

**POSITIVE LAND MANAGEMENT PRACTICES
IN THE THAMES RIVER BASIN**

A REPORT PREPARED FOR
THE THAMES RIVER IMPLEMENTATION COMMITTEE

SEPTEMBER, 1980

EXPERIENCE '80 PROJECT

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ACKNOWLEDGEMENTS

The Thames River Implementation Committee acknowledges the contributions and cooperation of the numerous individuals, organizations, institutions and agencies whose advice, time, opinions and technical assistance were crucial to the development of this document:

Township clerks, drainage commissioners and secretaries for providing site referrals, advice and assistance in obtaining maps.

The personnel of the Ontario Ministries of Agriculture and Food, Natural Resources and Environment for providing technical assistance and advice.

The Upper Thames River Conservation Authority for providing technical assistance and office facilities.

The Lower Thames Valley Conservation Authority for providing office facilities and the Experience'80 funding which made this report possible.

The members of the Soil and Crop Improvement Associations of the Thames River Basin for providing technical advice and site referrals.

The representatives of the Ontario Federation of Agriculture for providing technical advice and site referrals.

The personnel of the Ridgetown College of Agricultural Technology for providing technical advice.

Finally, the field survey crew extends special recognition and gratitude to all the members of the Thames River Basin farm community for their cooperation, patience and valuable time.

ABSTRACT

During the summer of 1980, four individuals were employed through the Provincial Experience '80 program to undertake a project on behalf of the Thames River Implementation Committee. The objective of the project was to identify, document and catalogue examples of positive land management efforts in the watershed.

The study team contacted representatives of local municipalities, government agencies, farm organizations and other knowledgeable persons. These contacts were able to direct summer staff to specific sites which exhibited efforts at controlling soil erosion. In addition, a number of sites were identified on an ad hoc basis while generally surveying each of the 40 townships involved.

A total of 36 particularly good examples of positive land management practices were documented. The practices identified consisted of the following:

- controlled cattle accesses
- grassed waterways
- proper tile outlet construction
- conservation tillage
- vegetative buffers
- windbreaks

For each site a number of factors were documented, eg. soil type, age of feature, initial costs, effectiveness, etc., and authorization was given to TRIC to utilize the site for promotional purposes by means of the farm operators signature. This document was prepared as an assist to local organizations in directing interested landowners to examples of conservation measures in the field. It is intended that the catalogue will periodically be updated and revised to include new sites.

1. INTRODUCTION

This document relates back to a report published in 1975 by the Ministry of Natural Resources in conjunction with the Ministry of the Environment, entitled Thames River Basin Water Management Study. This study identified non-point sources of pollution as being major contributors to the degeneration of water quality in the Thames River Watershed. Excessive erosion of topsoil due to poor land management is a significant problem. More specifically, the Thames River Basin Water Management Study states "surface run-off from fertilized fields and the free access of cattle to streams are major rural sources of water quality impairment". (p. 3)

Tons of valuable agricultural topsoil are lost to erosion every year. As a result, crop production is reduced and must be countered by increasing fertilizer application rates. Erosion also contributes to the destruction of drainage networks, and thus, increases maintenance costs. Sediment loading into the Thames River and its tributaries can be alleviated by the widespread adoption of conservation-oriented land management practices. For example, no till-planting can reduce soil loss by as much as 80% (see Ontario Ministry of Agriculture and Food publication, Control of Soil Erosion). In addition to improving water quality, proper soil management benefits the farm operator as well since crop yields can be maintained without substantial additional fertilizer application.

In an attempt to conserve the agricultural soil of the Thames River Watershed, and to reduce water quality impairment associated with current agricultural practices, the Thames River Implementation Committee (T.R.I.C.) has initiated a program promoting soil conservation practices. The strategy that was employed involved utilizing known effective soil conservation practices such as grassed waterways, vegetative buffers, windbreaks, proper drain outlet construction, controlled cattle accesses and conservation tillage practices as examples to other land operators. This is being accomplished in two ways:

- (1) A variety of 'problem areas' were identified through contacts with local knowledgeable people, and from these referrals a list of potential demonstration sites was prepared. It is the intention of the Committee to approach the respective landowners and work cooperatively with them, supplying technical and financial assistance when necessary, to undertake remedial measures appropriate to the site. These "active" demonstration sites will be well identified by means of a sign and tours encouraged.
- (2) A variety of existing 'positive' land management sites were identified in much the same manner as described above. These examples of conservation practices are considered to

be 'positive' demonstrations in that they have been put in place by the respective landowners on their own initiative without the active involvement of T.R.I.C. or similar programs. These sites will be promoted through inclusion in this report and identified by means of a small sign.

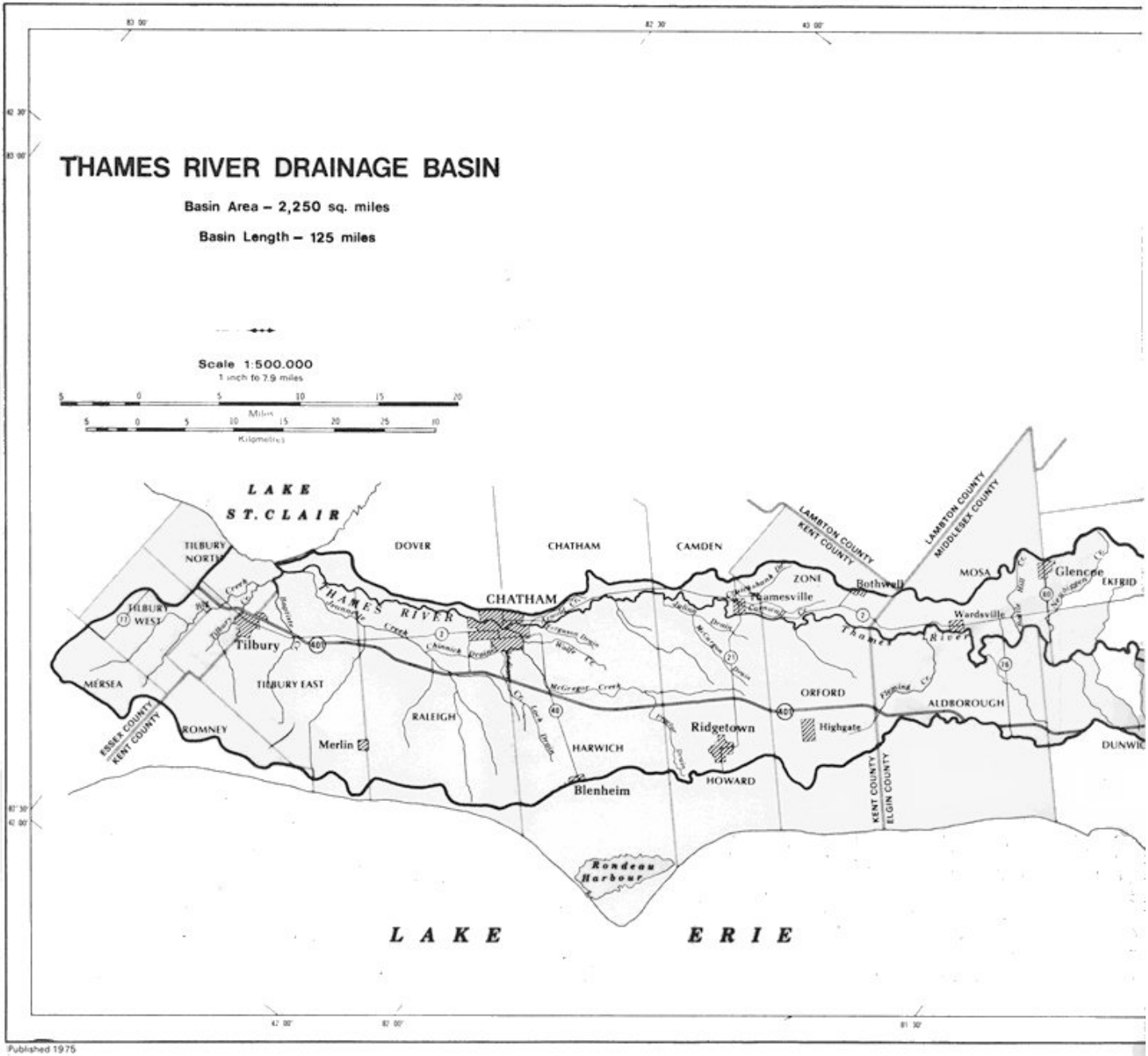
It is anticipated that both these demonstration approaches will provide encouragement and impetus to farmers to implement conservation practices where the need exists. It is the latter approach which is the subject of this report.

