4. Water Quality and Ecological Health

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Brown trout sighted in Chestnut Creek. Photo taken by Derrick Kelly, WAC.

4. Water Quality and Ecological Health

a. Chestnut Creek Fisheries Management

Setting

Chestnut Creek (H-139-14-48) is a tributary to the Rondout Creek (entering Rondout Reservoir), with its source located in the Sullivan County hamlet of Neversink. There are 11 identified perennial (flow year round) or intermittent (flow only following storms or snowmelt) tributaries to the mainstem Chestnut Creek.

All waters of the State have a classification and standard designation based on existing or expected best usage of each water or waterway segment. The classification AA or A is assigned to waters used as a source of drinking water. Classification B indicates a best usage for swimming and other contact recreation. Classification C is for waters supporting fisheries and suitable for non-contact activities. Waters with classifications, A, B, and C may also have a standard of (T), indicating that it is able to support a trout population, or (TS) indicating that it supports trout spawning. Special requirements apply to sustain these waters that support these valuable and sensitive fisheries resources. Chestnut Creek has a legal classification/standard of A(T) from mouth to source, as listed in New York State Conservation Rules and Regulations (6 NYCRR Part 862, item 470).

Fisheries

Fish species historically collected from Chestnut Creek include:

Brook trout (*Salvelinus fontinalis*) (wild)
Brown trout (*Salmo trutta*) (both wild and hatchery origin)
Slimy sculpin (*Cottus cognatus*)
Longnose dace (*Rhinichthys cataractae*)
Blacknose dace (*Rhinichthys atratulus*)
White sucker (*Catostomus commersoni*)
Common shiner (*Notropis cornutus*)
Chain pickerel (*Esox niger*)

Chestnut Creek is currently managed as a stocking-supplemented brown trout stream for a length of 1.9 miles, from just downstream of Grahamsville upstream to Clark Road off State Route 55 (Photo 1). The Department of Conservation (DEC), Region 3, has assigned a stocking scheme to Chestnut Creek based on fish survey results and knowledge of fishing pressure. There are two basic management types;
"A" (higher quality) with consistently good year-round trout habitat, good trout growth rates, OR high wild trout biomass.
"B" (lower quality) with one or more of: evidence of low fertility, habitat deficiency, high non-trout population

Photo 1. Brown trout sighted in Chestnut Creek upstream from Grahamsville.

density, unstable flows or high summer water temperatures, or poor or irregular growth and survival. Chestnut Creek is managed as a class B(s) trout fishery, indicating a lower grade trout stream (in the stocked section), managed by supplemental stocking ("s") of trout. The management target of supplemental stocked trout streams in New York State is an average trout catch rate of 0.5 fish/hr.

A lower grade trout stream is defined as one with evidence of low fertility, and/or habitat deficiency, and/or high non-trout density, and/or unstable flows or high summer temperatures which all result in poor or irregular growth and survival. Additionally, wild trout biomass will be less than 41 lbs./acre. The wild trout biomass in the stocked section of the Chestnut Creek was estimated to be 27.9 lbs./acre in 1990, the year of the last Department fisheries survey.

The current stocking policy calls for a first increment of 600 brown trout yearlings to be stocked in mid-April, followed by a second increment of 150 brown trout spring yearlings to be stocked in May. That policy has been modified to include a stocking of 72 larger two-year-old brown trout in mid-April, since these fish are a relatively recent management option from the State hatchery system.

Wild brown trout of five different year classes (0, 1, 2, 3, and 5) were collected in 1990, as well as brook trout of two different year classes (1 and 2). Although specific spawning habitats have not been documented by the Department of Environmental Conservation (DEC) in this system, it is likely that brook and brown trout spawn both in the Chestnut Creek proper as well as in the perennial tributaries.

Future Management Recommendations

Future management activities by the DEC may include:

1. An updated assessment of fishing pressure (important component in stocking policy calculation)

2. Routine fisheries surveys

3. Habitat protection as authorized under Environmental Conservation Law Article 15 (protection of bed and banks of protected waters)

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b. Chestnut Creek Surface Water Monitoring

Water quality in Chestnut Creek has been monitored and testes for many years as part of the NYCDEP Stream Monitoring Program. Parameters of interest to surface water quality for drinking water supplies include conductivity, chloride, turbidity, fecal coliform, dissolved oxygen and phosphorous. Prior to 2002, DEP collected samples twice a month year round, above and below the outfall of the Grahamsville Wastewater Treatment Plant (WWTP) (these sites are labeled "Chestnut Above" and "Chestnut Below", respectively, on the graphs below, see Figure 1). Following an evaluation of the sampling program, the frequency was changed to once a month for "Chestnut Above" and twice a month for "Chestnut Below." For comparative purposes, data are also presented from other streams in the Rondout Reservoir watershed that are monitored by DEP. These include:

- Red Brook, which largely follows Route 42 and flows into Chestnut Creek just upstream from the Grahamsville WWTP sampling sites (Red Brook monitoring ceased on 1/1/02 due to programmatic changes at DEP);

- Rondout Creek, a major tributary flowing directly into Rondout Reservoir;

- Sugarloaf Brook, which flows into Rondout Creek just upstream from the reservoir; and

- Sawkill Brook (also known as Trout Creek), which flows directly into the reservoir.

New York State Routes 55 and 42 run through the Chestnut and Red Brook watersheds, respectively. These roads generally run close to the streams, and the narrow valleys in the Chestnut Creek and Red Brook watersheds have relatively high density of housing and other development compared to Rondout Creek, Sugarloaf and Sawkill Brooks. In contrast, these latter three streams have heavily forested, largely undeveloped watersheds.

This report shows annual medians for selected water quality variables, plotted against time for monitored streams in the Rondout Reservoir watershed. The median is a statistic that expresses the "typical" condition of something. In this sense it is similar to the "average." However, the average may be strongly skewed by extreme values (such as might occur briefly during a flood) and so is considered a poor statistic to use for water quality data. The median is simply the value in the center of a data set, that is, half of the sample values are higher, and half lower. One drawback of the median is that it does not show data from extreme events (mainly floods in this case); maximum values are thus stated in the text as appropriate. The median is useful as a "broad brush" characterization of water quality, and is useful for comparing different streams. An alternative to using either the median or the average would be to show all the data points, but this can be very "noisy" and difficult to interpret, especially for long-term datasets such as this. The time period chosen, 1987-2002, was the period for which DEP has final data available in computer files ("final" means the data have been carefully checked and have passed quality control measures).

Conductivity describes the ability of water to conduct electricity, and is dependent on levels of dissolved minerals and other chemicals. It may be a fairly good indicator of human impacts on water quality. "Pristine" sites with little human impact normally have low conductivity (though local geology can add minerals to the water), while more developed sites have higher conductivity. There are no legal standards or scientific guidance values for conductivity. Conductivity is simple and inexpensive to measure, and so is often used to compare different sites, and an unusually high conductivity value at a site might indicate some form of contamination. Likely causes of elevated conductivity in this area are road salt runoff, leaching of pesticides and fertilizers from lawns and gardens, and septic system leachate.

