BIOTIC COMMUNITY

Fish Community

Historical records of fish community collections within the South Grand Watershed date back to 6 July, 1940 (MDC 1998a and MoRAP 2002a). From 1940 to 2002, 60 fish species (not including hybrids) in 15 families have been collected within the watershed (Table Bc01) (MNHP 2003; MDC South Grand Watershed Inventory and Assessment Fish Community Collections; MoRAP 2002a; MDC 1998a; Pflieger 1997; Dent and Macpherson, MDC Memorandum 1985; Dent, MDC Memorandum 1981). Fish community sampling sites are presented in Figure Bc01.

Analysis of temporal distribution of species within the watershed was accomplished by dividing the examined period of record for fish community collections into three periods: Period One (1940-1959), Period Two (1960-1979), and Period Three (1980-2002). This analysis revealed that the number of species within the watershed between periods 1 and 2 remained similar with 43 and 42 species collected respectively. Period Three saw an increase in the number of species collected within the watershed at 48. Six species found within the watershed in Period 3 had not been found in previous periods. These species include Quillback *(Carpiodes cyprinus)*, Golden Redhorse (*Moxostoma erythrurum)*, Warmouth (*Lepomis gulosus)*, Shortnose Gar *(Lepisosteus platostomus)*, White Bass *(Morone chrysops)*, Ohio Logperch *(Percina caprodes)*.

Twelve fish species found within the watershed in periods one and/or two were not found in period three. These include Black Buffalo (*Ictiobus niger)*, Longear Sunfish (*Lepomis megalotis)*, Goldfish (*Carassius auratus)*, Bleeding Shiner (*Luxilus zonatus)*, Silver Chub (*Macrhybopsis storeriana)*, Hornyhead Chub *(Nocomis biguttatus)*, Emerald Shiner *(Notropis atherinoides)*, Ghost Shiner *(Notropis Buchanan)*, Goldeye *(Hiodon alosoides)*, Tadpole Madtom *(Noturus gyrinus)*, Freckled Madtom *(Noturus nocturnes)*, and Longnose Gar *(Lepisosteus osseus*). Four species, including the goldfish, bleeding Shiner, black buffalo, and tadpole madtom, do not appear to have solid records of being common to the watershed. This is illustrated by the fact that only one individual for all four species is recorded as having been found in the watershed. In addition, each species was found only at a single site within the watershed with no additional individuals observed after Period One. Several other species not seen since Period One include the Goldeye (found at a single site), Longnose Gar (only three individuals recorded at 3 sites, one of which is now part of Truman reservoir), Longear Sunfish (four individuals found at two sites, one of which is now part of Truman Reservoir), Silver Chub (11 individuals found at 3 sites, two of which are now part of Truman Reservoir), and Ghost Shiner (14 individuals found at 3 sites, two of which are now part of Truman Reservoir). Another species, the freckled madtom is only recorded within the watershed in period two. Five individuals were found at a single site in 1976. This site has since become part of Truman Reservoir.

Two species which appear to have been relatively well established within the watershed during Periods One and Two are absent from Period Three collections. The hornyhead chub was previously reported from 4 sites (including one site which is now part of Truman Reservoir) within the watershed with 24 individuals recorded. Over 200 individuals of the emerald shiner were also reported during Periods One and Two from 5 sites, three of which are now part of Truman Reservoir.

The exact cause or causes of the appearance of some species and apparent disappearance of others in the watershed is difficult to ascertain given the many different variables one might need to take into account among these of which are differences in sampling effort and gear between the three time periods. Such an analysis not only goes beyond the scope of this document but could comprise a fairly lengthy report by itself. It is apparent however that changes have taken place within the watershed that could be beneficial to the appearance of some species while being detrimental to others. These changes include the creation of Truman Reservoir, and the lingering effects of channelization within the watershed. Future fish community sampling will be an important component in determining the effect and/or potential effect of watershed changes on the fish species residing there.

Game Fish

A total of 13 species of gamefish (as defined as game fish in MDC 2001c) are known to occur within the watershed (MDC 2003d, MoRAP 2002a; MDC 1998a; Dent and McPherson 1985). These include spotted bass, largemouth bass, white crappie, black crappie, blue catfish, channel catfish, flathead catfish, white bass, striped bass, walleye, and paddlefish. Muskellunge and warmouth have been observed in the watershed however, these are not considered to be significant fisheries. Flathead, blue, and channel catfish make up the primary game fishery of the South Grand River and its tributaries, while rough fish such as common carp, buffalo, and drum provide fisheries for alternative angling opportunities. (Bayless, personal communication) The lower portion of the South Grand supports a significant population of crappie. Spring rises also provide angling opportunities for hybrid striped bass and white bass. In addition, a limited amount of angling for paddlefish also occurs.

Truman Reservoir, located in the lower portion of the watershed, provides a diverse array of game fish. Significant game fish populations include black bass, crappie, white bass, hybrid striped bass, walleye, paddlefish, blue catfish, channel catfish, and flathead catfish. Since the early years of the existence of Truman Reservoir, paddlefish, and hybrid striped bass have been stocked nearly every year (MDC 2003b, MDC 1985-1990, Dent and McPherson 1985). In addition, recent walleye stockings in 2001 and 2002 have supplemented the existing walleye fishery within the reservoir.

