

**Joint hearing of the Senate Environmental Resources and Energy Committee and  
the Senate Veterans Affairs and Emergency Preparedness Committee**

**Michael W. Lovegreen, Bradford County Conservation District & Upper  
Susquehanna Coalition Testimony**

**April 25, 2018**

Good Morning Chairmen, Senators, Representatives and Members of the Committee(s)

I appreciate and thank you for the opportunity to provide testimony on a topic that has been of primary importance to my career for the past 37 years.

By way of introduction, I had been the Manager for the Bradford County Conservation District for 33 years and am still associated with the District; Stream Team Leader for the Upper Susquehanna Coalition – a 20 County coalition of Conservation Districts in NY and PA that share their knowledge and expertise across County and even State lines to manage common resource issues; one of the original members of the Keystone Stream Team; member of the Chesapeake Bay Stream Health Work Group and the former chair of the Hydro-modification Work Group for the former DER Section 319 Non-point Liaison Group.

In my years of experience of assisting landowners and communities with natural resource issues, it is reasonable to state that these issues related to stream corridors rank as one of the highest concerns. Water quality issues aside, stream channel instability and flooding issues have significant impacts on the socio economic health of our constituents as well as directly affecting their safety and welfare. In developing Bradford County's Hazard Mitigation Plan, a survey of all our Townships identified flooding and stream channel erosion as the top concern. I can spend the next hour or so of your time detailing the various causes of this but for summary sake let me simply give you the short list of what I see as some of the top issues:

- Hydrology and hydraulics that create flashy runoff events complicated by changing weather patterns
- Topography and Geology that varies across the State creating regions with exceptional instability
- Watershed landscape modifications over our 200+ year history that has created dynamic channel instability in runoff responses
- Stream Corridor management often undertaken without sound understanding of the resource response and consequences
- Some regulatory structures that often create a cumbersome response to resource needs

In my tenure in Bradford County, there have been two major task forces assembled to address these issues in the Northern Tier of PA. Initiated through the leadership of then

Reps. Madigan and Baker and the Department of Environmental Resources in 1994 to 1995 and again by then Senator Madigan and Rep. Baker and the Department in 2005 to 2007. These task forces assembled nearly 30 individuals from Federal, State, County and Local agencies and government and met monthly on an extensive discussion of the issues surrounding stream corridor issues and possible solutions. The final reports from both studies identified common issues, concerns, and even solutions, including:

- *DEP should continue to review and revise regulations and procedures, where necessary, to simplify and speed up the permitting process, including a permit to authorize perpetual gravel excavation from critical locations (1995)*
- *The means to stabilize streams and the need to routinely excavate gravel and debris remain unresolved general issues. Best management practices specifically developed for the glaciated northern tier area should be developed to provide guidance for landowners and municipalities... (1995)*
- *An effective outreach and educational effort needs to be focused on the development of an awareness of the nature and response of streams in the region to decisions and actions of landowners and municipal officials. This would include such elements as stream morphology; the importance and roles of floodplains, stormwater management, and riparian areas. (2007)*
- *Municipal, Agency and other personnel involved in stream maintenance need to understand how to conduct such activities in an environmentally sensitive manner so as to minimize adverse impacts of such activities. (2007)*
- *An incentive program for the training of individuals that work with stream maintenance is recommended. This could be in the form of a pilot project in the region that could include such incentives as financial assistance similar to the State's Dirt and Gravel Roads Program, or expedited permit processing for those entities trained. (2007)*

One of the central acknowledgements in both studies, and one that is constantly reinforced by my experience, is that the true stewards of our stream resources are the individuals, farmers and communities that live and manage the areas in the Stream Corridor. And in utilizing the term "stream corridor" I am including the stream channel, stream banks, floodplain, riparian areas and upland contributions, all of which work in conjunction to provide stability. While legislation and regulation are somewhat effective, true resource management can only be achieved when individuals directly impacting the resource understand the workings and consequences of their actions.

