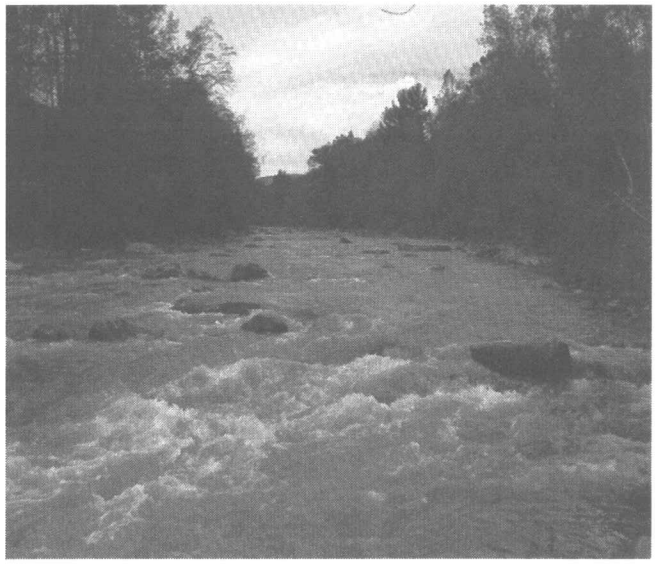
# Interests and Information Needs of Streamside Owners Related to the Stewardship of Esopus Creek



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Prepared by:

Tommy L. Brown
Human Dimensions Research Unit
Department of Natural Resources
Cornell University

Michael C. Courtney and Jeremy E. Magliaro
Cornell Cooperative Extension of Ulster County

Cornell University
Human Dimensions Research Unit

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This publication is part of a series of reports resulting from investigations dealing with public issues in the management of wildlife, fish, and other natural resources. The Human Dimensions Research Unit (HDRU) in the Department of Natural Resources at Cornell University studies the social and economic values of wildlife, fish, and other natural resources and the application of such information in management planning and policy. A list of HDRU publications may be obtained by writing to the Human Dimensions Research Unit, Department of Natural Resources, Fernow Hall, Cornell University, Ithaca, NY 14853, or by accessing our World Wide Web site at: http://www.dnr.cornell.edu/hdru.

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Nonresponse phone calls for this study were conducted by Heather Van Den Berg. Karlene Smith handled mailings and data entry. Nancy Connelly provided data analysis. Margie Peech formatted tables for the text and finalized the formatting of the publication.

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# EXECUTIVE SUMMARY

A community needs assessment on stream issues was conducted to find the best ways to provide education resources about stream issues. The community assessment included several different methods: this landowner survey, community meetings, focus groups, individual interviews, pilot projects, and input through the Cooperative Extension Field Office. Streamside landowners on the Esopus were a major focus of the assessment as most of the property along the Esopus consists of privately owned, residential lots. Accordingly, Cornell Cooperative Extension of Ulster County contracted with Cornell University Human Dimensions Research Unit (HDRU) as an independent party to conduct the streamside landowner survey. This survey represents a core component of the overall assessment as it provides insights into how to best educate and involve this important group in stream stewardship.

The Cornell Cooperative Extension of Ulster County office provided the list of names and addresses of streamside property owners. On September 5, 2006, the survey was mailed to all 237 owners on the list. The survey included a cover letter explaining the purpose of the study and an attractive questionnaire booklet with a photograph of Esopus Creek on the cover. Up to three follow-up mailings were sent to owners who had not responded by the time of each reminder mailing. Of the 237 questionnaires mailed out, 19 were undeliverable and 101 were returned for an adjusted response rate of 46%.

Esopus Creek streamside owners tended to be latter middle-aged to senior citizens. Most respondents (68%) were male; their mean age was 62, ranging from 34 to 92 years. Nearly half (45%) were retired; 44% worked full-time, 10% worked part-time, and 1% was unemployed. The majority (78%) had post-high school education, and 45% had at least a college degree. Respondents were well divided in the location of their properties with respect to Shandaken Tunnel—44% of the properties were upstream from the tunnel, while 56% were downstream from the tunnel.

The size of the mean streamside holding was 38 acres (range from 1 to 1300 acres). Owners held a mean of 748 linear feet and a median of 415 linear feet (range 20 to 6,000 feet) adjacent to Esopus Creek. The average property tenure was 24 years, and ranged from 1 to 72 years. Nearly half (47%) of respondents had another residence within the Greater New York City metropolitan area (including parts of NJ and CT). Wading or swimming and fishing were popular activities on respondents' properties.

Erosion of streambanks, flood damage to homes and buildings, management of flows from the Shandaken Tunnel (Portal), loss of streamside trees and vegetation, loss of habitat for fish and other aquatic species, turbidity of the stream, and development along the stream were all rated as very important by most owners, regardless of whether their properties were upstream or downstream from the Shandaken Tunnel. Improving coordination among town, county, and other public agencies received the highest overall rating of actions that would improve the environmental quality of the Creek and adjacent streambanks, followed by reconstructing or reshaping highly unstable sections of the stream, and conserving and planting trees and shrubs as a buffer along the streams.

Landowners need considerable information in order to work toward streamside improvements. For example, the topic for which the *fewest* respondents needed a lot of information was how to assess the need for streambank repair, but 47% indicated they needed a lot of information, and an additional 26% indicated they need some information. For all other topics, at least half of respondents indicated they need a lot of information.

Concerning conservation incentives, owners indicated strongest support (74%) for tax incentives for owners who adopt approved practices on Esopus Creek. A slight majority (53%) also supported applying for a grant program to pay for an eroding streambank if the owner were required to pay a portion of the repair cost. Little support (15%) was expressed for a program in which streamside owners could contribute to an escrow account for streambank repair projects by the local Soil and Water Conservation District, which would also seek funds from other sources. Less than half (39%) of respondents were aware of existing conservation easement programs for streamside owners. About one-third (34%) of all respondents indicated interest in exploring the possibility of a conservation easement on their property.