The more developed watersheds of Chestnut Creek and Red Brook show high conductivity compared to the heavily forested basins of Rondout, Sawkill, and Sugarloaf (Figure 1). However, even the relatively high conductivity values for Chestnut and Red Brook are low compared to streams in heavily developed basins, which may have conductivity values in the hundreds or thousands of micromhos/cm. The Grahamsville WWTP has little impact on conductivity. Road salt runoff may be one of the primary causes of the elevated conductivity, as suggested by chloride concentrations shown in Figure 2 (chloride is a chemical in road salt that imparts

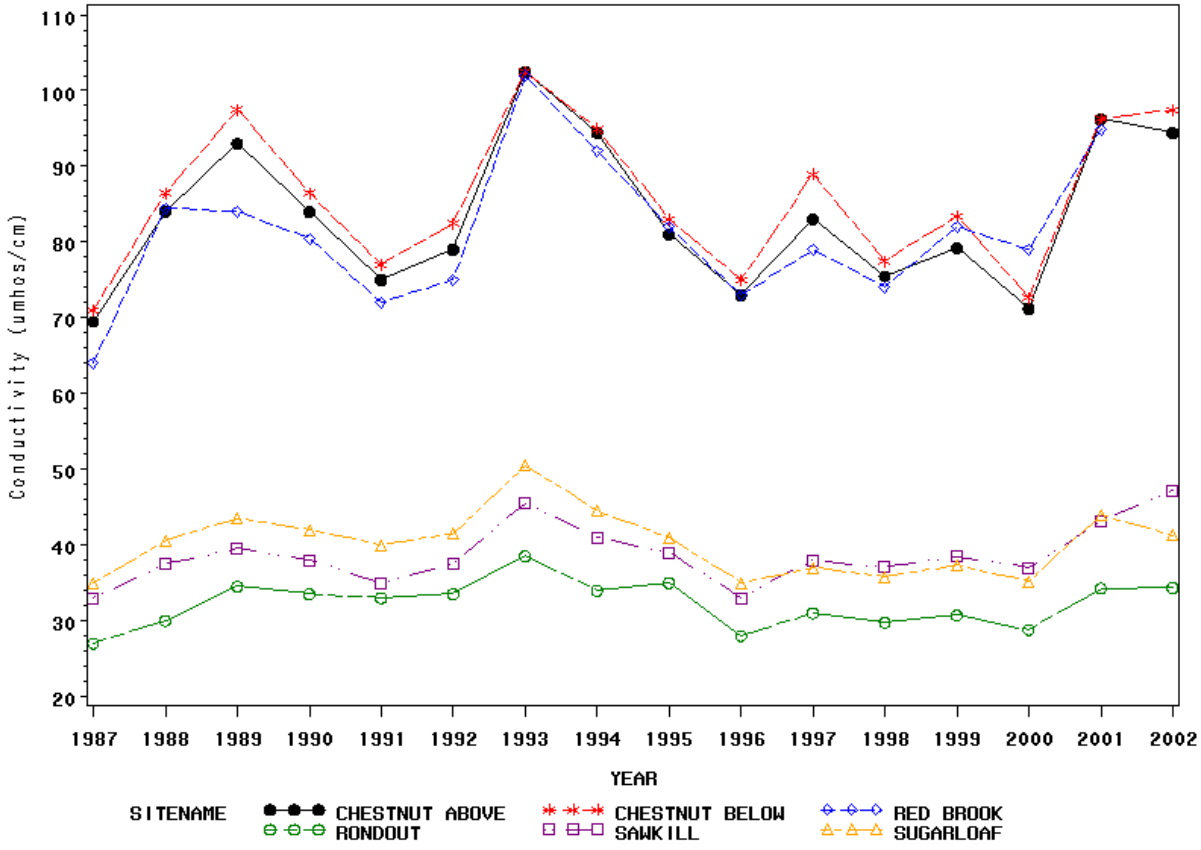

Figure 1. Median conductivity in Chestnut and surrounding streams.

conductivity to water). The Grahamsville WWTP has little impact on chloride concentrations. As with conductivity, even the relatively high chloride concentrations in Chestnut and Red Brook are not an issue. For these streams, the maximum chloride concentration allowed under NYS DEC Environmental Conservation Rules and Regulations is 250 mg/L (milligrams per liter). Median values for all sampled streams in the Rondout Reservoir basin are consistently less than 10% of the limit (Figure 2), and the maximum concentration measured during this time period was 38 mg/L (data not shown).

Turbidity measures how "cloudy" water appears. It is defined by EPA as "a principal physical characteristic of water and is an expression of the optical property that causes light to be scattered and absorbed by particles and molecules rather than transmitted in straight lines through a water sample." Turbidity can be caused by sediment (such as silt, clay, and sand), algae, or other materials suspended in the water. Turbidity does not necessarily relate to how much sediment is in the water; some sites might have a strong correlation between sediment and turbidity, while others would have a very weak correlation. Turbidity is measured in nephelometric units, or NTU. Values can range from less than 1 NTU to over 1000 NTU. Pristine sites commonly have values in the low single digits. There is no numerical standard for stream turbidity generated by human activities under State law, but there must be "No increase that

