VI. GLOSSARY OF TERMS

GLOSSARY OF STREAM AND FLOODPLAIN TERMS

Note: where a word within a definition is italicized, it is defined elsewhere within the glossary

aggradation - The process by which *sediment* and deposition causes a streambed elevation to increase, or fill in. The channel becomes more shallow by filling in with *sediment*. An aggrading stream will typically show a *bank height ratio* of less than 1.0.

aquatic habitat – Physical attributes of the stream channel and *riparian area* that are important to the health of all or some life stages of fish, aquatic insects and other stream organisms. Attributes include water quality (temperature, pH), *riparian* vegetation characteristics (shade, cover, density, species), stream bed *sediment* characteristics, and *pool*/*riffle* spacing**.**

backwater – An area in or along a stream where water has been held back by an obstruction, constriction or dam.

bankfull flow or discharge – typically recurs every 1 – 3 years. These floods are frequent and powerful enough to mobilize *gravel* and *cobble* on the streambed. Bankfull flow is considered most responsible for defining the stream form and is also referred to as channel forming flow.

Bank Erodibility Hazard Index (BEHI) – An index for predicting *erosion potential* on selected stream banks, usually associated with a *monitoring cross-section* for measurement of actual *erosion* rates over time (Rosgen, 1996).

bank height ratio-The ratio of height of bank to *bankfull* height, used in stream assessment to determine whether a stream is stable-bank height and *bankfull* height will be the same in a stable stream.

bar, mid-channel, point, side, lateral, etc. **-** a location within the stream channel in which sediment accumulates occupying a significant portion of the channel (vs.localized *sediment* deposits behind small obstructions).

base flow –The typical groundwater fed, low flow for a given stream between periods of no rainfall.

basin, drainage -- an area in which the margins dip toward a common center or depression, and toward which surface and subsurface channels drain. The common depression may allow free drainage of water from the basin as in a stream, or may be the end point of drainage as in a lake or pond.

berm – A mound of earth or other materials, usually linear, constructed along streams, roads, *embankments* or other areas. Berms are often constructed to protect land from flooding or eroding, or to control water drainage (as along a road-side ditch). Some berms are constructed as a byproduct of a stream management practice whereby stream bed *sediment* is pushed out of the channel and mounded on (and along the length of) the stream bank - these berms may or may not be constructed for flood control purposes; some are simply piles of excess

material. These berms often interfere with other stream processes such as *floodplain* function, and can exacerbate flood-related *erosion* or stream *instability*.

bioengineering – The use of live vegetation, either alone or in combination with harder materials such as rock or (dead) wood, to stabilize soils associated with stream banks or hillslopes. Roots stabilize the soil, while stems, branches and foliage slow high *velocity* water, reducing *erosion* and encourage deposition of fine *sediment*.

boulder – In the context of *stream assessment surveys*, a boulder is stream *sediment* that measures between 256 mm and 4096 mm (about 10 inches to 13.3 feet).

channel, stream– A defined waterway with definite bed and banks, which periodically or continuously contains flowing water.

channel forming flow—see *bankfull* flow.

channelization — The re-alignment of rivers involving straightening, widening, reshaping, entrenching or altering the slope. Often this work is accompanied by stream bank stabilization, grade control or berm construction.

cobble – In the context of *stream assessment surveys*, cobble material is *sediment* that measures between 64 mm and 256 mm (about 2.5 inches to 10 inches).

confluence – The location of the joining of two separate streams, each with its own *watershed*.

corridor—The area of land along a stream between the valley walls including floodplains, riparian areas, and terraces.

convergence – The downstream end of a split channel, where the stream merges back to one channel; the two channels having the same *watershed*.

cross-section (see also monitoring cross-section) – In the context of *stream assessment surveys*, a *cross-section* is a location on a stream channel where stream *morphology* is measured perpendicular to the stream flow direction (as if taking a slice through the stream), including width, depth, height of banks and/or *terraces*, and area of flow.

culvert – A closed conduit for the free passage of surface drainage water. In Chestnut Creek, culverts are typically used by the Town and County to control water running along and under the road, and to provide a crossing point for water from road side drainage ditches to the stream, as well as for routing *tributary* streams under the road to join the main Chestnut Creek stream. Culverts are also used by landowners to route roadside drainage ditch water under their driveways to reduce or prevent *erosion*.

degradation – The process by which a stream *reach* or channel becomes deeper by eroding downward into its bed over time, also called "*downcutting*", either by periodic episodes of bed scouring without filling, or by longer term transport of *sediment* out of a *reach* without replacement. A degrading stream will typically show a *bank height ratio* greater than 1.0.

demonstration stream restoration project (demonstration project) – A *stream (stability) restoration* project that is designed and located to maximize opportunities for *monitoring* of project success, public and agency education about different *stream restoration* techniques, and interagency partnerships funding and cooperation.

destabilized (see also instability, unstable) – Describing a section of stream that has been made *unstable*, by natural or human activity.

discharge (stream flow) – The amount of water flowing in a stream, measured as a volume per unit time, usually cubic feet per second (cfs).

discontinuous floodplains (see also floodplain) – A series of small *floodplains*, formed as a series of small benches along stream banks. These *floodplain* features, typically seen in steeper mountain streams, are not connected sequentially following the valley floor, but still provide the critical *floodplain* functions of reducing water *velocity* and enhancing *sediment* deposition and infiltration (water sinking into the ground rather than running straight to the stream).

downcutting—see *degradation*

drainage area – see *watershed.*

dumping site – For the purposes of the stream assessment survey, these are areas in the stream or on the *floodplain* where refuse or other non-natural or non-biodegradable materials were documented. A dumping site is not necessarily an actively used area, and may be the result of material washing downstream.

embankment – A linear structure, usually of earth or *gravel*, constructed so as to extend above the natural ground surface. Similar to a *berm*, but usually associated with *road fill* areas, and extending up the hillside from the road, or from the stream up to the road surface.

entrenched – In stream classification (see *stream type*), entrenchment (or entrenchment ratio) is defined by stream *cross-sectional* shape in relation to its *floodplain* and valley shape, and has a specific numerical value that in part determines stream type. For example, if this number is less than 1.4, the stream is said to be highly entrenched, if between 1.4 and 2.2 it is mildly entrenched, and greater than 2.2 it is not entrenched. Entrenchment ratio is used with other stream shape data to determine *stream type*, and define baseline data for future *monitoring* (Rosgen, 1996).

ephemeral– Referring to a stream that runs only in direct response to rain and whose channel is above the water table.

