



WEST BRANCH NEVERSINK RIVER





10/31/2012

Aquatic Habitat Demonstration Restoration at Frost Valley Road



Project Objectives:

- Improve the riparian buffer and stream function
- Mitigate contaminants from road salts, PAHs and metals
- Improve water quality & habitat value
- Protect the bridge abutment from direct channel flow
- Create community partnerships in preparation for Stream Management Implementation Program

Prepared by Mark Vian, NYC DEP and Karen Rauter, Sullivan County Soil & Water Conservation District

West Branch Neversink River

AQUATIC HABITAT DEMONSTRATION RESTORATION AT FROST VALLEY ROAD

Background:

During the summer of 2010, a comprehensive stream feature inventory was made of 33+ miles of the East and West Branches and main stem of the Neversink River upstream of the reservoir. The objective of the assessment was to identify the full range of stream management issues on these channels. During the inventory, this site was chosen as a potential project to meet a 2007 FAD requirement of completing a stream restoration demonstration project in the Neversink Watershed by February 2012.

Sullivan County Bridge 187 was replaced in 2009 along Sullivan County Rte 157 bridge at Claryville. Upon completion, the river approached the bridge at an oblique angle (> 45 degrees). Backwatering and aggradation occured upstream of the bridge, and a large gravel bar developed on this bend making the radius of curvature going through the bridge even tighter, and undermining the revetted northern approach to the bridge. In addition, bridge protection included approximately seven hundred feet of riprapped road embankment on the approach from the north, leaving no vegetated buffer between the road and stream.

During the stream feature inventory, it was noted that the bridge abutment would likely sustain damage by scour during high flows. This was confirmed during Tropical Storm Irene in August 2011, when high flows damaged the north side rip rap and nearby downstream abutment. Before construction could begin, the site had to be resurveyed and redesigned in order to resubmit the permit application to NYS DEC for construction in 2012.

A Multi-Objective Project:

The major goals of this project were to improve stream function and protect water quality by improving buffer function, reducing erosion and enhancing aquatic habitat. These goals were met by buffering the stream from effects of the road and protecting the bridge with better stream channel alignment, and:

- A large woody buffer area was constructed (to be planted with native tree species) between the stream and road, demonstrating newly designed equipment to plant willow stakes into the rip rap; this practice can be adopted throughout the watershed if successful.
- Relocating the willow island in the center of the channel was relocated toward the road, creating
 a new alignment sufficiently wide to handle regular stream flow and reduce scour at the base of
 the bridge and northern rip rap approach;
- Leaving the road side channel at a level where it will serve as a vegetated overflow flood channel;

• Embedding boulder clusters and rock structures into the stream bed to stabilize the bed and banks, and create trout holding habitat.

During the project, collaborative partnerships were initiated with:

- Wintoon Waters, LLC, the property owner of 5+ miles of stream which maintains the property for fishing recreation;
- Sullivan County DPW, which avoided mobilizing a separate repair crew for flood repairs to the bridge abutments by working together with Hubbell, Inc., the project contractor;
- Claryville Fire District, whose interest was to increase access to stream for filling fire truck water tanks:
- USGS also hosts a stream gage at this site and was made aware of the project prior to planning and
- Community members and elected officials walking, bicycling and driving by the site.

Project Design Elements Include:

- Stream channel realignment and narrowing to achieve a more perpendicular approach to the bridge opening, improving sediment transport through the bridge;
- Construction of a bankfull-stage rock-and-soil bench along the base of the rip-rapped embankment, tied into stable vegetated buffer at the upstream end of the meander bend; transplanted"willow clumps" from the vegetated center bar to this bench;
- Construction of root wad revetment underneath the floodplain bench to protect the base of the
 new channel stream bank using downed large woody debris located on site. Facing root wads
 upstream slows near-bank velocities and provides cover, shade and thermal refuge increasing
 trout habitat value. This practice is proving to be a cost-effective bank stabilization practice for
 post-flood emergency periods throughout the Catskills;
- Design incorporates trout habitat improvement structures built into both banks: boulder clusters, lunker structures, rock runs and concave rock vanes, to provide overhanging cover, and flow diversion structures to maintain or improve scour pool habitat;
- Use of a "Stinger" tool for interplanting rip-rap with live willow stakes. Upon proof of concept, Sullivan County Soil & Water would extend its use throughout the region.

