

Appendix 3.6 Kentucky's aquatic habitat guild descriptions and prioritized conservation actions.

CAVE STREAMS - Aquatic Guild

The Cave Stream guild includes three species of cavefish (family Amblyopsidae) and six species of Malacostracans. This category is based on the Cave Stream subsystem of the Riverine System located in the karst limestone regions of the Interior Plateau (Burr and Warren, 1986). It applies to streams that are associated with a larger surface opening than that of springs, and include sinking streams common in karst regions (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Northern Cavefish, Southern Cavefish, Spring Cavefish.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Appalachian Cave Crayfish, Clifton Cave Isopod, Cumberland Plateau Cave Crayfish, Ghost Crayfish, Mammoth Cave Crayfish, Mammoth Cave Shrimp.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 2 | 175 | Work with municipalities, industries, and government agencies to reduce physical impacts of non-point and storm water runoff including Total Maximum Daily Loads (TMDL's) |
| 3 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 4 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 5 | 174 | Establish working groups to address various broad issues and needs that pertain to water. |
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Appendix 3.6 Continued.

LARGE RIVERS IN CURRENT - Aquatic Guild

The Large Rivers in Current guild includes eight bivalve, nine fish, one amphipod, and two bird species. This category is derived from the Big River subsystem (Burr and Warren, 1986) that includes flowing waters of main channels over firm sand, gravel, and mud substrates. It applies to the largest rivers of the state, primarily the Mississippi and Ohio Rivers (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Alabama Shad, Blacktail Shiner, Flathead Chub, Lake Sturgeon, Paddlefish, Pallid Sturgeon, Plains Minnow, Sicklefin Chub, Sturgeon Chub.

BIVALVIA - Mussel

Butterfly, Catspaw, Elephantear, Orangefoot Pimpleback, Pink Mucket, Ring Pink, Scaleshell, Sheepnose.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Bousfield's Amphipod.

AVES - Bird

Greater Scaup, Lesser Scaup.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 166 | Work with dam and hydroelectric operators to enhance and protect aquatic habitat. |
| 2 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 3 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 4 | 170 | Develop public aquatic education programs to inform and educate user groups. |
| 5 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
| 6 | 175 | Work with municipalities, industries, and government agencies to reduce physical impacts of non-point and storm water runoff including Total Maximum Daily Loads (TMDL's) |
| 7 | 168 | Develop mitigation plan for impacted aquatic systems. |
| 8 | 180 | Develop priorities and technology for reintroducing and enhancing aquatic populations. |
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Appendix 3.6 Continued.

LARGE RIVERS IN SLACKWATER - Aquatic Guild

The Large Rivers in Slackwater guild includes two bivalve, five fish, five Malacostracans, and two bird species. This category is derived from the Big River subsystem (Burr and Warren, 1986) that includes slow-quiet pools and embayments over substrates of sand, mud, and organic debris. It applies to the largest rivers of the state, primarily the Mississippi and Ohio Rivers (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Alligator Gar, Black Buffalo, Burbot, Inland Silverside, Paddlefish.

BIVALVIA - Mussel

Bleufer, Fat Pocketbook.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Cajun Dwarf Crayfish, Gray-speckled Crayfish, Ohio Shrimp, Shrimp Crayfish, Swamp Dwarf Crayfish.

AVES - Bird

Greater Scaup, Lesser Scaup.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|-----|---|
| 1 | 166 | Work with dam and hydroelectric operators to enhance and protect aquatic habitat. |
| 2 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 3 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 4 | 170 | Develop public aquatic education programs to inform and educate user groups. |
| 5 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
| 6 | 175 | Work with municipalities, industries, and government agencies to reduce physical impacts of non-point and storm water runoff including Total Maximum Daily Loads (TMDL's) |
| 7 | 168 | Develop mitigation plan for impacted aquatic systems. |
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Appendix 3.6 Continued.