equilibrium (see also stable) – The degree to which a stream has achieved a balance in transporting its water and *sediment* loads over time without aggrading (building up), degrading (cutting down), or migrating laterally (eroding its banks and changing course).

erosion - The wearing away, detachment, and movement of the land surface (*sediment*), by running water, wind, ice, or other geological agents, including such

processes as gravitational creep or *slumping*. In streams, erosion is a natural process, but can be accelerated by poor stream management practices.

erosion potential – The amount of *erosion* that may be expected under given climatic, topographic, soil, and cultural conditions.

fascines – A *bioengineering* method using bundles of small branches of willow or other *riparian* tree species, tied together and laid into shallow trenches along a stream to stabilize and revegetate stream bank areas.

floodplain - The portion of a river valley, adjacent to river channel, which is covered with water when river overflows its banks at flood *stage*. The floodplain usually consists of *sediment* deposited by the stream, in addition to *riparian* vegetation. The floodplain acts to reduce the *velocity* of floodwaters, increase infiltration (water sinking into the ground rather than running straight to the stream - this reduces the height of the flood for downstream areas), reduce stream bank *erosion* and encourage deposition of *sediment*. Vegetation on floodplains greatly improves their functions.

floodplain connection - the stream's ability to access the land area adjacent to its active *channel* during higher flows in order for the stream system to function properly and dissipate energy or *velocity*.

fluvial – 1. Of or pertaining to a river or rivers. 2. Existing, growing, or living in or about a stream or river. 3. Produced by the action of a stream or river, as a fluvial plain.

gabions – Large wire-mesh baskets filled with rock material used to *harden* or *stabilize* road *embankments* and sometimes stream banks.

Geographic Information System (GIS) - Desktop software with a graphical user interface that allows loading and querying, analysis and presentation of spatial and tabular data that can be displayed as maps, tables and charts. The maps in the Chestnut Creek stream management plan were produced with a GIS, and can be updated as new information becomes available.

geomorphic - Pertaining to the form of the earth or of its surface features.

Global Positioning System (GPS) - A satellite based positioning system operated by the U.S. Department of Defense (DOD). When fully deployed, GPS will provide all-weather, worldwide, 24-hour position and time information.6 The *stream assessment survey* done for the Chestnut Creek stream management plan included the use of a GPS unit to document the locations of all mapped stream features. This information was added to the *GIS* to produce the maps.

gravel – In the context of *stream assessment survey*, gravel is *sediment* that measures between 2 mm and 64 mm (about 0.08 inches to 2.5 inches).

hardening – Any structural *revetment* that fixes in place an eroding stream bank, *embankment* or hillside by using hard materials, such as rock, sheet piling or concrete, that does not allow for revegetation or enhancement of *aquatic habitat*. *Rip-rap* and *stacked rock walls*

are typically considered to be hardening measures, though some revegetation of these areas is possible.

head-cut – A marked change in stream bed slope, as in a step or waterfall, that is unprotected or of greater height than the stream can maintain. This location, also referred to as a knick point, moves upstream, eventually reaching an *equilibrium* slope.

headwater - the uppermost portion or beginnings of a stream**.**

hydraulic - Relating to the flow or conveyance of water through a channel; movement or action caused by water**.**

impervious surface – A surface which will not permit water to pass through, such as concrete or asphalt.

inboard – Referring to a roadside ditch that is between the road and adjacent hillside, on the higher or uphill side of the road.

incised - The lowering of the streambed due to downcutting and removal of bed material by the stream, referring to a stream that has degraded such that the *bank height ratio* is greater than 1.0.

instability (see also unstable) - An imbalance in a streams capacity to transport *sediment* and maintain its channel shape, pattern and profile.

invasive plants – Species that aggressively compete with and replace native species in natural habitats.

Japanese Knotweed (see also invasive plants) – An *invasive plant*, not native to the Catskill region, that colonizes disturbed or wet areas, especially stream banks, road-side ditches and *floodplains*. This plant out-competes natives and other beneficial plants, and may contribute to *unstable* stream conditions.

large organic debris – Any woody material, such as from trees or shrubs, that washes into a stream channel or is deposited on a *floodplain* area. Organic debris provides important *aquatic habitat* functions, including *nutrient* sources and micro-habitats for aquatic insects and fish. Large wood is especially influential to stream *morphology* in small streams, though may be detrimental in the vicinity of structures or infrastructure.

leaching – The process by which chemical or mineral materials are removed from a physical *matrix* (such as soil, or mixed *sediment* materials) by water running through and creating a solution of those chemicals.

left bank – The left stream bank as looking or navigating downstream. This is a standard used in *stream assessment surveys*.

mass wasting –The fall or slide of a hillslope which results in the rapid or slow movement of soil organic debris and rock down slope. See *erosion*.

matrix – The framework material within which other materials are lodged or included. For example, *cobbles* could be embedded in a matrix of *sand* and fine *gravel*.

mainstem - The common outlet or stream, into which all of the *tributaries* within a *watershed* feed.

meander – Refers both to a location on a stream channel that is curved (a "meander bend"), and to the process by which a stream curves as it passes through the landscape (a "meandering stream").

meander width ratio—The quantitative expression of confinement (lateral containment of rivers) and is determined by the ratio of belt width/*bankfull* width.

monitoring – The practice of taking similar measurements at the same site, or under the same conditions, to document changes over time.

monitoring cross-section – For the purposes of the Chestnut Creek stream management plan, this is a location where metal rebar rods have been used to permanently locate an actively eroding stream bank. At this site, detailed data have been gathered to document the stream condition. The site is permanently marked to enable future measurements that, when compared to the existing condition, provide information about the stream's change. Measuring change over time is considered '*monitoring*,' and this information provides early warning to stream managers about important but perhaps visually imperceptible changes in the stream.

monumented – Refers to a location, usually a *cross-section*, that is marked with a permanent or semi-permanent marker, or "monument", to enable future *monitoring* at the same place.

morphology, stream morphology – The physical shape, or form, of a landscape or stream channel, that can be measured and used to analyze stream or landscape condition, type or behavior.

multiflora rose (see also invasive plants) – An *invasive plant*, not native to the Catskill region, that colonizes disturbed or wet areas such as fields, forest edges, stream banks, and roadsides. This plant spreads quickly and forms impenetrable thickets that exclude native species. It impedes succession and out competes other plants for soil nutrients.

native material – *Sediment* material with a local or on-site source, as in material pushed up out of a stream channel to armor the banks.