Fish Introductions

Limited availability of historic stocking records, the potential of “bait bucket” introductions and the availability of fish from commercial dealers, makes it difficult to address the entire scope of fish stocking which has or may have occurred in the South Grand Watershed. However, examination of various sources reveals some past stocking efforts.

Historic fish stocking efforts within the South Grand Watershed appear to have been limited to the stocking of warm water species. The common carp, a species native to Asia, was widely stocked in Missouri by the Missouri Fish Commission between 1879 and 1895 at which time the program was discontinued (Pflieger 1997). Earliest observations of common carp from MDC fish community collection files for sites within the watershed are from 1940 (MoRAP 2002a). While common carp are a component of the commercial fishing industry in Missouri (Barnes and Riggert 2000), common carp can also be a nuisance species. They compete in rivers, streams, and lakes with native species. They can increase stream and lake turbidity, destroy spawning habitat, while eating the eggs of native species of fish (Barnes and Riggert 2000).

As with the common carp, the western mosquitofish is another species whose presence in the watershed is

likely the result of stocking. A survey in the 1940s indicated that its distribution in Missouri included the "Lowland Faunal Region and northward along the Mississippi River to Ramsey Creek in Pike County" (Pflieger 1997). Today the mosquito fish can be found in all of the faunal regions of the state. The first observations of the western mosquitofish in fish collections within the watershed appear to have occurred in 1976.

Some Early MDC Annual Reports list largemouth bass, crappie, bluegill, green sunfish, "bullheads" (catfish), and minnows for the South Grand in tables under the heading "Fisheries Production and Distribution by Watersheds by Species" (MDC 1937-1942 and 1946-1992). In addition some MDC annual reports provide a general (not by watershed) tabulation of fish "rescued" (removing fish from intermittent pools of water and redistributing to areas deemed more suitable) by the MDC; a practice which has been discontinued. This data, while somewhat vague provides a glimpse of some early stocking and relocating of fish that occurred earlier in the last century and which may have had an impact on the fish community of the South Grand Watershed.

Records of recent stockings within public waters of the South Grand watershed by the MDC are well documented. Between 1991 and 2001, 14 species of fish have been stocked by the Missouri Department of Conservation in public impoundments within the South Grand Watershed (MDC 2003b). The majority of stockings have been warm water species with the exception of rainbow and brown trout which have been stocked on a limited basis in a single impoundment at MDC's Reed Wildlife Area during the winter and early spring. Fathead minnows, commonly stocked as forage for various sport fish species, accounted for the largest number of a single species of fish stocked in public waters within the watershed with 2,224,500 fish stocked. The stocking of 1,222,047 paddlefish in Truman Reservoir accounted for the largest number of game fish of a single species stocked. Table Bc02 lists other species which were stocked in public waters within the watershed between 1991 and 2001.

Since 1978, a large amount of stocking which has occurred in the watershed has been in Truman Reservoir. Since the early years of the existence of Truman Reservoir, paddlefish and hybrid striped bass have been stocked on nearly every year, with paddlefish first being stocked in Truman in 1978 and the initial stockings of hybrid striped bass taking place in 1982 (MDC 2003b, MDC 1985-1990, Dent and McPherson 1985). Yearly stockings of striped bass were initiated in 1977, but were discontinued in 1980, two years prior to the first hybrid stockings. Walleye were initially stocked in Truman from 1980 to 1986 after which time the stockings were discontinued until 1993 when stocking took place for that single year. Walleye stocking was reinitiated once again in 2001. Other species (and years) stocked within Truman Reservoir since it's creation include Blue Catfish (1979, 1983, 1991, 1994-1996), channel catfish (1978), threadfin shad (1980, 1981, 1983), largemouth bass (1977-1979, 1989), muskellunge (1978), and fathead minnow (1986).

The extent to which fish stocking of private waters has occurred within the watershed is more difficult to determine than public waters. Undoubtedly, farm ponds within the watershed have been stocked with largemouth bass, bluegill, and channel catfish by private individuals who obtained fish from the MDC, commercial dealers, and/or other water bodies. The availability of grass carp from commercial fish dealers also increases the probability of this species having been stocked in water bodies within the watershed. The potential of these fish being washed into streams exists during major precipitation events.

A lack of historical records, plus the occurrence of undocumented introductions makes it difficult to determine, with any reliability, all species which may have been introduced into the watershed. Effects

of introductions vary. While the introduction of species already present in the watershed may have minimal to no effect, the introduction of exotic (non-native) species can, in many instances, have disastrous consequences.

Mussels

It appears that no recent data regarding mussels in the South Grand Watershed is available. The Missouri Aquatic Gap Database (MoRAP 2002b) lists records for 7 collections within the watershed, the latest of which occurred in 1978. From these collections, a total of 15 species were identified (Table Bc03 and Figure Bc02). Eight species were found only at sites which are currently located within the flood control pool boundary of Truman Reservoir. These species include the mapleleaf, mucket, pimpleback, pink heelsplitter, pistolgrip, pondhorn, threeridge, and washboard. Without contemporary data regarding mussel distribution within the South Grand Watershed, it is left to speculation as to the fate of these species as well as species distribution elsewhere within the watershed. Future mussel sampling will be necessary in order to determine the current status of the mussel community within the South Grand Watershed.