2. STUDY OBJECTIVE

Through the auspices of the Ontario Experience '80 program, four individuals were hired on behalf of the Thames River Implementation Committee to carry out field surveys. The mandate of these employees involved locating, documenting and cataloguing positive land management efforts throughout the Thames River watershed. For the purposes of this exercise, positive land management efforts were considered to be those which reduce, retard or abate the detachment of soil fragments by water or wind.

The objective of the exercise was to prepare a catalogue or report on the extent and nature of conservation practices currently in place on rural land holdings in the Thames River basin. It is intended that this report be distributed to the appropriate provincial agencies and local organizations so that the information contained herein will assist those bodies in recognizing conservatory efforts in directing interested farmers to local examples of the practice being considered.

The examples contained herein will continually be updated and new examples incorporated. Recipients of copies of this report should check periodically with the T.R.I.C. through the Upper Thames River Conservation Authority to ensure that each copy is complete and up-to-date.





Transverse Mercator Projection

3. SURVEY METHODOLOGY

This study was conducted on the township level. All townships or parts thereof which fall within the drainage basin of the Thames River constitute the study area (see map, p. 6). A total of forty townships make up this area (see Appendix I).

Sites which have been documented in this report were located primarily through one or more of the following methods:

1. Referral by members of agriculture orientated associations (eg. Soil and Crop Improvement Associations).
2. Referral by Provincial Government officials (eg. O.M.A.F., M.N.R.).
3. Referral by municipal officials (eg. township clerks, drainage commissioners).
4. Random field investigation by the field crew.

Detailed information on each site was generated through personal observation and investigation in addition to farm operator field data sheets (see Appendix III, p.). Site specific data was supplemented with an appropriate number of photographs (slides). These data sheets and photographs have been retained for future reference in the Administration Building, Upper Thames River Conservation Authority.

READER'S CAUTION

1. Due to time constraints, the expertise of the field crew, the time of year the survey was carried out and the extent of the study area, is inevitable that a number of positive land management sites in the Thames River basin have been overlooked.
2. Although some of the sites in this document may not be of the highest quality, they nevertheless represent a concerted effort on the part of the landowners to control erosion.
3. Any individual who wishes to gain access to property documented in this report must obtain the express consent of the landowner to do so.
4. The six practices identified in the 'Introduction' do not represent all the alternatives available to landowners seeking to control soil erosion. A more complete list has been included in Appendix II of this report.

4. SURVEY ANALYSIS

The survey team members involved in this project were primarily interested in documenting six major soil conservation practices: controlled cattle accesses, grassed waterways, proper drain outlet construction, conservation tillage practices, vegetative buffer zones and tree windbreaks. As the summer progressed it became apparent to these individuals that landowners displayed distinct attitudes and opinions towards conservation practices which were reflected in the frequency and quality of the same. These attitudes, along with other perceptions by the field crew, are presented in this section.

4.1. Controlled Cattle Accesses:

Cattle access to streams and drainage ditches causes significant erosion problems and subsequent water quality impairment. Cattle destroy the vegetative cover of banks which serves to protect against natural erosion. In addition, cattle trampling destroys the soil structure and stability of watercourse banks which increases the susceptibility to erosion.

Denying cattle access to streams and drainage ditches is not a widespread practice in the Thames River Watershed. This appears to be directly related to the costs associated with fence construction.

4.2. Grassed Waterways:

Grassed waterways are vegetated channels that serve to transport heavy flows of surface water across a field and into a drainage outlet. These structures are often found in natural draws on fields where the landowner has experienced serious soil losses. The vegetation in the waterway decreases the velocity of the flow and subsequently, soil erosion is reduced.

The use of grassed waterways as a conservation practice is quite prevalent in the Upper Thames River region. Landowners in this area are very aware of the effectiveness and value of grassed waterways in controlling erosion.

In general, grassed waterways in the upper reaches of the Thames River watershed are usually quite old and well established. Grassed waterways two generations old are not unusual in this region. As a result, these structures are often taken for granted and neglected, or removed when farm ownership changes hands.

None of the landowners with waterways documented in this report called engineering services to provide technical guidance in the proper construction of their respective waterway. Many landowners have simply seeded natural draws where rill erosion was a chronic problem. A number of farmers interviewed indicated they were experiencing minor problems with their waterway associated with improper seed mixtures, incorrect dimensions, etc.

The effort devoted to the maintenance of waterways is very low if not non-existent. A small number of farm operators have grassed waterways large enough to make it worthwhile to harvest hay from them.

Grassed waterways in the Lower Thames River region are few. This can perhaps be explained by the flat, level topography that is characteristic of this area.

4.3. Proper Drain Outlet Construction

Poorly constructed drain outlets can lead to serious erosion problems. The costs associated with repairing damaged drain outlets usually accrues directly or indirectly to the landowner.

The use of rip-rap (i.e. field stone, concrete debris) was found to be a popular mechanism used to control erosion around drain outlets in both the upper and lower regions of the Thames River watershed. Several townships within the watershed should also be commended for their conscientious attitude towards the proper construction of drain outlets.

4.4. Conservation Tillage Practices

The use of conservation tillage and cropping practices is essential to the preservation of soil structure and protection from sheet erosion. Such practices include the use of conservation tillage implements the maintenance of adequate crop residues on fields, proper crop rotation as well as contour and strip cropping.

Due to the time of year this survey was carried out and because of obvious time restrictions, the field survey crew was not able to document these practices to any great extent.

4.5. Vegetative Buffer Zones

Vegetative buffer zones along drainage ditches and natural watercourses can be very effective in

filtering out soil particles suspended in surface run-off thus reducing sedimentation of nearby watercourses. As a result, maintenance costs involved in cleaning out ditches and streams will be reduced.

4.6. Tree Windbreaks

The adverse effects of wind erosion can have serious consequences for the farm operator. Wind erosion lowers soil productivity, causes crop damage, and can cause gradual changes in soil texture.

Tree windbreaks can be very effective in controlling this type of erosion. Windbreaks should be considered for fields consisting of sandy, muck, peat and to a lesser extent, clayey or silty soils.

Windbreaks are very prevalent in all areas of the Thames River watershed. However, it was noted that the majority of windbreaks in the Upper Thames River region serve as shelterbelts and protect buildings, laneways and farmyards from snow accumulation during the winter months. Windbreaks in the Lower Thames River region, are generally oriented towards the prevention of wind erosion. This can be explained by the higher susceptibility of the soils in the lower regions of the Thames River basin to wind erosion. Moreover, the topography of this area is very flat.

