TO: Federal Energy Regulatory Commission
Office of Energy Projects

FROM: John T. B. Mudge
25 Lamphire Hill Lane
Lyme NH 03768
Tel: 603-795-4350 Fax: 603-795-4355
Email: JMudgeNH@aol.com

RE: **Wilder Project, (FERC NO. 1892-026)**

Study Request:

Erosion of Farmland Caused by the Wilder Dam

DATE: February 25, 2013

CONTENTS:

To the reader:

For further information or to visit the Mudge fields, please contact me at the above address and phone.

Very truly yours,

John T. B. Mudge

I. Background

In 1962 my parents bought a 190± acre farm on the Connecticut River in Lyme, New Hampshire. In 1966 they bought an adjoining 17± acre field with the result that they then owned ¾ mile of frontage on the Connecticut River, about 58 acres of prime agricultural land, and a farmhouse and barns on a terrace over-looking the three fields, often referred to within the family as "the lower fields"—fields A, B & C, from south to north, on a survey map prepared in 1989.

The fertile lands at the bottom of the Connecticut River valley have long been known to be very valuable farmland. Different books and articles have described these lands as "farm soils that are among the best in the country, some say the world," "New England's breadbasket," and "a garden of delight."

Recognizing the importance of these fields from an agricultural point of view, a conservation easement with the New Hampshire Department of Agriculture was put on a portion of the land in 1989, and an additional easement was put on the rest of the land in 2006 with the Upper Valley Land Trust. This land will never be developed, and by following the best agricultural practices, it will forever produce food products.

There is now, and has been for a number of years, another threat to these fields. The fields are disappearing because of erosion. There are two ways to see this erosion: 1) two survey maps and 2) photographs. This will be addressed in detail beginning at page 7.

On January 28, 2013, at a FERC Scoping Meeting held in West Lebanon, New Hampshire, a spokesman for TransCanada, the company that owns the Wilder Dam, stated that the company did not "propose" a study on geology and soil resources as a part of the license renewal procedures for that dam. The purpose of this material is to request that such a study be made.

II. Study Request

§5.9(b)(1) — *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate the effects of the operation of the Wilder Dam on the erosion of farmland along the Connecticut River.

Specifically, the objectives of the study should include:

- Determine how the raising and lowering of the water level in the Connecticut River is a factor in the erosion of the riverbanks in both New Hampshire and Vermont and the resulting loss of agricultural farmland— valuable Hadley Silt Loam.
- Determine if and how the form of erosion known as "piping" has affected the riverbank.
- Document how the operation of the dam and the daily fluctuations in the water level have affected town roads that are beside the river.
- Document how the flow of the river, the operation of the dam, and the raising and lowering of water levels has eroded land and caused the widening of the river with the result that ever more land is then eroded.

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§5.9(b)(2) — *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not known to be applicable.

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§5.9(b)(3) — *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

When reviewing a proposed action, in this case the renewal of the license for the Wilder Dam, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

The requested study should address both land erosion issues on this section of the Connecticut River and also the increased sedimentation in the river which affects fish and wildlife that is a result of the erosion. The Commission has an obligation to address these issues.

The U. S. Department of Agriculture has provided grants to landowners, including my family, for erosion control projects on the riverbank. Grants were made to my family in 1992, 1996, and 2012. The erosion represents a *cost* to the federal government. It is in the public interest for the Commission to consider these costs to the Federal government as it grants a license to the dam.

**

§5.9(b)(4) — *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

In September 1992, D. J. Hagerty of the Civil Engineering Department at the University of Louisville, prepared a report for the U. S. Army Corps of Engineers, "Identification of Piping and Sapping Erosion of Streambanks." Piping, the process of erosion that he describes, is what is occurring on the Connecticut River. Portions of the Hagerty study are quoted below:

> "To understand bend erosion, it is necessary to investigate mechanics of erosion due to various causes including piping and sapping…
>
> "The major portion of this text is a description of evidence, direct and indirect, which indicates that piping and/or sapping has occurred on a given bank site. Direct evidence is limited to the condition of water actually flowing out of a bank and removing soil particles, in the sight of an observer or under detection by a monitoring device such as a motion picture camera. Indirect evidence includes primary evidence such as cavities in the bank face and deposits of removed particles in deltas or fans below a piping/sapping zone.
>
> "If water flows out of a streambank under a sufficiently high hydraulic gradient, the exfiltrating water can remove particles of soil from the bank face. This movement of soil particles by seeping water in soil voids is called internal erosion. Should the flow be concentrated by variations in hydraulic conductivity or by restriction of water supply (as from a leak from an underground pipe), the exfiltrating water can create cavities in the bank face. Because such cavities commonly have roughly cylindrical shape and are oriented virtually perpendicularly to the bank face, they have been called "pipes" and the internal erosion process by which they form has been called "piping." ……If exfiltration occurs over a broad area so that multiple "pipes" form or larger lenticular cavities appear, this process may be called "sapping."
>
> "…This process can be significant because the mechanism tends to intensify; removal of soil at the exfiltration face shortens the seepage path and increases the hydraulic gradient which causes the outflow. If the source of water is constant or is replenished periodically, the internal erosion tends to intensify. …local instability may be created in the soils above the cavity.

> Failure and erosion of streambanks occur by instability of bank soils undercut by piping cavities…
>
> “Among the circumstances that must prevail if piping or sapping is to happen, the one condition which is absolutely necessary is concentrated flow of intensity sufficient to remove an in situ particle of soil, entrain it, and carry it away from its point of origin… …Finally for internal erosion to produce cavities, there must be a free face or an external plane from which the water can move the soil particles… There must be an exit point by which seeping water can leave the bank and carry along dislodged particles, or piping cavities will not form…
>
> “The most obvious source of water to supply the piping/sapping process on a stream-bank is the stream itself. When the stream rises against the face of the bank, water enters the bank soils…”

Published in 1980, Katharine Blaisdell’s book *Over the River and Through The Years* includes, with her discussion of the unearthing of Native American artifacts through erosion, the following sentence: “The erosion of riverbanks has become a serious problem for farmers with meadows which border the Connecticut River — and are disappearing into it.”