Snails

Nine species of snails have been identified within the South Grand Watershed (Wu etal. 1997 and MoRAP 2002c). These include Ash Gyro (*Gyraulus parvu)*, Fragile Ancylid (*Ferrisia fragilis)*, Duck Physa (*Physa [Physodon] anatine)*, Glossy Physa (*Physa [Physodon] pomilia)*, Hale's Physa (*Physa [Physodon] halei)*, Lateritic Physa (*Physella acuta)*, Marsh Ramshorn (*Helisoma trivolvis)*, Mimic Lymnaea (*Pseudosuccinea columella)*, Sampson sprite (*Menetus sampsoni)* (Wu etal. 1997 and MoRAP 2002c). Figure Bc02 displays snail collection sites within the watershed in Missouri.

Crayfish

Only two crayfish species are known to occur within the South Grand Watershed. These are the grassland crayfish (*Procambarus gracilis)* and northern crayfish (*Orconectes virilis)* (Pflieger 1996 and MoRAP 2002d). The northern crayfish is fairly widespread throughout Missouri with the exception of the Central Ozarks where it appears to currently occur only in scattered pockets which may be the result of bait-bucket introductions (Pflieger 1996). The grassland crayfish is less widely distributed in Missouri than the Northern. It primarily occurs in the prairie region of the state with the exception of some locales along the western fringe of the Missouri Ozarks (Pflieger 1996). Figure Bc02 displays crayfish collection sites within the watershed in Missouri.

Benthic Invertebrates

One hundred and eighty three taxa of aquatic invertebrates have been collected within the South Grand Watershed since 1975 (MDC 1998c) (Table Bc04). Figure Bc02 displays benthic invertebrate collection sites within the watershed in Missouri.

Species of Conservation Concern

Within the South Grand Watershed, 22 species of conservation concern have been identified (Table Bc05) (MNHP 2003). These include 10 species of plants (flowering plants, ferns, fern allies, and mosses); 1 species of insect; 1 species of amphibian, and 10 species of birds. Three species within the watershed are federally listed as threatened. These include the Mead's milkweed, geocarpon, and bald

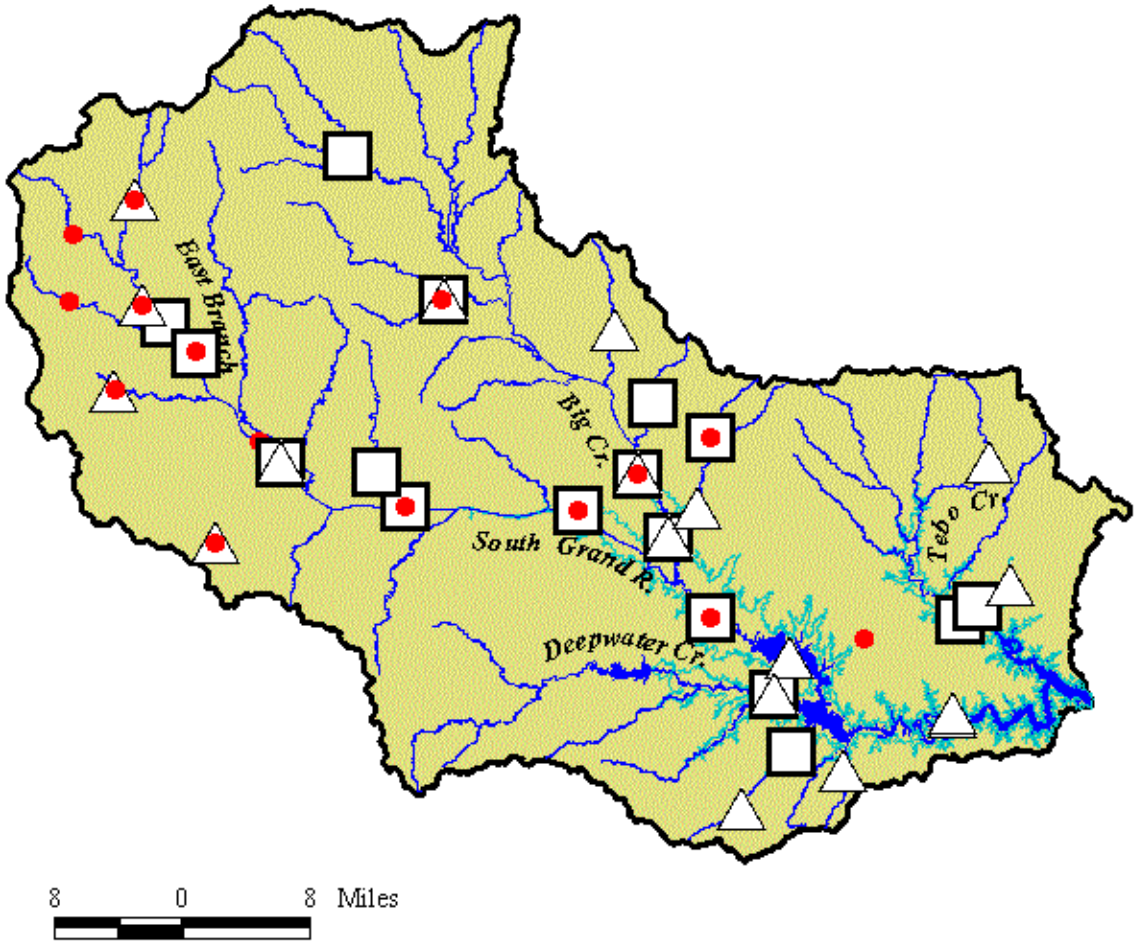
eagle. The aforementioned species are also state listed as endangered. An additional 3 species are also state listed as endangered. These are the northern harrier, greater prairie-chicken, and barn owl.