The 2011 storms, once again hammered home the need to address the needs to find opportunities to address our stream resource needs other than business as usual.

It is to this goal that we have been applying our focus – that of providing both an understanding how the resource functions and how our actions impact on that function.

One of Bradford County's initial responses to the previous Task Force reports was to develop a set of teaching modules entitled "Environmentally Sensitive Management of Streams". While somewhat successful, it was difficult to provide incentive for individuals to attend the awareness training.

Our next step was to develop a team of "stream managers" at the County level to provide design and resource assistance to landowners and municipalities to address stream issues. With the support of County, State and Federal funding, this has been and continues to be a highly functional and successful program.

The one program that I want to take this opportunity to highlight is one entitled "Emergency Stream Intervention" or ESI. The program is meant to provide knowledge and tools to our first responders in cases of flood emergency to assist them in restoring stream function without adding adverse impacts as a result of uninformed excavation of the stream channel.

Recognizing that streams in similar setting of watershed, hydrology, etc., develop characteristics (morphology) that are similar and that provide stable functions of water and sediment transport. With this transport stability also comes habitat stability. Working with the USGS and their "Stream Stats" program, we have been able to develop sets of "regional curves" that approximate the dimensions of a stream channel in an identified region and watershed, along with its corresponding floodplain needs. In Bradford County we have refined this tool down to a County specific level. This essential tool provides a manner to deliver a rough version of the science and engineering needed to approximate stable channel dimension for any point along a stream. Combined with a full day of training to explain both "how a stream works and responds" with a full explanation of the tool's use, we believe we finally have an approach to begin that "cultural change" in how we manage our stream corridors that is understandable at the local level.

This ESI program was first initiated in the NYC watershed area in 2006. NY has fully endorsed the program along with the Army Corp of Engineers, providing funding and promotion. A number of us have been trained as facilitator trainers, including 3 of us in Bradford County. To date, I personally have conducted over 45 trainings throughout NY and several in PA, training over 1,600 individuals consisting of municipal officials and along with 25% agency personnel. Feedback has been unanimously enthusiastic indicating that we have hit upon an approach that is both understandable and applicable. One of my favorite anecdotes is after a presentation at a PSATS meeting an older township official approached me and stated that "they have been telling me for 30 years that I shouldn't be dredging the streams. After your presentation I finally understand why."

Program tools have been incorporated into local township mapping that identifies color coded location indicating watershed size and stream dimensions expected on one sheet or map. I've included an example in my written testimony. As I mentioned, this is an "emergency response" tool but conceivably may be considered as a "maintenance guidance" tool.

While acceptance in NY has been fairly universal, to be honest, it has been slow in PA. Currently the Bradford County Conservation District has National Fish and Wildlife Foundation funding to train the trainers and work with USGS to enhance the PA Stream Stats Program. That product is due to be on-line this summer.

In order to address the incentive question of why local practitioners should participate, we are working with DEP in an attempt to initiate an expedited permit process. Individuals would be eligible for the proposed expedited permit if they utilized the tools and trainings provided through the County and Conservation District in addressing stream channel needs.

While this is far from the solution needed to comprehensively address our Stream Corridor issues, it is one that begins addressing the knowledge and management needs of our communities and landowners/managers.

I've attached several pages to this testimony to help clarify some of the tools I've been referring to. I appreciate the time to appear before this committee and am willing to discuss in any length or detail, at any time, of any of this material.

Thank you.