LOWLAND STREAMS IN RIFFLES - Aquatic Guild

The Lowland Streams in Riffles guild includes nine fish, two bivalve, and four crayfish species. This category is derived from the lowland subcategory of the Riverine System (Burr and Warren, 1986) that applies specifically to riffle habitats in streams having low gradients and current velocities, with substrates consisting primarily of sand, mud, and organic debris. Occurrence of riffles and shoals is low (constituting < 5-10% of stream length). Streams in this category are found in the Coastal Plain Province, including the Mississippi Alluvial Plain, Eastern Gulf Coastal Plain, and Tennessee River Plain (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Blacktail Shiner, Bluntnose Shiner, Brighteye Darter, Brown Madtom, Firebelly Darter, Gulf Darter, Least Madtom, Relict Darter, Shawnee Darter.

BIVALVIA - Mussel

Mountain Creekshell, Slabside Pearlymussel.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big South Fork Crayfish, Blood River Crayfish, Longclaw Crayfish, Mountain Midget Crayfish.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 2 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 3 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 4 | 164 | Restoration of degraded aquatic habitat through use of programs such as Fees in Lieu, or other federal grants. |
| 5 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 6 | 163 | Coordinate and implement existing Farm Bill programs, or other federal incentive programs as applied to aquatic systems. |
| 7 | 168 | Develop mitigation plan for impacted aquatic systems. |
| 8 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
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Appendix 3.6 Continued.

LOWLAND STREAMS IN SLACKWATER - Aquatic Guild

The Lowland Streams in Slackwater guild includes 14 fish, one bivalve, seven Malacostracans, and one bird species. This category is derived from the lowland subcategory of the Riverine System (Burr and Warren, 1986) that applies specifically to slackwater or pool habitats in streams having low gradients and current velocities, with substrates consisting primarily of sand, mud, and organic debris. Occurrence of riffles and shoals is low (constituting < 5-10% of stream length). Streams in this category are found in the Coastal Plain Province, including the Mississippi Alluvial Plain, Eastern Gulf Coastal Plain, and Tennessee River Plain (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Blacktail Redhorse, Blacktail Shiner, Central Mudminnow, Cypress Darter, Cypress Minnow, Dollar Sunfish, Golden Topminnow, Goldstripe Darter, Lake Chubsucker, Redspotted Sunfish, Spring Cavefish, Starhead Topminnow, Swamp Darter, Taillight Shiner.

BIVALVIA - Mussel

Texas Lilliput.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big South Fork Crayfish, Bousfield's Amphipod, Cajun Dwarf Crayfish, Longclaw Crayfish, Mountain Midget Crayfish, Swamp Dwarf Crayfish, Vernal Crayfish.

AVES - Bird

Spotted Sandpiper.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 2 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 3 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 4 | 164 | Restoration of degraded aquatic habitat through use of programs such as Fees i Lieu, or other federal grants. |
| 5 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 6 | 163 | Coordinate and implement existing Farm Bill programs, or other federal incentive programs as applied to aquatic systems. |
| 7 | 168 | Develop mitigation plan for impacted aquatic systems. |
| 8 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
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Appendix 3.6 Continued.

MEDIUM TO LARGE STREAMS - Aquatic Guild

The Medium to Large Streams guild includes 18 bivalve, five fish, and five crayfish species. This is a broad category that includes a large portion of the aquatic habitats in the state under the Riverine System (Burr and Warren, 1986), except for the Big River subsystem (i.e., main channels of Ohio, Mississippi, Lower Cumberland, and Lower Tennessee Rivers). It applies to flowing waters ranging in size from approximately 9 – 61 m (30 – 200 ft) in width (Jenkins et al., 1971).

Species

ACTINOPTERYGII - Fish

Northern Madtom, Pallid Shiner, Western Sand Darter.

CEPHALASPIDOMORPHI - Lamprey

American Brook Lamprey, Chestnut Lamprey.