As a landowner, I have never seen a study of the erosion on this portion of the Connecticut River. Much more scientific information is needed about the relationship between the operation of the Wilder Dam and the erosion of the Hadley Silt Loam that forms the riverbank before another license is given to the operators of the dam.

**

§5.9(b)(5) — *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

As shown in the accompanying photographs and diagrams, the erosion has had an adverse affect on the Hadley Silt Loam that is the soil at the bottom of the valley and forms the riverbank on this section of the Connecticut River. These are prime agricultural soils. Continued erosion of the land will result in the loss of more and more agricultural land and increased sedimentation in the river. Just through their personal observations, landowners are able to recognize the relationship between the rapid fluctuations in the level of the water in the river and the flow of the river and the resulting erosion.

**

§5.9(b)(6) — *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Trained experts in the causes and affects of erosion, in addition to civil engineers to measure the extent of the erosion and biologists to measure the impact of the sedimentation in the river, should be able to establish the relationship between the changing levels in the river and the flow of the river and the erosion. Field studies will be necessary to complete the requested work.

This erosion will be clearly evident to anyone just taking a boat tour of the river. The erosion is also visible when driving along some of the roads. The erosion is shown in the accompanying photographs.

It will probably be necessary to coordinate this study with the operators of the dam so that the person(s) preparing the study are able to not only study the riverbank when the river is high, but also when the river is very low. The dam operators may have to lower the level of the water for an extended period of time to permit this study.

**

§5.9(b)(7) — *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The cost of a detailed study in unknown. It will take some period of time and a number of different professional people to complete the study. It will take a serious effort to prepare the study plan, extensive fieldwork, and additional time to analyze the data and prepare reports. It should be remembered that the "pond" behind the Wilder Dam is about 45 miles in length, and that requires studies of 90 miles of riverbank in two states.

The cost in the loss of land and sediment in the river is very great. As stated earlier, the cost to the U. S. Department of Agriculture in assisting landowners to control the erosion is already very great.

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III. The Mudge Fields.

This discussion and these photographs describe and illustrate the existing erosion.

Two surveys of the lower fields

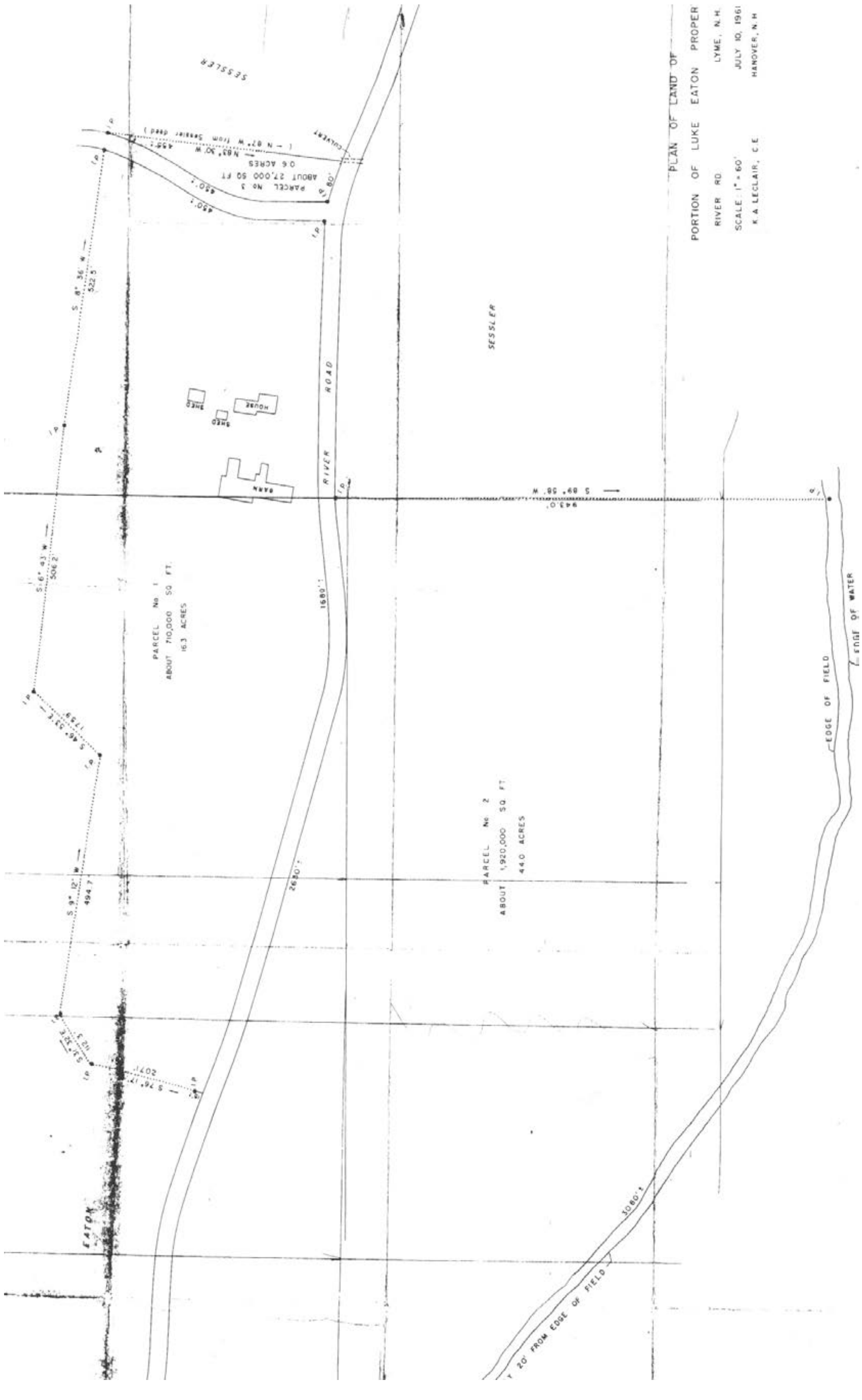
Q: *If a picture is worth a thousand words, what is a survey map worth*?