Most owners (61%) indicated some experience with flooding on their property. However, only 24% indicated support for a program modeled on other programs such as in Delaware County, that provided funds for people to voluntarily move to another property outside the flood plain at little or no cost to them (about one-third (32%) indicated they were unsure). Thus, with more information, such a program might gain additional support.

Most respondents (62%) have not spent any money previously repairing or protecting streambanks against erosion. Of those who had spent money on streambank protection, 54 % indicated their investment was worthwhile, and another 29% indicated it was somewhat worthwhile.

If owners were to repair their streambank or plant a stream side area, most (89%) indicated they would seek some assistance and not just do it based on their own knowledge. Most would seek assistance but then do the work themselves. Some (28%) would seek written materials and information and then proceed, while 40% would consult with someone who has done such work before doing it themselves. However, 41% indicated they would hire professionals to do the work.

Most owners (59%) indicated they would invest in environmental landscaping for their streamside property if it meant protecting fish and streamside wildlife as well as slowing the rate of erosion on their property. After protecting their own property, which 75% indicated they would invest time or money in, equal numbers (45%) indicated they would invest time or money to protect trout and other fish in the creek, and streamside habitat, wildlife, trees, etc. These were followed by clearer water (34%) and water quality for drinking and other uses (23%).

Most (59%) respondents indicated a willingness to work on trash removal along the stream, and many residents indicated a willingness to plant trees or shrubs along the stream (47%), photograph accessible sections of the creek to monitor changes over time (41%), map and remove invasive plants (36%), be trained to do water quality or stream stability surveys (35%), and map stream features (32%). Most (67%) indicated a willingness to attend an annual forum

on Esopus Creek, and 50% would attend quarterly meetings on conservation efforts. About half (52%) indicated they would join an Esopus Creek Landowners Association if it were formed to address stream problems involving multiple landowners.

As to available time for streamside improvement activities, 75% were willing to donate time if the work involved their property than if their property was not involved, while 56% would contribute time if their property were not involved. Over half of respondents would devote some time in either situation, so the potential to organize streamside improvement projects appears good if they are well-planned and publicized. However, respondents were well divided as to best times. Saturday morning was best (28%), followed by Saturday afternoon (22%), Sunday morning (21%), and weeknight evenings (21%). Only 14% indicated availability for early weeknight evenings (5:30-7:00 PM) or for Sunday afternoon.

Over one-quarter (27%) indicated it is very likely that they could work with their neighbor on streamside projects, and an additional 27% indicated there was a reasonable possibility of working with their neighbor. Over one-third (35%) didn't know, and only 11% thought it was not very likely they could work with their neighbor.

Owners seemed to prefer "hands on" types of educational information delivery — brochures, guidebooks or fact sheets, direct technical assistance, or help from local experienced, trained people. Generally, media sources (radio, newspapers) and internet sources were least preferred. Sources respondents placed greatest trust in for information on managing their streamside property included Cornell Cooperative Extension of Ulster County, neighbors or other local people with experience, Ulster County Soil and Water Conservation District, and DEC staff.

In summary, many owners indicated a willingness to commit time and resources to participate in actions that would preserve or enhance the environmental quality of the stream and its banks. However, for just about any projects that would improve water quality or streamside habitat, most owners indicated they would need considerable information before proceeding. Owners generally preferred various types of local, "hands-on" information as opposed to information given on the radio or in a newspaper. Thus, the need for types of information and delivery systems that Cooperative Extension could produce and deliver, working with organizations such as DEC and Cornell University, seem readily apparent from the results of this survey.

The diversity in characteristics of owners will make it challenging to schedule times, whether for educational sessions or streamside work projects, when large numbers are available. While nearly half of the respondents are retired and those who live full-time on their streamside property may have flexible schedules, about the same number still work full-time. Moreover, nearly half have another residence in the Greater New York City area, so they often are not at their property on Esopus Creek. For streamside projects, Saturday morning best for 28% of respondents, followed by Saturday afternoon (22%), Sunday morning (21%), and weeknight evenings (21%).

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# INTRODUCTION

Education and community outreach is an important component of any community-based planning effort, and stream management on the Esopus is no exception. Streams by nature involve a wide set of community members, and therefore opinions. Catskill streams themselves are also very dynamic and complicated natural systems that are difficult even for experts to completely understand. Learning what community members already know and what information they further need is the first step to community stewardship of streams.

A community needs assessment on stream issues was conducted to find the best ways to provide education resources about stream issues. This assessment included several different methods: this landowner survey, community meetings, focus groups, individual interviews, pilot projects, and input through the Cooperative Extension Field Office.

Previous watershed resident surveys and results from other assessment methods (e.g., Pfeffer 2001) were used to develop the survey questions. An attempt was made through the relationship between Cornell University and Cooperative Extension of Ulster County to develop a survey tool for streamside landowners that could be further used as a model in other watersheds.

Streamside landowners on the Esopus were a major focus of the assessment as most of the property along the Esopus consists of privately owned, residential lots. Any serious systematic effort to manage the Esopus Creek will necessarily involve streamside landowners early in the process. Thus, this survey represents a core component of the overall assessment, providing insights for developing educational materials and coordinating resources for private streamside stewardship.

# METHODS

The Cornell Cooperative Extension of Ulster County office provided the list of names and addresses of streamside property owners. On September 5, 2006, the survey was mailed to all 237 owners on the list. The survey included a cover letter explaining the purpose of the study and an attractive questionnaire booklet with a photograph of Esopus Creek on the cover. Up to three follow-up mailings were sent to owners who had not responded by the time of each reminder mailing. The second reminder mailing contained a replacement questionnaire. The mailing technique follows a standard method used in the social sciences and recommended by Dillman (2000).