BIVALVIA - Mussel

Clubshell, Cracking Pearlymussel, Cumberlandian Combshell, Dromedary Pearlymussel, Elktoe, Fanshell, Fluted Kidneyshell, Kentucky Creekshell, Longsolid, Northern Riffleshell, Oyster Mussel, Pocketbook, Pyramid Pigtoe, Rabbitsfoot, Rough Pigtoe, Round Hickorynut, Spectaclecase, Winged Mapleleaf.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big Sandy Crayfish, Big South Fork Crayfish, Bottlebrush Crayfish, Longclaw Crayfish, Mountain Midget Crayfish.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 166 | Work with dam and hydroelectric operators to enhance and protect aquatic habitat. |
| 2 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 3 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 4 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
| 5 | 170 | Develop public aquatic education programs to inform and educate user groups. |
| 6 | 175 | Work with municipalities, industries, and government agencies to reduce physical impacts of non-point and storm water runoff including Total Maximum Daily Loads (TMDL's) |
| 7 | 180 | Develop priorities and technology for reintroducing and enhancing aquatic populations. |
| 8 | 168 | Develop mitigation plan for impacted aquatic systems. |
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Appendix 3.6 Continued.

SMALL TO MEDIUM STREAMS - Aquatic Guild

The Small to Medium Streams guild includes four bivalve species and twelve crayfish. This is a broad category that includes small streams with sand and gravel substrates. This includes run, riffle, and pool habitat. The salamander mussel is generally association with large flat rocks where its host, the mudpuppy, can be found (Parmalee and Bogan 1998). Many of the streams are less than 9 meters wide. These species are generally distributed throughout the state and are closely associated with their host fishes. Sites include Tygarts Creek for the creek heelsplitter, sections of the Interior Low Plateaus and Appalachian Plateaus Province for the rayed bean, slippershell, and salamander mussel.

Species

BIVALVIA - Mussel

Creek Heelsplitter, Rayed Bean, Salamander Mussel, Slippershell Mussel.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big Sandy Crayfish, Big South Fork Crayfish, Blood River Crayfish, Bottlebrush Crayfish, Crittenden Crayfish, Gray-speckled Crayfish, Hairy Crayfish, Livingston Crayfish, Longclaw Crayfish, Louisville Crayfish, Mountain Midget Crayfish, Mud River Crayfish.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|--|
| 1 | 164 | Restoration of degraded aquatic habitat through use of programs such as Fees i Lieu, or other federal grants. |
| 2 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 3 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 4 | 163 | Coordinate and implement existing Farm Bill programs, or other federal incentive programs as applied to aquatic systems. |
| 5 | 159 | Encourage and assist in using, developing, and implementing Best Managemer Practices, including revision and evaluation as applied to aquatic systems. |
| 6 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 7 | 168 | Develop mitigation plan for impacted aquatic systems. |
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Appendix 3.6 Continued.

UPLAND HEADWATER STREAMS IN POOLS - Aquatic Guild

The Upland Headwater Streams in Pools guild includes seven fish and three crayfish species. This category is derived from the Upland Headwater Creeks Subsystem of the Riverine System (Burr and Warren, 1986). It applies specifically to slackwater or pool habitats in small headwater streams having high gradients and current velocities, and substrates consisting of boulder, cobble, pebble, and gravel with occasional patches of sand. Riffles and shoals constitute > 5-10% of the stream length. Streams in this category are range up to approximately 9 m (30 ft) in width (Jenkins et al., 1971), and are found in the Appalachian Plateaus Province, the Bluegrass, Shawnee Hills, and Highland Rim Sections of the Interior Low Plateaus Province, as well as the Tennessee River Plain of the Coastal Plain Province (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Blackside Dace, Cumberland Arrow Darter, Cumberland Johnny Darter, Highland Rim Darter, Kentucky Arrow Darter, Kentucky Darter, Redside Dace.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big South Fork Crayfish, Longclaw Crayfish, Mountain Midget Crayfish.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 2 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 3 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 4 | 164 | Restoration of degraded aquatic habitat through use of programs such as Fees i Lieu, or other federal grants. |
| 5 | 163 | Coordinate and implement existing Farm Bill programs, or other federal incentive programs as applied to aquatic systems. |
| 6 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 7 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
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Appendix 3.6 Continued.

