Water resource problems include lack of adequate cover for adult trout, embeddedness of riffle areas and some sedimentation of pools. Severe flooding and streambank erosion are also problems in the downstream portion where banks are relatively high and unstable. Bank erosion and resulting sedimentation of headwater riffle areas may be affecting spawning success. Land use in the stream corridor is primarily meadow, woodland and pasture in the upstream portion; and woodland in the lower reach. This stream would greatly benefit from reduced bank erosion and improvement of instream habitat.

Johnnycake Hollow Creek is a high gradient 1.8 mile tributary of Billings Creek. Minnows and other forage species comprise the fish community. The 1990 survey found fantail darter, creek chub, Johnny darter and brook lamprey. The stream substrate is primarily shifting sand.

Water resource problems include lack of instream habitat and sedimentation of the stream bottom. Land use in the stream corridor is primarily meadow pasture.

Creek 34-10 (township of Wellington, Monroe Co.) flows northwest 1.2 miles to Billings Creek. Minnows and other forage species comprise the fish community.

Water Resource Objectives

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

1. Improve fish habitat to increase trout reproduction and increase carryover of adult trout in Billings Creek.

2. Improve water resource conditions in the subwatershed streams by reducing sediment and organic loading.

Pollutants from Nonpoint Sources

Eroding Uplands (sediment and nutrients)

Approximately 46% (or 4,489 tons per year) of Billings Creek's sedimentation results from erosion occurring on upland land uses, primarily from cropland. Sedimentation also results from a large amount of acreage being used for grazed woodland.

Eroded and Trampled Streambanks (sediment and direct habitat impairment)

Eroding and trampled streambanks deliver 3,286 tons of sediment per year, or 33% of the subwatershed's sedimentation. Eroding outside banks tend to eliminate cover for trout. Cattle trampling tends to widen streams and make them shallow, thus warming the stream and reducing habitat.

Eroding Gullies (sediment and nutrients)

An estimated 2,031 tons of soil per year are delivered to Billings Creek as a result of gully erosion. This type of erosion accounts for roughly 21% of the subwatershed's sedimentation.

Animal Lots (oxygen demand and nutrients)

56 animal lots contribute 3,123 pounds of phosphorus to streams in the Billings Creek subwatershed. Manure from these lots are a probable source of oxygen demanding substances having an impact on water quality.

Winter Spread Manure (oxygen demand and nutrients)

Manure spread in winter on "critical" acres are a source of oxygen demanding substances having an impact on water quality in the Billings Creek subwatershed. Currently, winter spread manure is being applied on approximately 491 acres in this subwatershed.

Brush Creek Subwatershed (BR)

Subwatershed Description

Brush Creek is the largest subwatershed in the priority watershed, draining 28.9 square miles. Tributaries include Upper Brush Creek, Lower Brush Creek, and other unnamed streams(Hoff Valley, Heiser Valley, etc). The majority of the subwatershed lies in Monroe County. Much of the northern boundary is formed by St. Mary's Ridge. Brush Creek flows in a southeasterly direction until it empties into the Kickapoo River just south of the village of Ontario.

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

agricultural	56%
woodland	42%
other*	2%

* grassland, quarries, and scattered residences

Water Resources Conditions

Brush Creek flows southeasterly 7.7 miles to the Kickapoo River in Vernon County near Ontario. The stream is managed as a marginal Class III brown trout fishery, but the stream has few trout and a very diverse forage fish community. Brush Creek is not stocked with

trout by the Department but is stocked annually by the Ontario Sportsmen Club. The 1990 fish survey found 14 brown trout (8.5 - 11.5 inches) and 18 minnow and other forage species. Sand and gravel are the dominant stream substrate types. The stream HBI (Hilsenhoff Biotic Index) was 5.39, indicating some organic pollution, and the Habitat Rating was "fair".