The subwatershed is rural with land use divided as follows:

agricultural	40%
woodland	47%
grassland	11%
wetland	1%
other*	1%

* primarily residential areas

Water Resource Conditions

Bear Creek is a 1.6 mile tributary of the Kickapoo River that begins at the junction of North and South Bear Creeks. The stream is managed as a Class III brown trout fishery and was stocked in spring 1990 with 800 9-inch brown trout. The 1990 fish survey found 1 brown trout (8 inches) and 12 forage fish species. The dominate stream substrate is sand, with lesser amounts of silt and gravel.

Water resource problems include flooding, sedimentation of riffles and pools, and streambank erosion. Land use in the stream corridor is primarily open meadow and pasture.

South Bear Creek flows 2.5 miles and joins North Bear Creek to form Bear Creek. The stream is managed as a Class III brown trout fishery. The 1990 fish survey found 11 brown trout ranging from 5 - 13.9 inches, 1 rainbow trout measuring 9 inches, and 11 forage species. Sand is the primary substrate type, with lesser amounts of gravel and rubble. The stream HBI (Hilsenhoff Biotic Index) was 5.40, indicating some organic pollution, and the Habitat Rating was "fair".

Water resource problems include a lack of instream fish cover and heavy bank erosion on the lower end. Gravel in the stream riffle areas was highly embedded. Land use in the stream corridor is primarily meadow and open pasture.

Middle Bear Creek is a 2.3 mile tributary of South Bear Creek. The stream is managed as a Class III brown trout fishery. The recent fish survey found 6 brown trout, ranging from 7 - 8.9 inches, 1 rainbow trout measuring 7 inches and 5 forage species. A private trout hatchery is located in the upstream portion of the stream corridor. The dominant substrate is coarse gravel, with lesser amounts of sand and rubble.

Middle Bear Creek has no significant nonpoint problems. Much of the stream was ditched previously but little bank erosion currently exists. Land use in the stream corridor is primarily lowland meadow and woodland.

North Bear Creek flows 5.3 miles and joins South Bear Creek to form Bear Creek. The stream is managed as a Class III brown trout fishery and was stocked in spring 1990 with 500 9-inch brown trout. The dominant substrate is gravel, with some sand and silt present. The stream HBI (Hilsenhoff Biotic Index) was 5.21, indicating some organic loading, and the Habitat Rating was "fair".

Water resource problems include heavy bank erosion, elevated stream temperatures, lack of instream cover and sedimentation of pool and riffle areas. Gravel in the riffle areas is heavily embedded. Primary land use in the stream corridor is open pasture.

Water Resource Objectives

The following water resource management objectives are recommended for the Bear Creek subwatershed:

1. Improve fish habitat to increase carryover of adult trout in Bear Creek, North Bear Creek, Middle Bear Creek and South Bear Creek.

2. Improve water resource conditions to increase trout reproduction in South Bear Creek.

3. Protect fish habitat conditions in Middle Bear Creek and establish trout reproduction by introducing wild trout to the stream.

4. Improve water resource conditions by reducing sediment and organic loading to the subwatershed streams.

Pollutants From Nonpoint Sources

Eroding Uplands (sediment and nutrients)

Sedimentation from upland sources accounts for 45% (or 2,391 tons per year) of the pollutants reaching the stream. The majority of this sediment is from excessively eroding crop fields. Also woodlots that are heavily grazed contribute a substantial amount.

Eroding and Trampled Streambanks (sediment and direct habitat impairment)

Streambank erosion is spotty in this subwatershed, some stretches being relatively stable, and others having significant erosion problems. Overall, streambank erosion accounts for 16% of the total sediment reaching the streams (852 tons per year).

Eroding Gullies (sediment and nutrients)

Gully erosion makes up the remaining 39% of sediment reaching the streams in the Bear Creek subwatershed (Approximately 2,027 tons per year). The gullies most often occur in small drainage areas where the edges of ridge crop fields or pastures meet steep wooded hillsides.

Animal Lots (oxygen demand and nutrients)

Manure runoff from 17 animal lots account for most of the oxygen demanding substances having an impact on water quality. The 17 animal lots inventoried deliver approximately 703 lbs. of phosphorus to the streams in the Bear Creek subwatershed.

Winter Spread Manure (oxygen demand and nutrients)

Manure spread on "critical" acres can have a significant impact on water quality in the Bear Creek subwatershed. "Critical" acres are defined as those fields which are over 6% slope, or which lie in the flood plain. Currently, manure is being winter spread on approximately 220 critical acres in the subwatershed.

Billings Creek Subwatershed (BL)

Subwatershed Description

The Billings Creek subwatershed drains an area of 23 square miles. Tributaries include Johnnycake Hollow, Winchell Valley, and Crouch Valley, along with several small valleys draining directly into Billings Creek. Billings Creek flows in a southwesterly direction until it empties into the Kickapoo River in Vernon County between Rockton and Ontario. Billings Creek originates in Monroe County. Cheyenne Valley Creek is a major tributary of Billings Creek, but in this watershed it is a separate subwatershed.

This subwatershed is primarily rural with land use divided as follows:

agricultural	46%
woodland	50%
other*	4%

* grassland, wetland, and scattered residences

Water Resources Conditions

Billings Creek flows southwesterly 7.0 miles to the Kickapoo River. The lower portion of the stream flows through Wildcat Mountain State Park. The stream is managed as a Class II brown trout fishery and was stocked in 1990 with 2000 fingerling brown trout and 2000 9-inch brown trout. The 1990 fish survey found 89 brown trout (5.5 - 24.5 inches), 10 rainbow trout (5 - 13.9 inches), 1 brook trout (10 inches), and 15 minnow and other forage species. The predominant substrate type is gravel, with lesser amounts of sand, silt and rubble. The stream HBI (Hilsenhoff Biotic Index) was 5.45, indicating some organic loading, and the Habitat Rating was "good". Water temperatures in Billings Creek were suitable for trout survival, but exceeded optimal conditions for growth frequently during the summer.