5. POSITIVE LAND MANAGEMENT SITES

**BLANDFORD-BLENHEIM TOWNSHIP
OXFORD COUNTY**

LIMITED OR CONTROLLED LIVESTOCK ACCESS

TOWNSHIP: Blandford-Blenheim
CONCESSION: 3
LOT: 8
LANDOWNER: Paul Bayer (Bayer Farms Ltd.)
ADDRESS: R. R. 5, Woodstock-Innerkip
OPERATOR: As above
DATE OF INITIAL VISIT: June 26, 1980

1) GENERAL INFORMATION

TYPE OF LIVESTOCK: Beef cattle HERD SIZE: 4 head of cattle, 1 horse
TYPE OF CONTROL: Fencing (snow fence and wire fence)
APPROXIMATE LENGTH OF BANK: 75 yards.
ALTERNATE WATERING SOURCES: Pump and well

2) EFFECTIVENESS AND BENEFITS

The portion of the creek that runs through Mr. Bayer's pasture has been fenced off except for a small area which allows his herd limited access. The banks of the creek are fairly steep but have been vegetated. However, limited trampling of the bank is evident where the cattle have been allowed to enter the creek.

3) COSTS

The costs associated with this practice involve the purchase of fencing. The fencing that was used on this site was spare fencing that had been stored in Mr. Bayer's barn for a considerable length of time.

ADDITIONAL COMMENTS:

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 1: A Controlled Cattle Access On Lot 8, Concession 3, Blandford-Blenheim Township, Oxford County

**CARADOC TOWNSHIP
MIDDLESEX COUNTY**

WINDBREAK

TOWNSHIP: CARADOC
CONCESSION: MUNCEY SURVEY
LOT: 8
LANDOWNER: ALBERT FERKET
ADDRESS: R. R. # 5, Mt. BRYDGES
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 23, 1980

1) GENERAL INFORMATION

TREE SPECIES: SPRUCE AGE OF TREES: 40-50 YEARS
DISTANCE BETWEEN TREES: 8-10 FEET PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 2-3 ACRES% OF FIELD PROTECTED: 50%
LAND USE OF PROTECTED FIELD: CORN & TOMATOES
SOIL TYPE: CLAY

2) EFFECTIVENESS AND BENEFITS

This windbreak is very effective in protecting the adjacent field from wind erosion. In addition, the landowner has indicated that the trees have reduced water erosion on the more rolling portions of the lot.

3) COSTS

The costs associated with this windbreak are very difficult to assess, since the trees were planted several years ago. Maintenance costs are minimal.

ADDITIONAL COMMENTS:

This site is very accessible and visible from Conc. Road 11.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 2: A Spruce Windbreak On Lot 8, Muncey Survey, Caradoc Township, Middlesex County

DELAWARE TOWNSHIP

MIDDLESEX COUNTY

LIMITED OR CONTROLLED LIVESTOCK ACCESS

TOWNSHIP: DELAWARE
CONCESSION: D
LOT: 2
LANDOWNER: JOHN ROKS
ADDRESS: R. R. # 1, DELAWARE
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 22, 1980

1) GENERAL INFORMATION

TYPE OF LIVESTOCK: BEEF CATTLE HERD SIZE: APPROX. 100 HEAD
TYPE OF CONTROL: FENCING/FEEDLOT
APPROXIMATE LENGTH OF BANK: 100 YARDS
ALTERNATE WATERING SOURCES: WATER PUMPED UP FROM CREEK

2) EFFECTIVENESS AND BENEFITS

The fencing on this property has been very effective in protecting the banks of Dingman Creek. The banks are vegetated and stable.

3) COSTS

Mr. Roks could not give a figure for costs. The cattle have been fenced off since they are on grain supplement.

ADDITIONAL COMMENTS:

MR. ROKS originally fenced off his cattle from Dingman Creek, since he is involved in a feedlot operation. He doesn't allow his cattle to feed on hay or grass. However, this site is a good example of the result of controlling cattle accesses to a waterway.

This site is not visible from a road, however, a laneway leads to the farm.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 3: Fencing Protecting The Banks Of Dingman Creek On Lot 2, Concession D, Delaware Township, Middlesex County

DOVER TOWNSHIP

KENT COUNTY

WINDBREAK

TOWNSHIP: DOVER
CONCESSION: 2
LOT: 20
LANDOWNER: LLOYD BRAITHWAITE
ADDRESS: R. R. # 7, CHATHAM
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 19, 1980

1) GENERAL INFORMATION

TREE SPECIES: PINE	AGE OF TREES: 80 YEARS
DISTANCE BETWEEN TREES: 15 FEET	PREVAILING WIND: NORTH-WEST
AREA OF PROTECTED FIELD: 100 ACRES	% OF FIELD PROTECTED: 11%
LAND USE OF PROTECTED FIELD: CORN	
SOIL TYPE: CLAY	

2) EFFECTIVENESS AND BENEFITS

The effectiveness of this windbreak is limited due to the poor health of the trees.

3) COSTS

Costs associated with this windbreak are difficult to assess, since these trees were planted several years ago. Maintenance costs are minimal. MR. Braithwaite trims the trees regularly.

ADDITIONAL COMMENTS:

This windbreak is very accessible and visible from the nearby road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

DOWNIE TOWNSHIP

PERTH COUNTY

CONSERVATION TILLAGE

COUNTY: Perth
TOWNSHIP: Downie
CONCESSION: 11
LOT: 20
LANDOWNER: Jack Brown
ADDRESS: RR #2, St. Pauls, NOK 1V0
OPERATOR: Jack Brown
DATE OF INITIAL VISIT: September 29, 1980

1. GENERAL INFORMATION

The chisel plow has been used exclusively for Primary Tillage on this farm for a number of years. Soils ranging from a loam to heavy clay have been successfully worked. Weed control is no problem and good soil moisture conditions are easily arrived at. Working Depth is about 8 inches at speeds of 4-6 MPH.

2. EFFECTIVENESS AND BENEFITS

Sheet and rill erosion on this farm has been significantly reduced. One to two passes with the chisel plow thoroughly mixes the residue and leaves the surface ridged to cut down surface runoff and wind erosion. The chisel plow with mulching unit has been successfully used on small grains, bean and corn ground.

3. COSTS

Savings are associated with reduced soil erosion while maintaining yields equally good as moldboard plowed ground.

ADDITIONAL COMMENTS:

The operator would not go back to the moldboard. He is very satisfied with his yields and field conditions that have been attained through chisel plowing.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 4: Wheat Stubble Chisel Plowed Once On Lot 20, Concession 11, Downie Township, Perth County

CONSERVATION TILLAGE

COUNTY: Perth
TOWNSHIP: Downie
CONCESSION: 2
LOT: 6
LANDOWNER: Howard Ballantyne
ADDRESS: R.R. #3 Stratford, N5A 6S4
OPERATOR: Howard Ballantyne
DATE OF INITIAL VISIT: October 2, 1980

1) GENERAL INFORMATION

In corn stover and stubble one pass is made with the chisel plow after harvest. If manure is applied in the fall, one more pass is made with the chisel plow to incorporate it. Any residue is left well mixed and anchored to hedge surface water erosion in the winter and spring. Secondary tillage consists of one pass with the chisel plow in the spring followed by one pass with cultivator. The residue presents no real problem when planting.

2) EFFECTIVENESS AND BENEFITS

The increased surface residues and ridging action of the chisel plow aid to reduce erosion on the slopes. Because water is given a chance to percolate into the soil.