UPLAND STREAMS IN POOLS - Aquatic Guild

The Upland Streams in Pools guild includes ten fish, two bivalve, and three crayfish species. This category is derived from the Riverine System (Burr and Warren, 1986). It applies specifically to slackwater or pool habitats in streams having high gradients and current velocities, and substrates consisting of boulder, cobble, pebble, and gravel with occasional patches of sand. Riffles and shoals constitute > 5-10% of the stream length. Streams in this category are range from approximately 9 – 61 m (30 – 200 ft) in width (Jenkins et al., 1971), and with only slightly developed floodplains. Streams in this category are found in the Appalachian Plateaus Province, the Bluegrass, Shawnee Hills, and Highland Rim Sections of the Interior Low Plateaus Province, as well as the Tennessee River Plain of the Coastal Plain Province (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Ashy Darter, Blackfin Sucker, Blotched Chub, Duskytail Darter, Emerald Darter, Longhead Darter, Palezone Shiner, Pallid Shiner, Sawfin Shiner, Splendid Darter.

BIVALVIA - Mussel

Green Floater, Little Spectaclecase.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big South Fork Crayfish, Longclaw Crayfish, Mountain Midget Crayfish.

Top conservation actions for this guild.

Rank Code Conservation action

- | | | |
|----------|------------|---|
| 1 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 2 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 3 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 4 | 164 | Restoration of degraded aquatic habitat through use of programs such as Fees i Lieu, or other federal grants. |
| 5 | 163 | Coordinate and implement existing Farm Bill programs, or other federal incentive programs as applied to aquatic systems. |
| 6 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 7 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
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Appendix 3.6 Continued.

UPLAND STREAMS IN RIFFLES - Aquatic Guild

The Upland Streams in Riffles guild includes 11 fish, nine bivalve, and 3 crayfish species. This category is derived from the Riverine System (Burr and Warren, 1986). It applies specifically to riffle habitats in streams having high gradients and current velocities, and substrates consisting of boulder, cobble, pebble, and gravel with occasional patches of sand. Riffles and shoals constitute > 5-10% of the stream length. Streams in this category are range from approximately 9 – 61 m (30 – 200 ft) in width (Jenkins et al., 1971), and with only slightly developed floodplains. Streams in this category are found in the Appalachian Plateaus Province, the Bluegrass, Shawnee Hills, and Highland Rim Sections of the Interior Low Plateaus Province, as well as the Tennessee River Plain of the Coastal Plain Province (Burr and Warren, 1986).

Species

ACTINOPTERYGII - Fish

Bloodfin Darter, Frecklebelly Darter, Olive Darter, Slender Madtom, Smallscale Darter, Spotted Darter, Stargazing Minnow, Stone Darter, Striped Darter.

CEPHALASPIDOMORPHI - Lamprey

Mountain Brook Lamprey, Northern Brook Lamprey.

BIVALVIA - Mussel

Cumberland Bean, Cumberland Elktoe, Cumberland Moccasinshell, Cumberland Papershell, Littlewing Pearlymussel, Purple Lilliput, Snuffbox, Tan Riffleshell, Tennessee Clubshell.

MALACOSTRACA - Crayfish, amphipod, isopod, shrimp

Big South Fork Crayfish, Longclaw Crayfish, Mountain Midget Crayfish.

Appendix 3.6 Continued.

Top conservation actions for this guild.

Rank	Code	Conservation action
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|---|-----|---|
| 1 | 158 | Financial incentives to protect riparian corridors and watersheds. |
| 2 | 161 | Acquisition and conservation easements of critical aquatic habitat. |
| 3 | 159 | Encourage and assist in using, developing, and implementing Best Management Practices, including revision and evaluation as applied to aquatic systems. |
| 4 | 164 | Restoration of degraded aquatic habitat through use of programs such as Fees in Lieu, or other federal grants. |
| 5 | 163 | Coordinate and implement existing Farm Bill programs, or other federal incentive programs as applied to aquatic systems. |
| 6 | 160 | Inform and educate user groups on significance and importance of riparian corridors and watersheds. |
| 7 | 176 | Develop, encourage, and initiate local watershed improvement initiative. |
| 8 | 180 | Develop priorities and technology for reintroducing and enhancing aquatic populations. |
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