HABITAT CONDITIONS

Aquatic Community Classification

The Ozark Highlands are an area of very old, highly weathered, low plateaus. The time span over which the region evolved has created a very physiographically diverse area with many associated unique endemic species. The Osage Plains are an area of flat to rolling plains that was originally pure tallgrass prairie (MDC 1999). The Sac River is located at the southeastern edge of the Osage Plains and in the northwestern portion of the Ozark Highlands. A small part of the Sac River basin as delineated in this document is part of the Prairie-Osage Division Community, a small portion of the Prairie Faunal Region (Pflieger 1989). Streams in this portion of the Sac River basin tend to be intermittent and turbid with substrates consisting of sand/silt in pools and shale/sandstone in riffles. The fish fauna of this division lack diversity and there are no aquatic species endemic to the division. The majority of the Sac River basin is also part of the Ozark-Missouri Division Community, a small portion of the Ozark Faunal Region. (Pflieger 1989). Streams in this portion of the Sac River basin tend to be clear with extensive exposure to chert in their channels. Stream gradients are similar to those in the Ozark-Mississippi Division. The fish fauna of Ozark-Missouri Division includes several species that are found in no other area of Missouri including Niangua darter, Bluestripe darter, blacknose shiner, and mottled sculpin. There are no other endemic aquatic fauna in this division (Pflieger 1989).

Channel Alterations

Channelization has generally been small scale and widely scattered throughout the basin. Stream channels in the mid- and lower basin have been significantly altered due to impoundment and hydropower operations. Scouring of the channel bed and banks in the lower Sac River is apparent below Stockton Dam. Effects from the rapid high flow to low flow transition created by hydro-power peaking operation can be seen in the lower basin sub-watersheds in headcutting, steep eroding streambanks, and silt/mud deposition in stream channels. Floodwater retention in downstream Truman Reservoir inundates large sections of the lower Sac River and Coon Creek. These flood waters also inundate the mouths of Cedar Creek, Turkey Creek, and Brush Creek. Similarly, Stockton Reservoir inundates portions of several streams including Sac River, Little Sac River, Turnback Creek, and Sons Creek.

Unique Habitats

Cedar Creek has been listed on the Department of Interior’s nationwide rivers inventory (Bachant, et al 1982). There are large numbers of caves and sinkholes in the Sac River basin. Several species of bats, salamanders, frogs, crayfish, and the Ozark cavefish are some of the organisms that depend on these habitats. Numbers of cave dependant organisms by county are: Barton, Cedar, Polk, Vernon (0-1); Dade, Hickory, St. Clair (2-3); Greene, Lawrence (6-8); and Christian (9-10). Several unique natural communities/natural features in the Sac River basin are listed on the Natural Heritage Database. These features/areas include: Ozark cave streams, caves, effluent caves, Ozark and prairie creeks and small rivers, Ozark headwater streams, prairie headwater streams, freshwater marshes, pond marshes, acid seeps, dolomite glades, limestone glades, sandstone glades, sandstone savannas, sandstone talus, dry limestone/dolomite cliffs, dry sandstone cliffs, dry mesic chert prairies, dry limestone/dolomite prairies, dry-mesic limestone/dolomite prairies, dry-mesic sandstone/shale prairies, hardpan prairies, dry-mesic sandstone forests, mesic bottomland forests, and xeric sandstone forests (Kramer et al 1996). Walleye spawning riffles are located in the major tributaries to Stockton Lake, including the Little Sac River and

Turnback Creek, and in the Sac River below Stockton Dam. Walleye also spawn on the main-lake points and along the face of the dam in Stockton Lake.

Improvement Projects

There are no stream improvement projects currently underway in the Sac River basin besides the previously mentioned SALT and EARTH projects. There are numerous existing and pending stream improvement projects located in the Sac River basin. These include two projects on MDC areas, Fiddler's Ford Access and Paris Springs Access, and several projects on private lands that are part of the previously mentioned SALT and EARTH projects. Included in these projects are cedar tree revetments, alternative watering sources, and riparian corridor improvements. Details concerning these projects are available through MDC and NRCS.