3) COSTS

Savings are associated with reduced soil erosion while maintaining very acceptable yields.

ADDITIONAL COMMENTS:

The acreage here is quite hilly, there are both heavy and very light soil textures. The results from chisel plowing have been found favourable in all cases.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

DUNWICH TOWNSHIP

ELGIN COUNTY

BUFFER ZONE

TOWNSHIP: DUNWICH
CONCESSION: 5
LOT: 9
LANDOWNER: JAMES FORD
ADDRESS: R. R. # L, DUTTON
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 29, 1980

1) GENERAL INFORMATION

TYPE OF VEGETATION: ALFALFA	WIDTH:	40 FEET
LENGTH: 800 FEET	SECONDARY USES:	HAY CROP
ROADSIDE _____		
RIVERSIDE <u> X </u> (DITCH)		

LAND USE: (PRESENT) HAY AND CORN
(PAST) CORN

APPROXIMATE SLOPE OF FIELD: 1%
APPROXIMATE LENGTH OF SLOPE: 40 FEET

2) EFFECTIVENESS AND BENEFITS

This buffer zone has been very effective in protecting the banks of the ditch from erosion.

3) COSTS

In this case, costs are limited to the purchase and planting of alfalfa seed.

ADDITIONAL COMMENTS:

This site is very visible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 5: A Vegetative Buffer Strip Along A Drainage Ditch On Lot 9, Concession 5, Dunwich Township, Elgin County

EAST ZORRA-TAVISTOCK TOWNSHIP

OXFORD COUNTY

BUFFER ZONE

TOWNSHIP: EAST ZORRA-TAVISTOCK
CONCESSION: 16
LOT: 16
LANDOWNER: WAYNE SMITH
ADDRESS: R. R. # 1, INNERKIP
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 20, 1980

1) GENERAL INFORMATION

TYPE OF VEGETATION: GRASS, WILLOW TREES WIDTH: 10 YARDS
LENGTH: 250 YARDS SECONDARY USES: WILDLIFE HABITAT
ROADSIDE _____
RIVERSIDE X
LAND USE: (PRESENT) CORN
 (PAST) CORN
APPROXIMATE SLOPE OF FIELD: LEVEL
APPROXIMATE LENGTH OF SLOPE:

2) EFFECTIVENESS AND BENEFITS

The banks along this creek have been allowed to stabilize. There is no evidence of erosion along the banks.

3) COSTS

The costs associated with this buffer zone are minimal. Leaving a buffer of this magnitude presents no inconvenience to the operator.

ADDITIONAL COMMENTS:

This site is very visible from the adjacent road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 6. A Riverside Vegetative Buffer Strip On Lot 16, Concession 16, East Zorra-Tavistock Township, Oxford County

ADDITIONAL COMMENTS:

This waterway is not visible from the adjacent road once the corn grows to three or four feet in height.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committees may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 7: A Grassed Waterway On Lot 17, Concession 14, East Zorra- Tavistock Township, Oxford County

LIMITED OR CONTROLLED LIVESTOCK ACCESS

TOWNSHIP: EAST ZORRA-TAVISTOCK
CONCESSION: 14
LOT: 20
LANDOWNER: GLEN R. GARNER
ADDRESS: R. R. # 7, WOODSTOCK
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 20, 1980

1) GENERAL INFORMATION

TYPE OF LIVESTOCK: DAIRY CATTLE HERD SIZE: APPROX. 30 HEAD
TYPE OF CONTROL: FENCING
APPROXIMATE LENGTH OF BANK: 150 YARDS
ALTERNATE WATERING SOURCES: WATER IN CREEK

2) EFFECTIVENESS AND BENEFITS

Only one bank of the creek is fenced off. The fencing on this bank has been reasonably effective in controlling bank destruction.

3) COSTS

The costs associated with this site are difficult to assess, since the fencing was in place when Mr. Garner purchased the farm.

ADDITIONAL COMMENTS:

This site is very visible and accessible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 8: A Limited Cattle Access On Lot 20, Concession 14, East Zorra-Tavistock, Oxford County

FULLARTON TOWNSHIP

PERTH COUNTY

GRASSED WATERWAY

TOWNSHIP: FULLARTON
CONCESSION: 10
LOT: 9
LANDOWNER: DENNIS W. DOW
ADDRESS: R. R. # 2, STAFFA
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 24, 1980

1) GENERAL INFORMATION

LENGTH: 110 YARDS	WIDTH: 10 FEET
AGE: 1 YEAR	TYPE OF VEGETATION: NATURAL GRASS
CONDITION OF WATERWAY:	SOIL TYPE: HURON CLAY
LAND USE OF SURROUNDING FIELD:	(PRESENT) BEANS (PAST) BEANS
APPROXIMATE SLOPE OF FIELD:	2-3%
APPROXIMATE LENGTH OF SLOPE:	200 YARDS

2) EFFECTIVENESS AND BENEFITS

This waterway has alleviated a serious erosion problem on this site.

3) COSTS

According to Mr. Dow, the costs associated with the implementation and maintenance of this waterway are virtually nil. Mr. Dow indicated that the only costs would be in terms of land being withdrawn from production. However, this land is more than likely too wet to be very productive.

ADDITIONAL COMMENTS:

This waterway is only partially visible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 9: A Grassed Waterway On Lot 9, Concession 10, Fullarton Township, Perth County

HARWICH TOWNSHIP

KENT COUNTY

WINDBREAK

TOWNSHIP: HARWICH
CONCESSION: 5
LOT: 6 and 7
LANDOWNER: IAN MAYNARD
ADDRESS: R. R. # 3, CHATHAM
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 16, 1980

1) GENERAL INFORMATION

TREE SPECIES: SPRUCE	AGE OF TREES:	10 YEARS
DISTANCE BETWEEN TREES: 8 FEET	PREVAILING WIND:	WESTERLY
AREA OF PROTECTED FIELD: 130 ACRES	% OF FIELD PROTECTED:	100%
LAND USE OF PROTECTED FIELD: CORN		
SOIL TYPE: SANDY LOAM		

2) EFFECTIVENESS AND BENEFITS

Although the majority of the trees on this site are still too immature to be one hundred percent effective, this windbreak does provide protection against wind erosion. Moreover, the trees act as a shelterbelt during the winter months.

3) COSTS

The trees on this site were obtained from the ministry of natural resources at the price of one cent a tree. Other than initial costs, there are other costs associated with establishing a windbreak, such as fertilizer costs. Mr. Maynard also mows the grass in between the trees.

ADDITIONAL COMMENTS:

Mr. Maynard has indicated that his younger trees have been damaged by salt sprayed on the adjacent highway. However, once the trees become older, maintenance costs are reduced.

This site is very visible from highway 40.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 10: A Young Windbreak On Lot 6 And 7, Concession 5, Harwich Township, Kent County

WINDBREAK

TOWNSHIP: HARWICH
CONCESSION: 9 L.E.S.
LOT: 19
LANDOWNER: ANDREW KLUKA
ADDRESS: R. R. # 7, BLENHEIM
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 7, 1980

1) GENERAL INFORMATION

TREE SPECIES: CEDAR	AGE OF TREES:	4 and 20 YEARS
DISTANCE BETWEEN TREES: 10 FEET	PREVAILING WIND:	WESTERLY
AREA OF PROTECTED FIELD: N/A	% OF FIELD PROTECTED:	100%
LAND USE OF PROTECTED FIELD:	BEANS	
SOIL TYPE: SANDY LOAM		

2) EFFECTIVENESS AND BENEFITS

The more established cedars on this site provide a considerable amount of protection against wind erosion. Mr. Kluka has also planted younger cedars in between some overly mature pine trees.