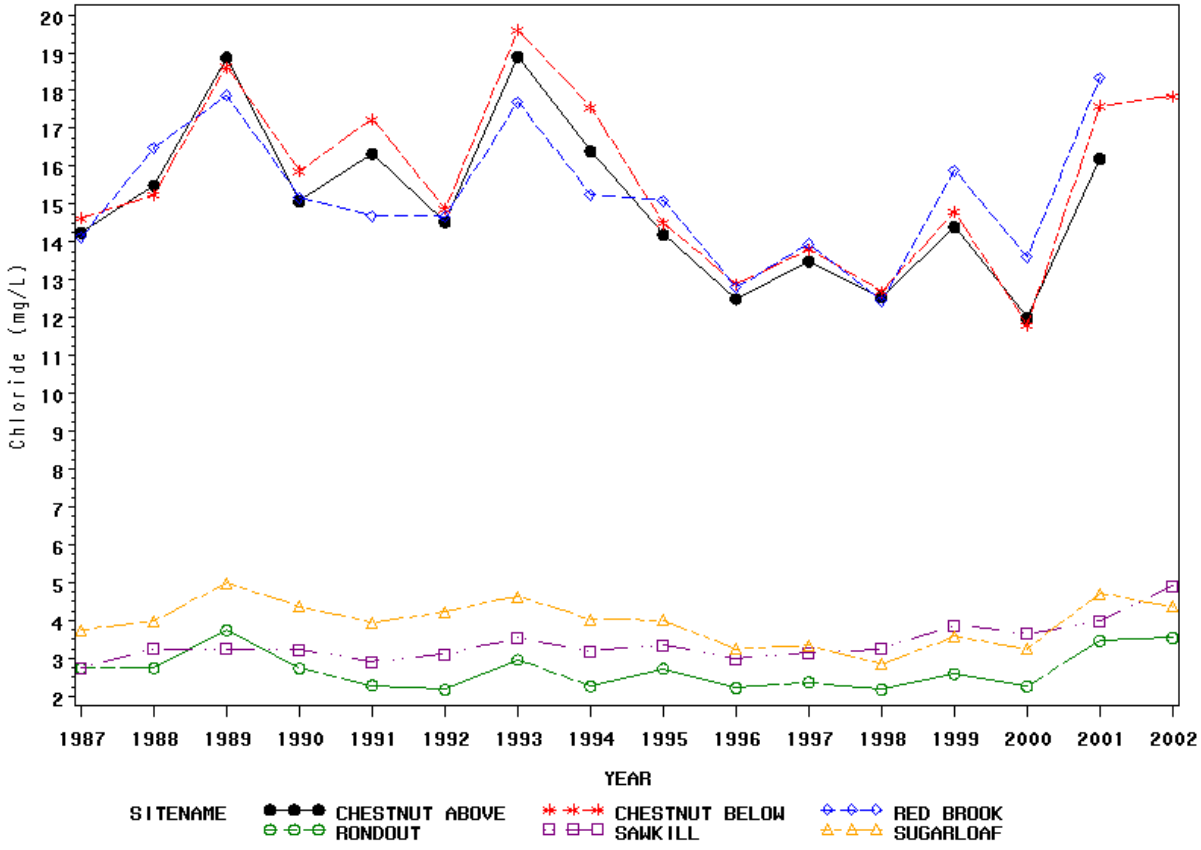

Figure 2. Median chloride concentration in Chestnut and surrounding streams.

will cause a substantial visible contrast to natural conditions" between upstream and downstream locations from a project site (this is called a "narrative standard").

Median turbidity values in Chestnut Creek are similar to other streams in the Rondout Reservoir watershed (Figure 3). The medians are all below 2 NTU, which generally is considered good water quality. The maximum value measured in Chestnut Creek during this time period was 134, though higher values have probably occurred but were not measured.

Fecal coliform bacteria, which can be from animal or human sources, are measured to determine if there is contamination of the water by fecal material, and if the degree of contamination is sufficient to cause concern and warrant further investigation. The New York State regulatory limit states: "The monthly geometric mean, from a minimum of five examinations, shall not exceed 200 CFU/100 mL" (colony forming units per100 milliliters of water; these are the units used to count coliform bacteria in water samples).

Based on DEP's twice-monthly sampling, Chestnut Creek coliform values are typically well under 100 CFU/100 mL (Figure 4). (Note: DEP also monitors the effluent from the WWTP as part of its WWTP monitoring program, but those data were not considered for this report.) There

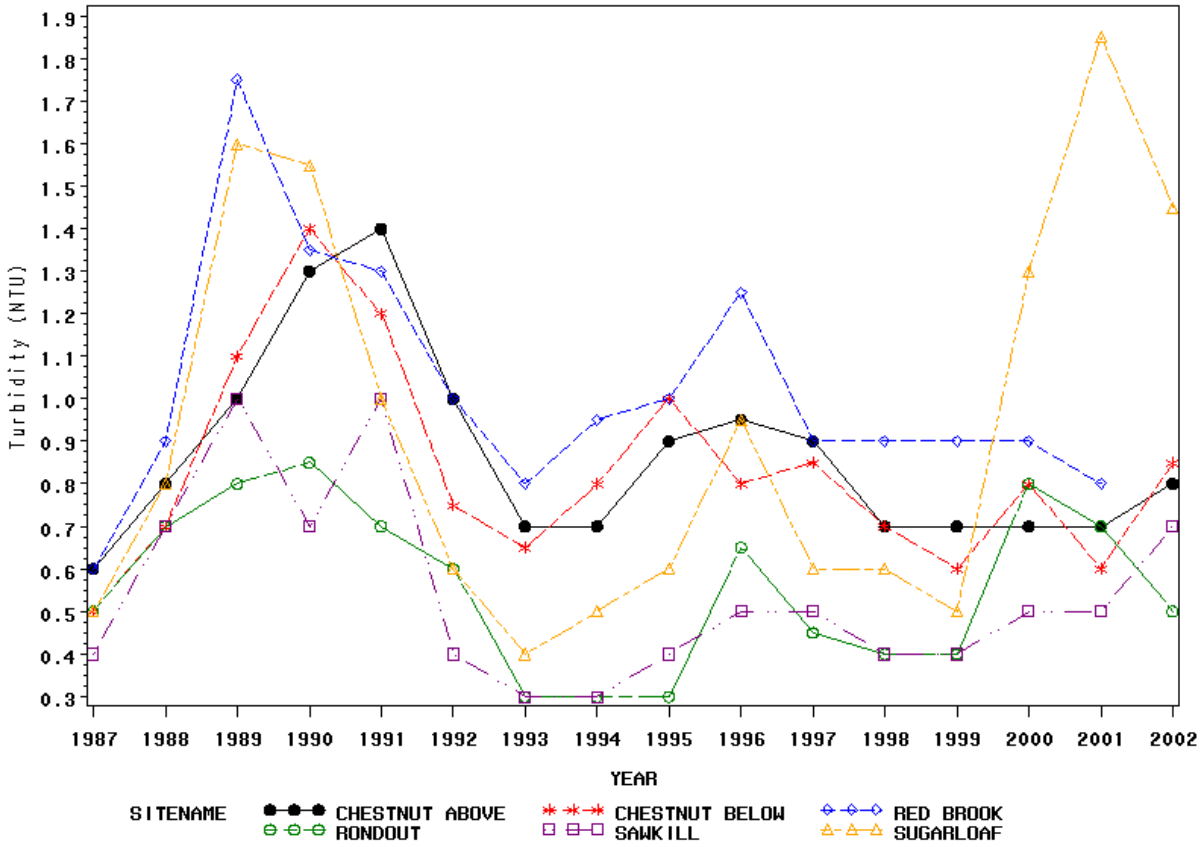

Figure 3. Median turbidity in Chestnut and surrounding streams.

is little impact of the WWTP on the stream, with median values above and below differing by no more than about 15 CFU. Chestnut Creek and, to a lesser extent Red Brook, do have somewhat elevated fecal coliform concentrations compared to the other monitored streams, but as previously noted, the median values are below the 200 CFU limit. Individual values in the 600 to 1000 CFU range have been measured at all monitored sites in the Rondout Reservoir watershed, including the relatively pristine sites on Rondout Creek, the Sawkill, and Sugarloaf Brook. These high values usually occur during high-flow events and normally don't last very long; DEP has done follow-up sampling a day after a high value was recorded and found the levels have fallen significantly, often close to the median values.

Fish and other aquatic life need oxygen to live just like terrestrial animals. Oxygen gas dissolves in water, and its concentration can be measured. According to NYS regulations: For cold waters suitable for trout spawning, the dissolved oxygen (DO) concentration shall not be less than 7.0 mg/L from other than natural conditions. The annual medians for Chestnut Creek and surrounding streams are well above the minimum allowed (Figure 5), and review of the data shows minimum individual measurements of 7.5 mg/L or higher at all sites. Dissolved oxygen concentrations are similar among all sampled streams (Figure 5), though the more heavily developed Chestnut Creek and Red Brook show lower DO content.

