WATER QUALITY

Beneficial Use Attainment

Stream life and fishing are both threatened by occasional low dissolved oxygen (MDNR 1984). Point sources are the predominant cause of excessive nutrients leading to nutrification of Muddy Creek. Seasonal peaks occur in agricultural subwatersheds, but high levels of phosphorous, ammonia, nitrate and nitrites reach the system from Sedalia’s sewage treatment plants and agriculture dependent industry. This is reflected within the aquatic invertebrate community as well. A specific beetle, family Staphylinidae, is commonly associated with cattle manure and was collected in good numbers on Flat Creek during summer months in 1988, 1989 and 1990. Whole-body recreation and boating on the Lamine River is usually safe but high levels of fecal coliform bacteria are sometimes found during high flows.

Chemical Quality of Stream Flow, Contaminants and Fish Kills

A review of MDC records revealed that several stream reaches in the Lamine River Basin have had chronic problems supporting fish populations. Low base flows during the summer contribute to these water quality problems. Most of these reaches are associated with point sources including Sedalia's sewage treatment plants and agriculture related industry. During the 1960's, effluent from Sedalia's south sewage treatment plant caused chronic fish kills in tributaries leading to Flat Creek as well as in the mainstem of Flat Creek. In 1967, fish were killed in 20 miles of Flat Creek due to high ammonia and/or low dissolved oxygen resulting from sewage effluent from the south plant. In 1971, 4000 fish were killed in the same reach of Flat Creek. Throughout the 1970's the problem continued until a new south sewage treatment plant was completed in 1985. Although fish kills in Flat Creek near Sedalia are no longer common, tributaries leading to Muddy Creek are chronically affected by raw sewage during storm runoff. Throughout the 1980's, poor separation of raw sewage from storm runoff has resulted in degraded conditions in Sewer Branch (Pearl River) which empties into Muddy Creek north of Sedalia. The reach of Sewer Branch above U.S. Highway 65 is frequently black from raw sewage effluent and is usually not habitable to fish. The city of Sedalia plans to improve the system to divert the sewage from the storm runoff but it will take several years to complete.

Repairs at Sedalia's central sewage treatment plant which releases effluent into Muddy Creek via Brushy Creek resulted in a fish kill in September 1990. Due to cool weather and rains, an accurate count of dead fish was difficult to obtain. Poorly treated sewage polluted the stream from September 1990 to March 1991 and did not met Missouri Water Quality Standards for ammonia or BOD during this time.

A major fish kill occured in November 1989, when sewage effluent from a chicken layer operation polluted Long Branch and Muddy Creek, resulting in high ammonia levels which killed approximately 20,000 fish. Approximately 14 miles of Long Branch and Muddy Creeks were affected beginning just upstream from the Johnson/Pettis County line. A project is currently underway to determine the extent of recolonization by fish and invertebrates in the reach which was almost devoid of life following the fish kill. The project is being conducted by MDC Fisheries regional personnel.

Drift and egg deposition from adult insects such as chironomid midges, dipterans, mayflies and stoneflies began to contribute to recovery by 22 weeks after the manure spill. The presence of a highly imbalanced invertebrate community at sites A, B, C and D indicates that the invertebrates had not yet recovered 50

weeks after the manure spill. Invertebrate sampling was not conducted after week 50.

Many fish and invertebrate species in Muddy Creek are fairly tolerant to organic enrichment. Steady improvement in fish abundance within all trophic groups by week 33 after the manure spill shows that recovery was well underway by then. However, fluctuations in abundance of fish species and individual fish continued to be relatively greater at polluted sites compared to the reference site at week 241. Greater fish trophic group instability observed at polluted sites compared to the reference site indicates that fish populations had not fully recovered within 241 weeks of the initial pollution event. The relative scarcities of sunfish > 7 inches and black bass > 12 inches at the polluted sites compared to what was observed during the fish kill provides further evidence that these species had not totally recovered 241 weeks after the fish kill. The low numbers of larger sunfish and bass that are available to anglers have greatly diminished the attractiveness of Muddy Creek for angling, since these sizes are more readily sought by anglers.

Water quality in streams of the Lamine River Basin is not routinely monitored. Dissolved oxygen, temperature and ammonia levels have been measured in association with fish kill investigations. As indicated above, typical water quality problems include low dissolved oxygen and/or high ammonia levels resulting from non-point and point-source pollution. Historic water quality data exists from a previous USGS gage station on the mainstem Lamine River near its confluence with the Blackwater River. Data for the period from 1979 to 1986 are available from MDC Streams South personnel or the USGS. The Missouri Department of Health’s advisory pertaining to fatty fishes outside of the Ozarks is applicable to fish caught anywhere in the Lamine River watershed. The advisory says you should eat no more than one pound per week of fatty fishes such as catfish, carp, buffalo, drum, suckers or paddlefish from anywhere in Missouri outside the Ozark region.

Water Use

Currently there are two public surface water withdrawals from the Lamine River Basin. The city of Sedalia withdraws water from Spring Fork Lake and has an auxiliary supply on Flat Creek (Pettis County S22, T45, R21). MDNR's current record of water users does not list any major water withdrawals (greater than 100,000 gallons/day) from the basin for irrigation or industry as of 1987. More current data is being compiled at this time (Jeanette Barnett, MDNR, Personal Communication).

Point Source Pollution

Almost all of Pettis County lies within the Lamine River watershed. From 1990 to 1994, twenty-four water quality investigations were performed in Pettis County. Three of these resulted in fish kills. Agriculture manure was identified as the cause of 5 of the 16 known causes. From 1995 thru July of 1999, twenty-eight water quality investigations were performed in Lamine River watershed. Six resulted in Fish Kills. Agriculture manure was identified in 15 of 23 known causes.

Although several point source discharges exist in the Lamine River basin (MDNR 1984), most pollution problems have been associated with effluent from the Sedalia area. Raw sewage commonly enters Sewer Branch during periods of high runoff due to poor diversion of solid waste from the storm sewer system to the north sewage treatment plant. This combined sewage outfall is located near the Grand Avenue crossing on Pearl River. Raw sewage has been observed in the river, which is unclassified for any beneficial use by MDNR, for at least one mile downstream from the outfall. Other than problems associated with the combined sewage outfall on Pearl River, point-source pollution is limited in the

Lamine River basin.

NonPoint Source Pollution

In 1997 there were an estimated 88,675 dairy and beef cattle in watershed. There were 67,830 hogs and pigs in watershed. The number of poultry occuring at any one time includes 5.7 million broiler chickens, ½ million breeders, 336,000 pullets, and 1.1 million turkeys.

In 1992 there was an estimated 1.5 million people equivalents (PE) of livestock in the Lamine River watershed. An estimate made in 1999 shows 2.6 million PE. The difference is almost entirely explained by the addition of 1.2 million PE added by chickens since 1992.

There are two small abandoned coal mined areas on upper Muddy Creek in Johnson County which may cause occasional minor problems with low pH, high sulfate and high iron levels in the receiving streams. To report incidents of pollution contact the Department of Natural Resources.