3) COSTS

Conservation authorities and the ministry of natural resources provide trees at the cost of one cent a piece. Once a windbreak becomes established, maintenance costs are very low.

ADDITIONAL COMMENTS:

This site can be viewed from centre line road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 11: A Windbreak On Lot 19, Concession 9, Harwich Township, Kent County. Note The Young Cedar Trees Planted Between The Older Pines.

HOWARD TOWNSHIP

KENT COUNTY

WINDBREAK

TOWNSHIP: HOWARD
'CONCESSION: 3
LOT: 12
LANDOWNER: JOHN GILLESPIE
ADDRESS: R. R. # 4, THAMESVILLE
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 3, 1980

1) GENERAL INFORMATION

TREE SPECIES: SPRUCE	AGE OF TREES: 30-40 YEARS
DISTANCE BETWEEN TREES: 6 FEET	PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 75 ACRES	% OF FIELD PROTECTED: 90%
LAND USE OF PROTECTED FIELD: BEANS	
SOIL TYPE: SANDY LOAM	

2) EFFECTIVENESS AND BENEFITS

This windbreak is very healthy and provides the adjacent field protection against wind erosion. In addition, this windbreak acts as a shelterbelt against snow during the winter months.

3) COSTS

Since this windbreak has been established for several years, it is difficult to estimate the costs associated with it's establishment. Maintenance costs are nil.

ADDITIONAL COMMENTS:

This site is very visible from Highway No. 21 and the third concession.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

LOGAN TOWNSHIP

PERTH COUNTY



PLATE NO. 12: A Spruce Windbreak On Lot 12, Concession 3, Howard Township, Kent County

WINDBREAK

TOWNSHIP: LOGAN
CONCESSION: 12
LOT: 32 and 33
LANDOWNER: JOE VANDENBERK
ADDRESS: R. R. # 2, MONKTON
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 4, 1980

1. GENERAL INFORMATION

TREE SPECIES: WILLOW AND POPLAR AGE OF TREES: WILLOW: 30 YEARS
DISTANCE BETWEEN TREES: 6 FEET PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 20 ACRES % OF FIELD PROTECTED: 80%
LAND USE OF PROTECTED FIELD: GRAIN AND POTATOES
SOIL TYPE: ORGANIC MUCK

2. EFFECTIVENESS AND BENEFITS

Due to the nature of the soils on Mr. VanDenBerk's farm, wind erosion was a large problem. The establishment of a windbreak on this property has alleviated this problem to a great extent.

3. COSTS

The trees on this site were obtained from the ministry of natural resources at the cost of a cent a piece.

ADDITIONAL COMMENTS:

This windbreak is very prominent and visible from the nearby concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 13: A Willow Windbreak On Lot 32 And 33, Concession 12, Logan Township, Perth County

LIMITED OR CONTROLLED LIVESTOCK ACCESS

TOWNSHIP: LOGAN
CONCESSION: 8
LOT: 24
LANDOWNER: CARL NEUBRAND
ADDRESS: R. R. # 1, BORNHOLM
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 5, 1980

1) GENERAL INFORMATION

TYPE OF LIVESTOCK: DAIRY CATTLE HERD SIZE: APPROX. 30 HEAD
TYPE OF CONTROL: ELECTRIC FENCING
APPROXIMATE LENGTH OF BANK: 100 YARDS
ALTERNATE WATERING SOURCES: PUMP AND WELL

2) EFFECTIVENESS AND BENEFITS

Mr. Neubrand's cattle have been fenced off from this stream since 1978. The banks are now overgrown with vegetation. Mr. Neubrand has also rip-rapped the banks of the stream with field stone obtained from his property. Erosion problems along this portion of the stream have been reduced drastically,

3) COSTS

The costs associated with this practice, as perceived by Mr. Neubrand, involve the purchase of fencing, a pump, and the digging of a well. In addition, there are costs associated with the gathering and placement of field stone along the streambanks.

ADDITIONAL COMMENTS:

This site is very visible from county road 11.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

LONDON TOWNSHIP

MIDDLESEX COUNTY



PLATE NO. 14: A Controlled Cattle Access On Lot 24, Concession 8, Logan Township, Perth County. Note The Field Stone On The Streambanks.

BUFFER ZONE

TOWNSHIP: LONDON
CONCESSION: 10
LOT: 23
LANDOWNER: MRS. BARBARA BLACKWELL
ADDRESS: R. R. # 3, ILBERTON
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 3, 1980

1) GENERAL INFORMATION

TYPE OF VEGETATION: GRASSES & TREES WIDTH: 10-15 FEET
LENGTH: 300 YARDS SECONDARY USES: WILDLIFE HABITAT
ROADSIDE _____
RIVERSIDE x
LAND USE: (PRESENT) HAY
 (PAST) CASH CROPS
APPROXIMATE SLOPE OF FIELD: 1%
APPROXIMATE LENGTH OF SLOPE: 100 YARDS

2) EFFECTIVENESS AND BENEFITS

This buffer is well established and is very effective in protecting the adjacent stream from excessive run-off.

3) COSTS

The costs associated with this buffer are nil since the vegetation is natural. The maintenance costs are nil as well.

ADDITIONAL COMMENTS:

This site is very visible from County Road 16.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 15: A Vegetative Buffer Strip On Lot 23, Concession 10, London Township, Middlesex County

ADDITIONAL COMMENTS:

This site is very visible and accessible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 16: A Grassed Waterway On Lot 13, Concession 6, London Township, Middlesex County

DRAIN OUTLET

TOWNSHIP: LONDON
CONCESSION: 11
LOT: 3
LANDOWNER: JOHN DEN OTTER
ADDRESS: R. R. # 3, ILBERTON
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 10, 1980

1. GENERAL DESCRIPTION

Mr. Den Otter has had an open drain on his property protected from erosion with gabion baskets and sandbags. Gabion baskets have been placed on the banks where the drain takes an abrupt change of direction. Sandbags have been placed around a culvert on the same drain.

2. EFFECTIVENESS AND BENEFITS

Gabion baskets and sandbags have been very successful in protecting erosion prone areas on the banks of this drain. Moreover, these mechanisms are also very durable.

3. COSTS

COSTS ASSOCIATED WITH THIS SITE INCLUDE:

- 1) Gabion Baskets
(ic: 6ft. x 3ft. x 3ft. = \$30.)
- 2) Field Stone
- 3) Sandbags
- 4) Labour

MAINTENANCE COSTS ARE VERY LOW.

ADDITIONAL COMMENTS:

Although the drain on this site is visible from County Road 16, the gabion baskets are obscured from view.

I hereby authorize the Thames River Implementation Committee (T.R.I.C) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 17: Field Stone Rip-rap Along A Ditch On Lot 3, Concession 11, London Township, Middlesex County.

MOSA TOWNSHIP

MIDDLESEX COUNTY

GRASSED WATERWAY

TOWNSHIP: MOSA
CONCESSION: RANGE 1 SOUTH
LOT: 2
LANDOWNER: ROBERT SIMPSON
ADDRESS: R. R. # 1, GLENCOE
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: AUGUST 1, 1980

1) GENERAL INFORMATION

LENGTH: 100 YARDS	WIDTH: 5 FEET
AGE: N/A	TYPE OF VEGETATION: NATURAL GRASS
CONDITION OF WATERWAY: FAIR	SOIL TYPE: SILT LOAM
LAND USE OF SURROUNDING FIELD:	(PRESENT) WHEAT (PAST) WHEAT
APPROXIMATE SLOPE OF FIELD:	5%
APPROXIMATE LENGTH OF SLOPE:	100 YARDS

2) EFFECTIVENESS AND BENEFITS

This waterway has been very effective in alleviating a serious erosion problem on this site.