At least four attempts were made to reach all nonrespondents by telephone to ask them a few key questions. We typically use this method in our surveys to gauge nonresponse bias and to adjust the data for it where necessary.

# RESULTS

Of the 237 questionnaires mailed out, 19 were undeliverable and 101 were returned for an adjusted response rate of 46%. After at least four attempts, only 15 nonrespondents could be reached. This is not a sufficiently large response from nonrespondents to ascertain statistically whether important differences exist between respondents and nonrespondents. As a result, we

added the data from nonrespondents to the overall data base, and that information will be reflected in the results presented below.

**Characteristics of respondents and property**

Esopus Creek streamside owners tended to be latter middle-aged to senior citizens. Most respondents (68%) were male. Their mean age was 62, ranging from 34 to 92 years. Nearly half (45%) were retired; 44% worked full-time, 10% worked part-time, and 1% was unemployed. The majority (78%) had post-high school education, and 45% had at least a college degree.

Respondents were well divided in the location of their properties with respect to Shandaken Tunnel—44% of the properties were upstream from the tunnel, while 56% were downstream from the tunnel. The size of the mean streamside holding was 38 acres (range from 1 to 1300 acres). Owners held a mean of 748 linear feet and a median of 415 linear feet (range 20 to 6,000 feet) adjacent to Esopus Creek. The distribution by quartiles was (1) 152 feet or less, (2) 170 to 415 feet, (3) 500 to 850 feet, and (4) 1,000 to 6,000 linear feet. The average property tenure was 24 years, and ranged from 1 to 72 years. Nearly half (47%) of respondents had another residence within the Greater New York City metropolitan area (including parts of NJ and CT).

Wading or swimming and fishing were popular activities on respondents' properties (Table 1).

**Table 1. Participation in recreation activities in Esopus Creek in the past year.**

| *Recreation activities* | *Percent participating* |
|---|---|
| Wading or swimming | 57.0 |
| Fishing | 44.7 |
| Tubing | 21.9 |
| Kayaking or canoeing | 12.3 |
| Other (primarily hiking) | 12.0 |

**Importance of Streamside Issues**

Erosion of streambanks, flood damage to homes and buildings, management of flows from the Shandaken Tunnel (Portal), loss of streamside trees and vegetation, loss of habitat for fish and other aquatic species, turbidity of the stream, and development along the stream were all rated as very important by most owners, regardless of whether their properties were upstream or downstream from the Shandaken Tunnel (Table 2). Owners downstream from the Portal rated the management of flows from the Portal and turbidity at a higher level of importance than upstream owners. Lack of public access to the Creek was rated lower than the other issues, perhaps because the owners already have their own private access and may wish to keep it private from other users; the mean score of 3.0 places this item at a somewhat important level.

**Table 2. Importance of various issues on upper Esopus Creek—overall and by whether the property is upsteam or downstream of the Shandaken Tunnel.**

| Issues | Mean importance* (st. dev.) | Not at all important | Slightly important | Somewhat important | Moderately important | Very important | Don't know |
|---|---|---|---|---|---|---|---|
| | | *Percent* | | | | | |
| Erosion of streambanks on private property | | | | | | | |
| Overall | 4.8 (0.7) | 0.9 | 1.7 | 2.6 | 6.9 | 82.7 | 5.2 |
| Upstream | 4.7 (0.8) | 2.3 | 2.3 | 2.3 | 4.7 | 83.7 | 4.7 |
| Downstream | 4.8 (0.6) | 0.0 | 1.8 | 1.8 | 10.9 | 80.0 | 5.5 |
| Flood damage to homes and buildings | | | | | | | |
| Overall | 4.7 (0.7) | 0.9 | 2.6 | 3.4 | 8.6 | 80.2 | 4.3 |
| Upstream | 4.7 (0.8) | 2.3 | 2.3 | 2.3 | 7.0 | 81.4 | 4.7 |
| Downstream | 4.7 (0.7) | 0.0 | 3.6 | 3.6 | 12.7 | 78.1 | 1.8 |
| Management of flows from the Shandaken Tunnel or "Portal" | | | | | | | |
| Overall | 4.7 (0.8) | 1.7 | 1.7 | 2.6 | 10.4 | 72.3 | 11.3 |
| Upstream | 4.4[a] (1.1) | 4.8 | 2.4 | 4.8 | 21.4 | 54.7 | 11.9 |
| Downstream | 4.9[a] (0.3) | 0.0 | 0.0 | 1.8 | 3.6 | 89.1 | 5.5 |
| Loss of streamside trees and vegetation | | | | | | | |
| Overall | 4.7 (0.7) | 1.7 | 0.0 | 6.0 | 11.2 | 78.5 | 2.6 |
| Upstream | 4.6 (0.9) | 2.3 | 0.0 | 9.3 | 7.0 | 76.7 | 4.7 |
| Downstream | 4.7 (0.7) | 1.8 | 0.0 | 3.6 | 14.5 | 78.3 | 1.8 |
| Loss of habitat for trout and other aquatic species | | | | | | | |
| Overall | 4.7 (0.7) | 1.7 | 0.0 | 4.3 | 10.3 | 79.4 | 4.3 |
| Upstream | 4.6 (1.0) | 4.7 | 0.0 | 4.7 | 11.6 | 74.3 | 4.7 |
| Downstream | 4.8 (0.5) | 0.0 | 0.0 | 5.5 | 10.9 | 81.8 | 1.8 |
| The turbidity or muddy appearance of the water | | | | | | | |
| Overall | 4.5 (0.9) | 1.7 | 1.7 | 9.6 | 20.0 | 63.5 | 3.5 |
| Upstream | 4.3[a] (1.0) | 2.3 | 2.3 | 14.0 | 25.6 | 51.1 | 4.7 |
| Downstream | 4.7[a] (0.5) | 0.0 | 0.0 | 3.7 | 18.5 | 74.1 | 3.7 |
| Development along the stream | | | | | | | |
| Overall | 4.3 (1.1) | 4.5 | 2.7 | 11.6 | 17.9 | 57.0 | 6.3 |
| Upstream | 4.5 (0.9) | 2.4 | 0.0 | 12.2 | 17.1 | 61.0 | 7.3 |
| Downstream | 4.2 (1.2) | 5.6 | 5.6 | 9.3 | 20.3 | 53.6 | 5.6 |
| Lack of public access to the Creek for fishing, tubing or exploration | | | | | | | |
| Overall | 3.0 (1.4) | 22.4 | 8.6 | 28.5 | 14.7 | 19.8 | 6.0 |
| Upstream | 3.0 (1.0) | 27.8 | 7.0 | 18.6 | 18.6 | 23.3 | 4.7 |
| Downstream | 3.0 (1.3) | 14.5 | 12.7 | 38.3 | 14.5 | 16.4 | 3.6 |