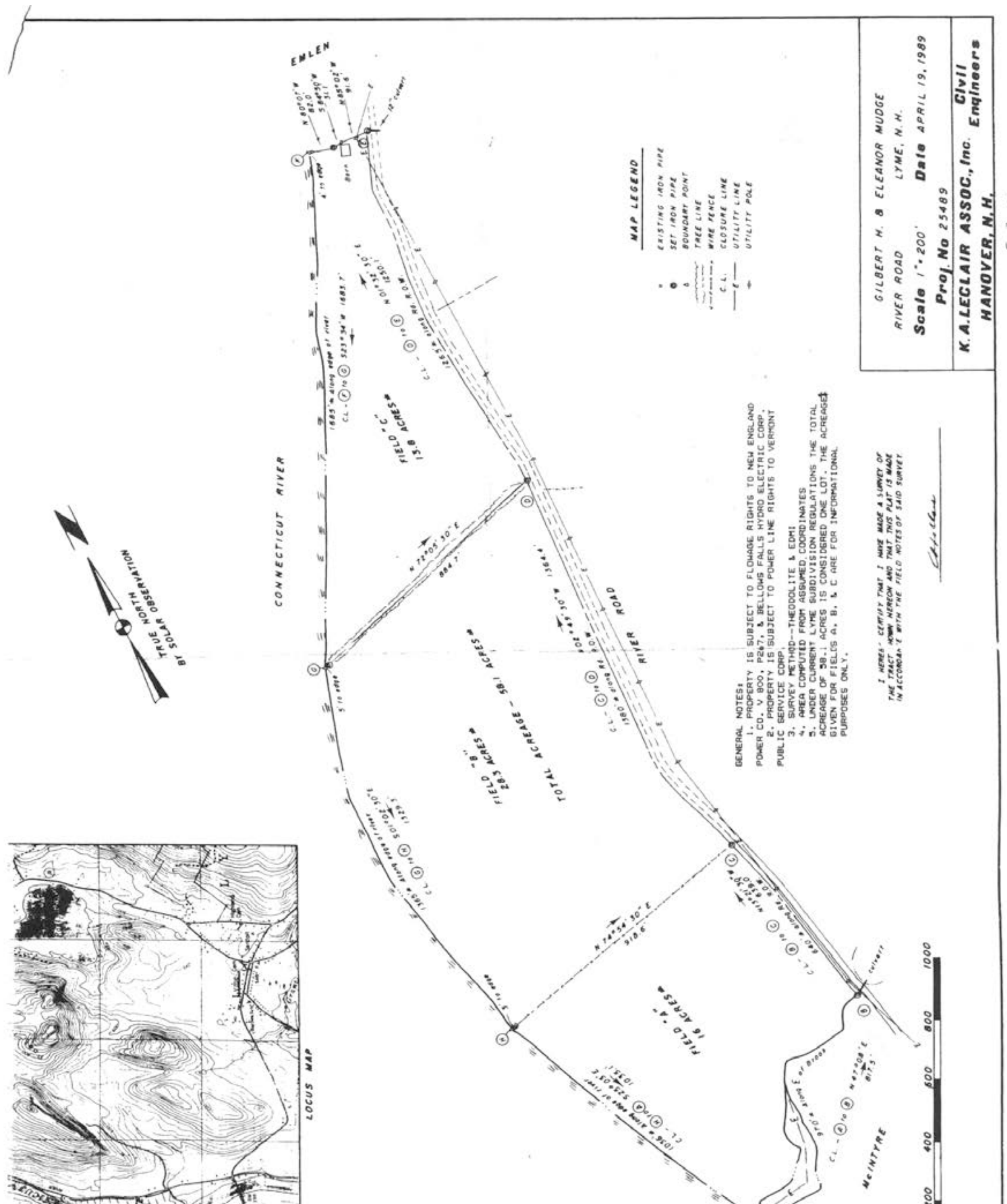
A: *Acres*.

When the farm was purchased in 1962, the attorney provided a survey prepared by K. A. LeClair, C. E. of Hanover titled, "Portion of Luke Eaton Property" dated July 10, 1961. The 1961 survey is of what are now called Fields B & C.

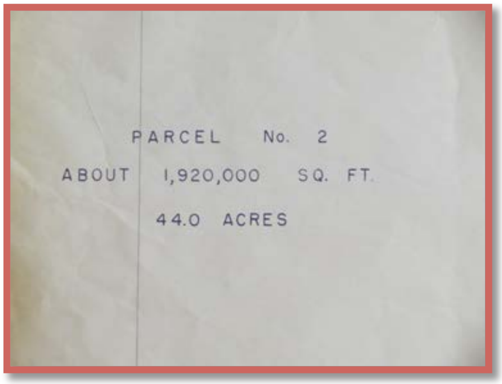
In 1989, when the conservation easement was placed on Fields A & B, LeClair prepared a survey of all three fields, A, B & C. I have been told that we are the only landowner in the area with two surveys that so clearly document the erosion.

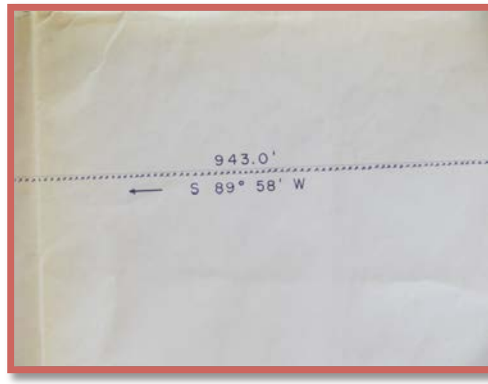
The 1961 and 1989 surveys are on the next two pages. The 1961 survey was drawn to a scale of 1" = 60 feet, and is printed on a piece of paper 67" x 33". It may not be very easy to read here. The 1989 survey has also been reduced from its original size.