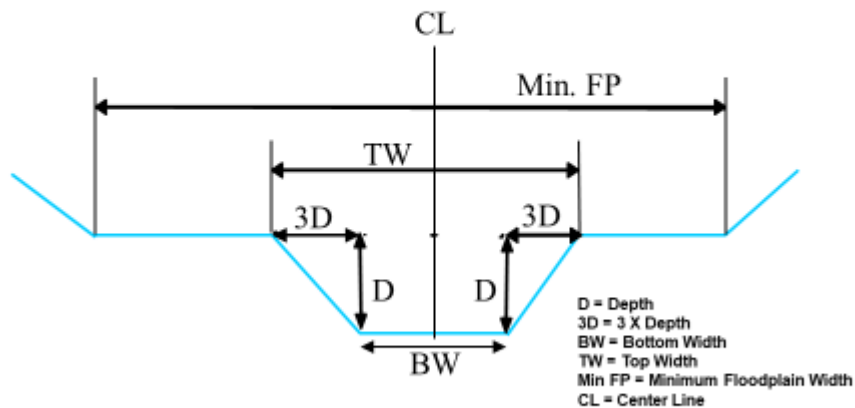
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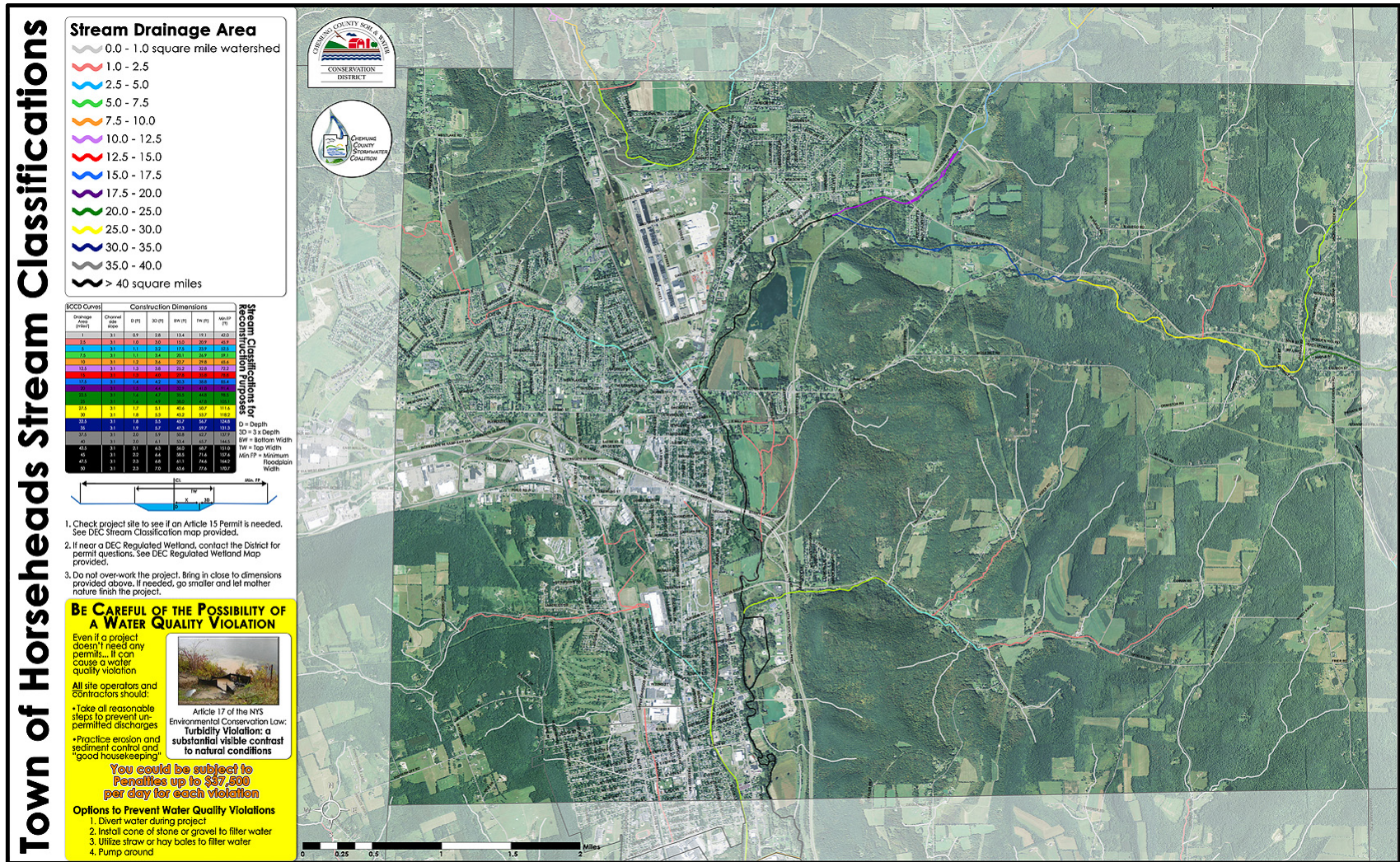
[www.u-s-c.org](http://www.u-s-c.org)  
<http://bccdpa.com/>