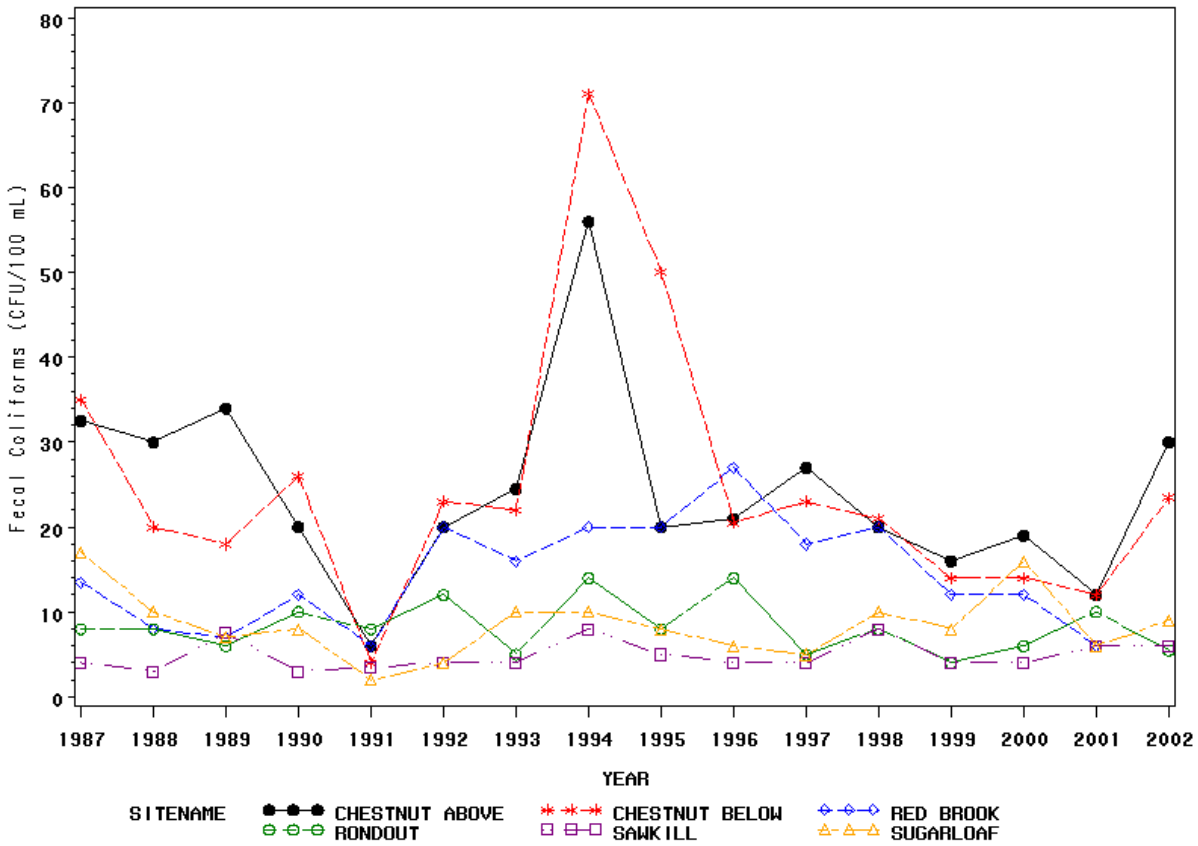

Figure 4. Median fecal coliform concentrations in Chestnut and surrounding streams.

Phosphorus is a nutrient that can promote growth of algae in water bodies. Common sources include runoff of fertilizer (including manure applied to fields), wastewater treatment plants, and failing septic systems. Some phosphorus also occurs naturally. There is no legal standard for phosphorus. There is a scientific guidance value of 50 micrograms/L (a microgram is one millionth of a gram) for streams, representing the phosphorus concentration below which there should not be problems with algal growth. Median total phosphorus concentrations in Chestnut Creek are well below the guidance value (Figure 6). Phosphorous concentrations are generally higher below the Grahamsville WWTP than above it, but the median concentrations below the plant are less than half the guidance value. Furthermore, in the last few years the differences in Total Phosphorus (TP) concentration above and below the plant have become almost negligible, due largely to the construction of a new WWTP in 1999, which utilizes phosphorus removal technology.

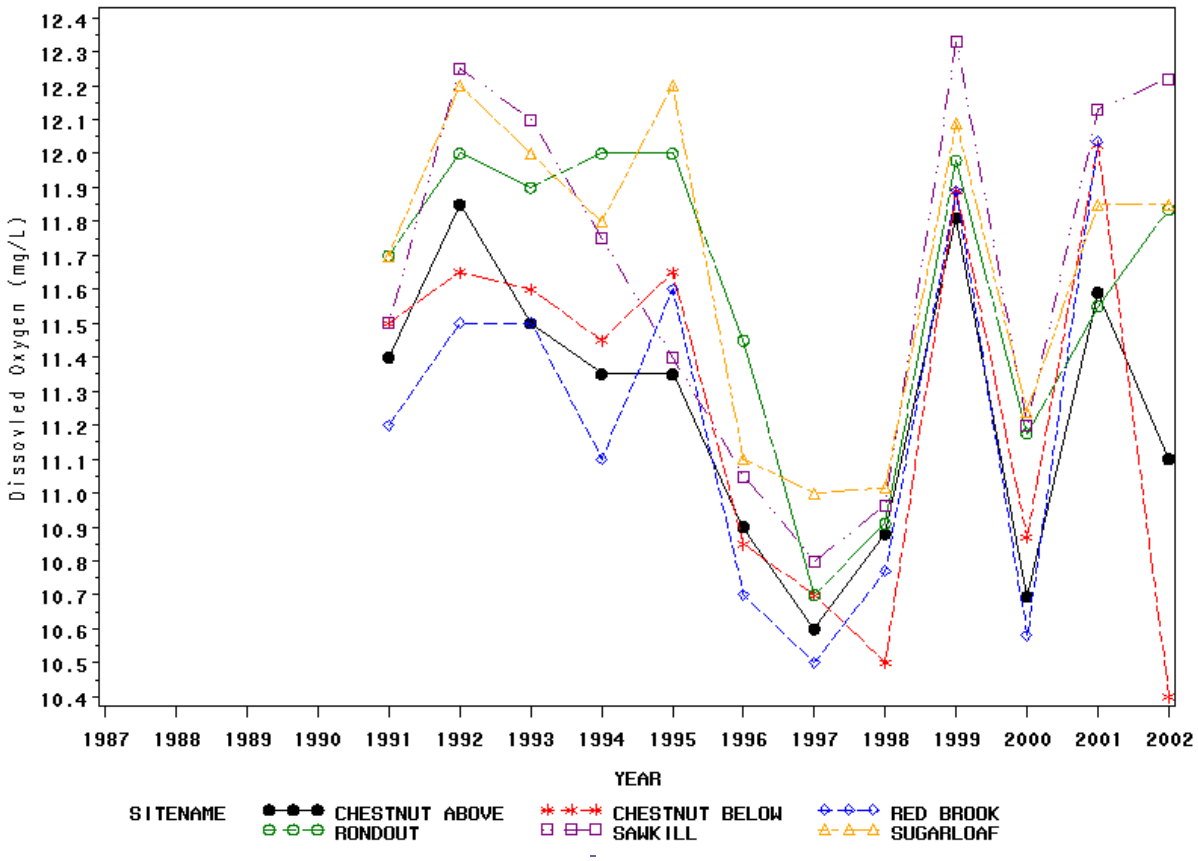

Figure 5. Median dissolved oxygen concentration in Chestnut and surrounding streams.