non-quarried, or natural boulders – *Boulder*-sized rock material, either *native* or imported material, not harvested from a quarry. This material has been used in the past in stream bank stabilization, usually harvested directly from the stream or from nearby hillsides.

nutrient – The term "nutrients" refers broadly to those chemical elements essential to life on earth, but more specifically to nitrogen and phosphorus in a water pollution context. In a water quality sense nutrients really deal with those elements that are necessary for plant growth, but are likely to be **limiting** -- that is, where used up or absent, plant growth stops.

pathogen – Disease-causing agent, especially microorganisms such as bacteria, protozoa, and viruses.

planform – Horizontal stream pattern, including sinuosity, meander radius, and belt width, as seen in plan view (from above).

pool – A small section of stream characterized by having a flat or nearly flat water surface compared to the average *reach* slope (at low flow), and deep and often asymmetrical *cross-sectional* shape.

perennial -A stream that runs all year long, regardless of precipitation patterns.

reach – A section of stream with consistent or distinctive *morphological* characteristics.

reference reach, stable reference reach – A *stable* portion of a stream that is used to model restoration on an *unstable* portion of stream. Stream *morphology* in the reference reach is documented in detail, and that *morphology* is used as a blueprint for design of a *stream stability restoration* project.

revetment – Any structural measure undertaken to stabilize a road *embankment*, stream bank or hillside.

riffle – A small section of stream characterized by having a steep water surface slope compared to the average *reach* slope (at low flow), and a shallow and often uniform *cross-sectional* shape.

right bank – The right stream bank as looking or navigating downstream. This is a standard used in *stream assessment surveys*.

riparian (area, buffer, vegetation, zone) – The area of land along stream channels, within the valley walls, where vegetation and other landuses directly influence stream processes, including flooding behavior, *erosion*, *aquatic habitat* condition, and certain water quality parameters.

riprap – Broken rock, *cobbles*, or *boulders* placed on earth surfaces, such as a road *embankment* or the bank of a stream, for protection against the action of water; materials used for soil *erosion* control.

road fill (see also *embankment*) – Typically *gravel*- and *sand*-sized material used to elevate the level of the road, control the road grade, or provide a buffer for the road grade from stream *erosion*.

runoff – The portion of precipitation (i.e., rainfall) that reaches the stream channel over the land surface.

sand – In the context of *stream assessment surveys*, sand material is *sediment* that measures between 0.063 mm and 2 mm (up to 0.08 inches).

sediment, stream bed sediment - Material such as *clay*, *sand*, *gravel* and *cobble* that is transported by water from the place of origin (stream banks or hillsides) to the place of deposition (in the stream bed or on the *floodplain*).

sheet flow - Water, usually storm runoff, flowing in a thin layer over the ground surface; also one form of overland flow.

silt – In the context of *stream assessment surveys*, silt material is *sediment* that measures between 0.0039 mm and 0.063 mm.

sinuosity - The ratio of stream length to valley length, or the ratio of valley slope to channel slope.

slump – The product or process of mass-wasting when a portion of hillslope slips or collapses downslope, with a backward rotation (also a rotational failure).

stable (see also equilibrium) – A stable stream is defined as maintaining the capacity to transport water and *sediment* loads over time without aggrading (building up), degrading (cutting down), or migrating laterally (eroding its banks and changing course). Stable streams resist flood damage and *erosion*, and provide beneficial *aquatic habitat* and good water quality for the particular setting.

stability – In stream channels, the relative condition of the stream on a continuum between *stable* (in *equilibrium* or balance) and *unstable* (out of *equilibrium* or balance). Stream stability assessment seeks to quantify the relative *stability* of stream *reaches*, and can be used to rank or prioritize sections of streams for management.

stacked rock wall – A *boulder revetment* used to line stream banks for stabilization. Stacked rock walls can be constructed on a steeper angle than *rip-rap*, so they take up less of the stream *cross-section*, provide a wider road surface, and provide less surface area for solar heating, allowing stream temperature to remain cooler relative to banks lined with *rip-rap*. These features can be augmented with *bioengineering* to enhance *aquatic habitat* and *stability* functions.

stage – In streams, stage refers to the level or height of the water surface, either at the current condition (i.e., current stage), or referring to another specific water level (i.e., flood stage).

stream assessment, stream assessment survey – The methods and summary information gathered in a stream *reach* or series of *reaches*, primarily focused on stream *morphology*. Stream assessment for the Broadstreet Hollow included detailed characterization and mapping of stream channel patterns, *cross-section* shapes and slope.

stream flow (discharge) – The amount of water flowing in a stream, measured as a volume per unit time, usually cubic feet per second (cfs).

stream stability restoration (design, project) – An *unstable* portion of stream that has been reconstructed, using *morphology* characteristics obtained from a *stable reference reach* in a similar valley setting, that returns the stream to a *stable* form (that is, to a shape that may allow the stream to transport its water and *sediment* load over time without dramatic changes in its overall shape).

stream type – As defined by Rosgen (1996), one of several categories defined in a stream classification system, based on a set of delineative criteria in which measurements of channel parameters are used to group similar *reaches*.

substrate - The bottom material of a waterway.

summer base-flow – Stream discharge primarily from groundwater (not from surface *runoff*). Typically this is the lowest flow of the year, occurring in late summer, or following extended periods of drought.

suspended sediment – *Sediment* carried in the water column (above the stream bed), including *clay*, *silt* and sometimes fine *sand*. These materials contribute to *turbidity*.

terrace – A level area in a stream valley, above the active *floodplain*, that was deposited by the stream but has been abandoned as the stream has cut downward into the landscape. These areas may be inundated (submerged) in higher floods, but are typically not at risk in more common floods.

thalweg – The line followed by the majority of the stream flow. 1 In *stream assessment*, this location is used as a reference location for surveys and other measurements, and is most often associated with the deepest point in the stream *cross-section* (stream channel that would still have water flowing in it at even the lowest flow conditions).

toe – The bottom, or base, of a stream bank or *embankment*.

tributary – A stream that feeds into another stream; usually the tributary is smaller in size than the main stream (also called "*mainstem*"). The location of the joining of the two streams is the *confluence*.

turbidity – A measure of opacity of a substance; the degree to which light is scattered or absorbed by a fluid. Streams with high turbidity are often referred to as being "turbid".

unstable (see also instability) – Describing a stream that is out of balance in its capacity to transport *sediment* and maintain its channel shape, pattern and profile over time.

velocity – In streams, the speed at which water is flowing, usually measured in feet per second.

watershed – A unit of land on which all the water that falls (or emanates from springs) collects by gravity and runs off via a common outlet (stream).

wetland – An area that is saturated by surface water or ground water with vegetation adapted for life under those soil conditions, as in swamps, bogs, fens, and marshes

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winter base flow - Stream discharge primarily from groundwater (not from surface runoff)—see *summer base flow*-- Winter base flow is generally higher due to lower rates of evapo-transpiration during vegetative dormancy.