Steps to Final Completion:

The goal of substantial completion of the project was met on August 31, 2012 per the request of the landowner to accommodate trout fishing season. Planting of dormant potted and live stake willow material is scheduled for November 2012.

A localized 50-year flood event occurred on September 18 on the Neversink River (a 2% chance annual event). The newly constructed, but still unvegetated bankfull stage bench was significantly scoured. A

post-flood survey and hydraulic model are being processed by the engineering firm Milone and Macbroom so that repair options can be considered for the floodplain bench, currently planned for late 2012 or in 2013. In either case, a short-term re-vegetation project will take place to prepare the site for this winter:

- The embankment will be treated with willow stakes, set into the rock, and the fringe of the road berm will be replanted with shrubs and/or trees.
- A piece of bioengineering equipment called "the Stinger" will be constructed to demonstrate itseffectiveness in creating voids for interplanting installed rip-rap with new vegetation (scheduled during willow dormancy November 2012). This equipment will subsequently be made available watershed-wide for use in similar riparian buffer improvement projects
- And then in Spring 2013, the floodplain bench will be interplanted with potted native tree and shrub stock.

Additional documents to supplement this report are attached. A full plan set of the project specifications is available for download.



Stream channel runs adjacent to road disconnecting riparian corridor.



Area identified to demonstrate new road buffer planting practice with Stinger and live willow stakes.



Before the project start: Wintoon Waters, LLC members: Mitchell Brock, Felicity Kelcourse, Hovey Brock, Ladd Connell (President); with Jessica Louisos of Milone and Macbroom, Inc, Mark Vian (NYC DEP) and Rudd Hubbell of Hubbell, Inc.



Looking downstream at pre-existing channel alignment.



Staking out new center of channel.



Coffer dam installation to create bypass channel; diverts stream around project site.



Construction of bypass channel/water diversion.



Constructing the base of the new stream bank with root wad revetment.



Building the new floodplain bench.



New floodplain elevation.



View of new right stream bank riparian buffer to be planted in fall.



With the bypass channel released, site restoration begins.



Damage from Tropical Storm Irene goes unseen from the road.



Repairs are made during project construction through a partnership with Sullivan County.



Claryville Fire District requests permission to install new access for water tanker, downstream right.



Contractor and engineer inspect installation of rock run, a project design element.



Forested left bank is restored with native seed mix and mulch; hydroseeding of right bank follows.



New riparian area ready for planting with trees, shrubs and live stake Stinger demonstration.



Site restoration as of August 31, 2012.



As water is rising on September 18. 2012, which will eventually prove to be a \sim 50-yr flood.

West Branch Neversink Demonstration Restoration Project Team:

Sullivan County Soil & Water Conservation District

Brian Brustman, District Manager

Karen Rauter, Rondout Neversink Stream Program Coordinator

Stacie Howell, Catskill Streams Buffer Coordinator

Brenden Wagner, Riparian Field Technician

New York City DEP

Beth Reichheld, Section Chief Stream Management Program

Mark Vian, Project Manager/Stream Ecologist

Doug Dekoskie, Project Coordinator

Chris Tran, Catskill Streams Buffer Coordinator

Wintoon Waters, LLC

Lawrence Connell, President

Milone and Macbroom, Inc.

W. Andrew Greene, P.E.

Jenn Hoyle, Water Resource Engineer

Dave Bragg, P.E.