Records that were not included in this analysis include Missouri Natural Heritage Program (MNHP) records of occurrences listed as historic, destroyed, or introduced (exotic). It is also important to note that the status of the above mentioned species are based on the status provided in the MNHP database at the time of this writing and may be subject to change.

Figure bc01.

South Grand River Watershed

Fish Community Sample Sites



Legend

Fish Community Sample Sites

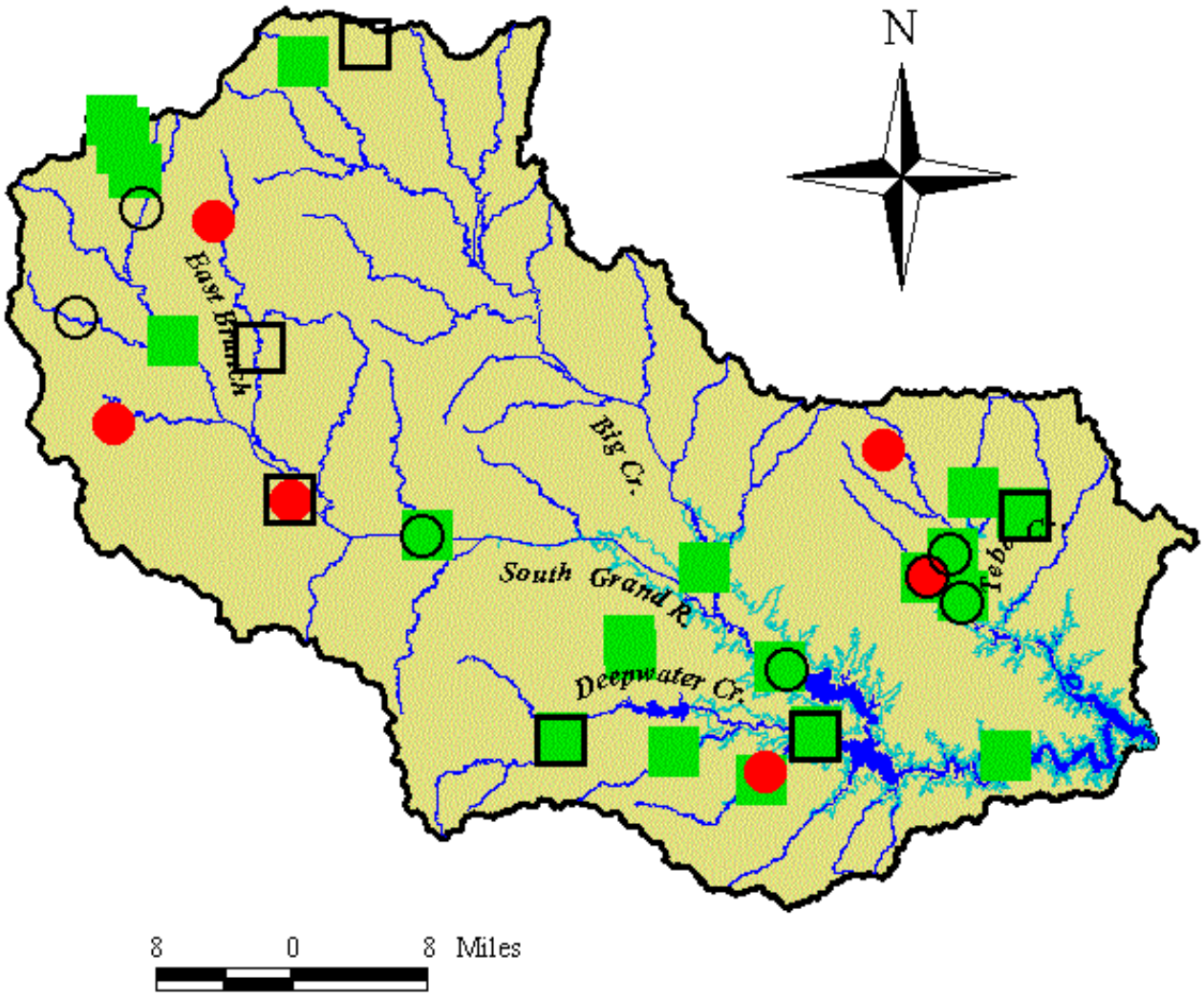
- 1980-2002
- 1960-1979
- 1940-1959
- Truman Flood Control Pool Boundary (approximate)

N

Figure bc02.

South Grand River Watershed

Biotic Community Sample Sites



Legend

- Mussel Sample Site (MoRAP 2002b)
- Snail Sample Site (MoRAP 2002b)
- Crayfish Sample Site (MoRAP 2002b)
- Benthic Community Sample Site (MDC 1998d)
- Truman Flood Control Pool Boundary (approximate)

Table Bc01. Fish species (and subspecies) whose distribution range includes the South Grand Watershed in Missouri (MNHP 2003; MDC South Grand Watershed Inventory and Assessment Fish Community Collections; MoRAP 2002a; MDC 1998a; Pflieger 1997; Dent and Macpherson, MDC Memorandum 1985; Dent, MDC Memorandum 1981).

