

# ***WATER QUALITY AND USE***

## **Contaminants and Fish Kills**

The U.S. Geological Survey does not maintain water quality records at the Wayland, Missouri gate station. In 1987, Missouri Department of Conservation personnel conducting faunal surveys in the Fox River Basin recorded various water quality parameters at selected sample sites (Table 6). All parameters measured were within acceptable standards for protection of aquatic life (MDNR 1987), and fish growth (Boyd and Lichtkoppler 1979). The only acute water quality problems known to the basin are low dissolved oxygen and high ammonia levels. Due to low base flow and nutrient loading from adjacent farmland, algal densities become elevated, often resulting in oxygen depletion when algae die. Ammonia problems may occur simultaneously due to organic waste input from livestock. Water temperature in many of these streams becomes unacceptably high from some species of fish, thereby limiting their distribution in the basin.

Only six pollution incidents have been recorded since 1969. Four incidents produced fish mortality, none of which were the result of natural causes. However, reports periodically surface detailing minor fish kills in localized areas. These episodes usually cease before the cause and extent of mortality can be determined.

Dumping of raw materials appears to have been the primary cause of fish loss in the last twenty years. The largest fish kill on record occurred in 1988 when an estimated 2,898 fish perished because liquid manure was pumped from a lagoon into a tributary of Honey Creek.

To date, no attempt has been made by the Environmental Protection Agency, Missouri Department of Natural Resources or the Missouri Department of Conservation to collect fish flesh samples for pesticide or heavy metal testing.

## **Point-Source Pollution**

Point-source pollution moderately affects four streams in the basin (Figure ps). Effluents from sewage treatment lagoons are released from the cities of Kahoka and Wayland into tributaries of Brush Creek and Fox River, respectively. The Kahoka facility (S19, T65N, R7W) degrades approximately four miles of Brush Creek through discoloration under extended dry conditions (MDNR 1984). The Wayland facility (S30, T65N, R6W) impacts five miles of an unnamed tributary through discoloration, and the effluent ditch may pose a potential health hazard (MDNR 1984).

Water quality data collected from Brush Creek by Missouri Department of Conservation personnel detected no problems at that time (Table 6). Historically, severe pollution problems have occurred in the stream due in part to discharges from area dairy processors. In a statewide stream pollution survey conducted in 1968 (MDC memo, W.L. Redmon to J. R. Whitley, October 30, 1970), two dairy processing plants were discharging milk wastes and starch into the Kahoka sewage lagoon in excess of its capacity. Brush Creek at this time was reported to be "grossly polluted" and supported a dense growth of *Sphaerotilus spp.* Fish kills occurred in Brush Creek in 1968 and 1969 and Fox River in

1971 when cheese whey was discarded at the Kahoka City Dump (which drains into Brush Creek) and later at a lagoon near Fox River. Improvements made at the Kahoka treatment facility and the closing of the dairy processing plants have improved conditions in Brush Creek.

Two non-municipal discharges also occur in the basin. One discharges sewage from a lagoon into Wade Branch and another employs an aeration system before discharging directly into Fox River. Impacts from these discharges are considered slight as only .013 MGD (million gallons daily) of sewage is released on the average (MDNR 1984).

Point source originating in Iowa are not believed to adversely impact the Missouri portion of the Fox or Little Fox rivers (MDNR 1984). There are currently no known industrial discharges.

### **Non-Point Pollution**

Sedimentation and inorganic turbidity are chronic and severe water quality problems. The Fox/Wyaconda basin delivers approximately 3 tons/acre of sediment to receiving streams annually and is ranked as the 9th worst subbasin of 45 subbasins in the state (SCS 1978).

Approximately 84% of the sediment originates from sheet erosion. Gully erosion problems are considered to be severe (SCS 1978), but have improved in the past 45 years as evidenced by fewer deep gullies observed on aerial photographs. No data are available on streambed or streambank erosion.

**Table 6. Water Quality Parameters From Selected Sites in the Fox River Basin.**

| Stream Code | Stream Name | Sample Station | Date     | Water Temp (F) | Cond. (umnos) | pH  | TDS (mg/l) | Hard. (mg/l) | D.O. (mg/l) | NH3 (mg/l) | NO (mg/l) | Secchi (in) |
|-------------|-------------|----------------|----------|----------------|---------------|-----|------------|--------------|-------------|------------|-----------|-------------|
| 37521000    | Little Fox  | 01             | 08-12-87 | 79             |               |     |            |              |             |            |           |             |
| 37521000    | Little Fox  | 02             | 08-12-87 | 82             | 290           | 9.4 | 189        | 239          | 13.0        | .5         | .1        | 8           |
| 37521000    | Little Fox  | 04             | 08-17-87 | 90             | 540           | 9.2 | 351        | 239          | 10.0        |            |           | 8           |
| 37521000    | Little Fox  | 08             | 08-18-87 | 83             | 530           | 9.3 | 345        | 171          | 9.0         |            |           | 10          |
| 37500000    | Fox         | 10             | 08-19-87 | 80             |               | 9.3 |            | 239          | 11.0        | .05        | 0         | 12          |
| 37500000    | Fox         | 11             | 08-19-87 | 80             |               | 9.6 |            | 222          | 11.0        |            |           | 13          |
| 37500000    | Fox         | 12             | 08-20-87 | 83             |               | 9.3 |            | 239          | 8.0         |            |           | 8           |
| 37500000    | Fox         | 16             | 08-20-87 | 82             |               | 9.4 |            | 222          | 14.0        |            |           | 8           |
| 37514000    | Brush Creek | 17             | 08-26-87 | 63             |               | 9.0 |            | 307          |             |            |           | 18          |
| 37500000    | Fox         | 19             | 08-26-87 | 72             |               |     |            |              |             |            |           | 12          |
| 37500000    | Fox         | 20             | 09-01-87 | 77             |               | 9.3 |            | 273          | 13.0        |            |           | 10          |
| 37500000    | Fox         | 22             | 09-02-87 | 71             | 450           |     | 275        |              |             |            |           |             |
| 37511000    | Honey Creek | 27             | 08-04-87 | 76             | 500           | 8.7 | 325        | 205          | 6.0         | .05        | 0         | 6           |
| 37511000    | Honey Creek | 28             | 08-04-87 | 84             | 490           | 9.6 | 319        | 188          | 10.0        |            |           | 17          |
| 37511000    | Honey Creek | 29             | 08-05-87 | 73             |               | 9.3 |            | 342          | 8.0         |            |           |             |
| 37511000    | Honey Creek | 31             | 08-05-87 | 85             |               | 9.2 |            | 239          | 10.0        |            |           |             |