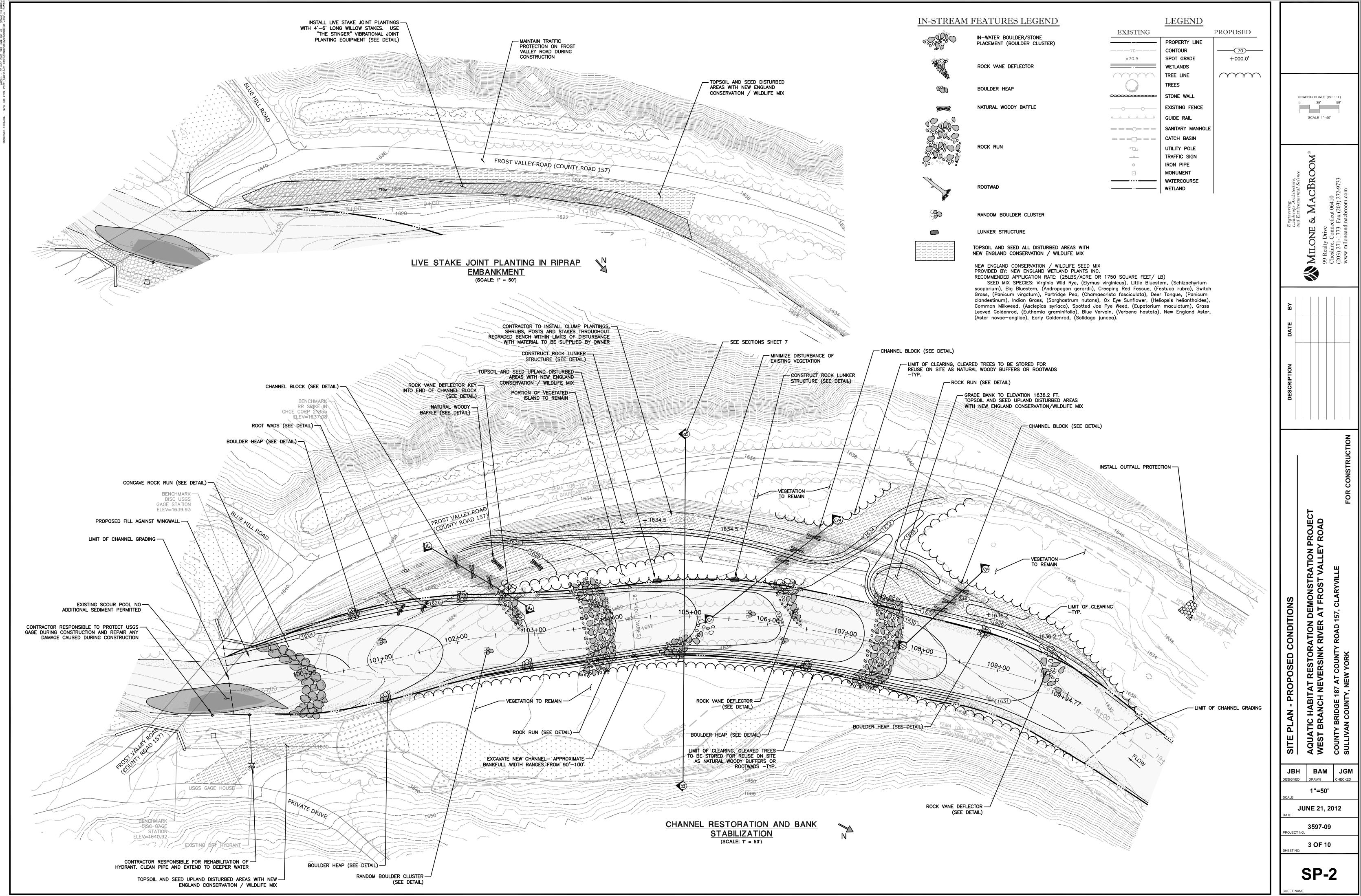
Hubbell, Inc., Contractor

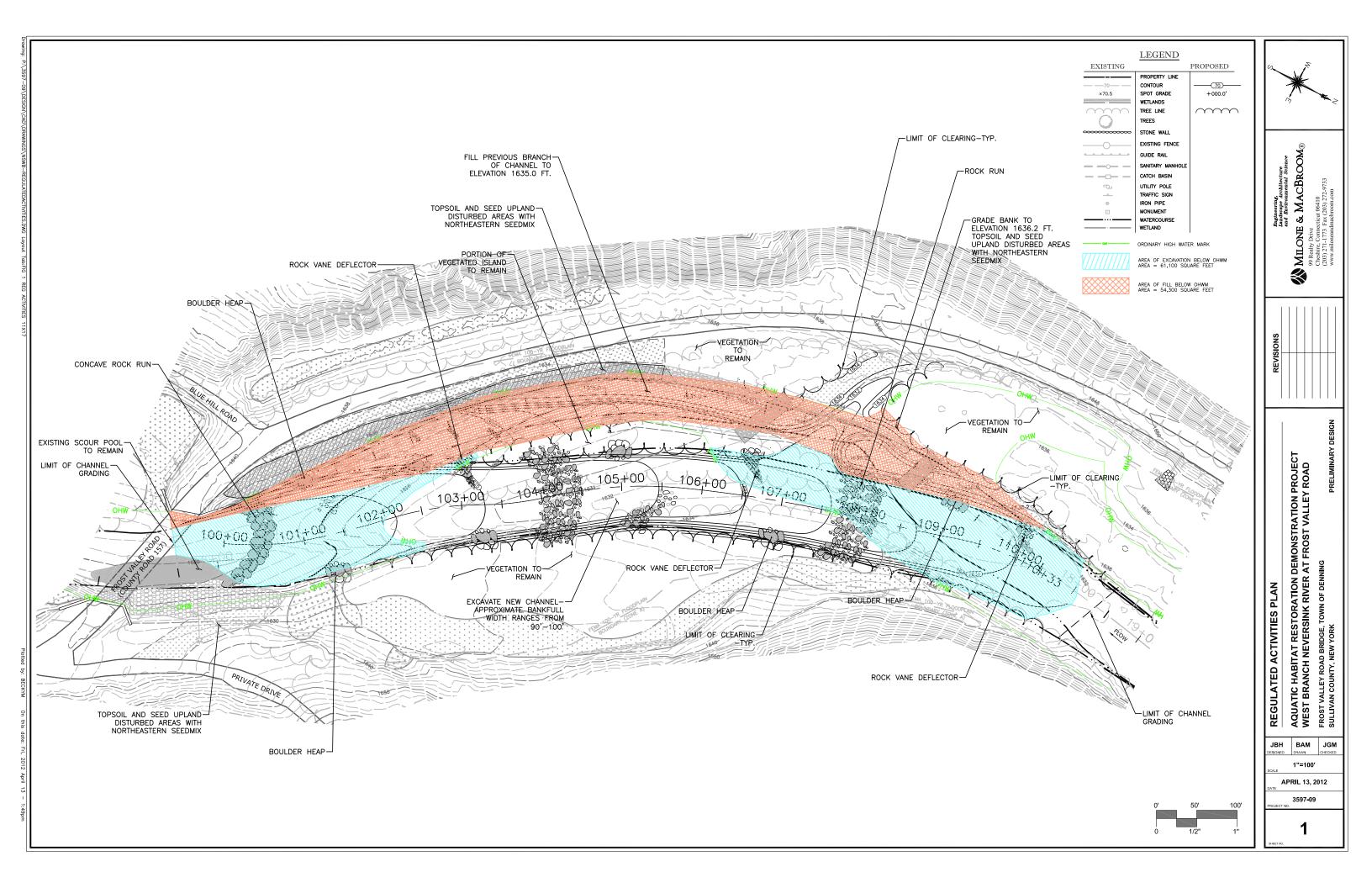
Tobey Hubbell, Site Manager

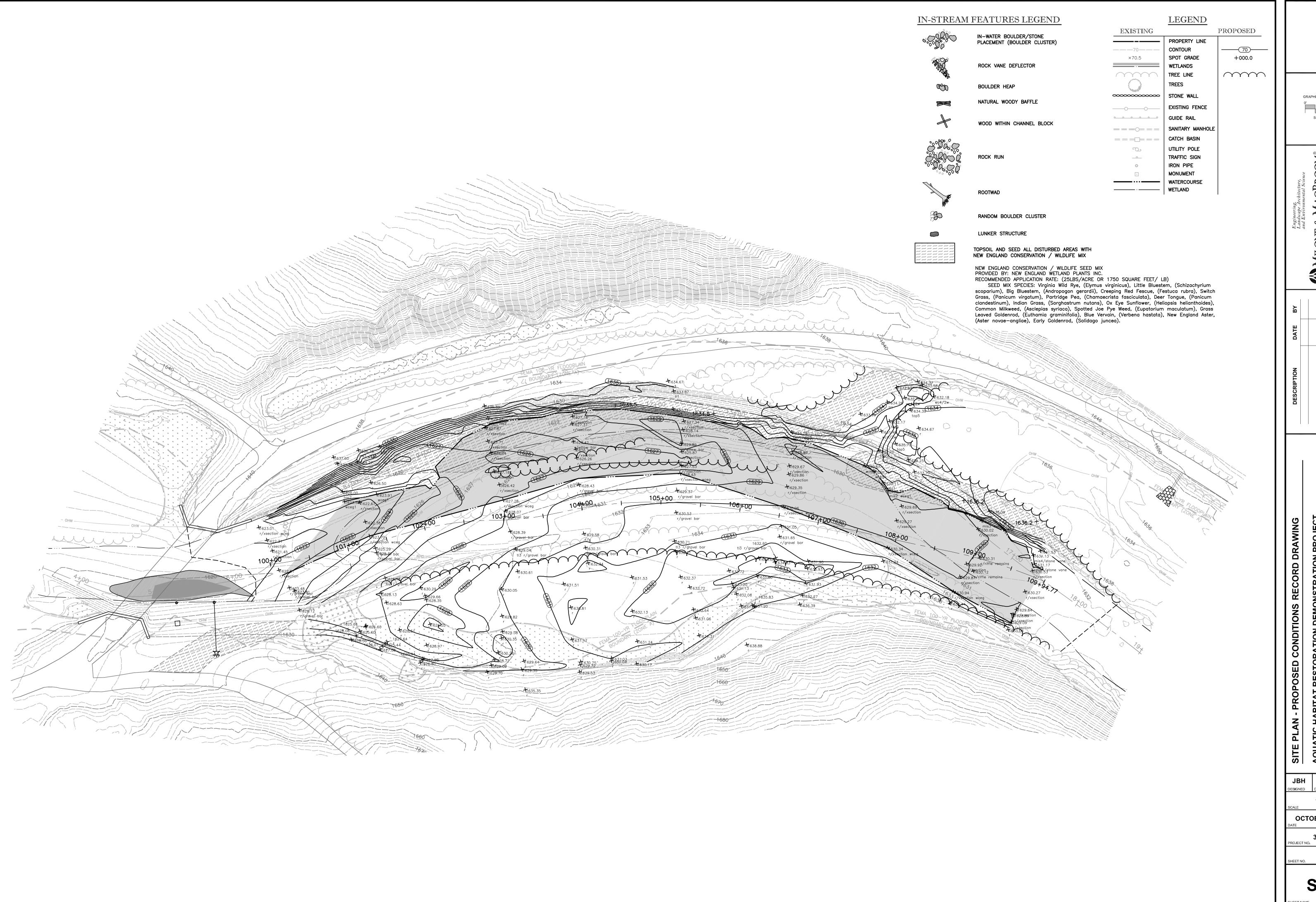
Rudd Hubbell, Predident

Burr Hubbell, Vice President

Selected Photos Vickers & Beechler







GRAPHIC SCALE (IN FEET) SCALE 1"=50'

AQUATIC HABITAT RESTORATION DEMONSTRATION PROJECT WEST BRANCH NEVERSINK RIVER AT FROST VALLEY ROAD COUNTY BRIDGE 187 AT COUNTY ROAD 157, CLARYVILLE SULLIVAN COUNTY, NEW YORK

DRM WAG
DRAWN CHECKED