Stream Habitat Assessment

Streams in the basin all have problems with cattle access and non-existent or poor quality riparian corridors. Symptoms of cattle problems include bank erosion, poorly vegetated riparian corridors, and nutrient enrichment from cattle wastes in and along the stream. There are a few areas where good forested streamside corridors are present (notably upper Turkey Creek and middle Brush Creek). These good areas are affected by lack of upstream and/or downstream corridor which create a patchy and ineffective stream corridor. The headwaters of most streams in the basin are typically expansive pasture that is heavily grazed. Stream channels are (generally first, second, and up to third order) generally eroded and frequented by loafing cattle.

Stockton Dam operation has impacted the lower Sac River and lower basin tributaries. Impacts include bank erosion, siltation, instream flow problems, poor water quality, loss of riparian corridor, loss of invertebrate habitats (and concurrent reduction in productivity), and reduction of spawning habitat.

The following observations for individual streams are based on information recorded at specific locations during fish collections in 1998 and 1999. These descriptions may not be representative of the conditions along the entire stream.

Sons Creek:

> The reach sampled along Sons Creek had poor streambank stability. Streambank vegetation consisted of trees (30%), shrubs (20%), and herbaceous plants (35%). Fifteen percent of the bank had no vegetation. The stream had several eroded banks. The width of the wooded riparian corridor ranged from 10 to 50 feet. In certain locations, the top of the bank was 10-15 feet above the stream. There was groundwater influence in some of the pools, however, in other areas, the stream seemed to be losing. Land use of the area was dominated by forest. The substrate was mixture of all categories with coarse gravel and cobble dominanting.

Turnback Creek:

> The reach sampled along Turnback Creek had excellent streambank stability. Only a small section (5%) of the streambank was not vegetated. Streambank vegetation consisted of shrubs (25%), herbaceous plants (40%), and (30%)

trees. Land use consisted of both timber and residential use. The width of the wooded riparian corridor was generally over 100 feet. The substrate consisted of all categories except clay and bedrock, with gravel dominanting.

Johnson Creek:

The reach sampled along Johnson Creek had excellent streambank stability with heavily vegetated banks. Streambank vegetation consisted of herbaceous vegetation (50%), shrubs (20%), and trees (30%). The stream had a closed canopy throughout. Land use was 50% forest with a mixture of cropland and residential. Where present, the wooded riparian corridor ranged from 10 to 50 feet. The substrate consisted primarily of gravel and clay with small amounts of pebbles, silt, and sand.

Horse Creek:

The reaches sampled on Horse Creek had poor bank stability with large areas of slumping bank. There were large amounts of woody debris in the stream indicating bank instability. Corridor vegetation consisted of trees (50%) and a mixture of shrubs (25%) and herbaceous vegetation (25%). Land use was almost entirely pasture with small pockets of forest. The substrate consisted of all categories except clay with gravel and sand being dominant. Upstream sections had a higher percentage of bedrock than downstream sections.

Cedar Creek:

The reach sampled along Cedar Creek had good to poor bank stability. Streambank vegetation consisted primarily of herbaceous vegetation (60%) mixed with trees (20%) and shrubs (20%). Land use was mostly pasture (80%) and a small amount of forest (20%). The width of the wooded riparian corridor was less than 10 feet when present. The substrate consisted of all categories except clay with gravel and pebble being dominant.

Sac River:

The reaches sampled along the Sac River had good to poor bank stability. Many reaches of the stream had steep eroded banks with little vegetation. Other areas that were heavily vegetated still had steep and scoured banks. The majority of the streambank vegetation consisted of trees with a mixture of shrubs and herbaceous plants. The width of the wooded riparian corridor varied from over 100 feet wide to less than 10 feet. The major land use varied from row crops and to completely forested. Substrate consisted of all categories with gravel and sand being dominant.