*Mean score was based on a 5-point Likert-type scale where 1 = not at all important and 5 = very important. ("Don't know" responses were not used in the calculation of the mean score.)

[a]Statistically significant difference in mean importance between upstream and downstream landowners using t-test at $P \leq 0.05$.

## Actions to Improve Environmental Quality of the Creek and Banks

Respondents were asked to indicate the extent to which a number of possible actions would improve the environmental quality of Esopus Creek and the adjacent streambanks. These 11 items are arrayed in Table 3 in the order of perceived effectiveness of respondents. Improving coordination among town, county, and other public agencies received the highest overall rating, followed by reconstructing or reshaping highly unstable sections of the stream,

**Table 3. Perceived effectiveness of actions to improve the environmental quality of upper Esopus Creek and the adjacent stream banks.**

| Actions | Mean Effect* (st. dev.) | Not desirable | Would have limited effect | Would help somewhat | Would help moderately | Would help greatly | Don't know |
|---|---|---|---|---|---|---|---|
| | | *Percent* | | | | | |
| Improving coordination among town, county, and other public agencies | 4.6 (0.8) | 1.0 | 1.0 | 7.1 | 22.2 | 65.7 | 3.0 |
| Reconstructing/re-shaping highly unstable sections of the stream | 4.4 (1.2) | 4.0 | 8.0 | 4.0 | 12.0 | 67.0 | 5.0 |
| Conserving and planting trees and shrubs as a buffer along the stream | 4.4 (1.0) | 2.0 | 4.0 | 7.9 | 20.8 | 61.3 | 4.0 |
| Coordinating restoration across multiple properties to address problems | 4.3 (1.1) | 3.0 | 6.1 | 7.1 | 17.2 | 60.5 | 6.1 |
| Preserving wetlands | 4.3 (1.1) | 3.1 | 5.2 | 11.5 | 14.6 | 55.2 | 10.4 |
| Cleanup of hazardous woody debris in the stream | 4.1 (1.2) | 3.0 | 10.9 | 10.9 | 19.8 | 52.4 | 3.0 |
| Protecting stream banks with "riprap" or rock walls | 4.1 (1.3) | 7.1 | 10.1 | 9.1 | 14.1 | 56.6 | 3.0 |
| Slowing and decreasing storm water runoff | 4.1 (1.2) | 3.0 | 9.0 | 11.0 | 17.0 | 51.0 | 9.0 |
| Updating flood maps to improve information about building or developing in flood hazard areas | 4.1 (1.1) | 3.0 | 9.1 | 10.1 | 21.2 | 51.5 | 5.1 |
| Organizing "neighborhood" citizen groups to work on stream conservation and protection | 3.9 (1.2) | 6.0 | 7.0 | 16.0 | 23.0 | 40.0 | 8.0 |
| Removing gravel/cobble from the Creek | 3.4 (1.6) | 16.3 | 13.3 | 10.2 | 7.1 | 34.7 | 18.4 |

*Mean score was based on a 5-point Likert-type scale where 1 = not desirable and 5 = would help greatly. ("Don't know" responses were not used in the calculation of the mean score.)

and conserving and planting trees and shrubs as a buffer along the streams (the latter two items had a similar rating). Most respondents thought all but the last item, removing gravel/cobble from the Creek, would help moderately or greatly.

**Information Needs on Streamside Management**

The survey listed eight potential types of information important for streamside management and asked owners to indicate on a 4-point scale the extent to which they would need information on each topic. The results suggest that landowners need considerable information on each topic (Table 4). The topic for which the *fewest* respondents indicated they needed a lot of information was how to assess the need for streambank repair, but 47% indicated they needed a lot of information, and an additional 26% indicated they need some information. For all other topics, at least half of respondents indicated they need a lot of information.