3) COSTS

The costs associated with this waterway are difficult to assess since it has been in place for many years. Maintenance costs are low. The costs associated with the land occupied by the waterway being taken out of production are minimal since this land's productivity is impaired due to wet conditions.

ADDITIONAL COMMENTS:

This waterway is visible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 18: A Grassed Waterway On Lot 2, Range 1 South, Mosa Township, Middlesex County.

NORTH DORCHESTER TOWNSHIP

MIDDLESEX COUNTY

ADDITIONAL COMMENTS:

This waterway is very visible from two concession roads since this property is on a corner lot.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

NORTH EASTHOPE TOWNSHIP

PERTH COUNTY



PLATE NO. 19: A Grassed Waterway On Lot 7, Concession 2, North Dorchester Township, Middlesex County

LIMITED OR CONTROLLED LIVESTOCK ACCESS

COUNTY: Perth
TOWNSHIP: North Easthope
CONCESSION: 1
LOT: 31
LANDOWNER: Laverne Pletsch
ADDRESS: R. R. #4 Stratford, N5A 6S5
OPERATOR: Laverne Pletsch
DATE OF INITIAL VISIT: October 2, 1980

1) GENERAL INFORMATION

TYPE OF LIVESTOCK: Dairy HERD SIZE: 45 milking; 60 total
TYPE OF CONTROL: Restricted from ditch
APPROXIMATE LENGTH OF BANK:
ALTERNATE WATERING SOURCES: Water pumped from barn to trough
(seasonal use only)

2) EFFECTIVENESS AND BENEFITS

The fencing and crossing have been in place for about 5 years. The condition of the ditch banks during that time has remained very stable. Cattle have not been allowed to enter the ditch at any point; this has eliminated any trampling of the banks and also prevents possible injury to the cows.

3) COSTS

The costs involved with this practice included permanent fencing and the alternate watering facility. Maintenance costs are minimal.

ADDITIONAL COMMENTS:

The site is very visible from Side road 30-31, Concession 1; just north off Highway 7, east of Stratford.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

LIMITED OR CONTROLLED LIVESTOCK ACCESS

COUNTY: Perth
TOWNSHIP: North Easthope
CONCESSION: 4
LOT: 35
LANDOWNER: Roger Cook
ADDRESS: R.R.#1 Stratford N5A 6S2
OPERATOR: Roger Cook
DATE OF INITIAL VISIT: September 29, 1980

1) GENERAL INFORMATION

TYPE OF LIVESTOCK: Dairy HERD SIZE: 35
TYPE OF CONTROL: Concrete Pad poured on drain bank with restricted access
APPROXIMATE LENGTH OF BANK: 12 Feet
ALTERNATE WATERING SOURCES:

2) EFFECTIVENESS AND BENEFITS

The controlled access has been very effective. The access is not used during the winter or spring months for obvious reasons.

3) COSTS

- was built by farmer so no real idea of costs
- very cost effective approach

ADDITIONAL COMMENTS:

Only improvement that could be made is some kind of small barrier to prevent runoff from entering the drain at that particular point.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

NORWICH TOWNSHIP

OXFORD COUNTY

ADDITIONAL COMMENTS:

This site is very visible and accessible from the adjacent concession road. This windbreak can also be viewed from highway no. 59.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 20: A Spruce Windbreak On Lot 21, Concession 8, Norwich (E. Oxford) Township, Oxford County

WINDBREAK

TOWNSHIP: NORWICH (EAST OXFORD)
CONCESSION: 5
LOT: 21
LANDOWNER: WOODSTOCK PUBLIC UTILITY COMMISSION
ADDRESS: 16 GRAHAM STREET, WOODSTOCK
OPERATOR: HOWARD PULLEN
DATE OF INITIAL VISIT: JULY 15, 1980

1) GENERAL INFORMATION

TREE SPECIES: WHITE PINE AND SPRUCE	AGE OF TREES: 50-60 years
DISTANCE BETWEEN TREES: 4 FEET	PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 4 ACRES	% OF FIELD PROTECTED: 80%
LAND USE OF PROTECTED FIELD: CORN	
SOIL TYPE: LOAM	

2) EFFECTIVENESS AND BENEFITS

This windbreak is mature and healthy and provides a great deal of protection to both the soils and crops on this field.

3) COSTS

The costs associated with this windbreak are difficult to assess, due to the advanced age of the trees. Maintenance costs appear to be nil.

ADDITIONAL COMMENTS:

This site is very visible from the nearby concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate

LANDOWNER/OPERATOR

RALEIGH TOWNSHIP

KENT COUNTY



PLATE NO. 21: A Coniferous Windbreak On Lot 21, Concession 5, Norwich (E. Oxford) Township, Oxford County

ADDITIONAL COMMENTS:

This windbreak runs parallel to the 8th concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 22: A Pine Windbreak On Lot 19, Concession 8, Raleigh Township, Kent County

ADDITIONAL COMMENTS:

This windbreak runs parallel to the concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 23: A Mature Pine Windbreak On Lot 22, Concession A, Raleigh Township, Kent County

WINDBREAK

TOWNSHIP: RALEIGH
CONCESSION: 8
LOT: 22
LANDOWNER: JAMES CHITTIM
ADDRESS: R. R. # 6, CHATHAM
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 7, 1980

1) GENERAL INFORMATION

TREE SPECIES: NORWAY SPRUCE AGE OF TREES: 10 YEARS
DISTANCE BETWEEN TREES: 5 FEET PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 50 ACRES % OF FIELD PROTECTED: 80%
LAND USE OF PROTECTED FIELD: WHEAT
SOIL TYPE: CLAY LOAM

2) EFFECTIVENESS AND BENEFITS

This windbreak has been very effective in controlling wind erosion on this site. Mr. Chittim has also indicated that his crops have come up sooner since the windbreak was established.

3) COSTS

Mr. Chittim obtained his trees from the ministry of natural resources at the cost of one cent a tree. Mr. Chittim also trims his trees. However, overall maintenance costs are low.

ADDITIONAL COMMENTS:

This site is very visible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 24: A Young Spruce Windbreak On Lot 22, Concession 8, Raleigh Township, Kent County

SOUTH-WEST OXFORD TOWNSHIP

OXFORD COUNTY

GRASSED WATERWAY

TOWNSHIP: SOUTH-WEST OXFORD
CONCESSION: 3
LOT: 8
LANDOWNER: WILLIAM MITCHELL
ADDRESS: R. R. # 2, MOUNT ELGIN
OPERATOR: N/A
DATE OF INITIAL VISIT: JUNE 10, 1980

1. GENERAL INFORMATION

LENGTH: 400 YARDS	WIDTH: 15 YARDS
AGE: 25 YEARS	TYPE OF VEGETATION: NATURAL GRASS
CONDITION OF WATERWAY: GOOD	SOIL TYPE: CLAY LOAM
LAND USE OF SURROUNDING FIELD:	(PRESENT) CORN (PAST) CORN
APPROXIMATE SLOPE OF FIELD:	2% - 4%
APPROXIMATE LENGTH OF SLOPE:	400 YARDS

2. EFFECTIVENESS AND BENEFITS

Mr. Mitchell has indicated that wash-out problems had ceased since this natural drainage course has been seeded.