Coon Creek:

The reach sampled along Coon Creek had poor bank stability. The area is periodically inundated by Truman Lake causing streambank vegetation to be weakened or killed. Streambank vegetation, when present, consisted of a

mixture of herbaceous plants, shrubs, and trees. The width of the wooded riparian corridor was generally less than 10 feet. Land use was almost entirely row crops and pasture with a small (10%) amount of forest. The substrate consisted of gravel and pebbles covered with 1-6 inches of sand and silt.

Bear Creek:

The reach sampled along Bear Creek had good to poor bank stability with areas of steep vertical cut banks. Streambank vegetation consisted of equal amounts of trees, shrubs, and herbaceous plants. Land use was primarily pasture (80%) and forest (20%). The width of the wooded riparian corridor was generally less than 25 feet. The substrate consisted mostly of slab rock with small amounts of boulders, cobble, pebble, gravel, sand, and silt.

Cedar Creek:

The reach sampled along Cedar Creek had good to poor bank stability with fairly steep vegetated banks. Streambank vegetation was primarily trees (75%) with few shrubs (15%) and herbaceous plants (10%). Almost all the land in the area was pasture (90%) with a small amount of forest (10%). The width of the wooded riparian corridor was generally less than 25 feet. The substrate consisted of all forms except boulder and bedrock.

Little Sac River:

The reaches sampled along the Little Sac River had good to poor bank stability with many steep banks devoid of vegetation. In some areas, cattle had free access to the river causing heavy localized erosion. The most dominant streambank vegetation was herbaceous plants with a small percentage of trees and shrubs. The width of the wooded riparian corridor was generally less than 25 feet, but some areas extended to 100 feet wide. The substrate consisted of all categories.

South Dry Sac River:

The reach sampled along the South Dry Sac River had poor bank stability. The stream had areas of vertical and lateral erosion and a large area of gravel deposition. Streambank vegetation was mostly herbaceous plants (60%) with a mixture of trees (20%) and shrubs (10%). Land use in the region was 100% pasture. The width of the wooded riparian corridor was usually less than 25 feet. The dominant substrate was gravel with smaller amounts of sand, cobble, and pebbles.

Goose Creek:

The reach sampled along Goose Creek had good to poor bank stability with a few vertical cut banks. Other banks were well vegetated. When present, herbaceous plants (55%) were the most dominant plant along the streambank. Trees (20%) and shrubs (20%) were also present. The width of the wooded

riparian corridor was approximately 50-100 feet. The substrate consisted of all categories except boulder and bedrock.

Lynn Branch:

The reach sampled along Lynn Branch had good bank stability with little erosion. Streambank vegetation consisted of trees and shrubs, but they were mostly dead from Stockton Lake inundation. Land use in the area consisted of 100% forest and the width of the wooded riparian corridor was more than 100 feet. The substrate consisted of all categories except bedrock.

Maze Creek:

The reach sampled along Maze Creek had poor bank stability with many areas of unprotected vertical cut banks. Cattle had free access to the stream. When present, streambank vegetation consisted primarily of herbaceous plants (60%) with smaller amounts of trees (25%) and shrubs (10%). Land use in the region was 100% pasture. The width of the wooded riparian corridor ranged from 25-100 feet. The substrate was a mixture of categories.

Limestone Creek:

The reach sampled along Limestone Creek had poor bank stability with several areas of unprotected vertical banks. Streambank vegetation consisted of herbaceous plants (40%), trees (25%), and shrubs (25%). Many of the gravel bars were in early stages of re-vegetation. Land use in the area consisted of 100% pasture. The width of the wooded riparian corridor, when present, was less than 10 feet. The substrate consisted of all categories.

Little Dry Sac River:

The reach sampled along Little Dry Sac River had good bank stability with moderately vegetated banks. Streambank vegetation consisted of herbaceous plants (35%), trees (35%), and shrubs (20%). Land use in the region was 100% ungrazed pasture. The width of the wooded riparian corridor ranged from 25-50 feet. The dominant substrate consisted of gravel and pebbles with smaller amounts of silt, sand, cobble, and boulders.