**Table 4. Need for information on streamside management topics.**

| *Streamside management topics* | Mean information need* (st. dev.) | No information needed | A little information is needed | Some information is needed | A lot of information is needed | Don't know |
|---|---|---|---|---|---|---|
| | | *Percent* | | | | |
| Specific strategies for streambank repair | 3.5 (0.8) | 4.0 | 7.1 | 20.2 | 59.6 | 9.1 |
| Best ways to protect my property from flooding | 3.5 (0.9) | 6.1 | 9.1 | 14.1 | 66.7 | 4.0 |
| How the Stream Management Plan can help me | 3.5 (0.8) | 2.0 | 10.1 | 20.2 | 59.6 | 8.1 |
| What native plants to grow in a streamside buffer | 3.4 (0.9) | 6.1 | 9.1 | 22.2 | 56.5 | 6.1 |
| How to assess the need for streambank repair | 3.3 (0.9) | 7.1 | 8.1 | 26.3 | 47.4 | 11.1 |
| How stream processes affect my property and my neighbors | 3.3 (0.9) | 6.1 | 11.2 | 22.4 | 53.2 | 7.1 |
| How the amount of sediment or "cobble" in the stream affects my property | 3.3 (1.0) | 7.1 | 13.3 | 21.4 | 52.1 | 6.1 |
| Stream biology—how fish and other aquatic life rely on nutrient cycles, in-stream habitat, water quality, and stream side vegetation for good habitat | 3.2 (1.0) | 9.2 | 12.2 | 22.4 | 50.1 | 6.1 |

*Mean score was based on a 4-point Likert-type scale where 1 = no information needed and 4 = a lot of information is needed. ("Don't know" responses were not used in the calculation of the mean score.)

## Support for Conservation Incentives and other Programs

Streamside owners were asked to indicate the degree to which they would support or oppose three different types of conservation incentives. The strongest support was indicated for tax incentives for owners who adopt approved practices on Esopus Creek; 74% of all respondents indicated support (strongly support or support), while only 13% opposed such an incentive (Table 5). A slight majority (53%) of respondents also supported applying for a grant program to pay for an eroding streambank if the owner were required to pay a portion of the repair cost. However, little support was expressed for a program in which streamside owners could contribute to an escrow account for streambank repair projects by the local Soil and Water Conservation District, which would also seek funds from other sources. Only 15% of respondents supported this option. For each of these possible programs, the level of overall support was similar for year-round versus seasonal owners, although year-round owners were more likely to indicate that they strongly supported each program.

**Table 5. Degree of support or opposition to various conservation incentives—overall and for year-round and seasonal residents.**

| Conservation incentive | Strongly support | Support | Neither oppose nor support | Oppose | Strongly oppose |
|---|---|---|---|---|---|
| | *Percent* | | | | |
| Tax incentives for streamside landowners who adopt approved practices on Esopus Creek | | | | | |
| Overall | 53.6 | 20.5 | 12.5 | 4.5 | 8.9 |
| Year-round | 63.5 | 11.5 | 9.6 | 5.8 | 9.6 |
| Seasonal | 48.0 | 28.0 | 14.0 | 2.0 | 8.0 |
| Applying for a grant program to pay for your eroding streambank if it required you to contribute to a portion of the repair cost | | | | | |
| Overall | 32.7 | 20.9 | 17.3 | 10.0 | 19.1 |
| Year-round | 37.3 | 15.7 | 13.7 | 13.7 | 19.6 |
| Seasonal | 34.6 | 24.5 | 18.4 | 4.1 | 18.4 |
| Streamside landowners contributing to an escrow account for streambank repair projects by the local Soil and Water Conservation District, which would also seek funds from other sources | | | | | |
| Overall | 7.1 | 8.0 | 26.8 | 19.6 | 38.4 |
| Year-round | 11.3 | 3.8 | 22.6 | 17.0 | 45.3 |
| Seasonal | 4.1 | 12.2 | 24.5 | 26.5 | 32.7 |

Less than half (39%) of respondents were aware of existing conservation easement programs for streamside owners. About one-third (34%) of all respondents indicated interest in exploring the possibility of a conservation easement on their property. Approximately one in ten (11%) stated that they already had an existing conservation easement.

**Flooding Experience and Interest in Programs:**

Most owners (61%) indicated some experience with flooding on their property: 28% in the last year, 37% two to five years ago, 25% six to ten years ago, 13% eleven to fifteen years ago, and 15% had experienced flooding 16 to 20 years ago. However, only 24% indicated support for a program modeled on other programs such as in Delaware County, that provided funds for people to voluntarily move to another property outside the flood plain at little or no cost to them. About one-third (32%) indicated they were unsure. Thus, with more information, such a program might gain additional support.

**Streambank Protection**

Most respondents (62%) have not spent any money previously repairing or protecting streambanks against erosion. Fifteen percent had spent $1,000 or less, 11% had spent from $1,001 to $5,000, and 12% had spent over $5,000, ranging as high as in excess of $30,000. Of those who had spent money on streambank protection, 54 % indicated their investment was worthwhile, and another 29% indicated it was somewhat worthwhile.

If owners were to repair their streambank or plant a stream side area, most (89%) indicated they would seek some assistance and not just do it based on their own knowledge. Most would seek assistance but then do the work themselves. Some (28%) would seek written materials and information and then proceed, while 40% would consult with someone who has done such work before doing it themselves. However, 41% indicated they would hire professionals to do the work. Note that these figures add to over 100%, as some respondents checked more than one option. Compared with 41% who would hire professionals in the absence of special programs, 63% indicated they would do so if there was a modest grant program for using professional services, and an additional 20% said they were unsure..

Owners were asked to react to the statement that they would invest in environmental landscaping for their streamside property if it meant protecting fish and streamside wildlife as well as slowing the rate of erosion on their property. The majority (59%) agreed or strongly agreed; 13% neither agreed nor disagreed, and 16% disagreed. Another 12% indicated they did not know.