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VI. Appendices

A. Chestnut Creek Landowner Survey, 2001.

B. Landowner Survey Results.

C. Chestnut Creek News meeting minutes.

Fishing on the Chestnut Creek has generally

☐ Improved in recent years. The reason is

_____

☐ Deteriorated in recent years. The reason is

_____

☐ Remained consistent (please explain)

☐ I don't fish

☐ Other (please explain)

_____

_

***Decisions* about how streams are managed on *private property* should**

☐ Rest with landowners

☐ Rest with the County Soil and Water Districts

☐ Rest with the town highway department

☐ Rest with the county highway department

☐ Be shared between landowners and local government

☐ Rest with the federal government

- ☐ FEMA
- ☐ Army Corps of Engineers
- ☐ Natural Resources Conservation Service
- ☐ U.S. Fish and Wildlife

☐ Don't know

☐ Other (please explain)

_____

The main financial responsibility for management of streams on *private property* should

☐ Rest with landowners

☐ Rest with the County Soil and Water Districts

☐ Rest with the town highway department

☐ Rest with the county highway department

☐ Rest with the federal government

- ☐ FEMA
- ☐ Army Corps of Engineers
- ☐ Natural Resources Conservation Service
- ☐ U.S. Fish and Wildlife

☐ Be shared between landowners and government

☐ Don't know

☐ Other (please explain)_____

I would be interested in a stewardship program involving Chestnut Creek

☐ I would like to attend a summer community information- sharing day

☐ I would like to attend a stream walk

☐ I would be supportive of a school based event

☐ I would like to volunteer for field work assistance

If anything has been omitted that you feel is a concern in the Watershed area, please feel free to express it here_____

I would be interested in participating in a Chestnut Creek Landowners Meeting to insure that landowner concerns and knowledge are represented in the development of a management strategy.

☐ Yes ☐ No

I would be willing to represent my neighbors in the landowners association on the Project Advisory Committee of the management plan.

☐ Yes ☐ No

Name (optional)_____

Address_____

_

Phone_____

For more information contact:
Sullivan County Soil & Water Conservation District
64 Ferndale-Loomis Road Liberty, NY 12754
Phone (845) 292-6552 Fax (845)295-9073 e-mail
scswcd@ln4web.com

Chestnut Creek

Landowner Perspective Survey

I live in the Chestnut Creek Watershed

☐ Year round ☐ Mostly on weekends

☐ Primarily in the summer season

One of these tributaries or the Chestnut Creek runs along or through my property

☐ The Chestnut mainstem

☐ Pepacton Hollow

☐ Denman Mountain

☐ Red Brook

☐ Scott Brook

☐ Davis Lane

☐ Other_____

I enjoy the Chestnut Creek on my property for

(check all that apply to you)

☐ Walking along the stream

☐ Fishing

☐ Camping along the stream

☐ Swimming

☐ The view

☐ Household water supply

☐ Watching the wildlife, birds

☐ Lawn or garden water supply

☐ Hunting along the stream

☐ Area to dispose of grass clippings and brush

☐ Source of gravel or rock materials

Conditions on the Chestnut Creek in my area are generally

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

I've lived here ____years.

While I've lived here, flooding along the Chestnut Creek

☐ Has been a frequent problem
☐ Has been a relatively minor problem
☐ Has never been a problem
☐ Has gotten worse
☐ Has gotten better

My main concerns about the stream include (check all that apply to you)

☐ Streambank erosion
☐ Flooding of property
☐ Impaired fishing
☐ Groundwater connection to my well
☐ Pollution from upstream runoff, dumping
☐ Nuisance wildlife (e.g., mosquitos)
☐ Difficulty obtaining permits for streamwork
☐ Removal of trees & woody debris from immediate/upstream area
☐ Time and money required for proper stream care
☐ Government regulation of private property rights
☐ Getting enough water for my lawn and garden
☐ Washout of roads and bridges
☐ Other (please explain)

_____

I personally have been affected by flooding
(Check all that apply to you)

☐ Never ☐ Once ☐ A number of times
☐ Extensively

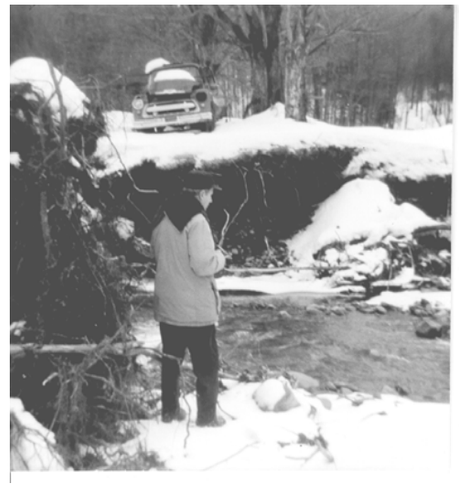
☐ Damage to my home
☐ Washout of road access
☐ Washout of bridge access
☐ Erosion of stream banks
☐ Other (please explain)_____

_____

The best way to solve flooding problems is to

☐ Clean gravel and cobble out of the stream
☐ Restore natural channels and floodplains
☐ Straighten the stream
☐ Clear trees and brush away from the channel
☐ Build berms and levees
☐ Build more flood control structures
☐ Keep buildings out of the floodplain
☐ Maintain wetland storage in headwater valleys
☐ Other (please explain)

_____



Some people think that rip-rap (large rock placed on the streambank) is the best way to treat bank erosion.

Others say that rip-rap just deflects the erosion downstream, creates poor fish habitat and destroys the natural function and look of the stream.