PLAN OF LAND OF
PORTION OF LUKE EATON PROPER
RIVER RD.
LYME, N.H.
SCALE: 1" = 60'
JULY 10, 1961
K.A. LECLAIR, C.E.
HANOVER, N.H.
SESSLER
SESSLER
RIVER ROAD
PARCEL No. 1
ABOUT 710,000 SQ. FT.
16.3 ACRES
PARCEL No. 2
ABOUT 1,920,000 SQ. FT.
44.0 ACRES
PARCEL No. 3
ABOUT 27,000 SQ FT
0.6 ACRES
HOUSE
SHED
SHED
BARN
CULVERT
EDGE OF FIELD
EDGE OF WATER
EATON


LOCUS MAP
TRUE NORTH
BY SOLAR OBSERVATION
CONNECTICUT RIVER
EMLEN
FIELD "C"
13.8 ACRES±
FIELD "B"
28.3 ACRES±
TOTAL ACREAGE - 58.1 ACRES±
FIELD "A"
16 ACRES±
RIVER ROAD
McINTYRE
MAP LEGEND
EXISTING IRON PIPE
SET IRON PIPE
BOUNDARY POINT
TREE LINE
WIRE FENCE
CLOSURE LINE
UTILITY LINE
UTILITY POLE
GENERAL NOTES:
1. PROPERTY IS SUBJECT TO FLOWAGE RIGHTS TO NEW ENGLAND POWER CO. V 800, P267, & BELLOWS FALLS HYDRO ELECTRIC CORP.
2. PROPERTY IS SUBJECT TO POWER LINE RIGHTS TO VERMONT PUBLIC SERVICE CORP.
3. SURVEY METHOD--THEODOLITE & EDM!
4. AREA COMPUTED FROM ASSUMED COORDINATES
5. UNDER CURRENT LYME SUBDIVISION REGULATIONS THE TOTAL ACREAGE OF 58.1 ACRES IS CONSIDERED ONE LOT. THE ACREAGES GIVEN FOR FIELDS A, B, & C ARE FOR INFORMATIONAL PURPOSES ONLY.
I HEREBY CERTIFY THAT I HAVE MADE A SURVEY OF THE TRACT SHOWN HEREON AND THAT THIS PLAT IS MADE IN ACCORDANCE WITH THE FIELD NOTES OF SAID SURVEY
0 200 400 600 800 1000
GILBERT H. & ELEANOR MUDGE
RIVER ROAD LYME, N.H.
Scale 1" = 200' Date APRIL 19, 1989
Proj. No 25489
K.A.LECLAIR ASSOC., Inc. Civil Engineers
HANOVER, N.H.

Two details from the 1961 survey map are shown below. In 1961, "Parcel 2" referred to what in 1989 are Fields B & C:





These details show the acreage of fields B & C and the bearing and distance of the line between fields A & B. This bearing is shown on the 1989 survey as N 74° 54' 30" E, the difference being that magnetic north was used in 1961 and a solar observation was made in 1989— therefore, the magnetic declination of about 16°.

From the two surveys:

	1961 LeClair Survey	1989 LeClair Survey
Length of boundary between fields A & B	943.0 feet	916.6 feet
Acreage of Fields B & C	44.0	42.1
River frontage	Fields B & C: 3,080± feet	Fields A, B & C: 4,086± feet– Approximately .77 miles.

As the result of erosion, fields B & C lost 1.90 acres between 1961 and 1989.

As the result of erosion, the boundary line between Fields A & B was 26.4 feet shorter in 1989 than in 1961. A yellow surveyor's pin that was at the western end of this line in 1962, by the river, is now gone.

If the entire riverbank for fields B & C, 3,080 feet, had eroded 26.4 feet in that time period, that would amount to 1.87 acres.

Yes, survey maps are worth *acres*.

There have been over twenty years of additional erosion since 1989. Additional land has been lost. Additional silt has been added to the river.

The two surveys clearly document the extent of the erosion that has taken place and is continuing to occur on these and other lands along the river.

IV. The Erosion

How is the erosion occurring, both on these fields and throughout this portion of the Connecticut River Valley?