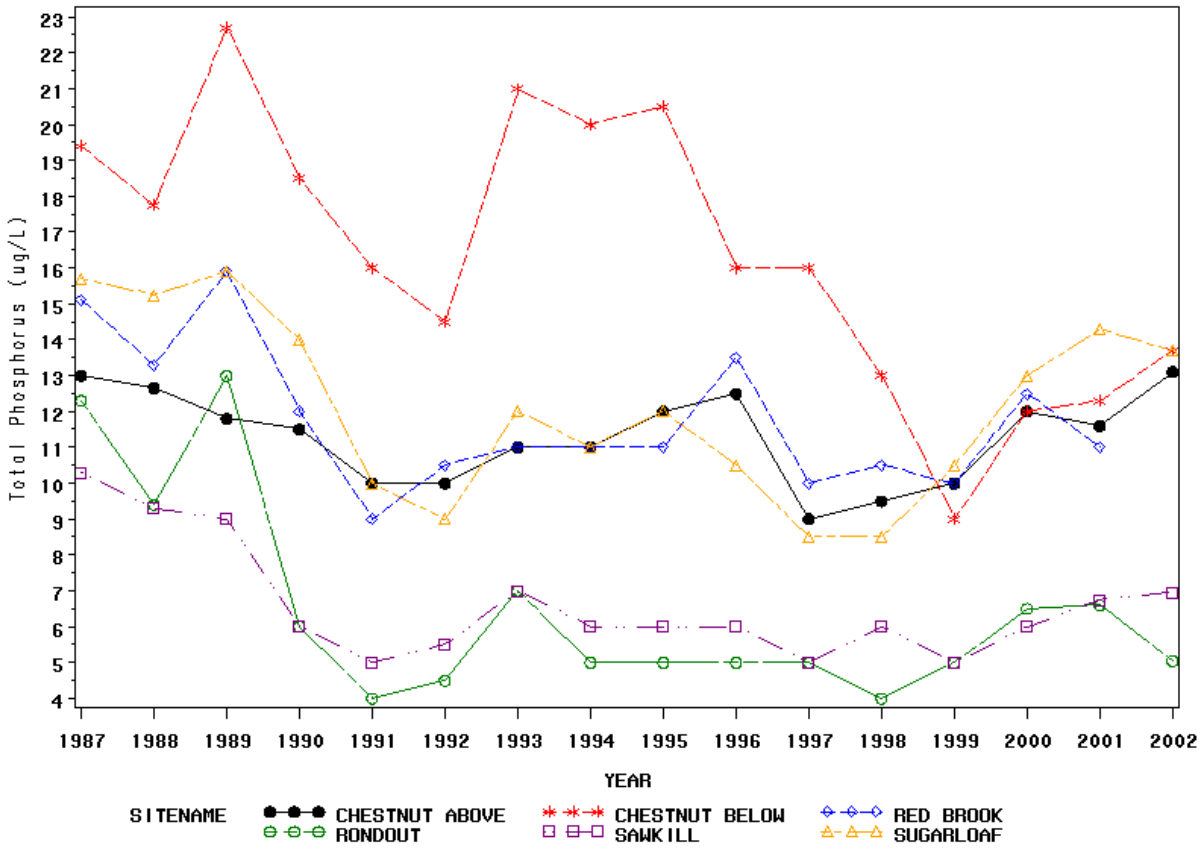

Figure 6. Median phosphorus concentration in Chestnut and surrounding streams.

c. Chestnut Creek Biomonitoring

One of the ways NYCDEP monitors water quality in streams is by sampling and identification of stream benthic macroinvertebrates (animals without backbones visible to the naked eye) in accordance with NYSDEC stream biomonitoring protocols. These protocols, derived from USEPA Rapid Bioassessment methods, require qualitative sampling of invertebrates from riffle habitats in streams. Randomly generated subsamples of 100 organisms are taken from raw samples often consisting of several hundred organisms. These organisms, primarily insect larvae, are sent to a contractor for identification to the genus or species level. When the 100 organisms in the subsample are identified and counted, four metrics are calculated:

- species richness, or the total number of different taxa (species classification groups) in the subsample,
- EPT richness, or the total number of different taxa from the mayfly (***E****phemeroptera*), stonefly (***P****lecoptera*), and caddisfly (***T****richoptera*) orders,
- biotic index, an average score reflecting the overall pollution tolerance of the sub sampled benthic community, and
- percent model affinity, or the similarity of the subsample to an "ideal" stream benthic macroinvertebrate community in New York State.

The four metric scores are averaged resulting in a final water quality score which falls into one of four narrative categories: severely impacted (0-2.5), moderately impacted (2.5-5), slightly impacted (5-7.5), and non-impacted (7.5-10). While this program samples and identifies aquatic biota rather than the water itself, a long history of this work in the U.S. and around the world leads scientists to accept that the community present is a reflection of water quality.

DEP's primary sampling site on Chestnut Creek is 315, located just below the outfall of the Grahamsville WWTP (Figure 1).

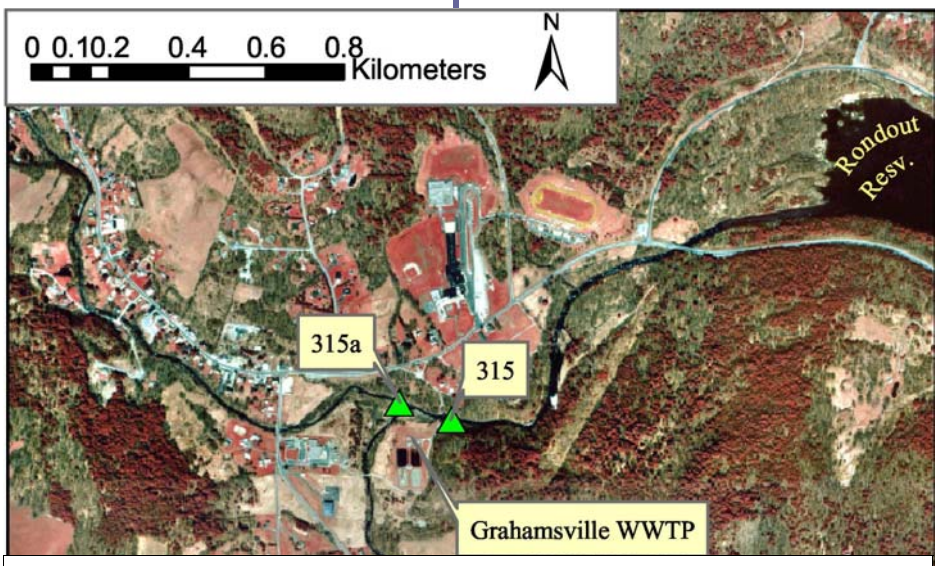

Figure 1. Aerial photograph of the vicinity of Grahamsville, N.Y. showing the locations of DEP stream biomonitoring sites on Chestnut Creek in relation to the Grahamsville Wastewater Treatment Plant. (streamflow from left to right)