### Bradford County Stream Maintenance Curves/Tables

BCCD Curves				Construction Dimensions					
Drainage Area (miles <sup>2</sup> )	X-sect Area (ft <sup>2</sup> )	Width (ft)	Mean Depth (ft)	channel side slope	D (ft)	3D (ft)	BW (ft)	TW (ft)	Min FP (ft)
1	11.1	19.1	0.9	3:1	0.9	2.8	13.4	19.1	42.0
2.5	15.8	20.9	1.0	3:1	1.0	3.0	15.0	20.9	45.9
5	23.7	23.9	1.1	3:1	1.1	3.2	17.5	23.9	52.5
7.5	31.6	26.9	1.1	3:1	1.1	3.4	20.1	26.9	59.1
10	39.5	29.8	1.2	3:1	1.2	3.6	22.7	29.8	65.6
12.5	47.4	32.8	1.3	3:1	1.3	3.8	25.2	32.8	72.2
15	55.3	35.8	1.3	3:1	1.3	4.0	27.8	35.8	78.8
17.5	63.2	38.8	1.4	3:1	1.4	4.2	30.3	38.8	85.4
20	71.1	41.8	1.5	3:1	1.5	4.4	32.9	41.8	91.9
22.5	79.0	44.8	1.6	3:1	1.6	4.7	35.5	44.8	98.5
25	86.9	47.8	1.6	3:1	1.6	4.9	38.0	47.8	105.1
27.5	94.8	50.7	1.7	3:1	1.7	5.1	40.6	50.7	111.6
30	102.7	53.7	1.8	3:1	1.8	5.3	43.2	53.7	118.2
32.5	110.6	56.7	1.8	3:1	1.8	5.5	45.7	56.7	124.8
35	118.5	59.7	1.9	3:1	1.9	5.7	48.3	59.7	131.3
37.5	126.4	62.7	2.0	3:1	2.0	5.9	50.8	62.7	137.9
40	134.3	65.7	2.0	3:1	2.0	6.1	53.4	65.7	144.5
42.5	142.2	68.7	2.1	3:1	2.1	6.3	56.0	68.7	151.0
45	150.1	71.6	2.2	3:1	2.2	6.6	58.5	71.6	157.6
47.5	158.0	74.6	2.3	3:1	2.3	6.8	61.1	74.6	164.2
50	165.9	77.6	2.3	3:1	2.3	7.0	63.6	77.6	170.7
					D= Depth				
					3D= 3 x Depth				
					BW= Bottom Width				
					TW = Top Width				
					Min FP = Minimum Floodplain Width				

## Construction Design





# Upper Susquehanna Coalition Emergency Stream Intervention

## THE CHALLENGE

Unstable channels, excess sediment loads

UNRAVELED STREAMS



**SUSPENSION:** Fine, light material is carried along by the river

**SOLUTION:** Minerals are dissolved in the water. This is a chemical change

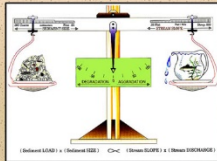
**TRACTION:** Large boulders and rocks are rolled along the river bed