3. COSTS

This waterway was established twenty-five years ago, therefore, initial costs are difficult to determine. Maintenance costs appear to be nil.

ADDITIONAL COMMENTS:

This waterway has been tiled.

This site is very visible and accessible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 25: A Grassed Waterway On Lot 8, Concession 3, Southwest Oxford Township, Oxford County

ADDITIONAL COMMENTS:

The view of this waterway is limited once the corn reaches height of four to five feet. However, this waterway is visible from the concession road in the spring.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

TILBURY EAST TOWNSHIP

KENT COUNTY



PLATE NO. 26: A Grassed Waterway On Lot 9, Concession 3, Southwest Oxford Township, Oxford County

ADDITIONAL COMMENTS:

This buffer zone runs parallel to the concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

TILBURY NORTH TOWNSHIP

ESSEX COUNTY



PLATE NO. 27: A Wheat Buffer Strip Along A Ditch On Lot 9, Concession 12, Tilbury East Township, Kent County

ADDITIONAL COMMENTS:

This property is on a corner lot, therefore, the buffer zone can be viewed from two roads.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

WINDBREAK

TOWNSHIP: TILBURY NORTH
CONCESSION: 6 (MIDDLE ROAD SOUTH)
LOT: 19
LANDOWNER: PAUL COUREY
ADDRESS: R. R. # 3, TILBURY
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 20, 1980

1) GENERAL INFORMATION

TREE SPECIES: CEDAR AND SPRUCE
AGE OF TREES: 5 YEARS
DISTANCE BETWEEN TREES: 4 FEET PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 250 ACRES
% OF FIELD PROTECTED: 100% LAND USE OF PROTECTED FIELD: BEANS AND CORN
SOIL TYPE: LAY

2) EFFECTIVENESS AND BENEFITS

The trees that make up this windbreak are still too immature to be one hundred per cent effective. However, once this windbreak becomes established, it is expected to be very effective in controlling wind erosion.

3) COSTS

These trees were obtained from the ministry of natural resources at the cost of one cent per tree. Four thousand trees were planted. Mr Courey estimates that the maintenance of this windbreak requires no more than three man days per year. It is predicted that less maintenance will be required as the trees grow older.

ADDITIONAL COMMENTS:

This windbreak is visible from County Road No. 46, and the concession road that runs perpendicular to No. 46 at this site.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

TILBURY WEST TOWNSHIP

ESSEX COUNTY



PLATE NO. 28: A Young Cedar And Spruce Windbreak On Lot 19, Concession 6, Tilbury North Township, Essex County

WINDBREAK

TOWNSHIP: TILBURY WEST
CONCESSION: 4
LOT: 5
LANDOWNER: NORMAN MASSE
ADDRESS: R. R. # 1, COMBER
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JUNE 20, 1980

1) GENERAL INFORMATION

TREE SPECIES: CEDAR	AGE OF TREES: 6-7 YEARS
DISTANCE BETWEEN TREES: 2 FEET	PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 30 ACRES	% OF FIELD PROTECTED: 100%
LAND USE OF PROTECTED FIELD: CORN	
SOIL TYPE: CLAY	

2) EFFECTIVENESS AND BENEFITS

The trees in this windbreak are still too young to be highly effective in reducing wind erosion. However, the benefits of this windbreak increase through time.

3) COSTS

These trees were obtained from the ministry of natural resources at the cost of one cent a tree. Maintenance costs are low.

ADDITIONAL COMMENTS:

This windbreak runs parallel to the concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

USBORNE TOWNSHIP

HURON COUNTY



PLATE NO. 29: A Young Cedar Windbreak On Lot 5, Concession 4, Tilbury West Township, Essex County

ADDITIONAL COMMENTS:

This waterway is very visible from County Road No. 6.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

_____ -

LANDOWNER/OPERATOR



PLATE NO. 30: A Grassed Waterway On Lot 9, Concession 13, Usborne Township, Huron County

ADDITIONAL COMMENTS:

This waterway is very visible and accessible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 31: A Grassed Waterway On Lot 12, Concession 10, Usborne Township, Huron County

WESTMINSTER TOWNSHIP

MIDDLESEX COUNTY

ADDITIONAL COMMENTS:

This waterway is visible from the adjacent concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 32: A Grassed Waterway On Lot 10, Concession 4, Westminster Township, Middlesex County

WEST MISSOURI TOWNSHIP

MIDDLESEX COUNTY

WINDBREAK

TOWNSHIP: WEST NISSOURI
CONCESSION: 7
LOT: 16
LANDOWNER: GARY STEVENS
ADDRESS: R. R. # 3, THORNDALE
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 18, 1980

1) GENERAL INFORMATION

TREE SPECIES: PINE & WHITE SPRUCE	AGE OF TREES: 2 YEARS
DISTANCE BETWEEN TREES: 5 FEET	PREVAILING WIND: WESTERLY
AREA OF PROTECTED FIELD: 5 ACRES	% OF FIELD PROTECTED: 100%
LAND USE OF PROTECTED FIELD: CORN	
SOIL TYPE: CLAY LOAM	

2) EFFECTIVENESS AND BENEFITS

This windbreak is still too immature to be one hundred percent effective. However, it is anticipated to provide protection against wind erosion and crop damage (ie. Wind burn).

3) COSTS

The trees that make-up this windbreak were obtained from the Upper Thames River Conservation Authority, at the cost of four dollars per tree. This price includes labour. The authority will provide windbreak stock at the price of two dollars a piece, which does not include labour.

ADDITIONAL COMMENTS:

This windbreak is not visible from the concession road, but is accessible from Mr. Steven's laneway.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

ADDITIONAL COMMENTS:

This Waterway Cannot Be Viewed From A Public Road. It May Be Reached via Mr. Steven's Farm.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 33: A Grassed Waterway On Lot 16, Concession 7, West Nissouri Township, Middlesex County

BUFFER ZONE

TOWNSHIP: WEST MISSOURI
CONCESSION: 5
LOT: 3
LANDOWNER: ALLAN LEITCH
ADDRESS: R. R. # 2, THORNDALE
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 14, 1980

1. GENERAL INFORMATION

TYPE OF VEGETATION: GRASSES & SHRUBS WIDTH: 50-60 FEET
LENGTH: 700 FEET SECONDARY USES: WILDLIFE HABITAT
ROADSIDE
RIVERSIDE
LAND USE: (PRESENT) ALFALFA
 (PAST) N/A
APPROXIMATE SLOPE OF FIELD: LEVEL
APPROXIMATE LENGTH OF SLOPE: NIL

2. EFFECTIVENESS AND BENEFITS

This vegetative buffer is very effective in protecting the adjacent stream from excessive sediment loading and the banks of the stream from erosion problems.

3. COSTS

The initial costs of establishing this buffer were virtually nil, since the vegetation is natural. There are costs associated with the land occupied by the buffer zone being withdrawn from production. However, in this case, if this buffer zone was put into production, erosion problems would probably occur in successive years.