This site was sampled in 1996, 1999, and 2000. In 2000, a site above the WWTP, 315a, was sampled in order to assess whether or not the macroinvertebrate community in the stream was being altered as a result of the discharge from the plant. The upgrade to microfiltration at the Grahamsville WWTP was functionally complete in March of 1997. Increases in water quality scores at site 315 after the 1996 sample could be attributable in part to this upgrade, but insufficient data are available to reliably support this assertion. Samples collected in 2001 have not yet been fully processed.

Chestnut Creek appears to exhibit excellent water quality with a healthy assemblage of aquatic invertebrates according to this sampling regime. Four converted metric scores and final water quality scores are reported for all fully processed samples (Table 1). All final water quality scores from samples collected on Chestnut Creek after 1996 are well into the range of non-impacted, although a few of the species richness scores fell below the 7.5 slightly/non-impacted threshold. While final scores at the upstream site appear a bit lower than at the downstream site, since the latest available final scores indicate no impact to water quality, the difference between the two sites is not considered environmentally significant. A review of water quality data collected by DEP's Hydrology group at the same sites in 1999 and 2000 did not find statistically significant differences in pH, dissolved oxygen, temperature, or specific conductance.

Table 1. Converted metric and final water quality scores from samples collected on Chestnut Creek, Sullivan County, N.Y.

Site	Sample Date	Species Richness	EPT Richness	Biotic Index	Percent Model Affinity	Final Water Quality Score
315	9/9/96	5.88	7.27	7.13	8.90	7.29
315	9/10/99	8.33	8.00	7.56	9.47	8.39
315 (sample replicate)	9/10/99	10.00	8.50	7.84	8.54	8.72
315	9/14/00	7.35	9.50	7.98	9.36	8.55
315 (sample replicate)	9/14/00	8.89	10.00	7.58	9.42	8.97
315a	9/14/00	6.47	8.00	7.86	9.23	7.89
315a (sample replicate)	9/14/00	6.47	8.50	7.93	8.25	7.89

5. Public Infrastructure Concerns and Interests

a. Concerns by Management Unit
b. General Concerns

6. Landowner Concerns and Interests

Mohr Bridge. Photo taken by Lori Kerrigan, SCSWCD.

5. Public Infrastructure Concerns and Interests

Sullivan County Soil and Water Conservation District (SCSWCD) staff interviewed Dean Smith of the State Highway Department, Charles Burgio of the Sullivan County Bridge Unit, and Gary VanValkenburg of the Town of Neversink Highway Department in order to document their interests and concerns about public infrastructure along Chestnut Creek. Where possible, information collected was divided among the management units to which it pertained. General concerns are listed at the end of the document. Also see Table 1 for more bridge information.

a. Concerns by Management Unit

MU1

No specific information provided.

MU2

No specific information provided.

MU3

No specific information provided.

MU4

Kelly Road Bridge – This bridge has a good span, able to handle high flows. Pilings were drilled into bedrock during construction. The bridge is currently in good condition.

Scott Brook Culvert – This culvert is a six-foot diameter reinforced pipe. It has experienced erosion of the embankment behind its wingwalls. The gravel bar upstream of the pipe should be removed. The above should be strictly maintenance work.

MU5

A few of landowners in MU5 have complained to Dean Smith about erosion and flooding problems on their property. However, the State Highway Department has not viewed most of these problems as serious enough to address with public funds to date.

Riprap in Chestnut Creek across from Maschio's failed in 1975 and was replaced immediately because Route 55 was washed out. Another riprapped area upstream of the Covered Bridge is experiencing undercutting action and shifting of the stream. The stream bank on the highway side is falling into the Creek and a gravel bar is forming.

Mohr's Bridge - This bridge is located across from Maschio's Restaurant concerns the Highway Department because the abutment closest to the road is being undercut. If Mohr's Bridge collapses it may cause damage to Route 55 and will be addressed as deemed necessary.

Covered Bridge - This bridge is owned by the Agricultural Society. The Town uses the bridge for access to town property which the town leases for 3 months out of the year. The County paid for the Town's labor to repair the bridge in Summer 2003.

Storm water runoff from the Fairgrounds is being funneled beneath the upstream wingwall of the Covered Bridge on the Fairgrounds side, which undercuts the wingwall and causes damage. During the interview, Gary VanValkenburg inquired of SCSWCD staff whether removing the gravel bar along the Fairgrounds would be

helpful, and suggested cutting the trees that are about to fall into the stream to prevent log jams.

Hilltop Road Bridge – This bridge is built out of timber. Depending on whether it becomes infested with ants/termites, it may need to be replaced in the near future. The facing and gabions were installed in 1991. Charles Burgio stated that the opening of this bridge is narrower than those upstream and downstream. The narrow opening could cause a restriction in high flow conditions. The bridge is currently in good structural condition.

Clark Road Bridge – This bridge has a timber deck and rail. It has been posted by the state for annual inspection due to its 22 ton weight limit. Posting generally refers to the weight limit, and posted bridges generally require annual inspections (others usually get biennial inspection). Bridges not posted are assumed to be able to carry all legal limits. The bridge was originally built in 1965 and rebuilt in 1995 and is currently in excellent condition.

MU6

Storm water drainage was a concern for Dean Smith. In the fall of 2003 the State Highway Department extended and improved the drainage system near the Methodist Church. Problems with ice build up, which prevents drainage, have often been encountered in MU6. Storm water runoff drains naturally into the stream through town until you reach the firehouse. From the firehouse to the light at the 42/55 intersection, the runoff collects on the street. Drainage must be improved here as well.

Culvert outfalls have been difficult to locate and replace. A culvert in MU6 was recently plugged and to find the outfall, the State Highway Department brought in a truck full of water, dumped it into the basin and used food coloring to find the culvert's outfall. An in ground pool and trees made replacement impossible. After the outflow was unplugged by hand digging, it still worked efficiently, so the Highway Department continues to rely on what exists.

River Road Bridge – Originally built in 1933, this bridge was replaced in 1940, widened in 1954, and completely rebuilt in 1996. There have been no problems with this bridge since 1996.

Davis Lane Bridge – The state inspects this bridge every year because it has been posted due to its weight limit. There is a meander upstream of this bridge and the stream has shifted. The state assigns alignment ratings to bridges ranging from 1 to 7, 7 being the best. The state alignment rating of this bridge with the stream is 3 out of 7. Otherwise, everything (riprap, etc.) is in good condition.

