

HABITAT CONDITIONS

Channel Alterations

No large channel alteration projects have taken place within the basin (MDNR 1986). However, small sections of many streams have been straightened for bridge construction; gravel pushing is commonly practiced in misguided attempts at streambank stabilization.

Sedimentation from erosion of mine waste is extensive in portions of Big and Flat rivers (MDNR 1984 1986 1994a, Buchanan 1980, Kramer 1976, Ryck 1974b, Zachritz 1978) and other basin streams (Duchrow 1976, Jennett et al. 1981, MDNR 1984 1986 1994a, Ryck 1974b). Shaw (2.0 miles), Shibboleth (0.5 miles), and Fountain Farm (0.2 miles) branches continue to be affected by barite mining sediment (MDNR 1994a). Mine waste sedimentation has smothered aquatic habitats within these streams; making them inhabitable for some invertebrates.

Three instream sand and gravel mining operations are permitted by MDNR--in Big River (Washington County), Mineral Fork (Washington County) and lower Dry Creek (Jefferson County; MDNR 1994b), while two illegal Washington County operations (Big River and Cedar Creek) have been stopped.

The Washington County operations negatively affect adjacent stream reaches through increased channel instability (downcutting and channel widening), streambank erosion, increased turbidity, and loss of aquatic habitat.

The lower 1.5 miles of Dry Creek is mined, but has a bedrock bottom which prevents upstream downcutting. However, past gravel removal from Big River near the Dry Creek confluence may have caused lower Dry Creek to downcut to bedrock and has caused the Big River channel to become unstable and streambank erosion to occur. Gravel is periodically removed from many basin streams by unpermitted and undocumented small operators.

Two floodplain sand and gravel operations are permitted near Big River in Jefferson County (MDNR 1994b). Other unpermitted floodplain operations exist near Big River and Mineral Fork in Washington County.

Watershed urbanization has decreased wooded riparian corridors and increased stormwater runoff, thereby increasing channel instability.

Unique Habitats

Nineteen sensitive natural communities have been documented within the basin (MDC 1995b). Included in these communities are two examples of Ozark creeks and four examples of Ozark springs and spring branches (Appendix 8).

Stream Improvement Projects

In October, 1991, a cedar tree revetment and corridor planting project was installed on Cedar Hill Access (RM 18.5). Forty cedar trees (20-45 ft.) were anchored along a 525-foot long, 14-foot tall, vertical eroding streambank immediately downstream from a breached mill dam. The revetment consisted of a 180-foot triple and 345-foot single rows of cedar trees. Seventy-five hardwood trees (6-8 ft.) were planted in April, 1992 and a 100-foot "no mowing zone" was marked to help re-establish the riparian corridor.

Although no cedar trees were lost and bank toe remains stable, natural backsloping and capture of sediment haven't occurred in adequate amounts to stabilize the streambank. Mechanical backsloping and immediate willow planting may have improved results. Planted corridor trees continue to survive; however, dense ragweed growth is greatly inhibiting natural regeneration of trees.

In April, 1995, with the help of 38 STREAM TEAM volunteers, 5,000 tree seedlings were planted on Mr. Tim Smith's property along Big River (RM 58.4-59.0) and Mineral Fork (RM 0-0.4). This frontage was planted with sweetgum, pin oak, tulip poplar, silver maple, and green ash at four sites. Trees were planted on 6 x 6 ft. spacing to create a corridor that ranged from 60 to 120 ft. wide.

Despite well-marked planting sites and Mr. Smith's assurances of good stewardship, 75% of the planted seedlings were mowed or plowed under by Mr. Smith's lessee farmer. The remainder of trees are doing well.

In April, 1997, 18 STREAM TEAM volunteers planted 1,800 tree seedlings on private property along Sandy Creek (Jefferson County). Sweetgum, pin oak, and green ash were planted on 6- x 6-foot spacing. Survival was estimated to be about 60%.

Stream Habitat Assessments

Stream habitat quality was evaluated by using MDC's Stream Habitat Assessment Device (SHAD Version II) and aerial video tape (Big River only). SHAD was utilized at 113 sites on 49 streams (Figure hb).

Overall, SHAD surveys revealed streambanks were in good condition. Most Big River and tributary streambanks showed minimal (74%) or no (79%) bank erosion. Trees and shrubs were the dominant types of streambank protection.