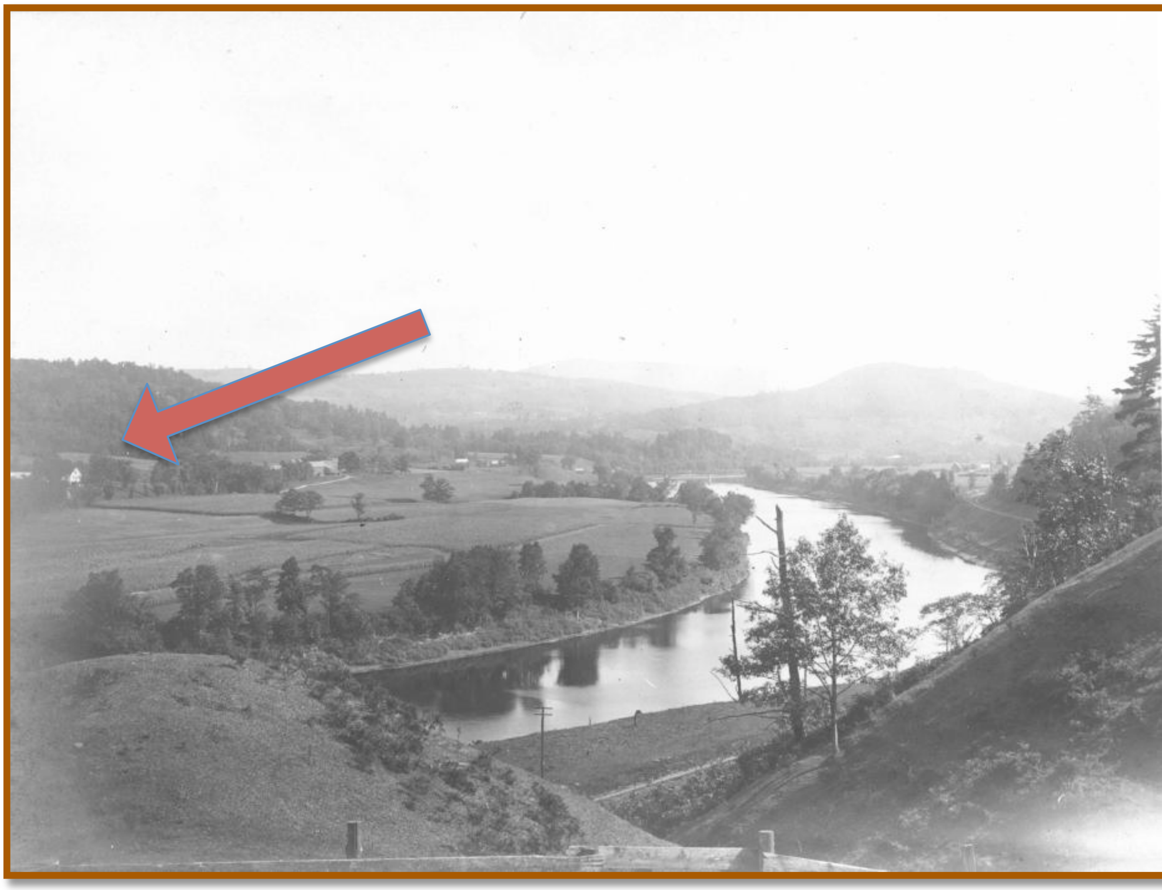
Remember, this is not a free flowing river. The Connecticut River, or sometimes called Wilder Lake, is controlled by a dam, and the water may go up and down by as much as five feet in a day. As the dam opens and closes, the flow of the river speeds up, stops, and goes backwards. The result of the operations of the dam is that the dynamics of the river are not the natural flow of a river, and this is not a lake as is normally thought of lakes– bodies of water that do not go up and down in such a dramatic and frequent way.

Some say that the erosion is caused by ice flows. No. In over fifty years, I have never seen an ice flow or ice jam on this portion of the river. Remember, it is all controlled by a dam. If you want to see an ice flow, visit White River Junction in the spring as the White River is thawing.

What is the problem? Drawings and photographs will show how this erosion works.

"Piping," as a consequence of the operation of the Wilder Dam, may be the cause of the erosion

Imagine a time before the dam was built and the water was at a hypothetical 380' above sea level and there was little daily fluctuation in the river.



This is the earliest known photograph of the Mudge fields, a pre-1896 photograph, looking southeast from the Vermont side of the river, from up near Route 5, between East Thetford and North Thetford. The date can be estimated because the covered bridge in the background was destroyed in 1896.

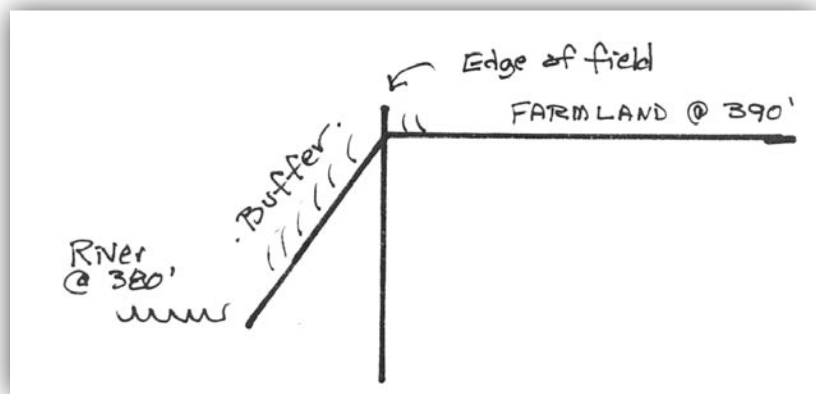
The Mudge house, see arrow, is on the far left side in the center of the picture

The fields *are* the photograph.

This photo clearly shows the vegetation on the riverbank. The shrubs protected the bank at high water times, and the trees provided additional buffer. There was a well established riparian buffer.

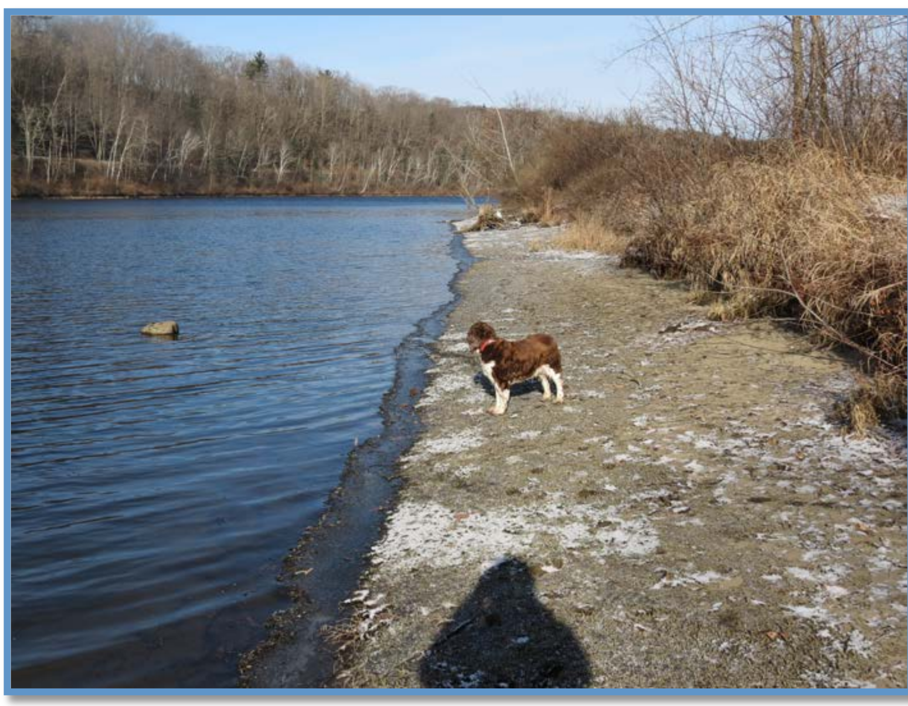
In 2013, all of these shrubs and trees are gone. There is no protection. Today there is no riparian buffer, and no such buffer can be created.

