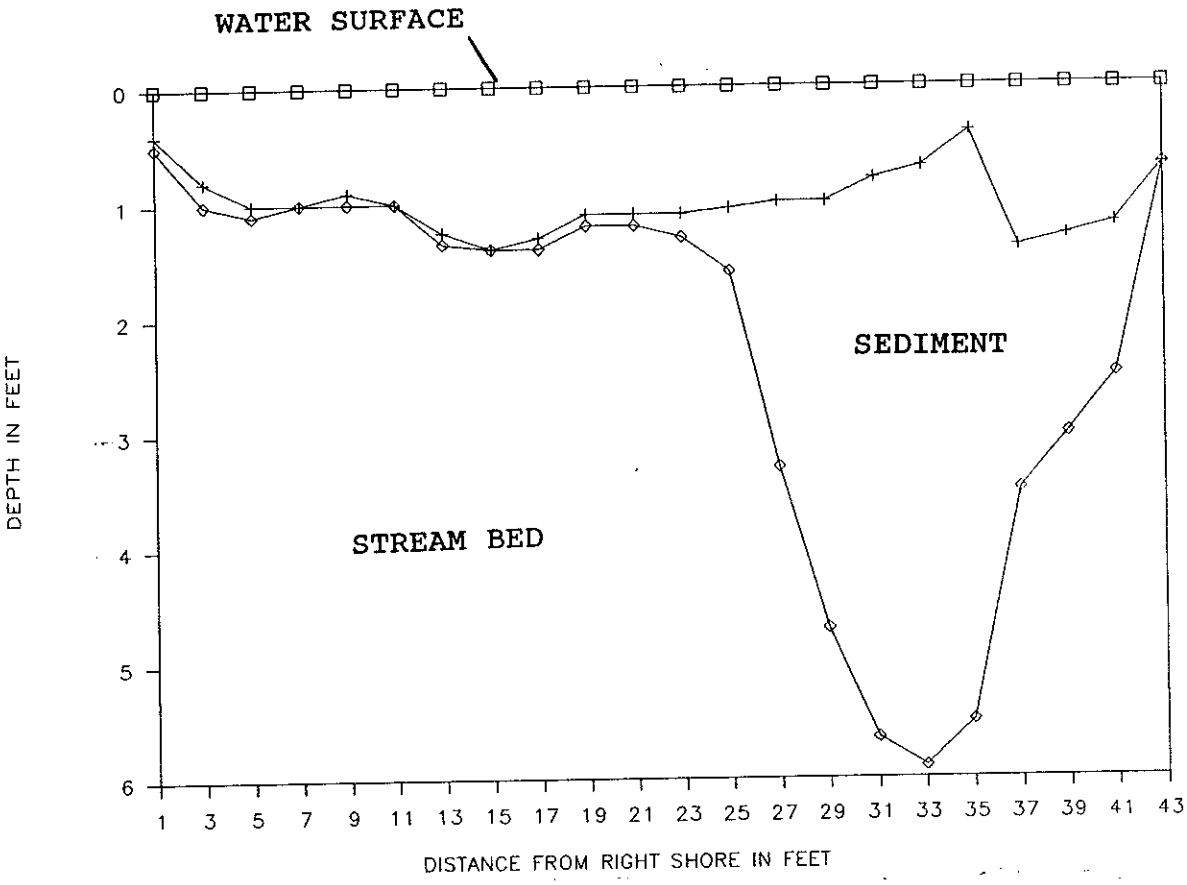
FIG. 11. Cross Section of Black Earth Creek at Demonstration Site



Pollutants from Nonpoint Sources

Eroding Croplands (sediment and nutrients). Oover 90% of the sediment reaching Black Earth Creek - Garfoot to Vermont subwatershed, is from eroding croplands. Based on soil erosion estimates, Table 10 shows about 86% is from croplands with very high erosion rates (greater than about 10 tons/acre/year) and about 1% is from croplands with high erosion rates (greater than about 7-to-10 tons/acre/year). Table 10 also shows that these very high/high erosion cropland fields comprise about 32% of the croplands. Locations of these critical croplands are shown on Figure 10. Overall, they comprise about 20% of the area of the subwatershed.

TABLE 10. Cropland Soil Erosion in Black Earth Creek - Garfoot to Vermont Subwatershed.

Erosion Rate	Tons/year	%
> 10 tons/acre/yr.	37,708	86
7-to-10 tons/acre/yr.	463	1
4-to-7 tons/acre/yr.	1,060	2
< 4 tons/acre/yr.	4,432	10
totals	43,663	100
Erosion Rate	**Acres**	**%**
> 10 tons/acre/yr.	1,085	31
7-to-10 tons/acre/yr.	42	1
4-to-7 tons/acre/yr.	187	5
< 4 tons/acre/yr.	2,170	62
totals	3,484	100

Eroding and Trampled Stream Banks (sediment and direct habitat impairment).

Recent stream bank stabilization work by the Dane County Land Conservation Department and Trout Unlimited have controlled eroding stream banks on two properties in this segment. Through the use of Trout Stamp Funds, the Department of Natural Resources has controlled eroding banks on its property near the Village of Black Earth. However, stream bank erosion due to cattle access is degrading a portion of the stream in the class I trout segment. Downstream of South Valley Road, there are a number of sites where banks are eroding due to the deposition of sediment on the stream bed. In certain locations the sediment has formed small islands; causing the stream to fork and erode the banks.