Family	*Scientific Name*	Common Name	1	2	3
Atherinidae	*Labidesthes sicculus*	Brook Silverside	X	X	X
Castostomidae	*Carpiodes carpio*	River Carpsucker	X	X	X
	Carpiodes cyprinus	Quillback			X
	Catostomus commersonni	White Sucker	X	X	X
	Ictiobus bubalus	Smallmouth Buffalo	X	X	X
	Ictiobus cyprinellus	Bigmouth Buffalo	X	X	X
	Ictiobus niger	Black Buffalo	X		
	Moxostoma erythrurum	Golden Redhorse			X
	Moxostoma macrolepidotum	Shorthead Redhorse		X	X
Centrarchidae	*Lepomis cyanellus*	Green Sunfish	X	X	X
	Lepomis gulosus	Warmouth			X
	Lepomis humilis	Orange Spotted Sunfish	X	X	X
	Lepomis macrochirus	Bluegill	X	X	X
	Lepomis megalotis	Longear Sunfish	X		
	Micropterus punctulatus	Spotted Bass		X	X
	Micropterus salmoides	Largemouth Bass	X	X	X
	Pomoxis annularis	White Crappie	X	X	X
	Pomoxis nigromaculatus	Black Crappie	X		X
Clupeidae	*Dorosoma cepedianum*	Gizzard Shad	X	X	X
	Dorosoma petenense	Threadfin Shad		X	X
Cyprinidae	*Campostoma pullum*	Central Stoneroller	X	X	X
	Carassius auratus	Goldfish	X		
	Cyprinella lutrensis	Red Shiner	X	X	X
	Cyprinus carpio	Common Carp	X	X	X
	Luxilus zonatus	Bleeding Shiner	X		
	Lythrurus u. umbratilis	Western Redfin Shiner	X	X	X
	Macrhybopsis storeriana	Silver Chub	X		
	Nocomis biguttatus	Hornyhead Chub	X	X	
	Notemigonus crysoleucas	Golden Shiner	X	X	X
	Notropis atherinoides	Emerald Shiner	X	X	
	Notropis buchanani	Ghost Shiner	X		
	Notropis stramineus	Sand Shiner	X	X	X
	Phenacobius mirabilis	Suckermouth Minnow	X	X	X
	Pimephales notatus	Bluntnose Minnow	X	X	X

	Pimephales promelas	Fathead Minnow	X	X	X
	Semotilus atromaculatus	Creek Chub	X	X	X
Esocidae	*Esox masquinongy*	Muskellunge		X	X
Fundulidae	*Fundulus notatus*	Blackstripe Topminnow			X
Hiodontidae	*Hiodon alosoides*	Goldeye	X		
Ictaluridae	*Ameiurus melas*	Black Bullhead	X	X	X
	Ameiurus natalis	Yellow Bullhead	X	X	X
	Ictalurus furcatus	Blue catfish		X	X
	Ictalurus punctatus	Channel Catfish	X	X	X
	Noturus exilis	Slender Madtom	X	X	X
	Noturus flavus	Stonecat	X	X	X
	Noturus gyrinus	Tadpole Madtom	X		
	Noturus nocturnus	Freckled Madtom		X	
	Pylodictis olivaris	Flathead Catfish	X	X	X
Lepisosteidae	*Lepisosteus osseus*	Longnose Gar	X		
	Lepisosteus platostomus	Shortnose Gar			X
Percichthyidae	*Morone chrysops*	White Bass			X
	Morone saxatilis	Striped Bass		X	X
Percidae	*Etheostoma f. lineolatum*	Striped Fantail		X	X
	Etheostoma s. spectabile	Northern Orangethroat Darter	X	X	X
	Percina caprodes	Logperch	X	X	X
	Percina phoxocephala	Slenderhead Darter	X	X	X
	Stizostedion vitreum	Walleye	X		X
Poecilliidae	*Gambusia affinis*	Western Mosquitofish		X	X
Polyodontidae	*Polyodon spathula*	Paddlefish		X	X
Sciaenidae	*Aplodinotus grunniens*	Freshwater Drum	X	X	X

Period:1 = collected 1940 to 1959; 2 = collected 1960 to 1979; 3 = collected 1980 to 2002

Table Bc02. Species stocked in public waters within the South Grand Watershed in Missouri between 1991 and 2001.

Species
Blue Catfish
Bluegill
Brown Trout
Channel Catfish
Flathead Catfish
Fathead Minnow
Grass Carp
Hybrid Striped Bass
Hybrid Sunfish
Largemouth Bass
Rainbow Trout
Paddle Fish
Redear Sunfish
Walleye

Table Bc03. Mussel species found historically within the South Grand Watershed in Missouri (MoRAP 2002b).