**Activities Owners Would Commit Time or Money Toward**

Owners were asked to indicate what personal or community benefits related to streamside improvement are important enough that they would be willing to contribute money or time toward. After protecting their own property (75%), equal numbers (45%) indicated that (a) trout and other fish in the creek, and (b) streamside habitat, wildlife, trees, etc. were of sufficient importance that they would contribute time or money toward (Table 6). These were followed by clearer water (34%) and water quality for drinking and other uses (23%).

| **Table 6. Items owners are willing to conserve or protect by committing time and/or money.** | |
|---|---|
| *Things to be conserved or protected* | *Percent willing to commit to conservation or protection** |
| My own property | 75.2 |
| Trout and other fish in the Creek | 45.5 |
| Streamside habitat, wildlife, trees, etc. | 44.6 |
| Clearer water—not muddy or brown | 33.7 |
| Water quality for drinking and other uses | 22.8 |
| Community businesses supported by tourism related to the Creek | 9.9 |
| The pride of Catskill community life on the Creek | 8.9 |
| The tourism base related to the Creek | 7.9 |
| White water recreation opportunities | 6.9 |
| *Respondents were asked to check no more than three items. | |

Participation in a number of volunteer projects and forums was also investigated. Most (59%) respondents indicated a willingness to work on trash removal along the stream, and many residents indicated a willingness to plant trees or shrubs along the stream (47%), photograph accessible sections of the creek to monitor changes over time (41%), map and remove invasive plants (36%), be trained to do water quality or stream stability surveys (35%), and map stream features (32%) (Table 7). Most (67%) indicated a willingness to attend an annual forum on Esopus Creek, and 50% would attend quarterly meetings on conservation efforts. About half (52%) indicated they would join an Esopus Creek Landowners Association if it were formed to address stream problems involving multiple landowners. Over one-third (36%) were unsure if they would join, and 12% indicated they would not join.

As to available time for streamside improvement activities, more respondents were willing to donate time if the work involved their property than if their property was not involved. Table 8 shows that 75% would contribute some time if their property were involved, but only 56% would contribute time if their property were not involved. Over half of respondents would devote some time in either situation, so the potential to organize streamside improvement projects appears good if they are well-planned and publicized. However, respondents were well divided as to best times. Saturday morning was best (28%), followed by Saturday afternoon (22%), Sunday morning (21%), and weeknight evenings (21%). Only 14% indicated availability for early weeknight evenings (5:30-7:00 PM) or for Sunday afternoon.

Over one-quarter (27%) indicated it is very likely that they could work with their neighbor on streamside projects, and an additional 27% indicated there was a reasonable possibility of working with their neighbor. Over one-third (35%) didn't know, and only 11% thought it was not very likely they could work with their neighbor.

**Information Sources for Providing Information to Landowners**

A number of information sources were investigated as possible ways to provide "how to" information to streamside owners. Generally, media sources (radio, newspapers) and internet sources received the lowest ratings. Owners seemed to prefer more "hands on" information—

| Table 7. Willingness to participate in various volunteer projects or forums related to Esopus Creek—overall and for year-round and seasonal residents. | | | |
|---|---|---|---|
| | Yes | No | Not sure |
| *Volunteer projects* | *Percent* | | |
| Removing trash along the stream | | | |
| Overall | 59.4 | 27.1 | 13.5 |
| Year-round | 64.3 | 26.2 | 9.5 |
| Seasonal | 64.4 | 22.2 | 13.3 |
| Planting streamside trees or shrubs | | | |
| Overall | 47.4 | 30.9 | 21.6 |
| Year-round | 54.8 | 28.6 | 16.7 |
| Seasonal | 47.8 | 26.1 | 26.1 |
| Photographing accessible sections of the Creek to monitor changes over time | | | |
| Overall | 40.8 | 38.8 | 20.4 |
| Year-round | 48.8 | 32.6 | 18.6 |
| Seasonal | 39.1 | 41.3 | 19.6 |
| Mapping and removing invasive plants | | | |
| Overall | 36.5 | 39.6 | 24.0 |
| Year-round | 41.5 | 36.6 | 22.0 |
| Seasonal | 37.0 | 37.0 | 26.1 |
| Being trained to do water quality or stream stability surveys | | | |
| Overall | 34.7 | 46.3 | 18.9 |
| Year-round | 31.7 | 46.3 | 22.0 |
| Seasonal | 44.4 | 42.2 | 13.3 |
| Mapping stream features | | | |
| Overall | 32.3 | 41.7 | 26.0 |
| Year-round | 39.0 | 43.9 | 17.1 |
| Seasonal | 30.4 | 37.0 | 32.6 |
| | | | |
| *Forums* | | | |
| An annual forum on Esopus Creek | | | |
| Overall | 67.0 | 9.2 | 23.9 |
| Year-round | 66.0 | 9.4 | 24.5 |
| Seasonal | 70.2 | 4.3 | 25.5 |
| Quarterly meetings on community conservation efforts for Esopus Creek | | | |
| Overall | 49.5 | 22.0 | 28.4 |
| Year-round | 51.9 | 19.2 | 28.8 |
| Seasonal | 47.9 | 22.9 | 29.2 |
| Monthly meetings on community conservation efforts for Esopus Creek | | | |
| Overall | 11.2 | 49.5 | 39.3 |
| Year-round | 13.5 | 46.2 | 40.4 |
| Seasonal | 8.7 | 52.2 | 39.1 |

**Table 8. Amount of time respondents would be willing to volunteer for stream-based restoration or monitoring activities on their own property or outside their property.**

| | Own property | Outside own property |
|---|---|---|
| *Time for stream-based restoration or monitoring activities* | *Percent* | |
| None at all | 25.3 | 43.6 |
| A little: 1-4 afternoons or evenings per year | 28.4 | 33.0 |
| Occasionally: 5-7 afternoons or weekends per year | 26.3 | 21.3 |
| Regularly: 1-2 afternoons a month, and occasional daylong projects | 20.0 | 2.1 |

brochures, guidebooks or factsheets; direct technical assistance, or help from local experienced, trained people (Table 9). Sources respondents placed greatest trust in for information on managing their streamside property included Cornell Cooperative Extension of Ulster County, neighbors or other local people with experience, Ulster County Soil and Water Conservation District, and DEC staff (Table 10).