Animal Lots (oxygen demand and nutrients). Manure from animal lots and winter spread fields are the most probable source of oxygen demanding substances. Table 11 shows the number of animal lots and pollutant loads by range of phosphorus load. Locations of these animal lots are shown on Figure 10.

TABLE 11. Animal Lot Pollutant Loads for Black Earth Creek - Garfoot to Vermont Subwatershed.

Phosphorus Load Range	Operations	Lbs.*	%
> 20 lbs. phosphorus **	0	0	0
15-to-20 lbs. phosphorus	0	0	0
10-to-15 lbs. phosphorus	1	14	40
5-to-10 lbs. phosphorus	2	13	38
< 5 lbs. phosphorus	7	8	23
Total	10	35	100

* Pounds for a 10-year, 24-hour storm

** Phosphorus is used as an indicator of the amount of manure reaching streams. The amount of BOD or COD is proportional to the amount of phosphorus.

Winter Spread Manure (oxygen demand and nutrients). Winter spread manure was not analyzed. However, based on the erodibility of the soils and the steepness of slopes, it is likely a number of the 10 livestock operations in this subwatershed are sources of manure to the stream from winter spread sites.

Nonpoint Source Control Needs to meet the Water Resources Objectives

To achieve the water resources objectives identified for Black Earth Creek - Garfoot to Vermont Subwatershed, the nonpoint sources identified below must be controlled.

1. Cropland Management Needs:

   Erosion needs to be controlled on an estimated 1127 acres of cropland.

The cropland analysis estimated over 90% of the erosional tons occurs on fields with very high or high erosion rates (greater than 10-to-15 tons/acre/year and 7-to-10 tons/acre/year). These very high/high erosion rates occur on about 1127 acres.

2. Stream Bank Management Needs:

   Cattle access needs to be eliminated - particularly on the site upstream of South Valley Road.

Cattle access at this site degrades trout habitat.

   Stream bank erosion downstream of South Valley Road needs to be controlled in conjunction with stream habitat improvement.

The majority of the remaining stream bank erosion downstream of South Valley Road is associated with the stream bed sedimentation causing the stream to widen. Stream bank stabilization without corresponding stream habitat improvements will control a source of sediment but will not result in improved habitat.

3. Animal Lot Management Needs:

   The amount of manure from animal lot runoff needs to be reduced on 3 of the 10 operations.

Based on the simulation of runoff controls, it is estimated that a 60% reduction can be achieved by reducing the amount of phosphorus on the 3 of 10 operations with estimated amounts of 5 or more pounds.

4. Manure Spreading Management Needs:

Manure spreading management plans need to be prepared for the 10 livestock operations to minimize the amount of manure entering the stream.

Although the amount of manure could not be quantified and the significant sites could not be identified, the very high oxygen demand levels during trout hatch periods warrants control of this type of nonpoint source.

Fishery Management and Other Resource Needs

1. Habitat Improvement Needs:

The segment of Black Earth Creek downstream of South Valley Road to the confluence with Vermont Creek needs improvement.

This segment of Black Earth Creek has been identified as one of two segments where habitat improvements are most needed. Sediment deposition on the stream beds is extensive and the stream is actively widening.

2. Land Acquisition Needs:

Specific lands adjoining Black Earth Creek - Garfoot to Vermont, within this subwatershed need to be acquired to protect the trout waters.

Land acquisition along Black Earth Creek - Garfoot to Vermont, has been an ongoing activity for many years. A site north of STH 14 was recently purchased by the Department of Natural Resources. Purchase of at least one additional site is being negotiated. Both the Department of Natural Resources and Trout Unlimited hold easements for land adjoining Black Earth Creek in this subwatershed. Additional lands need to be acquired by fee simple purchase, rent or easement to further protect the trout waters. Seventeen parcels in this subwatershed and the upstream subwatershed have been identified. Lands in this subwatershed rank second in priority for the Black Earth Creek watershed.

VERMONT CREEK SUBWATERSHED - VC

Vermont Creek

"This once clear tributary to the Wisconsin River now carries tons of soil from croplands on ridges and slopes. Silver maples, willows and box elders grow on the soil deposited by erosion. The low peaty meadows on both sides of the creek serve as a sponge by trapping silt and providing a steady supply of cleaner water to the creek, enabling some trout to survive ..."

from the sign placed by
Dane County along
Vermont Creek

Subwatershed Description

The Vermont Creek subwatershed contains the 14.6 square mile drainage area of Vermont Creek. Vermont Creek (master waterbody # 1249200) is six miles long. The stream flows from south to north and enters Black Earth Creek just downstream of the Village of Black Earth Creek. Vermont Creek has four sub-segments with fairly distinctive habitat characteristics.(12) As shown in Figure 12, stream fishery potential varies between the lower four miles and the upper two miles of the creek.(17)

Most of the subwatershed is rural. The Village of Black Earth is located in the downstream end of the subwatershed. Overall the land use is:

agriculture	53%
woodlands	38%
wetlands	3%
incorporated (urban)	1%
other	5%

Other includes roads and scattered residences. Figure 13 shows the urban sewer service area for the Village of Black Earth.