Common Name	Scientific Name	Stream	Reference
Fat Mucket	*Lampsilis siliquoidea*	South Grand	RDO
Fragile Papershell	*Leptodea fragilis*	Sand Creek, Tebo Creek, South Grand	RDO
Giant Floater	*Pyganodon grandis*	East Creek, South Grand	MDC, RDO
Mapleleaf	*Quadrula quadrula*	South Grand, Tebo Creek	RDO
Mucket	*Actinonaias ligamentina*	South Grand	RDO
Pimpleback	*Quadrula pustulosa*	Tebo Creek	RDO
Pink Heelsplitter	*Potamilus alatus*	Sand Creek, Tebo Creek	RDO
Pistolgrip	*Tritogonia verrucosa*	Sand Creek, South Grand	RDO
Plain Pocketbook	*Lampsilis cardium*	South Grand	RDO
Pondhorn	*Uniomerus tetralasmus*	Tebo Creek	RDO
Pondmussel	*Ligumia subrostrata*	Poney Creek, East Creek	MDC
Threeridge	*Amblema plicata*	South Grand, Tebo Creek	RDO
Washboard	*Megalonaias nervosa*	South Grand	RDO
White Heelsplitter	*Lasmigona complanata*	South Grand, Tebo Creek	RDO
Yellow Sandshell	*Lampsilis teres*	South Grand, West Fork Tebo Creek, Tebo Creek	RDO

Reference: MDC=Missouri Department of Conservation, RDO=Ronald D. Oesch

Table Bc04. Benthic invertebrate taxa of the South Grand Watershed in Missouri (MDC 1998c).

Order	Family	Species
Amphipoda	Crangonyctidae	Crangonyx minor Bousfield
Amphipoda	Gammaridae	Gammarus pseudolimnaeus Bousfield
Amphipoda	Gammaridae	Gammarus sp.
Amphipoda	Talitridae	Hyalella azteca (Saussure)
Coleoptera	Curculionidae	Endalus sp.
Coleoptera	Curculionidae	Onychylis sp.
Coleoptera	Dryopidae	
Coleoptera	Dytiscidae	
Coleoptera	Dytiscidae	Deronectes/Oreodytes
Coleoptera	Dytiscidae	Hydaticus sp.
Coleoptera	Dytiscidae	Hydroporus niger Say
Coleoptera	Dytiscidae	Hydroporus undulatus Say
Coleoptera	Dytiscidae	Hydrovatus sp.
Coleoptera	Dytiscidae	Laccophilus fasciatus Aube
Coleoptera	Elmidae	Dubiraphia bivittata (LeConte)
Coleoptera	Elmidae	Dubiraphia sp.
Coleoptera	Elmidae	Macronychus glabratus Say
Coleoptera	Elmidae	Optioservus sandersoni Collier
Coleoptera	Elmidae	Stenelmis sp.
Coleoptera	Gyrinidae	Dineutus sp.
Coleoptera	Gyrinidae	Gyretes sp.
Coleoptera	Heteroceridae	
Coleoptera	Hydrophilidae	
Coleoptera	Hydrophilidae	Anacaena sp.
Coleoptera	Hydrophilidae	Berosus sp.
Coleoptera	Hydrophilidae	Helochares sp.
Coleoptera	Hydrophilidae	Helophorus sp.
Coleoptera	Hydrophilidae	Hydrobius sp.
Coleoptera	Hydrophilidae	Hydrochus sp.
Coleoptera	Hydrophilidae	Paracymus sp.
Coleoptera	Hydrophilidae	Tropisternus blatchleyi modestus D'Orchymont
Coleoptera	Hydrophilidae	Tropisternus lateralis nimbatus (Say)
Coleoptera	Hydrophilidae	Tropisternus sp.
Coleoptera	Scirtidae	
Coleoptera	Scirtidae	Cyphon sp.
Coleoptera	Scirtidae	Scirtes sp.

Decapoda	Cambaridae	
Decapoda	Cambaridae	Orconectes sp.
Decapoda	Palaemonidae	Palaemonetes kadiakensis Rathbun
Diptera	Ceratopogonidae	
Diptera	Ceratopogonidae	Bezzia/Probezzia...
Diptera	Ceratopogonidae	Ceratopogon sp.
Diptera	Ceratopogonidae	Culicoides sp.
Diptera	Ceratopogonidae	Forcipomyia sp.
Diptera	Ceratopogonidae	Probezzia sp.
Diptera	Chaoboridae	
Diptera	Chaoboridae	Chaoborus sp.
Diptera	Chironomidae	
Diptera	Culicidae	
Diptera	Culicidae	Aedes sp.
Diptera	Culicidae	Anopheles sp.
Diptera	Culicidae	Culiseta sp.
Diptera	Culicidae	Mansonia perturbans Walker
Diptera	Culicidae	Psorophora sp.
Diptera	Empididae	
Diptera	Ephydridae	
Diptera	Muscidae	
Diptera	Psychodidae	
Diptera	Psychodidae	Psychoda sp.
Diptera	Simuliidae	
Diptera	Stratiomyidae	
Diptera	Stratiomyidae	Nemotelus sp.
Diptera	Syrphidae	Eristalis sp.
Diptera	Tabanidae	
Diptera	Tabanidae	Chrysops sp.
Diptera	Tipulidae	Erioptera sp.
Diptera	Tipulidae	Hexatoma sp.
Diptera	Tipulidae	Tipula sp.
Ephemeroptera	Baetidae	
Ephemeroptera	Baetidae	Acentrella sp.
Ephemeroptera	Baetidae	Baetis sp.
Ephemeroptera	Baetidae	Baetis tricaudatus Dodds
Ephemeroptera	Baetidae	Callibaetis sp.
Ephemeroptera	Caenidae	Caenis sp.
Ephemeroptera	Ephemeridae	
Ephemeroptera	Ephemeridae	Hexagenia limbata Serville