**Table 9. Likelihood of using various information sources for the care of streamside property.**

| *Information sources* | Very likely | Somewhat likely | Not likely |
|---|---|---|---|
| | *Percent* | | |
| Specific "how to" programs | 46.3 | 37.6 | 16.1 |
| Direct technical assistance | 45.0 | 33.0 | 22.0 |
| Help and information from local, experienced, trained people | 44.7 | 43.6 | 11.7 |
| Availability of a local office to provide technical assistance | 43.0 | 30.1 | 26.9 |
| Brochures, small guidebooks, or fact sheets | 41.9 | 44.1 | 14.0 |
| Newsletters | 38.5 | 50.5 | 11.0 |
| E-mail notice plus website information | 31.5 | 25.0 | 43.5 |
| Stream education walks and tours of restoration sites | 25.8 | 35.5 | 38.7 |
| Newspaper articles | 19.6 | 48.9 | 31.5 |
| Lectures | 15.4 | 50.5 | 34.1 |
| Radio ads or stories | 8.7 | 25.0 | 66.3 |

| Table 10. Level of trust in each source of information for management of streamside property. | | | |
|---|---|---|---|
| *Source of information* | High trust | Some trust | Little trust |
| | *Percent* | | |
| Cornell Cooperative Extension of Ulster County | 50.0 | 42.5 | 7.5 |
| Neighbors or other locals with experience | 31.1 | 50.0 | 18.9 |
| NYS Department of Environmental Conservation (DEC) | 27.2 | 44.6 | 28.2 |
| Ulster County Soil and Water Conservation District | 23.2 | 62.1 | 14.7 |
| Shandaken Highway Department | 20.4 | 48.5 | 31.1 |
| NYC Department of Environmental Protection (DEP) Stream Management Program | 18.4 | 35.0 | 46.6 |
| Professional contractors | 10.0 | 59.0 | 31.0 |

**Write-in Comments**

Respondents were encouraged to provide any additional comments they wished to make concerning the study, their property, and management of Esopus Creek, and 63 such comments were received. Portions of these comments were organized into topic areas and appear in Appendix A.

## SUMMARY AND IMPLICATIONS

This landowner survey was conducted as part of a community needs assessment to find the best ways to provide education resources about stream issues. A good representation of owners was achieved whose properties are located upstream as well as downstream from the Shandaken Tunnel.

Management of erosion, flood control, fish and other aquatic species, maintaining streamside vegetation and wildlife habitat, and water quality were all rated important by respondents. Having the various units of local government improve coordination of their activities was seen as the most important action that could be taken, but restructuring or reshaping unstable areas of the stream and planting vegetation as buffers along the stream were also seen as important.

Many owners indicated a willingness to commit time and resources to participate in actions that would preserve or enhance the environmental quality of the stream and its banks. Three-fourths of respondents indicated a willingness to do actions on their own property, and sizable numbers (at least one-third of respondents) indicated a willingness to work at projects that would improve streamside habitat generally, habitat for fish, and that would improve water clarity. However, for just about any projects that would improve water quality or streamside habitat, most owners indicated they would need considerable information before proceeding. Owners generally preferred various types of local, "hands-on" information as opposed to information given on the radio or in a newspaper. Thus, the need for types of information and delivery systems that Cooperative Extension could produce and deliver, working with

organizations such as Ulster County Soil and Water Conservation District, DEC and Cornell University, seem readily apparent from the results of this survey.

The diversity in characteristics of owners will make it challenging to schedule times, whether for educational sessions or streamside work projects, when large numbers are available. While nearly half of the respondents are retired and those who live full-time on their streamside property may have flexible schedules, about the same number still work full-time. Moreover, nearly half have another residence in the Greater New York City area, so they often are not at their property on Esopus Creek. For streamside projects, Saturday morning best for 28% of respondents, followed by Saturday afternoon (22%), Sunday morning (21%), and weeknight evenings (21%).

## LITERATURE CITED

Dillman, D. A. 2000. Mail and internet surveys: the tailored design method. Johns Hopkins, New York.

Pffeffer, M. J. 2001. Otsego Lake watershed issues and concerns: a report on survey findings. Center for the Environment, Cornell University, Ithaca, NY.

# APPENDIX A. WRITE-IN COMMENTS ORGANIZED BY TOPIC

(These write-in comments are excerpts, but have not been edited otherwise.)

About Cornell (Cooperative Extension):

- As a graduate of Cornell, I am relying on you to straighten out these misguided people.
- We appreciate all the work of Cornell extension on the Esopus Management Plan and support all its efforts.
- Cornell could be the solution but jury is still out. Let's see what Cornell does.
- The fact that they are paying for Cornell's involvement is highly suspect
- My wife spoke with someone at the Cooperative Extension in Phoenicia back in the spring about the stream and the damage it has caused our property. They were to come and take a look and they never followed through.