I think rip-rap

☐ Is the only reliable way to treat bank erosion
☐ Is rarely a good way to treat bank erosion
☐ Is the treatment of last resort to be used when other bank stabilization measures cannot be used
☐ Other (please explain)

_____

_____

Survey Result

		Percent of TotaL
SumOfYear Round	31	73.81%
SumOfMostly on Week ends	3	7.14%
SumOfPrimarily in t	4	9.52%
SumOfWalking	24	57.14%
SumOfCamping	2	
SumOfThe View	25	
SumOfWatching	22	
SumOfHunting	2	
SumOfFishing	15	
SumOfSwimming	7	
SumOfHousehold wa	1	
SumOfLawn or gard	6	
SumOfArea to dispose	2	
SumOfSource of gravel	1	
CountOf2 Other	0	

Survey Results

		Percent of Total
Excellent	11	26.19%
Good	16	38.10%
Fair	11	26.19%
Poor	4	9.52%

Ave years	28		
less 5	-1	less 5	2.38%
5-10:	-7	5-10:	16.67%
10-20:	-6	10-20:	14.29%
20 +	-23	20 +	54.76%

A frequent problem	5	11.90%
Relatively minor problem	20	47.62%
Never been a problem	9	21.43%
Has gotten worse	2	4.76%
Has gotten better	1	2.38%

Streambank erosion	27	64.29%
Flooding of property	11	26.19%
Impaired fishing	6	14.29%
Groundwater connection to well	4	9.52%
Pollution from upstream runoff	14	33.33%
Nuisance wildlife	4	9.52%
removal	20	47.62%
fDifficulty obtaining permits for stre	4	9.52%
Time and money required for proper	10	23.81%
Government regulation of private pro	14	33.33%
Getting enough water for my lawn an	0	0.00%
Washout of roads and bridges	7	16.67%
Other	7	16.67%

Never affected by flooding	20	47.62%
Once	8	19.05%
A number of times	9	21.43%
Extensively	0	0.00%
Damage to my home	5	11.90%

Washout of road access	5	11.90%
Washout of bridge access	3	7.14%
Erosion of stream banks	13	30.95%
Clean gravel out of stream	13	30.95%
Restore natural channels	14	33.33%
Straighten the stream	5	11.90%
Clear trees and brush away	11	26.19%
Build berms and levees	4	9.52%
Build more flood control structures	6	14.29%
Keep buildings out of floodplain	7	16.67%
Maintain wetland storage in headwat	3	7.14%
Other	4	9.52%
Rip rap is the only reliable way	10	23.81%
is rarely a good way	4	9.52%
a last resort	18	42.86%
Fishing has improve	4	9.52%
Reason	3	7.14%
Has deterioriated in recent years	9	21.43%
Reason	5	11.90%
Remained consisten	3	7.14%
Don't fish	19	45.24%
Other	2	4.76%
Rest with landowners	3	7.14%
County Soil and Water districts	3	7.14%
town highway dept	1	2.38%
county highway dept	1	2.38%
Shared between landowners and lo	23	54.76%
Federal government	6	14.29%
FEMA	2	4.76%
Army Corps of Engineers	4	9.52%
NRCS	2	4.76%
US Fish and Wildlife	1	2.38%
don't know	8	19.05%
other	5	11.90%

rest with landowners	3	7.14%
County Soil and Water district	7	16.67%
town highway dept	4	9.52%
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Army Corps of Engineers	4	9.52%
NRCS	1	2.38%
US Fish and Wildlife	2	4.76%
don't know	7	16.67%
other	10	23.81%

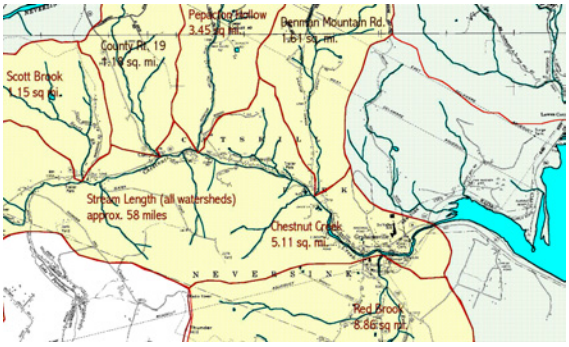
Community Info share	16	38.10%
Stream walk	11	26.19%
school based event	10	23.81%
volunteer:	3	7.14%

Other Comments	8	19.05%

Landowner Association	25	59.52%	Project Advisory Committee	4	9.52%

CHESTNUT CREEK NEWS

The Chestnut Creek Watershed



The Chestnut Creek mainstem flows 5 linear miles through the town of Neversink and the hamlet of Grahamsville before it empties into the Rondout Reservoir. Its tributaries span over 21 square miles and include the 3.5 mile Pepacton Hollow, whose headwaters originate on Denman Mountain, and the 8 mile Red Brook, which originates in the Town of Fallsburg. Over three hundred people own land within the watershed.

Informational Meeting Held

On the evening of February 22, 2001, about 30 riparian landowners braved snowy conditions to attend an informational meeting hosted by the Sullivan County Soil and Water Conservation District (SCSWCD) at the Neversink Town Hall. The Soil and Water District, the Town of Neversink and NYC DEP's Stream Management Program are embarking on a multi-year project - A Stream Management Plan - for the Chestnut Creek and its tributaries.

Brian Brustman, District Manager, welcomed the group and gave a general introduction to stream issues encountered by the District in their work. After heavy stream flows, the District is often called by landowners about stream bank erosion. Usually, the District works on a site-by-site basis, but this often only fixes a problem temporarily. Les Kirby, SCSWCD Project Technician gave a slide presentation about natural channel stability. A naturally stable channel is able to transport the sediment and water moving through the stream, without building up in the channel, or down-cutting the stream banks. He explained that Project staff will be doing an assessment in the stream beginning this summer. Lori Kerrigan, SCSWCD Project Coordinator described the process that will be used to create a community-based stream management plan.

The project seeks input from streamside landowners regarding flooding and erosion problems, and other information about your experience living near the stream.

Beth Gelber, DEP Project Manager, explained that like the Catskill system's Ashokan Reservoir, the Rondout Reservoir is a "Terminal Basin" for the City's Delaware system - it collects water from other reservoirs (Neversink, Cannonsville, Pepacton) for distribution into the rest of the supply system. Since water in the Rondout has less time for impurities to settle out, it is of special interest to DEP.

During the question and answer session, an attendee mentioned his prompt attention to woody debris deposited by storm flows in order to protect the stream bank. Others reported that they didn't have any immediate problems with eroding stream banks. A question was asked about landowner liability for District staff, and landowner permission to access private property. The District covers all liability for Project staff in the field. Any requests to the District by landowners regarding property access will be honored.

Project Advisory Committee

A Project Advisory Committee (PAC) is being formed, made up of local officials such as Town Highway, Town Planning, County Department of Public Works, and County Planning. The landowners will be asked to select two representatives to sit on the PAC at an upcoming public meeting. The Project Advisory Committee will meet several times during the year to review the stream assessment underway by the District, and make recommendations.