**SALTATION:** Small pebbles and stones are bounced along the river bed

River bed

Streams transport both water & sediment

Healthy Stream



Healthy Balance

Stream Channel Stability Impacted by:

- ★ Lack of understanding of function
- ★ Lack of tools to aid local responders
- ★ Stream disconnect with flood plains through over excavation or berms
- ★ Excess sediment
- ★ Undersized stream crossing structures

Funded in part by NYS DEC and NFWF

## THE SOLUTION

Better management through better understanding

### Post Flood ESI Components

- ★ Education of local municipal officials, contractors, and agency personnel to stream function, causes of instability, impacts of improper maintenance
- ★ Introduce emergency response protocol that considers hazard priority and evaluation of stream channel function to transport water & sediment
- ★ Training in tools that utilizes USGS Stream Stats (NY), simplified tools and reference reaches to evaluate/reconstruct stream channel and reconnection to flood plain
- ★ Field demonstration of application
- ★ Utilization of methodology by flood responders to utilize non-traditional funding – emergency dollars – to address stream corridor rehabilitation

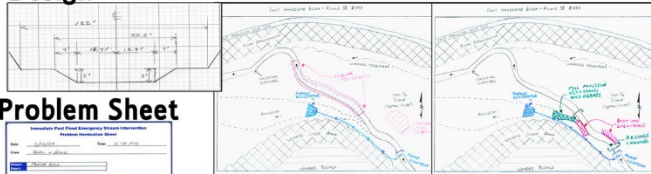
EDUCATION

### Training Options

- |  |   |                   |
|--|---|-------------------|
| 1. Training & Concepts Overview<br>45 - 90 min | 2. Professional/ Agency Training<br>4 - 6 hrs | 3. 3-Day Training |
|--|---|-------------------|

Enhancing the capacities of local managers and responders

TOOLS



**Geometry Table**

*Southern Tier Region*

*Bank Full Hydraulic Geometry by Drainage Area for Selected Hydrologic Region*

Drainage Area (Acres)	Construction Drainage			
	D	S	A	W
100	1.00	1.00	1.00	1.00
1000	1.50	1.50	1.50	1.50
10000	2.50	2.50	2.50	2.50
100000	4.00	4.00	4.00	4.00
1000000	6.00	6.00	6.00	6.00



For more information or to schedule a training contact USC at:  
[www.u-s-c.org/ESI](http://www.u-s-c.org/ESI)

## THE RESULTS

Better understanding through common sense practical training

CLASSROOM & FIELD WORK

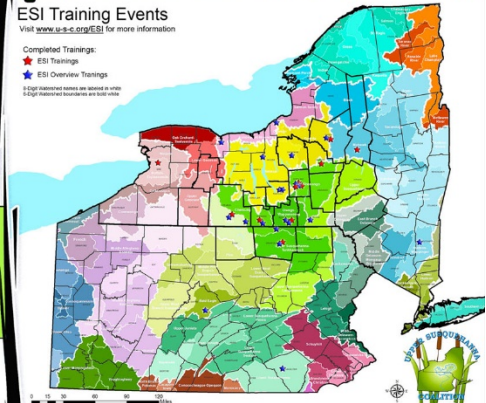
TRAININGS



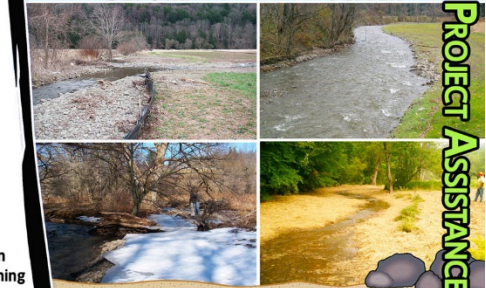
ESI Training Events  
Visit [www.u-s-c.org/ESI](http://www.u-s-c.org/ESI) for more information

- ★ Completed Trainings:
- ★ ESI Trainings
- ★ ESI Overview Trainings

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BEFORE AFTER



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