MU7

The State Highway Department has recently increased drainage at the 42/55 intersection due to ice build up problems. A steep eroding slope exists on DEP property past the blinking light in Grahamsville. During construction fill material was dumped on these slopes and the State Highway Department believes that this is the material that slid into the stream and the slope is now stabilizing.

MU8-Pepacton Hollow

Gary VanValkenburg observes that Pepacton Hollow, along with Denman

Mountain and Gillette Road, all suffer from repeated erosion towards the town road and have had riprap wash out. The Town of Neversink Highway Department plans to replace Pepacton Hollow culvert in 2004 because the culvert is undersized and becomes plugged repeatedly.

MU9-Red Brook

There is a lot of water coming off the mountain near Ackerly Road, which contributes to Red Brook. Since the drainage network is insufficient, this runoff causes erosion near the town road.

Big Hollow Road provides easy access to Chestnut Creek by proximity to the stream bank and has been utilized for illegal dumping. This is a problem that is continually cleaned up by the Town.

South Hill Road Bridge – Charles Burgio, of the Sullivan County Bridge Unit, has written a 5 year plan, which includes all 400 bridges that the County is responsible for. The only bridge noted for replacement in this plan that is situated in the Chestnut Creek watershed is South Hill Road Bridge, which crosses Red Brook, a tributary to Chestnut Creek. Either the bridge will be replaced or it will receive new beams and a rail.

Table 1. Chestnut Creek Road Crossings. Width vs. Channel Bankfull Width Up and Downstream.

Chestnut Creek Road Crossings	Conveyance bridge/ culvert	Span width/ diameter	Upstream X.S.	BFW	Downstream X.S.	BFW
Benton Hollow Road	culvert	7.3' d.	XS 29	13'	XS 32-33	14'--19'
Slater Road	culvert	15' d.	XS 75-76	23'--24'	XS 77-78	27'--20'
Scheirer driveway	bridge	38.5'	XS 79	32'	XS 80-81	29'--26'
Kelly Road	bridge	23.3'	XS 83	21'	XS 84-85	21'--29'
Mohr driveway	bridge	23.9'	XS 104-105	33'--25'	XS 107-C1	30'--36'
Clark Road	bridge	30.2'	XS 109-110	36'--30'	XS 112-XS1	31'--37'
Hilltop Road	bridge	22.6'	XS 116-117	40'--41'	XS 117.3-118	38'--36'
Covered Bridge	bridge	37.8'	XS 134-135	50'--48'	XS 136-137	51'--66'
Davis Lane	bridge	57.4' combined openings	XS 139-141	56'-45' (split channel)	XS 146-147	40'--50'
River Road	bridge	42.9'	XS 153-155	47'--51'	XS 0301-0302	44'--46'
NYS Route 42	bridge	65.8'	XS 164-165	40'--37'	XS 168-169.5	37'--36'

b. General Chestnut Creek Infrastructure Concerns

Drainage

The original drainage system in the Town of Neversink was constructed in the 1920's, and to this point the State Highway Department has been replacing sections and extending the system a piece at a time. Water from sump pumps in homes can no longer discharge into the sanitary sewer line, so many now discharge directly into catch basins for the storm sewers. No private pump lines are connected directly into storm sewer lines with a "T" as this could lead to clogging in the future.

The water table under Route 55 adjacent to the bridge over Chestnut Creek near the Rondout Reservoir is so close to the surface it is causing the road to heave following freeze/thaw conditions. There has been much under drainage installed by the State in this area without complete success. A test hole was bored in the road and water gushed out like a geyser indicating water beneath the road is under pressure. This section of road should be torn out when the bridge is replaced in 2007 to install proper drainage.

Gary VanValkenburg agreed that runoff increases with development. As development expands, culverts must be increased in size to accommodate runoff.

Highways

When the reservoirs were constructed, Route 55 had to be relocated because it ran along the bottom of the valley that would become part of Rondout Reservoir. Confusion developed about ownership and maintenance of Highways running through the Town of Neversink. Route 42 is owned and maintained by the State. Route 55 is maintained by a combination of entities. The State maintains Route 55 from Liberty to West Shields Road in Neversink, the County maintains Route 55 from West Shields Road to Wagner Road, and the State resumes the responsibility from Wagner Road on. In areas where NYC owns Route 55, (from in front of Tri-Valley School to the County Line), the State maintains Route 55. The Town maintains the roads along the tributaries to Chestnut Creek.

Bridges

The State is responsible for maintenance of 3 bridges in Chestnut Creek Watershed; the bridge over the outlet from the Neversink Reservoir, the bridge over Chestnut Creek in Grahamsville that carries Route 42, and the bridge over Chestnut Creek that carries Route 55 just before the Creek enters the Rondout Reservoir.

There was a legal battle over the Chestnut Creek Bridge (Route 55 near the Rondout Reservoir) concerning whether the City or the State should pay for its replacement. The dispute went to the Attorney General's office and it was found that the city should pay for the replacement. The Chestnut Creek Bridge is scheduled for replacement in 2007.

The County began inspecting all the Bridges in Sullivan County in 1948. The County Bridge Unit is responsible for the maintenance and repair of 400 bridges in Sullivan County. Due to lack of county funding and personnel, the state currently inspects the 250 County Bridges that span over 20 feet every other year, unless posted. The State submits a bridge report,

along with a hydraulic vulnerability assessment of the 250 County Bridges that span over 20 feet to the County Bridge Unit. The County inspects the other 150 bridges that span less than 20 feet. The County hopes to establish a 2 year inspection plan like the State in the near future for those bridges less than 20 feet. The last time an inspection was performed by the County was in 1999.

When a bridge needs replacement, the County Bridge Unit performs their own watershed study. The County has replaced most of the Bridges in the Chestnut Creek watershed in recent years, accomplishing a great deal of work. The only bridge in the Chestnut Creek Watershed slated for replacement within the next 5 years is South Hill Road Bridge. The other bridges are currently in good structural condition.

Ditches (Road Drainage)

The State Highway Department now leaves vegetation intact during construction as much as possible and provides seed and mulch after road work is completed. They are interested in a hydroseeder, if funding becomes available, to alleviate the problem of seed immediately washing off exposed banks. The Highway Department is not in favor of paving ditches and gutters because it increases water velocity, increases erosion and heats up the water which is harmful to aquatic habitat. In addition, some infiltration occurs in well-vegetated and maintained road side ditches, reducing size and timing of flood peaks.

The Town usually cleans ditches in the spring and summer to allow adequate time for vegetation to establish. The town seeds everything with a premix suitable for the area, and also expressed an interest in hydroseeding if the cost to operate it was not too high.

Culverts

Town:

The Town crew goes into the field when it is raining to check that the culverts are functioning and not plugged. This is in part why the Town experiences minimal flood damage. When paving roads, the Town checks all culverts and replaces those that are not in excellent condition. The Town replaced a 4' culvert with a 5' culvert on Cummings Road in 2003. Gary VanValkenburg always upsizes when the Town can afford it because it minimizes risks of damage during flood events. Most property damage occurs after bursts of heavy rainfall because increased precipitation in a short amount of time causes more runoff and pressure on the culvert drainage network.