3597-09 10F 1

SP-1

Photo Series: West Branch Neversink River Demonstration Restoration Project



Prior to construction of demonstration project, stream channel threatening embankment, no riparian buffer.



Immediately following substantial completion, buffer bench established, but not yet vegetated.



Looking upstream into project at substantial completion, but before revegetation of the floodplain bench, left.



Final channel inspection with engineers at substantial completion, looking downstream through project.



Water rising at project on September 18, 2012





Inundation of floodplain bench



High water and large woody debris at bridge



Following ~50yr flood, loss of significant bench material



Looking upstream from bridge



November 2012, remaining bench and revetment, prior to being interplanted

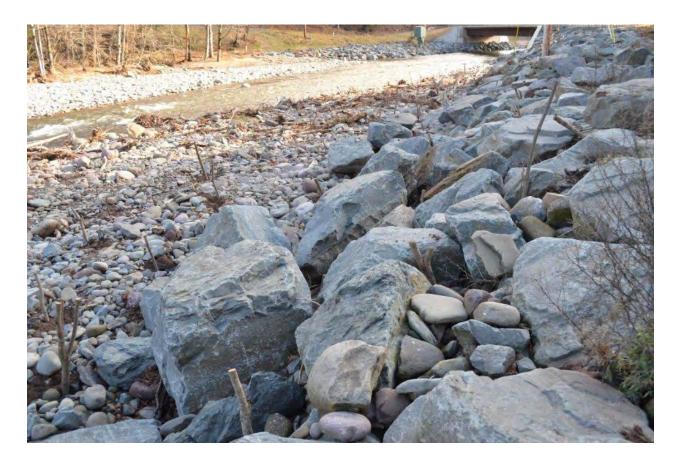


"The Stinger" being used to interplant willow posts into preexisting rip-rap









Revetment and bench after Stinger installation