

Appendix 1
Landowner Survey Information



Delaware County Soil and Water Conservation District

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May 2002

Dear Resident and/or Landowner

WE NEED YOUR OPINION

As you may know, the Delaware County Soil & Water Conservation District (SWCD) is working on the development of a Stream Corridor Management Plan (SCMP) for the West Branch of the Delaware River and its tributaries. Funding is provided by a contract with the New York City Department of Environmental Protection (NYC DEP) as a part of the Memorandum of Agreement between the DEP and the watershed communities. The SWCD is a local conservation service agency based in Walton, New York.

The purpose of the SCMP is to identify the current problems and issues relating to stream management in the basin as well as unstable areas for future remediation. This shall form the framework for potential solutions and management strategies in the final Stream Management Plan. Our goal is to develop a practical plan with crucial input from you and local and state agencies. Hopefully, by working together, we can succeed in leveraging the money needed for future stream restoration projects and making the current regulatory process more user friendly.

Enclosed please find a survey that we would like you to complete and return to us by June 28, 2002. This survey is important to us to understand your thoughts and concerns with current and future management of the river and its tributaries and also to develop an understanding of historic and current land uses. The results of this survey will be compiled and made publicly available at a date to be announced.

I encourage you to call me with any questions, comments, suggestions, or requests for additional information and look forward to your reply to this survey. Thank you in advance for your time and participation.

Sincerely,

A handwritten signature in cursive script that reads "Scotty R. Gladstone".

Scotty R. Gladstone
Stream Program Coordinator

SRG:sg
encl.

**WEST BRANCH OF THE DELAWARE RIVER
STREAM CORRIDOR MANAGEMENT PROGRAM**

**LANDOWNER SURVEY ANALYSIS & RESULTS
AREA 1**

INTRODUCTION

In May 2002, the Stream Corridor Management Program surveyed riparian landowners along the West Branch main stem and the main stems major tributaries. The survey area included the Towns of Harpersfield, Kortright, and Stamford, and that part of the Kidd Brook watershed and the West Branch main stem to its confluence with Kidd Brook in the Town of Delhi, as shown on Map 1 in **Attachment A**. This area was chosen for initial distribution to keep the survey at a manageable level for our first solicitation and also because it was the area of focus for the 2002 field season. The purpose of the survey was to gain a general idea of the values they place on the river or tributary and the concerns they feel may need to be addressed.

METHODS

There are several diverse land uses and types of property along the West Branch and its tributaries. To make it possible to view trends among the different types of landowners, the survey forms were color coded and categorized by the type of land classifications identified in the Delaware County Tax database. The definitions of each property type classification and ownership codes may be obtained from the New York State Board of Real Property Services. A cover letter accompanied the survey and self-addressed return envelopes were included with the survey for the convenience of the respondents. After the surveys were returned, the data were compiled and used to create the summary tables in the next section of this report. A copy of the cover letter and survey may be found in **Attachment B**.

RESULTS

Table 1 on the following page summarizes the number of surveys distributed versus those received.

Landowner Survey- May 2002				
Category	Color	Number of Surveys Distributed	Number of Surveys Received	Number Returned As Non Deliverable
Agricultural	Green	66	20	
Commercial	Blue	22	5	
Gov't/Public Service	White	11	3	
Permanent Resident (Non-Ag)	Yellow	182	30	3
Seasonal Resident	Pink	43	24	8
Vacant Land/Forested	Purple	105	4	5
Total mailed 5/31/02		429		
Total Rec'd by 7/19/02			86	
Total Returned				16
Percent surveys received (of total mailed)		20.05		
Percent surveys returned		3.73		
Percent surveys received (adjusted for returns)		20.82		

Table 1 shows that 86 landowners responded which indicates an overall response rate of 20.05%. From the total number of surveys received, the table also shows that the most significant number of responses came from the agricultural community, seasonal residents, and permanent residents. Within these three categories of respondents, it is shown that 30.30% of the agricultural community responded, 16.48% of the non-agricultural permanent residents responded, and 55.81% of the seasonal residents responded.

For each respondent the length and type of residency was determined. The results are included in **Table 2**.

TABLE 2. LENGTH & TYPE OF RESIDENCY

Residency		
	Q	% Of total
Year-round:	56	65
0-5 yrs	1	2
6-10 yrs	2	4
11-20 yrs	12	21
Over 20 yrs	40	71
Mostly weekends:	16	19
0-5 yrs	3	19
6-10 yrs	2	13
11-20 yrs	3	19
Over 20 yrs	6	38
Summer:	9	10
0-5 yrs	0	0
6-10 yrs	1	11
11-20 yrs	3	33
Over 20 yrs	4	44
Other:	4	5
No response	1	<1

* 9 landowners did not respond to # years lived here.

Table 2 shows that 65% of the responses came from permanent residents. Furthermore, in each category of residency type, the number of respondents that have lived on the West Branch for more than 20 years represents the most significant portion. Conversely, the number of responses from the 0-5 year category was significantly low.

To illustrate the multiple benefits of the West Branch to riparian landowners, the survey asked residents what they enjoyed most about the river on their property. The results are presented in **Table 3** on the next page.

TABLE 3. FREQUENCY & PERCENTAGE OF RESPONSES TO QUESTION 4 BY LANDOWNER TYPE.

“I enjoy the West Branch on my property for...”					
Agriculture (20):	Q	%	Business (5):	Q	%
-agricultural livelihood	17	85	-agricultural livelihood	0	0
-hiking along river	5	25	-hiking along river	1	20
-camping along river	4	20	-camping along river	1	20
-the view	13	65	-the view	3	60
-wildlife viewing	9	45	-wildlife viewing	2	40
-hunting	9	45	-hunting	0	0
-fishing	10	50	-fishing	2	40
-swimming	3	15	-swimming	1	20
-canoeing/kayaking	2	10	-canoeing/kayaking	0	0
-other (written response)	1	5	-other (written response)	2	40
Gov't (3):			Part-Time Res.(24):		
-agricultural livelihood	0	0	-agricultural livelihood	4	17
-hiking along river	1	33	-hiking along river	12	50
-camping along river	1	33	-camping along river	3	13
-the view	3	100	-the view	18	75
-wildlife viewing	2	67	-wildlife viewing	19	79
-hunting	0	0	-hunting	8	33
-fishing	1	33	-fishing	13	54
-swimming	1	33	-swimming	6	25
-canoeing/kayaking	1	33	-canoeing/kayaking	2	8
-other (written response)	0	0	-other (written response)	1	4
Year-Round Res.- Non-Ag. (30):			Vacant (4):		
-agricultural livelihood	4	13	-agricultural livelihood	0	0
-hiking along river	10	33	-hiking along river	1	25
-camping along river	3	10	-camping along river	0	0
-the view	24	80	-the view	2	50
-wildlife viewing	24	80	-wildlife viewing	3	75
-hunting	11	37	-hunting	1	25
-fishing	14	47	-fishing	2	50
-swimming	10	33	-swimming	1	25
-canoeing/kayaking	3	10	-canoeing/kayaking	0	0
-other (written response)	5	17	-other (written response)	0	0

When considering the three most significant demographic groups based on the number of responses, the survey results can be evaluated by the trends viewed in each. **Table 3** shows that the agricultural community considered the primary benefits of living on the West Branch to be agricultural livelihood (85%), aesthetics (65%), and fishing (50%) respectively. Permanent, non-agricultural residents were split between aesthetics and wildlife viewing (80%), but also considered fishing (47%) as a major benefit. Similarly, part-time residents listed aesthetics (75%), wildlife viewing (79%), and fishing (54%) as the primary benefits of the river on their property. Among all types of demographic groups, the aesthetics of the West Branch is the main benefit to having property along the river.

The landowner class and the years of residence analyzed landowner opinions about the condition of the West Branch on their property. The results are shown in **Table 4**.

TABLE 4. FREQUENCY & PERCENTAGE OF LANDOWNER RESPONSES TO QUESTION 5: “CONDITIONS ON THE WEST BRANCH ARE...”

"Conditions on the West Branch" by landowner type & years lived here					
Agriculture (20):	Q %	0-5	6-10	11-20 (4)	Over 20 (16)
-excellent	3 15				19%
-good	11 55			50%	56%
-fair	2 10			25%	6%
-poor	4 20			25%	19%
Business (5):		0-5	6-10	11-20 (1)	Over 20 (3)
-excellent	1 20				33%
-good	4 80			100%	67%
-fair	0 0				
-poor	0 0				
Gov't (3):		0-5	6-10	11-20	Over 20 (3)
-excellent	0 0				
-good	1 33				33%
-fair	0 0				
-poor	2 67				67%
Part-Time Res.(24):		0-5 (3)	6-10 (3)	11-20 (6)	Over 20 (8)
-excellent	9 38	33%	33%	67%	38%
-good	12 50	67%	67%	17%	50%
-fair	2 8			17%	13%
-poor	0 0				
Year-Round Res.– Non-Ag (30):		0-5 (1)	6-10 (2)	11-20 (7)	Over 20 (19)
-excellent	12 40	100%	100%	29%	37%
-good	11 37			57%	32%
-fair	3 10			14%	11%
-poor	4 13				21%
Vacant (4):		0-5	6-10	11-20	Over 20
-excellent	0 0				
-good	1 25				
-fair	1 25				
-poor	0 0				

Table 4 shows that in general, landowners who have lived on the West Branch for at least 11 years consider the conditions on the river to be good, but there could be some improved management. 55% of the agricultural community and 50% of seasonal residents believe that conditions are good. Permanent (non-ag) residents however were split closely between feeling that conditions are excellent and in no need of a change (40%), and that conditions are good (37%). Collectively, the remaining portions of landowners (government, businesses, and vacant landowners) represent a small percentage of responses. However, their responses may also help to gain a better understanding of landowner opinion.

Table 5 shows the frequency and percentage of total responses to the question regarding landowner's main concerns about the West Branch.

TABLE 5. SUMMARY OF LANDOWNER'S MAIN CONCERNS

"Main Concerns are..."		
Problem	Q	% of total
-bank erosion	50	58
-flooding of property	33	38
-gov't regs of private property	32	37
-obtaining permits	25	29
-time and money required for proper stream care	23	27
-pollution from upstream runoff, dumping	19	22
-impaired fishing	17	20
-trespassing	16	19
-how it affects my livelihood	14	16
-washouts	13	15
-other (written response)	11	13
-groundwater connection to my well	4	5

Table 5 shows that the top three concerns of landowners are bank erosion, flooding, and government regulations of private property. The results were categorized further in **Table 6** to show trends between main concerns and the type of landownership.

TABLE 6. MAIN CONCERNS ABOUT THE RIVER BY LANDOWNER TYPE.

Main Concerns About The River	Agriculture (20):		Business (5):		Gov't (3):		Part-Time Res.(24):		Year-Round Res. (30):		Vacant (4):	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
-bank erosion	16	80	2	40	2	67	10	42	17	57	3	75
-flooding of property	10	50	3	60			9	38	11	37	1	25
-impaired fishing	1	5					7	29	8	27	1	25
-groundwater connection to my well							2	8	2	7		
-pollution from upstream runoff, dumping	4	20			1	33	10	42	3	10	1	25
-trespassing	4	20	2	40			4	17	6	20		
-obtaining permits	10	50	2	40	2	67	4	17	7	23		
-time and money required for proper stream care	12	60	1	20	1	33	2	8	7	23		
-gov't regs of private property	11	55	3	60	1	33	8	33	9	30		
-washouts	2	10			1	33	3	13	6	20	1	25
-how it affects my livelihood	7	35	2	40					5	17		
-other (written response)	2	10	1	20			2	8	3	10	3	75

Table 6 illustrates that the majority of respondents in each landowner type indicated bank erosion as their main concern. Flooding of property also seemed to be of universal

importance to landowners. However, compared to other types of landowners, the agricultural community has the highest degree of concern for bank erosion. The agricultural community is also more concerned with the time and money required for proper stream care than the other types of landowners. On the other hand, the table shows that farmers are much less concerned about impaired fishing than permanent (non-ag) and seasonal residents, who exhibit a relatively high degree of concern. Furthermore, seasonal residents show a high level of concern for pollution, while for the other landowner types, the level of response is not as significant.

The survey asked landowners to rate the severity of flooding along the West Branch. **Table 7** is a summary of the results.

TABLE 7. SUMMARY OF RESPONSES TO FLOODING PROBLEM

Flooding Problem		
Response	Q	% of total
-relatively minor problem	40	47
-frequent problem	20	23
-has never been a problem	18	21
-has worsened	3	3
-no response	2	2
-other (written response)	2	2
-has improved	0	0

Table 7 shows that the majority of respondents believe that flooding along the West Branch is a relatively minor problem.

The responses to the flooding problem were also categorized by the type of landowner and the years they have lived on the West Branch. The most significant trends may be seen in the portion of respondents that have lived on the river for more than twenty years. Of the sixteen farmers residing on the West Branch for over twenty years, 50% felt that flooding has been a relatively minor problem. The highest percentages of seasonal and permanent residents living on the river for over twenty years feel the same. In addition, none of the seasonal residents feels that flooding is a frequent problem, but a small portion of farmers and permanent residents feel that it is a frequent problem.

The next question in the survey sought to gain an understanding of how landowners have been affected by floods. **Table 8** is a summary of the total responses to the question.

TABLE 8. SUMMARY OF RESPONSES TO
“I HAVE BEEN AFFECTED BY FLOODING...”

"Affected by flooding..." Total Responses		
Response	Q	%
Never	37	43
A number of times	32	37
Blank	7	8
Once	6	7
Extensively	4	5

Table 8 shows that the majority of respondents have either never been affected by flooding or have been affected a number of times. The results were further categorized in the table below to show possible trends based on length of residency and landowner type.

TABLE 9. RESPONSES TO QUESTION 9 BASED ON LENGTH OF RESIDENCY & LANDOWNER TYPE

Responses to "I have been affected by flooding..."						
Type & Length of Residency	Expressed as a %					Total
	Never	Once	A number of times	Extensively	Blank	
Agriculture (20):						
11-20 yrs		25	50	25		4
Over 20 yrs	19		44	13	25	16
Business (5):						
11-20 yrs	100					1
Over 20 yrs	67		33			3
No response	100					1
Gov't (3):						
Over 20 yrs	33		67			3
Part-Time Res.(24):						
0-5 yrs	67		33			3
6-10 yrs	67	33				3
11-20 yrs	33	33			33	6
Over 20 yrs	44		56			9
No response	67	33				3
Year-Round Res.- Non-Ag. (30):						
0-5 yrs	33					1
6-10 yrs	50		50			2
11-20 yrs	57		43			7
Over 20 yrs	53		42		5	19
No response			100			1
Vacant (4):						
No response	50		25		25	4

The most significant trend seen in **Table 9** is that the largest proportion of landowners who said that they had never been affected by flooding were permanent residents with at least 11 years of residence on the West Branch. A majority of the agricultural community responded that they had been affected by flooding a number of times, while part-time residents seem to have had less of a problem with flooding on their property. A trend in the data is much less obvious for the other types of landowners, due to the relatively low number of responses.

Next, landowners were asked to describe how floods have affected them. **Table 10** on the following page is a summary of the results. Additional descriptions of damage may be found in **Attachment C**.

TABLE 10. TYPES OF DAMAGE BASED ON FLOOD FREQUENCY

Type of Damage per Frequency of Flooding Response									
Response	Expressed as a %						Total (Q)	%	
	water damage to my house	washout of road/private bridge	washout of bridge access(public)	erosion of river banks	loss of cropland	loss of cropland			no response
Never							100	37	43
Once	17	50					33	6	7
A number of times	9	47	16	63	16	3		32	37
Extensively				25	100			4	5
Blank (no response)	43	43			14	14		7	8

Of those who said that they had been affected a number of times, bank erosion (63%) and road/private bridge washout (47%) were the number one responses. This trend also correlates with the question regarding landowner’s main concerns where bank erosion was also indicated as a major problem for landowners.

The survey then asked landowners what they felt was the best solution to flooding problems. To obtain the most unbiased response from landowners, the question did not provide any opportunities to check an answer box but rather left the question open-ended so that respondents would be free to make any suggestions they wished. The responses to this question may be found in **Attachment D**.

Many landowners indicated that they enjoy fishing on the West Branch. The respondents that indicated fishing as a major benefit (49%) were then further categorized by their opinions of the fishing conditions on the river. The results are presented in **Table 11** on the next page.

TABLE 11. SUMMARY OF LANDOWNER OPINIONS ABOUT FISHING CONDITIONS ON THE WEST BRANCH.

Condition has...	Q	%	Reasons/ Comments
Improved:	7	17	Clean. Increased stocking return of holes after 95 flood.
Deteriorated:	14	33	Too many beaver dams. Do not know- but class of people has changed they leave all their garbage where they fish. Soil erosion from runoff. Do not know. Cannonsville Dam killed off most warm water species and prevents shad migration. No management. Flooding Reason unknown to me.
Remained Consistent::	13	31	
No response:	8	19	

Table 11 illustrates that most landowners who enjoy fishing on the West Branch feel that the conditions have either deteriorated or remained the same. The comment section further displays what the respondents feel are the reasons for the decline in conditions.

Table 12 below examines who landowners feel should make decisions regarding stream management.

TABLE 12. SUMMARY OF LANDOWNER OPINIONS ABOUT WHO SHOULD MAKE STREAM MANAGEMENT DECISIONS.

Decisions should...	Q	%	Full-Time Res (56)	Part-Time Res (24)
be shared b/t landowners and local gov't	35	41	43%	36%
rest w/ landowners	25	29	27	36
don't know	12	14	20	4
blank	5	6	5	8
other	4	5	4	4
rest w/ SWCD's	2	2	2	4
rest w/ state gov't	2	2	0	4
rest w/ fed. gov't	1	1	0	4
rest w/ town gov't	0	0	0	0
rest w/ county gov't	0	0	0	0

Table 12 shows that the majority of respondents believe that stream management decisions be shared between local government and the landowner. 43-percent of those responses came from full-time residents. Part-time residents on the other hand, are split between thinking that solely the landowners should make decisions and that decisions be shared with local government.

The results were categorized further to show how different types of landowners with different lengths of residency felt about stream management decision-making. The results are shown in **Table 13**.

TABLE 13. LANDOWNER OPINION OF DECISION-MAKING BASED ON LENGTH OF RESIDENCY & LANDOWNER TYPE

"Decisions should..." Based on Landowner Type & Years of Residence											
Type & Length of Residency	Expressed as a%							Total Responses			
	rest w/ landowners	be shared b/t landowners and local gov't	rest w/ SWCD's	rest w/ town gov't	rest w/ county gov't	rest w/ state gov't	rest w/ fed. Gov't		don't know	other	blank
Agriculture (20):											
11-20 yrs	100										4
Over 20 yrs	38	50					6	6			16
Business (5):											
11-20 yrs	100										1
Over 20 yrs	33								67		3
No response	100										1
Gov't (3):											
Over 20 yrs	100										3
Part-Time Res.(24):											
0-5 yrs	67									33	3
6-10 yrs	67	33									3
11-20 yrs	17	33			17	17		17			6
Over 20 yrs	33	44					11		11		9
No response	67	33									3
Year-Round Res.- Non-Ag (30):											
0-5 yrs	100										1
6-10 yrs							100				2
11-20 yrs	57	14					29				7
Over 20 yrs	37	21	5				26	5	5		19
No response									100		1
Vacant (4):											
No response	25	25			25			25			4

Table 13 further illustrates that the majority of respondents felt that decisions about stream management should be shared between landowners and local governments. There does not appear to be any significant trends with landowner types or length of residency.

The next question in the survey asked landowners what they would like changed about the West Branch. A list of the responses may be found in **Attachment E**.

The remaining question posed to landowners dealt with who they believe should have primary financial responsibility of stream management on private property. The results are summarized in **Table 14**.

TABLE 14. SUMMARY OF LANDOWNER OPINIONS ABOUT FINANCIAL RESPONSIBILITY OF STREAM MANAGEMENT

<u>Primary Financial Responsibility should...</u>	<u>Q</u>	<u>%</u>
be shared b/t landowners and local gov't	26	33
don't know	16	20
rest w/ SWCD's	15	19
rest w/ state gov't	9	11
no response	7	9
rest w/ landowners	6	8
rest w/ fed. gov't*	4	5
other	3	4
blank	0	0
rest w/ town highway dept.	0	0
rest w/ county highway dept.	0	0

* 1FEMA, 2 NRCS, 1USF&W

The results of **Table 14** show correlation between the results in **Table 12**. The majority of responses for both indicate that landowners feel that decision-making as well as the primary financial responsibility for stream management should be shared between landowners and local government. The distinct difference between the results is that while a relatively large number stated that decisions should be made by landowners, only a small fraction felt that they should bear the financial responsibility alone. Furthermore, a much higher percentage felt that County Soil & Water Districts should be financially responsible, whereas the number of responses for the same category in **Table 12** was much less. A list of the written responses to this question may be found in **Attachment F**.

CONCLUSIONS

During the process of tabulating the responses, several portions of the survey were identified as areas that could be improved upon before the next mailing in Spring 2003. The proposed improvements would simplify the task of summarizing the results and allow trends in the data to be viewed much easier. The following suggestions are:

- Group “mostly on weekends” and “primarily in the summer” into one category entitled “Part-time” with a short description in parenthesis. i.e. (seasonal, weekend, other).
- Instruct respondents to check only one box for the type of property.

- In each question that refers to the “West Branch”, change the phrasing of the question to read “West Branch or tributary”.
- Change questions 12 and 14 by instructing respondents to check only one box OR to rank their responses, i.e. top 3 choices in order of importance.
- Mixing the current order of choices in Questions 12 and 14 so as not to bias the response and to encourage respondents to look at all the choices rather than those at the top of the list.

The changes suggested will alleviate difficulty in generating results from landowner surveys in the future.

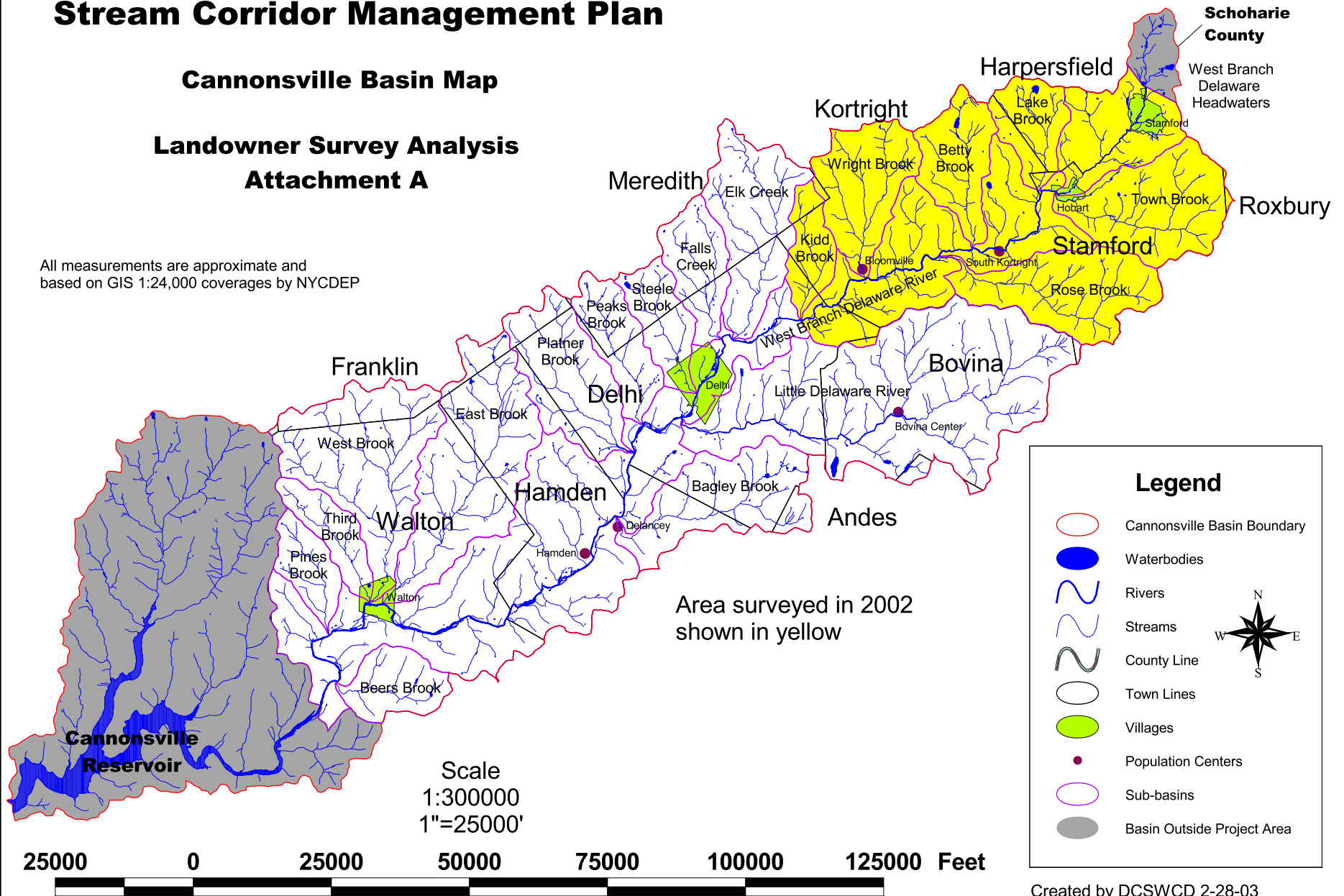
It has also been suggested that we get the Town Supervisors to sign the cover letter accompanying the survey. This may generate a greater response.

West Branch of the Delaware River Stream Corridor Management Plan

Cannonsville Basin Map

Landowner Survey Analysis Attachment A

All measurements are approximate and based on GIS 1:24,000 coverages by NYCDEP



Area surveyed in 2002
shown in yellow

Legend

- Cannonsville Basin Boundary
- Waterbodies
- Rivers
- Streams
- County Line
- Town Lines
- Villages
- Population Centers
- Sub-basins
- Basin Outside Project Area

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West Branch – Delaware River Stream Management Program Landowner Survey Form

Please take a few minutes to complete the following survey questions. This survey is designed to give the Stream Corridor Management Program Team at the Delaware County SWCD a general idea of the importance of the West Branch of the Delaware River to the landowners, and what values you place on the river. Please include additional information on a separate sheet of paper and return with this form. Thank you for your assistance with this project.

I live in the West Branch river valley

- Year round Mostly on weekends
- Primarily in the summer

- How it affects my livelihood
- Other (please explain)

I've lived here _____ years

My property is:

- Agricultural Residential Non-Profit
- Business Agency/Government

While I've lived here, flooding along the West Branch

- Has been a frequent problem
- Has been a relatively minor problem
- Has never been a problem
- Has worsened
- Has improved
- Other (please explain)

**I enjoy the West Branch river on my property for
(check all that apply)**

- Agricultural livelihood
- Hiking along the river
- Camping along the river
- The view
- Watching the wildlife, birds
- Hunting along the river
- Fishing
- Swimming
- Canoeing/Kayaking
- Other (please explain)

**I personally have been affected by flooding
(check all that apply)**

- Never Once A number of times Extensively
- Water damage to my house
- Washout of road access or private bridge
- Washout of bridge access (public bridge)
- Erosion of river banks Loss of cropland

Describe Damages: _____

Conditions on the West Branch in my area are generally

- Excellent, needs no change in management
- Good, but could use some improved management
- Fair, needs much more management
- Poor, needs urgent management

The best way to solve flooding problems is to:

Please explain:

**My main concerns about the river include
(check all that apply)**

- Bank erosion
- Flooding of property
- Impaired fishing
- Groundwater connection to my well
- Pollution from upstream runoff, dumping
- Trespassing
- Obtaining permits for stream work
- Time and money required for proper stream care
- Government regulation of private property rights
- Washout of roads and bridges

Fishing on the West Branch has generally

Improved in recent years. The reason is:

Deteriorated in recent years. The reason is:

Remained consistent

Decisions about how streams are managed on private property should

- Rest with landowners
- Be shared between landowners and local government
- Rest with the County Soil and Water Districts
- Rest with the Town government
- Rest with the County government
- Rest with the State government
- Rest with the Federal government
 - FEMA
 - Army Corps of Engineers
 - Natural Resources Conservation Service
 - U.S. Fish and Wildlife
- Don't know
- Other (please explain)

What would you like changed about the West Branch?

The primary financial responsibility for management of streams on private property should

- Rest with landowners
- Be shared between landowners and government
- Rest with the County Soil and Water Districts
- Rest with the Town highway department
- Rest with the County highway department
- Rest with the State government
- Rest with the Federal government
 - FEMA
 - Army Corps of Engineers
 - Natural Resources Conservation Service
 - U.S. Fish and Wildlife
- Don't know
- Other (please explain)

Optional Information

Name _____
Address _____
Phone _____
E-Mail _____

I would be willing to participate on the West Branch Project Advisory Committee for the development of the management plan. Yes No

Thank You for Your Assistance

Return address optional



**Delaware County Soil & Water Conservation District
44 West Street, Suite 1
Walton, NY 13856**

Please fold & seal with tape or staple

ATTACHMENT C:

FLOOD DAMAGE DESCRIPTIONS

AGRICULTURE COMMENTS:

1. Flooding pasture, stranded animals and washed out fences.
2. Logs and debris left on cropland after water recedes.
3. a) Water took out our water line from spring to barn
b) Took out our passage way so that our machinery cannot cross over to our pastures.
4. 3 Acre lot had to be re-soiled after major washout.
5. Needed to fill back around culverts.
6. River becomes blocked by debris from above deserted land. Water floods over one of the main meadows on my farm.
7. Flooding on fields.
8. Cuts into banks, general flooding of my field.
9. Have had to do major repair work due to wash outs several times.

BUSINESS COMMENTS:

1. No damage to house came up into driveway.

SEASONAL RESIDENT COMMENTS:

1. In 1995, the wing walls to my bridge were washed away and bank damage occurred.
2. They were working on the main road and redirected overflow. We had a rainstorm and our lower field flooded and our road washed out and the bridge was damaged.
3. Soil washout from field.

YEAR ROUND (NON-AG) RESIDENT COMMENTS:

1. Roof needed replacing loss of all personal items in basement including: a pool table, needed a new water heater, etc.
2. Water completely took out end of driveway (access to road) and washed out all and part of road.
3. Since 1989, I have lost approximately a 6'x20' amount of soil.
4. Several washouts have cause access to be limited.
5. You've seen them!
6. Road washed out and public bridge destroyed.
7. 5 ft. of water in my cellar. My driveway washed out. My riverbanks eroded more and more.
8. Have replaced bridge and pond in low area also got flood debris in it.
9. Washed out driveway, water in cellar, damaged sheet rock and some furniture.

VACANT COMMENTS:

1. Washed out road to camp twice in last 10 years.

ATTACHMENT D:

QUESTION # 10 **LANDOWNER OPINIONS** **OF POTENTIAL FLOODING SOLUTIONS**

AGRICULTURE

1. Cannot be solved, natural phenomenon. Stabilizing stream banks would certainly be a plus and removing gravel bars.
2. I have not a clue-hope you do!
3. Maintain riverbanks, clean out gravel deposits and fallen trees.
4. Plant trees to slow down erosion. Flooding is in God's hands. We can only slow down the results of flooding by preventive measures.
5. Use large rocks if available to slow water force.
6. Let landowners clean stream banks when needed.
7. Clean out the existing river and clean debris out on above vacant land owned by city people.
8. River bank management with rock!
9. Rip rap, clean out gravel bars, deepen and narrow the streams.

GOV'T

1. Maintain floodwater plains and stabilize banks.

SEASONAL RESIDENTS

1. I thought that's what you fellas did.
2. As I understand it, flooding is a problem when structures are built in a flood zone. If building in the flood zone is restricted, the floods can occur naturally without interfering with activities.
3. Need bridge over stream instead of pipe under driveway on my property. In general, large overflow basins in strategic flood areas may help minimize the occasional flooding. The basins require good drainage so they empty soon after filling.
4. My property is raised so no problems like neighbors.
5. Have a program to rebuild bank in the summer. A log framework backfilled with rocks from the river bottom works best.
6. They fixed the overflow and it hasn't happened since then.
7. By dredging the river bottom
8. Reinforce bulkhead, replace broken rotted out beams.

YEAR-ROUND RESIDENTS

1. Bank is too high for property to flood here.
2. There isn't a flooding problem this far up stream. In this case, leave Mother Nature alone!!!
3. Bank the riverbanks.

ATTACHMENT D:

4. Build up the bank on both side of stream.
5. Dig riverbeds deeper and town to make and maintain ditches and other water escape ways. Ditches on Kiff Brook Road have not been cleaned in about 2-3 years.
6. Repair Banks. A wall next to me made from railroad ties is washing out.
7. I may try to place naturally occurring local stone on a bulkhead along the erosion line (can I do this?)
8. Is proper drainage sizes calculated by water flow that can be substantial better management of washouts that happens at least every three years cause by rain snow melt and the like.
9. Make channel deeper clean all debris, cut brush, etc.
10. Spend money wisely.
11. Have clean up of brush and fallen trees.
12. The stream comes over the banks by Gregory's garage then down the street into my yard and cellar. Deepen the stream to accept extra water. Down stream put up a floodwall where it comes over the banks.
13. Cleaning of riverbed trees and gravel bars. Planting trees to hold stream banks. Also the DEC use to reinforce the banks with stone wire and treated logs. This hasn't been done since the mid 1960's.
14. Walk the entire watercourse and design remedies with qualified technicians. Provide funding for remedies.

ATTACHMENT E:

QUESTION 13

WHAT WOULD YOU LIKE CHANGED ABOUT THE WEST BRANCH?

AGRICULTURE COMMUNITY

1. Easier permit process to remove gravel bars.
2. Gravel bars removed.
3. Increase fish population.
4. See file "additional Survey Comments" Survey #10
5. It would do me no good to give my opinion because the other organization would only disagree-I have tried.
6. Stream bank improvement without a lot of hassle.
7. See file "additional survey comments" #21

BUSINESS COMMUNITY

1. Garbage removed and better entrance and fines to people who leave it.

PART-TIME RESIDENTS

1. Stock more fish.
2. More public fishing access parking areas.
3. Stable banks and stream improvement for recreational fishing.
4. Rebuild banks where erosion has occurred.
5. Property owners get some rights back (example being able to construct a bridge over a stream without going broke from cost of regulations)
6. Old abandoned farms have dumped old machinery and all kinds of junk along the banks. It is an eyesore, yet it remains to set there.

YEAR-ROUND RESIDENTS

1. Nothing.
2. Nothing except governmental intervention remove the governmental intervention.
3. Build up banks.
4. Cleaned up
5. To remove NY City's regulation of it and turn it back to DEC.
6. Better access & WS management.
7. Eliminate pollution completely now!
8. More bank erosion protection offered.
9. I would like the dead trees removed which cause obstructions.
10. Clean up of river beds, banks re-do the DEC reinforcement on the banks that need it.
11. Get it out from under the thumb of N.Y. City.
12. Restoration of DEC installed pool diggers, cribbing and other structures.
Stabilization of severely eroding bank areas, which are adding much of the "silt" to the water during floods.
13. Clear fallen river trees and debris.
14. Nothing
15. No change.

ATTACHMENT F:

QUESTION 14
**RESPONSES TO “PRIMARY FINANCIAL RESPONSIBILITY FOR STREAM
MANAGEMENT SHOULD...”**

Written Responses:

1. We need to access every and all agencies for financial assistance and man power.
2. NYCDEP too because of NYC watershed regulatory burden.
3. Let NYC pay for it. They had a free ride for too long!!!!
4. NYC
5. At the upper river area there is no need for any agency to be financial responsible because there is no need to manage it.
6. If stream needs improvements the government should pay for it without the landowner giving up his rights.

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Delaware County Soil and Water Conservation District

44 West Street, Suite 1

Walton, New York 13856

Phone 607-865-7161
FAX 607-865-5535

April 2003

Dear Resident and/or Landowner

WE NEED YOUR OPINION

Enclosed is a survey that we would like you to complete and return by May 30, 2003. This survey is important to understand your thoughts and concerns with current and future management of the West Branch of the Delaware River and its tributaries, and to develop an understanding of historic and current land uses.

This survey is a component of a Stream Corridor Management Plan (SCMP) for the West Branch of the Delaware River and its tributaries being developed by the Delaware County Soil & Water Conservation District. Funding is provided by a contract with the New York City Department of Environmental Protection (DEP) as a part of the Memorandum of Agreement between the DEP and watershed communities.

The purpose of the Stream Corridor Management Program is to identify the current problems and issues relating to stream management in the basin, and to identify unstable areas for future remediation. This shall form the framework for potential solutions and management strategies in the final SCMP. The goal is to develop a practical plan with crucial input from you and local and state agencies. Hopefully, by working together, we can succeed in leveraging the money needed for future stream restoration projects and making the current regulatory process more user friendly.

I encourage you to call with your questions, comments, suggestions, or requests for additional information, and look forward to your reply. Thank you in advance for your time and participation.

Sincerely,

A handwritten signature in cursive script that reads "Scotty R. Gladstone".

Scotty R. Gladstone
Stream Program Coordinator

SRG:sg
encl.

WEST BRANCH OF THE DELAWARE RIVER STREAM CORRIDOR MANAGEMENT PROGRAM

LANDOWNER SURVEY ANALYSIS & RESULTS AREA 2

INTRODUCTION

In April 2003, the Stream Corridor Management Program (SCMP) surveyed riparian landowners along the main stem of the West Branch and each of the major tributaries in the lower half of the Cannonsville watershed. The survey area included the Town and Village of Delhi, Town of Meredith, Town of Hamden, Town of Bovina, and the Town and Village of Walton as illustrated on Map 1 in **Attachment A**. The purpose of the survey was to gain a general idea of the importance of the river or tributary in the landowner's lives and to gain insight into problems or concerns they feel may need attention.

METHODS

There are several diverse land uses and types of property along the West Branch and its tributaries. To make it possible to view trends among the different types of landowners, the survey forms were color coded and categorized by the type of land classifications identified in the Delaware County Tax database. The definitions of each property type classification and ownership codes may be obtained from the New York State Board of Real Property Services. A cover letter accompanied the survey and self-addressed return envelopes were included for the convenience of the respondents. A copy of the cover letter and survey may be found in **Attachment B**.

The survey mailed to Area 2 riparian landowners had some minor differences from the original survey that Area 1 residents received. The changes made are as follows:

- The first question was shortened to only two available responses: Year-round or Part-time.
- Different lengths of time were provided in a check box format as opposed to the write-in response in the Area 1 survey.
- All references made to the West Branch in the Area 1 survey were changed to include tributaries so as not to limit a response from a landowner who may not live on the main stem.
- If the landowner lives on a tributary of the West Branch, the Area 2 survey asked residents to please indicate which one.
- Questions 12 and 14 were changed so that the list of possible responses was scrambled so as not to bias the results. Furthermore, the questions were altered from the original format of "check all that apply" to a ranking system whereby respondents were asked to rate their top three choices by placing a number next to their selection.

For use as a basis for comparison, a copy of the original Area 1 survey can be found in **Attachment C**.

After the surveys were returned, the data were compiled and used to create the summary tables in the next section of this report. The data and landowner comments will then be considered during the process of drafting a comprehensive Stream Corridor Management Plan for the West Branch basin.

RESULTS

Table 1 summarizes the number of surveys distributed versus those received as well as the percent response for each land use classification.

TABLE 1. RESPONSE TO AREA 2 LANDOWNER SURVEY.

Landowner Survey April 2003						
Land Type	Color	Number of Surveys Distributed	Number of Surveys Received	Number Returned As Non Deliverable	% of Total Received by Land Type	% of Total Received
Agricultural	Green	90	21	2	23	15
Commercial	Blue	55	9	5	18	6
Gov't/Public Service	White	28	4	0	14	3
Permanent Residence	Yellow	306	84	17	29	58
Seasonal Residence	Pink	114	21	15	21	15
Vacant Land/Forested	Purple	80	5	10	7	3
Total mailed:04/12/03		673				
Total Rec'd by:06/17/03			144			
Total Returned				49		
Percent surveys received (of total mailed)		21				
Percent surveys returned		7				
Percent surveys received (adjusted for returns)		23				

Table 1 shows that 144 landowners responded which indicates an overall response rate of 21%. From the total number of surveys received, the table also shows that the most significant number of responses came from the permanent residents, the agricultural community, and seasonal residents respectively. Within these three categories of respondents, it is shown that 29% of permanent residents responded, 23% of the agricultural community responded, and 21% of the seasonal residents responded.

Table 2 on the following page shows the percentage of respondents who indicated that they live on a tributary of the West Branch.

TABLE 2. PERCENTAGE OF TOTAL RESPONDENTS LIVING ON A WEST BRANCH TRIBUTARY.

Tributary	Q	% of Total
Bagley Brook	3	2.1
Brush Brook	1	0.7
East Brook	12	8.3
Elk Creek	3	2.1
Freer Hollow	1	0.7
Honest Brook	2	1.4
Little Delaware River	13	9.0
Oxbow Brook	1	0.7
Peake's Brook	2	1.4
Pines Brook	1	0.7
Platner Brook	5	3.5
Steele Brook	7	4.9
Third Brook	3	2.1
West Brook	7	4.9
TOTALS	61	42.7

Table 2 shows that almost 43 percent of riparian landowners that responded to the survey own property along a tributary of the West Branch. Furthermore, responses from riparian landowners along a tributary accounted for nearly 10 percent of the total surveys mailed. The highest level of response came from the Little Delaware River, which comprised over 9 percent of the total 144 responses.

For each respondent the length and type of residency was determined. The results are included in **Table 3**.

TABLE 3. LENGTH & TYPE OF RESIDENCY

Residency	Residency	
	Q	% Of total
Year-round:	97	82
0-5 yrs	3	3
6-10 yrs	2	2
11-20 yrs	16	14
Over 20 yrs	71	62
Part-time:	22	18
0-5 yrs	2	2
6-10 yrs	0	0
11-20 yrs	8	7
Over 20 yrs	12	10

* 5 landowners did not respond to # years lived here.

Table 3 shows that 82% of the responses came from permanent residents. Furthermore, in each category of residency type, the number of respondents that have lived on the West Branch or tributary for more than 20 years represents the most significant portion. Conversely, the number of responses from the 0-5 and 6-10 year category was significantly low.

To illustrate the multiple benefits of the West Branch to riparian landowners, the survey asked residents what they enjoyed most about the river on their property. The results are presented in **Table 4** shown below.

TABLE 4. FREQUENCY & PERCENTAGE OF RESPONSES TO QUESTION 4 BY LANDOWNER TYPE.

"I enjoy the West Branch on my property for..."					
Agriculture (20):		Q	%	Business (9):	
-agricultural livelihood	19	95	-agricultural livelihood	1	11
-hiking along river	8	40	-hiking along river	0	0
-camping along river	2	10	-camping along river	1	11
-the view	15	75	-the view	9	100
-wildlife viewing	16	80	-wildlife viewing	6	67
-hunting	7	35	-hunting	2	22
-fishing	11	55	-fishing	3	33
-swimming	4	20	-swimming	1	11
-canoeing/kayaking	5	25	-canoeing/kayaking	1	11
-other (written response)	1	5	-other (written response)	1	11
Gov't (4):				Part-Time Resident (21):	
-agricultural livelihood	0	0	-agricultural livelihood	0	0
-hiking along river	2	50	-hiking along river	10	48
-camping along river	1	25	-camping along river	1	5
-the view	2	50	-the view	20	95
-wildlife viewing	2	50	-wildlife viewing	19	90
-hunting	0	0	-hunting	3	14
-fishing	2	50	-fishing	12	57
-swimming	0	0	-swimming	6	29
-canoeing/kayaking	2	50	-canoeing/kayaking	8	38
-other (written response)	0	0	-other (written response)	2	10
Residential (85*):				Vacant (4):	
-agricultural livelihood	7	9	-agricultural livelihood	2	40
-hiking along river	27	35	-hiking along river	3	60
-camping along river	9	12	-camping along river	2	40
-the view	61	78	-the view	3	60
-wildlife viewing	73	94	-wildlife viewing	5	100
-hunting	16	21	-hunting	3	60
-fishing	49	63	-fishing	3	60
-swimming	24	31	-swimming	4	80
-canoeing/kayaking	21	27	-canoeing/kayaking	3	60
-other (written response)	5	6	-other (written response)	0	0

*7 people from this group did not respond.

When considering the three most significant demographic groups based on the number of responses, the survey results can be evaluated by the trends viewed in each. **Table 4** shows that the agricultural community considered the primary benefits of living on the West Branch or tributary to be agricultural livelihood (95%), wildlife viewing (80%), and aesthetics (75%) respectively. Permanent residents considered wildlife viewing (94%), aesthetics (78%) and fishing (63%) as major benefits. Similarly, part-time residents listed aesthetics (95%), wildlife viewing (90%), and fishing (57%) as the primary benefits owning riparian land. Among all types of demographic groups in Area 2, watching birds and other wildlife is regarded as the number one overall benefit to owning property along a stream.

The landowner class and the years of residence analyzed landowner opinions about the condition of the West Branch on their property. The results are shown in **Table 5**.

TABLE 5. FREQUENCY & PERCENTAGE OF LANDOWNER RESPONSES TO QUESTION 5: “CONDITIONS ON THE WEST BRANCH ARE...”

"Conditions on the West Branch" by landowner type & years lived here						
Agriculture (21):	Q	%	0-5	6-10	11-20	Over 20
-excellent	4	19				100%
-good	7	33	14%		29%	57%
-fair	8	38				88%
-poor	2	10				100%
No response	1	10				
Business (9):			0-5	6-10	11-20	Over 20
-excellent	1	11				100
-good	5	56			20	80
-fair	2	22				100
-poor	1	11			100	
Gov't (4):			0-5	6-10	11-20	Over 20
-excellent	1	25				100
-good	1	25				100
-fair	1	25				100
-poor	1	25				100
Part-Time Res.(21):			0-5	6-10	11-20	Over 20
-excellent	4	19			75	25
-good	10	48			30	50
-fair	4	19			50	50
-poor	2	10				100
* 1 “don’t know” response						
Year-Round Res. (84):			0-5	6-10	11-20	Over 20
-excellent	13	15			23	77
-good	43	51	2	2	16	72
-fair	7	8			14	71
-poor	13	15		8	8	77
No response	9	11				
Vacant (5):			0-5	6-10	11-20	Over 20
-excellent	1	20				100
-good	1	20				100
-fair						
-poor	3	60			33	66

Table 5 shows that in general, riparian landowners who live in the West Branch basin consider the conditions on the river to be good, but there could be some improved management. The majority of two of the largest landowner types have indicated that conditions are good (48-percent of part-time residents and 57-percent of full-time residents). The agricultural community was closely split between feeling that conditions were either good or fair. Collectively, the remaining portions of landowners (government, businesses, and vacant landowners) represent a small percentage of responses. However, their responses will help to gain a better understanding of landowner opinion.

Table 6 shows the frequency and percentage of total responses to the question regarding landowner's main concerns about the West Branch.

TABLE 6. LANDOWNER'S TOP 3 MAIN CONCERNS ABOUT THE RIVER OR TRIBUTARY.

Concern (out of 139 responses)	1		2		3	
	Q	%	Q	%	Q	%
Bank erosion	52	37	22	16	19	14
Don't know	1	.7	-	-	-	-
Flooding of property	18	13	10	7	20	14
Gov't regulation of private property rights	21	15	10	7	18	13
Groundwater connection to my well	5	4	2	1	2	1
How it affects my livelihood	-	-	4	3	4	3
Impaired fishing	4	3	7	5	7	5
No response	5	4	23	17	29	21
Obtaining permits for stream work	8	6	15	11	7	5
Pollution from upstream runoff, dumping	11	8	19	14	11	8
Time and money required for proper stream care	3	2	10	7	10	7
Trespassing	9	6	6	4	5	4
Washout of roads and bridges	7	5	16	12	9	6

Other response: *It is a main route for 4-wheelers and snowmobilers and they wear the grass down to nothing which sends silt down slope.

** Debris and beaver dams.

Table 6 shows that bank erosion is the number one concern of the respondents from Area 2 (36-percent). Furthermore, it appears that government regulations and flooding are major concerns as well. Unfortunately, a majority of the respondents did not indicate their second and third concerns about the river or tributaries. However, a significant portion of the second and third responses indicates that bank erosion is a main concern for riparian landowners. The results were categorized further in **Table 7** to show trends between main concerns and the type of landownership.

TABLE 7. MAIN CONCERNS ABOUT THE RIVER BY LANDOWNER TYPE.

Main Concerns About The River	Agriculture (21):		Business (9):		Gov't (4):		Part-Time Res.(21):		Year-Round Res.(84):		Vacant (5)	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
Bank erosion	12	57	2	22	1	25	10	48	25	30	2	40
Don't know							1	5				
Flooding of property	3	14	2	22	1	25	3	14	9	11		
Gov't regulation of private property rights	2	10	1	11			1	5	16	19	1	20
Groundwater connection to my well							2	10	3	4		
Impaired fishing			1	11			2	10	1	1		
No response									5	6		
Obtaining permits for stream work			3	33					4	5	1	20
Pollution from upstream runoff, dumping	2	10					2	10	7	8		
Time and money required for proper stream care	2	10							1	1		
Trespassing											1	20
Washout of roads and bridges					2	50			5	6		

Table 7 illustrates that the majority of respondents in each landowner type indicated bank erosion as their main concern with the exception of the business community, which were slightly more concerned with obtaining permits. Flooding of property also seemed to be of universal importance to landowners. However, compared to other types of landowners, the agricultural community has the highest degree of concern for bank erosion. The agricultural community is also more concerned with the time and money required for proper stream care than the other types of landowners. For year-round residents, government regulation of private property rights seems to be of secondary importance behind bank erosion. However, it still represents a significant portion of the demographic.

The survey asked landowners to rate the severity of flooding along the West Branch or tributary. **Table 8** is a summary of the results.

TABLE 8. SUMMARY OF RESPONSES TO FLOODING PROBLEM

Flooding Problem		
Response	Q	% of total
-relatively minor problem	61	43
-frequent problem	42	30
-has never been a problem	12	8
-has worsened	16	4
-no response	-	
-other (written response)	9	6
-has improved	5	4

Table 8 shows that the majority of respondents believe that flooding along the West Branch is a relatively minor problem. The full written responses will be found in **Attachment C**.

The responses to the flooding problem were also categorized by the type of landowner and the years they have lived on the West Branch. The most significant trends may be seen in the portion of respondents that have lived on the river for more than twenty years. Of the sixteen farmers residing on the West Branch for over twenty years, 50% felt that flooding has been a relatively minor problem. The highest percentages of seasonal and permanent residents living on the river for over twenty years feel the same. In addition, none of the seasonal residents feels that flooding is a frequent problem, but a small portion of farmers and permanent residents feel that it is a frequent problem.

The next question in the survey sought to gain an understanding of how landowners have been affected by floods. **Table 9** is a summary of the total responses to the question.

TABLE 9. SUMMARY OF RESPONSES TO
“I HAVE BEEN AFFECTED BY FLOODING...”

"Affected by flooding..." Total Responses		
Response	Q	%
Never	38	28
A number of times	60	43
Blank	4	3
Once	25	18
Extensively	10	7
Other	1	1

Table 9 shows that the majority of respondents have either never been affected by flooding or have been affected a number of times. The results were further categorized in the table below to show possible trends based on length of residency and landowner type.

TABLE 10. RESPONSES TO QUESTION 9 BASED ON LENGTH OF RESIDENCY & LANDOWNER TYPE

Type & Length of Residency	Expressed as a %					Total
	Never	Once	A number of times	Extensively	Blank	
Responses to “I have been affected by flooding...”						
Agriculture (21):						
0-5 yrs	50		50			2
11-20 yrs	33	33	33			3
Over 20 yrs	13	13	53	20	7	15
Business (9):						
11-20 yrs		50	50			2
Over 20 yrs	14	29	57			7
Gov't (4):						
Over 20 yrs		25	75			4
Part-Time Res.(21):						
0-5 yrs	100					2
11-20 yrs	38	25	25		13	8
Over 20 yrs	9	18	64	9		11
Year-Round Res. (84):						
0-5 yrs		50		50		2
6-10 yrs	50		50			2
11-20 yrs	38	23	31		8	13
Over 20 yrs	33	14	37	8	8	63
No response	50		50			4
Vacant (4):						
11-20 yrs			100			1
Over 20 yrs	25	25	25	25		4

Table 10 shows that a large majority of riparian landowners has been affected by flooding a number of times. As one might expect, landowners with 20 or more years of residence are the most significant fraction of respondents that indicated being affected by flooding multiple times. A lesser number of respondents said that they had been affected only once or extensively. It is also important to note that a significant portion of residents of all types in the 11-20 year category stated that they have never been affected by flooding.

Next, landowners were asked to describe how floods have affected them. **Table 11** on the following page is a summary of the results. Additional descriptions of damages are located in **Attachment D**.

TABLE 11. TYPES OF DAMAGE BASED ON FLOOD FREQUENCY

Type of Damage per Frequency of Flooding Response							
Response	Expressed as a %					Total (Q)	%
	water damage to my house	washout of road/private bridge	washout of bridge access(public)	erosion of river banks	loss of cropland		
Never			66		33	3	3
Once	25	55	15	45	5	20	22
A number of times	38	13	30	72	21	53	57
Extensively	40	50	10	90	40	10	11
Blank (no response)	14	14	100	29		7	8

Of those who said that they had been affected a number of times, bank erosion (72%) and water damage (38%) were the number one responses. This trend also correlates with the question regarding landowner’s main concerns where bank erosion was also indicated as a major problem for landowners. Residents who claimed that that they had only been affected once, appear to have been affected the most by a washout of a private road/bridge.

The survey then asked landowners what they felt was the best solution to flooding problems. To obtain the most unbiased response from landowners, the question did not provide any opportunities to check an answer box but rather left the question open-ended so that respondents would be free to make any suggestions they wished. The responses to this question are found in **Attachment E**.

Many landowners indicated that they enjoy fishing on the West Branch. The respondents that indicated fishing as a major benefit (49%) were then further categorized by their opinions of the fishing conditions on the river. The results are presented in **Table 12** on the next page.

TABLE 12. SUMMARY OF LANDOWNER OPINIONS ABOUT FISHING CONDITIONS ON THE WEST BRANCH.

Condition has...	Q %	Reasons/ Comments
Improved:	28	<p>More attention by public to the stream</p> <p>Has improved last couple of years but not up to level of 15-20 years ago.</p> <p>Stocking of stream, clearing of debris from riverbed.</p> <p>Stocking by private club.</p> <p>Better control of business and residential pollution.</p> <p>Installation of sewer plants</p> <p>Cleaner water</p> <p>Stocking</p> <p>More fish stocked, larger fish stocked, I have become a better fisherman.</p> <p>Cleaner water. Less silt and salt runoff from roads</p> <p>DEC releasing larger trout in rivers. Also we don't have the pollution we had in the 1970's.</p> <p>Cleaner water.</p> <p>Fewer fishermen.</p> <p>* 7 people stated that stocking was the reason for the improved conditions.</p>
Deteriorated:	32	<p>Lack of water in late summer.</p> <p>Bank erosion and loss of cover.</p> <p>DEC doesn't stock tributary.</p> <p>Gravel bars.</p> <p>Dry summers</p> <p>Flooding has changed the course and the brook is not stocked with trout any longer.</p> <p>Flooding near bridges changed river flow pattern in Delancey at Hawley's Station.</p> <p>Improper stocking of fish and pollution.</p> <p>Upstream pollutants.</p> <p>Not getting enough native trout...stockers don't count!</p> <p>Believe frequent high water has washed out pools.</p> <p>Low water, no pools in brooks.</p> <p>Fishing holes have filled in, water line has been affected, and temperature of water discourages trout.</p> <p>I think it is because of carp overrun and eating everything.</p> <p>Not restocked. Less environmental condition favorable to fish habitat. I.E. waterpools</p> <p>Don't know</p> <p>Erosion, lack of fish habitat due to poor stream maintenance.</p> <p>Carp...they are like hogs rooting up the river bottom. Always turbidity in the stream.</p> <p>Stream bank erosion</p> <p>Absence of Rock Bass, sunfish, bullheads, pickerel. Easy fish for kids to catch.</p> <p>Lack of stream and road drainage maintenance.</p> <p>To my knowledge, are not stocking it with fish anymore.</p> <p>Dirty water</p> <p>Erosion of fishing holes.</p> <p>Too many city fishers.</p>
Remained Consistent::	40	don't know
No response/don't know/don't fish	44	

Table 12 shows that riparian landowners feel that fishing conditions on the West Branch and its tributaries have remained consistent. More informative though are the responses that suggest that conditions either have deteriorated or have improved. The comment

section further displays what the respondents feel are the reasons for the decline or improvement in conditions. It is apparent that the respondents feel that a major reason behind improved fishing conditions is more stocking and that the most common reasons behind deteriorated conditions are a lack of stocking and erosion.

Table 13 below examines who landowners feel should make decisions regarding stream management.

TABLE 13. SUMMARY OF LANDOWNER OPINIONS ABOUT WHO SHOULD MAKE STREAM MANAGEMENT DECISIONS.

Decisions should...	Full-Time Res* (123)						Part-Time Res (21)					
	1		2		3		1		2		3	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
be shared b/t landowners and local gov't	49	43	22	27	4	6	5	24	5	38	1	10
rest w/ landowners	23	20	8	10	6	9	6	29	-	-	1	10
don't know	7	6	1	1	2	3	2	10	-	-	-	-
other	1	.8	-	-	2	3	-	-	-	-	-	-
rest w/ SWCD's	16	14	29	35	14	21	4	19	1	8	2	20
rest w/ state gov't	7	6	5	6	6	9	2	10	1	8	-	-
rest w/ fed. gov't	-	-	-	-	2	3	-	-	-	-	-	-
rest w/ fed. gov't-FEMA	1	.8	1	1	2	3	-	-	-	-	1	10
rest w/ fed. gov't-USFW	3	3	3	4	4	6	-	-	3	23	1	10
rest w/ fed. gov't-COE	2	2	1	1	1	1	1	5	2	10	-	-
rest w/ fed. gov't-NRCS	1	.8	4	5	5	7	1	5	1	8	-	-
rest w/ town gov't	1	.8	4	5	8	12	-	-	-	-	2	20
rest w/ county gov't	-	-	3	4	8	12	-	-	-	-	2	20
Blank (% of total)	8	7	40	33	56	46	-	-	8	38	11	52

In **Table 13**, 43-percent of full-time riparian landowners indicated that they should be included with local government in the decision-making process of how streams should be managed. 35-percent of full-time landowner's second choice and 21-percent of their third choice was that decisions about how streams are managed should be made by the County Soil and Water Conservation District.

On the other hand, 29-percent of residents' indicated in their first choice that stream management decisions should rest solely with the landowner. However, 38-percent of second choice responses illustrate that decisions be shared between landowners and local government. **Table 13** also shows that the number of responses to the question decreased exponentially with each level of ranking after the first choice.

The results were categorized further to show how different types of landowners with different lengths of residency felt about stream management decision-making. The results are shown in **Table 14** on the next page.

TABLE 14. LANDOWNER OPINION OF DECISION-MAKING BASED ON LENGTH OF RESIDENCY & LANDOWNER TYPE*

"Decisions should..." Based on Landowner Type & Years of Residence											
Type & Length of Residency	Expressed as a %									Total Responses	
	rest w/ landowners	be shared b/t landowners and local gov't	rest w/ SWCD's	rest w/ town gov't	rest w/ county gov't	rest w/ state gov't	rest w/ fed. Gov't	don't know	other		blank
Agriculture (21):											
0-5 yrs			100								1
11-20 yrs		100									2
Over 20 yrs	35	24	24	6				6	6		17
No response		100									1
Business (9):											
11-20 yrs		100									2
Over 20 yrs	14	57				14			14		7
Gov't (4):											
Over 20 yrs			25		25	25	25				4
Part-Time Res. (21):											
0-5 yrs	50					50					2
11-20 yrs	13	38	13		25		13				8
Over 20 yrs	40	20	30			10					10
Year-Round Res. (84):											
0-5 yrs		100									2
6-10 yrs		100									2
11-20 yrs	15	46	8		23				8		13
Over 20 yrs	16	43	13	2	2	14	8		3		63
No response		50					25	25			4
Vacant (5):											
11-20 yrs	100										1
Over 20 yrs	25		25		50						4

*only the respondents' first choices were considered

Table 14 further illustrates that the majority of riparian landowners with 11 or more years of residency in the West Branch watershed feel that decisions about streams should be shared between landowners and local government. The exception is the response from the agricultural community and some part-time residents who felt that stream management

decisions should rest solely with the landowner. Due to the small number of responses in some categories, the percentages are somewhat suspect.

The next question in the survey asked landowners what they would like changed about the West Branch or tributary. A list of the responses may be found in **Attachment F**.

The remaining question posed to landowners dealt with who they believe should have primary financial responsibility of stream management on private property. The results are summarized in **Table 15**.

TABLE 15. SUMMARY OF LANDOWNER OPINIONS ABOUT FINANCIAL RESPONSIBILITY OF STREAM MANAGEMENT

<u>Primary Financial Responsibility should...</u>	<u>Q</u>	<u>%</u>
be shared b/t landowners and local gov't	24	19
don't know	11	9
rest w/ SWCD's	27	22
rest w/ state gov't	11	9
rest w/ landowners	9	7
rest w/ fed. gov't*	22	18
rest w/ town gov't	2	2
rest w/ county gov't	10	8
no response	17	12
other	7	6

* 6 FEMA, 5 COE, 5 NRCS, 3 USF&W

The results of **Table 15** show that there are significant differences between the results found in **Table 13**. Although the majority of respondents felt that decisions about how streams are managed should be shared between local government and landowners, they felt that the financial burden should rest with the Soil and Water Conservation District. However, a large portion of respondents did feel that the financial responsibility be shared. The distinct difference between the results is that while a relatively large number stated that decisions should be made by landowners, only a small fraction felt that they should bear the financial responsibility alone. Many felt that the Federal government should be involved in the financing of stream management activities.

CONCLUSION

In general, the response to the Area 2 survey was better than that of Area 1 by almost 2.5 – percent. Furthermore, the changes that were made to the Area 1 survey helped to simplify the responses thereby making them easier to analyze. For example, it was especially helpful to the Stream Corridor Management Program (SCMP) Team to know whether a response came from a riparian landowner along a tributary versus one along the West Branch main stem. If a landowner describes an erosion problem, it helps to know that the tributary where the erosion occurs is a source of sediment to the main stem and a potential area for restoration.

It is important to note that each question had a certain portion that did not answer and left the response section blank. These were omitted from the total number of responses to maintain accurate calculations.

The open-ended questions where respondents were free to write in their opinions, suggestions, or concerns were also very beneficial to the SCMP Team. Due to the responses, the SCMP Team can gain specific information for potential areas to target for restoration projects as well as how to better focus landowner education programs. Furthermore, the open-ended questions can also show a high frequency of similar responses thus indicating a trend in the data.

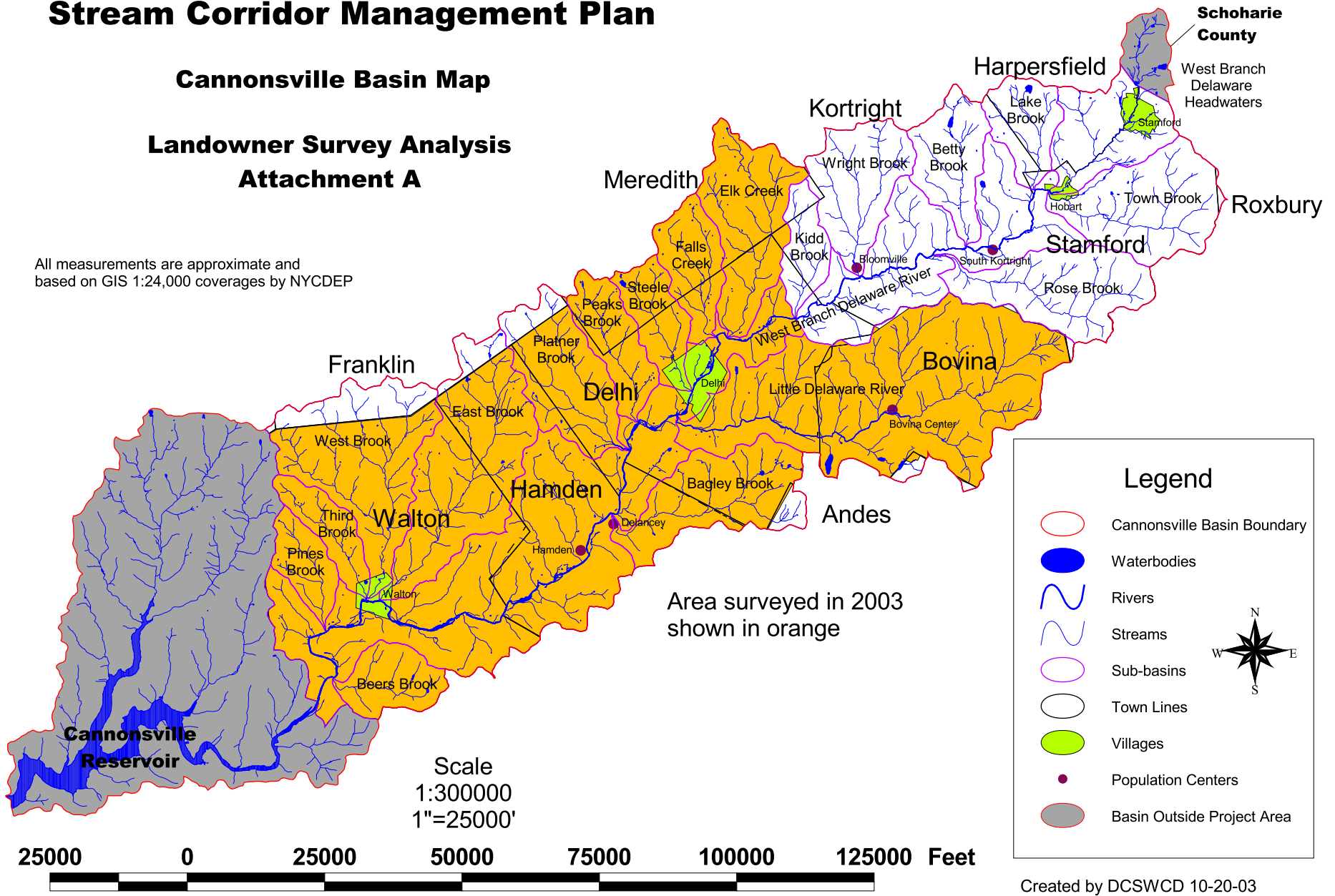
The only portion of the Area 2 survey where the changes made may have complicated the responses was in Questions 12 and 14. Requesting the respondents to rank their choices appeared either too confusing or too involved for many. This was made evident in the low numbers of responses to the second and third selections. However, it was definitely more helpful to know which response the landowners felt was the most important. Therefore, it is recommended that no changes be made to the current format of this survey.

West Branch of the Delaware River Stream Corridor Management Plan

Cannonsville Basin Map

Landowner Survey Analysis Attachment A

All measurements are approximate and based on GIS 1:24,000 coverages by NYCDEP



Legend

- Cannonsville Basin Boundary
- Waterbodies
- Rivers
- Streams
- Sub-basins
- Town Lines
- Villages
- Population Centers
- Basin Outside Project Area

Area surveyed in 2003 shown in orange

Scale
1:300000
1"=25000'



Created by DCSWCD 10-20-03
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survey_area1.apr

**West Branch – Delaware River Stream Management Program
Landowner Survey Form**

April 2003

Please take a few minutes to complete the following survey questions. This survey is designed to give the Stream Corridor Management Program Team at the Delaware County SWCD a general idea of the importance of the West Branch of the Delaware River to the landowners, and what values you place on stream. Please include additional information on a separate sheet of paper and return with this form. Thank you for your assistance with this project.

I live in the West Branch river valley:

- Year-round
- Part-time (seasonal, weekend, or other)

I've lived here 0-5 6-10 11-20 20+ years

If you live on a tributary, please indicate which one.

My property is (check one):

- Agricultural Residential Non-Profit
- Business Agency/Government

I enjoy West Branch or tributary on my property for (check all that apply):

- Agricultural livelihood
 - Hiking along the river
 - Camping along the river
 - The view
 - Watching the wildlife, birds
 - Hunting along the river
 - Fishing
 - Swimming
 - Canoeing/Kayaking
 - Other (please explain)
-
-

Conditions on the West Branch or tributary in my area are generally:

- Excellent, needs no change in management
- Good, but could use some improved management
- Fair, needs much more management
- Poor, needs urgent management

My main concerns about the river or tributary include (rank your top three selections by placing a 1,2 or 3 next to your choice):

- Trespassing
- Washout of roads and bridges
- Impaired fishing
- Groundwater connection to my well
- Pollution from upstream runoff, dumping
- Bank erosion
- Obtaining permits for stream work

- Time and money required for proper stream care
 - Government regulation of private property rights
 - Flooding of property
 - How it affects my livelihood
 - Other concerns about the stream (please explain)
-
-
-

While I've lived here, flooding along West Branch or tributary:

- Has been a frequent problem
 - Has been a relatively minor problem
 - Has never been a problem
 - Has worsened
 - Has improved
 - Other (please explain)
-
-
-

I personally have been affected by flooding:

- Never Once A number of times Extensively
- (check all that apply)**
- Water damage to my house
 - Washout of road access or private bridge
 - Washout of bridge access (public bridge)
 - Erosion of river banks
 - Loss of cropland

Describe Damages: _____

The best way to solve flooding problems is to:

Please explain:

Fishing on the West Branch or tributary has generally:

- Improved in recent years. The reason is:

- Deteriorated in recent years. The reason is:

- Remained consistent

Decisions about how streams are managed on private property should (rank the top three selections by placing a 1,2 or 3 next to your choice):

- Rest with the State government
- Rest with the Federal government
(if selected, choose one of the federal agencies below)
 - FEMA
 - Army Corps of Engineers
 - Natural Resources Conservation Service
 - U.S. Fish and Wildlife
- Be shared between landowners and local government
- Rest with the County Soil and Water Districts
- Rest with the County government
- Rest with landowners
- Rest with the Town government
- Don't know
- Other (please explain)

What would you like changed about the West Branch or tributary?

The primary financial responsibility for management of streams on private property should (rank the top three selections by placing a 1,2 or 3 next to your choice):

- Rest with the County government
- Don't know
- Rest with the County Soil and Water Districts
- Be shared between landowners and local government
- Rest with the Federal government
(if selected, choose one of the federal agencies below)
 - FEMA
 - Army Corps of Engineers
 - Natural Resources Conservation Service
 - U.S. Fish and Wildlife
- Rest with landowners
- Rest with the Town Highway department
- Rest with the State government
- Other (please explain)

Optional Information

Name _____
Address _____

Phone _____
E-Mail _____

I would be willing to participate on the West Branch Project Advisory Committee for the development of the management plan. Yes No

Thank You for Your Assistance

Return address optional



**Delaware County Soil & Water Conservation District
44 West Street, Suite 1
Walton, NY 13856**

Please fold & seal with tape or staple

ATTACHMENT C:

LANDOWNER RESPONSES TO FLOODING PROBLEMS

AGRICULTURE:

1. The stream work after the '96 flood worsened bank erosion and now large trees are undermined and falling.
2. A serious concern for us, requiring care to keep soil covered in winter and spring.
3. Brings and leaves a lot of flood trash.
4. That's nature.

BUSINESS:

1. By "prevent" I mean once every five to ten years.
2. Its part of nature.

GOVERNMENT:

1. Has happened once.
2. Has been a periodic problem.

SEASONAL RESIDENTS:

1. Don't know.
2. Three times in 10 years.
3. Has improved after the flood of '96
4. I have heard of one time, a few years ago when it was a major flood problem- I myself have not seen a problem.
5. In Jan 1996- we had to totally rebuild, lose major bank, all due to poor management of tributary across the river.
6. Beaver have added to loss of fields to expanded wetlands.

FULL-TIME RESIDENTS:

1. Constant erosion.
2. Has been a problem on the southeast side.
3. Flooding has been eliminated but high water keep eating my rear yard away due too erosion.
4. Have had three serious floods. 1935, the '40 and 1973. Ice jam also.
5. My home has improved thanks to retaining walls.
6. Has happened – West Branch not Third Brook.
7. Major problem during and after flood of '96. Severe undercutting of large steep bank needs major corrective project – beyond my means.
8. The flood of 1996 eroded 10 feet of bank which has never been reclaimed.

VACANT PARCEL LANDOWNERS:

1. Haven't observed.

ATTACHMENT D:

FLOOD DAMAGE DESCRIPTIONS

AGRICULTURE:

1. We lost all the high tensile fencing in '96.
2. Stream bank damage for 11/2 of frontage, erosion of topsoil from flooding.
3. Water runs thru our tree/shrub planting when water is high.
4. Delaware St office bldg. 1/19/96
5. Flood washed my topsoil into binnacle. It needs to be dredged and put back on field-isolated 4 acres of land I can no longer use.
6. We get sheet erosion on unprotected soil and gullies in swift areas.
7. Erosion eats away at pastures and cropland. Develops gravel bars that we cannot legally remove.
8. Flooding of fields, deep gullies formed.
9. Gravel bars forming, diverting water into banks.
10. Minor erosion of banks.
11. Water in basement.
12. Flooded our septic system.

BUSINESS:

1. Bridge replacement; stream bank erosion. I.e. muddy water.
2. Lower stream bottom in areas where needed to control large increases in water flow.
3. Live with it.
4. Let responsible landowners take care of problems-than when help is needed it is given freely!
5. Ground damage.
6. Our buildings have experienced flooding several times in the past 100 years.

GOVERNMENT:

1. Water damage to the school. Jan '96.
2. Do not build in floodplain.
3. Water damage to homes, disruption of municipal service, cost associated with cleanup and repair.

SEASONAL RESIDENTS:

1. Water seepage in my basement from hill behind the house...not from East Brook water.
2. Every high water, I lose property. If I lose two willows, my house is a goner!
3. In 1996 we had to totally rebuild, lose major bank, all due to poor management of tributary across the river.

4. Beavers have added to loss and fields to expanded wetland.

FULL-TIME RESIDENTS:

1. Minor in flood of '96.
2. \$10,000 worth of damage in the '96 flood.
3. Lost approximately 1.5 ft this year.
4. Minor washout of banks.
5. Loss of bank at rear of home.
6. House foundation, 3x major driveway damage, erosion at any point not protected by a grass root system.
7. Unable to get across East Brook to home or Park St or sometimes from home to other areas.
8. Bank erosion, but in 1973, I lost two Holstein calves, their shelter, apple trees, dog house and my home was evacuated at 2:30 am. The Brook was re-routed to the front yard.
9. Water heater-furnace, small amount of erosion on foundation.
10. Lost a building and damaged yard.
11. Flooding of my business in Village of Walton.
12. Lost 10-12 large maple trees and over 4,000 square feet of land (40' x 100')
13. Flooding in house of 3-5 feet.
14. Lawn washed away, bridge washed out, house undermined. My home has improved thanks to retaining wall.
15. Lost firewood.
16. Loss of personal possessions.
17. Furnace damage in basement, severe erosion (4'deep gullies, exposed gas line washed out driveway.)
18. Debris left behind on my river flat.
19. Peake's Brook in yard; Water in cellar. (minor continuous erosion each year; minor water in cellar)
20. Water in cellar 1996
21. 2 feet of water in house, foundation damaged. Loss of personal property.
22. About 100 feet of gravel road eroded by floodwaters. 90% of damage repaired by simply collecting lost gravel from adjacent field and filling in the holes.
23. While some landowners were able to reclaim their land, I don't feel they were consistent with people who live outside the village.
24. Water damage to the foundation of my garage. Flooding of my basement.
25. I have lost over \$10,000 in property.

ATTACHMENT E:

LANDOWNER OPINIONS OF POTENTIAL FLOODING SOLUTIONS

AGRICULTURE:

1. Strike a balance between natural wetlands on floodplain and some intervention to mitigate yearly flood damage.
2. Changes of cropping practices for soil erosion, continued effort with various gov't departments and Agriculture-related groups to solve the flooding effects to the farm.
3. Let us clean where needed in the creek. One or two places.
4. Excavate the riverbed.
5. Dredge the whole river. Open up a clear channel and remove gravel bars that direct current towards my field instead of down the river channel.
6. Do not use iron tubes for roads...use span bridges. Use riprap to prevent stream bank erosion. The stream thru our property is in pretty good shape with good fishing and limited erosion due to work done by my grandfather 50 or more years ago.
7. I think flooding is a natural function of the river given the narrowness of the valley and the size of seasonal melt. Therefore, protection of flood plain soils is our aim. Flood "control" approaches usually change rivers and would, in my opinion, be detrimental to the W. Branch.
8. Can't really stop flooding-but stable stream banks would prevent damage.
9. Deeper stream channel.
10. Consult and hire qualified personnel.
11. Do not know the answer to that.
12. Flooding is a natural process-the banks should be protected from erosion. CREP program is excellent.
13. Being able to clean streambeds occasionally.
14. Clean out gravel bars, slope banks.
15. Clean out brook in certain spots and build up bank where needed.
16. Lower the streambed.
17. No possible way. Fitch's bridge acts as a dam.
18. Rip rap/ clear channels where practical.

BUSINESS:

1. I don't know.
2. Dredge sandbars, build up riverbanks, removal of tree trunks that have fallen into river and floated down stream causing a dam effect.
3. Issue stream disturbance permits to remove gravel bars or deposits and replace riprap on eroding slopes.
4. Keep the transition smooth and flowing-erosion pile up.

5. Eliminate construction along rivers-especially in flood plains-unfortunately, most of the construction was completed years ago and it is not practical, or economically possible to relocate.
6. Clean the gravel bars out of rivers and streams.

GOVERNMENT:

1. Rechannel river and do bank stabilization project.
2. Maintain/improve wetlands and soil cover and limit paved surfaces up stream.

SEASONAL RESIDENTS:

1. Build log retaining walls and backfill with stone at badly eroded river edges. As a child in the 50's by town or county crews (see sketch). Work can be done by prisoners (it will give them badly needed job skills) or by summer gov't crews.
2. Don't know.
3. Contain erosion by changing East Brook flow. 1999 berms have been abandoned, unfinished.
4. Keep streams free of trees, brush and beavers.
5. Repair banks.
6. Let us dig the brook deeper and secure banks with big rocks.
7. Clean out main river.
8. ...not build on the floodplain!
9. Keep loose banks covered with plantings or riprap, build berms, and pray for less rain!!!
10. Please help us with the bank and tributary across the river from us. We lost major bank from Jan. 1996.

FULL-TIME RESIDENTS:

1. Build small berms or dikes along the river in flood areas.
2. Keep rivers unobstructed by excessive build-up of silt, dirt etc. Also, maintain banks along rivers and streams to prevent erosion.
3. Stop people from building in or filling in the floodplain. Removing areas that have been filled in such as the alliance church, Breakey Motors, etc.
4. Don't know if we can be ready for the winter melt floods, such as the one five or six Januaries ago. This winter saw some flooding, which caused little damage.
5. I don't know the score of the problem. Total elimination can't be expected, perhaps just reduced.
6. Identify problem areas and engineer proper hydrologic remedies.
7. Don't strip away soil holding vegetation. Don't encourage building around waterways known to flood. Expect that it will happen and stop complaining. Be thankful we have water.
8. a) As pointed out by the NYSDEC Region 4 Richard Pop, one tree in the wrong place can cause water to change course.

- b) Dikes/berms are expensive ways to keep a river in check. I did an estimate on a 4" high x 32' x 1500' dike down on my property years ago and I think I came up with a figure of about 75000 complete with a clay core/keyway.
9. Clean out brooks from silt over the years. Widen certain areas water runs under the rocks.
 10. There has been a lot of development on the municipalities along the river and on Main St in Delhi that has affected the water on the East Side of the Village of Delhi.
 11. After '73 flood, Delaware Co. Soil and Water helped by re-directing the brook out where it used to run, but erosion of bank has been a problem since. At one point, we let Soil and Water District store riprap on our lot so they could fix erosion problems but they used it south of us and never fixed our problem.
 12. Clean out riverbanks and culverts.
 13. Clean out fallen trees and clean up riverbanks.
 14. Plan-respect property rights, keep the GD trees! Make sure you are planning for people, not some politician's resume.
 15. Keep brook cleaned out.
 16. Reinforce the stream bank.
 17. Remove gravel and debris in West Branch within Village limits.
 18. I believe a reverse weir in the river would work best.
 19. Channel wide shallow areas, narrow the stream banks, and install barriers to prevent bank erosion. Plant trees-but not like the city program. When this many trees mature, they suck too much water.
 20. Plant trees along the river.
 21. Improve riverbanks.
 22. Clean channel when and where sand bars form causing a change in present waterway and perform bank repairs when necessary. Bank repair decreases erosion and flooding-decreases need for channel dredging.
 23. Plant basket willows to prevent erosion. Place pool diggers in stream to slow water. Simple ones log and cable. Do not restrict the floodplain by filling that narrows it, causing damage.
 24. Clean out gravel bars at end of Steel Brook.
 25. Raise banks to protect residential area and to protect Agricultural areas.
 26. Dredging at river basin between Bridge St and US28 in Delhi.
 27. Address storm water and flashy nature of streams from direct piping of runoff to streams. Avoid building structures (including roads near streams).
 28. Removal of silt and gravel that has washed in over the years.
 29. Maintain riverbank stability and allow clear river to flow.
 30. Getting into stream and removing gravel bars.
 31. Stop building along rivers and floodplains.
 32. Maintain proper river management.
 33. Properly manage stream channels. A lot lots of \$\$ for stabilization projects. Co-coordinated efforts of gov's, landowners and other agencies (DEP,DEC,COE)
 34. Dredge river at regular intervals, it will not hurt anything. But will help with build up in streams.
 35. Clean debris from river.

36. Needs extensive work on banks and better drainage from road runoff. Presently very poorly controlled.
37. Not build in flood prone areas.
38. Loss of land and peril to buildings
39. To clean out creeks of washed stones in pile and tree debris.
40. Wooded buffer zones along streams.
41. Monitor debris and ice dams from the head of the river to Cannonsville bridge in streams and rivers. Volunteer (landowners) would be least costly than or will help reduce the cost of patrolling.
42. Reforest tributaries will also solve pollution problems eg. Silt run-off and cattle waste.
43. I don't know.
44. Selectively remove slip off slope runoff from main channel and straighten river. Clearance of channel. Build levees in village areas where flooding prevails.
45. In my opinion, the riverbeds should be cleaned out occasionally at intersections of larger brooks that feed into the river, especially in the Village of Walton. There are large deposits of dirt, rocks, etc at these intersections. Huge deposits at the area of the bridge in Walton, which crosses. Several years ago NYSDOT cleaned this area out yearly or semi-yearly however, nothing has been done in I would say the past 15-20 years. At some point, I believe we have to realize that humans are more important than fish. Fish will survive-they have in the past.

VACANT PARCEL LANDOWNERS:

1. Let private maintain their own streams.
2. Allow concerned professionals plan.

ATTACHMENT F:

WHAT WOULD YOU LIKE CHANGED ABOUT THE WEST BRANCH?

AGRICULTURE:

1. Less government.
2. Drain the reservoir and return the land to farming
3. Improvements to stream banks.
4. I am glad this survey is being done. I think the need for changes (or not) will come out in this process.
5. More emphasis on stream bank stabilization and improving fish and wildlife habitat.
6. Nothing.
7. Stop erosion where soil is washed away. Clear of fallen trees. Remove gravel bars. Cleanup trash.
8. Remove gravel bars.
9. OK
10. Would like some solution to downed trees. Most landowners don't wish to spend money to snag the trees-they cause problem for other owners and damage to canoeists.
11. More attention paid to flood damage.

BUSINESS:

1. More active SCS in stream management and funding of stream repair projects. Take some of the burden off landowner.
2. To take NYC out of the management picture.
3. Ability to maintain with responsibility to environment and river condition.
4. Keep sluices clear. Keep bridges clear.

GOVERNMENT:

1. Bank stabilization.

SEASONAL RESIDENTS:

1. More stocking of fish including trout and salmon to improve fishing.
2. Don't know
3. Bank erosion control. Finish work from last two floods.
4. Better, flood control.
5. More access for fishing and to stock bigger fish.
6. Nothing much that I can see.
7. Paths and trails that allow people from all over to enjoy our natural resource. Perhaps these paths and parks could serve the dual purpose of bank stabilization and recreation.

8. To be clean up, remove all debris, dump along it over many years. Help increase fishing, hunting and more beautification.
9. Banks need to be restored-deep pools for trout or swimming no longer exists. Banks becoming overgrown limiting creek access.

FULL-TIME RESIDENTS:

1. More fish stocking.
2. Reduce seasonal flooding.
3. More stocking of side streams
4. Stop bank erosion in Walton area
5. Better beaver management. Fallen trees into the river are a problem.
6. Reduce the problem if possible.
7. There should be fishing and hiking access along the riverbanks over private property.
8. Not a thing.
9. All watercourses need management. Trout unlimited if they had their way would never touch a stream. I feel that if a tree or rock needs to be removed along a watercourse because it is in the best interest of the "public" then, with proper planning, it should be done.
10. Banks and pools to be maintained
11. Perhaps walls built along banks of brooks where erosion is a problem.
12. Repair washed out areas from flooding
13. Nothing.
14. Clean out of gravel bars.
15. Repair gabions along East Brook before serious erosion or highway damage occurs.
16. Nothing
17. Needs to be cleaned, but it seems the fish have more rights than landowners.
18. My bank is severely eroding and I would like to have the Conservation District Management take measures to stabilize my bank. Large amounts of soil are falling into the river each year and the bank is moving towards my house.
19. Clean out gravel lays and narrow up the channels, repair banks, and install hole diggers to create trout habitat.
20. More trees
21. Continued effort to keep it clean.
22. More stream bank repair.
23. Kill all carp in stream and put a falls in river to prevent up stream return. Restock with native fish.
24. The gravel bank removed from end of Steele Brook
25. Stop flooding of my property.
26. Address stream bank erosion and storm water issues.
27. More easily accessible from which to launch canoes, etc.
28. Bank restoration with plan to help minimize erosion.
29. Have all trash, stoves, tires, and irrigators, cleaned up. Want to see a dike put in to stop the erosion. I am 81 years old and will do anything to save my property.

30. Better flood control and maintenance.
31. Less NY City regulation.
32. Have streams cleaned out because when there are heavy rains it floods on fields and pasture lands.
33. Riparian owners need to understand the issues of water conservation.
34. Clean out the old Walton Village reservoir on Third Brook filled with sediment. Then open to public for picnic area and fishing.
35. Fertilizer, field and barn wastewater should be collected in ponds and purified of silt and chemicals similar to industrial waste.
36. The county is a big contributor to pollution of the river. The parking lot is ugly and a source of pollution. A park next to the river could improve these conditions.
37. Selectively remove slip off slope runoff from main channel and straighten river. Clearance of channel. Build levees in village areas where flooding prevails.
38. Cleaning of the riverbed.

VACANT PARCEL LANDOWNERS:

1. Need maintenance of erosion control. So far nothing has been done. Still pay same taxes on untaxable land.
2. Stop the water from flooding the meadow.
3. Let landowners do own maintaining.
4. Absolutely certain not polluted. Water levels such to allow canoeing.

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TABLE 1. RESPONSE TO WEST BRANCH LANDOWNER SURVEY.

Landowner Survey						
Land Type	Color	Number of Surveys Distributed	Number of Surveys Received	Number Returned As Non Deliverable	% of Total Received by Land Type	% of Total Received
Agricultural	Green	156	41	2	26	18
Business	Blue	77	14	5	18	6
Gov't/Public Service	White	39	7	0	18	3
Permanent Residence	Yellow	488	114	20	23	50
Seasonal Residence	Pink	157	45	23	29	20
Vacant Land/Forested	Purple	185	9	15	5	4
Total mailed		1102				
Total Received			230			
Total Returned				65		
<hr/>						
Percent surveys received (of total mailed)		21				
Percent surveys returned		6				
Percent surveys received (adjusted for returns)		22				

Table 1. Constructed by adding numbers in area 1 table 1 and area 2 table 1 Landowner survey report.

TABLE 2. PERCENTAGE OF TOTAL RESPONDENTS LIVING ON A WEST BRANCH TRIBUTARY.

Tributary	Q	% of Total
Bagley Brook	3	2.1
Brush Brook	1	0.7
East Brook	12	8.3
Elk Creek	3	2.1
Freer Hollow	1	0.7
Honest Brook	2	1.4
Little Delaware River	13	9.0
Oxbow Brook	1	0.7
Peake's Brook	2	1.4
Pines Brook	1	0.7
Platner Brook	5	3.5
Steele Brook	7	4.9
Third Brook	3	2.1
West Brook	7	4.9
TOTALS	61	42.7

Table 2. Taken directly from Area 2 Table 2.

TABLE 3. LENGTH & TYPE OF RESIDENCY

Residency			
	Q	% year-round	% Of total surveyed
Year-round:	153		67
0-5 yrs	4	3	
6-10 yrs	4	3	
11-20 yrs	28	18	
Over 20 yrs	121	79	
		% part-time	
Part-time:	47		20
0-5 yrs	5	11	
6-10 yrs	3	6	
11-20 yrs	14	30	
Over 20 yrs	22	47	
Other	4		2
No response	1		<1
* 14 landowners did not respond to # years lived here.			

Table 3. Numbers for this table came from Area 1 table 2 and Area 2 table 3. The percent of total surveyed is out of 230.

TABLE 4. FREQUENCY & PERCENTAGE OF RESPONSES TO QUESTION 4
BY LANDOWNER TYPE.

“I enjoy the West Branch on my property for...”					
Agriculture (41):		Q	%	Business (14):	
-agricultural livelihood		36	88	-agricultural livelihood	1 7
-hiking along river		13	32	-hiking along river	1 7
-camping along river		6	15	-camping along river	2 14
-the view		28	68	-the view	12 86
-wildlife viewing		25	61	-wildlife viewing	8 57
-hunting		16	39	-hunting	2 14
-fishing		21	51	-fishing	5 36
-swimming		7	17	-swimming	2 14
-canoeing/kayaking		7	17	-canoeing/kayaking	1 7
-other (written response)		2	5	-other (written response)	3 21
Government (7):				Part-Time Resident (45):	
-agricultural livelihood		0	0	-agricultural livelihood	4 9
-hiking along river		3	43	-hiking along river	22 49
-camping along river		2	29	-camping along river	4 9
-the view		5	71	-the view	38 84
-wildlife viewing		4	57	-wildlife viewing	38 84
-hunting		0	0	-hunting	11 24
-fishing		3	43	-fishing	25 56
-swimming		3	43	-swimming	12 27
-canoeing/kayaking		3	43	-canoeing/kayaking	10 22
-other (written response)		0	0	-other (written response)	3 7
Residential (114):				Vacant (9):	
-agricultural livelihood		11	10	-agricultural livelihood	2 22
-hiking along river		37	32	-hiking along river	4 44
-camping along river		12	11	-camping along river	2 22
-the view		85	75	-the view	5 56
-wildlife viewing		97	85	-wildlife viewing	8 89
-hunting		27	24	-hunting	4 44
-fishing		63	55	-fishing	5 56
-swimming		34	30	-swimming	5 56
-canoeing/kayaking		24	21	-canoeing/kayaking	3 33
-other (written response)		10	9	-other (written response)	0 0

*7 people from this group did not respond.

Table 4. Data is from Area 1 table 3 and Area 2 table 4. All percentages are land use per landowner type. Landowner type totals are in parentheses next to landowner type headings.

TABLE 5. FREQUENCY & PERCENTAGE OF LANDOWNER RESPONSES TO QUESTION 5: "CONDITIONS ON THE WEST BRANCH ARE..."

"Conditions on the West Branch" by landowner type & years lived here						
			Expressed as a %			
Agriculture (41):	Q	%	0-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs
-excellent	7	17				100
-good	18	44	6		22	72
-fair	10	24			10	80
-poor	6	15			17	83
No response	1	2				
Business (14):			0-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs
-excellent	2	14				100
-good	9	64			22	67
-fair	2	14				100
-poor	1	7			100	
Government (7):			0-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs
-excellent	1	14				100
-good	2	29				100
-fair	1	14				100
-poor	3	43				100
Part-Time Residents (45):			0-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs
-excellent	13	29	8	8	54	31
-good	22	49	9	9	18	41
-fair	6	13			50	50
-poor	2	4				100
* 1 "don't know" response	1	2				
Year-Round Residents (114):			0-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs
-excellent	25	22	4	8	20	68
-good	54	47	2	2	20	67
-fair	10	9			20	70
-poor	17	15		6	6	82
No response	9	8				
Vacant (9):			0-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs
-excellent	1	11				100
-good	2	22				
-fair	1	11				
-poor	3	33			33	66
No response	2	22				

Table 5. Data for this table was taken from Area 1 table 4 and Area 2 table 5. Qs from the two tables were added. The percent column was gotten by dividing land owner response by the total landowners in that specific group. All other percentages represent the number surveyed in each landowner group, who think the river is in a certain condition and have lived in the area a specified number of years.

TABLE 6. LANDOWNER'S MAIN CONCERNS
ABOUT THE RIVER OR TRIBUTARY.

Total Q = 688		
	Q	% of Total surveyed
Bank erosion	143	62
Don't know	1	<1
Flooding of property	81	35
Gov't regulation of private property rights	81	35
Groundwater connection to my well	13	6
How it affects my livelihood	22	10
Impaired fishing	35	15
No response	57	25
Obtaining permits for stream work	55	24
Pollution from upstream runoff, dumping	60	26
Time and money required for proper stream care	46	20
Trespassing	36	16
Washout of roads and bridges	45	20
Other (written response)	13	6

Other response: *It is a main route for 4-wheelers and snowmobilers and they wear the grass down to nothing which sends silt down slope.

** Debris and beaver dams.

Table 6. Numbers are from Area 1 table 5 and Area2 table 6. Percents are landowner concern divided by total numbered surveyed (230).

TABLE 7. MAIN CONCERNS ABOUT THE RIVER BY LANDOWNER TYPE.

Main Concerns About The River	Agriculture (41):		Business (14):		Gov't (7):		Part-Time Res.(45):		Year-Round Res.(114):		Vacant (9)	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
Bank erosion	28	68	4	29	3	43	20	44	42	37	5	56
Don't know							1	2				
Flooding of property	13	32	5	36	1	14	12	27	20	17	1	11
Gov't regulation of private property rights	13	32	4	29	1	14	9	20	25	22	1	11
Groundwater connection to my well							4	9	5	4		
Impaired fishing	1	2	1	7			9	20	9	8	1	11
No response									5	4		
Obtaining permits for stream work	10	24	5	36	2	29	4	9	11	10	1	11
Pollution from upstream runoff, dumping	6	15			1	14	12	27	10	9	1	11
Time and money required for proper stream care	14	34	1	7	1	14	2	4	8	7		
Trespassing	4	10	2	14			4	9	6	5	1	11
Washout of roads and bridges	2	5			3	43	3	7	11	10	1	11
How it affects my livelihood	7	17	2	14					5	4		
Other (written response)	2	5	1	7			2	4	3	3	3	33

Table 7. Numbers from Area 1 table 6 and Area 2 table 7. The Q's were added together with respect to landowner type and concern. Percents are type of concern divided by total landowner type. Each total landowner type is given in parentheses after the landowner type.

TABLE 8. SUMMARY OF RESPONSES TO FLOODING PROBLEM

Flooding Problem		
Response	Q	% of total
-relatively minor problem	101	44
-frequent problem	62	27
-has never been a problem	30	13
-has worsened	19	8
-no response	2	1
-other (written response)	11	5
-has improved	5	2

Table 8. Q's were gotten from adding Area 1 table 7 and Area 2 table 8. Percents are response divided by total surveyed (230).

TABLE 9. SUMMARY OF RESPONSES TO
 “I HAVE BEEN AFFECTED BY FLOODING...”

“Affected by flooding...” Total Responses		
Response	Q	%
Never	75	33
A number of times	92	40
Blank	17	7
Once	31	13
Extensively	14	6
Other	1	<1

Table 9. Q’s were obtained by adding Area 1 table 8 and Area 2 table 9. Percents are response divided by total surveyed (230).

TABLE 10. RESPONSES TO QUESTION 9 BASED ON LENGTH OF RESIDENCY & LANDOWNER TYPE

Responses to "I have been affected by flooding..."						
Type & Length of Residency	Expressed as a %					Total
	Never	Once	A number of times	Extensively	Blank	
Agriculture:						41
0-5 yrs	50		50			2
11-20 yrs	14	29	43	14		7
Over 20 yrs	16	6	45	16	16	31
No response					100	1
Business:						14
11-20 yrs	33	33	33			3
Over 20 yrs	30	20	50			10
No Response	100					1
Government:						7
Over 20 yrs	14	14	71			7
Part-Time Residents:						45
0-5 yrs	80		20			5
6-10 yrs	67	33				3
11-20 yrs	36	29	14		21	14
Over 20 yrs	25	10	60	5		20
No Response	67	33				3
Year-Round Residents:						114
0-5 yrs	33	33			33	3
6-10 yrs	50		50			4
11-20 yrs	45	15	35		5	20
Over 20 yrs	38	11	38	7	6	82
No response	40		60			5
Vacant:						9
11-20 yrs			100			1
Over 20 yrs	25	25	25	25		4
No response	50		25	25		4

Table 10. Totals were gotten by adding numbers from area 1 table 9 and area 2 table 10 based on landowner type and length of residence. The percents indicate the amount of people in a specific landowner type and length of residency to have a certain type of flooding problem.

TABLE 11. TYPES OF DAMAGE BASED ON FLOOD FREQUENCY

Type of Damage per Frequency of Flooding Response								
Response	Expressed as a %						Total (Q)	%
	water damage to my house	washout of road/private bridge	washout of bridge access(public)	erosion of river banks	loss of cropland	no response		
Never			5			95	40	17
Once	19	46	23	35	4	8	26	11
A number of times	27	26	25	68	19	1	85	37
Extensively	29	36	7	71	57		14	6
Blank (no response)	7	29		71	21	7	14	6

Table 11. Data retrieved from Area 1 table 10 and Area 2 table 11. Percents were calculated by dividing the response by the total surveyed (230).

TABLE 13. SUMMARY OF LANDOWNER OPINIONS ABOUT WHO SHOULD MAKE STREAM MANAGEMENT DECISIONS

Decisions should...	Full-Time Res* (179)		Part-Time Res (45)		Total	
	Q	%	Q	%	Q	%
be shared b/t landowners and local gov't	99	55	20	44	121	37
rest w/ landowners	52	29	16	36	69	19
don't know	21	12	3	7	24	5
other	5	3	1	2	7	1
rest w/ SWCD's	60	34	8	18	69	29
rest w/ state gov't	18	10	4	9	23	9
rest w/ fed. gov't	30	17	11	24	41	17
rest w/ town gov't	13	7	2	4	15	7
rest w/ county gov't	11	6	2	4	13	6
Blank	11	6	2	4	13	6

Table 13. Total is all responses that were given. The rank of one, two and three from the area 2 survey was disregarded in order to combine with area 1 survey. Total percents are out of the total number of surveys received (230). The other percents were obtained by dividing the number of people, in the full-time residents or the part-time residents group who had a certain opinion, by the total number in that specific group.

TABLE 14. LANDOWNER OPINION OF DECISION-MAKING BASED ON LENGTH OF RESIDENCY & LANDOWNER TYPE*

"Decisions should..." Based on Landowner Type & Years of Residence											
Type & Length of Residency	Expressed as a %									Total Responses	
	rest w/ landowners	be shared b/t landowners and local gov't	rest w/ SWCD's	rest w/ town gov't	rest w/ county gov't	rest w/ state gov't	rest w/ fed. Gov't	don't know	other		blank
Agriculture (41):											
0-5 yrs			100								1
11-20 yrs		100									6
Over 20 yrs	36	36	12	3				3	6	3	33
No response		100									1
Business (14):											
11-20 yrs	33	67									3
Over 20 yrs	10	50					10			30	10
No Response		100									1
Gov't (7):											
Over 20 yrs		43	14			14	14		14		7
Part-Time Res. (45):											
0-5 yrs	20	40					20			20	5
6-10 yrs	67	33									3
11-20 yrs	14	36	7		7	21		7	7		14
Over 20 yrs	37	32	16				5	5		5	19
No Response	67	33									3
Year-Round Res. (114):											
0-5 yrs	33	67									3
6-10 yrs	50							50			4
11-20 yrs	10	50	10			15		10		5	20
Over 20 yrs	21	38	11	1		1	11	12	1	4	82
No response		40						20		40	5
Vacant (9):											
11-20 yrs	100										1
Over 20 yrs	25		25			50					4
No Response	25	25				25			25		4

*only the respondents' first choices were considered

Table 14. Data compiled from Area 1 table 13 and Area 2 table 14. Percents were calculated by dividing the number of people with a certain opinion by the total responses in that specific landowner group and length of residency.

TABLE 15. SUMMARY OF LANDOWNER OPINIONS ABOUT FINANCIAL RESPONSIBILITY OF STREAM MANAGEMENT

Primary Financial Responsibility should...	Q	%
be shared b/t landowners and local gov't	50	22
don't know	27	12
rest w/ SWCD's	42	18
rest w/ state gov't	20	9
rest w/ landowners	15	6
rest w/ fed. gov't*	26	11
rest w/ town gov't	2	1
rest w/ county gov't	10	4
no response	24	10
other	10	4

* 7 FEMA, 5 COE, 2 NRCS, 4 USF&W

Table 15. Data for this table was gotten from Area1 table 14 and Area 2 table15. Percents were calculated by dividing by the total number surveyed (230).

Appendix 2
Riparian Buffer Information

Maintaining a Healthy Streambank Using Riparian Forest Buffers

Conservation buffers can be a key to maintaining stream health and protecting water quality. They slow water run-off, trap sediment, and enhance infiltration within the buffer. They also trap fertilizers, pesticides, pathogens, and cut down on blowing soil in areas with strong winds and help to stabilize streambank erosion caused by high water flows. In addition, they protect livestock and wildlife from harsh weather and buildings from wind damage.

What is a Riparian Forest Buffer?

A riparian forest buffer is an area along flowing water which is maintained in a healthy vegetative state.

Trees and shrubs are allowed to grow along the stream to provide shade, nutrient uptake, and sediment and erosion control.

For urban backyards, buffers should average 10 feet in width.

For mid-sized streams in larger backyards the buffer average should be 25 feet wide.

Along agricultural lands, the buffer should average 35-180 feet.

For very large streams, a 150 foot buffer is ideal.

The buffer should not be a mowed lawn and trash should be removed.

The more miles of streams and tributaries that are protected by buffers, the greater the overall benefit to water quality and stream health. Conservation buffers are also a visual showcase of the conservation ethics of a landowner. This fact sheet will help you evaluate and maintain a healthy buffer along your stream. For more information, contact the Delaware County Soil & Water Conservation District at 865-7161, or your local soil & water conservation district.



What Healthy Buffers Do?

If properly installed and maintained, buffers have the capacity to:

- Stabilize streambanks and reduce erosion.
- Provide wildlife habitat.
- Provide shade to keep stream water at cooler temperatures for healthy plants and animals and less algae growth.
- Remove up to 75% or more of sediment.
- Remove up to 50% or more of nutrients and pesticides.
- Remove up to 60% or more of certain pathogens from rainwater runoff.



“ Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land.”

Luna Leopold

References

Nurseries that stock Native Plants:

- Annie Miller
Salem, NY
(518) 692-7839
(woody species only)
- The Flower Co.
Altamont, NY
(518) 869-8000
- Saratoga State Tree Nursery
Saratoga Springs, NY
(518) 581-1439
- Northern Nurseries
Wholesale
Schenectady, NY
(518) 382-1600

Soil and Water Conservation Districts (SWCD):

- ◆ You can also purchase native trees from your local SWCD
- Delaware County SWCD
Walton, NY
(607) 865-7161
- Greene County SWCD
Cairo, NY
(518) 622-3620
- Sullivan County SWCD
Liberty, NY
(845) 292-6552
- Ulster County SWCD
Highland, NY
(914) 883-7162

For Further information on Riparian Buffers, Bioengineering, and Natives vs. Exotics, visit:

- www.ipcnys.org
- www.crjc.org/riparianbuffers.htm
- www.chesapeakebay.net/info/forestbuff.cfm
- www.nhq.nrcs.usda.gov/CCS/Buffers.html
- www.epa.gov/glnpo/greenacres/nativeplants/index.html
- www.nynjtc.org/committees/science/native.html
- www.hort.cornell.edu/gardening
- www.ianr.unl.edu/pubs/soil

For permit information, contact:

- NYS Dept. of Environmental Conservation
Region 4 SUB – Office
65561 State Hwy 10
Stamford, NY 12167-9503
(607) 652-7741

Riparian Buffers

Why Do I Care?

- ✦ Everyone lives downstream from someone else.
- ✦ What you do or don't do will affect others, therefore what your neighbor does or does not do, will affect **you**.

Riparian Buffers

Help to:

- ✦ Stabilize stream banks
- ✦ Reduce erosion, sediment, nutrient and chemical runoff
- ✦ Improve or provide aquatic and wildlife habitat
- ✦ Provide shade for you and the stream
- ✦ Increase aesthetics

What Can I Do?

- ✦ One of the easiest and most inexpensive methods is to let nature take care of itself. Allow the grass to grow along the land stream bank. Eventually, shrub and tree seeds will and grow.
- ✦ Please read pesticide and fertilizer directions carefully. Applying the appropriate amount will decrease chemical and nutrient runoff.
- ✦ Create a Riparian Buffer

Creating a Riparian Buffer

Step 1: Contact your local Soil and Water Conservation District to find out if there are any stream stabilization or restoration projects ongoing in your area.

Step 2: Spend time outside during a heavy rainstorm and watch how the water flows along your property. A buffer will spread out runoff, rather than allowing it to flow straight into the stream like a channel. If the latter is the case you can:

- ✦ Re-grade, use stones or landscape timber to divert runoff into flatter areas where it can be absorbed.
- ✦ If your land receives storm water runoff from a road, consult your local highway department or appropriate authority.

Step 3: Talk with your neighbors. (What are they doing or what have they done?) Then assess your stream edge:

- ✦ Steepness of bank?
- ✦ Frequent water level changes?
- ✦ Type of soil? Well drained or saturated?
- ✦ Active erosion?
- ✦ Existing plant cover? Type?
- ✦ Human access desired?

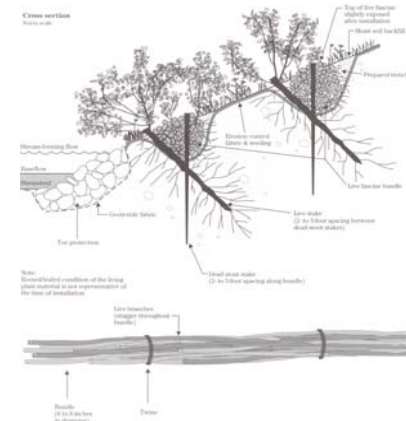
Step 4: Once you have assessed your stream edge, consult your regional Dept. of Environmental Conservation Office about permits and planting advice.

a. If your bank is severely eroding and professional help is not an option, there are two simple bioengineering techniques you can do:

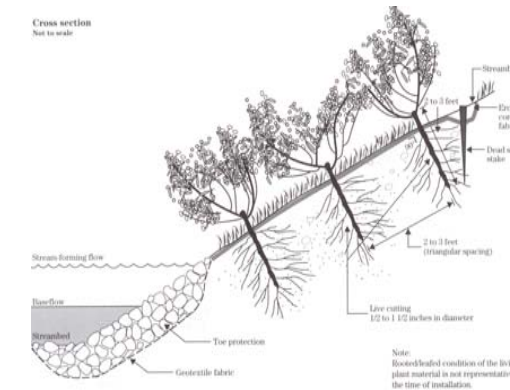
- ✦ Live Fascines: An oblong, cylindrical bundle of live cut branches from a species that roots easily from cuttings, typically willows.
- ✦ Live Stakes: Live cut branches that root easily. A system of stakes will stabilize and dry out the bank soon after installation.

b. If your bank is not severely eroding, you can plant grass, shrubs, and trees by following steps 5 – 9.

Live Fascines bioengineering technique:



Live Stakes bioengineering technique:



Step 5: Determine Buffer Width

- The width of your buffer depends on your reason (s) for creating a buffer.
- The basic buffer is 50 ft. from the top of the bank. You get more water protection with every foot (see figure below).

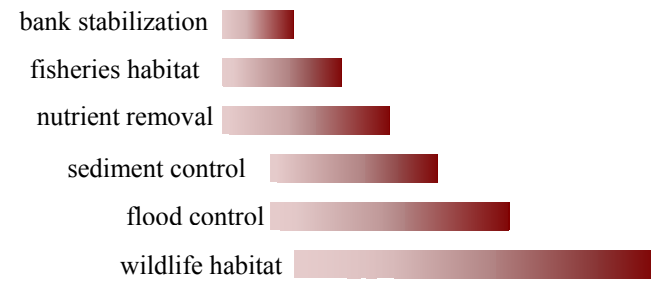
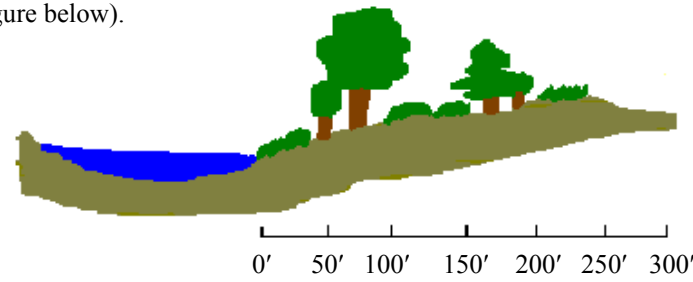


Figure modified from the Connecticut River Joint Commissions, Living with the River series no.1

Step 6: Determine how many plants you will need based on your buffer width. Be sure there are enough to be effective. See the table below for determining plant types.

- You will want to space shrubs 3' – 5' apart, small trees (25' at maturity) 15' apart, large trees 25' apart, and ground covers 1' - 3' apart.
- Wider spacing will still provide water quality protection, but allow more stream view.

Effectiveness of Different Vegetation Types for Specific Buffer Benefits

Benefits	grass	shrubs	trees
stabilize streambank	Low	Moderate	High
filter sediment and the nutrients, pesticides, & pathogens bound to it	Moderate	High	High
filter nutrients, pesticides, and microbes from surface water	Moderate	High	High
protect groundwater and drinking water supplies	Low	Moderate	High
improve aquatic habitat	Low	Moderate	High
improve wildlife habitat for field animals	Moderate	High	Low
improve wildlife habitat for forest animals	Low	Moderate	High
provide economically valued products	Moderate	High	High
provide visual interest	Low	Moderate	High
protect against flooding	Low	Moderate	High

Low Moderate High

Table modified from the Connecticut River Joint Commissions, Living with the River series no.8

Step 7: Plant Selection

- In general, native plants are the best choice for your riparian buffer because they require less care than non-native plants and are compatible with native soils and wildlife.
- Keep in mind that you want to select the most **appropriate** species for your site. The most **appropriate** species are those thriving in the area near your buffer site. Walk up and down stream of your site, taking note of the most common species.
- In general, plant selection is based on soil type (saturated, well drained), slope and buffer width.
- Try to include deciduous plants since their leaf litter traps nitrogen. Too much nitrogen in a stream can cause algal blooms, which reduce the amount of dissolved oxygen available for fish and invertebrates.
- Favor plants that have multiple values, such as erosion control, timber, nesting, fruit.
- You want to avoid invasive species. Those that reproduce quickly, displacing many of the other species in their domain and are difficult to eradicate (often exotic or non-native species).
- Note that nursery catalogues frequently do not use the term invasive or exotic, rather use phrases like “a very vigorous grower.” For example, Japanese Knotweed.
- Lastly, confirm all plant sources and check their quality.

Step 8: Planting a Riparian Buffer

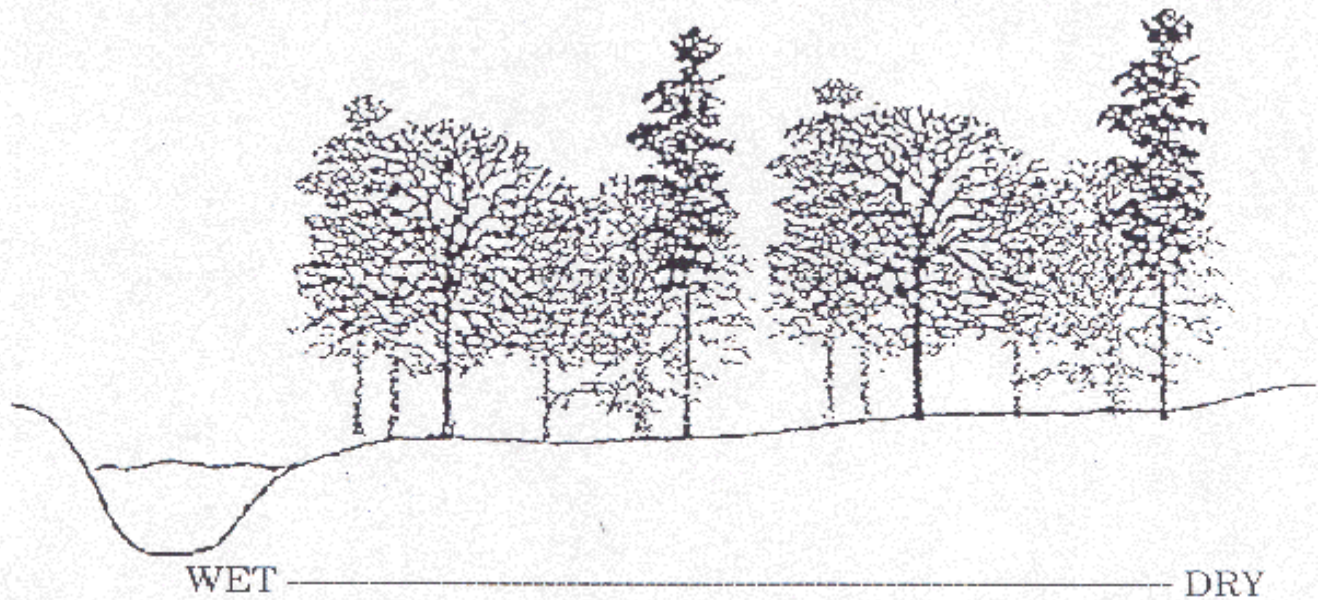
- Plant trees and shrubs when they are dormant (early spring or in autumn after leaf fall).
- Arrange plantings to create a gradual edge rather than an abrupt one, for a more natural appearance and for blowdown protection.
- For woody cuttings or live posts: Drive them deeply into the soil allowing a foot or so to remain exposed.
- For rooted plants: Prune any large roots before planting. Set plant in a hole 2 –3 times as wide but only as deep as the root ball. Plant at the same depth it was growing in the container or before transplanting. Fill hole gently but firmly with the original soil, watering to settle soil.
- Water once a week through the first growing season. Take care not to start gullies or erosion.
- Use only lime or wood ash to fertilize in your buffer zone.
- Mulching limits surface erosion, suppresses weeds and retains soil moisture. Use organic mulches such as leaf humus, wood chips, pine mulch or other shredded bark. Avoid redwood or cedar, since they are toxic to some seedlings and their chemistry interferes with buffer function.
- Stockpile fresh wood chips for at least 6 months before using, to avoid introducing disease and other troubles.
- Fencing is useful to control grazers, equipment, onlookers and vandals. To deter small mammals from girdling saplings, surround individual plants with simple fine wire mesh or use below ground collars. Deer require robust fencing until well-chosen plants are established. Use temporary fences on flood plains; permanent fences can be used elsewhere.

Step 9: Maintenance

- Inspect plantings and erosion control after rainstorms and regularly every 2 weeks for the first 2 months; then once a month for 6 months; then every 6 months for 2 years.
- Look for stressed or failed plants, invasives, weed competition, deer or beaver browsing, ineffective erosion control, debris accumulation and encroachments.
- Anticipate the need to replant if the buffer is subjected to prolonged high water, drought or ice damage before plants are fully established.

Steps 8-9 modified from the Connecticut River Joint Commissions, Living with the River series no. 8

Sample Planting Recommendations According to Moisture Conditions



TREES

- Silver maple
- Swamp white oak
- Green ash
- Sycamore ÿ
- Japanese larch ÿ
- Tamarack
- River Birch

SHRUBS

- Dogwood, Red osier & Silky
- Winterberry ÿ
- Inkberry ÿ
- Highbush blueberry ÿ
- N. Arrowwood (Viburnum)
- Willow, Basket/Stream-Co., Dwarf or Pussy
- Elderberry ÿ
- Button bush ÿ

TREES

- ² Red maple ÿ
- ² White ash ÿ
- Blackgum ÿ
- ² Pin oak ÿ
- ² Shellbark hickory ÿ
- ² Bitternut hickory ÿ
- ² Butternut ÿ
- ² Eastern/Canadian Hemlock
- ^ÿ Spruce, White & Norway ÿ
- ² E. White pine ÿ
- N. White cedar/Arborvitae ÿ
- ² Hornbeam ÿ
- Hackberry ÿ

SHRUBS

- ² Gray dogwood ÿ
- American Filbert / Hazelnut
- ^ÿ Spicebush ÿ
- ² Ninebark ÿ
- Northern Bayberry ÿ
- ² Highbush cranberry (Viburnum) ÿ
- ² Nannyberry ÿ

TREES

- Sugar maple
- White oak
- ² Red oak
- Black walnut
- ² Black cherry

SHRUBS

- ² Snowberry
- ² Am. Red Raspberry
- ² Chokecherry

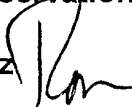
Arrows denote that certain species can tolerate either a wetter or drier environment.

Appendix 3
SPDES Memorandum of Understanding

**NEW YORK STATE
SOIL AND WATER CONSERVATION COMMITTEE
1 Winners Circle, Albany, NY 12235**

M E M O R A N D U M

TO: Soil and Water Conservation Districts

FROM: Ronald T. Kaplewicz 

DATE: September 24, 2003

SUBJECT: MOU for Implementation of Agricultural Best Management Practices - SPDES General Permit for Stormwater Discharges from Construction Activity, GP-02-01

Attached is a copy of the executed MOU between NYS DEC, NYS Ag. & Mkts. and the NYS Soil and Water Conservation Committee for the implementation of agricultural best management practices as it relates to the general permit for stormwater discharge.

If you have any questions, please contact your Associate Environmental Analyst or Regional Water Quality Specialist.

RTK:cj
Encl.
cc: Staff
State Committee Voting
and Advisory Members

MEMORANDUM OF UNDERSTANDING
BETWEEN
NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AND
NYS DEPARTMENT OF AGRICULTURE AND MARKETS
AND
NYS SOIL AND WATER CONSERVATION COMMITTEE
FOR
IMPLEMENTATION OF AGRICULTURAL BEST MANAGEMENT PRACTICES
IN CONFORMANCE WITH
THE SPDES GENERAL PERMIT FOR STORMWATER
DISCHARGES FROM CONSTRUCTION ACTIVITY, GP-02-01

Background

The New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Agriculture and Markets (NYSDA&M), and the New York State Soil and Water Conservation Committee (NYSSWCC) have worked cooperatively to support implementation of agricultural best management practices (AgBMP's). The implementation of these AgBMP's result in improved soil management and water quality.


However, some of the AgBMP's could be required to obtain coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-02-01). This Memorandum of Understanding clarifies which AgBMP's must be authorized by SPDES permit and which may proceed without such permitting.

Clarification

1. Operational and vegetative agricultural best management practices (BMP's), as identified in Table II (attached) of the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" are agricultural activities exempt from requirements to obtain authorization to discharge construction stormwater under a SPDES permit.
2. Practices that are structural as identified in Table II in the "Agricultural Management Practices Catalogue for Nonpoint Source Pollution in New York State" are agricultural activities exempt from requirements to obtain authorization to discharge construction stormwater under a SPDES permit provided that such practice:
 - a. improves water quality or reduces soil erosion,
 - b. does not degrade water quality or substantially exacerbate water quantity fluctuations,
 - c. has been planned and designed to USDA/NRCS standards and specifications,
 - d. is constructed in a manner consistent with the current version of the "New York Standards and Specifications for Erosion and Sediment Control", as prepared by the Urban Erosion and Sediment Control Committee, and
 - e. disturbs less than 5 acres.

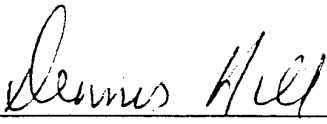
3. Wetland reconstruction projects installed in a manner consistent with the current version of the "New York Standards and Specifications for Erosion and Sediment Control", as prepared by the Urban Erosion and Sediment Control Committee, are agricultural activities exempt from requirements to obtain authorization to discharge construction stormwater under a SPDES permit.

4. Construction activities not set forth in clarification one, two, or three, such as construction of a barn or other agricultural building, silo, stock yard or pen, are not exempt by virtue of their status as agricultural activities.



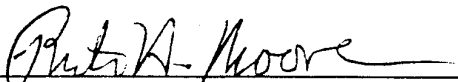
Sandra Allen, Director, Division of Water
NYS Department of Environmental Conservation

dated: SEP 10, 2003



Dennis Hill, Chair
NYS Soil and Water Conservation Committee

dated: 9/16/03, 2003



Ruth Moore, First Deputy Commissioner
NYS Department of Agriculture and Markets

dated: September 15, 2003

Table II. Agricultural Management Practices by Category and Lifespan

Management Practices	Management Practice Categories			Management Practice Lifespan
	Operational	Vegetative	Structural	
Access Road Improvement		●	●	Permanent
Alternative Water Supply	●		●	Temporary/Permanent
Barnyard Runoff Management System	●	●	●	Permanent
Conservation Tillage: - Minimum-Till - No-Till	● ●	● ●		Temporary Temporary
Constructed Wetlands		●	●	Permanent
Contour Farming	●			Temporary
Cover and Green Manure Crop	●	●		Temporary
Critical Area Protection: - Permanent Vegetative Cover - Streambank and Shoreline Protection	●	● ●	●	Permanent Permanent
Crop Rotation	●	●		Temporary
Diversions		●	●	Permanent
Fencing			●	Permanent

Table II. Agricultural Management Practices by Category and Lifespan (Continued)

Management Practices	Management Practice Categories			Management Practice Lifespan
	Operational	Vegetative	Structural	
Filter Strips		●		Permanent
Grassed Waterway		●	●	Permanent
Integrated Pest Management (IPM):				
- Biological Controls	●	●		Temporary
- Cultural Practices	●	●		Temporary
- Resistant Crop Varieties	●	●		Temporary
- Scouting	●	●		Temporary
- Trap Crops	●	●		Temporary
Irrigation Water Management:				
- Scheduling	●			Temporary
- Trickle Irrigation	●		●	Permanent
Nutrient Management:				
- Anaerobic Digestion	●		●	Temporary/Permanent
- Composting	●		●	Temporary/Permanent
- Fertilizer Management	●			Temporary
- Land Application of Manure	●			Temporary
- Manure Nutrient Analysis	●			Temporary
- Manure Storage System	●		●	Permanent
- Soil Testing	●			Temporary
Nutrient/Sediment Control System		●	●	Permanent

Table II. Agricultural Management Practices by Category and Lifespan (Continued)

Management Practices	Management Practice Categories			Management Practice Lifespan
	Operational	Vegetative	Structural	
Pathogen Management	●			Temporary/Permanent
Pasture Management: Short-Duration Grazing Systems		●	●	Permanent
Pesticide Management	●			Temporary
- Computerized Precision Application	●			Temporary
- Evaluation of Site-Specific Leaching and Surface Loss Potential	●			Temporary
- Pesticide Application Education and Training	●			Permanent
- Pesticide Handling Facility	●		●	Temporary
- Proper Equipment Calibration	●			Temporary
- Proper Timing of Pesticide Application	●			Temporary
- Read and Follow the Label Directions	●			Temporary/Permanent
Petroleum Product Storage, Spill Prevention and Containment			●	Permanent
Riparian Forest Buffer		●		Temporary/Permanent
Silo Leachate Control	●	●	●	Temporary
Stripcropping	●			Permanent
Terraces			●	Permanent

DRAFT

Appendix 4
Project Site Prioritization Protocol/Matrix

**Delaware County Soil & Water Conservation District
West Branch Delaware River
Stream Corridor Management Program**

Project Site Prioritization Protocol/Matrix

This prioritization procedure is intended to be used on a pilot basis for initial demonstration stream restoration projects in the Town Brook sub-basin. Future modifications will be made as deemed necessary by the Program staff, Project Advisory Committee, and Soil & Water Conservation District Board.

Data used as the basis for this procedure include field measurements of streams using survey equipment, collection and analysis of stream sediment, documented observation including digital photographs, Global Positioning System (GPS) points associated with field flagged features, historic and current (digital) aerial photography, and contact with riparian landowners. Collection and analysis procedures include the Rosgen system of stream classification and assessment, Mecklenburg Stream Assessment software, and various protocols developed by the New York City Department of Environmental Protection. It should be noted that data were collected and analyzed to date for the main-stem of the Town Brook sub-basin including the impacted (proposed project) reaches. Proposed project reaches were initially selected by field observation and review of GPS data after processing through the Geographic Information System (GIS) mapping database.

Ranking criteria were also developed based on tasks that can be completed with current staffing, available funding, and geomorphic approach. The tasks include data collection and analysis, project site survey, project design, and construction supervision and documentation. This protocol is designed that more difficult projects, particularly those with a higher risk in the event of failure (see Natural Resources Conservation Service Hazard Class criterion), will receive a lower score. Such projects will require a higher level of assessment, complicated designs, and will exceed available funding. These projects would need to be contracted to professional consultants having considerable experience with larger geomorphic based projects until later program phases. High risk sites may be selected from the list of all sites and prioritized with a modified protocol designed to determine the site in greatest need of restoration. Any such projects could be bid out pending availability of funding.

Following are the criteria to be used for establishment of the objective (rank) matrix component:

Ranking: 1 = Low Priority, 2 = Medium Priority, 3 = High Priority

Criteria 1 through 4 will be used to initially identify potential project reaches. Once a list of reaches are identified, the reaches will be re-ranked using criteria 5 through 9. Criteria 10-16 will be used to assist in the final project reach selection. Criterion 17 will currently **only** be used when public infrastructure is an issue and **only** when outside resources are available. In those instances Criterion 17 will be a Phase 1 Criterion.

Phase 1 Criteria

1 Eroding Banks (sediment contribution)

Data have been collected and analyzed on eroding banks to evaluate severity and potential for continued or increased sediment contribution to the stream system. Sediment loading greater than a stream's natural transport capacity results in degradation of water quality, increased nutrient loading, and degradation of aquatic habitat. Bank erosion can also result in damage to or loss of agricultural land; residential, commercial and public property and/or structures; and damage to public infrastructure.

- A. Surface Area
- 1 = <1000 sq. ft./1000 ft. of stream length
 - 2 = 1001 sq. ft. - 3000 sq. ft./ 1000 ft. of stream length
 - 3 = >3000 sq. ft./ 1000 ft. of stream length
- B. Eroded length (total) vs. reach length (stream centerline)
- 1 =Eroded/Reach < 25%
 - 2 =Eroded/Reach 25% - 50%
 - 3 =Eroded/Reach > 50%
- C. Bank materials
- 1 =Bank clay materials none
 - 2 =Bank clay materials slight to moderate
 - 3 =Bank clay materials significant (glacial lake clays)
- D. Proximity to residence, business, or public building
- 1 =< 30 ft. (higher risk site, requires higher level expertise)
 - 2 =31 ft - 100 ft. (moderate risk site, may require further evaluation)
 - 3 => 100 ft. (lower risk site)
- E. Proximity to public infrastructure
- 1 =< 30 ft. (higher risk site, requires higher level expertise)
 - 2 =31 ft - 100 ft. (moderate risk site, may require further evaluation)
 - 3 => 100 ft. (lower risk site)

2 Channel Conditions

Certain channel conditions indicate that a stream's capacity to transport sediment is out of balance. Stream bed aggradation (deposition) indicates an excessive sediment supply, usually upstream. Stream bed degradation (cutting of the bed) indicates sediment starvation usually due to upstream aggradation. Center bars, side bars, and transverse bars are forms of aggradation and are given additional consideration since these formations further alter desirable stream flow conditions and can compound erosion

problems.

- A. Aggraded areas
 - 1 = None to slight
 - 2 = Moderate
 - 3 = Significant
- B. Degraded areas
 - 1 = None to slight
 - 2 = Moderate
 - 3 = Significant
- C. Center bars, side bars, transverse bars
 - 1 = Not present
 - 2 = Moderately present (# 3 points per 1000 feet of reach)
 - 3 = Significantly present (\$5 points per 1000 feet of reach)
- D. Incision
 - 1 = None to slight
 - 2 = Moderate incision
 - 3 = Significantly incised
- E. Debris
 - 1 = Not present, or beneficial
 - 3 = Debris present, creating flow problems present

3. **Lateral Migration**

Lateral migration is a natural stream phenomenon. However, excessive migration can be destructive to property, aquatic habitat, and has serious consequences with respect to sediment transport regimes. Excessive migration can be the result of past practices and intervention.

- A Lateral migration
 - 1 = Migration minimal
 - 2 = Migration moderate
 - 3 = Migration significant

4. **Soil Conditions**

For a site to be considered for restoration, soils must exhibit favorable characteristics for re-vegetation and with enough structure to support heavy equipment. Although offsite soils may be brought in for re-vegetative purposes, this is costly and is not considered a favorable option.

- A. Soil conditions
 - 1 = Soils inadequate for both re-vegetation and equipment access
 - 2 = Soils adequate for equipment access but not re-vegetation
 - 3 = Soils adequate for both re-vegetation and equipment access

Phase 2 Criteria

5 NRCS Hazard Class

The Natural Resource Conservation Service (NRCS) Conservation Practice Standard 580 - Streambank and Shoreline Protection, contains criteria for assessing the design standards that must be used in any streambank stabilization project. These criteria include a hazard classification. The standard states, "A hazard classification shall be assigned each site to establish the level of design for streambank protection measure.

Hazard classes are:

- A. Low Hazard - sites where failure of measure would result in damage to cropland, woodland, pastureland, or other lands.
- B. Medium Hazard - sites where failure of measure would result in damage to uninhabited structures, farm buildings, limited access roads and their appurtenances, parks, and other improved properties.
- C. High Hazard - sites where failure of measure would result in damage to residences, businesses, state and local highways and their appurtenances, or other structures which if imperiled would threaten the life and safety of the people."

- 1 = Hazard Class C
- 2 = Hazard Class B
- 3 = Hazard Class A

6 Stream Bank Maintenance

Many stream reaches have historically been maintained. Most of this maintenance takes the form of some sort of revetment including berms, log crib-walls, rip-rap, dumped stone, stacked rock walls, concrete slabs, and other various structures of varying degrees of integrity. All revetments affect stream hydraulics and some restrict stream access to the floodplain. Some revetments have been continually maintained, some somewhat maintained, while others were placed and rarely or never maintained. Some revetments have had a positive effect decreasing bank erosion with some enhancing aquatic habitat while others have created and/or compounded bank erosion at their locations and/or further downstream. No revetment is not necessarily indicative of a stable or unstable reach but could be an indicator that past maintenance was not deemed necessary, or that the stream could adequately access its floodplain.

- A. Revetments
 - 1 = Not present (if no revetment present, skip next three categories)
 - 2 = Present, in good condition
 - 3 = Present, in fair to poor condition
- B. Revetment effectiveness (erosion, floodplain access, habitat)
 - 1 = Beneficial or no detected adverse effects
 - 2 = Moderate adverse effects
 - 3 = Significant adverse effects

- C. Revetment length (total) vs. reach length (stream centerline)
 - 1 = Revetment/Reach <25%
 - 2 = Revetment/Reach 25% - 50%
 - 3 = Revetment/Reach >50%
- D. Proximity to public infrastructure
 - 1 =< 30 ft. (higher risk site, requires higher level expertise)
 - 2 =31 ft - 100 ft. (moderate risk site, may require further evaluation)
 - 3 => 100 ft. (lower risk site)

7 **Riparian Buffers**

The presence or lack of riparian buffers can affect the rate at which a bank is eroding or the potential for either increased or decreased erosion. Absence of buffers results in increased runoff thereby increasing erosion and nutrient loading. As buffers reach their full potential, nutrients are assimilated, sediments are trapped, and the energy of overland water flow is decreased while infiltration of water is increased.

- A. Presence of riparian buffer (minimum width of 35 ft. from top of bank)
 - 1 =Established buffer
 - 2 =Newly created (CREP) or narrow established buffer
 - 3 =No buffer

8 **Proximity to Natural/Cultural Resources**

Potential sites in close proximity to public parks, New York State Department of Environmental Conservation (NYSDEC) Reforestation Areas, NYSDEC Wildlife Management Areas, NYSDEC Significant Habitats, critical ecological areas, cemeteries, and nationally or State registered districts and buildings will require special permitting or may be precluded from any work at all. Therefore this criterion is included to identify a potential deterrent to restoration.

- A. Proximity to Natural/Cultural Resources
 - 1 = Resources within potential project footprint
 - 3 = No resources within potential project footprint

9 **Program Goals are Defined and Achieved (Conceptually)**

Restoration projects must meet the goals of the Stream Corridor Management Program. Conceptual plans will assess and define how these goals will be achieved. These goals are listed as follows: 1) Protection or enhancement of water quality; 2) Protection of private and/or public property; 3) Increased stream reach stability; 4) Improved aquatic habitat; 5) Other goals as defined.

- A. Program goals defined and achieved
 - 1 = 2 or less goals will be achieved
 - 2 = At least 3 goals will be achieved
 - 3 = All goals will be achieved

Phase 3 Criteria

10 Program Partnering

Partnering programs exist for some project phases such as riparian buffers, agricultural crossings, etc. Projects with potential for government funding and established deadlines should be a higher priority.

- A. Project partnering available
- 1 = No program partnering available
 - 3 = Program partnering available

11 Dewatering Potential

Current NYSDEC regulations require stream projects to be dewatered. This can be a costly process on sites where dewatering options are difficult.

- A. Dewatering
- 1 = Site dewatering will be costly and difficult
 - 3 = Site can be effectively and economically dewatered

12 Complicating Factors

It is advisable to keep initial demonstration projects uncomplicated. Tributaries within a project reach may need to be included in a restoration plan which could greatly increase both the scope of work and cost. Tributaries can also create hydraulic challenges at their confluences, especially where a main stream may require realignment. It is also advisable to address unstable reaches from upstream to downstream.

- A. Tributaries within proposed project reach (storm drains & springs not included)
- 1 = Tributaries present
 - 3 = No tributaries (if no tributaries, then skip category B)
- B. Sediment load from tributaries if tributaries present
- 1 = Significant sediment load
 - 2 = Moderate sediment loading
 - 3 = Minimal to no sediment loading
- C. Unstable upstream reaches
- 1 = Unstable upstream reaches present
 - 3 = No unstable upstream reaches
- D. Unstable downstream reaches (within reasonable proximity to project reach that could affect project success)
- 1 = Unstable downstream reaches present
 - 3 = No unstable downstream reaches

13 Survey, Design, and Construction Supervision

It is desirable to reserve initial demonstration projects requiring complicated survey, design, and construction supervision be reserved for later program phases. These tasks must be within the capabilities of current staffing and time constraints. Larger, more complicated projects that may require outside resources could result in projects not being completed before current contract deadlines.

- A. Survey, design, and construction supervision
- 1 = Complicated, lengthy, outside resources required
 - 2 = Moderately complicated, may be lengthy, outside resources not required
 - 3 = Uncomplicated, fits within time constraints, outside resources not required

14 Geomorphic Approach is Used

The Stream Corridor Management Program's fundamental approach to classification, assessment, and restoration is the fluvial geomorphology, or natural stream channel design approach (Rosgen approach). This methodology seeks to identify and solve an adverse stream condition. It is dependent on the data collection, analysis, and surveys of the project site watershed, as well as the data collection, analysis, and survey of a suitable stable reference reach (stream reach with same stream type and morphology). Designs need to be compatible with Rosgen's channel evolution sequencing. Strong consideration will be given to integration with other watershed protection programs. Objectives could include bringing stream back to acceptable range of width to depth ratio, pool/riffle length and depth, adjust slope or sinuosity, or reconnect the stream with its floodplain.

- A. Geomorphic approach is used
- 1 = Project approach has limited geomorphic objectives
 - 2 = Project approach addresses several geomorphic objectives
 - 3 = Project approach addresses several geomorphic objectives and has program partnering

15 Estimated Restoration Costs

Funding is currently limited and is a significant factor in scoping potential projects. Initial projects need to fall within the limits of existing funding. Reasonably priced projects would better enable similar projects to be funded in the future and allow funds to be reserved for future operation and maintenance. Additionally, time and types of funding available may not allow for procurement of funds and completion of construction before current contract deadlines.

- A. Estimated restoration costs
- 1 = Estimated costs exceed available funding
 - 2 = Estimated costs may exceed available funding

- 3 = Estimated costs within limits of available funding

16 Post Project Monitoring

It is necessary for initial demonstration projects to be visible and accessible. Completed projects must be monitored to measure success and will provide valuable data for use in future projects where similar solutions might be applied. This is to build expertise and test solutions. Project sites will be visited by program staff and other agencies and stakeholders for various monitoring and educational purposes. Strong consideration will be given to sites where access easement is likely to be given.

- A. Project site visibility
 - 1 = Site not visible
 - 2 = Site partially visible
 - 3 = Site highly visible
- B. Project site accessibility
 - 1 = Easement not attainable
 - 2 = Easement attainable, site somewhat difficult to access
 - 3 = Easement attainable, site offers good access

Public Infrastructure Criterion

17 Public Infrastructure (use only when adequate outside resources available)

Streams and roads exist in close proximity throughout much of the basin, existing parallel to each other and/or often crossing. As a result, they both affect each other. In some instances, the effects are not mutually beneficial. Although every potential project reach will not involve public infrastructure, many will. There will also be potential project sites where infrastructure will be the main focus. Therefore this criterion is being included but is designated for use only when roads and bridges are an issue. The eroding bank and revetment criteria address proximity to infrastructure and are the criteria most likely to have mutual impacts. This score for this criterion will be added to the rest of the criterion after initial prioritization of all potential sites to prevent bias toward only those sites where roads and bridges are an issue: 1) where the road or bridge is deemed important to or for a project; and 2) adequate outside resources are available.

- A. Scour condition at a road embankment or bridge
 - 1 = None to slight
 - 2 = Moderate
 - 3 = Significant
- B. Aggradation condition at a bridge
 - 1 = None to slight
 - 2 = Moderate
 - 3 = Significant

Following is the initial subjective (weight) matrix component.

1. Eroding Banks (sediment contribution)
 2. Channel Conditions
 3. Lateral Migration
 4. Soil Conditions

 5. NRCS Hazard Class
 6. Stream Bank Maintenance
 7. Riparian Buffers
 8. Proximity to Natural/Cultural Resources
 9. Program Goals are Defined and Achieved

 10. Program Partnering Available
 11. Dewatering Potential
 12. Complicating Factors
 13. Survey, Design, and Construction Supervision
 14. Geomorphic Approach is Used
 15. Estimated Restoration Costs
 16. Post Project Monitoring

 17. Public Infrastructure*
- * Use only when adequate outside resources available)

Delaware County Soil & Water Conservation District
West Branch Delaware River
Stream Corridor Management Program

Project Site Prioritization Matrix

Location	Criterion	Phase 1														Phase 2						Phase 3 Score	Total Score													
		1A	1B	1C	1D	1E	2A	2B	2C	2D	2E	3A	4A	17A*	17B*	Score	5A	6A	6B	6C	6D			7A	8A	9A	Score	10A	11A	12A	12B	12C	12D	13A	14A	15A
	Weight	3	3	3	3	3	2	2	2	2	2	2	2	1	1	0	3	1	1	1	1	2	1	2	0	3	3	2	2	2	2	2	2	3	3	3
	Rank																																			
	Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Weight	3	3	3	3	3	2	2	2	2	2	2	2	1	1	0	3	1	1	1	1	2	1	2	0	3	3	2	2	2	2	2	2	3	3	3
	Rank																																			
	Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Weight	3	3	3	3	3	2	2	2	2	2	2	2	1	1	0	3	1	1	1	1	2	1	2	0	3	3	2	2	2	2	2	2	3	3	3
	Rank																																			
	Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Weight	3	3	3	3	3	2	2	2	2	2	2	2	1	1	0	3	1	1	1	1	2	1	2	0	3	3	2	2	2	2	2	2	3	3	3
	Rank																																			
	Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Weight	3	3	3	3	3	2	2	2	2	2	2	2	1	1	0	3	1	1	1	1	2	1	2	0	3	3	2	2	2	2	2	2	3	3	3
	Rank																																			
	Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Weight	3	3	3	3	3	2	2	2	2	2	2	2	1	1	0	3	1	1	1	1	2	1	2	0	3	3	2	2	2	2	2	2	3	3	3
	Rank																																			
	Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Public Infrastructure Criterion when applicable

Appendix 5
DCSWCD Board Stream Policy

DRAFT

APPENDIX C

Delaware County Soil and Water Conservation District Technical Standard to Address the Issue of Livestock in Streams, Rivers and Hydrologically Sensitive Areas

When reviewing ~~Whole Farm Plans for technical content~~, the SWCD Board of Directors requires that each Whole Farm Plan provide for the exclusion of livestock from all streams, rivers and HSAs following one or more of the following methods.

These methods include:

- 1) Conservation Reserve Enhanced Program (CREP) – The Landowner/Producer agrees to utilize the CREP Program.
- 2) Fencing – The Landowner/Producer agrees to use Watershed Agricultural Program funds to fence cattle from streams, rivers and HSAs.
- 3) Behavioral Changes – When options 1 and 2 above are not practical, the Landowner/Producer agrees to use Watershed Agricultural Program funds to implement BMP's that will provide limited livestock access to streams, rivers and HSAs. BMP's may include but are not limited to the development of alternative water sources, location of alternative feeding areas and prescribed grazing.

Appendix 6
GPS Data Dictionary

DRAFT

West Branch Assess
 Updated 6/12/03 SRG

Bankfull	Point Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left bank	
right bank	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Beaver Dam P	Point Feature, Label 1 = text, Label 2 = camera #
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Beaver Dam L	Line Feature, Label 1 = text, Label 2 = camera #
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Bedrock P	Point Feature, Label 1 = location, Label 2 = grade control
location	Menu, Required, Required
all (bed,both banks)	
bed	
bank rt	
bank lt	
bed rt	
bed lt	
grade control	Menu, Normal, Normal
yes	
no	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Bedrock L	Line Feature, Label 1 = location, Label 2 = grade control
location	Menu, Required, Required
all (bed,both banks)	
bed	
bank rt	
bank lt	
bed rt	
bed lt	
grade control	Menu, Normal, Normal
yes	
no	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
BEHI Pin	Point Feature, Label 1 = location, Label 2 = camera #
location	Menu, Required, Required
left	
right	
left upper	
right upper	
left lower	
right lower	
camera #	Text, Maximum Length = 30
	Normal, Normal
text	Text, Maximum Length = 30
	Normal, Normal
Benchmark	Point Feature, Label 1 = location, Label 2 = description
location	Text, Maximum Length = 30
	Normal, Normal
description	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal

Bridge	Point Feature, Label 1 = type, Label 2 = bridge #
type	Menu, Required, Required
state	
county	
town	
village	
private	
bridge #	Text, Maximum Length = 30
	Normal, Normal
road name	Text, Maximum Length = 30
	Normal, Normal
wing wall	Menu, Normal, Normal
us left	
us right	
ds left	
ds right	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Camera	Point Feature, Label 1 = text, Label 2 = camera #
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Channel	Point Feature, Label 1 = state, Label 2 = bed material
state	Menu, Normal, Normal
aggraded	
high bed load	
degraded	
transverse bar	
center bar	
side bar	
divergence	
convergence	
bed material	Menu, Normal, Normal
clay	
sand	
gravel	
cobble	
boulder	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Clay Exposure P	Point Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left bank	
right bank	
bed,all	
bed,left	
bed,right	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
type	Menu, Normal, Normal
glacial lake	
glacial till	
behi #	Numeric, Decimal Places = 2
	Minimum = 0, Maximum = 30, Default Value = 0
	Normal, Normal
Clay Exposure L	Line Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left bank	
right bank	
bed	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal

type	Menu, Normal, Normal
glacial lake	
glacial till	
behi #	Numeric, Decimal Places = 2 Minimum = 0, Maximum = 30, Default Value = 0 Normal, Normal
Control Pin	Point Feature, Label 1 = type, Label 2 = location
type	Menu, Required, Required
behi	
erosion	
surv sta	
x-section	
DOT marker	
USGS marker	
location	Menu, Required, Required
control pin	
right pin	
left pin	
trav pt	
text	Text, Maximum Length = 30 Normal, Normal
local elevation	Numeric, Decimal Places = 3 Minimum = 0, Maximum = 50000, Default Value = 0 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
Culverts	Point Feature, Label 1 = size, Label 2 = material
size	Menu, Required, Required
4"	
6''	
8''	
10''	
12''	
15''	
18''	
21''	
24''	
30''	
36''	
42''	
48''	
54''	
60''	
66''	
72''	
84''	
other	
material	Menu, Required, Required
corrugated	
smooth steel	
plastic	
concrete	
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
flow status	Menu, Normal, Normal
dry	
wet	
running	
Debris	Point Feature, Label 1 = location, Label 2 = material
location	Menu, Required, Required
bank right	
bank left	
across stream	
in stream	
material	Menu, Required, Required
tree, log	
other	
text	Text, Maximum Length = 30 Normal, Normal
camera#	Text, Maximum Length = 30 Normal, Normal

Dump	Point Feature, Label 1 = location, Label 2 = materials
location	Menu, Required, Required
bank right	
bank left	
hillside right	
hillside left	
other	
materials	Menu, Normal, Normal
glass	
metal	
wood	
mixed	
toxic, dangerous	
text	Text, Maximum Length = 30
	Normal, Normal
camera#	Text, Maximum Length = 30
	Normal, Normal
Edge Water P	Point Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left	
right	
island	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Edge Water L	Line Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left	
right	
island	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Eroding Bank P	Point Feature, Label 1 = location, Label 2 = height
location	Menu, Required, Required
left	
right	
left lower	
right lower	
left upper	
right upper	
height	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 100, Default Value = 0
	Required, Required
text	Text, Maximum Length = 30
	Normal, Normal
behi #	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 200, Default Value = 0
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Eroding Bank L	Line Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left	
right	
left lower	
right lower	
left upper	
right upper	
text	Text, Maximum Length = 30
	Normal, Normal
behi #	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 200, Default Value = 0
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Gage	Point Feature, Label 1 = gage ID #, Label 2 = gage plate reading
gage ID #	Text, Maximum Length = 30

	Normal, Normal
gage plate reading	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Grade Control P	Point Feature, Label 1 = type, Label 2 = text
type	Menu, Normal, Normal
check dam	
mill dam	
flood dam	
habitat structures	
sheet piling	
handworked	
concrete	
log sill	
cross-vane	
earthen	
other	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Grade Control L	Line Feature, Label 1 = type, Label 2 = text
type	Menu, Normal, Normal
check dams	
mill dam	
flood dam	
log-jam, lwd	
habitat structures	
sheet piling	
handworked	
concrete	
log sill	
bedrock sill	
cross-vane	
earthen	
other	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Headcut	Point Feature, Label 1 = height, Label 2 = text
height	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 50, Default Value = 0
	Required, Required
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
HWM Flag	Point Feature, Label 1 = type, Label 2 = location
type	Menu, Required, Required
high water mark	
bankfull	
water surface	
location	Menu, Required, Required
left bank	
right bank	
date	Date, Month-Day-Year Format
	Required, Required
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Information	Point Feature, Label 1 = contact, Label 2 = hydrology
contact	Text, Maximum Length = 30
	Normal, Normal
hydrology	Text, Maximum Length = 30
	Normal, Normal
misc.	Text, Maximum Length = 30
	Normal, Normal

Land Use P Point Feature, Label 1 = type, Label 2 = buffer
type Menu, Normal, Normal
Forest/decid, heavy
Forest/decid, light
Forest/coniferous
Agricultual/crops
Agricultural/grass
Agricultural/pasture
Residential
Commercial
Other
buffer Menu, Normal, Normal
CREP
Trees/Brush
Grade/Berm
Other
buffer width Text, Maximum Length = 30
Normal, Normal
text Text, Maximum Length = 30
Normal, Normal
camera # Text, Maximum Length = 30
Normal, Normal

Land Use L Line Feature, Label 1 = type, Label 2 = buffer
type Menu, Normal, Normal
Forest/decid, heavy
Forest/decid, light
Forest/coniferous
Agricultual/crops
Agricultural/grass
Agricultural/pasture
Residential
Commercial
Other
buffer Menu, Normal, Normal
CREP
Trees/Brush
Grade/Berm
Other
buffer width Text, Maximum Length = 30
Normal, Normal
text Text, Maximum Length = 30
Normal, Normal
camera # Text, Maximum Length = 30
Normal, Normal

Revetment P Point Feature, Label 1 = location, Label 2 = type
location Menu, Required, Required
left
right
type Menu, Normal, Normal
berm
log cribwall
habitat structures
gabion
old abutment
rip-rap
sheet piling
stacked rock wall
other
concrete
laid-up stone
dumped stone
bankrun - bare
bank run, seed&mulch
concrete slabs
poured concrete
brush/lwd
Description Text, Maximum Length = 30
Normal, Normal
camera # Text, Maximum Length = 30
Normal, Normal

Revetment L Line Feature, Label 1 = location, Label 2 = type
location Menu, Required, Required
left

right	
type	Menu, Normal, Normal
berm	
log cribwall	
habitat structures	
gabion	
old abutment	
rip-rap	
sheet piling	
stacked rock wall	
other	
concrete	
laid-up stone	
dumped rock fill	
bankrun - bare	
bank run, seed&mulch	
concrete slabs	
poured concrete	
brush/lwd	
Description	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Reference Reach	Point Feature, Label 1 = location, Label 2 = Classification
location	Menu, Normal, Normal
top	
middle	
bottom	
Classification	Menu, Normal, Normal
Aa	
A	
B	
C	
D	
E	
F	
G	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Road	Line Feature, Label 1 = feature, Label 2 = materials
feature	Menu, Normal, Normal
guiderail	
ditch - bare	
ditch - veg	
ditch - hardened	
edge - uphill	
edge - downhill	
centerline	
hillside staywall	
materials	Menu, Normal, Normal
blacktop	
gravel	
crushed stone	
grass/veg	
concrete	
other	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Stream Channel TW P	Point Feature, Label 1 = text
text	Text, Maximum Length = 30
	Normal, Normal
Stream Channel TW L	Line Feature, Label 1 = text
text	Text, Maximum Length = 30
	Normal, Normal
Stream Crossing	Point Feature, Label 1 = type, Label 2 = text
type	Menu, Required, Required
farm equip	

cattle	
recreational	
other	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Stream Feature	Point Feature, Label 1 = feature, Label 2 = chan type
feature	Menu, Required, Required
top riffle	
run	
top pool	
glide	
step pools	
point bar	
spring seep	
trout area	
chan type	Menu, Required, Required
MC	
SC1	
SC2	
BP	
text	Text, Maximum Length = 30
	Normal, Normal
Rosgen Class	Menu, Normal, Normal
Aa	
A	
B	
C	
D	
E	
F	
G	
camera #	Text, Maximum Length = 30
	Normal, Normal
Stream Type Change	Point Feature, Label 1 = top of, Label 2 = bottom of
top of	Menu, Normal, Normal
Aa?	
A?	
B?	
C?	
D?	
E?	
F?	
G?	
bottom of	Menu, Normal, Normal
Aa?	
A?	
B?	
C?	
D?	
E?	
F?	
G?	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Terrace	Point Feature, Label 1 = location, Label 2 = text
location	Menu, Required, Required
left bank	
right bank	
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Tributary	Point Feature, Label 1 = location, Label 2 = type
location	Menu, Required, Required
left bank	
right bank	
thalweg	
type	Menu, Required, Required

perennial	
intermittent	
spring	
storm drain	
binnekill	
name	Text, Maximum Length = 30
	Normal, Normal
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Utilities	Point Feature, Label 1 = type, Label 2 = pole #
type	Menu, Normal, Normal
electric	
phone	
sewer	
well	
water supply	
cable	
pole #	Text, Maximum Length = 30
	Normal, Normal
text	Text, Maximum Length = 30
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Undercut Bank P	Point Feature, Label 1 = location, Label 2 = height
location	Menu, Required, Required
left	
right	
height	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 100, Default Value = 0
	Required, Required
depth into bank	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 100, Default Value = 0
	Required, Required
vegetation	Menu, Normal, Normal
none	
tree roots	
woody	
other	
grasses,etc	
text	Text, Maximum Length = 30
	Normal, Normal
behi #	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 200, Default Value = 0
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Undercut Bank L	Line Feature, Label 1 = location, Label 2 = height
location	Menu, Required, Required
left	
right	
height	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 100, Default Value = 0
	Required, Required
depth into bank	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 100, Default Value = 0
	Required, Required
vegetation	Menu, Normal, Normal
none	
tree roots	
woody	
other	
grasses,etc	
text	Text, Maximum Length = 30
	Normal, Normal
behi #	Numeric, Decimal Places = 1
	Minimum = 0, Maximum = 200, Default Value = 0
	Normal, Normal
camera #	Text, Maximum Length = 30
	Normal, Normal
Valley Type	Point Feature, Label 1 = Types, Label 2 = text

Types	Menu, Normal, Normal
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
Vegetation P	Point Feature, Label 1 = type, Label 2 = text
type	Menu, Normal, Normal
brush	
knotweed	
multiflora rose	
other invasive	
other non-invasive	
sparse/stressed	
lawn	
other	
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
Vegetation L	Line Feature, Label 1 = type, Label 2 = text
type	Menu, Normal, Normal
brush	
knotweed	
multiflora rose	
other invasive	
other non-invasive	
sparse/stressed	
lawn	
other	
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
X-Section	Point Feature, Label 1 = location, Label 2 = Type
location	Menu, Required, Required
bankfull flag LB	
bankfull location LB	
thalweg	
bankfull flag RB	
Bankfull location RB	
Type	Menu, Required, Required
existing	
proposed	
reference	
classification	
BEHI	
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
Point Generic	Point Feature, Label 1 = text, Label 2 = camera #
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal
Line Generic	Line Feature, Label 1 = text, Label 2 = camera #
text	Text, Maximum Length = 30 Normal, Normal
camera #	Text, Maximum Length = 30 Normal, Normal

Area Generic
text

Area Feature, Label 1 = text, Label 2 = camera #
Text, Maximum Length = 30
Normal, Normal

camera #

Text, Maximum Length = 30
Normal, Normal

Appendix 7
Entrainment Calculation Form

DRAFT

Entrainment Calculation Form (Andrews)

Stream:		Reach:	
Date:		Observers:	
	D ₅₀ Riffle bed material D ₅₀ (mm)		
	D [^] ₅₀ Bar sample D ₅₀ (mm)		
	D [^] ₁₀₀ (mm) Largest particle from bar sample	0.000 (ft)	304.8 mm/ft
	S Existing bankfull water surface slope (ft/ft)		
	d Existing bankfull mean depth (ft)		
1.65	G _s Submerged specific gravity of sediment		
D _{50riffle}	D [^] _{50bar/subpave.}	Ratio 1: D _{50riffle} /D _{50bar/subpavement}	
0	0	#DIV/0!	If between 0.3 & 4.2, use Eq.1. If outside range, calculate Ratio 2
D [^] ₁₀₀	D _{50riffle}	Ratio 2: D [^] _{100(bar/subpave.)} /D _{50riffle}	
0	0	#DIV/0!	If not between 0.3 and 4.2, use Equation 2
If ratios are outside either of the above ranges, use Shields relationship.			
Use Equation 1? (1=yes, blank=no)			Use Equation 2? (1=yes, blank=no)

Critical Dimensionless Shear Stress (Equation 1)

$$\tau_{ci} = 0.0834(D_{50riffle}/D^{^}_{50bar/subpave.})^{-0.872}$$

Value	Variable	Definition
0	D ₅₀ (mm)	D ₅₀ Bed Material (D ₅₀ from riffle pebble count)
0	D [^] ₅₀ (mm)	Bar Sample D ₅₀ or Sub-pavement D ₅₀
0.000	τ _{ci}	Critical Dimensionless Shear Stress

Critical Dimensionless Shear Stress (Equation 2)

$$\tau_{ci} = 0.0384(D^{^}_{100bar/subpave.}/D_{50riffle})^{-0.887}$$

Value	Variable	Definition
0	D [^] ₁₀₀ (mm)	Largest Particle from Bar/Sub-pavement Sample
0	D ₅₀ (mm)	D ₅₀ Bed Material (D ₅₀ from riffle pebble count)
0.000	τ _{ci}	Critical Dimensionless Shear Stress

Bankfull Mean Depth Required for Entrainment of Largest Particle in Bar Sample:

$$d_r = (\tau_{ci} * 1.65 * D^{^}_{100}) / S_e \text{ (Equation 3)}$$

1.65 = submerged specific weight of sediment

Value	Variable	Definition
	τ _{ci}	Critical Dimensionless Shear Stress (input value)
0.000	D [^] ₁₀₀ (ft)	Largest particle from Bar/Sub-pavement sample (D _(mm) /304.8)=D _(ft)
0.0000	S _e (ft/ft)	Existing Bankfull Water Surface Slope
#DIV/0!	d _r (ft)	Bankfull Mean Depth Required
0	d _e (ft)	Existing Bankfull Mean Depth (from riffle cross section)
#DIV/0!	d _e /d _r	Ratio of Existing Mean Depth to Required Mean Depth

Check one: Stable (de/dr = 1) Aggrading (de/dr < 1) Degrading (de/dr > 1)

Bankfull Water Surface Slope Required for Entrainment of Largest Particle in Bar Sample:

$$S_r = (\tau_{ci} * 1.65 * D^{^}_{100}) / d_e \text{ (Equation 4)}$$

1.65 = submerged specific weight of sediment

Value	Variable	Definition
	τ_{ci}	Critical Dimensionless Shear Stress (input value)
0.000	D_{100}^{\wedge} (ft)	Largest particle from Bar/Sub-pavement sample $(D_{(mm)}/304.8)=D_{(ft)}$
0	d_e (ft)	Existing Bankfull Mean Depth (from riffle cross section)
0.0000	S_e (ft/ft)	Existing Bankfull Water Surface Slope
#DIV/0!	S_r (ft/ft)	Bankfull Water Surface Slope Required
#DIV/0!	S_e/S_r	Ratio of Existing Slope to Required Slope
Check one: <input type="checkbox"/> Stable ($S_e/S_r = 1$) <input type="checkbox"/> Aggrading ($S_e/S_r < 1$) <input type="checkbox"/> Degrading ($S_e/S_r > 1$)		

Sediment Transport Validation	
0	Largest Particle in Bar Sample D_{100}^{\wedge} (mm)
	Hydraulic Radius (ft) (input value)
0.00	Bankfull Shear Stress $\tau_e = \gamma RS$ (lb/ft ²) $\gamma = 62.4$ R=Hydraulic Radius S=Slope
0	Moveable particle size (mm) at bankfull shear stress (predicted by the Shields Diagram: Blue field book: p238, Red field book: p190)
0	Predicted shear stress required to initiate movement of D_{100}^{\wedge} (mm) (see Shields Diagram: Blue field book: p238, Red field book: p190)
	Input value in light blue cells
	Yellow cells contain formulas, value will be calculated

After Wildland Hydrology 2001

Appendix 8
Agency Contacts and Funding Sources

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Appendix 8 - Agency Contacts and Funding Sources

Technical Assistance

A wealth of information and assistance is available to local municipalities, landowners, and businesses in the West Branch watershed. Services are wide ranging through a variety of programs. Although funding and grant opportunities may not always be a possibility, the organizations listed below offer a variety of solutions for water quality, infrastructure, and property protection. Please do not hesitate to contact these resources with questions and requests. Many of these organizations also offer grant and other funding opportunities. Please see the grant resources list for more information on monetary support.

Delaware County Soil & Water Conservation District

With a soil and water conservation district in each upstate county in New York State, these local entities provide a variety of services to its local constituency. Most districts focus on offering agricultural assistance with best management practices (BMPs) through design, installation, and oversight. These BMPs include water management such as diversions, barnyard management systems, manure storages, grazing systems, and livestock water systems. Other services provided by DCSWCD include stream management, nutrient management, riparian buffer management and environmental education. DCSWCD is often a good starting place for information and assistance. If they cannot help, they can most likely point you in the right direction.

Delaware County SWCD
44 West Street, Suite 1
Walton, NY 13856
(607) 865-7161/7090
(607) 865-5535 Fax

Rick Weidenbach, Executive Director
rick-weidenbach@ny.nacdnet.org

Scotty Gladstone, Stream Program Coordinator
scott-gladstone@ny.nacdnet.org

Elaine Hitt, Watershed Ag Program Manager
Elaine-hitt@ny.nacdnet.org

New York City Department of Environmental Protection (NYCDEP)

www.nyc.gov/dep

The Bureau of Water Supply works closely with landowners to achieve goals in an environmentally sensitive manner. NYCDEP has a variety of programs that assist landowners with the management of their property and streams. Please see below for a brief description of the various programs.

Land Acquisition: In 1997, the New York State Department of Environmental Conservation (NYSDEC) issued a permit that allowed the NYCDEP to acquire land for the purpose of watershed protection. The acquisition of land is one of the best ways to ensure the ongoing prevention of pollution and to prevent future water quality problems from occurring as a result of adverse development close to critical natural features and reservoir intakes. Purchase of land at fair market value or placement in an easement is

negotiated only from willing sellers. Interested parties should contact Dave Tobias dtobias@dep.nyc.gov, or the Land Acquisition Program at (845) 340-7540.

Stream Management: NYCDEP's Stream Management Program was established after the 1996-snowmelt flood to address the systemic challenges to overall water quality in the Catskill/Delaware watershed. Its mission is to establish long-term stewardship of the streams through a watershed-scale, community-based, geomorphic approach. Essential to achieving this goal is the provision of technical assistance to local municipalities, landowners, and businesses within the watershed. The stream management staff is available for consultation on property and infrastructure protection through natural channel design. Staff members also offer training and educational programs regarding these topics. Concerns or requests for service should be made to Beth Reichheld at ereichheld@dep.nyc.gov or call the Stream Management Program at (845) 340-7517.

Land Management: This program aims towards good stewardship of the natural resources in the West of Hudson watershed. Providing good stewardship is critical to the success of any water quality protection program. The Land Management Program develops land resource management plans for NYCDEP properties, conducts a recreational review, and develops basin plan, incorporating specific property by property uses and stewardship. In addition, the NYCDEP has implemented a public access program, making 50% of acquired lands available for recreational purposes like hiking, hunting, and fishing. For additional information contact John Potter at jpotter@dep.nyc.gov or call (845) 340-7541.

The DEP also oversees a number of other programs like the watershed agricultural and watershed forestry programs, sewer and septic maintenance, economic development, and watershed education through the Catskill Watershed Corporation (CWC). Please see the CWC description below for more details.

New York State Department of Environmental Conservation (NYSDEC)

www.dec.state.ny.us (Verified 12-07-04)

Many water related programs are offered by the NYSDEC. The agency has various divisions, which handle watershed assessment and management, environmental education, fisheries, and flood protection. Information about the NYSDEC stocking schedule, fishing licenses, and access points is available at <http://www.dec.state.ny.us/website/dfwmr/fish/index.html> (Verified 12-07-04) or by calling (607) 652-7366.

To receive information regarding any flooding issues and the National Flood Insurance Program, see <http://www.dec.state.ny.us/website/dow/bfp/gisfpm/index.htm> (Verified 12-07-04) or call (518) 402-8141 about flood control projects, or (518) 402-8146 about flood plain management.

In addition to the above services, the NYSDEC is also the regulatory agency for the state of New York's waterways. Having classified Catskill streams, the NYSDEC requires a

Protection of Waters Permit for disturbing the bed or banks of a stream. Please contact the following individual for direction and advice.

NYS Department of Environmental Conservation
Bureau of Habitat
65561 State Hwy 10
Stamford, NY 12167
(607) 652-2645

U.S. Army Corps of Engineers (USACOE) New York District
www.nan.usace.army.mil/index.htm (Verified 12-07-04)

The U.S. Army Corps of Engineers has a variety of duties related to stream management. If a municipality or landowner wishes to install a water-related structure, dredge or fill a stream, or affect a wetland area, USACOE will often assign a field technician to visit the sight in order to evaluate the need for a federal permit. USACOE also offers engineering designs and other technical expertise. In addition, they are available for planning, designing, and constructing flood control projects. For a field technician contact the office listed below:

Department of the Army
New York District, Corps of Engineers
Albany Field Office
1 Bond Street
Troy, NY 12180
(518) 270-0588

Catskill Watershed Corporation
www.cwconline.org (Verified 12-07-04)

The CWC is a not-for-profit corporation with a dual goal: to protect the water resources of the New York City Watershed west of the Hudson River, while preserving and strengthening communities located in the region. Although the CWC is mainly a source of funding (see grant information section below), they can also provide technical assistance. Pertinent programs for Catskill/Delaware stream stakeholders include the Stormwater Controls for New Construction, Stormwater Retrofit, Septic System Rehabilitation and Replacement, and Alternate Design Septic Program. For more information call (845) 586-1400. See also **Section 4.7**.

Watershed Agricultural Council (WAC)
www.nycwatershed.org (Verified 12-07-04)

WAC offers the Watershed Agricultural Program and the Watershed Forestry Program. WAC subcontracts with local, state, and federal agricultural assistance agencies, Cornell University, and the private sector to provide planning, education, training, engineering, scientific, and administrative support. See also **Section 4.5**.

National Rural Water Association

www.nrwa.org (Verified 12-07-04)

The National Rural Water Association is a non-profit federation of [State Rural Water Associations](#). Their mission is to provide support services to State Associations who have more than 22,000 water and wastewater systems as members. Please see description below for New York state contact information.

New York Rural Water Association

www.nyruralwater.org/tech_assistance.shtml (Verified 12-07-04)

New York Rural Water Association (NYRWA) is a not-for-profit group organized in 1979 with the goal of promoting the development, improvement, and sound operation of rural drinking water and wastewater systems throughout New York State. New York Rural Water Association recently expanded its scope to offer training, technical, and administrative assistance to rural communities on solid waste management matters as well. Contact (518) 828-3155, or e-mail nyruralwater.org

Federal Emergency Management Association (FEMA)

<http://www.fema.gov/> (Verified 12-08-04)

FEMA is the federal government agency responsible for administering emergency and disaster relief, recovery, planning and preparedness programs across the United States and territories. While FEMA's most apparent role is emergency response and recovery, its role in risk reduction through the establishment of building codes and administration of insurance programs like the national flood insurance program provide protection against losses of life and property in the case of an emergency or natural disaster. Based in Washington, FEMA operates regional offices across the United States including the Region II office in New York City, covering New York State. FEMA works in cooperation with other federal agencies and State and local emergency response entities such as the State Emergency Management Office (SEMO) and county Emergency Management officials (please see below). FEMA provides training to state and local officials on most aspects of their work including emergency response, disaster response planning, hazard mitigation planning, code interpretation and enforcement. Following a Presidentially declared disaster, FEMA's assistance can be available to state and local government, private individuals, and businesses. See also **Section 5.14**.

To contact the FEMA Region II office, please call (212) 680-3600.

New York State Emergency Management Office (SEMO)

www.nysemo.state.ny.us (Verified 12-08-04)

As stated above, the New York State Emergency Management Office is the state entity for pre- and post disaster assistance. Like FEMA, the state office provides planning and resources through cooperation with local governments, volunteer organizations like Red Cross, and the private sector. Where FEMA is primarily involved immediately after a disaster event, SEMO provides long-term recovery solutions. The state agency is more involved in the day to day planning and preparation for disaster response. Below are summaries of some of SEMO's major programs. See also **Section 5.14**.

Mitigation: This may be one of SEMO's most influential programs by providing preventative assistance to communities within the Catskills. Mitigation efforts intend to reduce negative impacts of floods and other major disasters by preparing predisaster planning. This program also aims to identify potential threats and repeatedly damaged structures and to offer positive solutions to reduce future losses and protect against the loss of life and property. It is the intention that preventative efforts will greatly reduce the cost of recovery and will also reduce the loss of property. SEMO manages a Hazard Mitigation Grant program available to communities that prepare hazard mitigation plans. Communities preparing the plan are eligible for grant program funds to implement hazard mitigation projects following Presidentially declared disasters within New York State. Individuals living in communities with plans may benefit from the program through the reduction in flood insurance rates.

Disaster Recovery Assistance: Recognizing that not all disasters can be prevented, this program aims to provide local assistance for faster recovery by coordinating public assistance funds, disaster housing assistance, individual family grants, and small business administration assistance.

Other Emergency Assistance: SEMO also provides a variety of services during times of emergency. These services include state of the art communications, information dissemination, and emergency operation coordination.

Call the Emergency Coordination Center at (518) 457-2200 with questions or requests.

Cornell Cooperative Extension (CCE)

<http://www.cce.cornell.edu/> (Verified 12-08-04)

Cooperative Extension builds partnerships and coalitions with individuals, communities, organizations, government agencies, and businesses around issues of mutual concern; develops local leaders who use CCE knowledge to inform decisions; promotes youth development through 4-H clubs and other experiences; strives to help participants make informed choices using the best knowledge available; connects learners with educational resources found in locations throughout the world; consults with individuals and groups on multiple topics; provides resources via technologies such as the World Wide Web, satellite, and compressed video.

(607) 865-6531 e-mail: delaware@cornell.edu

Natural Resources Conservation Service (NRCS)

www.nrcs.usda.gov/ (Verified 12-08-04)

NRCS puts nearly 70 years of experience to work in assisting owners of America's private land with conserving their soil, water, and other natural resources. Local, state and federal agencies and policymakers also rely on our expertise. They deliver technical assistance based on sound science and suited to a customer's specific needs. Cost shares and financial incentives are available in some cases. Most work is done with local partners. NRCS's partnership with local conservation districts serves almost every county. For further information contact:

USDA NRCS
Walton Service Center
44 West Street, Suite 1
Walton, NY 13856
(607) 865-4005

United States Geological Society (USGS)

<http://ny.water.usgs.gov/index.html> (Verified 12-08-04)

The USGS provides the Nation with reliable information about the Earth to minimize the loss of lives and property from natural disasters, to manage biological, water, mineral, and energy resources, to enhance and protect the quality of life, and to contribute to wise economic and physical development. The USGS provides a variety of assistance related to the four main categories of biology, geography, geology, and water. The water division is broken down into ground water, surface water, and water quality. Individuals can find a multitude of data throughout the website, search various resource databases, and view a number of maps. For more information call the Troy office at (518) 285-5600.

Catskill Forest Association (CFA)

www.catskillforest.org/ (Verified 12-08-04)

The Catskill Forest Association is a non-profit organization dedicated to enhancing all aspects of the forest in New York's Catskill region. CFA offers educational programs at all levels, from one-on-one on-site visits at landowner properties to group woods-walks, workshops and seminars. School-based activities include classroom visits and teacher training such as the Watershed Forestry Institute. CFA is also active in advocating for proper forest management, as well as promoting the economic development of viable markets for a variety of forest products. For more information, email cfa@catskill.net or call (845) 586-3054.

Catskill Center for Conservation and Development (CCCD)

www.catskillcenter.org/ (Verified 12-08-04)

The Catskill Center is a non-profit organization working to protect the cultural, historic, and natural resources of the Catskill Mountains. The CCCD has a few integrated program areas:

Land Conservation & Natural Resource Protection: This program identifies, monitors, and engages in effective actions to protect and preserve sensitive, ecologically significant, aesthetically, or recreationally critical lands and waters.

Community Outreach and Planning Assistance: This program provides technical support to rural communities in the Catskills on grants-writing, planning, land use, zoning, subdivision, community empowerment, main street revitalization, regional forums, conferences and workshops, producing reports and publications, and public policy development.

Education: This program consists of a curriculum entitled The Catskills: A Sense of Place, which is a series of five modules on the water resources, geography and geology, ecosystems, human history, and culture and arts of the Catskills. A Sense of Place is designed to give children a better awareness, understanding, and appreciation of the distinctive features of our area. In addition, The Center has partnered with Hudson Basin River Watch to support advanced water quality monitoring efforts by adult volunteer groups. Lastly, we host a hike, lecture, and recreation series for our membership and the general public throughout the year.

Visit their website at www.catskillcenter.org or call (845) 586-2611.

Trout Unlimited (TU)

www.tu.org/index.asp (Verified 12-08-04)

Trout Unlimited's mission is to conserve, protect and restore North America's trout and salmon fisheries and their watersheds. TU accomplishes this mission on local, state and national levels with an extensive and dedicated volunteer network. Local TU members have been active in many aspects of stream management planning throughout the Catskill/ Delaware watershed. Not only do they participate in public meetings, legislative activities, and volunteer events, but TU has also funded research projects such as the "Economic Impact Assessment of the Beaverkill-Willowemoc Trout Fishery" to promote improved trout habitats and stream health. Please contact the following local chapters for further information:

Upper Susquehanna 210: (607) 432-8587

Ashokan-Pepacton 559: (845) 254-5904

ESRI Environmental Conservation Program (CSP)

This program provides donations and discounts of GIS software, data, books, and training. It offers free on-line live workshops. The overall goal of the ECP is to support conservation groups in acquiring, learning, and using GIS tools and methods. ECP has a particular focus on appropriate levels of technology for locally sustainable programs. Its goal is not to throw out one-off donations into a vacuum with no forethought, but to build permanent, locally based support structures that provide ongoing evolutionary growth in GIS skills. Email redgrant@esri.com for detailed information.

Name	Focus	Due Date	Contact	Award Example	Notes/Priority	on-the-ground research	planning	<\$20k	\$20k to \$100k	>\$100k	Range
National Resources Conservation Service Conservation on Private Land http://www.nfwf.org/programs/nrcsnacd.htm	Projects that engage private landowners, primarily farmers, on-the-ground projects.	1/7/2005 9/16/2005	NE Regional Office, Tim Kelsch, 202-857-0166 or Lynn Dwyer, 631-312-4793		Partnerships with NRCS or local conservation districts, priority given to landscape, watershed scale projects integrating agriculture and forestry that benefit fish and wildlife	X		X	X		4K-100K
Emergency Watershed Protection http://www.nrcs.usda.gov/programs/ewp/factsheet.html	Projects support such work as clearing debris from clogged waterways, restoring vegetation, and stabilizing streambanks after major storm events	on-going	Walton Service Center 607-865-6713		The measures that are taken must be environmentally and economically sound and generally benefit more than one property owner.	X					
National Oceanic and Atmospheric Administration http://nmfs.noaa.gov/habitat/restoration	Provides funds for small-scale, locally driven habitat restoration projects that foster natural resource stewardship within communities.	9/14/2005	Robin Buchner 301-713-0174	Provides funding to implement on-the-ground habitat restoration projects to benefit marine, estuarine and riparian habitats		X			X	X	14K-8mil
Federal Emergency Management Association http://www.fema.gov	Program helps states and communities identify and implement measures to reduce or eliminate the long-term risk of flood damage to homes and other structures	established by states	26 Federal Plaza, New York, NY 10278 212-680-3600		Two types offered: planning and project grants for National Flood Insurance Program for participating communities	X	X				
U.S. Fish and Wildlife Service North American Wetlands Conservation Act Grants http://birdhabitat.fws.gov/NAWCA/grants.htm	Standard and small grants programs help deliver funding to on-the-ground projects through the protection, restoration or enhancement of an array of wetland habitats	3/04/2005 7/29/2005	Standard-David Buie 301-497-5870; Small Keith Morehouse 703-358-1888				X	X	X	X	small=-<50K standard= 50K 1mil
Partners for Fish and Wildlife http://partners.fws.gov/	Focuses on restoring former and degraded wetlands, native grasslands, stream and riparian areas, and other habitats to conditions as natural as feasible.	on-going	Martha Naley 703-358-2201	The program has partnered landowners to restore wetlands in-stream aquatic and riparian habitat. Has reopened stream habitat for fish and other aquatic species by removing barriers to fish passage.	Provides technical and financial assistance to landowners interested in voluntarily restoring or otherwise improving native habitats for fish and wildlife on their lands.	X		X	X		<25K
State Emergency Management Office http://www.nysemo.state.ny.us/	Provides leadership, planning, education, and resources to protect lives, property and the environment.	on-going	Chief of Recovery 518-457-7082 postmaster@semo.state.ny.us			X	X	X	X	X	
Catskill Watershed Corporation Catskill Fund for the Future http://www.cwconline.org/econ_dev/ed_index.htm	Funds used to make loans and grants to businesses and organizations proposing environmentally responsible projects.	accepted on a rolling basis	Michael Triolo, triolo@cwconline.org or Phil Sireci, sireci@cwconline.org	Delhi received money for establishment of a Riverwalk Community Park (purchase of riparian property and development of a village riverfront area with canoe access).	This fund program includes a variety of grant and loan programs.	X	X	X	X	X	2K-100*K
Septic System Rehabilitation and Replacement http://www.cwconline.org/programs/septic/septic.htm	This program reimburses homeowners for repairing or replacing damaged septic tanks	after completion of repair or replacement	Leo LaBuda, labuda@cwconline.org; John Jacobson, jacobson@cwconline.org or Kirsten Miller kmiller@cwconline.org		Program limited to homeowners in areas highly sensitive to water quality, as identified by NYCDEP.	X		X			60% and 100% of eligible costs for non-primary and primary landowners, respectively
Stormwater Controls for New Construction http://www.cwconline.org/programs/strm_wtr/strmwtr_controls.htm	Program to design and construct runoff and erosion control measures.		Elizabeth Mastrianni, emastrianni@cwconline.org			X				X	
Stormwater Retrofits http://www.cwconline.org/programs/strm_wtr/strmwtr_retro.htm	Program to provide funds for stormwater management needed to correct or reduce existing erosion, polluted runoff or other problems associated with stormwater.		Elizabeth Mastrianni, emastrianni@cwconline.org	Town of Andes, \$260,000 to install drainage along Tremperkill Road and its intersection with Main Street and Cabin Hill Road in the hamlet of Andes	Projects to implement stormwater BMPs that reduce erosion and/or pollutant loading associated with conditions existing on or before January 21, 1997 are eligible to apply.	X		X	X	X	up to 75% of project costs

Name	Focus	Due Date	Contact	Award Example	Notes/Priority	on-the-ground research	planning	<\$20k	\$20k to \$100k	>\$100k	Range
Public Education http://www.cwconline.org/programs/pub_edu/pe.htm	Projects that are intended to increase awareness, understanding and appreciation of clean water, the City's vast water delivery system, and the upstate Watershed which supplies 90 percent of the water consumed by nine million people		Diane Galusha, dgalusha@cwconline.org	South Kortright Central School (two grants); Delaware Academy and Central School, Delhi; Sidney Central School; Sidney Memorial Public Library; the Roxbury Arts Group, and the Catskill Forest Association.		X		X			1K-12K
Community Wastewater http://www.cwconline.org/programs/wastewater/wastewater.htm	Intended to address wastewater handling needs in five of the remaining 15 hamlets on the priority list			New Program for 2005 -06							
National Fish and Wildlife Foundation General Challenge http://www.nfwf.org/programs/guidelines.htm	Projects that address priority actions promoting fish and wildlife conservation and the habitats on which they depend, work proactively to involve other conservation and community interests.	year round, two decision cycles	NE Regional Office, Tim Kelsch, 202-857-0166 or Lynn Dwyer, 631-312-4793	Tioga County SWCD received \$9,700 to restore 8 acres of former floodplain to benefit fish and wildlife habitat along the Catatunk Creek.	Goods and services that are exchanged for cash are ineligible.			X	X	X	10K-150K
Native Plant Conservation Initiative http://www.nps.gov/plants/nfwf/index.htm	Projects that protect, enhance and/or restore native plant communities on public and private land, including protection and restoration, information and education, and inventory and assessment.	twice/year, 12/1/2005 7/15/2005	Ellen Lippincott, 202-857-0166		Special emphasis is placed on larger projects that demonstrate a landscape-level approach and produce lasting broad based results on the ground.						
Five Star Grant Program http://www.nfwf.org/programs/5star-rfp.htm	Projects must include a strong on-the-ground wetland, riparian, or coastal habitat restoration component and should also include training, education, outreach, monitoring, and community stewardship components.	annually 3/01/2005	Sarah Ellgen, 202-857-0166			X		X			5K-20K
Watershed Agricultural Council NYC Watershed Forestry Program http://www.nycwatershed.org/	Provides cost-sharing incentives and technical assistance to watershed forest owners to promote forest management planning and help establish streamside buffers.	rolling assistance	607-865-7790		Assistance from this program could be used to establish additional grants from matching programs that require existing challenge funds and partnerships.			X	X		
Fish America Foundation http://www.fishamerica.org	Supports fisheries conservation and research in the best way by providing matching grants that empower citizen conservationists in their own communities nationwide.	7/31 each year	703-519-9691	Coldwater Fisheries Coalition & the New Hampshire Council of Trout Unlimited (2002: \$8,000) To restore fisheries habitat and improve water quality along the Cold River by installing instream habitat structures, stabilizing streambanks and planting the riparian areas.		X	X				\$500-10K
The Conservation Fund Kodak American Greenways Award http://www.conservationfund.org/?article=2372	Small grants to stimulate the planning and design of greenways in communities throughout America.	3/01 to 6/01 each year	greenways@conservationfund.org 703-525-6300		Grants used for appropriate expenses needed to complete greenway projects including planning, technical assistance, legal and other costs			X	X		up to \$2,500
TechGrants http://www.techfoundation.org	TechFoundation is committed to bringing financial resources, technology solutions and management expertise to nonprofits to strengthen the social sector.	March each year	Kathleen Sherwin, 617-354-7595, grants@techfoundation.com	Colorado Environmental Coalition, www.ourcolorado.org	Awardees selected for focus on projects that will bring quality resources to nonprofits and show that effectively deployed technology can have a great impact on the ability of a nonprofit to achieve their mission.	X		X	X	X	5K-35K
Earthwatch Institute Research Program http://www.earthwatch.org/research/index.html	Supports scholarly field research worldwide in the biological, physical, social and cultural sciences.	on-going	978-461-0081 research@earthwatch.org	Projects monitor water quality in lakes, streams, wetlands and agricultural areas. Projects involve the inventory, monitoring or restoration of watershed environments.	Grants cover cost of maintaining volunteers and principal research staff in the field. Cannot be used for PI salaries, capital equipment or overhead costs.			X	X	X	7K-130K
Toshiba America Foundation http://www.toshiba.com/taf/apply.html	Contributes to the quality of science and mathematics in U.S. communities by investing in projects designed by classroom teachers to improve science and mathematics education.	accepted year round	212-596-0620 foundation@tai.toshiba.com	Chimacum Middle School received money for 7th and 8th grade earth science students to conduct a water quality study in their area.		X		X	X		2K-24K