Interesting Comments:

- Having been one of the few recreational rental businesses on the Esopus Creek, relative to questions asked pertaining to the removal of woody debris and/or points of stream bank erosion that result in trees falling in the river (forming strainers), the analysis of this survey should take into consideration the responses proportional to the number of whitewater recreationalists that will not have input because they do not live in the area and will not receive this survey. These questions will directly affect the safety, health, and welfare of roughly 15-20 thousand of the general public, which is our annual customer base. Improvement, signage, identification, and the installation of informational kiosks at all Esopus Creek public access points is paramount
- My answers to the following questions are qualified by the fact that I was one of eleven landowners who benefitted from a stream restoration project completed in 2003 by the NYC DEP & UCSWCD #15, #16, #27

Flooding:

- In the flood of April 2005, again we had substantial damage
- Our interest in the stream is primarily to prevent future flooding.
- Since 1980 we have suffered severe damage ever time the stream is at flood stage.
- Every flood we had to fix road and driveway
- I have lost more stream bank this past year by far than any other year due to the continued high water and recent flood
- My property has had erosion from recent flooding.
- We need HELP! $$$ or we will continue to be flooded in the McKenly Hollow area.
- The lost Clove Bridge on Olivera Rd. has washed out about four times since 1971.
- Fear of flooding--we have experienced 3 big ones - one devastating.
- We have experienced much flood damage.

- Moved our place back twice due to floods.. Lost a lot of frontage.

DEP/DEC

- DEP and DEC should be cleaning these streams out–rip rap the clay banks–and then replant the trout.
- It disturbs me to see the current condition of the water. I place blame on the DEC and DEP
- Any money spent on this stream should be provided entirely by the DEC and DEP. 2) DEP - by its importation of polluted (turbidity and phosphorus) waters from another water system.
- NYC doesn't care about homeowners. They are only concerned about water quality and enough water for NYC residents.
- NYSDEP is a hindrance to proper stream management.
- I don't believe the DEP can be trusted with anything ...and unfortunately you are an employee of them.
- DEP has lost my trust long ago.
- I think the presence of the DEP is of the worst influence on the Esopus
- Have the DEC properly repair the berm on my property as agreed to by agreeing to an easement; bare rip-rap does not add to the beauty of the stream of the Catskills

Portal (Diversion tunnel from Schoharie Reservoir):

- Portal has ruined my ability to fully enjoy and use my property

Gravel Dredging and Rip-Rap (Channelization):

- This stream and problems have been created by: (1) DEC not allowing cobble to be removed from stream - thereby filling the stream from its normal bed, (
- We then dozed and rip-rapped another 100'. It wasn't until - due to the stream bed again filling in 3 feet. That's 3 feet of cobble that takes up the space that water could be running in. Also, the rip rap the state and county is using is too small.
- I'm mainly concerned about the gravel build-up in the Creek in the area of the Rt. 28 bridge at Mt. Tremper.
- Couldn't we use and all (NYC Watershed, environment, etc.) benefit from a consultation and template, or standard for rip-wrap walls? And other stabilizing around which we could replant the streamside?
- Use of rock walls on stream would be the best approach

River Course has Changed / Lateral Erosion Problems:

- Most of this 1.9 acres is now under water. The river has changed its course a lot, increasing its curve, and has eroded the share into the land (diagram showing this).

- The stream keeps moving. How do you "stop" that? It ripped the trees from my 500 year flood plain tiny plot of land.

"All Talk & No Action":

- What I am angry about–all talk and no action
- Over the past many years, we also have heard about quite a lot of planned improvements, including strengthening the bank of the creek, environmental protection, water resources, etc. But every time there is a flood, much rain, or snow melt, we all experience the same thing time and time again
- It's taking too long to come to terms with who is "responsible" and who can handle this for everyone's "benefit." Requires a lot of work and money but it is time to get started. Thanks for this opportunity.

Little Damage / "Doesn't Affect Us"

- During our period of ownership, and my parents (approx. 32 years), there has been very little damage to our property caused by flooding
- We live 6 miles upstream from the Big Esopus on the Little Esopus so a lot of these questions do not affect us.

Positive Comments:

- Thank you for your interest and concern of the Esopus. My major concerns are keeping it clean for drinking and wildlife habitat and
- We want to protect the environment around the Creek. We would be willing to contribute some of our time or money or both. Thank you for asking our opinion.
- I appreciate contacting me for this survey.
- Very important questions. I'm willing to work on the stream
- The stream definitely needs taking care of as it enhances the beauty of the mountains and is needed for the wildlife and protection of homes.
- You're on the right track and I "visit" my home in Oliverea only 4-5 times a year but I am interested in our crusade.
- This questionnaire is of the utmost importance. It concerns people, animals, and preservation.
- The Esopus Creek does need maintenance. I'm glad there is a plan or planning going on. Thanks.
- I believe you are on the right track to accomplish good for the Esopus Creek & its tributaries.

Comments That Encourage Conservation Measures

- I would like to see the law limiting the number of trees one could cut down on private property.
- I would like to encourage the planting of native species in private gardens.

- Would be very happy to plant stabilizing species there if I knew how to get them.
- Our property is being affected by bank erosion on property upstream from us. This area needs to be raised and trees/shrubs planted to maintain bank.
- The tributaries of the Esopus Creek are also as important (if not more important) with respect to the subjects dealt with in this survey
- I know tourism is important to the area but I hate to see the stream suffer due to too much foot traffic or any unnecessary commercial building or the proposed resorts aimed at bringing thousands more people to the region. Thank you
- We need to make sure the full-time local residents of the area know what a treasure they have in the Catskill/Esopus region.

Age/Ability Issues:

- Because of my age I would be limited with regards to some of the more physical work required for restoration
- If my health permitted, I would assist in the programs, but sadly I'm unable to do so.

Taxes:

- My concern is that my home on the Esopus that my father and I built will be come unaffordable to keep with taxes going up all the time and mandated stream improvements could be the last straw.
- In spite of this we are paying ever increasing taxes each year.

Need More Information

- If you have info on identifying invasive species and where to purchase helpful ones, please send to me
- I am really interested in having someone with knowledge visit my property and work with me.
- I am also very interested in setting up conservation easements and/or selling off the development rights to my property. The majority (½) of our property is wetland/streamside and is very environmentally sensitive. Could you please send me any available info. on these programs. Thanks.