyla crucifer crucifer</i>	basinwide
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	basinwide
Eastern Gray Treefrog	<i>Hyla versicolor</i>	basinwide
Western Chorus Frog	<i>Pseudacris triserata</i>	basinwide
Great Plains Narrowmouth Toad	<i>Gastrophryne olivacea</i>	Missouri River floodplain
Northern Crawfish Frog	<i>Rana areolata circulosa</i>	basinwide
Plains Leopard Frog	<i>Rana blairi</i>	basinwide
Bullfrog	<i>Rana catesbeiana</i>	basinwide
Green Frog	<i>Rana clamitans</i>	basinwide
Southern Leopard Frog	<i>Rana sphenocephala</i>	basinwide

Table 9. Reptiles found in the Crooked River basin (Johnson 1987).

Common Name	Scientific Name	Area
Common Snapping Turtle	<i>Chelydra serpentina serpentina</i>	basinwide
Stinkpot	<i>Sternotherus odoratus</i>	basinwide
Western Painted Turtle	<i>Chrysemys picta bellii</i>	basinwide
Map Turtle	<i>Graptemys geographica</i>	basinwide
Mississippi Map Turtle	<i>Graptemys kohnii</i>	basinwide
False Map Turtle	<i>Graptemys pseudogeographica pseudogeographica</i>	basinwide
Three-toed Box Turtle	<i>Terrapene carolina triunguis</i>	basinwide
Ornate Box Turtle	<i>Terrapene ornata ornata</i>	basinwide
Red-eared Slider	<i>Trachemys scripta elegans</i>	basinwide
Midland Smooth Softshell	<i>Trionyx muticus muticus</i>	basinwide
Western Spiny Softshell	<i>Trionyx spinifer hartwegi</i>	basinwide
Five-lined Skink	<i>Eumeces fasciatus</i>	basinwide
Broadhead Skink	<i>Eumeces laticeps</i>	basinwide
Ground Skink	<i>Scincella lateralis</i>	basinwide
Prairie-lined Racerunner	<i>Cnemidophorus sexlineatus viridis</i>	basinwide
Western Slender Glass Lizard	<i>Ophisaurus attenuatus attenuatus</i>	basinwide
Western Worm Snake	<i>Carphophis amoenus vermis</i>	basinwide
Eastern Yellowbelly Racer	<i>Coluber constrictor flaviventris</i>	basinwide
Prairie Ringneck Snake	<i>Diadophis punctatus arnyi</i>	basinwide
Great Plains Rat Snake	<i>Elaphe guttata emoryi</i>	basinwide
Black Rat Snake	<i>Elaphe obsoleta obsoleta</i>	basinwide
Eastern Hognose	<i>Heterodon platyrhinos</i>	basinwide
Prairie Kingsnake	<i>Lampropeltis calligaster calligaster</i>	basinwide
Speckled Kingsnake	<i>Lampropeltis getulus holbrooki</i>	basinwide
Red Milk Snake	<i>Lampropeltis triangulum syspila</i>	basinwide
Blotched Water Snake	<i>Nerodia erythrogaster transversa</i>	basinwide
Diamondback Water Snake	<i>Nerodia rhombifer rhombifer</i>	basinwide
Northern Water Snake	<i>Nerodia sipedon sipedon</i>	basinwide

Common Name	Scientific Name	Area
Rough Green Snake	<i>Opheodrys aestivus</i>	basinwide
Bullsnake	<i>Pituophis melanoleucus sayi</i>	basinwide
Grahams Crayfish Snake	<i>Regina grahamii</i>	basinwide
Texas Brown Snake	<i>Storeria dekayi texana</i>	basinwide
Northern Redbelly Snake	<i>Storeria occipitomaculata occipitomaculata</i>	basinwide
Western Ribbon Snake	<i>Thamnophis proximus proximus</i>	basinwide
Western Plains Garter Snake	<i>Thamnophis radix haydenii</i>	basinwide
Red-sided Garter Snake	<i>Thamnophis sirtalis parietalis</i>	basinwide
Central Lined Snake	<i>Tropidoclonion lineatum annectens</i>	basinwide
Northern Lined Snake	<i>Tropidoclonion lineatum lineatum</i>	basinwide
Western Earth Snake	<i>Virginia valeriae elegans</i>	basinwide
Osage Copperhead	<i>Agkistrodon contortrix phaeogaster</i>	basinwide
Timber Rattlesnake	<i>Crotalus horridus</i>	basinwide

Table 10. Threatened and endangered species in the Crooked River basin (MDC 1998; USFWS 1999).

Common Name	Scientific Name	State Status	Federal Status
Auriculate false foxglove	<i>Agalinus auriculata</i>	Imperiled (S2)	
Greater prairie-chicken	<i>Tympanuchus cupido</i>	Critically imperiled (S1)	

Table 11. Fish stocked in the Crooked River basin by the Missouri Department of Conservation (MDC NW Region files).

Water Body	County	Species Stocked
Lawson City Reservoir	Ray	Channel Catfish
Ray County Community Lake	Ray	Black Bullhead, Brown Bullhead, Channel Catfish, and Largemouth Bass