Follow-Up Meeting

At an upcoming public meeting to be held this summer, we encourage you to bring your photos and other archives of the Chestnut Creek. We will use a scanner to create images and maps that contain your photos.

What is proposed for the Stream Management Plan?

The Stream Management Plan will include an inventory of historical and present conditions related to water quality, flooding, and stream ecology. The plan may include recommendations to direct local, state, and federal resources toward the long-term protection of water quality in the Chestnut Creek and its tributaries. The management plan seeks to promote and encourage stewardship of the Chestnut Creek by the community of Grahamsville, the Tri-valley Central School, and other community groups. The plan also includes a restoration demonstration project based on the principles of natural channel restoration.

Other cooperative Stream Management plans are underway with the Soil and Water Conservation Districts in Greene, Ulster and Delaware counties, on the Batavia Kill, Stony Clove, Broadstreet Hollow, and West Branch Delaware River.

Landowner Survey

In order to begin communicating directly with landowners in the Chestnut Creek watershed, we have enclosed a survey that we hope you will fill out and send back to us at your earliest convenience. Thanks for your time and concern.

County and Local Officials participate in Stream Management Planning Workshop

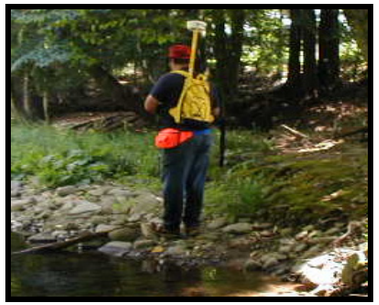
On March 1st and 2nd, representatives from Sullivan County Planning and Public Works Departments and the Town of Neversink participated in a multi-county workshop that focused on the goals of stream management plans being developed by the Soil and Water Districts throughout the Catskills, and identified methods to involve and inform local communities. The group agreed that this newsletter might be a helpful way to convey information to you, the community of the Chestnut Creek watershed.

Daniel Pierce Library Lecture Series, at the Grahamsville Methodist Church

On May 18, 2001, at 7:30 PM, as a part of a ten lecture series, funded by the Catskill Watershed Corporation, Lori Kerrigan, Project Coordinator for the Chestnut Creek Stream Management Project will give a slide presentation about the Chestnut Creek Management Plan at the Grahamsville Methodist Church. The presentation will be advertised in the local paper.
All are welcome to attend.

Field Season (2002)

This field season we have been concentrating mostly on the tributaries to the Chestnut Creek, to get a more complete picture of what is happening in the whole watershed. We have covered the entire mainstem length of Red Brook and Pepacton Hollow tributaries with the G.P.S. unit (Global Positioning System) and the digital camera. By using photographic documentation and locating these areas with the G.P.S. unit, we are able not only to see what is happening, but where it is happening. When this information is linked to a map, we can pick a point and access the photos and data that are relevant to this area to better answer your questions.



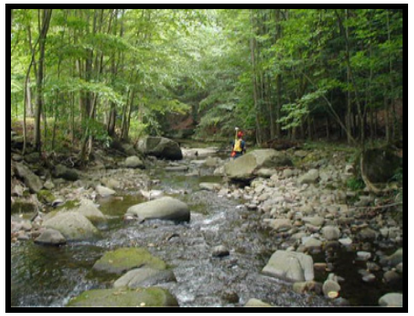
SCSWCD Project Technician , Les Kirby gathers GPS satellite points.

We have contracted with consultants to help us analyze our data to determine what additional field information remains to be gathered, and where we should concentrate our efforts.

We will also be asking for input from the Project Advisory Committee (PAC) this fall. This will provide us with a wealth of information from a local prospective. We will be asking the community to elect 2 landowners as representatives to the committee this fall and will of course have a public gathering at the Town Hall for all to participate.

What is a Stable Stream Reach?

During the winter of 2002, the Chestnut Creek stream team organized and analyzed the field data, collected previously, to determine stream types and stability for each *reach* or continuous sections of the same type of stream. *Stream stability* is defined as the ability of the stream segment to move all of the water and all of the sediment produced by its watershed, with minimum rates of erosion, over time. A naturally stable stream reach is one that has survived flood after flood without excessive rates of streambed or stream bank erosion. A *reference reach* of a stream indicates a well functioning stream section. The SWCD will survey and use a reference reach as a template, or blueprint, for restoration of degraded sections of the Chestnut Creek, or when replacement or maintenance of infrastructure is required.

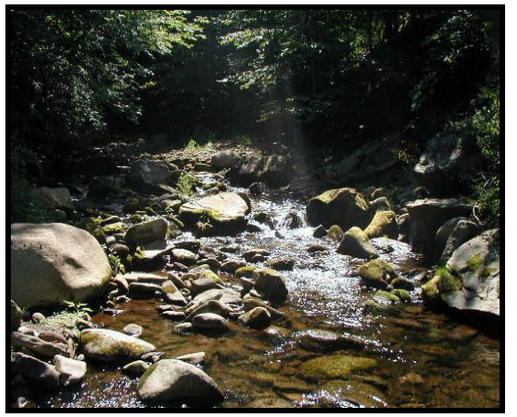


A stable reach of a similar type and can be used to model other less stable areas.

The Chestnut Creek *Stream Management Plan* will identify areas of instability and stream bank erosion and make recommendations for treatment based on their relative severity. A demonstration project will be constructed according to "natural channel design" principles, using the dimensions of a stable reach as a reference or template/ blueprint.

Sullivan County
Soil and Water Conservation District
64 Ferndale - Loomis Road
Liberty, NY 12754

Chestnut Creek News



For the past 2 years, the Sullivan County Soil and Water Conservation District has been engaged in the development of a stream management plan for the Chestnut Creek.

Throughout this time, the Chestnut Creek Project Team has been measuring stream channel stability - the channel dimensions such as slope, width, depth, sinuosity - that will enable the SWCD to map the condition of the stream in different sections or reaches.

Stream channel stability assessment is important because the physical processes that shape channels have consequences for public (bridges and roads) and private property loss, flood protection, fish habitat, and water quality.

Stream Watch at Tri-Valley School

Last May, the Catskill Center for Conservation and Development held a *Stream Watch* program for 30 students at Tri-Valley Central High School. The students learned about pH, riparian vegetation, stream flow, temperature, and macro-invertebrates, the components of a healthy stream including vertebrates – a major food supply for fish. At the end of the week they sampled a small tributary of the Chestnut Creek that flows near the school. They found an abundance of aquatic critters from stoneflies and mayflies to crayfish. This educational program will continue with the Tri-Valley School next year.

