CBP STAC 2014 Proactive Workshop Proposal:

Re-plumbing the Chesapeake Watershed:
Improving roadside ditch management to meet TMDL water quality goals

Steering Committee Members:

Kathy Boomer – TNC, MD/DC Chapter
Rebecca Schneider – Cornell University
Norm Goulet – Northern VA Regional Commission; CBP Urban Stormwater GIT
Steven Bloser – Director, PA Center for Dirt and Gravel Roads
David Orr – Director, Cornell Center for Local Roads
Michael Slattery – USFWS, Chesapeake Bay Program
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Workshop Objectives:

- Share scientific evidence indicating impacts to regional surface water quality from ditches alongside low-volume, rural roads;
- Review CBP accepted best management practices to mitigate impacts from roadside ditches and also explore novel approaches to treating road runoff; and
- Outline additional policy and research and monitoring needs to enhance rural roadside ditch management.

***Description of Workshop Topics and Degree of Urgency*:**

Roadside ditches crisscross every watershed, and capture more than 20% of runoff from road surfaces and adjacent hillslopes. Each ditch acts as a high velocity "faucet", shunting water, soil nutrients, and sediment to our waterways. For example, in the Upper Susquehanna basin, roadside ditches contributed up to 15% of the total TSS and TP measured storm loads (Diaz-Robles 2007). Roadside ditches also act as rapid conduits for fecal coliform, moving runoff from concentrated animal feeding operations to downstream water supplies in just a few hours (Falbo et al. 2012). Across the Chesapeake Bay watershed, thousands of artificial channels more than triple the effective stream length. The rapid runoff significantly increases peak storm flows, reduces water quality, and also increases downstream flooding (Buchanan et al 2012). All of these impacts will be exacerbated by climate change, particularly by the increased frequency of high intensity storms already observed throughout the Northeastern US (Buchanan et al 2013).

Ditch management practices, however, have remained the same for nearly a century, and likely been overlooked as a key strategy to protect water resources (Schneider et al, in review). Town highway staff routinely "clean" or scrape ditches, resulting in hundreds of miles of exposed dirt that washes into streams during each storm, along with nutrients, deicers, and other road contaminants. Improved ditch management can provide a key a strategy to improving regional surface water quality and also enhancing resiliency to climate change. Promising 'modern' strategies range from simple hydroseeding and channel reconfiguration to more resource intensive solutions including bioswales, permeable asphalt, and under-road drain tubes. Given growing concerns both about degraded water quality in

the Chesapeake Bay and increasing storm intensities, there is an urgent need to consider re-plumbing the Chesapeake Bay watershed by identifying the best ditch management practices and simplifying the adoption process.

NY State Cooperative Extension workshops engaging nearly NYS 2,500 town highway staff(e.g. the on-the-ground implementers) consistently revealed that changing the policy and practices enforced by a century of momentum will require support from policy-makers at regional and state levels, who can allocate resources and funding, and also introduce regulatory mandates to mitigate impacts from roadside ditches. The proposed workshop would provide an opportunity to share information on this topic among a broad array of stakeholders, including federal, state, and level policy makers, watershed planners, public works and highway staff, and restoration specialists.

Workshop Products: The workshop will culminate with a report developed for local practitioners that includes a detailed overview of our understanding regarding impacts from roadside ditches, a summary of feedback concerning obstacles and potential solutions to addressing impacts from roadside ditches, and an outline of recommended next steps and strategies. In addition, the broad constituency targeted for the workshop will establish a network of practitioners committed to better managing Chesapeake Bay water resources.

Anticipated Sessions and Speakers (additional speakers will be added to finalize the agenda)*:*

I. Sizing up the Problem and Evaluating Opportunities:

- Zachary. Easton (VA Tech): Impacts from roadside ditches to watershed hydrology
- Mark Noll (SUNY Brockport): Roadside ditches increase TSS loads
- Mark Tomer (USDA ARS-Iowa): Nutrient loads linked to roadside ditches and ag runoff
- Dan Buckly (Cornell): Roadside ditches as conduits for fecal coliforms

II. Strategies and Estimated Costs for "Re-plumbing" our Watersheds:

- Rebecca Schneider (Cornell): Quick, cheap fixes with big impacts
- Steve Bloser (PA Center for Dirt and Gravel Roads): Disconnecting ditches – the pros and cons of infiltration basins, detention ponds, under-road drains, and constructed wetlands
- David Wick (SWCD – Warren Cty, NYS): Successful case studies
- David Orr (Cornell Local Roads): Cutting edge alternatives– permeable asphalt
- Bern Sweeny (Stroud Water Research Institute): Level lip spreaders

III. Linking Ditch Management Policies across Multiple Spatial Scales:

- Gary Shenk/Jeff Sweeny (CBP) Roadside ditches in the current and future TMDL management framework
- Shorna Allred (Cornell): Overview on Barriers to Adoption of Green Infrastructure

IV. Short Field Trip – (to nearby demonstration site)

Workshop Logistics:

Timeline: The workshop will be an ambitious effort to convene a diverse group of approximately 100 policy-makers, scientists, and practitioners in early October, 2014. A draft report will be ready for review and comment by workshop participants in late November, 2014 (60 days post-workshop), with the final report to be completed by late December, 2014.

Location: Harrisburg, Pennsylvania, to minimize travel distances for all participants.

***Requested Budget*:**

Item	**Estimated Cost**
Venue	$1,500
Lodging at $100/night for 50 participants (50 nights, total)	$5,000
Local Transportation for 50 participants at $100/trip	$5,000
Food	$1,500
Travel, lodging for steering committee to prepare report (2 days, 1 night)	$500
Total	$13,500

Additional potential fiscal partners supporting workshop: *Cornell University*

Previous related STAC funded workshops: The proposed workshop would build on previous efforts initiated by STAC and the CBP Local Government Advisory Committee to explore urban storm water programs (Exemplary Strategies to Protect and Restore Urban Watersheds: Preparing for the Chesapeake Bay TMDL and Watershed Implementation Plans, held May 13, 2010). This workshop will **shift the focus** from highly developed, urban areas to t**he intersection of development, agriculture, and timber harvest in rural settings, specifically to low-volume roads and associated drainage ditches**. Further, the previous workshop was conducted prior to the TMDL regulations; local policy-makers and practitioners had not stepped through the WIP process or begun defining strategies to meet mandated water quality goals. Participants in the 2010 workshop would be invited to this workshop with the hope that they would contribute their experience and insights gained since the 2010 meeting.

Literature Cited:

Schneider, R.L., and others. (in prep) Re-plumbing watersheds: consequences of roadside drainage on water resources..
Buchanan, B., and others. 2013. Modelling hydrologic effects of roadside ditch networks. J of Hy 486: 293-305.
Falbo, K., and others. 2013. Roadside ditches as conduits of fecal indicator organisms and sediment:. JEM 128: 1050-1059.
Buchanan, B.P., and others. 2012. Hydrologic impact of roadside ditches in an agricultural watershed in c. New York: implications for non-point source pollutant transport. Hydrologic Processes. [doi: 10.1002/hyp.9305] (online May 2012)
Diaz-Robles. J. 2007. Evaluation of the effects of ditch management practices on suspended sediment, bedload and dissolved chemical contaminants transported to downstream receiving waters. Ms. Thesis. Dept. Civil and Environmental Engineering, Cornell University.