Riparian corridor condition was fair to poor. Generally, Big River's corridors were in better condition than its tributaries. Sixty percent of Big River sites exhibited a timbered stream corridor ≥ 75 ft., versus 44% for tributary stream sites. Timbered corridor was absent on 24% of Big River and 44% of tributary streams' SHAD sites. Twenty-one percent of tributary SHAD sites had corridors that consisted mainly of grasses, compared to only 6% for Big River. Cattle

grazing and hay production were more prevalent land uses around tributaries than around Big River. Row cropping and hay production took place near Big River, but generally comprised a smaller portion of the riparian corridor. Corridor width is being reduced along streams with increasing amounts of urbanization.

Results from SHAD surveys suggest that the potential for soil erosion and non-point source pollution may be greater from tributary streams than from Big River, due to heavier riparian corridor land use and poor vegetative quality (narrow corridor and prevalence of grasses). Cattle grazing increases erosion and greatly limits the development of wooded corridors. Row cropping and hay production eliminates wooded corridors through constant plowing or mowing. Generally, intensive riparian corridor land use and poor vegetative quality increased as the size of stream decreased.

Big River basin's instream habitat is typical of Ozark streams with gravel present at 89% of the SHAD sites. Water willow bordering pools and boulder slides from bluffs was common. The percentage of SHAD sites with downed logs or rootwads was high, with 74% in tributary streams and 88% in Big River.

Appendix 8. Sensitive natural communities within the Big River basin (MDC 1995b).

Category	Location
Ozark creek	Cedar Creek shut-ins, Washington Co., sec. 18, T35N, R3E and sec. 13, T35N, R2E. West of Highway 21 bridge, 6.5 miles NE of Banner.
Ozark creek	Mineral Fork, Washington Co., sec. 8, T38N, R2E to sec. 15, T39N, R3E. Confluence with Big River, upstream to Highway F, near Aptus.
Gravel wash	Cedar Creek, Washington Co., sec. 18, T35N, R3E. Along Cedar Creek east of Highway 21 bridge, about 6.5 miles NE of Banner.
Ozark spring & spring branches	Mammoth Creek, Jefferson Co., sec. 11&12, T39N, R3E.
Ozark spring & spring branches	Coonville Creek, St. Francois Co., sec.19 & 30, T38N, R5E and sec. 25, T36N, R2E.Coonville Creek Natural Area, St. Francois State Park.
Ozark spring & spring branches	Clear Creek, Washington Co., sec. 23 & 24, T36N, R1E and sec. 19, T36N, R2E. Mark Twain National Forest.

Appendix 8 continued

Ozark spring & spring branches	North Fork Creek, Washington Co., sec.9, 16, & 17, T36N, R2E. Tributary to Cedar Creek about 3 miles north of Belgrade.
Dry igneous forest	Round Mountain, Washington Co., sec. 34, T36N, R3E. Two and one half miles SSW of Irondale.
Fen	St. Francois Co., sec. 19 & 30, T38N, R3E & sec 25, T38N, R4E. Coonville Creek Conservation Area and St. Francois State Park.
Fen	Appleberry Meadows, St. Francois Co., sec. 19 & 20, T38N, R5E. On NNE boundary of St. Francois State Park near Appleberry Cemetery.
Fen	Cruise Meadow, Washington Co., sec. 30, T39N, R3E. West of Washington State Park, along Old Mines Creek, at junction of highways 47 and 21.
Igneous glade	Buford Mountain Glades, Iron Co., sec. 16, 17, 21, 22, 27, 34, and 35, T35N, R3E. Buford Mountain Conservation Area.
Igneous glade	Hanson Hill, Washington Co., sec. 17 & 18, T35N, R2E. Three miles NW of Banner.
Igneous glade	Unnamed, Washington Co., sec. 17 & 18, T35N, R3E. Three miles NW of Banner.
Igneous glade	Hughes Mill Glade, Washington Co., sec. 21, 22, 27, and 28, T36N, R3E.
Igneous glade	Round Mountain Glade, Washington Co., sec. 33 & 34, T36N, R3E. Round Mountain.
Mesic Limestone/dolomite forest	Washington State Park Hardwoods Natural Area, Washington Co., sec. 22 & 23, T39N, R3E. Washington State Park.
Xeric igneous forest	Unnamed, Washington Co., sec 21, 22, 27, and 28, T36N, R3E. Hughes Mill Glade.
Xeric igneous forest	Unnamed, Washington Co., sec. 28, T36N, R3E. Hughes Mountain.