ADDITIONAL COMMENTS:

This site is very visible from the concession road.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR



PLATE NO. 34: A Vegetative Buffer Strip Along A Stream On Lot 3, Concession 5, West Nissouri Township, Middlesex County

ZORRA TOWNSHIP

OXFORD COUNTY

GRASSED WATERWAY

TOWNSHIP: ZORRA
CONCESSION: 2
LOT: 15
LANDOWNER: RICHARD HISCOCKS
ADDRESS: R. R. # 3, LAKESIDE
OPERATOR: AS ABOVE
DATE OF INITIAL VISIT: JULY 5, 1980

1) GENERAL INFORMATION

LENGTH: 150 YARDS	WIDTH: 8 YARDS MAX.: 2 YARDS MIN.
AGE: 3 YEARS	TYPE OF VEGETATION: ALFALFA, TIMOTHY
CONDITION OF WATERWAY: FAIR	SOIL TYPE: SILT LOAM
LAND USE OF SURROUNDING FIELD:	(PRESENT) CORN (PAST) ALFALFA
APPROXIMATE SLOPE OF FIELD:	2%
APPROXIMATE LENGTH OF SLOPE:	150 YARDS

2) EFFECTIVENESS AND BENEFITS

This waterway has been very effective in channelling surface run-off to a nearby drain.

3) COSTS

Three years ago this property was planted in alfalfa. Eventually, Mr. Hiscocks left the natural draw on this field in alfalfa. Therefore, the costs of this waterway involve the purchase of alfalfa seed and the landowner's time spent seeding. Maintenance costs are low.

ADDITIONAL COMMENTS:

This waterway becomes obscured by corn from mid-summer on. However, it can be viewed by county road 16 and the adjacent concession road in the spring.

I hereby authorize the Thames River Implementation Committee (T.R.I.C.) to utilize the site described above as an example of a positive land management practice. The Thames River Implementation Committee may also promote this site through inclusion in a catalogue of similar good conservation measures and by placing a small sign at an appropriate location.

LANDOWNER/OPERATOR

6. RELEVANT LITERATURE

ARNOLD, J.B. *et al.* 1980. GRASSED WATERWAYS. Ontario Ministry of Agriculture and Food Publication.

ARNOLD, J.B. *et al.* 1979. SOIL EROSION - CAUSES AND EFFECTS. Ontario Ministry of Agriculture and Food Publication.

MOORE, N. *et al.* 1979. CONTROL OF SOIL EROSION. Ontario Ministry of Agriculture and Food Publication.

ONTARIO MINISTRY OF AGRICULTURE AND FOOD, 1977. SOIL EROSION. Dept. of Land Resource Science, O.A.C. University of Guelph, Guelph, Ontario.

ONTARIO MINISTRY OF THE ENVIRONMENT AND NATURAL RESOURCES. 1975. THAMES RIVER BASIN WATER MANAGEMENT STUDY. Toronto, Ontario.

7. APPENDICES

APPENDIX I

Townships Surveyed By Alphabetical Order:

ALBOROUGH	SOUTH-WEST OXFORD
BIDDULPH	SOUTHWOLD
BLANDFORD-BLENHEIM	TILBURY EAST
BLANSHARD	TILBURY NORTH
CAMDEN	TILBURY WEST
CARADOC DELAWARE	WESTMINSTER
DOVER	WEST MISSOURI
DOWNIE	ZONE
DUNWICH	ZORRA
EAST-ZORRA TAVISTOCK	
EKFRID	
ELLICE	
FULLARTON	
HARWICH	
HIBBERT	
HOWARD	
LOBO	
LOGAN	
LONDON	
MERSEA	
MOSA	
NORTH DORCHESTER	
NORTH EASTHOPE	
NORWICH	
ORFORD	
USBORNE	
RALEIGH	
ROMNEY	
SOUTH EASTHOPE	

APPENDIX II
ALTERNATIVE REMEDIAL MEASURES

<u>PROBLEM</u>	<u>REMEDIAL MEASURES</u>
1. Rural Sheet Erosion	Recharge/detention storage basins Conservation cultivation on steep slopes No-till cultivation Roughening of the land surface-windbreaks Shooting of the land surface Promotion of soil clods or aggregates Contour listing Surface water diversions Diversion terraces Strip cropping Misc. tillage alternatives Conservation tillage Sod-based crop rotation Winter cover crops Timing of field operations Contouring or contour cultivation Vegetative buffer strips Sediment basin Grassed waterways
2. Stream/bank Erosion	Recharge-detention storage basins Surface water diversion & most other sheet erosion control practices Vegetative buffer strips Sediment basin Misc. erosion control fabrics & materials Gabion baskets Exclusion of livestock from watercourses Bank protection by jetties, deflectors Permanent diversions Streambank protection with vegetation Protection of culvert outlets, chute outlets etc.

Rip-rap bank protection
 Check dams
 Drop inlets
 Grassed outlets
 Seed areas protected with organic mulch
 Temporary check dams on small swales and watercourses
 Plant materials for bank slop stabilization Hydroseeding
 Appropriate geometry of drain x-sections
 Revegetation-reforestation of cut areas and bare slopes
 Seeded areas protected by netting or matting
 Conservation construction practices
 Precast concrete lattice blocks and bricks
 Chemical soil stabilizers
 Conservation of woodlots and retention headwaters
 Drain maintenance

3. Sewage and manure Handling (influent to stream course)
- Disposal of treated sewage effluent by spray irrigation
 Timing of
 Treatment lagoon
 Improved methods of sludge disposal on land
 Annual storage & land application of livestock wastes
 Controlling feedlot runoff
 Trickling filters
 Rotating biological contactors
 Swirl concentrator for runoff treatment
 Direct dosing of alum to septic tanks
 Septic tank/tile bed sewage disposal
 Package sewage treatment plants (multi-family use)
 Misc. individual wastewater treatment systems
 Clivus multrum
 Single family aerobic treatment systems

4. Pesticide and Fertilizer inputs to watercourses
 - Chemical absorption onto clays
 - Pesticide application methods
 - Alternatives to chemical pesticides
 - Slow release fertilizers Placement of fertilizers
 - Timing of fertilizer application
 - All remedial measures for sheet erosion

5. Gully erosion
 - included with stream/bank erosion

APPENDIX III
T.R.I.C. Exp. 80 Field Sheet
POSITIVE LAND MANAGEMENT PRACTICES

Map name:
Lot:
Concession:
Township:
County:
Landowner:
Address:

Date:
Time:
Field Photo No.:
Chronoflex No.:

1. FEATURE

(check one)

- i) Grassed Waterway _____
- a) Length:
 - b) Width:
 - c) Age:
 - d) Type of Vegetation:
 - e) Condition:
 - f) Land Use of Surrounding Area:
- ii) Windbreak _____
- a) Tree Species:
 - b) Age of Trees:
 - c) Distance between Trees:
 - d) Prevailing Wind:
 - e) % of Field Protected:
- iii) Buffer Zones: _____
- a) Type of Vegetation
 - b) Width:
 - c) Length:
 - d) Roadside or Riverside?
 - e) Secondary Uses:

- iv) Tillage and Cropping Practices _____
 - a) Specifics:

- v) Limited or Controlled Livestock Access _____
 - a) Type:
 - b) Type of Barrier:
 - c) Alternate Water Sources:
 - d) Gravel Cross-overs:

- vi) Tile Outlets _____
 - a) Specifics:

2. General Information

- i) Slope:
- ii) Length of Slope:
- iii) Soil Type:
 - a) Unconsolidated Till _____
 - b) Clay _____
 - c) Loam or Silt _____

- iv) Area of Field Protected:

- v) Land Use:

Past	
Present	

3. EFFECTIVENESS

4. BENEFITS

5. COSTS

6. FEASIBILITY

ADDITIONAL COMMENTS:

ACCESSIBILITY/VISIBILITY

RECEPTIVITY OF LANDOWNER:

SKETCH MAP: