## SURVEY REPORT

*Opinions and Interests Concerning Stream Management Expressed By Streamside Landowners in the Upper Rondout and the East and West Branches of the Neversink River* 

November 24, 2009







Town of Neversink

Prepared by:



Great Plans for Special Places

## OPINIONS AND INTERESTS CONCERNING STREAM MANAGEMENT EXPRESSED BY STREAMSIDE LANDOWNERS IN THE UPPER ROUNDOUT AND THE EAST AND WEST BRANCHES OF THE NEVERSINK RIVER

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Besides those listed above, we also thank the assemblage of over a dozen persons interested in stream management who met in June 2009 and again in October 2009. The group took time to review and comment on an earlier draft of the survey instrument. They also reviewed a draft survey report. Throughout this process, the group provided insightful comments.

We did look to prior studies as sources of guidance. Most notably, we reviewed <u>Interests</u> <u>and Information Needs of Streamside Owners Related to the Stewardship of Esopus Creek</u> prepared by the Human Dimensions Research Unit at Cornell University in 2006.

This study was underwritten by the New York City Department of Environmental Protection (DEP) as part of the requirements of New York City's Filtration Avoidance Determination with the U.S. Environmental Protection Agency.



#### <u>EXECUTIVE SUMMARY</u>

This report identifies critical issues in stream management by exploring the opinions and interests concerning stream management expressed by streamside landowners. This group has a great deal of influence on the future protection, management and enhancement of the streamside environment for the upper Rondout River basin (Rondout Creek) and the east and west branches of the Neversink River.

Survey analysis gauged perceptions of change, identified issues, and obtained landowner rankings of risks to stream stability. It also explored understanding of issues, evaluated streamside landowner demands for and inherent interests in technical assistance related to achieving stream management, as well as how to best educate and involve these landowners in stream stewardship.

This information may be used to guide the scoping and policy selection during stream management plan (SMP) initiatives for these areas. Rondout SMP development is scheduled for 2009/early 2010 and the Neversink basin planning is set for 2010/early 2011. The opinion research may also inform how to involve landowners in stewardship and prioritize actions and investments.

#### Some key findings from this landowner public opinion research are:

- Seasonal residents make up a large part of all responding landowners. As with the majority of all respondents, they place high value on the natural environment within the study area.
- Landowners believe that not enough is being done to reduce negative impacts on the stream environment. They appear likely to support strategic stream management planning and conservation-oriented policies.
- Many landowners identify 'bank erosion', 'flooding' and 'road washouts' as factors that are changing in the basins, while fewer, but a substantial part also perceive change in the quality of the fisheries.
- One quarter of landowners report real property assets located within 100 feet of a stream -- this is a dynamic area which is prone to change and more susceptible to risk than those locations that are set back further from the stream corridors.
- Landowners perceive higher order threats to stream stability as: 'destabilization of slopes'; 'cutting of mature trees next to streams' and 'insensitive logging/ timber harvesting'.





- There is support for carrying out more 'flood planning and emergency preparations' plus 'road drainage and infrastructure improvements'.
- Landowners desire more information and education on the factors and forces influencing stream stability.
- Besides contact through mail and email plus periodic project meetings and/or updates provided to neighborhood groups, some property owners showed interest in interacting with stream management processes by contributing time and use of their property for activities like litter clean-up and ecological research.
- There were high overall levels of interest in a variety of technical assistance (TA) topics, including but not limited to: bank stabilization; habitat improvement; tree planting/ maintenance; and flood proofing.

#### INTRODUCTION

This survey was created in an effort to obtain feedback from landowners regarding topics related to stream management planning. Gilmour Planning LLC, a New Paltz, New York based community planning consultant was hired as an independent party to carry out aspects of streamside landowner survey development and formulate this report.

The geography analyzed encompasses three valleys within the Catskill Park and the watersheds for the Neversink and Rondout Reservoirs. The study area overlays parts of the main stems of the Neversink and Rondout Rivers within the Town of Denning (Ulster County) and the Town of Neversink (Sullivan County).

#### <u>SURVEY METHODS</u>

Survey techniques were developed and refined with feedback from the study sponsors. In addition, in June 2009, a group interested in stream management was asked to test and comment on the draft survey instrument.

The survey was distributed on July 31, 2009 and mailed to 175 property owners identified through real property tax data. Mailing labels were developed for streamside property owners along the three main stream stems in the Neversink basin, the main stem of the Rondout Creek and a major tributary located besides Greenville Road. Included in the mailing was a two-sided survey instrument, a cover letter from the Sullivan County Soil and Water Conservation District (SCS&WCD) Executive Director, a map of the two drainage basins, and a stamped, addressed and coded return envelope.

The return deadline on the survey cover letter was August 10, 2009. There were four press releases distributed over a one month period for posting at local town halls. These



were also distributed to local newspapers. A follow-up post card reminder was mailed 20 days after the original survey distribution, with a request to return the survey. Surveys were accepted and data fully recorded up through September 15, 2009.

There were a total of 76 completed surveys returned, although seven came in after the cutoff for full data entry. While the names and contact information for these last seven surveys were included in the project database; the full data (sample) covers 69 surveys.

For responses showing an error, like when an answer was illegible, or two responses were checked when a maximum of one was intended, it was coded 'Inapplicable' ('IA'). Based upon a review of the 'inapplicable' answers across the survey, it does not appear that any question proved to be particularly problematic. The highest rate was 8.7% (six out of 69 responses) for a question requesting the gender of the respondent – it appears there were cases where two adults filled-out the survey and two responses were checked.

In other cases, respondents may not have answered a question or questions. For instance, while it is unclear why people responded as they did, users may have inadvertently skipped questions, chose not to answer questions they were unsure of their response, or which they may have felt was sensitive. If an answer was left blank, data was coded 'not ascertained' ('NA'). In the tables that follow, the rates of IAs and NAs are shown. The rates of NA throughout the survey are generally low, with a range for individual sub-questions of 1.4% (survey question 1.A.) to 17.4% (survey question 5.E.).

Margin of error is a statistic representing the amount of error in a sample survey. A smaller margin of random error exhibits greater potential for results to situate probabilistically similar to that which would be observed if the whole population of streamside landowners were actually polled. Using a 90% confidence level, a population of 175<sup>1</sup> (the number of mailed-out surveys) and 69 returned surveys, the random margin of error is 7.73%<sup>2</sup>. Since the population of actual streamside properties is larger than those actually sent the survey, a nominal margin of error is set at 10%.

Administrative protocols were developed prior to survey distribution. This included quality assurance/quality control (QA/QC) measures to ensure that data were input with sufficient accuracy. An audit was performed on a set of transcribed information, with four surveys randomly selected. Based on a review of 98 possible data points that could be input for each record, over these four surveys, transcription rates were 100% correct. A paper copy of the survey, the raw data and the data tables produced in the course of populating the report have been placed on file with the SCS&WCD.



<sup>&</sup>lt;sup>1</sup> There were 175 surveys distributed although this number does not represent all properties adjacent to main streams within the study area. This actual population, properties adjacent to main stems, is undefined. <sup>2</sup> Margin of error was calculated on-line using <u>Raosoft Sample Size Calculator</u>

http://www.raosoft.com/samplesize.html -- no formula corrections were provided for small sample size.



#### <u>SURVEY RESULTS</u>

#### CHARACTERISTICS OF RESPONDENTS & PROPERTY

This survey polled streamside landowners with properties adjacent to riparian areas, specifically certain perennial streams. The sample, meaning the number of returned surveys for which data were analyzed, was 69. With 175 surveys distributed, this represents 39% of all surveys.

Landowners tended to be older, 60.3 years on average, with a median of 61.0 years and a respondent age range of 41 to 91 years old. Most respondents were male (63.8%). The level of education reported shows over two thirds (70.9%) as having some level of post-high school education, which appears relatively high.<sup>3</sup>

For employment status 49.2% reported 'full employment' or 'self-employment', 31.9% listed 'retired', 8.7% were 'employed part time' and the remaining 10.1% did not provide information. As for reported 'household income' the survey sample reported what appears to be relatively high levels with 44.9% at greater than \$75,000, 21.7% reporting between \$25,000 to \$75,000, 5.8% reporting less than \$25,000 household income and a full one quarter (27.5%) of the survey sample not providing a response. Compared with the whole population of landowners in the study area, the group responding to the survey is likely more affluent and better educated.

Table 1						
WHICH BASIN ARE YOU IN?						
<u>Watershed</u>	<u>Number</u>	<u>Percentage</u>				
Neversink	37	53.6%				
Rondout	31	44.9%				
Not ascertained	1	1.5%				
Total	69	100.0%				

In the initial mailing of 175 pieces, 89 (50.9%) were directed within the Neversink basin and 86 (49.1%) were Rondout addresses. In the sample returned, as shown in Table 1, the mix of responses is skewed slightly towards the Neversink with 53.6% of the responses, compared with 44.9% for the Rondout and one (1.5%) not ascertained.

<sup>&</sup>lt;sup>3</sup> For instance, this compares with a 3-year (2005-7) estimated rate of 54.4% among all persons 25 years and over within New York State having 'some college, no degree' or higher according to the U.S. Census Bureau's <u>American Community Survey</u>, and 44.5% for Denning or 48.8% for Neversink as captured in the 2000 U.S. Census.



Seasonal residents make up a large part of the responding landowners. Just less than 2/3 (60.9%) of the sample listed their property as a 'second home'. This appears higher than the rates of second home ownership demonstrated in each town according to 2000 U.S. Census data, although it does not seem surprising<sup>4</sup>. It is plausible that seasonal residents were more likely to respond to the survey or had more interest in stream management planning. Overall, the length of ownership is typically 20 or more years (62.3%) and more than half (56.5%) indicated they spent over 80 days at this location last year.

The range of reported property sizes extends from one to 850 acres. While average parcel size was 73.7 acres, the many smaller and middle size parcels drive the median lot size to 8.0 acres. Put another way, a smaller set of parcels represents a relatively large proportion of the land in the geography analyzed in both basins. Broken down by basin, average parcel size in the Rondout was 21.4 acres versus 115.8 in the Neversink. Median reported lot size was 6.0 acres in the Rondout and 28.5 acres in the Neversink. Information on property characteristics within the study area which would enable comparison of the sample with actual existing conditions were not made available as part of this project.

Most respondents, 81.2%, reported that they own the stream or land immediately adjacent to their property. Asked how many linear feet they own next to the stream, respondents reported an average distance of 1,455.0 linear feet. The median distance was 350.0 linear feet and the range reported extended from zero to 21,120 linear feet. As for the differences in reported stream frontage in the Rondout versus the Neversink basins, the Neversink had a mean of 2,210.8 linear feet and a median of 600 linear feet while the Rondout had an average of 510.3 linear feet and a median of 300 linear feet. In both cases the data appears to skew towards the Neversink driven by a set of larger lots.

Table 2							
DISTANCE FROM MAIN HOUSE OR SENSITIVE							
INFRASTRUCTURE TO M	AIN STREAM (	' <u>Ques. 1E)</u>					
<u>Distance (in Feet)</u>	<u>Number</u>	<u>Percent</u>					
0 - 50 ft	11	15.9%					
51 – 100 ft	7	10.1%					
101 - 200 ft	18	26.1%					
More than 200 ft	27	39.1%					
Inapplicable	3	4.3%					
Not ascertained	3	4.3%					
Total	69	100.0%					

<sup>&</sup>lt;sup>4</sup> A review of <u>http://factfinder.census.gov/</u> (U.S. Census data portal for 2000), Question QT-H1 'General Housing Characteristics' for the Towns of Denning and Neversink, shows that based on 'total housing units', 'vacant housing units' and the part labeled 'For seasonal, recreational, or occasional use', second homes were 54.7% of the stock in Denning and 25.4% of that in Neversink in 2000.





The area within 100 feet of streams is often a dynamic streamside area, and one which is typically prone to the change and more susceptible to risk than more recessed locations. Usually, the reported distance from the house or sensitive infrastructure to the main stream was greater than 100 feet. As derived from Table 2, nearly two thirds of respondents (65.2%) reported that their dwelling unit and/or sensitive infrastructure are situated over 100 feet from the main stream. Conversely, a quarter (26.0%) were within one hundred feet, and of that sub-group 15.9% said they were less than 51 feet from the stream. This means that one quarter of the respondents self-report that they have real estate assets within a 100 foot limiting distance from a stream.

# STAKEHOLDER INTERESTS IN RELATION TO THE STREAM ENVIRONMENT

Asking what landowners desire, are interested in, or motivated by in relation to the stream environment can aid identification and understanding of issues or priorities. Questions were asked that attempted to ascertain stakeholder preferences. While not definitive, these questions can inform whether there may be potential support for different stream management activities that come under consideration.

RELATIVE INTEREST IN VARIOUS ACTIVITIES IN STREAM BASINS (Qs. 8.)							
		About the					
<u>Activity /Land Use</u>	<u>More</u>	<u>Same</u>	<u>Less</u>	<u>Don't know</u>	<u>IA &amp; NA</u>		
Flood planning & Emergency prep.	53.6%	27.5%	1.4%	11.6%	5.8%		
Road/drainage infrastructure improvements	50.7%	33.3%	2.9%	5.8%	7.2%		
Managed woodlands	36.2%	34.8%	7.2%	11.6%	10.1%		
Restored floodplain	36.2%	27.5%	5.8%	21.7%	8.7%		
Meadows	24.6%	46.4%	4.3%	13.0%	11.6%		
Agriculture	17.4%	46.4%	18.8%	10.1%	7.2%		
Public access to streams	13.0%	44.9%	31.9%	4.3%	5.8%		
Snowmobile access	10.1%	18.8%	56.5%	7.2%	7.2%		
Campgrounds	8.7%	36.2%	37.7%	7.2%	10.1%		
Seasonal cottages & Hunting camps	2.9%	55.1%	26.1%	8.7%	7.2%		
Home development	2.9%	34.8%	44.9%	8.7%	8.7%		
Commercial development	1.4%	21.7%	63.8%	5.8%	7.2%		

#### Table 3

Table 3 shows preferences for more flood planning, emergency preparation and road and drainage improvements. A majority seem comfortable with existing levels of seasonal cottages and hunting camps. A majority do not show support for commercial



development and snowmobile access. At 21.7%, a high proportion appears uncertain about what is entailed in floodplain restoration.

<b>RELATIVE INTEREST IN SEEI</b>	NG VARIOU	JS ACTIVI	<mark>FIES IN TH</mark>	IE STREAN	<u>I BASINS</u> :	
High Rates of 'N	High Rates of 'More' Further Sorted by Basin (Qs. 8.)					
		About		Don't		
	<u>More</u>	<u>Same</u>	<u>Less</u>	<u>Know</u>	<u>IA &amp; NA</u>	
Flood planning & emergency preparatio	n					
NEVERSINK	43.2%	32.4%	2.7%	18.9%	2.7%	
RONDOUT	67.7%	22.6%	0.0%	3.2%	6.5%	
Road/drainage infrastructure improvem	ients					
NEVERSINK	54.1%	35.1%	0.0%	8.1%	2.7%	
RONDOUT	48.4%	32.3%	6.5%	3.2%	9.7%	
Managed woodlands						
NEVERSINK	40.5%	32.4%	5.4%	13.5%	8.1%	
RONDOUT	32.3%	38.7%	9.7%	9.7%	9.7%	
Restored floodplain						
NEVERSINK	27.0%	35.1%	5.4%	27.0%	5.4%	
RONDOUT	48.4%	19.4%	6.5%	16.1%	9.7%	

#### Table 4

There was an effort to compare response patterns by basin for the sub-questions where landowners indicated a high level of 'more' interest in a land use or activity. The results for the four top ranking sub-questions in Question 8 are in Table 4. Small differences of ten or fewer percent between one basin and another may simply be due to random variation. Yet, there is a spread of 24.5% between landowners interested in 'more' flood planning and emergency preparation in the Rondout versus the Neversink basins. Interestingly, for that same sub-question there was also a higher prevalence of landowners checking 'don't know' if flood planning and emergency planning is needed in the Neversink. Landowners in the Rondout checked 'more' restored floodplain 1.75 times more than in the Neversink. If all landowners had sampled and returned surveys, it is statistically probable that the actual differences between the basins would be smaller, but there still appears to be noteworthy differences as highlighted here.



## **ISSUE IDENTIFICATION/ PERCEPTIONS OF PROBLEMS**

A set of questions explored landowner perceptions of critical problems or issues. The findings may be useful in scoping future plans. The information may also be useful in attempting to understand the facets or dimensions of key problems or priorities.

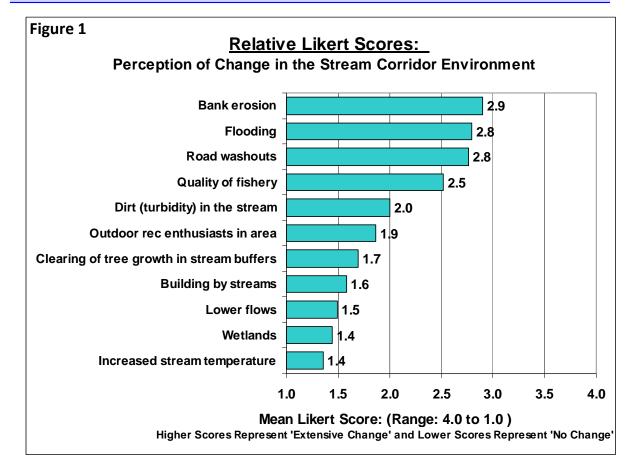
Table 5							
PERCEPTION OF CHANGE IN STREAM CORRIDOR ENVIRONMENT (Qs. 6							
	Extensive <u>change</u>	Moderate <u>change</u>	Don't <u>know</u>	Slight <u>change</u>	No <u>change</u>	<u>IA &amp; NA</u>	
Bank erosion	33.3%	24.6%	2.9%	18.8%	11.6%	8.7%	
Flooding	29.0%	24.6%	7.2%	17.4%	14.5%	7.2%	
Road washouts	26.1%	21.7%	10.1%	18.8%	13.0%	10.1%	
Quality of fishery	21.7%	17.4%	23.2%	1.4%	26.1%	10.1%	
Dirt (turbidity)	11.6%	14.5%	10.1%	17.4%	37.7%	8.7%	
Clearing trees in buffers	8.7%	5.8%	14.5%	14.5%	46.4%	10.1%	
Outdoor recreation	7.2%	15.9%	7.2%	18.8%	42.0%	8.7%	
Building by streams	2.9%	13.0%	5.8%	14.5%	53.6%	10.1%	
Wetlands	2.9%	7.2%	27.5%	1.4%	43.5%	17.4%	
Lower flows	2.9%	5.8%	18.8%	13.0%	46.4%	13.0%	
Increased stream temp	1.4%	2.9%	47.8%	7.2%	30.4%	10.1%	

Table 5 shows that a majority of the property owners surveyed perceive 'extensive' or 'moderate' change in the stream corridor environment related to bank erosion (57.9%) and flooding (53.6%). A majority also believe there has been 'no change' in building by the stream environment and there has been either 'no' and/or 'slight' change in the clearing of tree growth by buffers (60.9%), the level of outdoor recreation enthusiasts in the area (60.8%), and lower flows (59.4%). Not surprisingly, many (47.8%) were uncertain if stream temperature increased and nearly a quarter of those polled did not know if there was change in wetlands (27.5%) or the quality of the fishery (23.2%).

Comparing the Rondout versus the Neversink for survey question #6, there appear to be some noteworthy differences, particularly for flooding and road washouts. For flooding, those listing 'extensive change' were 48.4% in the Rondout versus 13.5% in the Neversink. For road washouts, 'extensive change' was selected 41.9% in the Rondout versus 13.5% in the Neversink. Also, for 'clearing tree growth in stream buffers', 58.1% of the respondents in the Rondout identified 'no change' versus 37.8% in the Neversink.







Likert scores identify the strength of agreement with a particular statement by calculating a mean (average) score and standard deviation. Likert scores were derived by assigning each survey response a value of 4 for 'extensive change' through 1 for 'no change' (no opinion received a 0). Higher scores indicate stronger overall agreement. Figure 1 shows that the landowner population associated higher levels of change with the first four items.







#### **RANKING ISSUES**

Table 6

RANKINGS OF THREATS TO STREAM STABILITY (Q. 5)							
_				Not			
<u>Potential Threat</u>	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Ascertained</u>			
Destabilization of slopes by streams	66.7%	21.7%	2.9%	8.7%			
Cutting of mature trees next to streams	53.6%	15.9%	21.7%	8.7%			
Insensitive logging/timber harvesting	52.2%	20.3%	20.3%	7.2%			
Lack of debris management in streams	50.7%	26.1%	14.5%	8.7%			
Poor, altered drainage by public roads	37.7%	36.2%	14.5%	11.6%			
Climate change	27.5%	23.2%	34.8%	14.5%			
Upstream activity	26.1%	42.0%	15.9%	15.9%			
Buildings in floodplains	26.1%	24.6%	33.3%	15.9%			
Narrow bridges	8.7%	33.3%	40.6%	17.4%			

Asked to rank threats to stream stability (Table 6), four topics were identified as larger or 'high' risks by a majority of respondents. Destabilization of slopes was ranked the highest by far, capturing 2/3 of all responses. The other three items garnering a majority of all responses are shown in the table in order. Landowners do appear to understand the importance of an intact tree canopy adjacent to the stream, but with only a small majority (53.6%) ranking this 'high', it may point to an opportunity to provide more education on the risks introduced by cutting trees within stream buffers.

On the other hand, narrow bridges were ranked low, which seems surprising, although it may be telling that in 12 cases the person completing the survey did not provide an answer (coded 'not ascertained), which was the highest level for this question. Since there was not a chance to answer 'don't know' for this question, it may indicate that this is a technical subject that some people did not feel they understand or were uncertain how they would rank this risk. Interestingly, three quarters (76.8%) of streamside landowners defined lack of debris management as a threat to stability, although widely accepted science does indicate that these types of features can influence slower water velocity and reduce instability associated with fast moving water. It may be useful to explore this topic. For one, there might be efforts to develop understanding of what people perceive as the problem locations and some case study performed around these spots.





TABLE 7						
RANKINGS OF	SEVERITY	<mark>/ OF EAC</mark>	<mark>H PROBLEI</mark>	M ON YO	UR LAND	(Qs. 7)
	Very		Somewhat	Not a	Don't	
Problem	<u>severe</u>	<u>Severe</u>	<u>severe</u>	<u>problem</u>	<u>know</u>	<u>IA &amp; NA</u>
Stream bank erosion	20.3%	10.1%	30.4%	23.2%	7.2%	8.7%
Flooding	10.1%	13.0%	23.2%	36.2%	5.8%	11.6%
Invasive species	2.9%	2.9%	10.1%	46.4%	29.0%	8.7%

Question #7 (sorted results in Table 7) had one in five (20.3%) persons taking the survey rank stream bank erosion as a 'very severe' problem. Conversely, less than a third (30.4%) of all persons identified bank erosion as 'not a problem' or 'don't know'. There seem to be a lot of owners (69.6%) who perceive potential for relatively severe impacts from bank erosion. On the other hand, with 29% putting 'don't know' for invasive species, it probably means that many were unsure if they are being impacted, or they do not have adequate information to make a ranking.

Comparing the results for bank stability in Questions #5 and #7, it appears that people consistently code this as a significant issue. The finding is also supported by the many open-ended and general comments which identify and address the topic of bank stability (see the 'Streamside Environment and Issues' sub-section of 'General Comments' below).



## CIVIC ENGAGEMENT/ PROGRAM PARTICIPATION

The survey explored landowner preferences regarding the methods through which they obtain information on stream management. Another set of questions researched the preferred forms or levels of involvement by exploring active interest in specific programs or initiatives. A third aspect of evaluation, investigates the types of information or TA that streamside landowners may prefer to obtain or seek out.

#### Table 8

ACCESSING PROJECT INFORMATION & TECHNICAL ASSISTANCE (Qs. 11)						
	<u>Yes</u>	<u>No</u>	<u>Not ascertained</u>			
Are you interested in receiving more info on this project?	88.4%	7.2%	4.3%			
May we contact you for further information?	84.1%	11.6%	4.3%			
Would you like to be contacted concerning technical assistance matters of interest to you?	71.0%	20.3%	8.7%			

Question 11 gauged the interest by landowners in receiving more information on this project. It also explored whether people can be contacted for further information or concerning TA matters of interest to them. In Table 8 and as shown in Figure 2, the vast majority of respondents, 88.4%, want to continue receiving technical information, while nearly the same level, 84.1%, were comfortable being contacted. Yet, a gap does exist between the larger numbers interested in contact for further information and the smaller

#### Figure 2



set, 71.0% of the responding landowners, who would like direct contact concerning TA matters of interest.

It is noteworthy that just shy of three quarters (71.0%) of the sample indicated an interest in receiving contact surrounding TA. This is a large group. It is not known is what influences the 12.9% difference between people (84.1%) seeking some form of further contact on the project versus the smaller group of people (71.0%) seeking contact on matters of TA. One might hypothesize that it is due to people's belief that they do not face issues on or around their property. Alternatively, they may not have time or interest





or they may be uncomfortable approaching a subject they perceive is technical. They might want to avoid a dialogue concerning their interests and conditions at their property.

Importantly, in 'General Comments', 55 respondents (79.7%) provided a postal mailing or email address for future contact and follow-up. This corresponds with the level of interest expressed in Question #11. Moreover, there is consistency with the response pattern in Question #4 which examined the specific types of TA that people might be interested in. In that question, three quarters of the respondents (75.4%) identified at least one subject for which they were interested in TA.

Table 9						
PREFERRED METHODS FOR RECEIVING INFORMATION (Qs. 9)						
Method (Tallies include multiple responses)	<u>Count</u>	Percent				
Mail	47	48.0%				
Email	28	28.6%				
Not Ascertained	9	9.2%				
Public meeting	5	5.1%				
Newsletter	3	3.1%				
Website	2	2.0%				
Newspaper; Telephone; Community group/						
Nonprofit; From family members (one each)	4	4.0%				
Total	98	100.0%				

Question 9 explored how landowners want to receive information and updates on the project. Slightly less than half identified postal mail and just over a quarter listed e-mail. There is no single technique preferred by most landowners. With no uniform preference, a variety of techniques may be necessary; however, besides the two main mediums, only six other techniques appeared and none were very prevalent. For example, the third highest preference 'public meeting' garnered only five (5.1%) of responses.

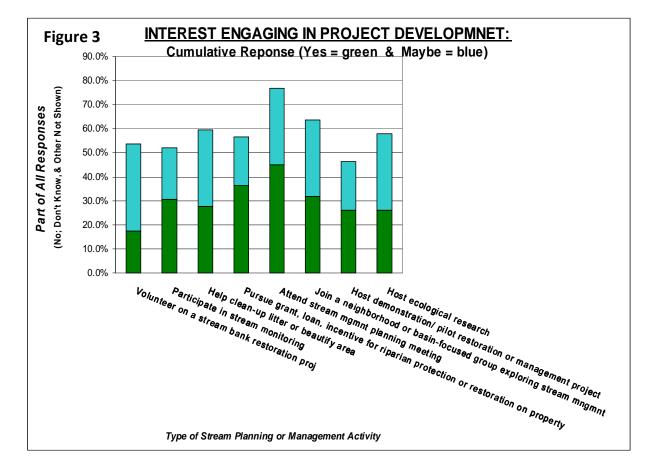
Considering that project sponsors seek guidance about how to optimally structure participation, achieving broad community input should involve varied methods of engagement. Many landowners reported primary residences outside of the study area. Also, large parts are older and retired, a group that may not be as comfortable using electronic media to receive or dispense information. Finally, higher speed internet access does not appear uniformly available in the study area and it would appear to be a factor influencing the local use of this communication technology by landowners.





Table 10

INTEREST IN PARTICIPATING IN PROJECT DEVELOPMENT (Qs. 3)						
<u>Type of Stream Planning /Mngmnt Activity</u>	<u>Yes</u>	<u>Maybe</u>	<u>No</u>	Don't <u>Know</u>	IA & <u>NA</u>	<u>Total</u>
Attend stream mgmnt planning meeting	44.9%	31.9%	14.5%	2.9%	5.8%	100.0%
Pursue grants, loans, incentives to advance riparian protection/restoration on property	36.2%	20.3%	31.9%	2.9%	8.6%	100.0%
Join a neighborhood or basin-focused group that will explore stream management?	31.9%	31.9%	23.2%	7.2%	5.8%	100.0%
Participate in stream monitoring	30.4%	21.7%	30.4%	8.7%	8.7%	100.0%
Help clean-up litter or beautify an area	27.5%	31.9%	29.0%	4.3%	7.2%	100.0%
Host demonstration/ pilot restoration or management project on property	26.1%	20.3%	46.4%	1.4%	5.8%	100.0%
Host ecological research on your property	26.1%	31.9%	34.8%	0.0%	5.8%	100.0%
Volunteer on a stream bank restoration project	17.4%	36.2%	30.4%	7.2%	8.7%	100.0%



Asking "Would *you* be willing to:" in Question #3 was intended to explore relative interest in direct involvement by the property owners in aspects of stream management.



By positioning 'Maybe' between 'Yes' and 'No', the question was designed to identify persons unsure or on the fence about involvement, versus ones who may not understand the intent, an initiative, or may need more information as embodied in 'Don't Know'.

Considering the set of activities presented, between 17.4% to 44.9% indicated willingness through a 'yes' (*Note: the differences between many variables are small and could be due to random error*). Not surprisingly, the activity respondents were most willing to act on was attending a meeting (44.9%), perhaps indicating that this may be an effective means of local engagement. Conversely, almost half (46.4%) of respondents did not appear willing to host a project on their property.

An inability to discern strong responses for this question may point to a need to build more familiarity with the possible ways of participating in project development. There could also be returns from promoting the associated potential benefits. Providing incentives to landowners may be a way to enhance the rates of participation. Users may not be able to actively differentiate between the possible responses. There were few responses coded 'Inapplicable', so it does not appear people were confused by the construction of the question, although for each sub-question it was typical for five to seven percent to be coded 'Not-applicable', meaning that there was uncertainty or part of the sample choose not to answer a sub-question.

If 'yes' and 'maybe' answers are combined (see Figure 3), attending a meeting remains an activity a strong majority of people appear willing to participate in (76.8%). Driven by 'maybes' a combined 63.8% indicated possible willingness to join a neighborhood or basin focused group that will explore stream management. While neighborhood group was not identified as a preferred method for getting information in Question #9, it did rank high.

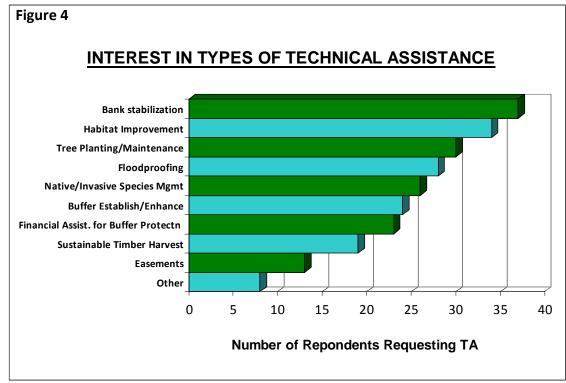
Even considering that differences could be random, there appear to be some noteworthy differences in opinion among respondents sorted by geographic area. In particular, 43.2% of Neversink basin respondents versus 19.4% of Rondout residents indicated 'yes' regarding joining a neighborhood or basin-focused group. This is probably attributable to the fact that there is a group in existence here; however, there may be other local and regional groups now, so it may help to understand people's awareness and perspectives concerning these groups. Finally, indications of 'yes' for interest in hosting ecological research in the Neversink basin (35.1%) were more than double the rate in the Rondout (16.1%).



#### **TECHNICAL ASSISTANCE DEMANDS & INTEREST**

Table 11					
INTEREST IN STREAM MANAGEMENT TECHNICAL ASSISTANCE (Qs. 4)					
Type of Technical Assistance <u>Number</u> Percen					
Bank stabilization		37	15.3%		
Habitat Improvement		34	14.0%		
Tree Planting/ Maintenance		30	12.4%		
Floodproofing		28	11.6%		
Native/ Invasive Species Mgmt		26	10.7%		
Buffer establishment/ Enhancement		24	9.9%		
Financial assistance for buffer protection		23	9.5%		
Sustainable Timber Harvest		19	7.9%		
Easements		13	5.4%		
Other		8	3.3%		
	Total	242	100.0%		

Survey question #4 explored subjects for which landowners desire TA. Table 11 shows that most (53.6%) indicated an interest in bank stabilization while nearly half (49.3%) identified habitat improvement. The third most common request was for tree planting/maintenance. Table 11 results are displayed in Figure 4.



For question #4, eight respondents identified 'other': three said they did not need





assistance or there was no problem; two were interested in native fish and stocking; two in erosion; and one suggested assistance to maintain the areas which receive repairs. Overall, it is clear that people seek to access a diversity of topics.

Table 12

INTEREST IN STREAM MANAGEMENT TECHNICAL ASSISTANCE:						
Sorted By Neversink Vs. Rondout						
	NEVERSINK		RONDOUT			
<u>Type of TA</u>	<u>(Number)</u>	<u>(%)</u>	<u>(Number)</u>	<u>(%)</u>		
Bank stabilization	19	13.6%	18	19.1%		
Habitat Improvement	22	15.7%	12	12.8%		
Tree planting, pruning and maintenance	20	14.3%	10	10.6%		
Native/invasive species management	17	12.1%	9	9.6%		
Floodproofing	14	10.0%	14	14.9%		
Buffer establishment/enhancement	14	10.0%	10	10.6%		
Financial assit. for buffer protection	13	9.3%	10	10.6%		
Sustainable Timber Harvest	13	9.3%	6	6.4%		
Easements	8	5.7%	5	5.3%		
SUB-TOTAL OF 234 RESPONSES HERE	140	100.0%	94	100.0%		

# Based on Table 12, there was more interest in the various forms of TA expressed by the landowners completing surveys who reside in the Neversink basin than in the Rondout. While Neversink surveys accounted for 53.6% of all instruments returned, they accounted for 59.8% (140) of the total of 234 times that persons identified interest in one of the types of TA listed above.

There appear to be subtle differences in the types of TA requested by basin. Some of these would appear outside of an attributed margin of error of error of ten percent. Notably, among the more popular activities overall there appears to be stronger support for bank stabilization (5.5 percentage points difference) and floodproofing (4.9 percentage points difference) within the Rondout. There is more support for habitat improvement (2.9% difference) and for invasive species management in the Neversink basin.





#### **OPEN-ENDED QUESTIONS**

Respondents were encouraged to provide any additional comments they had concerning the study, their property, and their perception of the stream environment in a 'General Comments' section at the end of the survey. A total of 35 comments were received and are included, transcribed in full, in Appendix A of this study.

In the results displayed in Appendix A, the management basin in which the respondent is located is provided if it is known. When the person completing a survey made two distinct comments, these were created as two separate bullet points. Some basic sorting of questions occurred according to the following headings, although the comments are transcribed as they were received with the exception of light grammatical modifications: 'Streamside Environment & Issues'; 'Community & Property Ownership'; and 'Other'.





#### SUMMARY AND POSSIBLE FINDINGS, IMPLICATIONS AND APPLICATIONS

By and large landowners are interested in stream management planning and stewardship. On average, there were more than three TA topics that landowners checked as having an interest in.

While data is inconclusive, it is interesting to consider the potential for different levels of interest in TA between the basins. For instance, are there more first order streams in the populated portion of the Rondout versus the Neversink? Do different stream characteristics influence different needs and interests for TA? Alternatively, do different socio-economic factors in one basin versus another influence more interest or comfort accessing TA? Landowners in the Neversink could potentially be more comfortable accessing TA or incentives from government agencies or non-profits.

Examining representativeness gauges whether characteristics of the sample likely correspond with the whole population of landowners. It is plausible that there is a difference between characteristics of the people returning surveys versus those opting not to. Specifically, the sample may under-represent full-time (year round) residents. Depending on public participation objectives and the policy or the TA questions under consideration, there may be a benefit to providing special action to outreach to that group.

This research provides a general characterization of the opinions of streamside property owners. This group was mostly male. There is reason to believe that men responding to the survey were more conservative than females. Thus, care should be taken in generalizing the findings of this research to broader groups, such as all persons residing in the study area. These results probably inadequately capture the perspectives of younger people or females.

With its early placement in the instrument, Question #2 was designed to provide context on the interests of landowners, including what may motivate them in relation to stream planning. By attempting to understand agreement or disagreement with statements, the sub-questions were meant to assess potential receptivity to streamside management or conservation activities. Some sub-questions were also designed to test respondent's beliefs or level of knowledge, as these may influence the feasibility of gaining support for undefined alternative approaches to stream management. This question provides a snapshot of the interests of landowners.



#### TABLE 13

AGREEMENT	<sup>-</sup> WIT	<mark>h the</mark>	E STAT		NTS: (	'QUES	<u>; 2)</u>	
Question tested	Likert Mean & (Std. Dev.)	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	Don't Know	IA & NA
I am concerned about the location of future growth. (Q.2A)	<b>4.2</b> (1.0)	37.7%	47.8%	4.3%	2.9%	0.0%	2.9%	4.3%
It is Important to reconstruct/ reshape highly unstable sections of stream. (Q.2B)	<b>4.0</b> (1.2)	36.2%	37.7%	7.2%	8.7%	2.9%	1.4%	5.8%
Installing Berms increases the height of flood waters kept in the channel & the risk of more severe bank erosion. (Q.2C)	<b>2.9</b> (1.8)	18.8%	23.2%	11.6%	14.5%	2.9%	15.9%	13.0%
The stream environment by my property is ideal for observing/ enjoying nature. (Q.2D)	<b>4.4</b> (0.7)	52.2%	39.1%	1.4%	4.3%	0.0%	0.0%	2.9%
Enough is being done currently to reduce negative impacts on the streamside environment. (Q.2E)	<b>1.8</b> (1.3)	2.9%	7.2%	17.4%	26.1%	21.7%	18.8%	5.8%
Preserving what is valued highly in this area involves proactively managing future growth. (Q.2F)	<b>4.0</b> (1.0)	29.0%	50.7%	7.2%	4.3%	1.4%	1.4%	5.8%
Landowners are knowledgeable of floodplain management and seldom need better under- standing of protection or improvement strategies, including BMPs (Q.2G)	<b>2.3</b> (1.2)	5.8%	10.1%	13.0%	46.4%	17.4%	2.9%	4.3%
The stream banks by my house are adequately vegetated within 100 feet of stream bank. (Q. 2H)	<b>3.5</b> (1.5)	20.3%	43.5%	4.3%	10.1%	5.8%	5.8%	10.1%
I received technical assistance on streamside maintenance and protection and information was useful and understandable (Q.21)	<b>2.3</b> (1.1)	2.9%	11.6%	20.3%	34.8%	21.7%	2.9%	5.8%

Table 13 shows responses to Question 2 in percentages along with Likert Scale ratings. Considering that higher Likert scores mean more agreement with a sub-question, it appears there is concurrence with the statements: 'I am concerned about the location of future growth'; 'The Stream Environment by my property is ideal for observing/ enjoying nature' and 'Preserving what is valued highly in this area involves proactively managing future growth'. Based on these, it is construed that many landowners would likely support some strategic stream management planning. They value the natural environment here and may support growth management or conservation-oriented policies. Still, for the table above there should be care to recognize that questions are not



on a continuum. Due to varying lines of inquiry and directions of question patterns, there should not be comparison of the agreement with one sub-question versus another.

Respondents agree that 'It is important to reconstruct/ reshape highly unstable sections of stream'. It appears that landowners are somewhat technologically optimistic. They do seem to believe that it is possible to provide direct, physical management to stabilize stream corridors or avoid disruption. The results construe that landowners need more information and education on what factors and forces influence stream stability. That particular sub-question was presented as a test. The questionnaire designers construed that an appropriate response would be to disagree or identify uncertainty with the statement. They presumed that stability in one location is strongly influenced not just by physical factors in the stream and on or around the bank at that point, but by factors upstream of where instability actually is evident. Put another way, it is usually important to deal holistically with the sources of instability upstream as opposed to dealing directly with instability itself.

Interestingly, the aggregate score of 1.8 for the question "Enough is being done currently to reduce negative impacts on the stream environment" shows that people disagree with the statement. They do believe that not enough is currently being done to reduce negative impacts on the stream environment.