Ephemeroptera	Ephemeridae	Hexagenia sp.
Ephemeroptera	Heptageniidae	Heptagenia sp.
Ephemeroptera	Heptageniidae	Stenacron (interpunctatum grp.)
Ephemeroptera	Heptageniidae	Stenacron interpunctatum canadense (Walker)
Ephemeroptera	Heptageniidae	Stenacron sp.
Ephemeroptera	Heptageniidae	Stenonema femoratum (Say)
Ephemeroptera	Heptageniidae	Stenonema mediopunctatum (McDunnough)
Ephemeroptera	Heptageniidae	Stenonema pulchellum (Walsh)
Ephemeroptera	Heptageniidae	Stenonema terminatum (Walsh)
Ephemeroptera	Isonychiidae	Isonychia sp.
Ephemeroptera	Tricorythidae	Tricorythodes sp.
Gordiida		
Hemiptera	Corixidae	
Hemiptera	Corixidae	Hesperocorixa sp.
Hemiptera	Corixidae	Trichocorixa sp.
Hemiptera	Gerridae	
Hemiptera	Gerridae	Gerris sp.
Hemiptera	Gerridae	Limnoporus sp.
Hemiptera	Gerridae	Rheumatobates sp.
Hemiptera	Gerridae	Trepobates sp.
Hemiptera	Nepidae	Ranatra sp.
Hemiptera	Notonectidae	Buenoa sp.
Hemiptera	Notonectidae	Notonecta sp.
Hemiptera	Pleidae	Neoplea sp.
Hemiptera	Veliidae	
Hemiptera	Veliidae	Microvelia sp.
Hemiptera	Veliidae	Rhagovelia sp.
Hirudinea[2]		
Hirudinea[2]	Branchiobdellidae[1]	
Hydracarina	Acari	
Isopoda	Asellidae	Caecidotea sp.
Isopoda	Asellidae	Lirceus sp.
Lepidoptera	Pyralidae	Petrophila sp.
Lymnophila	Ancylidae	Ferrissia fragilis (Tryon)
Lymnophila	Ancylidae	Ferrissia sp.
Lymnophila	Lymnaeidae	
Lymnophila	Physidae	
Lymnophila	Physidae	Physa (Physella) sp.
Lymnophila	Planorbidae	

Lymnophila	Planorbidae	Helisoma sp.
Megagastropoda	Pleuroceridae	
Megaloptera	Corydalidae	Chauliodes sp.
Megaloptera	Corydalidae	Corydalus cornutus (Linnaeus)
Megaloptera	Sialidae	Sialis sp.
Nemata[3]		
Odonata	Aeshnidae	Aeshna sp.
Odonata	Aeshnidae	Anax sp.
Odonata	Aeshnidae	Basiaeschna janata (Say)
Odonata	Calopterygidae	Calopteryx maculata (Beauvois)
Odonata	Calopterygidae	Hetaerina americana (Fabricius)
Odonata	Calopterygidae	Hetaerina sp.
Odonata	Coenagrionidae	
Odonata	Coenagrionidae	Argia moesta (Hagen)
Odonata	Coenagrionidae	Argia sedula (Hagen)
Odonata	Coenagrionidae	Argia sp.
Odonata	Coenagrionidae	Argia tibialis/apicalis
Odonata	Coenagrionidae	Enallagma praevarum (Hagen)
Odonata	Coenagrionidae	Enallagma sp.
Odonata	Gomphidae	
Odonata	Gomphidae	Gomphus sp.
Odonata	Gomphidae	Ophiogomphus sp.
Odonata	Libellulidae	
Odonata	Libellulidae	Perithemis sp.
Odonata	Macromiidae	Macromia sp.
Oligochaeta		
Plecoptera	Capniidae	
Plecoptera	Capniidae	Allocapnia sp.
Plecoptera	Chloroperlidae	
Plecoptera	Nemouridae	
Plecoptera	Perlidae	Acroneuria sp.
Plecoptera	Perlidae	Neoperla clymene (Newman)
Plecoptera	Perlidae	Perlesta placida (Hagen)
Plecoptera	Perlidae	Perlinella drymo (Newman)
Plecoptera	Perlodidae	
Plecoptera	Perlodidae	Hydroperla sp.
Plecoptera	Perlodidae	Isoperla bilineata (Say)
Plecoptera	Taeniopterygidae	Taeniopteryx metequi Ricker & Ross
Trichoptera	Brachycentridae	Brachycentrus americanus (Banks)
Trichoptera	Glossosomatidae	Agapetus sp.