In the below sketch, imagine the river at a hypothetical 380' before the dam, with bushes and trees along the bank forming a buffer, much as in the earlier picture. The buffer is also at the border of the farmland, at an elevation of 390'.



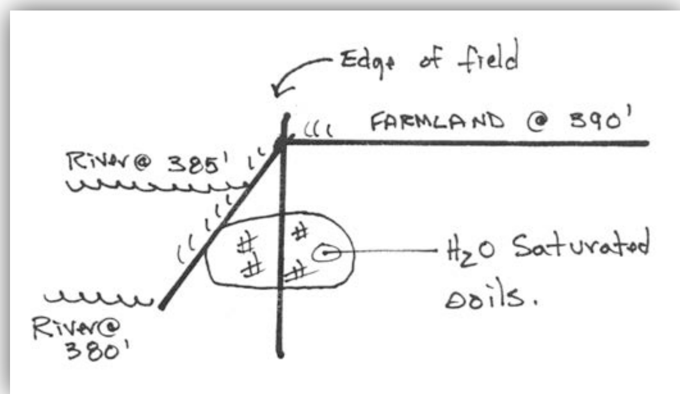
All is fine with this situation.

Now build the dam.



As shown in the above photograph, the stumps of the trees cut in the 1940s are still visible when the water is low. These trees were on the riverbank before the dam was built. The mud flats are a result of the erosion. Notice the distance between the stump, the location of the old bank, and the bank today.

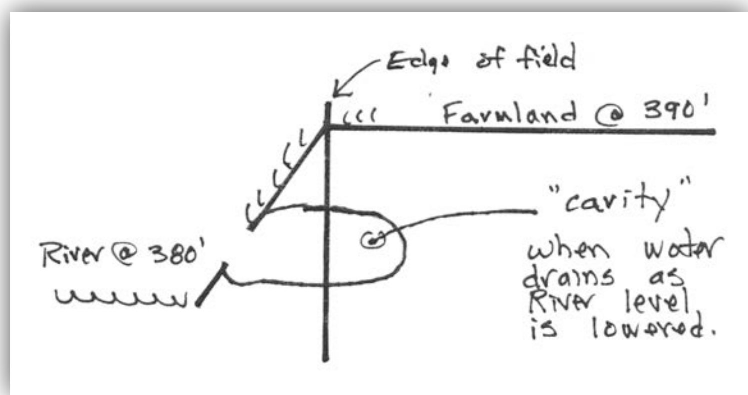
With the construction of the dam, the level of the water fluctuates, but the flowage rights are "not to exceed an assumed elevation of 385 feet." The deeds granting flowage rights say nothing about the width of the river, just the elevation of the water.



In the above diagram, the water is at the 385' level *and* water has saturated the bank and farmland. The water quickly saturates the Hadley Silt.

Then the water level goes down—

When the water is lowered, the saturated Hadley soils drain, and with the water goes some soil. This continues on a daily basis— a small amount of soil every day. Eventually, a cavity, a hole with perhaps a domed roof, is created below the surface of the ground, out of sight, as shown in the below sketch— piping.



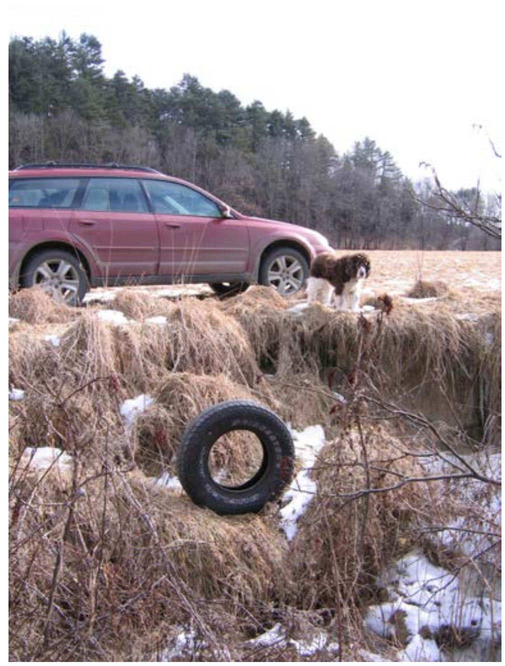
A hole in the riverbank was visible when the river level was low on November 30, 2012, the date of the below photograph. The saturated soil has drained and the soil has been eroded when the river was lowered. This hole is four feet deep. Many such holes are visible when the river is low., These holes are invisible when the water level is high, but they are still there— filled with water.

"Indirect evidence [of piping] includes primary evidence such as cavities in the bank face and deposits of removed particles in deltas or fans below a piping/sapping zone."

— D. J. Hagerty, University of Louisville

Next there are what landowners refer to as *sinkholes* along the river!

For a property owner, the sinkholes are the *first visible* consequences of the erosion. They are seen as you walk in the fields along the edge of the river. You do not see the "cavities" beneath that have been caused by the washing away of the soil because those are only visible from the mud flats when the river is low. You see the sinkholes when the "cavities" cave in.