Students measuring stream flow, and sampling

Streamside Landscaping Workshop

On Saturday, July 27, 2002, 48 residents of the Catskill region attended a free streamside landscaping workshop cosponsored by the Stony Clove Creek and Broadstreet Hollow Landowners Associations. The focus was on the benefits of using native vegetation and planting techniques to prevent and remediate excessive stream bank erosion, enhance stream and floodplain ecosystems and attract particular birds, butterflies and other wildlife. The workshop also described programs available to help fund the design and implementation of these landscaping plans. For a list of native riparian plants and wildlife, please call or Email us.

AmeriCorps Joins the Chestnut Project

In December 2001, Derrick Kelly joined the District's Stream Management project staff as an AmeriCorps * member serving a 12 month term. Derrick is a native of Liberty. Derrick graduated from SUNY Oneonta in 2001 with a Bachelor's degree in Environmental Science. Last winter, his help was essential as the Project team began to analyze a great deal of data collected in the stream last summer. This summer he has spent plenty of time in the field, assisting the Project Technician with GPS mapping and photo documentation of the creek and its tributaries. We want to thank Derrick for his hard work, dedication, and good humor! A new AmeriCorps member will be joining the team in 2003!

*AmeriCorps is the national domestic service corps established in 1993. Members receive technical training and professional experience while accomplishing specific tasks at their Host Sites. Americorps members receive a weekly stipend and an Educational Award following their term of duty.

NYS DOT, 1929 Cloth Maps

We were able to get copies of old cloth highway maps from 1929 that are still updated and used by NYS DOT. We are in the process of scanning these maps into our computer files and aligning them with our existing files so they can be overlain to show any major changes in the stream over the years. Some changes the maps display are the historic relocation of the Chestnut Creek for Route 55 construction and the original location of the stream along the highway. We have talked to many landowners who have given us many valuable historical accounts of changes in and along the creek. We look forward to scanning or copying any photos, old news articles or historic maps that are available.

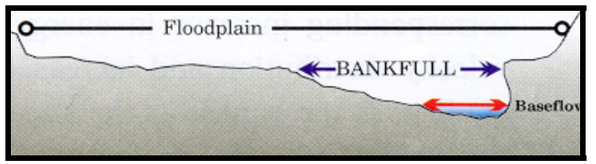
Sizing up a Stream

All of our stream channel measurements are based on the theory of ***bankfull discharge.***

Bankfull discharge is associated with a common stream flow, like a spring flood, that occurs approximately every other year. Bankfull discharge is also the flow in which the sediment transported by the stream, shapes the channel dimensions.

We use the bankfull stage as a benchmark flow level at which we measure the channel's shape or morphology.

The term "bankfull" is somewhat of a misnomer – for some streams, bankfull flow fills the channel to the top of the banks at the level of the flood plain, i.e., the banks are full. Other streams don't have a distinct flood plain, such as steep mountain streams, this common flow is expressed by a different characteristic level or stage.



Rosgen, Dave 1996. (Figure 2-7; p. 2-10)

Changes in the watershed that affect the quantity, or timing of stream flows are activities such as vegetation removal, roads, soil compaction, diversions, urban development, or drainage alteration.
Streams need to be considered often, not only in their current state but also in terms of their future, similarly, it's essential that restoration goals are compatible with the current and future stream type.

Developing A Successful Watershed Association

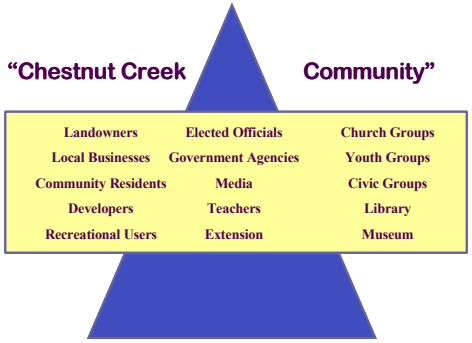
With your participation, a watershed association can become an influential voice in your community. Come find out how.

On Sunday, September 22nd at the Phoenicia Elementary School from 2:00-3:30pm, Robin Ulmer of the Boquet River Association, in the Adirondacks, NY, will be speaking about how their watershed association has influenced the local decision-making about their river and ultimately improved the overall health of the stream.

Ms. Ulmer has directed the Boquet River Association for nearly 12 years. Previously, she was a Peace Corps volunteer, an educator at all levels, conducted research for alternative energy and alternative agricultural cooperatives.

This event is being co-sponsored by the Stony Clove Creek & the Broadstreet Hollow Landowner Association. These two Associations are being developed locally in Ulster and Greene Counties in response to the Management Plans that are being formulated by the Conservation Districts and the Department of Environmental Protection. Please RSVP to Amy at (518) 622-3620 or amy@gcswcd.com Drop-ins welcomed.

Sullivan County Soil and Water
Conservation District
64 Ferndale-Loomis Road
Liberty, NY 12754
Email: SCSWCD@IN4WEB.COM
Phone: 845-292-6552 ext. 105
Fax: 845-295-9073



Community Participation The attendants were broken into groups according to the "Management Unit" their property is located in. Each group had a facilitator who helped get the discussion rolling by asking questions concerning Chestnut historical events, concerns and problem areas of the stream, and recreational values and ideas for future community events.

The most predominant historical influence in the watershed was determined to be the construction of the reservoirs. Floods and the damage they have caused were discussed, specifically the floods of 1928, 1938, and 1975. A suggestion made by one group was that the reservoirs might have actually helped with the flooding.

The most frequent concern expressed was that of erosion on personal property. In addition to the sites previously assessed and ranked by the Project Advisory Committee, areas such as erosion and aggradation of gravel and cobble above River Road Bridge, downstream of Davis Lane and Slater Rd, sites on Pepacton Hollow and Red Brook were also recorded as problematic areas.

The Creek was valued most highly for aesthetic purposes. Controversy over fish stocking was noted and questions rose as to whether it hurts the native fish or if there is ample habitat for the native inhabitants to reproduce and sustain a healthy population. It seemed lack of fishing results from an absence of public access to Chestnut Creek, however the majority at the meeting expressed that the reservoirs were also valued for fishing purposes.

Sullivan County Soil and Water Conservation District
64 Ferndale-Loomis Road
Liberty, NY 12754

Chestnut Creek News

Thank-you to those who attended and the rest of the Chestnut Community for their support and ideas!

Streamside planting volunteers needed! Another project meeting is to be scheduled this summer.