The Town has been using smooth plastic culverts because they have a better flow, fewer freezing problems, are easier to unplug. Metal corrugated pipes allow for sediment deposition. Gary VanValkenburg does not know how long the plastic pipes last because they have not been installing them that long, but it appears that they should outlast the metal pipes. They could experience sun damage and deterioration on the ends, or debris may wear the culvert lining. According to the Town Highway Department most of the large culverts (more than 5' in diameter) are still adequate, with the exception of the pipe that schedule to be replaced on Pepacton Hollow Road in summer 2004.

State:

According to the State culvert inspection program, culverts over 5' in diameter are

inspected about once every 3 years. Smaller culverts are not looked at unless they are plugged or the road is sinking or some other problem occurs about which the Highway Department is notified. The State has begun using plastic culverts, but galvanized ones are preferred when the culverts are close to the road surface because galvanized culverts support more weight. The State does not have enough staff to examine streambeds or culverts on a more frequent basis. However, the Culvert program has a construction department in addition to the maintenance department, so during the winter the construction department has extra time to inspect large pipes.

Snow Removal

Responsibility for snow plowing is divided between the State/County portions of Route 55. The Town Highway Department is responsible to remove snow from the Town Roads. The State is conservative with spreading sand and salt because their trucks have limited capacity. Current watershed rules and regulations prohibit use of chemicals near the reservoir so only a combination of salt and sand is used on the roads in the Chestnut Creek Watershed.

Sand and Salt Storage

Town:

Sand and salt for road ice control in the Chestnut Creek Watershed is stored at the Town of Neversink Highway Department in Grahamsville. New York City DEP funded construction of a new building for storage, but it only holds 1/3 of the winter supply. Gary VanValkenburg has not had a problem getting the sand through the winters to date. However, he buys sand by bid, and is not sure if the next lowest bid will be reliable. He would like to put an addition on the building or install a filling elevator so he would be able to stockpile the material higher. The Highway Department could then utilize the full height of the building that already exists, which would be most cost effective and not require any additional building.

6. Landowner Concerns and Interests

Landowners have made a significant contribution to the development of the stream management plan for Chestnut Creek. Landowners have provided historical information and photos, participated in Project Advisory Committee (PAC) meetings and answered survey questions to communicate their concerns and opinions. The information collected through this process has helped the SCSWCD to identify and address the most unstable reaches and important issues of Chestnut Creek. The following section summarizes concerns expressed by landowners throughout the stream management planning process. Comments are reported by Management Unit (MU1-MU9).

MU1

A major concern held by landowners in MU1 is that other landowners are not removing debris from Chestnut Creek, and its headwaters, which could lead to flooding.

MU2

No specific comments were received.

MU3

No specific comments were received.

MU4

The landowners that responded in MU4 identified the fallen trees and woody debris (log jams) in the stream channel as their prevailing concern. According to some, debris jams have been a problem for over 17 years, and have become worse in recent years. Other worries include pollution from upstream runoff, flooding of property, streambank erosion and the time and money required for proper stream care. Most landowners in MU4 report that flooding has been a relatively minor problem in this Management Unit. Brown Trout have been sighted and are thought to be breeding near the old town barn below Grey's woodworking. Several pairs were sighted in 2003. Debris jams in this area are a concern not only for flooding and erosion threats they might pose but also as a potential barrier to fish migration.

MU5

Leading concerns for residents of MU5 include stream bank erosion and pollution from upstream runoff and dumping. Other issues included flooding of property, impaired fishing, removal of trees and woody debris and government regulation of private property rights. Aggradation of gravel, especially where tributaries enter the mainstem, was a common concern. Most landowners reported flooding as a minor problem, however one resident noted damage to their home and property due to an increased flow of water onto the property during high flow events. Another resident went into detail about trees, which have fallen into the stream as a result of bank erosion, causing more debris to accumulate because they are not removed.

MU6

Stream bank erosion was the most voiced concern for landowners in MU6. Other concerns about the stream include flooding of property, pollution from upstream runoff and dumping, time and money required for proper stream care, government regulation of private property rights, the effect of chemicals on fish, impaired fishing, washout of roads and bridges, removal of trees and woody debris, and difficulty obtaining permits for stream work. Flooding was identified as a

relatively minor problem in MU6, however, a few flooding related incidents were reported. One resident explained that the stream ran through their barn on one occasion and the barn had to be removed. Another resident complained of a nearby culvert being plugged with debris, resulting in frequent flooding of the road during storms.

MU7

No specific comments were received.

MU8-Pepacton Hollow

The number one concern of landowners in MU8 is erosion of stream banks. One landowner included additional comments stating the erosion is a result of the meandering stream changing direction due to the drains from the road collecting runoff from the other side for flood control and releasing it under higher pressure than it would otherwise into Chestnut Creek. Other concerns include impaired fishing, government regulation of private property rights, removal of trees and woody debris, nuisance wildlife, flooding of property, and cleanup of the dump. Flooding was considered a relatively minor problem and some residents stated that conditions have improved.

MU9-Red Brook

Of the three landowners that responded from MU9, stream bank erosion, removal of trees and woody debris and government regulation were the primary concerns. Also included were flooding of property and pollution from dumping. Flooding is considered a minor problem. Red Brook fisheries play an important role for the community especially for the historic Beaver Dam Club with property including the upper reaches of the stream (Volume I, Section IV.A.3. A History of the Beaver Dam Club).

Other Tributaries

For the Chestnut Creek Management Plan, we have decided to group opinion survey results of the smaller tributaries together until we have the resources to scientifically survey them. The two top concerns of Tributary landowners were stream bank erosion and the time and money required for proper stream care. Other concerns included government regulation of private property rights, flooding of property, groundwater connection to private wells, pollution, nuisance wildlife, difficulty obtaining permits for stream work, removal of trees and woody debris, the effect of logging on the watershed and the stream, and road washouts. One resident of Denman Mountain explained how during Hurricane Floyd, the road at the base of the guardrail eroded into the stream. Flooding ranges from a frequent problem to never a problem. One resident claimed they are unable to utilize their property during high flow periods due to flooding.

Unknown MU

A few landowners submitted surveys anonymously, making it difficult to assign the results to a specific MU. Among these responses there was a consensus that stream bank erosion is the number-one concern. Remaining issues range from impaired fishing to washout of roads and bridges. Flooding has been a minor to frequent problem. Most landowners throughout the watershed considered fishing in Chestnut Creek to have remained consistent or to have improved in recent years.

Generally, if high waters have affected property and roads, erosion of stream banks seemed to be of highest concern in those areas. Where flooding has not presented a problem, concerns focus on trees and woody debris in the immediate/ upstream area and pollution from upstream runoff and dumping. It is apparent that portions of Chestnut Creek require a long-term solution of proper stream stewardship to not only promote a more stable stream, but also to reduce the overall cost of stream maintenance and the number of stream work permits required every year. Landowners have expressed an interest in learning more about these long-term solutions and how to implement them.