Late 1970s *January 2012*

Sinkholes in the fields on the edge of the Connecticut River in Lyme, N. H.

On the left, Mrs. Eleanor Mudge is standing in a sinkhole, five to six feet deep, that is a result of the erosion, while the family dog appears to be suspicious of the hole.

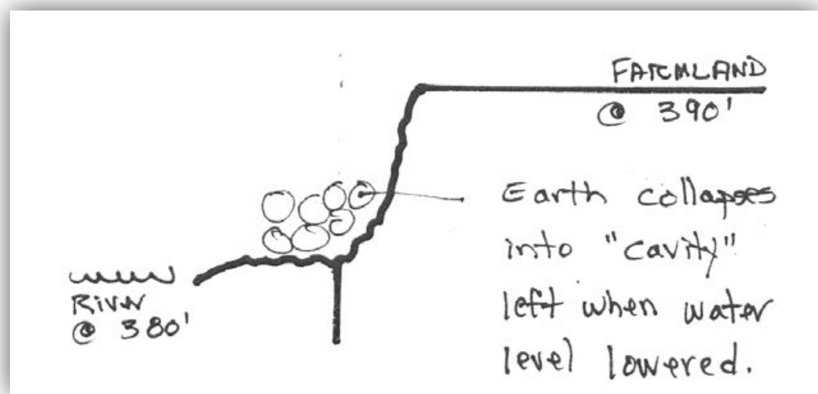
On the right, another family dog, (there have been three Springer Spaniels on the farm), seems suspicious of another sinkhole, also five to six feet deep.

Sinkholes are not good for prime agricultrual land. Some farm equipment has been damaged when a hole has collapsed beneath it. At least one horse has stumbled into one of these holes.

…local instability may be created in the soils above the cavity. Failure and erosion of streambanks occur by instability of bank soils <u>undercut</u> by piping cavities…

— D. J. Hagerty, University of Louisville

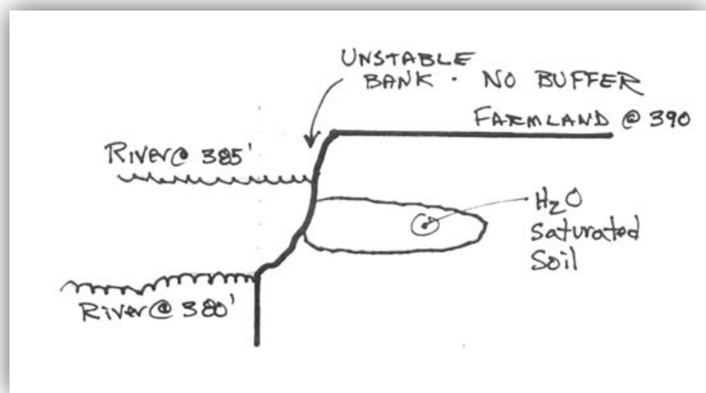
As shown in the below diagram, eventually the ground collapses, the domed cavity collapses, and sinkholes form. The edge of the field has been moved back and the riverbank is now unstable since there is no vegetation on it.



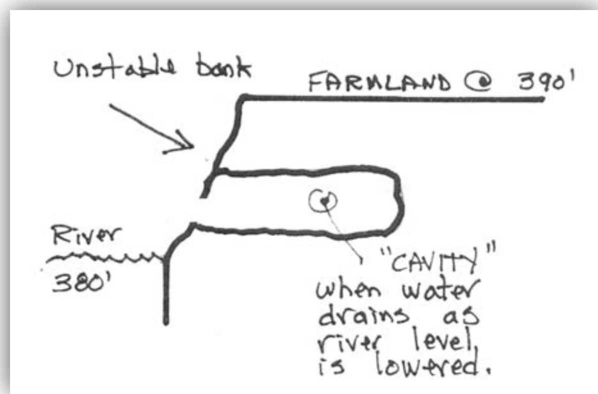
As shown above, today, November 30, 2012, the riverbank is unstable and there will be continued erosion. This is bank failure as the result of the undercutting of the bank, and there is much slump material that will continue to erode.

"Failure and erosion of streambanks occur by instability of bank soils undercut by piping cavities…" — D. J. Hagerty, University of Louisville

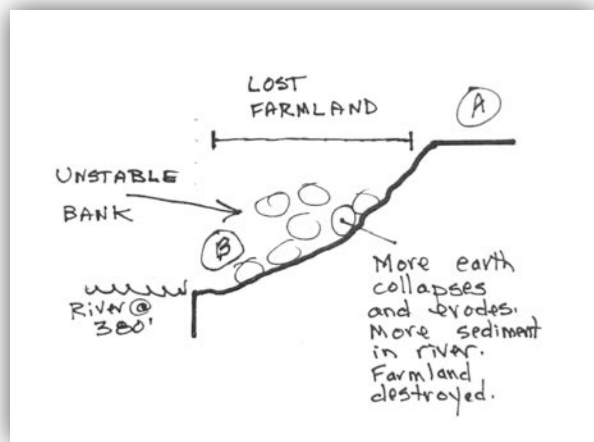
In the below sketch, the process repeats itself— on a daily basis the water level is raised and lowered and the natural flow of the river is manipulated. As the water is raised, the soil becomes saturated, and then, as the water level goes down, and the saturated soil is flushed out, another cavity is slowly, silently, and undeniably formed.



In the below diagram there is the cavity and the unstable bank.



Eventually the land collapses, there is a sinkhole, more erosion, more farmland is lost, and more sediment is in the river.



By now, people are saying that there should be a buffer at "A" in the farmland, but they are ignoring the fact that the erosion is happening at "B" and that the bank is being *undercut* by the rise and fall of the water levels. The simple truth is that no amount of planting at "A" will stop the erosion at "B". The riparian buffer must be by the water at "B." Vegetation is in the pre-1896 photograph, page 12. However, because of the dynamics of the river, the raising and lowering of the water, no vegetation will ever grow at "B" today and planting at "A" is of no use.