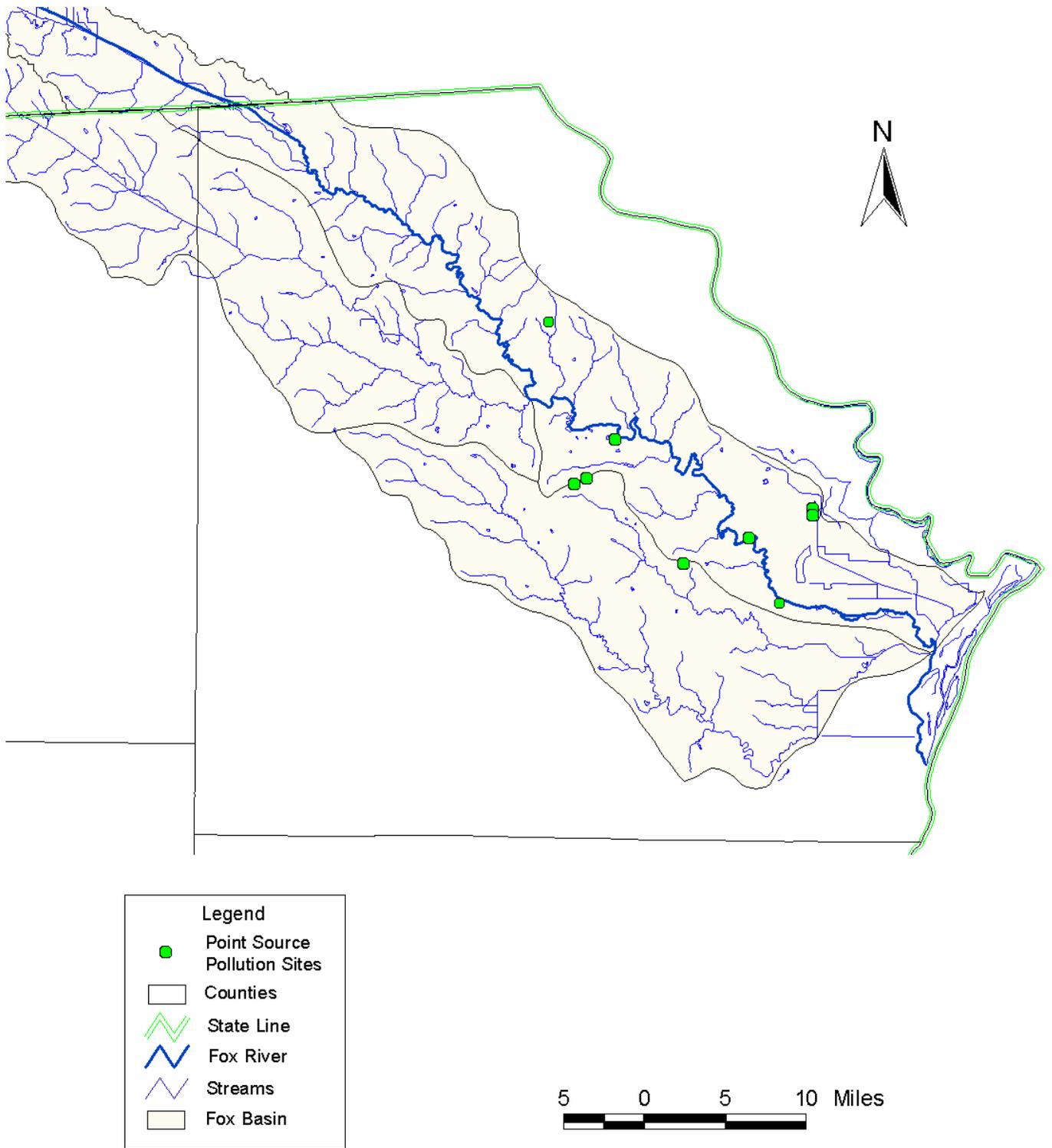


Figure ps. Point source pollution locations within the Fox River Basin, in Missouri.