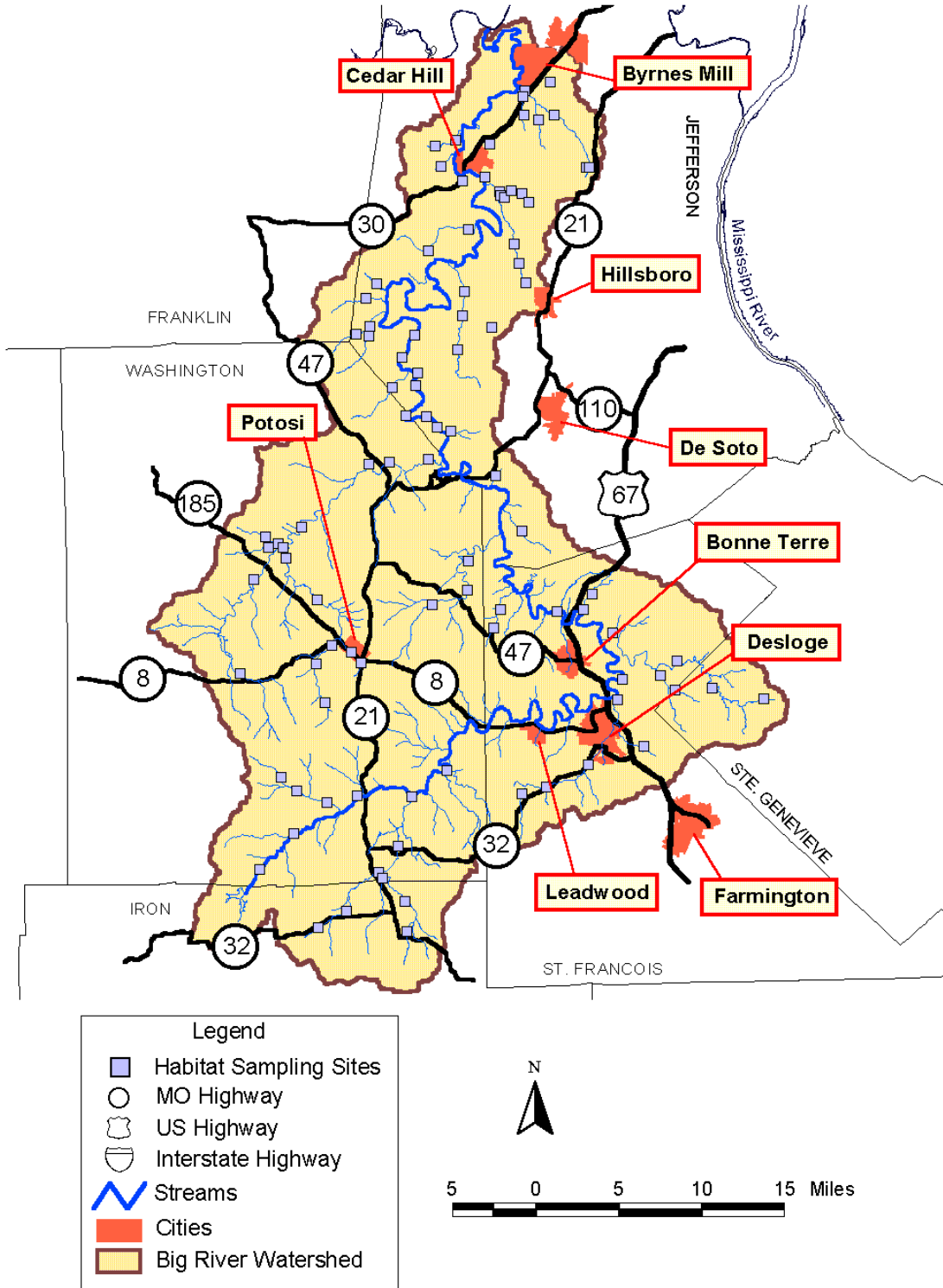


Figure hb. Habitat sampling locations within the Big River basin, Missouri.