Just as the bank is being undercut, trees growing near it are being undercut.

These trees will eventually fall into the river and take with them tons of soil.

The erosion continues unabated. November 30, 2012—

Visible when the river was very low: The stump of a pre-Wilder Dam tree, the wider river area and the mudflats, the continued undercutting and erosion of the bank caused by the saturation of the soils along the riverbank and the subsequent collapsing and formation of sinkholes that will then continue to erode more and more land.

This cycle of erosion caused by the Wilder Dam constantly repeats itself as the level of the water rises and falls every day. This is not natural erosion that you would find in a lake. It is not the erosion that would be here if the riverbanks were bedrock rather than Hadley Silt Loam. There was a vegetation buffer before the dam was built, but the erosion prevents new vegetation from getting established. The erosion continues. Planting a buffer of shallow rooted bushes up in the fields will not prevent erosion down at the river, perhaps 6-8+ feet lower, where the higher land is being undercut by the raising and lowering of the river.

The flowage rights specified in the deeds are to an elevation of 385 feet, but the result of the saturation of the soil, the "piping", the unstable soils, the collapsing of the sinkholes and the ever continuing erosion means that much land above 385 feet has been undercut and eroded. The river has become wider. Valuable farmland has been lost.

To prevent more erosion, it may be necessary to modify the way that the Wilder Dam operates. How can the already created problems be corrected? It may take a massive mitigation effort to establish new vegetation along the river's edge.

In his book *Confluence— A River, The Environment, Politics, & The Fate of All Humanity,* a book about the Connecticut River, Nathaniel Tripp writes about the river's edge: "It is in the river's edge environment, as it is in the edges of other systems, that the variety of life is both the richest and the most sensitive to disturbance. It is in the edge, where the waters rise and fall, that eggs are most likely incubated, that larvae emerge, that seeds sprout, each species having evolved in synchrony with the river's rise and fall. When that flow is manipulated — when the magnitude, frequency, duration, and timing of flows are changed by the many uses of humankind such as dams for power generation or recreation, or water withdrawals for industrial uses, irrigation, or snow-making — there are ripple effects throughout the ecosystem that are only now beginning to be understood. Aside from the well–known cleansing and renewal of extremely high flows, there are also ecosystem benefits from extremely low flows, such as the elimination of invasive species. But few species can thrive in a river that experiences both high flows and low flows several times a day."

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V. Photographs

The National Geographic, April 1943.

This photograph by *National Geographic* photographer B. Anthony Stewart (1904-1977) was taken near the cemetery north of East Thetford VT. Stewart joined the National Geographic in 1927 and remained with that publication until his retirement in 1969. He said of his work that it was "planned but not staged." At the time of his death, Stewart had contributed more photographs to the *National Geographic* than any other photographer.
"Beside the Venerable Connecticut, a New Generation Gathers Goldenrod — Here the river passes East Thetford, Vermont— one stretch of its 400-odd miles of rapids, oxbow turns, and tidewater. From wilderness to lovely village, to smoking city, it nourishes a cross section of New England. Indians canoed it; early settlers made it their road. Flood and hurricane have not dismayed it."* [*Joann Huggett Tomlinson]

Haying Field A.

Once upon a time— Butternut Trees, now gone, growing along the edge of Field A.

Three pictures of erosion on the Mudge fields, Lyme, N. H. November 30, 2012.

The River's Edge

Hole, 5 feet deep.

Looking across to the Vermont side of the river:

Rocks below the railroad tracks across from the Mudge fields. Rocks and vegetation are protecting the riverbank.

Trees about to fall into the river in East Thetford, VT, across from the Mudge fields.

Protected riverbank in VT.

Two NRCS – U. S. Department of Agriculture projects on the Mudge fields, 2012:

A.

B.

NRCS (Natural Resources Conservation Services) approved these projects and then NH–DES (New Hampshire Department of Environmental Services) required changes. In Photo A (upper) the rocks go to the water and there is woven geotextile beneath the rocks. In Photo B (lower) NH–DES would not allow the rocks or fiber to extend to the water though the erosion extended to the water. The erosion control work in Photo B will probably fail as the water penetrates underneath the rock that has been laid down and then the rocks will collapse. The erosion control work in Photo A will probably succeed, and there will be vegetation there in future years. Both sites had silt dams. The entire project is intended to prevent the massive silting of the river that is caused by the erosion when the water undercuts the bank. The silt being "controlled" by these silt dams is but a tiny fraction of the silt that is being eroded. I believe that landowners and the USDA understand the causes of the erosion. It is important that all parties come to understand what is happening on the banks of the Connecticut River and work together to control it.

The above project was probably done in 1996 and clearly shows the vegetation, grass and bushes, that comes back over time.

And lastly, a tree near the riverbank—

and—

its root system—

In a very short period of time this tree will fall into the Connecticut River and take with it tons of soil— prime agricultural soil that is "protected" by conservation easements. Bank erosion. Bank failure. Lost farmland. Sediment in the river.

This is as clear a picture as is possible of the undercutting that is occurring along the entire riverbank. The tree did not grow this way. This erosion has *no*t been caused by water running over the field. *The riverbank is being undercut by the operation of the Wilder Dam.*

Today this is the "edge "of the field, but years ago this tree was twenty feet from the edge of the field. I took this picture standing on the mud flats and can remember when there was another larger tree 15-20 feet further to the west, behind me, towards the river. It and many tons of irreplaceable soil are gone.

No amount of planting and attempting to create a riparian buffer at the top of the bank will control this erosion.

The lost land is irretrievable. Where will the edge of the field be in 25 years? Where will food be grown?

Farmland erosion caused by the Wilder Dam must be stopped.