Trichoptera	Hydropsychidae	Cheumatopsyche sp.	1
Trichoptera	Hydropsychidae	Hydropsyche betteni Ross	
Trichoptera	Hydropsychidae	Hydropsyche cuanis Ross	
Trichoptera	Hydropsychidae	Hydropsyche frisoni Ross	
Trichoptera	Hydropsychidae	Hydropsyche orris Ross	
Trichoptera	Hydropsychidae	Hydropsyche simulans/incommoda	
Trichoptera	Hydropsychidae	Hydropsyche sp.	
Trichoptera	Hydropsychidae	Potamyia flava (Hagen)	
Trichoptera	Hydroptilidae	Agraylea multipunctata Curtis	
Trichoptera	Hydroptilidae	Hydroptila sp.	
Trichoptera	Hydroptilidae	Ochrotrichia sp.	
Trichoptera	Lepidostomatidae		
Trichoptera	Leptoceridae		
Trichoptera	Leptoceridae	Oecetis inconspicua (Walker)	
Trichoptera	Leptoceridae	Oecetis sp.	
Trichoptera	Limnephilidae	Neophylax fuscus Banks	
Trichoptera	Limnephilidae	Pycnopsyche sp.	
Trichoptera	Philopotamidae	Chimarra aterrima Hagen	
Trichoptera	Philopotamidae	Chimarra obscura (Walker)	
Trichoptera	Polycentropodidae	Cyrnellus fraternus (Banks)	
Trichoptera	Polycentropodidae	Neureclipsis sp.	
Trichoptera	Polycentropodidae	Polycentropus sp.	
Trichoptera	Psychomyiidae		
Trichoptera	Rhyacophilidae		
Tricladida	Planariidae		
Unionoida	Unionidae	Lampsilis sp.	
Veneroida	Sphaeriidae		
Veneroida	Sphaeriidae	Pisidium sp.	

Subclass, [2] Class, [3] Phylum

Table Bc05. Species of conservation concern within the South Grand Watershed in Missouri (MNHP 2003). Note: Listing does not include records of occurrences listed as historic, destroyed, or introduced (exotic).

Scientific Name	Common Name	F	M	Grank	Srank	Year
Ammodramus henslowii	Henslow's Sparrow			G4	S2	1994
Ardea herodias	Great Blue Heron			G5	S5	2000
Asclepias meadii	Mead's Milkweed	T	E	G2	S2	2002
Bartramia longicauda	Upland Sandpiper			G5	S3	1988
Carex trichocarpa	Hairy-Fruited Sedge			G4	S1	1995
Certhia americana	Brown Creeper			G5	SU	1995
Circus cyaneus	Northern Harrier		E	G5	S1S2	1993
Erysimum capitatum	Western Wallflower			G5	S?	1999
Geocarpon minimum	Geocarpon	T	E	G2	S2	2000
Gryllotalpa major	Prairie Mole Cricket			G3	S3	1987
Haliaeetus leucocephalus	Bald Eagle	T	E	G4	S2	2002
Ixobrychus exilis	Least Bittern			G5	S2	1983
Lomatium foeniculaceum *Ssp foeniculaceum*	Hairy Parsley			G5T5	S1S3	1987
Malvastrum hispidum	Yellow False Mallow			G3G5	S3	1982
Pandion haliaetus	Osprey			G5	S3	2001
Panicum leibergii	A Panic Grass			G5	SU	1987
Poa interior	Inland Bluegrass			G5	S1	1987
Rana areolata circulosa	Northern Crawfish Frog			G4T4	S3	2001
Riccia sullivantii	A Liverwort			G4Q	S?	1992
Speyeria idalia	Regal Fritillary			G3	S3	1994
Tympanuchus cupido	Greater Prairie-Chicken		E	G4	S1	2001
Tyto alba	Barn Owl		E	G5	S2	1998

Year=Last year observed in watershed.

F=Federal Status

M=Missouri Status

E=Endangered

T=Threatened

* =Former category-2 candidate (In December of 1996, the USFWS discontinued the practice of maintaining a list of species regarded as “category-2 candidates”. MDC continues to distinguish these species for information and planning purposes.

SRrank

S1=Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. (typically 5 or fewer occurrences or very few remaining individuals)

S2=Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. (6 to 20 occurrences or few remaining individuals or acres)

S3=Rare and uncommon in the state. (21 to 100 occurrences)

S4=Widespread, abundant, and apparently secure in state, with many occurrences, but the species is of long-term concern. (usually more than 100 occurrences)

S5=Demonstrably widespread, abundant, and secure in the state, and essentially ineradicable under present conditions.

SU=Unrankable: Possibly in peril in the state, but status uncertain; need more information.

SE=Exotic: An exotic established in the state; may be native in nearby regions.

SH=Historical: Element occurred historically in the state (with expectation that it may be rediscovered). Perhaps having not been verified in the past 20 years, and suspected to be still extant.

SX=Extirpated: Element is believed to be extirpated from the state.

S?=Unranked: Species is not yet ranked in the state.

Qualifier:

? =Inexact or uncertain: for numeric ranks, denotes inexactness. (The ? qualifies the character immediately preceding it in Srank)

GRank

G1=Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. (typically 5 or fewer occurrences or very few remaining individuals or acres)

G2=Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction throughout its range. (6 to 20 occurrences or few remaining individuals or acres)

G3=Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range. (21 to 100 occurrences)

G4=Widespread, abundant, and apparently secure globally, though it may be quite rare in parts of its

range, especially at the periphery. Thus, the element is of long-term concern. (usually more than 100 occurrences)

G5=Demonstrably Widespread, abundant, and secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Subrank:

T=Taxonomic subdivision: rank applies to subspecies or variety.

Qualifier:

? =Inexact: denotes inexact numeric rank.

Q=Questionable taxonomy: taxonomic status is questionable; numeric rank may change with taxonomy.

Note: Data in table subject to revision. This table is not a final authority.