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64 Ferndale-Loomis Road
Liberty, NY 12754
Email: SCSWCD@IN4WEB.COM
Phone: 845-292-6552 ext. 105
Fax: 845-295-9073

Chestnut Watershed Public Meeting at Neversink Fire House

On Thursday, May 1, 2003, a meeting was held for the Chestnut Creek Watershed Landowners from 7pm-9pm in the Grahamsville Fire Hall. The purpose of the meeting was to discuss the progress of the Chestnut Creek Management Plan and to collect input from residents regarding their stream related needs, along with their vision of the past, present and the future of stewardship of the Chestnut Creek. Project Partners include the SCSWCD, the Town of Neversink, NYCDEP, and the US Army Corps of Engineers, and the Chestnut Watershed Project Advisory Committee (PAC).

The meeting was attended by a number of Neversink residents who were eager to participate and share their experiences. A special thank you to all the residents who brought pictures to be scanned into the Chestnut Creek archives!

Lori Kerrigan, SCSWCD project coordinator, started off the meeting with a short PowerPoint presentation. Lori proposed ways of organizing the Management Plan that would meet the multi-objective needs of the Watershed.

- **Organize resources and contacts**
- **Investigate and address stream related questions and concerns**
- **Address permitting issues and funding sources**
- **Include local history of the stream**
- **Conduct riparian or streamside vegetation assessment**
- **Summarize geological and hydrological characteristics**
- **Include fisheries & recreation information**
- **Divide recommendations into manageable sections**

Chestnut Watershed Management Units

The results of the stream assessment were presented and revealed that Chestnut Creek is for the most part a healthy stream with over 60% of the bank remaining untouched. However, unstable areas do exist. With the information provided by the Chestnut Community we will be able to further evaluate and make recommendations for these sites.

In order to facilitate the organization and prioritization of issues along the stream the Chestnut Watershed Project Team has mapped the condition of the stream in different sections or reaches, called Management Units. Nine Management Units (MU) that were determined according to the following criteria:

Topography *Geology*

Stream Types *Vegetation*

Land use *Population Density*

Within these management units, stable and unstable sections of stream along with historically significant information and landowner concerns are being noted. Several project sites have been prioritized by the Chestnut Watershed Project Advisory Committee as significant community sites, important to the general health of the stream, or repeated problem areas. The following 3 sites were voted highest priority by the PAC. Further assessment of these sites is underway along with the development of designs and plans for the areas:

- Covered Bridge area erosion
- Town Hall bank stabilization and planting
- Pepacton culvert replacement

As funding becomes available, we will prioritize additional sites. Recommendations will be made for all sites in the Stream Management Plan, with resources and contact information.

Erosion-left bank behind Town Hall parking lot-view looking downstream with dry hydrant visible in the background

Chestnut Creek Management Plan

The Sullivan County Soil and Water Conservation District has been engaged in collecting data and information for the development of a stream management plan for the Chestnut Creek. Now it is time to begin to assemble the Plan. To carry out this task, we need input from you, residents of the Chestnut Creek Watershed. The goals of the Plan, determined last year were to:

- Reduce Flood Risk & Property Damage
- Enhance Fisheries
- Improve Water Quality
- Stream Restoration Projects
- Protect Drinking Water
- Promote Good Stewardship.

Kate Schmidt of the Cornell Cooperative Extension, talked about ways that the community could become more involved in the process. She stressed the importance of good streamside stewardship and the development of a Chestnut Watershed Association that could assist the Project Advisory Committee in keeping abreast of current local issues.

Chestnut Creek News

What's New?

Sullivan County Soil and Water Conservation District (SCSWCD) would like to announce the Demonstration Stream Restoration project at the Town of Neversink, Town Hall in Grahamsville, N.Y., in cooperation with Town Supervisor, Georgianna Lepke, the NYC Department of Environmental Protection, Stream Management Program (DEP SMP), and the Watershed Agricultural Council (WAC). The project will consist of 300 feet of native Catskill flora, planted as a streamside buffer for the Chestnut Creek, along with the repair of two eroded areas along the banks behind the Town Hall. The project is set to commence in September, dependent on the weather.

The Town Hall project site was selected as one of the top ranked sites by the Chestnut Project Advisory Committee (PAC). Some of the other projects proposed require additional site evaluation and preparation and therefore will be considered next year, as funding allows.

Project Details

The project is intended to stabilize the stream, act as a bio-filter for overland runoff and provide an educational forum on best management practices along local streams in this region. The native Catskill plant roots will help to anchor the soils along the stream, and the foliage will provide shade for fish habitat, with the added benefit of flowers and berries to attract birds and butterflies to the Town's amphitheatre and fishing park. The eroded areas along the stream will be remedied by restructuring an already existing low "bankfull" bench that has been scoured by a piece of riprap that was dislodged during a storm event. The low bank, or bench, provides a much needed flood-overflow feature for the stream. This bankfull bench allows small storm flows to dissipate energy by spreading out laterally, in the same manor as a larger storm flow would temporarily spread out over the adjacent floodplain to reduce its velocity.

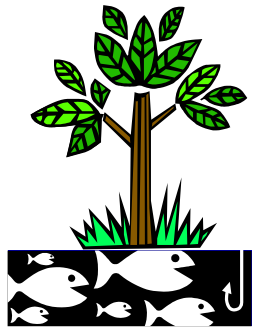
Small signs identifying the plants species accompanied by an informational pamphlet will be developed in cooperation with the Town and the DEP. In addition, the Catskill Center, through the Catskill Stream and Watershed Education Program with the TriValley School, is attempting to incorporate this site into their curriculum for stream assessment and monitoring, as well as instruction on proper care for streamside habitat.

The Players

The project site planting has been laid out by SCSWCD, with local landscape architect, Barbara Restaino. Georgianna Lepke has provided us with design ideas and support for the preservation of the stream's natural ecosystem. Planning and technical assistance have been provided by Douglas DeKoskie of Integrated River Solutions, Cornell Cooperative Extension (CCE), Natural Resources Conservation Service (NRCS), WAC and DEP SMP staff. Funding for this project has been provided through an ongoing grant with the NYC DEP SMP and WAC. We would also like to thank Gary VanValkenburg of the Town Highway Department for his support.

What can you do?

Volunteers are welcome to assist in the site planting phases to be conducted mid to late September. For more information or to volunteer your assistance please contact SCSWCD at 845-292-6552 ext. 111.



Sullivan County Soil and Water Conservation District
64 Ferndale-Loomis Road
Liberty, NY 12754
Phone: 845-292-6552 ext. 5 Fax: 845-295-9073 email:
scswcd@in4web.com