Based on a broad dispersion of answers to 'Installing berms increases the height of flood waters kept in the channel and the risk of more severe bank erosion', with a score centered on 'no opinion' it appears that people wanted to withhold judgment regarding whether installing berms increases the height of flood waters in the channel and increases the risk of severe bank erosion. This was another question designed to examine understanding of floodplain/floodway management. For this question, 15.9% of landowners answered 'don't know' (and there was a high incidence of no answer being provided). It seems that many respondents are skeptical of a notion that installing berms can increase the probability of a bank erosion or failure in the future.

In conclusion, besides polling this group further in the future, addition outreach might explore the opinions of non-landowners or other residents of the study area, such as other than heads of households (who predominantly responded to this survey), may prove valuable. Going forward, as a way to build interest and sustain community participation in the upcoming stream management projects, it is suggested to invite the community to attend a meeting at which survey results are presented. This would provide a way to present the broader community with the topics explored, the findings and themes identified. If so desired, the meeting(s) may be structured to provide the community with an opportunity to comment and discuss the various strategies for dealing with the issues raised in relation to the findings.



## Appendix A: General Comments

	RESPONSE CATEGORY
BASIN	Streamside Environment & Issues
Neversink	• Keep the Neversink River free & clear. Don't cut any more trees down. Keep area in a Natural stage.
Neversink	• Expansion of YMCA facilities on East Branch of Neversink River (including Straus lands) raises questions.
Neversink	<ul><li>[Re: 2B] Depends on how.</li><li>[Re: 5I] What kind?</li></ul>
Neversink	• I am concern(ed) about road maintenance adjacent to the Neversink and about stream bank erosion.
Neversink	• The most severe land erosion is below my property and the new bridge over the west banks of the Neversink.
Neversink	• Not a full-time resident. Interested in stream restoration & improvement with trees.
Neversink	• I am interested in help with bank erosion to protect a pasture/hayfield that has been significantly diminished due to erosion.
Neversink	• East branch of Neversink: the army corp. of engineers had surveyors here in the mid-80s. At that time the stream channels were filled in between 6 + 8 feet from the 1950s survey - let's get these channels back to their original depth. Let the towns + county take the material removed from the channel cleaning and gravel bar removal. It can be crushed for road resurfacing - or used as fill once the clean-up is done. Vegetate the banks. Then most important a maintenance program. It's much easier to cut up a tree that's fallen in the river before a bunch more get washed downstream and become an entangled mess that the river now has to find a new way around. The fish won't mind-the acidity is so bad in this river they'll probably all be dead soon anyway. Or have we forgotten of the lives already lost due to the flooding. My daughter hasn't. She's afraid to go to sleep when it rains.
Neversink	Property at origin of West Br. Neversink, human habitation minimal & seasonal.
Rondout	• I lost a lot of land from stream relocation + rotting of dock.
Rondout	• I hope someone can do something about the flooding!
Rondout	• High water = water in cellar.
Rondout	<ul> <li>Significant threat to stream quality is home septic systems and abandoned automobiles in and near floodplain. Road runoff may also be contributing pollutants and sediments.</li> </ul>
Rondout	• I have been coming to the Sundown area for my whole life + have never worried about the creek before. We have had 2 serious flood incidents impacting our property over the last 8 years + are concerned now every time it rains. What is going on??
Rondout	• Streams should be kept clean of debris + when erosion exists, stone walls need to be installed for strength and beauty.
Rondout	• My general concern is filling in of natural pools within the river by erosion. I think they should be reestablished if they a lost due to floods/erosion etc.
Rondout	• The most disturbing changes/symptoms that I have noted since 1972 (prop. acquisition) are: repeat flooding with mud in the water; more trash at streamside.
Rondout	• Stream bed management for small streams is essentially non-existent and has cost us 15' of streambank, a substantial loss to our property.
Rondout	<ul> <li>[Re:2C] We agree that installing bermes haphazardly increases risks &amp; destroys the natural environment - however a berme was built behind our house in the '50s &amp; has prevented flooding in our yard.</li> <li>[Re:6H Lower Flows] varies year-to-year.</li> </ul>
Rondout	• My comments are based on my stream border. I see stream banks elsewhere with problems.



## (Last page of the Survey -- responses grouped by category)

	RESPONSE CATEGORY
BASIN	Community & Property Ownership
Neversink	• I believe the Frost Valley YMCA is a tremendous asset in Denning. They are doing wonderful research. I think they should be approached to do more.
Neversink	• This is a family estate.
Neversink	• We used the property when our children were small through the summers (late husband was a teacher). When retired, he used it as a hunting camp. Now land is used as weekend retreat by children + grandchildren.
Neversink	• Eight shareholders in eight related families own this property.
Neversink	• Because of limited time spent @ residence, I don't feel that I am qualified to make decisions for the full time residents, therefore my answers might be quite vague. Thank you for the map of the area. ES.
Neversink	• Two members of club (Winnisook) water committee responded on club's behalf. Members are happy to participate but seasonal habitation makes volunteer participation difficult.
Rondout	<ul> <li>[Re: 2G] You people never listen to those that have lived by the creek for +20 years.</li> <li>If you listen more to the folks that live by the streams and show concern for them instead of FISH, we'd be a lot better off.</li> </ul>
Rondout	• Dear Mr. Brustman, The property I own in the town of Denning is not in either the Neversink or Roundout Reservoir Basin. It is located along Peekamoose Road. For years it has been monitored by the USGC, DEP and DEC.
Rondout	Property owned is 59 Peekamoose Rd., Sundown, NY

	RESPONSE CATEGORY
	Other
BASIN	<u>Other</u>
Neversink	• Well done questionnaire.
Neversink	• [Re: 3] yes, but not now; I plan to retire in 2020.
Neversink	• [Re:11B] email only
not	• Sounds like your organization is planning an invasion of my property?
ascertained	• PS The water is much cleaner now than 30 years ago.
Rondout	• DEP is useless.
	• [Re: Map] Why is Peekamoose branch of Rondout Creek not shown? Too much state
	land?
Rondout	• 2A + 2E need more explanation.

